Neighborhood Centers, Inc.

Preliminary Energy Assessment

July 29, 2010

Prepared for:

Neighborhood Centers, Inc.

Houston, TX

Prepared by:

Nick Steinbuck, E.I.T.
Chad Nobles

SIEMENS INDUSTY, INC.
8850 Fallbrook Road
Houston, TX 77064
Telephone: (281) 949-3000
Fax: (281) 949-3100

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Preliminary Energy Assessment

As a follow up to the discussions between Siemens Industry (Siemens) and Neighborhood Centers, Inc (NCI), Siemens has conducted a walk-through assessment of three NCI properties. The properties visited include:

- Ripley House Community Center & Charter School
- Harbach-Ripley Community Center & Charter School
- Cleveland-Ripley Community Center

These site visits were performed on Friday, July 9, 2010 by Siemens engineer, Nick Steinbuck. Also present on this day was the Director of Facilities, Bob Basye; Facilities Manager, Michael Metzler; and Facilities Staff, Sonny. Siemens would like to thank all three of these gentlemen for the opportunity to conduct these site visits and for all of the insight in regards to facility operations. Siemens would also like to thank Katherine LeBlanc for her help with coordination and data compilation.

Although only three facilities were visited, Siemens was provided utility data for fifteen properties managed by NCI. Aside from the corporate headquarters and the Ripley House, the remaining thirteen facilities are small in size and are very similar to one another. Based upon insight from NCI personnel, Siemens has concluded that Harbach-Ripley and Cleveland-Ripley are typical facilities and that they fairly represent the remaining facilities. In the report to follow, Siemens will describe applicable energy conservation measures and will analyze the utility data provided for the following facilities encompassing over 287,000 square feet.

- Albury Head Start – 11125 Albury, Houston, TX (6,500 sq. ft.)
- Cleveland-Ripley Community Center (CC) – 720 Fairmont, Pasadena, TX (16,000 sq. ft.)
- Cook Road Head Start – 6959 Cook, Houston, TX (14,106 sq. ft.)
- Corporate Office & Freedom Station Head Start – 4500 Bissonnet, Bellaire, TX (76,422 sq ft)
- Gulfton Promise Head Start – 6515 Rookin, Houston, TX (11,500 sq. ft.)
- Harbach-Ripley CC & Charter School (CS) – 6225 Northdale, Houston, TX (16,000 sq. ft.)
- Independence Heights CC– 205 W. Crosstimbers, Houston, TX (10,860 sq. ft.)
- Klein Early/Head Start – 6447 Prestwood, Houston, TX (8,100 sq. ft.)
- LaPorte CC – 526 San Jacinto, LaPorte, TX (15,150 sq. ft.)
- New Horizon Early/Head Start – 6565 Rookin, Houston, TX (11,500 sq. ft.)
- Ripley House CC & CS – 4410 Navigation, Houston, TX (65,000 sq. ft.)
- Sharp ECOC – 4202 Reed, Houston, TX (8,000 sq. ft.)
- Sharpview Head Start – 12280 Sharpview, Houston, TX (13,500 sq. ft.)
- Spring Branch Head Start – 9655 Lon Point, Houston, TX (15,000 sq. ft.)

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- Tsanoff – 340 N. Sidney, Houston, TX (18,480 sq. ft.)

Total building area: 287,638 square feet

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Utility Data Analysis

In order to measure the overall efficiency of the selected facilities, Siemens normalized each facility's energy use and compared each to a regional average. Each building was normalized by summing twelve months of energy usage including electrical and natural gas utilities and divided the total by the facility area. This normalized data is the energy use index (EUI) and is in units of British thermal units per square foot (energy per square foot). The EUI is compared to a regional average for similar functioning facilities. The regional average data presented is from the U.S. Department of Energy's Energy Information Administration's most recent Commercial Buildings Energy Consumption Survey (CBEC 2003). In the following table, each facility is compared to the national averages. Since these numbers are a direct representation of a buildings energy use, a lower number represents less energy use and vice-versa for a larger number. Moreover, if the facility performance is less than the region 5 mean, then the facility consumes less energy than most facilities with similar functions.

Energy Use Index

Facility Name	Facility ID	Facilitiy Performance (Mbtu/sq ft)	CBECs Region 5 Mean (Mbtu/sq ft)	Predicted New Facility Performance (Mbtu/sq ft)
Albury Head Start	11125	59	76	48
Cleveland-Ripley Community Center	720	321	76	257
Cook Road Head Start	6959	67	76	53
Corporate Office & Freedom Station Head Start	4500	98	70	79
Gulfton Promise Head Start	6515	83	76	66
Harbach-Ripley Community Center and Charter School	6225	292	76	234
Independents Heights Community Center	205	188	76	150
Klein Early/Head Start	6447	268	76	214
LaPorte Community Center	526	211	76	169
New Horizon Early/Head Start	6565	100	76	80
Ripley House Community Center & Charter School	4410	338	76	270
Sharp ECOC	4202	395	76	316
Sharpview Head Start	12280	47	76	37
Spring Branch Head Start	9655	63	76	50
Tsanoff	340	104	76	83

Although comparing existing utility data to a regional average serves as a decent baseline comparison, there are still several variables which affect this data. Many of the facilities presented above are very small and have functions ranging from office space to gymnasiums. Due to the limitations of CBECs data, it is near impossible to have a

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completely fair comparison of data in facilities with such a broad range of utilization. Siemens predicts savings on the order of twenty percent in each facility; however these values may vary slightly depending on the complexity of each facility. In more sophisticated facilities, the opportunity for savings may be limited whereas older and less sophisticated facilities may provide significantly more opportunity.

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Billing Structure

The following table summarizes the utility cost and usage to NCI for the billing period of June 2009 through May 2010. The appendix shows a complete breakdown for each facility.

Annual Energy Cost		
Electrical	Natural Gas	Water/Sewer
$814,560	$32,900	$67,463
Annual Energy Consumption		
kWh	CCF	kgal
7,786,972	30,181	7,742
Average Energy Rates		
$/kWh	$/CCF	$/kgal
$0.105	$1.09	$8.71

In the following table are the rates that Siemens has determined NCI is paying for utilities. Electricity is treated as a blended rate although it is actually billed per kWh as well as per kW. Combining the two of these represents a more accurate cost to NCI.

The water rates are not a function of the bills Siemens received from NCI. The water rates are taken directly off of the associated City website for each of the listed cities. Because NCI has property in each of the four cities, they will be billed at the corresponding rate. Because the majority of water use is in Houston, the average rate above is very close to the published Houston rates. The additional cost in the average is due to the base charges that are incurred in addition to the volumetric charges.

Energy & Utility Rates		
Electricity	$0.105	per kWh
Gas	$1.09	per MMBtu
Bellaire Water	$3.50	per kgal (75+ kgal)
Bellaire Sewage	$2.40	per kgal
Houston Water	$3.56	per kgal
Houston Sewage	$5.04	per kgal
LaPorte Water	$2.98	per kgal (up to 8 kgal)
LaPorte Sewage	$3.00	per kgal (after 2 kgal)
Pasadena Water	$4.50	per kgal (40+ kgal)
Pasadena Sewage	$4.00	per kgal (40+ kgal)

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Facility Improvement Measures (FIMs)

The table below summarizes the FIMs Siemens has preliminarily identified.

Typical FIM Payback

Facility Improvement Measure	Simple Payback (Years)
Lighting Efficiency Improvements	5-6
HVAC Equipment Upgrades	12
Energy Management Systems	10
Plumbing Fixture Improvements	3-5
Irrigation Equipment Improvements	8-10
Solar Window Film	10-12
Vending Miser	3-5
Rain Water Harvesting	15+
Solar Photovoltaic	15+

LIGHTING EFFICIENCY IMPROVEMENTS

In recent years, significant improvements in lighting systems have been made readily available by the introduction of electronic ballasts, T8 and compact fluorescents lamps and LED exit signs. Electronic ballasts are the next generation of ballasts for fluorescent lamps. These ballast offer "flicker free" operation, generate less heat and operate more efficiently than the previous technology of magnetic ballasts.

Fluorescent T8 lamps are the next generation of T12 lamps. These T8 lamps can be directly substituted in most T12 installations provided the ballasts are also changed from a magnetic to an electronic type. T8 lamps offer longer life cycle operation, up to 36,000 hours at 80% of the 40W T12 lamps. These lamps also operate more efficiently and maintain more than 90% the initial lumen output while a T12 in the same application will experience a 15% loss of light output.

The compact fluorescent lamp (CFL) has made a tremendous impact on energy conservation as a direct replacement for incandescent lamps. In most cases, incandescent lamps are replaced with compact fluorescents one fourth the size (Watts). Typical incandescent lamps have an average rated life cycle of 2,000 hours while a suitable replacement CFL is 12,000 hours.

LED exit sign lighting technology has been the first proven application of the use of LED technology in occupied buildings. Traditional exit signs are powered by incandescent or florescent lamps with input Wattage as high as 40 Watts; furthermore, these fixtures operate continuously. Because of the extensive run time on the lamps, these lamps often fail within 1 year of installation, thus requiring frequent replacements. Most often, LED signs used to replace incandescent/fluorescent exit signs only require 2 Watts of power which is a 95% reduction in energy usage. Because LED life cycles can easily last 20 times longer than incandescent, these require minimum maintenance in replacing burned out lamps.

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In specific applications, many lighting systems can further benefit in efficiency performance by the use of occupancy sensors. Occupancy sensors monitor the lighted space for human occupancy and if no occupancy is detected, the lights are automatically turned off to conserve energy. Due to the critical design requirements for a successfully implementation of sensor technology, it is not recommended that sensors be installed in all areas. For areas suitable for occupancy sensors, it is highly recommended that proper selection of sensor technology and location be carefully evaluated in design prior to implementation.

EXISTING CONDITION

The majority of the facilities appear to be lighted via 32W T8 fluorescent lamps, yet certain facilities still contain T12 lamps as the primary light source. Although most facilities were retrofitted to T8, certain areas within each facility appear to have been left out and still contain T12 lamps. These were most likely left out due to low run hours; however with T12 lamps ending production in 2012, the need to eliminate all T12 lamps is becoming imperative. No occupancy sensors were observed to be in place.

It appears as though there will be several gymnasiums throughout the properties. Of the facilities visited, the gyms were lighted with both metal halide (MH) and high pressure sodium (HPS) lamps. These systems have a long relamp (sometimes referred to as warm up) time which does not allow for the lights to be switched on and off efficiently.

In numerous instances, emergency exit signs are still lighted via incandescent and fluorescent lamps. There are various incandescent lamps which are out of date.

There are also parking lot lights and floodlights on top of each building which appear to be older style MH lighting. In the facilities visited, these systems are on a time-clock to ensure that the lights only operate when dark. Entryways and walkways were lighted via high HPS lamps in certain instances. These lights remain on 24/7 for security reasons.

There was also a lighted baseball field and a lighted basketball court outside. The fixtures on the baseball field are most likely 1500 Watt MH lamps. The poles are old and wooden with underground wiring. Although the field was not observed with the lights on, the general appearance of the lighting system implies that the lamps are not efficiently aimed on the field. It was reported that the lights are turned on and off as necessary. The

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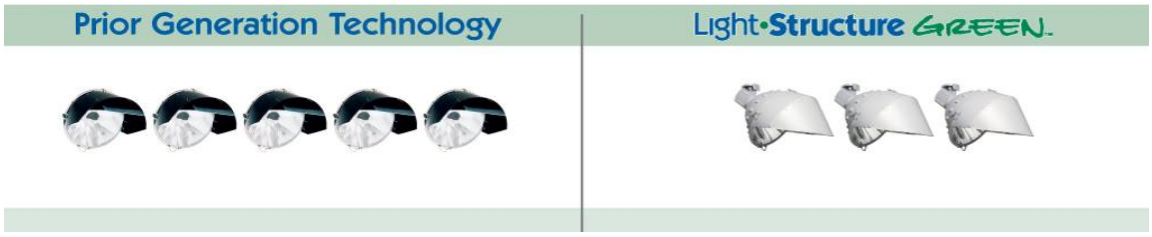
basketball court was covered and was lighted by MH fixtures which are most likely 1000 Watt lamps. This system has a time-clock near the court which ensures that the lights are only operating when appropriate.



RECOMMENDED SCOPE OF WORK

Siemens recommends maximizing energy efficiency by converting all fluorescent fixtures to linear fluorescent lamps with electronic ballasts. T-8 and T-12 fluorescent lamps should be replaced with 28 Watt, T-8 fluorescent lamps. Magnetic ballasts should be replaced with electronic ballasts. Siemens also recommends installing specular reflectors in select locations in order to improve light levels. Siemens also recommends installing occupancy sensors in several other locations, including offices, hallways, restrooms, etc.

Converting the indoor metal halide lighting to linear fluorescent will significantly reduce energy consumption. This enables the connected fixtures to be automatically controlled by occupancy sensors. In another effort, it is recommended to replace all non-LED emergency exit signs with LED lamps.

The parking lot lights and flood lights can also be replaced with lower wattage lamps in many instances. Due to the advancements in the industry, sufficient light levels can still be reached with new, lower wattage lamps.

The sports fields can be addressed via a new lighting system. Depending on the existing conditions at each field, the system can include poles and lamp heads or just the lamp heads. If the poles are old, wooden poles, it is recommended to replace the entire system. In either case, the new system can be properly aimed to ensure that light levels are properly maintained to meet sufficient light levels at each part of the field. In addition to improved light levels, these systems can also significantly reduce energy consumption by improved use of lighting.

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Another major benefit of many of these types of systems in the controls included. These systems can be automatically turned on and off from a remote location or can be scheduled to do so. As a major manufacturer, Musco lighting systems offer all of the above as well as a 25 year guarantee on the complete system and 10 years on just the lamps. Included in this warranty is spot maintenance, group relamps, and guaranteed light levels. This majorly reduces the man power required to replace a lamp atop a 300 foot pole.

For this type of project, Siemens will typically generate a room by room audit including all fixture types and quantities in the entire facility as well as the proposed retrofit. Similar to this, Siemens can also provide an audit of the outdoor fixtures as well as indicate how they are controlled. Siemens ensures that all lighting retrofits proposed will meet or exceed IESNA guidelines. Upon acceptance of a project, Siemens will also schedule and coordinate with each facility to perform lighting upgrades in a non-intrusive manner.

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HVAC EQUIPMENT IMPROVEMENTS

Existing unitary HVAC equipment (split systems or packaged units) may be operating at low energy efficiency due to the outdated technology as well as the performance degradation due to use. This facility improvement measure (FIM) consists of replacing the low efficiency HVAC units or units of poor condition with new, energy efficient units, resulting in considerable energy savings, as well as enhanced reliability.

EXISTING CONDITION

Based upon the site visit, Siemens assumes that both of the larger facilities are cooled via air-cooled chillers and that the smaller facilities are cooled via split systems are unitary packaged systems.

The chillers inspected appeared to be in functioning condition although one of the chilled water pumps was recently replaced. The air handling units also appeared to be in good condition.

In the smaller facilities, the condition of the split systems inspected varied. In many instances, Siemens presumes that these units will be old systems that have trouble operating on a day to day basis. The poor functionality of these systems not only costs man hours to repair these units, but the degraded efficiencies also waste significant amounts of energy.

In the facilities observed, heating was provided via a hot water boiler. Even in the smaller facilities, hot water was cycled through a fan coil shared with the split system. Although all boilers inspected were old, rusted units, it was reported that there were no issues with any of the heating systems.

RECOMMENDED SCOPE OF WORK

Siemens recommends maximizing energy efficiency by replacing all out of date split systems and unitary packaged systems. The replacement of the condensing units is a simple swap out which requires minimal to zero custom fabrication. Because of this, the replacement of these units can be performed with minimal interruption of service. For units with natural gas heating, Siemens recommends replacing these units with premium efficiency unitary packaged air conditioning units with natural gas heating. It is also recommended to replace all units utilizing electric strip heat with premium efficiency

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heat pumps with an electric heat supplement. All replacements shall cohere to ASHRAE Standard 90.1-2007.

The chillers can also be replaced; however this should not be done unless they are beginning to deteriorate. Although significant energy savings will be realized, it does not make sense financially to replace a chiller with useful life remaining. Same theory shall be applied to the boilers. Although modern boilers can provide significant savings on a large scale, the size of these boilers limits the amount of energy savings that can be achieved. If the units are old and have trouble functioning properly, then savings can justify replacement of either a chiller or boiler, however a portion of these savings must consist of the reduced maintenance associated with a new unit.

In general, Siemens initial assumption is that there will not be any air handling units in these facilities that warrant replacement. However, during a detailed audit of each facility, Siemens will determine if this initial assumption holds true or if some units needs to be replaced. Typically, these types of units are better addressed with an energy management control system. This recommendation is addressed in the following section.

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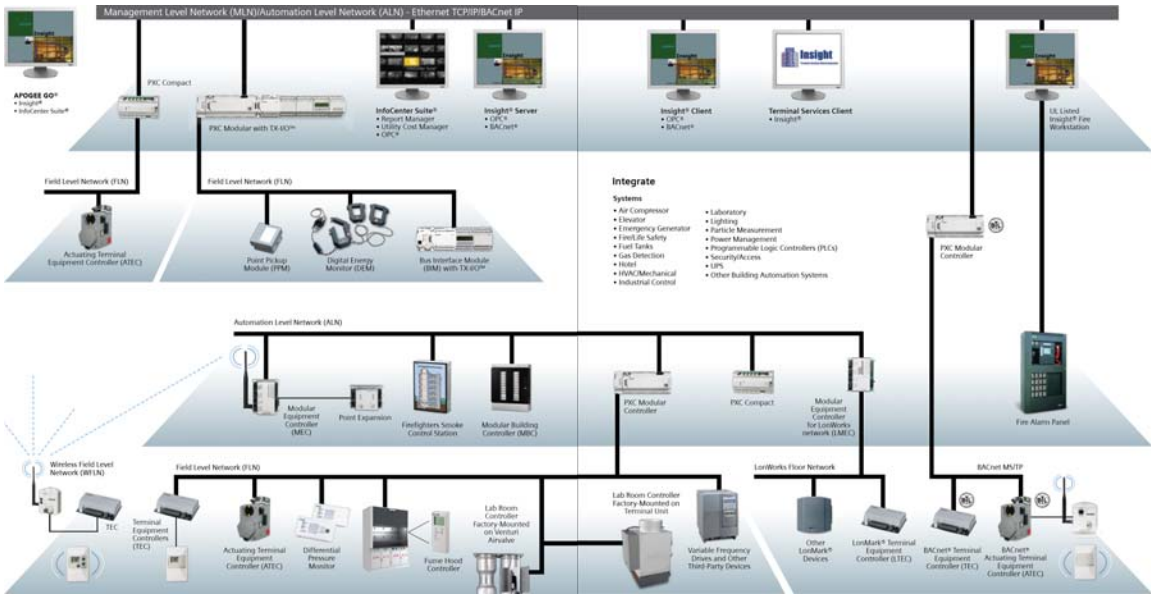
ENERGY MANAGEMENT CONTROL SYSTEMS

The function of an energy management control system (EMCS) (sometimes known as Direct Digital Controls – DDC) is to integrate the building HVAC systems for optimal control. Some of the benefits of an EMCS are:

- Centralized control;
- Capability to remotely monitor and change the building's environmental parameters;
- Enhanced functionality, such as night setback and optimal start/stop of HVAC units;
- Improved working environment and occupant comfort.

In buildings without an EMCS, HVAC systems are typically controlled by individual thermostats (some programmable, some not). Building occupants or maintenance personnel have to routinely set the HVAC cooling/heating mode. Even with programmable thermostats, the night setback function is generally not used properly, and often bypassed by occupants. Also, since the different HVAC systems are not integrated, it is possible for one system to work in cooling mode, while another is in heating mode, thus wasting substantial amounts of energy while fighting each other. An EMCS can produce considerable energy savings by implementing a well-designed plan to schedule equipment, as well as control space temperature set points properly according to time of day, day of the week, and around special events and holidays.



In addition to this improved control, there are several additional features that can also be implemented with an EMCS. A highly practiced measure called Demand Control Ventilation consists of installing carbon dioxide (CO_2) sensors in the HVAC system. The control system will monitor the CO_2 levels in the air and adjust outside air accordingly. By

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reducing the amount of outside air taken into the building, the cooling load is reduced leading to a significant reduction in energy use.

Similar to CO_2 sensors, the HVAC system can also make use of the occupancy sensors used in the lighting system. Just as done with the lights, the sensor will send a signal to the EMCS to notify when the room is occupied or unoccupied. There are several different options that can be implemented in unoccupied mode. Typically, the temperature will be set back in the space to a point where the room will be able to respond in a timely manner when an occupant enters the space.

EXISTING CONDITION

It appears as though the extent of controls in each building will vary. In the three buildings audited, there were three different control systems. One facility contained an old control system, another facility contained a 3 to 4 year old system by Johnson Controls (JCI), and the other facility did not have a control system.

The old control system appeared to be that of a small independent manufacturer and was maintained by TD Industries. The system had electronic control valves on all chilled water and hot water coils as well as all air dampers. The system could only be viewed locally and it did not appear to have a schedule implemented.

The JCI system appeared to be in good shape although it could only be viewed locally. It was reported that the system was on a schedule although the system did not appear to have a local override. The thermostats did not allow local temperature control. All control valves were electronic.

In the facility with no controls, the HVAC system was controlled locally. Each unit is individually controlled with no indication of the status of all other units. It appeared as though each fan coil was on an old time clock although the functionality of each is questionable.

Throughout all facilities it appeared as though the existing control systems were used for nothing more than temperature control. There are several additional functions of a basic control system that are available, yet are not implemented. Some of these energy savings functions were listed in the section above.

SCOPE OF WORK

Siemens recommends installing communication devices throughout each of the facilities along with a shared platform at the facility headquarters. There are several different protocols that can be used for communications; however the end product will be the

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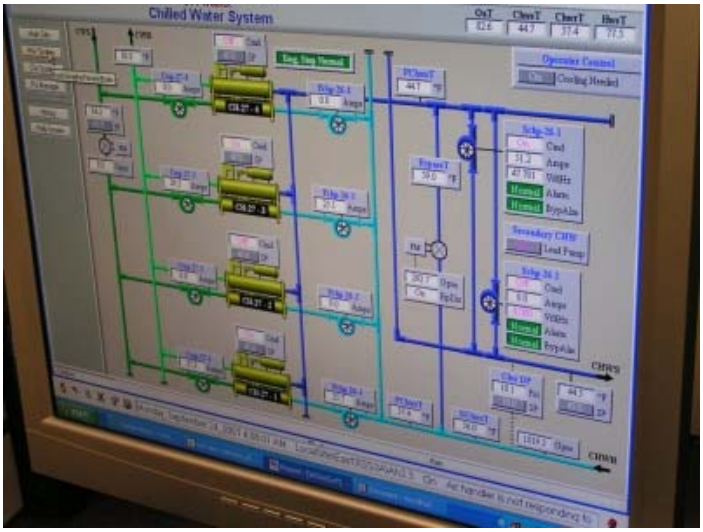
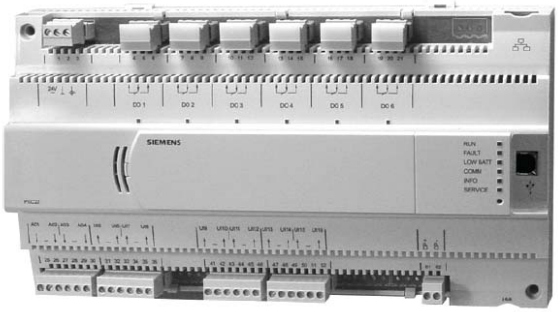
same for each. The systems in each building shall be installed with a software package that allows for the system to be monitored and controlled from a remote location.

There are many DDC control systems on the market today. Siemens will work with NCI to determine which system best fits the needs of NCI's facilities and staff. Siemens suggest that NCI attempt to integrate all facility control systems, no matter the manufacturer, into a single platform with equipment that is current in technology offerings. In addition, this control system should be backwards compatible; meaning that if certain pieces of the system require replacement, the whole system does not need to be upgraded. This ensures a longer, more cost effective product.



For example, the old system at the Ripley House, Siemens would recommends reusing the existing wiring and replacing the controller. This new controller would allow for an upgraded graphical user interface and for more accurate control, potentially including CO_2 sensors where applicable.

In each facility, Siemens recommends that all controls sequences be reviewed and revised as necessary. It is essential to ensure that all equipment is optimally scheduled so that it only operates as needed. In addition to scheduling, CO_2 sensors shall be implemented to eliminate any excess amounts of outside air. It may also be possible to tie the occupancy sensors into this system; however this must be approached on a more specific basis. Some systems may just need re-commissioning to ensure proper programming and functionality of the existing controls.



Siemens also recommends ensuring that the chillers are properly monitored and controlled. With a modern control system, the efficiency of the chilled water system can be dramatically increased through the implementation of proper controls sequencing. In additional to this, the life of the equipment can be increased through proper cycling of the primary and secondary chillers.

For unitary packaged rooftop units and split systems, Siemens recommends installing basic control systems with on-off capabilities. This will allow for these units to be shut off during unoccupied hours resulting in reduced annual run hours. Using sophisticated

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control systems can also limit the temperature variance at the thermostat allowing for the temperature set points to be set at the management level.

For space temperature sensors, Siemens typically recommends that there is no display, and in some cases not even a slider bar that would allow for occupant adjustments, since these features can cause unnecessary perceptions of space temperature or overrides. However since the system will be scheduled to shut off at night, it is highly recommended that an override function be provided. On most manufactures sensors there is a button on the sensor that can be pushed to allow the system to operate for a set period of time (typically programmable in length of time such as 2 hours).

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PLUMBING FIXTURE UPGRADES

Water and sewer costs can be a large component of annual utility costs. Water-conserving equipment has been developed and improved in recent years. High quality, water-conserving fixtures, aerators, and ultra low flow pressure-assisted water closets and faucets are some of the water conserving devices that are currently available. A reduction in water consumption not only reduces water and sewer costs but also reduces energy costs used to generate heating water.

EXISTING CONDITION

Currently, the toilets examined throughout the facilities included a variety of different commercial flush-valve type toilets. The majority of the toilets examined were older 3.5 GPF toilet china and 3.5 GPF diaphragm type valves. These valves most likely exhibit flush rates in excess of 3.5 GPF on low flow china which is common with diaphragm type valves as the internal components begin to deteriorate.

Most of the urinals examined consisted of 1.6 GPF urinal china and 1.6 GPF diaphragm type valves that exhibited flush rates in excess of 2.0 GPF.

Currently, the faucets examined during the walkthrough inspection contain aerator type flow controls. A wide variety of aerator flow rates was examined during the site walkthrough, including primarily 2.2 GPM aerators with a few 0.5 GPM and 1.0 GPM types mixed in randomly.

SCOPE OF WORK

Siemens recommends replacing all existing 3.5 GPF commercial flush valve toilets with new 1.28 GPF vitreous high efficiency toilets (HET) and any diaphragm-type valves should be replaced with 1.28 GPF piston valves.

Urinal china does not need to be replaced. All urinal valves are recommended to be replaced with new 1.0 GPF piston valves. The piston valves contain a set screw that will allow them to be dialed down to 0.75 GPF, so that urinal savings can be maximized.

Siemens recommends retrofitting all lavatory faucets that do not already contain them with 0.5 GPM aerator flow controls.

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IRRIGATION IMPROVEMENTS

Irrigation water and sewer costs can be a large component of annual utility costs. Because sewage costs are based upon water usage, irrigation systems are unnecessarily charged for sewage. By sub-metering irrigation systems, NCI can be credited any necessary sewage fees. In addition to this, irrigation systems are commonly found to be utilizing treated water whereas rain water or other sources of untreated water are sufficient for irrigation.

Modern day irrigation systems provide many improvements to overall turf management and water consumption. Control systems, moisture sensors, and accurate placement of nozzles are key to operating an efficient irrigation system. Installation of weather based web controllers, allow for efficient operation and watering schedules. These central controls have the ability to collect and disseminate daily weather information so that water savings can be maximized. The systems are set up so that weather information (ET-EvapoTranspiration) is automatically sent to each controller daily from an onsite weather station. Once information is received, the controller intelligently modifies the scheduled runtimes to meet turf demand. The controller may also initiate a “rain shutdown” if it has determined that the rain fall on site has provided adequate precipitation.

There are several sensors that can be implemented within the system which will send the system into alarm mode in the event of certain equipment malfunctions. By having remote capability over each system, a specific zone can be immediately shut off in the case of an alarm.

EXISTING CONDITION

Throughout the facilities visited, it appeared as though irrigation systems will be placed sporadically to allow for the artificial watering of sports fields and surrounding plantation. It appeared that the entire system consisted of a time clock to tell the system when to water and for how long. No soil moisture sensors were noticed and the nozzle types appeared to make poor use of the water. By looking at the plantation, it appeared as though several areas were under watered due to the brownish color of the grass and other areas appeared to be over watered. This implies a deficiency in the watering system which would be corrected through the implementation of a modernized irrigation

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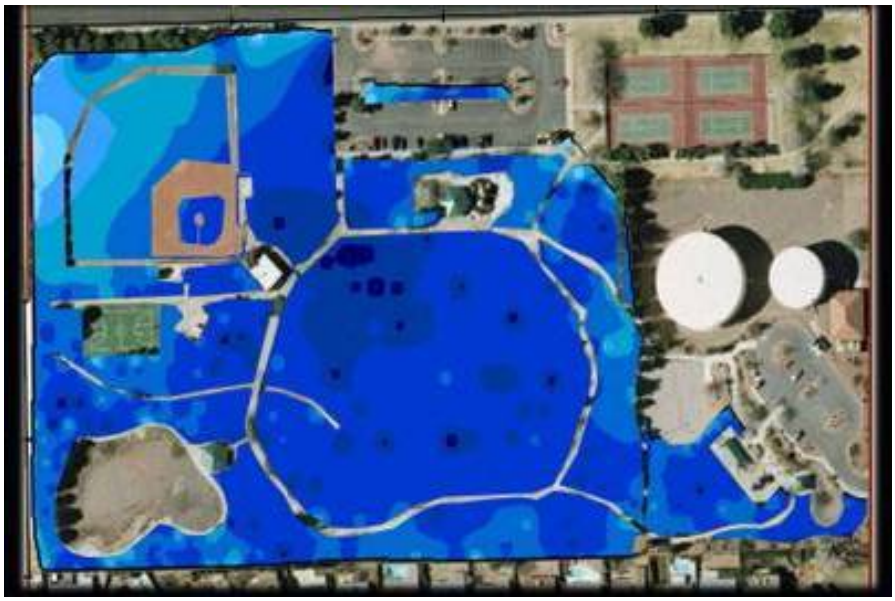
system, addition or correction of watering zones, or re-comissioning of the existing systems. Irrigation water also appeared to be treated water which could be possible be replaced with harvested rain water.

SCOPE OF WORK

The irrigation systems at the facilities present significant opportunities for improvement, including modernized controls and distribution upgrades. Several key components of an improved system are pictured below. The ability to gather distribution uniformity data with soil moisture probes and GPS allows Siemens to image each location to evaluate the performance of the existing systems design. The graph below details the natural versus artificial rain fall and what the soil moisture requirements actually are. We would also recommend tying the local Houston weather station to the national weather service for predictive analysis and scheduling adjustments if there is a likelihood of rain within a 12-24 hour period greater than 50%.

The picture below shows the irrigation water distribution on a typical sports field. Upon a detailed investigation of the irrigation system, Siemens will create such a map and use it in order to document any areas that appear to be either over or under watered. After the installation and commissioning of a new system, the map below would depict a uniform water distribution by exhibiting a constant blue color across the entire irrigated area.



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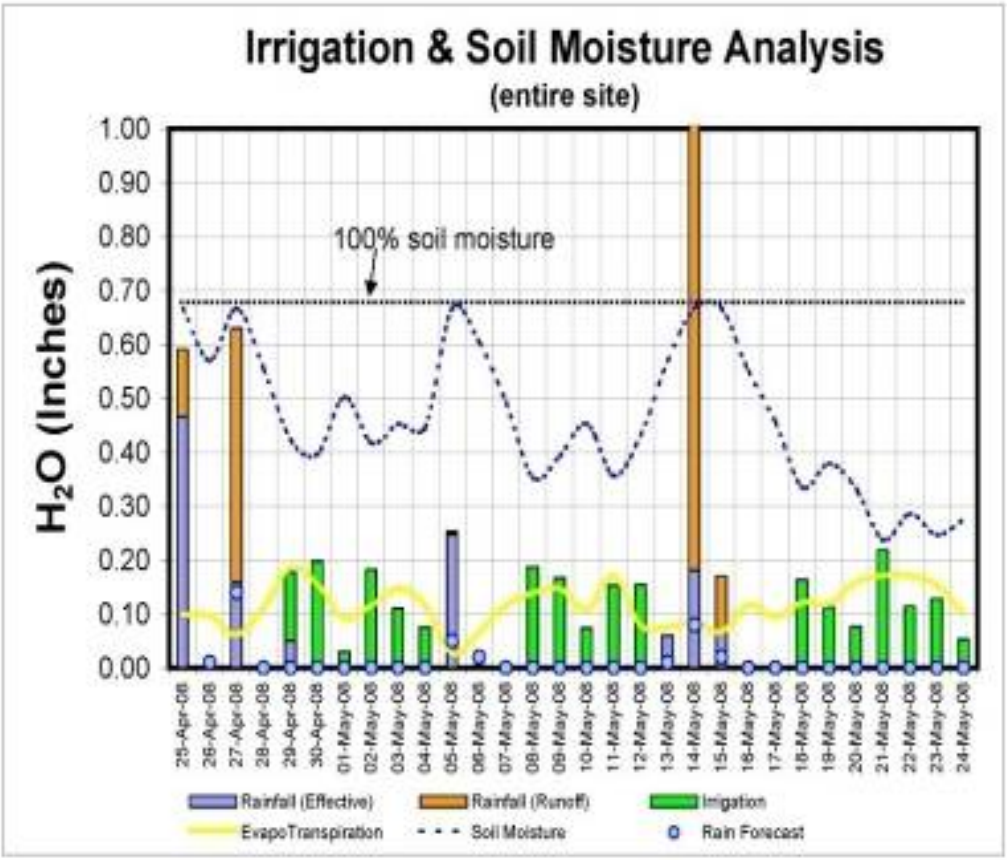

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SOLAR WINDOW FILM

Although natural lighting is a sufficient light source, it has several negative effects as well. Sunlight raises cooling peaks and demands within a building; it results in hotspots and glares. By implementing a thin film on the inside of the windows, these effects can be minimized. Typical window film can reject near 80% of solar energy, while reducing annoying glares. This reduced energy load will not only make spaces in direct sunlight more comfortable, but will also reduce an entire building's load, leading to a more efficient system overall. In addition to energy savings and comfort improvements, window film also provides an extra layer of protection against shattering glass and ultraviolet rays.

EXISTING CONDITION

Of all the facilities, typically only the two larger ones will most likely be able to qualify for window film. Window film is typically qualified based upon the ratio of building floor area to window area. Because these smaller buildings are only one story and do not have ample window space, window film usually is not a cost effective solution. The larger facilities may have ample window area; however, they will have to be further evaluated. The large foyer area in the Ripley House appears as though it would benefit greatly. Another major factor affecting the qualification is the amount of shading on the window from surrounding objects as well as the buildings orientation.

SCOPE OF WORK

The table below compares three films that Siemens has had success within the past. There are several other films made by several other manufacturers. The ones below are simply examples of the different alternatives available.

The most cost effective film exhibited is the Affinity 15. Although this film provides the most energy savings, it is a highly reflective film. The Prestige 40 film does not provide as much energy savings, but it is a near unnoticeable film. The Low-E 35 film yields energy savings between the Affinity and the Prestige although it is amber in color and is typically used in environments with greater heating loads. In general, it can be seen that

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the better the energy savings, the more noticeable the film. Siemens recommends sampling each film before applying it to the entire building.

3M Film Type	Color	SHGC*	UV Block	Glare	3M Warranty
Affinity 15	Bronze / Silver	0.18	99%	Strong	10 Year
Low-E 35	Amber	0.2	99%	Moderate to Strong	7 Year
Prestige 40	Neutral	0.34	99%	Moderate	15 Year

*SHGC = The fraction of the heat from the sun that enters though a window. Lower is better.

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VENDING MISERS

Vending Miser is a special controller designed to optimize vending machine energy use by powering the units down during unoccupied times while maintaining the required food environment.

Vending machines, including glass-front coolers, typically operate constantly. During unoccupied hours these machines waste energy by running refrigeration and lighting when there is no chance of sale. Vending Miser products monitor occupancy and control the machines operation to minimize energy use while maintaining product environment. For refrigerated vending machines and coolers Vending Miser uses a Passive Infrared Sensor to:

- Power down the machine when the surrounding area is vacant
- Monitor the room's temperature
- Automatically re-power the cooling system at one- to three-hour intervals, independent of sales
- Ensure the product stays cold

For non-refrigerated machines, if there is anyone within 25 feet of the machine, the controller waits for 15 minutes of vacancy, then powers down the machine. If a customer approaches the machine while powered down, the controller will sense the presence and immediately power up.

Vending Miser is approved by the major soft drink manufacturers (including Coca-Cola™ and Pepsi™).

Installation of Occupancy Sensor

EXISTING CONDITION

Currently all vending machines viewed throughout the facilities appeared to be operating 24/7. There was a mix of cold drink machines and snack machines.

SCOPE OF WORK

Siemens recommends installing Vending Misers on all vending machines that do not contain perishable items such as sandwiches or ice cream.

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RAIN WATER HARVESTING

Harvesting rain water is an excellent way to utilize free water in managing water resources. The rain water can be filtered, treated, stored and re-used in various applications throughout a facility. While rain water harvesting systems can often have a large upfront cost, the benefits of using a renewable water source outweigh these costs by adding long term sustainability to the facility.

EXISTING CONDITION

Currently all of the irrigation systems use city water. Each facility would have to be further surveyed to determine if harvesting opportunities would be cost effective. In general, Siemens would recommend placing a system where a slanted roof tends to direct all of the water into one area.

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SCOPE OF WORK

A typical rainwater harvesting system includes a 500 to 2,000 gallon above ground or below ground cistern/tank, sediment filter, proper downspout connections, and pump system to pressurize the stored water. With over fifty-three inches of annual rainfall in Houston, Siemens believes that for every 1,000 of surface area over 33,000 gallons of water can be captured. These surface areas will primarily include building roofs, but in locations where the logistics is feasible we would capture drains from basketball play areas or other surrounding buildings.

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SOLAR PHOTOVOLTAIC

In general, it is ten times more cost effective to save energy that it is to create it. With that being said, solar photovoltaic (PV) power is an alternative solution that most lobbyists promote for the positive effects on the environment. Although it may not be justifiable on a strictly financial basis, many consumers choose to use renewable energy for its "green" effect. Before employing a solar PV system, it is essential to reduce demand as much as possible. This will allow for a smaller system to have a greater effect on the building.

A solar PV system employs solar panels comprised of a number of cells containing a photovoltaic material. This material absorbs the radiation from the sun and uses semiconductors to convert this energy into electricity. Once run through a series of electrical components, this electricity is used by the consumer at no cost. If the amount of electricity generated is more than that consumed, the power is sent to the grid and the utility provider pays the consumer for the generated electricity.

EXISTING CONDITION

PV systems are typically located on large flat roofs. It is important that there is no shading that will impede the sunlight directly hitting the panels. Of the facilities visited, it would appear that Harbach-Ripley would be a prime candidate for such a system; however the exact details of such a system would have to be further evaluated.

SCOPE OF WORK

As mentioned above, before any assumptions can be made it is essential to ensure that the facilities power connection is able to accept another source of power generation without major modifications. If so, panels could be placed on the roof in an orientation such that they would gather the most sunlight. Aside from these panels and the rack on which they must reside, this system only consists of electrical components.

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FIMs Investigated But Not Recommended

POWER FACTOR CORRECTION

Of the facilities presented, it was determined that the electricity bills at each facility are too small for power factor correction to provide a cost effective solution.

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Summary

For the NCI facilities presented in this report, there exists significant energy and cost savings to be realized. Nearly all of the savings can be captured by implementing automated controls and replacing inefficient equipment. There are additional opportunities in lighting efficiency and maintenance improvements. In some areas, equipment has failed, thus replacing these units with high efficiency units will provide optimum space conditioning and improve system performance and reliability. These opportunities uniquely present ideal conditions to rehabilitate the aged facilities and modernize the equipment and operation. As a partner with Neighborhood Centers, Siemens will strive to achieve high energy efficiency standards such as LEED and Energy Star accreditation. Siemens is committed to building successful projects with NCI that are sustainable, efficient, reliable and economically justifiable.

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Just Remember....Money Spent on Energy Efficiency is Money Well Spent!

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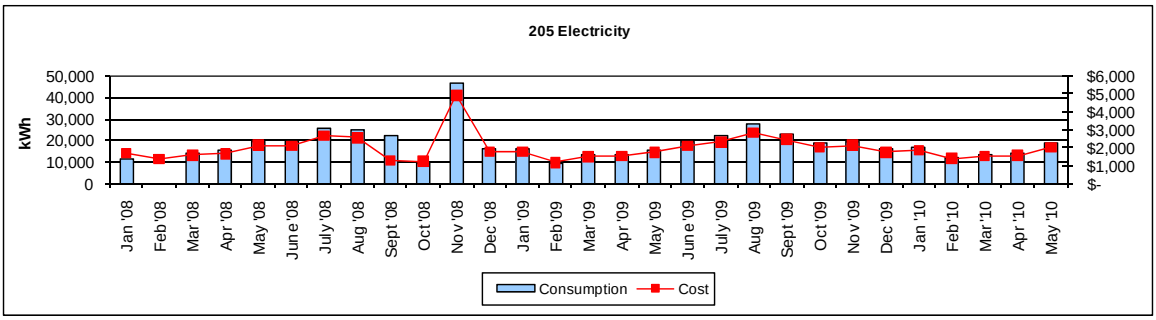
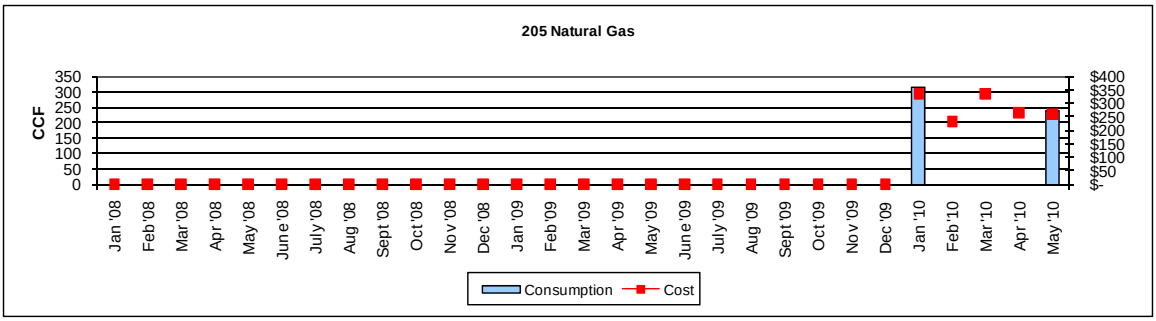
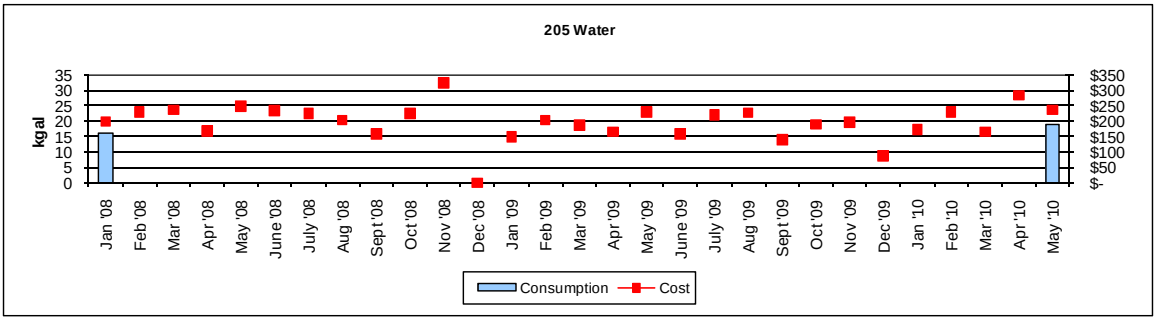
Appendix

PLOTTED UTILITY DATA

205 – Independence Heights Community Center







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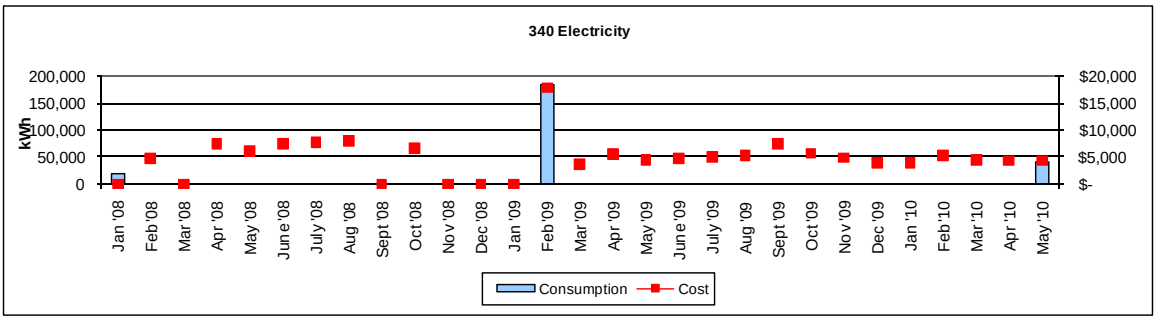
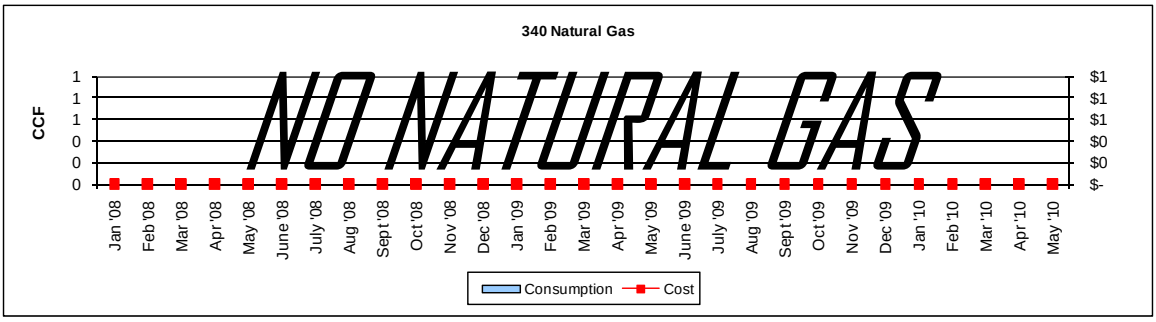
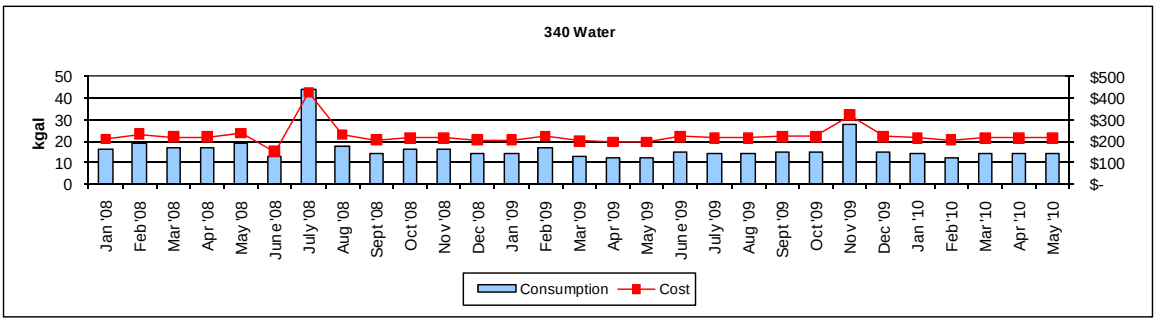
340 – Tsanoff







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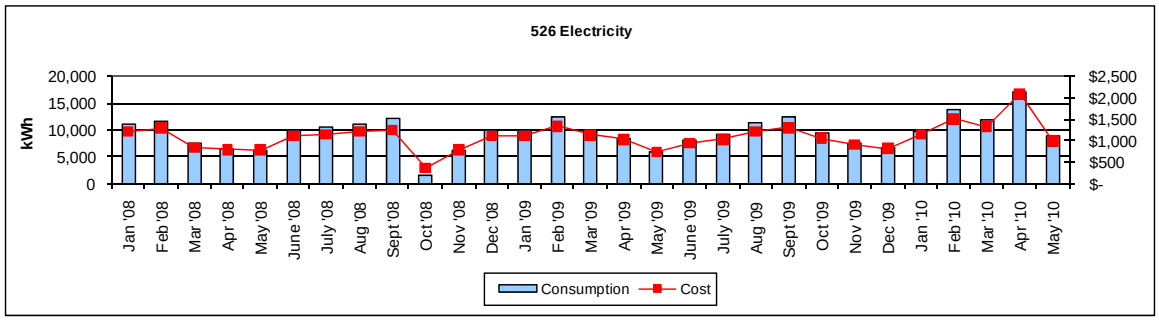
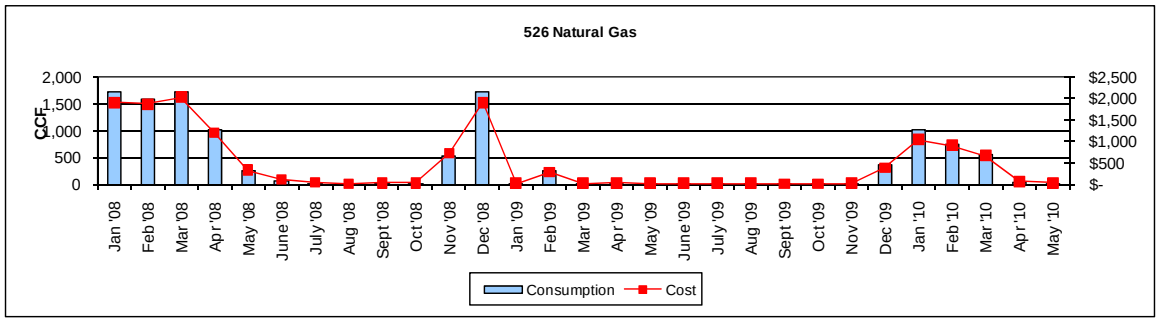
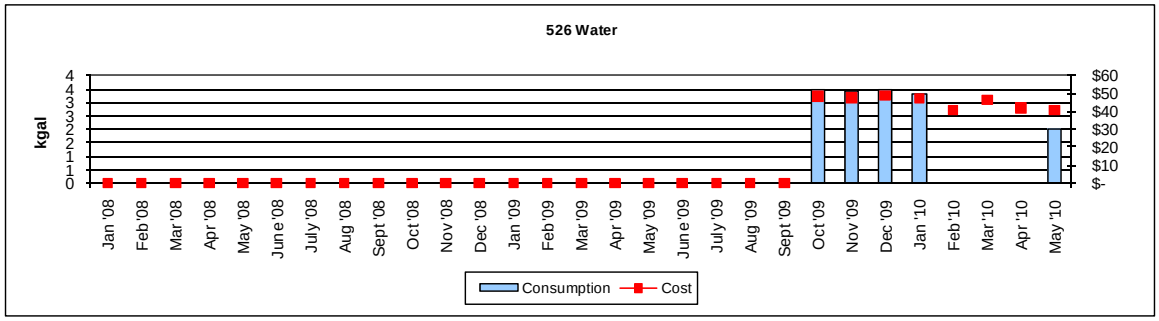
526 – LaPorte Community Center







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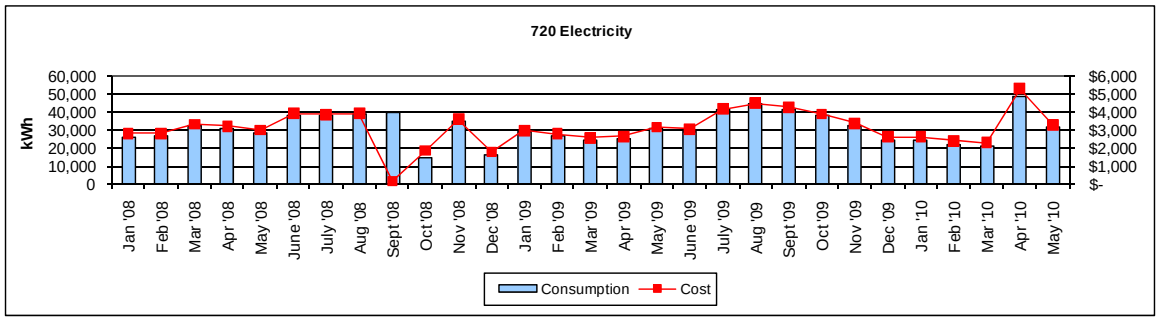
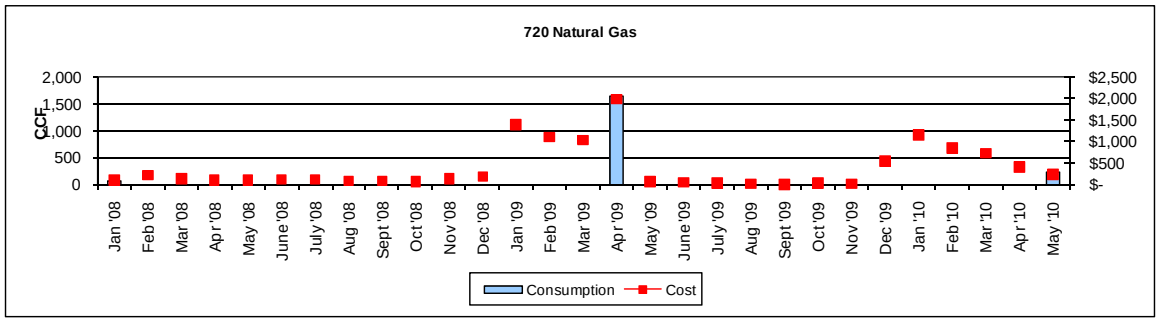
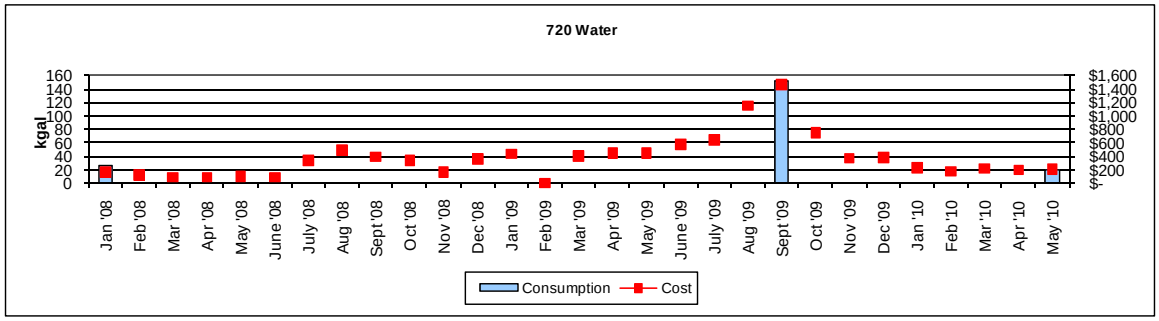
720 – Cleveland-Ripley Community Center







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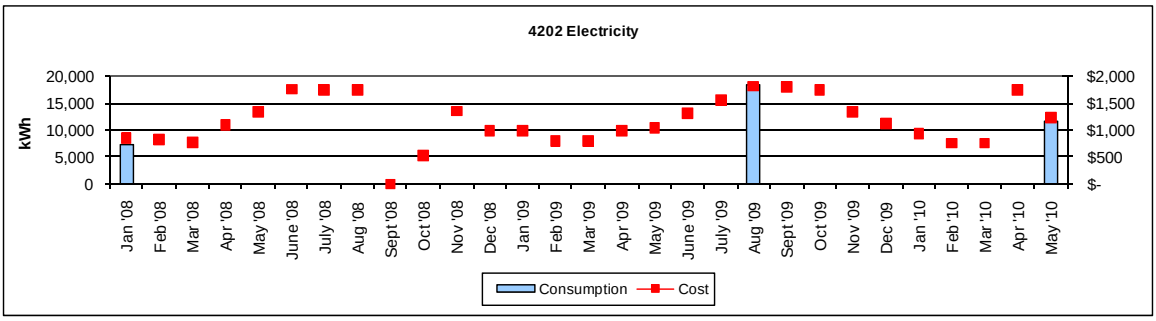
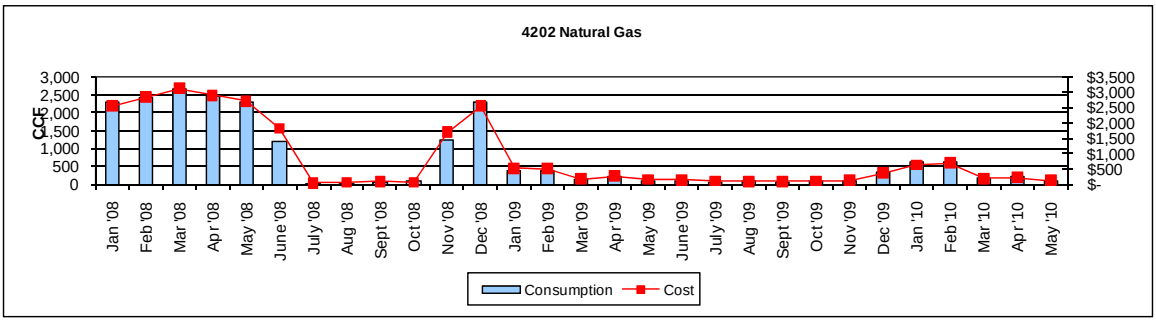
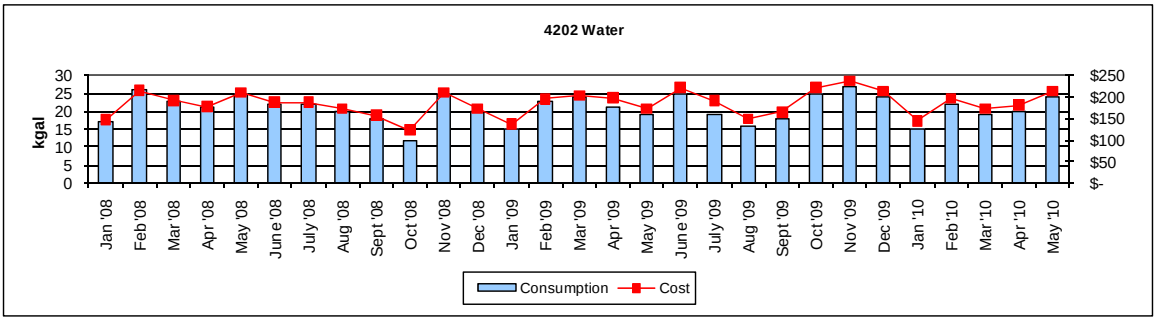
4202 – Sharp ECOC







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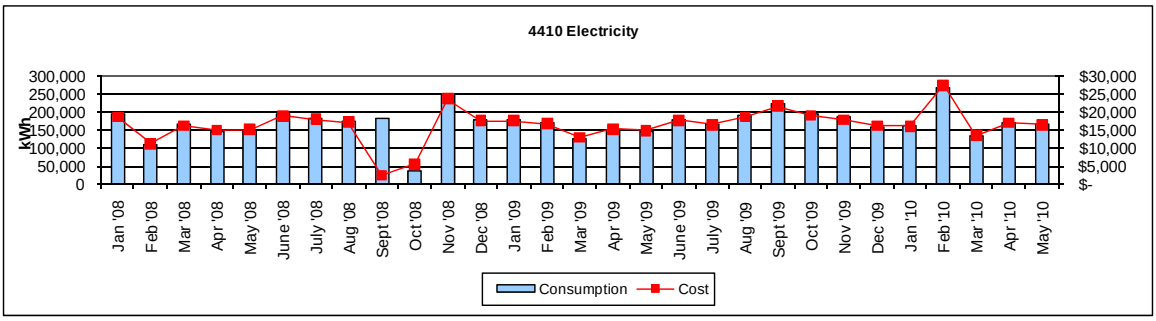
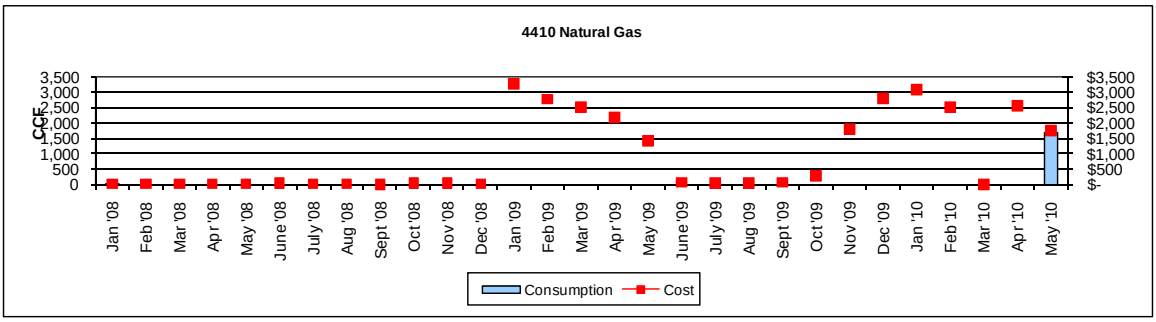
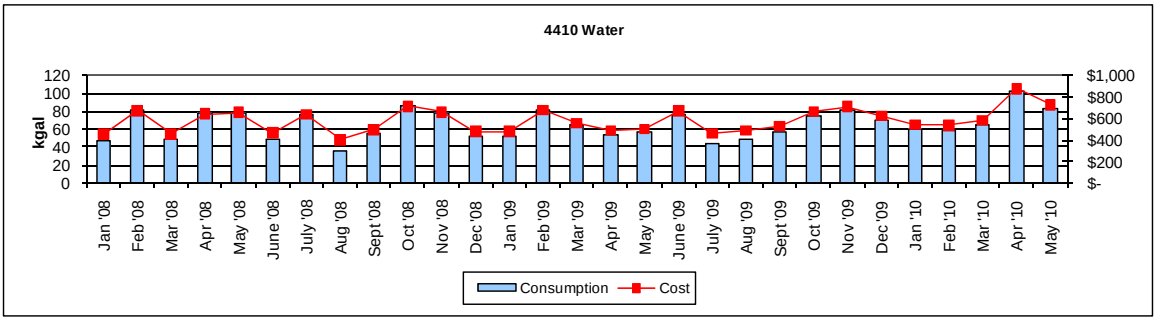
4410 – Ripley House Community Center & Charter School







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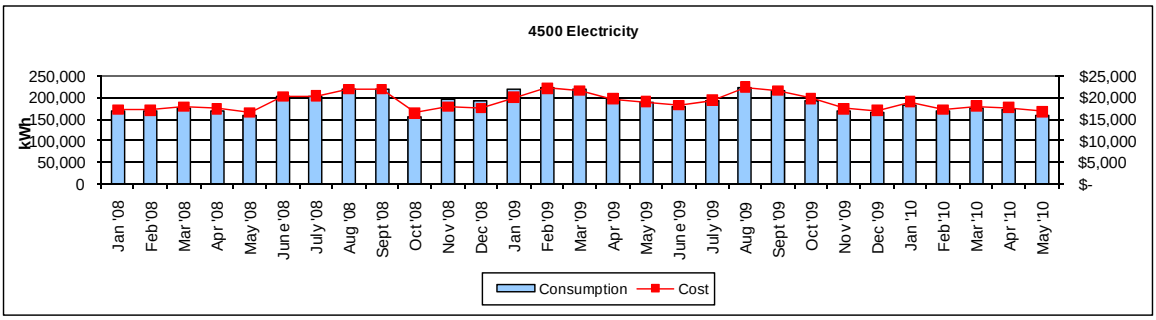
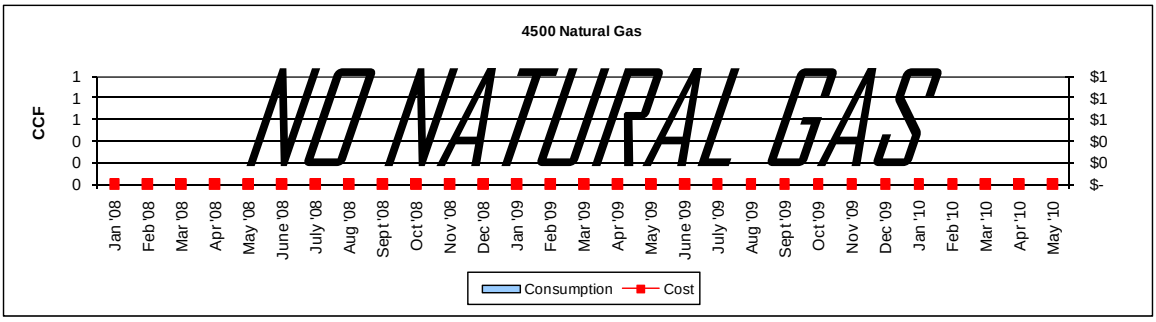
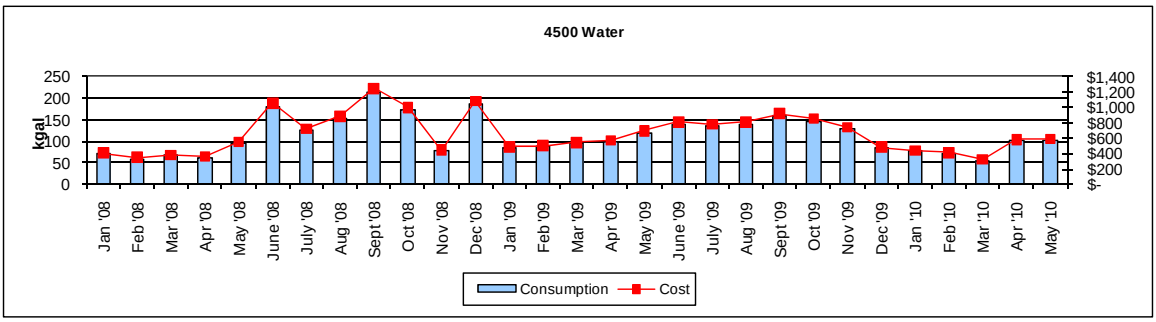
4500 – Corporate Office & Freedom Station Head Start







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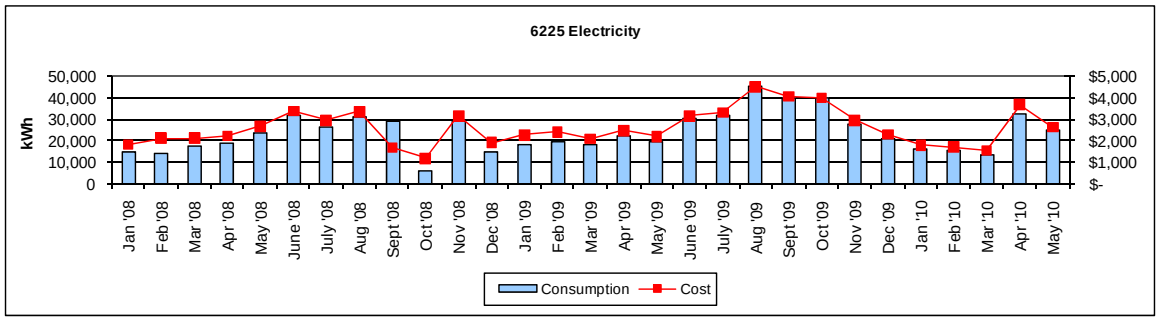
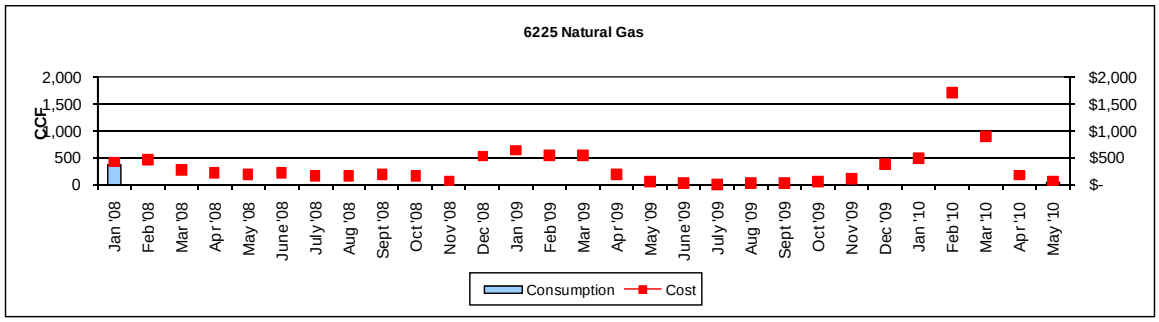
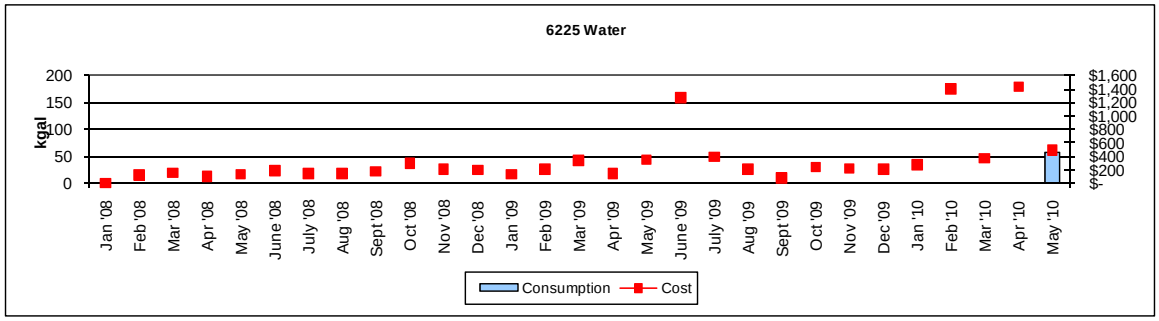
6225 – Harbach-Ripley Community Center & Charter School







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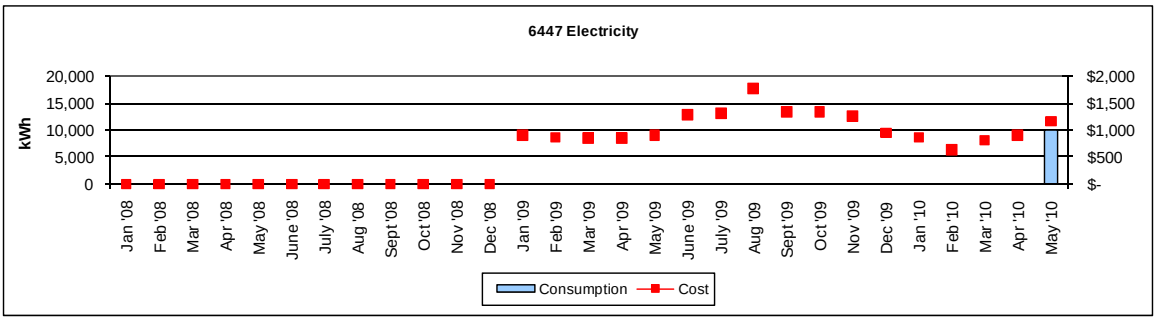
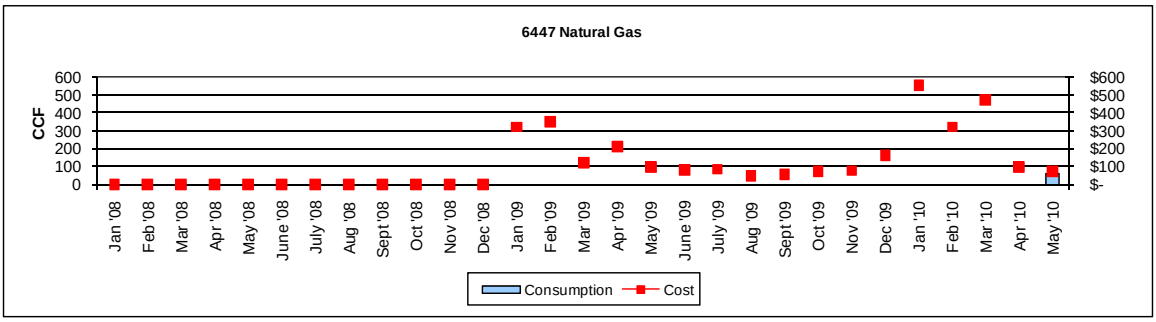
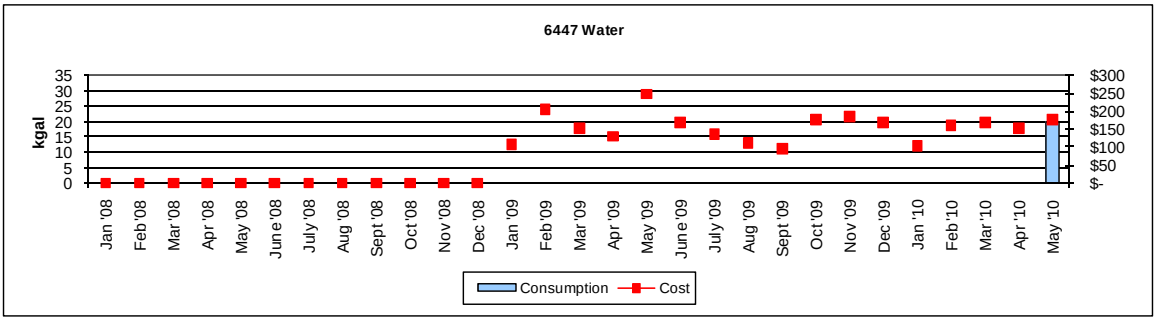
6447 – Klein Early/Head Start







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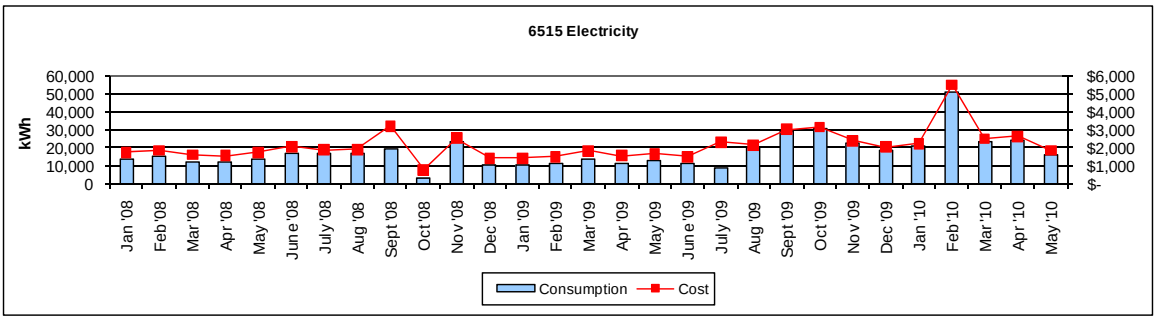
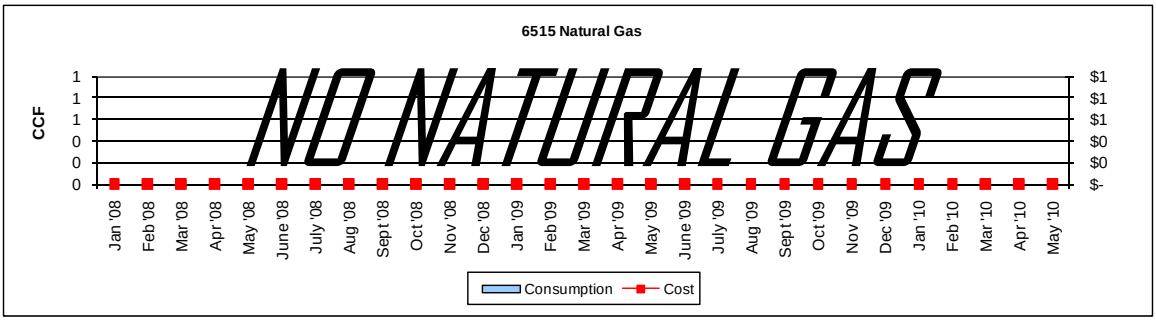
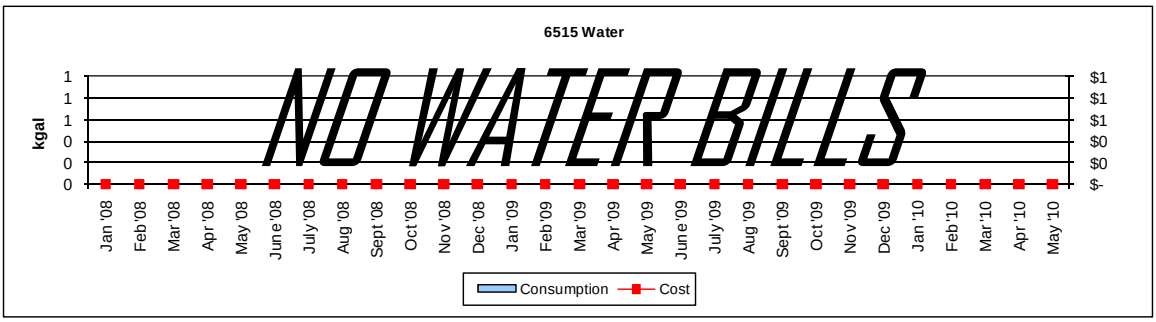
6515 – Gulfton Promise Head Start







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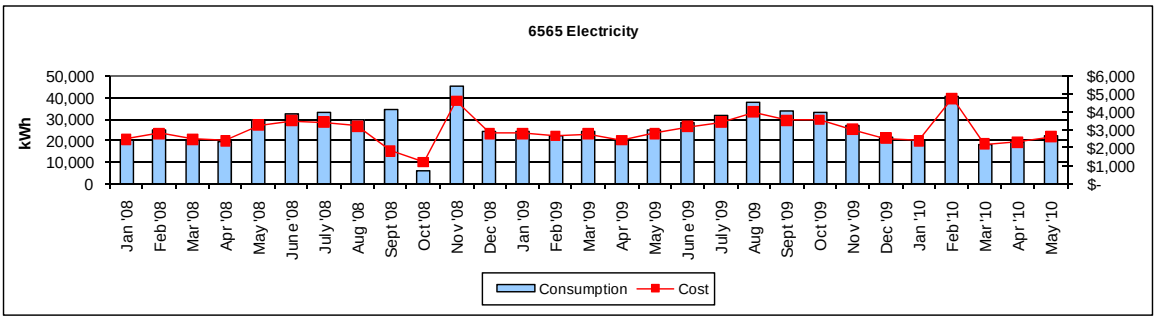
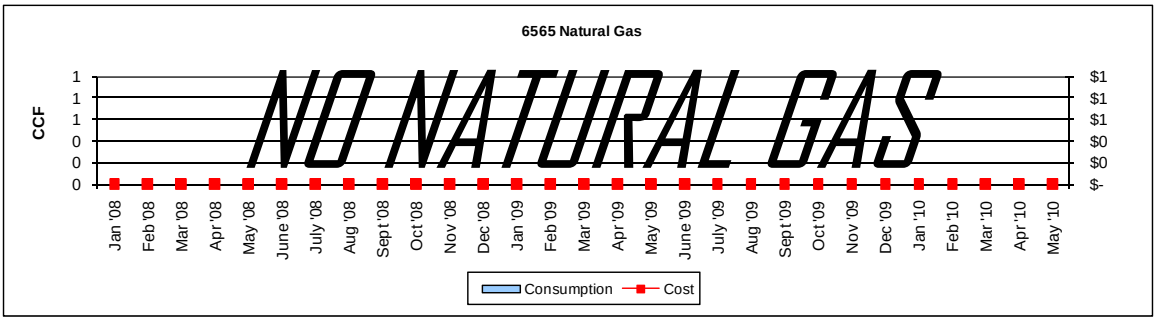
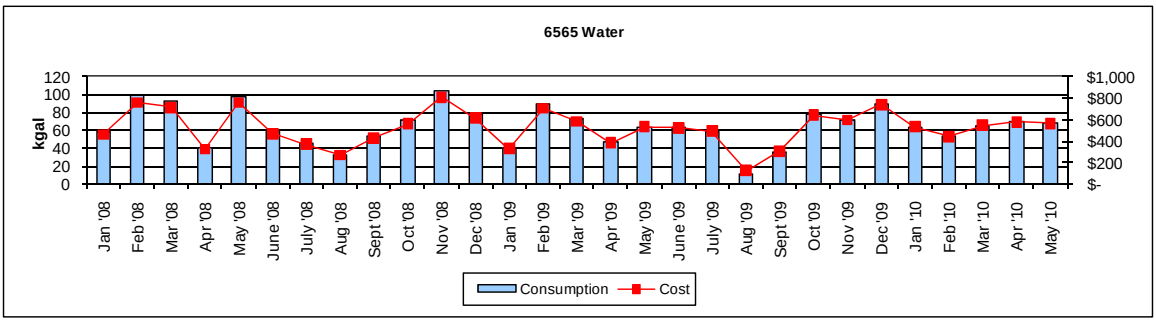
6565 – New Horizon Early/Head Start







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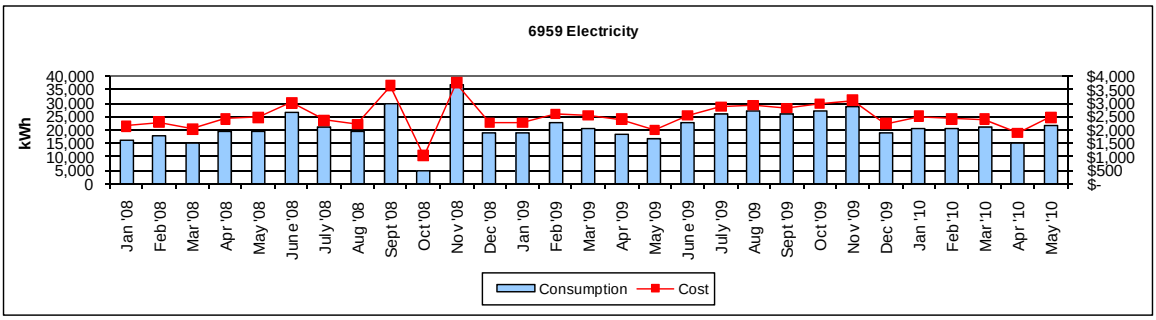
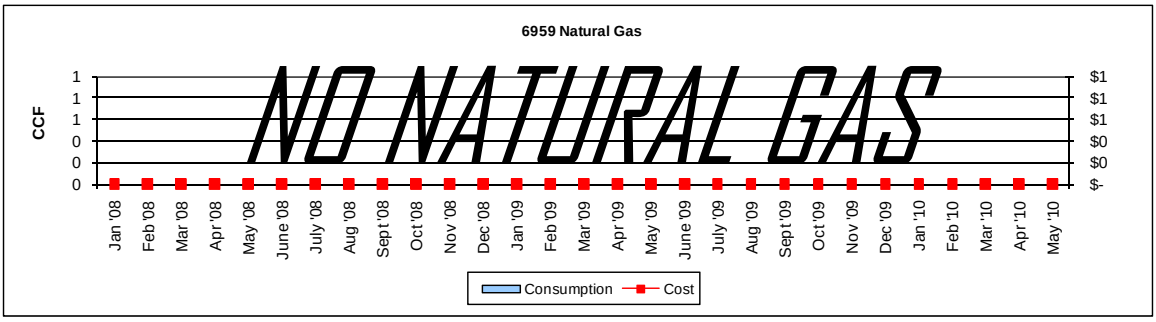
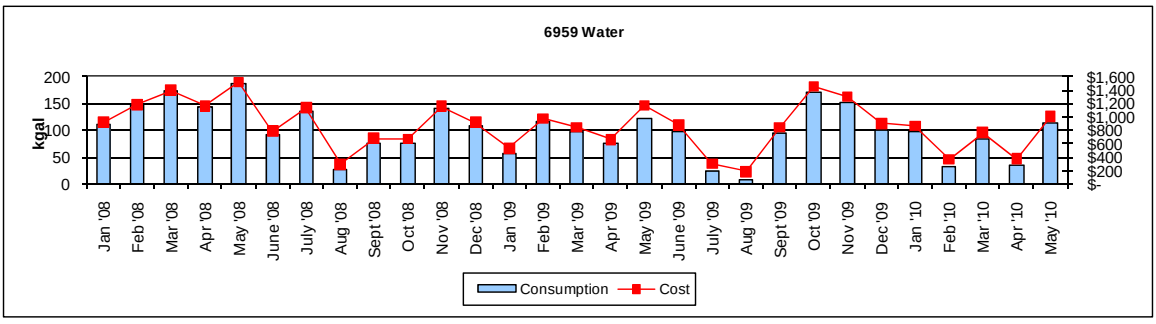
6959 – Cook Road Head Start







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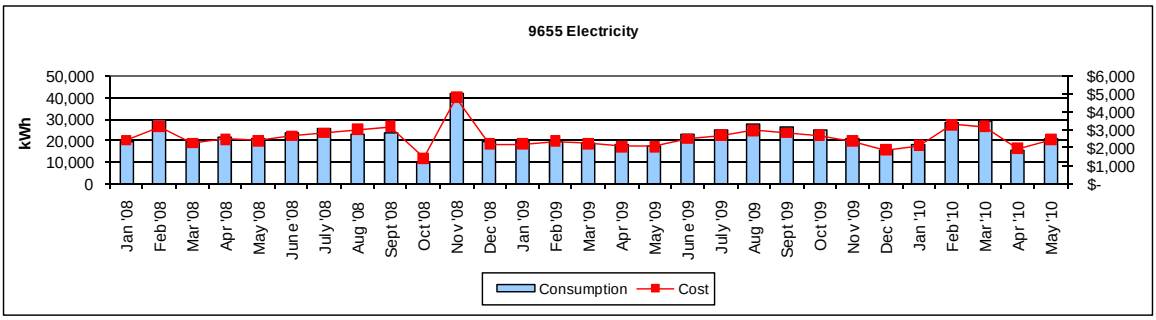
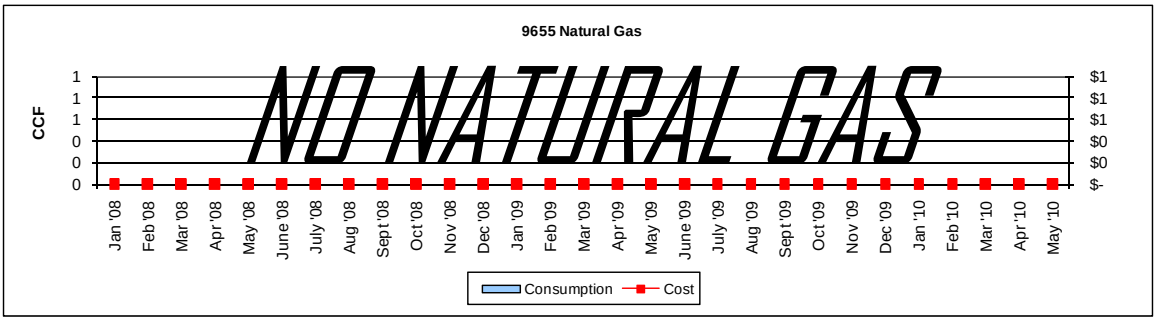
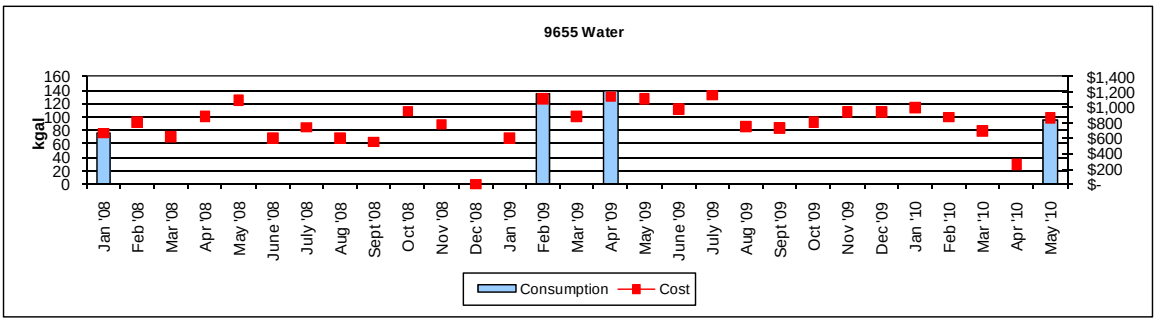
9655 – Spring Branch Head Start







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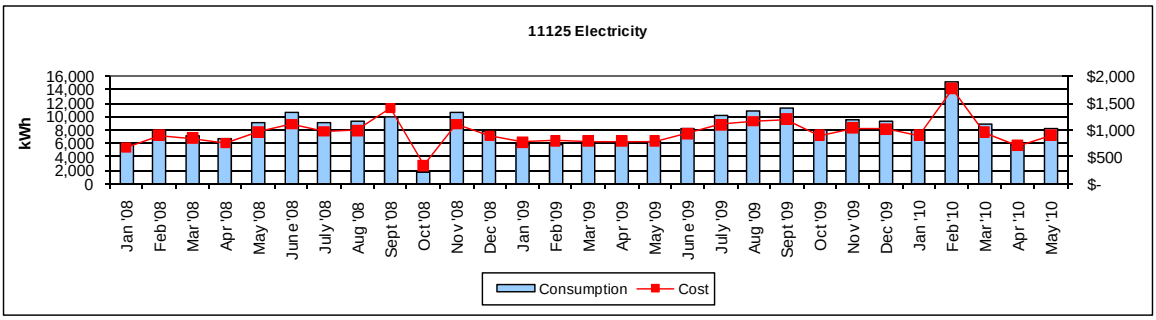
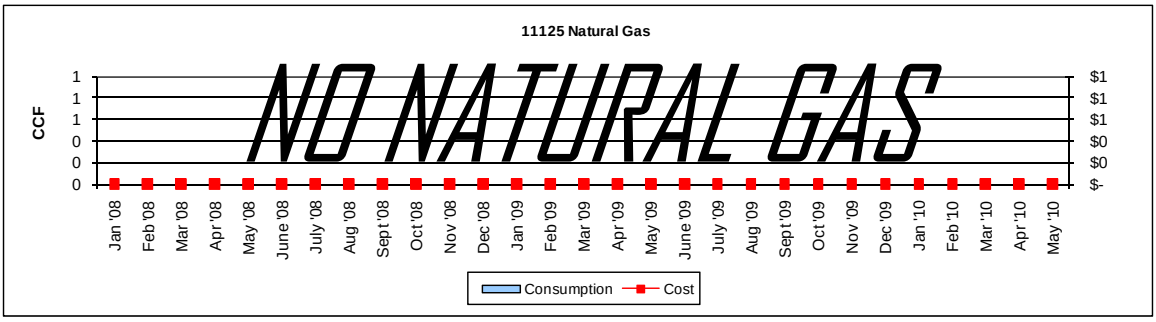
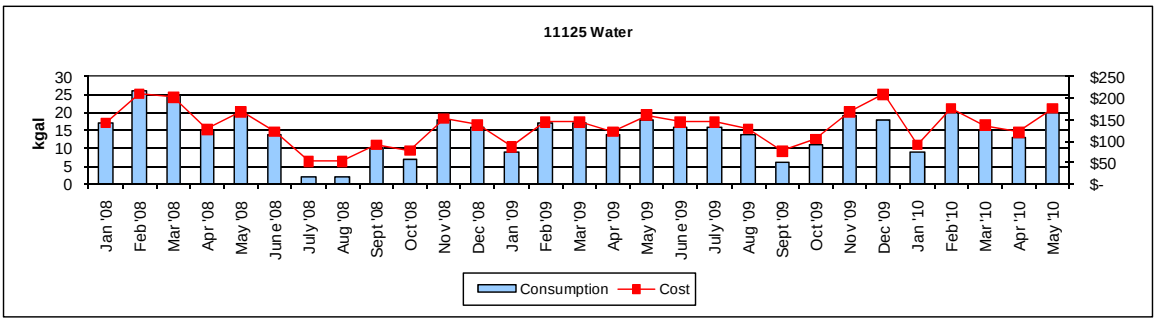
11125 – Albury Head Start







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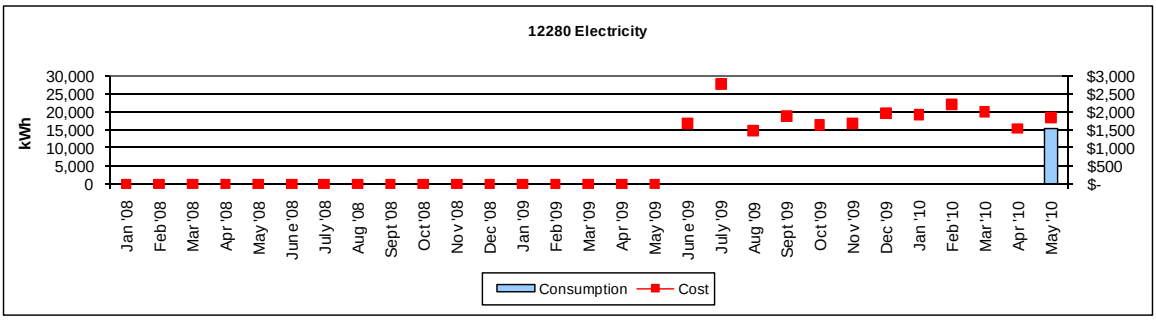
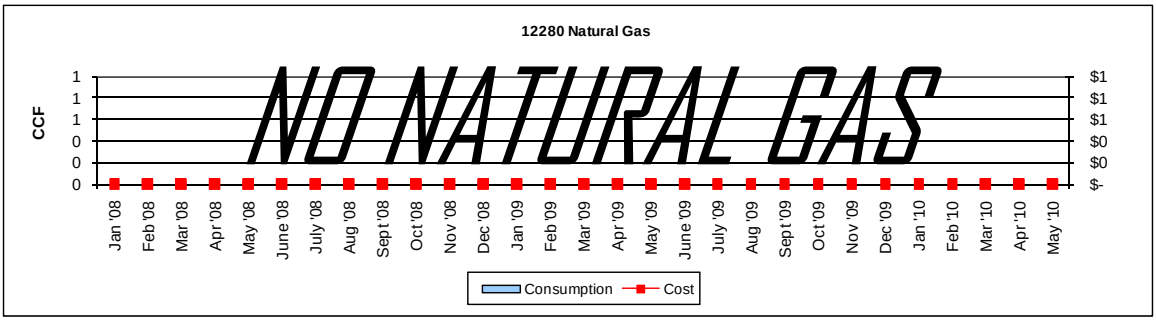
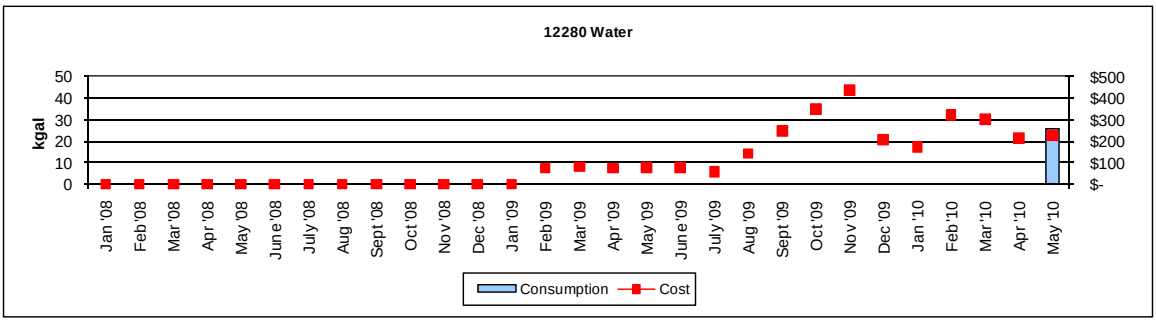
12280 – Sharpview Head Start







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TABULATED UTILITY DATA

The table on the following pages summarizes the monthly utility consumption and cost data for each facility.

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Facility ID	Facility Size (sq. ft)	Electricity Consumption (kWh) Jan '08	Electricity Consumption (kWh) Feb '08	Electricity Consumption (kWh) Mar '08	Electricity Consumption (kWh) Apr '08	Electricity Consumption (kWh) May '08	Electricity Consumption (kWh) June '08	Electricity Consumption (kWh) July '08	Electricity Consumption (kWh) Aug '08	Electricity Consumption (kWh) Sept '08	Electricity Consumption (kWh) Oct '08	Electricity Consumption (kWh) Nov '08	Electricity Consumption (kWh) Dec '08	Electricity Consumption (kWh) Jan '09	Electricity Consumption (kWh) Feb '09	Electricity Consumption (kWh) Mar '09	Electricity Consumption (kWh) Apr '09
205	10,860	11,560		14,040	15,200	19,680	19,440	25,400	24,840	22,320	9,440	46,400	16,120	16,120	9,640	13,480	13,320
340	18,480	18,816	16,608	55,680	77,856	60,768	76,704	79,776	83,424						182,880	33,312	53,472
526	15,150	11,200	11,680	7,600	6,440	6,240	10,080	10,480	11,200	12,280	1,480	6,240	9,960	9,960	12,440	10,040	8,320
720	16,000	25,680	27,120	32,160	31,200	28,480	38,480	38,000	38,560	40,000	14,560	34,560	16,120	28,960	26,800	24,320	24,880
4202	8,000	7,360	7,360	6,880	10,680	12,920	17,840	17,680	17,600	17,080	3,560	13,120	9,000	9,000	7,160	7,240	8,800
4410	65,000	193,248	108,576	167,328	148,032	149,472	193,536	183,456	173,088	184,320	36,000	247,104	178,848	178,848	168,480	127,584	150,912
4500	76,422	167,398	167,751	177,223	170,208	160,479	201,768	202,435	218,953	218,952	153,955	197,376	193,405	220,612	224,110	220,612	196,437
6225	16,000	15,168	14,400	17,664	19,008	23,808	31,680	26,688	31,104	29,184	5,952	28,992	14,976	18,307	19,685	18,164	22,522
6447	8,100													7,360	6,760	6,640	6,880
6515	11,500	13,560	15,420	12,460	11,820	13,920	17,300	16,960	16,740	19,660	3,560	23,760	10,580	10,580	11,420	13,380	11,420
6565	11,500	20,448	24,768	20,544	19,488	29,856	32,544	32,832	29,856	34,560	6,240	45,408	24,672	24,672	22,272	24,288	20,544
6959	14,106	16,224	18,048	15,072	19,296	19,680	26,304	21,024	19,584	29,952	5,088	36,672	18,816	18,816	22,944	20,448	18,528
9655	15,000	19,296	29,760	19,392	21,888	20,928	23,904	25,920	22,944	23,712	9,792	42,144	19,392	19,392	19,488	18,816	17,952
11125	6,500	5,820	7,840	7,060	6,640	8,980	10,520	9,120	9,360	9,920	1,800	10,520	7,840	5,880	5,920	6,161	6,241
12280	13,500																
	306,118																

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Facility ID	Electricity Consumption (kWh) May '09	Electricity Consumption (kWh) June '09	Electricity Consumption (kWh) July '09	Electricity Consumption (kWh) Aug '09	Electricity Consumption (kWh) Sept '09	Electricity Consumption (kWh) Oct '09	Electricity Consumption (kWh) Nov '09	Electricity Consumption (kWh) Dec '09	Electricity Consumption (kWh) Jan '10	Electricity Consumption (kWh) Feb '10	Electricity Consumption (kWh) Mar '10	Electricity Consumption (kWh) Apr '10	Electricity Consumption (kWh) May '10	Electricity Consumption (kWh) Jan '08 - May '10	Electricity Consumption (kWh) June '09 - May '10	Nat Gas Consumption (CCF) Jan '08	Nat Gas Consumption (CCF) Feb '08
205	15,800	19,880	22,480	27,920	22,840	18,960	19,800	16,360	17,200	11,880	13,440	13,960	18,760	516,280	223,480		
340	44,352	46,368	48,096	50,016	78,144	53,664	47,136	35,712	35,328	43,296	43,392	40,896	41,088	1,346,784	563,136		
526	5,840	8,120	9,160	11,280	12,320	9,440	7,680	6,680	9,760	13,920	11,800	17,040	8,800	277,480	126,000	1,714	1,579
720	31,040	29,200	41,200	44,240	41,200	38,160	32,400	24,000	24,400	22,160	20,720	49,040	31,520	899,160	398,240	70	172
4202	9,520	12,680	15,520	18,440	18,200	17,640	13,000	10,560	8,880	7,040	7,000	16,480	11,640	339,880	157,080	2,305	2,419
4410	146,016	179,424	165,024	192,672	225,216	194,976	185,184	158,688	162,720	268,128	133,344	171,072	166,752	4,938,048	2,203,200	6	14
4500	189,419	179,831	191,837	222,970	216,071	194,095	168,677	164,174	183,159	169,335	175,652	171,898	160,510	5,479,297	2,198,207		
6225	19,804	30,124	32,004	45,352	39,979	39,865	28,032	21,120	15,936	15,552	13,248	32,448	24,960	695,726	338,620	362	375
6447	7,360	11,720	11,880	16,760	11,720	11,760	11,000	7,560	6,840	4,680	5,840	7,160	9,920	151,840	116,840		
6515	13,120	11,140	8,960	20,320	29,400	30,560	22,680	18,840	20,960	50,880	23,640	24,640	16,120	513,800	278,140		
6565	25,152	28,512	32,064	38,208	33,600	32,928	27,072	21,696	20,352	40,704	18,432	19,584	22,464	773,760	335,616		
6959	16,608	22,464	26,112	26,976	25,824	27,264	28,608	18,912	20,448	20,352	21,024	15,264	21,792	618,144	275,040		
9655	17,856	22,752	24,960	27,840	26,208	24,960	21,120	15,552	18,336	28,416	29,376	15,456	20,928	648,480	275,904		
11125	6,221	8,201	10,101	10,821	11,301	7,941	9,460	9,220	7,920	15,160	8,960	5,920	8,240	239,088	113,245		
12280		9,984	26,016	10,848	16,512	13,920	14,304	14,592	15,744	18,912	16,512	11,424	15,456	184,224	184,224		
														17,621,991	7,786,972		

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Facility ID	Nat Gas Consumption (CCF) Mar '08	Nat Gas Consumption (CCF) Apr '08	Nat Gas Consumption (CCF) May '08	Nat Gas Consumption (CCF) June '08	Nat Gas Consumption (CCF) July '08	Nat Gas Consumption (CCF) Aug '08	Nat Gas Consumption (CCF) Sept '08	Nat Gas Consumption (CCF) Oct '08	Nat Gas Consumption (CCF) Nov '08	Nat Gas Consumption (CCF) Dec '08	Nat Gas Consumption (CCF) Jan '09	Nat Gas Consumption (CCF) Feb '09	Nat Gas Consumption (CCF) Mar '09	Nat Gas Consumption (CCF) Apr '09	Nat Gas Consumption (CCF) May '09	Nat Gas Consumption (CCF) June '09	Nat Gas Consumption (CCF) July '09
205																	
340																	
526	1,710	1,008	270	67	22	2	17	16	526	1,714	10	263	16	20	14	12	11
720	97	66	76	64	69	41	46	35	91	125	1,020	895	842	1,636	32	28	20
4202	2,662	2,467	2,303	1,196	24	34	68	116	1,249	2,305	382	406	135	214	122	105	79
4410	8	8	7	17	9	8	0	21	13	8	2,437	2,308	2,069	1,793	1,172	45	27
4500																	
6225	210	161	142	137	93	93	123	112	38	382	462	434	441	134		13	
6447											225	276	84	159	64	52	56
6515																	
6565																	
6959																	
9655																	
11125																	
12280																	

Facility ID	Nat Gas Consumption (CCF) Aug '09	Nat Gas Consumption (CCF) Sept '09	Nat Gas Consumption (CCF) Oct '09	Nat Gas Consumption (CCF) Nov '09	Nat Gas Consumption (CCF) Dec '09	Nat Gas Consumption (CCF) Jan '10	Nat Gas Consumption (CCF) Feb '10	Nat Gas Consumption (CCF) Mar '10	Nat Gas Consumption (CCF) Apr '10	Nat Gas Consumption (CCF) May '10	Nat Gas Consumption (CCF) Jan '08 - May '10	Nat Gas Consumption (CCF) June '09 - May '10	Water Consumption (kgal) Jan '08	Water Consumption (kgal) Feb '08	Water Consumption (kgal) Mar '08	Water Consumption (kgal) Apr '08	Water Consumption (kgal) May '08
205						314	211	285	226	238	1,274	1,274	16	20	21	12	20
340											0	0	16	19	17	17	19
526	8	6	5	9	363	1,008	745	545	43	17	11,740	2,772					
720	2		18	2	526	1,126	756	668	397	229	9,149	3,772	26	21	16	15	17
4202	86	76	102	115	346	613	618	168	206	112	21,033	2,626	17	26	23	21	25
4410	29	53	253	1,752	2,773	3,056	2,283		2,484	1,695	24,348	14,450	48	82	49	78	78
4500											0	0	71	60	67	63	96
6225	12	16	29	97	358	462	1,525	795	158	52	7,216	3,517		12	18	7	14
6447	27	35	52	56	144	525	272	414	78	59	2,578	1,770					
6515											0	0					
6565											0	0	59	99	93	41	97
6959											0	0	111	146	174	143	188
9655											0	0	77	96	71	46	132
11125											0	0	17	26	25	15	20
12280											0	0					
											77,338	30,181					

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Facility ID	Water Consumption (kgal) June '08	Water Consumption (kgal) July '08	Water Consumption (kgal) Aug '08	Water Consumption (kgal) Sept '08	Water Consumption (kgal) Oct '08	Water Consumption (kgal) Nov '08	Water Consumption (kgal) Dec '08	Water Consumption (kgal) Jan '09	Water Consumption (kgal) Feb '09	Water Consumption (kgal) Mar '09	Water Consumption (kgal) Apr '09	Water Consumption (kgal) May '09	Water Consumption (kgal) June '09	Water Consumption (kgal) July '09	Water Consumption (kgal) Aug '09	Water Consumption (kgal) Sept '09	Water Consumption (kgal) Oct '09	Water Consumption (kgal) Nov '09
205	20	19	16	10	19	32		8	16	14	10	9	9	15	16	5	13	14
340	13	44	18	14	16	16	14	14	17	13	12	12	15	14	14	15	15	28
526																	4	3
720	15	37	55	43	37	13	40	41	0	37	44	44	62	70	130	151	83	41
4202	22	22	20	18	12	25	20	15	23	24	21	19	25	19	16	18	25	27
4410	49	76	36	56	86	79	52	52	81	65	54	57	76	44	49	57	75	81
4500	182	125	152	214	172	78	186	85	88	95	99	121	140	135	140	159	147	128
6225	21	17	16	20	36	25	23	14	25	41	17	41	156	42	23	22	25	25
6447								12	25	18	15	29	19	15	12	10	20	21
6515																		
6565	59	46	33	54	71	104	78	41	90	74	48	64	63	59	12	36	78	72
6959	92	137	27	77	76	140	109	58	116	99	75	122	98	26	9	94	170	151
9655	67	85	67		113	90		67	134	104	138	127	111	133	82	79	89	105
11125	14	2	2	10	7	18	16	9	17	17	14	18	16	16	14	6	11	19
12280									1	2	0	2	2	6	2	20	33	43

Facility ID	Water Consumption (kgal) Dec '09	Water Consumption (kgal) Jan '10	Water Consumption (kgal) Feb '10	Water Consumption (kgal) Mar '10	Water Consumption (kgal) Apr '10	Water Consumption (kgal) May '10	Water Consumption (kgal) Jan '08 - May '10	Water Consumption (kgal) June '09 - May '10	Electricity Cost Jan '08	Electricity Cost Feb '08	Electricity Cost Mar '08	Electricity Cost Apr '08	Electricity Cost May '08	Electricity Cost June '08	Electricity Cost July '08	Electricity Cost Aug '08	Electricity Cost Sept '08	Electricity Cost Oct '08	Electricity Cost Nov '08	Electricity Cost Dec '08
205	8	11	18	10	25	19	425	163	$ 1,714	$ 1,370	$ 1,584	$ 1,680	$ 2,134	$ 2,114	$ 2,686	$ 2,580	$ 1,304	$ 1,252	$ 4,914	$ 1,775
340	15	14	12	14	14	14	475	184		$ 4,729		$ 7,490	$ 6,005	$ 7,388	$ 7,645	$ 7,963	$ 24	$ 6,654		
526	4	3	3	3	2	2	24	24	$ 1,219	$ 1,299	$ 845	$ 801	$ 783	$ 1,116	$ 1,149	$ 1,212	$ 1,250	$ 375	$ 786	$ 1,117
720	22	24	14	19	17	20	1,151	651	$ 2,811	$ 2,814	$ 3,337	$ 3,229	$ 2,994	$ 3,910	$ 3,879	$ 3,929	$ 167	$ 1,860	$ 3,588	$ 1,775
4202	24	15	22	19	20	24	607	254	$ 855	$ 828	$ 774	$ 1,103	$ 1,332	$ 1,759	$ 1,743	$ 1,737		$ 525	$ 1,351	$ 994
4410	70	60	59	65	102	83	1,899	821	$ 18,713	$ 11,152	$ 16,195	$ 14,983	$ 15,097	$ 18,920	$ 18,025	$ 17,134	$ 2,361	$ 5,592	$ 23,691	$ 17,644
4500	84	77	72	55	101	103	3,293	1,340	$ 17,190	$ 17,138	$ 17,902	$ 17,440	$ 16,601	$ 20,306	$ 20,373	$ 21,933	$ 22,003	$ 16,433	$ 17,933	$ 17,572
6225	24	31	172	44	177	58	1,146	799	$ 1,829	$ 2,115	$ 2,108	$ 2,226	$ 2,672	$ 3,387	$ 2,951	$ 3,352	$ 1,689	$ 1,183	$ 3,157	$ 1,911
6447	19	11	18	19	17	20	300	201												
6515							0	0	$ 1,755	$ 1,875	$ 1,621	$ 1,566	$ 1,754	$ 2,083	$ 1,894	$ 1,904	$ 3,229	$ 786	$ 2,532	$ 1,438
6565	90	64	53	66	70	68	1,882	731	$ 2,488	$ 2,823	$ 2,486	$ 2,396	$ 3,280	$ 3,514	$ 3,441	$ 3,210	$ 1,839	$ 1,200	$ 4,630	$ 2,817
6959	101	97	34	84	35	114	2,903	1,013	$ 2,137	$ 2,294	$ 2,042	$ 2,411	$ 2,468	$ 3,018	$ 2,354	$ 2,215	$ 3,652	$ 1,037	$ 3,756	$ 2,274
9655	106	113	97	74	32	96	2,531	1,117	$ 2,431	$ 3,188	$ 2,271	$ 2,500	$ 2,417	$ 2,675	$ 2,847	$ 3,041	$ 3,190	$ 1,427	$ 4,815	$ 2,227
11125	18	9	20	15	13	20	424	177	$ 677	$ 903	$ 844	$ 756	$ 965	$ 1,110	$ 976	$ 990	$ 1,409	$ 342	$ 1,106	$ 894
12280	23	19	34	35	24	26	272	267												
							17,332	7,742												

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Facility ID	Electricity Cost Jan '09	Electricity Cost Feb '09	Electricity Cost Mar '09	Electricity Cost Apr '09	Electricity Cost May '09	Electricity Cost June '09	Electricity Cost July '09	Electricity Cost Aug '09	Electricity Cost Sept '09	Electricity Cost Oct '09	Electricity Cost Nov '09	Electricity Cost Dec '09	Electricity Cost Jan '10	Electricity Cost Feb '10	Electricity Cost Mar '10	Electricity Cost Apr '10	Electricity Cost May '10	Electricity Cost Jan '08 - May '10	Electricity Cost June '09 - May '10	Nat Gas Cost Jan '08	Nat Gas Cost Feb '08	Nat Gas Cost Mar '08
205	$ 1,775	$ 1,179	$ 1,515	$ 1,538	$ 1,753	$ 2,120	$ 2,326	$ 2,836	$ 2,457	$ 2,030	$ 2,136	$ 1,760	$ 1,867	$ 1,407	$ 1,527	$ 1,565	$ 2,017	$ 56,912	$ 24,047			
340	$ -	$ 17,829	$ 3,567	$ 5,507	$ 4,393	$ 4,772	$ 4,922	$ 5,183	$ 7,520	$ 5,650	$ 4,894	$ 3,887	$ 3,857	$ 5,338	$ 4,540	$ 4,327	$ 4,360	$ 138,443	$ 59,250			
526	$ 1,117	$ 1,336	$ 1,132	$ 1,031	$ 745	$ 942	$ 1,032	$ 1,216	$ 1,311	$ 1,063	$ 911	$ 819	$ 1,147	$ 1,510	$ 1,326	$ 2,086	$ 998	$ 31,677	$ 14,363	$ 1,906	$ 1,873	$ 2,024
720	$ 2,974	$ 2,783	$ 2,570	$ 2,643	$ 3,169	$ 3,042	$ 4,175	$ 4,498	$ 4,265	$ 3,901	$ 3,378	$ 2,621	$ 2,613	$ 2,415	$ 2,300	$ 5,312	$ 3,290	$ 90,240	$ 41,810	$ 97	$ 222	$ 134
4202	$ 994	$ 795	$ 806	$ 982	$ 1,044	$ 1,318	$ 1,563	$ 1,816	$ 1,795	$ 1,748	$ 1,347	$ 1,130	$ 926	$ 757	$ 753	$ 1,753	$ 1,231	$ 33,756	$ 16,136	$ 2,545	$ 2,841	$ 3,121
4410	$ 17,644	$ 16,743	$ 12,961	$ 15,256	$ 14,832	$ 17,721	$ 16,476	$ 18,722	$ 21,681	$ 19,081	$ 17,881	$ 16,163	$ 16,138	$ 27,482	$ 13,526	$ 17,011	$ 16,431	$ 475,255	$ 218,313	$ 20	$ 31	$ 23
4500	$ 20,044	$ 22,227	$ 21,682	$ 19,774	$ 19,002	$ 18,274	$ 19,434	$ 22,408	$ 21,653	$ 19,832	$ 17,471	$ 16,998	$ 19,062	$ 17,233	$ 17,998	$ 17,707	$ 16,760	$ 550,383	$ 224,829			
6225	$ 2,281	$ 2,419	$ 2,087	$ 2,476	$ 2,202	$ 3,149	$ 3,311	$ 4,516	$ 4,049	$ 3,993	$ 2,949	$ 2,290	$ 1,799	$ 1,709	$ 1,561	$ 3,674	$ 2,639	$ 75,684	$ 35,637	$ 419	$ 460	$ 267
6447	$ 913	$ 861	$ 847	$ 852	$ 901	$ 1,278	$ 1,309	$ 1,771	$ 1,335	$ 1,340	$ 1,254	$ 951	$ 869	$ 632	$ 811	$ 905	$ 1,164	$ 17,993	$ 13,619			
6515	$ 1,438	$ 1,517	$ 1,824	$ 1,555	$ 1,686	$ 1,520	$ 2,328	$ 2,149	$ 3,024	$ 3,158	$ 2,401	$ 2,045	$ 2,248	$ 5,507	$ 2,525	$ 2,647	$ 1,862	$ 61,870	$ 31,413			
6565	$ 2,817	$ 2,679	$ 2,787	$ 2,444	$ 2,817	$ 3,178	$ 3,440	$ 4,016	$ 3,548	$ 3,564	$ 3,038	$ 2,534	$ 2,417	$ 4,775	$ 2,221	$ 2,321	$ 2,621	$ 85,342	$ 37,673			
6959	$ 2,274	$ 2,597	$ 2,549	$ 2,390	$ 1,998	$ 2,544	$ 2,865	$ 2,916	$ 2,816	$ 2,975	$ 3,095	$ 2,237	$ 2,513	$ 2,425	$ 2,401	$ 1,886	$ 2,478	$ 72,614	$ 31,150			
9655	$ 2,227	$ 2,388	$ 2,255	$ 2,077	$ 2,078	$ 2,516	$ 2,712	$ 2,968	$ 2,827	$ 2,714	$ 2,383	$ 1,887	$ 2,148	$ 3,293	$ 3,182	$ 1,977	$ 2,450	$ 75,109	$ 31,057			
11125	$ 774	$ 797	$ 791	$ 795	$ 797	$ 939	$ 1,098	$ 1,160	$ 1,202	$ 905	$ 1,040	$ 1,015	$ 903	$ 1,770	$ 956	$ 711	$ 903	$ 27,531	$ 12,603			
12280						$ 1,672	$ 2,793	$ 1,481	$ 1,884	$ 1,654	$ 1,678	$ 1,963	$ 1,932	$ 2,206	$ 2,000	$ 1,537	$ 1,857	$ 22,659	$ 22,659			
																		$ 1,815,468	$ 814,560			

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Facility ID	Nat Gas Cost Apr '08	Nat Gas Cost May '08	Nat Gas Cost June '08	Nat Gas Cost July '08	Nat Gas Cost Aug '08	Nat Gas Cost Sept '08	Nat Gas Cost Oct '08	Nat Gas Cost Nov '08	Nat Gas Cost Dec '08	Nat Gas Cost Jan '09	Nat Gas Cost Feb '09	Nat Gas Cost Mar '09	Nat Gas Cost Apr '09	Nat Gas Cost May '09	Nat Gas Cost June '09	Nat Gas Cost July '09	Nat Gas Cost Aug '09	Nat Gas Cost Sept '09	Nat Gas Cost Oct '09	Nat Gas Cost Nov '09	Nat Gas Cost Dec '09	Nat Gas Cost Jan '10	Nat Gas Cost Feb '10	Nat Gas Cost Mar '10	Nat Gas Cost Apr '10
205																						$ 338	$ 233	$ 334	$ 264
340																									
526	$ 1,205	$ 337	$ 121	$ 53	$ 23	$ 43	$ 41	$ 725	$ 1,906	$ 29	$ 292	$ 32	$ 37	$ 30	$ 28	$ 27	$ 24	$ 22	$ 21	$ 25	$ 389	$ 1,046	$ 912	$ 672	$ 69
720	$ 98	$ 109	$ 116	$ 123	$ 81	$ 81	$ 67	$ 142	$ 187	$ 1,393	$ 1,097	$ 1,033	$ 1,987	$ 58	$ 53	$ 43	$ 22		$ 38	$ 22	$ 552	$ 1,160	$ 854	$ 733	$ 413
4202	$ 2,897	$ 2,708	$ 1,819	$ 56	$ 71	$ 111	$ 72	$ 1,695	$ 2,545	$ 532	$ 509	$ 182	$ 278	$ 167	$ 146	$ 114	$ 107	$ 97	$ 123	$ 136	$ 370	$ 640	$ 701	$ 200	$ 227
4410	$ 24	$ 21	$ 41	$ 30	$ 29	$ 15	$ 44	$ 33	$ 29	$ 3,272	$ 2,780	$ 2,498	$ 2,172	$ 1,431	$ 74	$ 52	$ 49	$ 73	$ 276	$ 1,788	$ 2,800	$ 3,080	$ 2,523		$ 2,552
4500																									
6225	$ 210	$ 187	$ 226	$ 160	$ 159	$ 185	$ 170	$ 71	$ 532	$ 639	$ 542	$ 551	$ 182	$ 46	$ 25		$ 32	$ 36	$ 49	$ 118	$ 382	$ 487	$ 1,703	$ 889	$ 178
6447										$ 322	$ 352	$ 121	$ 212	$ 97	$ 82	$ 86	$ 47	$ 55	$ 72	$ 76	$ 165	$ 551	$ 320	$ 470	$ 96
6515																									
6565																									
6959																									
9655																									
11125																									
12280																									

Facility ID	Nat Gas Cost May '10	Nat Gas Cost Jan '08 - May'10	Nat Gas Cost June '09 - May '10	Water Cost Jan '08	Water Cost Feb '08	Water Cost Mar '08	Water Cost Apr '08	Water Cost May '08	Water Cost June '08	Water Cost July '08	Water Cost Aug '08	Water Cost Sept '08	Water Cost Oct '08	Water Cost Nov '08	Water Cost Dec '08	Water Cost Jan '09	Water Cost Feb '09	Water Cost Mar '09	Water Cost Apr '09	Water Cost May '09	Water Cost June '09	Water Cost July '09	Water Cost Aug '09	Water Cost Sept '09	Water Cost Oct '09
205	$ 259	$ 1,428	$ 1,428	$ 200	$ 230	$ 238	$ 170	$ 251	$ 234	$ 226	$ 204	$ 158	$ 226	$ 325		$ 148	$ 204	$ 188	$ 166	$ 232	$ 161	$ 220	$ 228	$ 141	$ 190
340		$ -	$ -	$ 212	$ 234	$ 219	$ 219	$ 238	$ 153	$ 428	$ 231	$ 206	$ 215	$ 215	$ 206	$ 206	$ 223	$ 201	$ 196	$ 196	$ 221	$ 216	$ 216	$ 221	$ 221
526	$ 36	$ 13,946	$ 3,270																						$ 48
720	$ 244	$ 11,161	$ 4,135	$ 160	$ 127	$ 93	$ 90	$ 99	$ 90	$ 339	$ 486	$ 389	$ 334	$ 171	$ 364	$ 436		$ 408	$ 453	$ 453	$ 578	$ 644	$ 1,150	$ 1,460	$ 753
4202	$ 130	$ 25,139	$ 2,990	$ 147	$ 215	$ 192	$ 177	$ 211	$ 188	$ 188	$ 173	$ 157	$ 123	$ 211	$ 173	$ 137	$ 195	$ 203	$ 198	$ 173	$ 221	$ 191	$ 149	$ 165	$ 221
4410	$ 1,746	$ 27,504	$ 15,012	$ 452	$ 673	$ 457	$ 643	$ 654	$ 465	$ 639	$ 402	$ 498	$ 715	$ 662	$ 479	$ 479	$ 677	$ 556	$ 489	$ 503	$ 671	$ 463	$ 488	$ 528	$ 663
4500		$ -	$ -	$ 406	$ 348	$ 384	$ 365	$ 554	$ 1,056	$ 724	$ 885	$ 1,250	$ 999	$ 448	$ 1,085	$ 487	$ 504	$ 546	$ 569	$ 697	$ 813	$ 781	$ 809	$ 921	$ 855
6225	$ 69	$ 8,971	$ 3,967		$ 121	$ 155	$ 97	$ 133	$ 180	$ 150	$ 142	$ 173	$ 294	$ 211	$ 195	$ 133	$ 211	$ 332	$ 150	$ 349	$ 1,267	$ 393	$ 205	$ 83	$ 243
6447	$ 76	$ 3,201	$ 2,098													$ 107	$ 206	$ 153	$ 130	$ 248	$ 169	$ 137	$ 113	$ 97	$ 177
6515		$ -	$ -																						
6565		$ -	$ -	$ 461	$ 761	$ 716	$ 327	$ 758	$ 469	$ 370	$ 271	$ 431	$ 560	$ 811	$ 613	$ 332	$ 705	$ 583	$ 385	$ 532	$ 524	$ 492	$ 129	$ 309	$ 644
6959		$ -	$ -	$ 922	$ 1,184	$ 1,394	$ 1,162	$ 1,523	$ 793	$ 1,135	$ 299	$ 679	$ 671	$ 1,158	$ 922	$ 535	$ 975	$ 846	$ 664	$ 1,172	$ 881	$ 306	$ 191	$ 849	$ 1,455
9655		$ -	$ -	$ 668	$ 810	$ 623	$ 877	$ 1,097	$ 603	$ 740	$ 603	$ 550	$ 953	$ 778		$ 603	$ 1,112	$ 884	$ 1,143	$ 1,112	$ 984	$ 1,160	$ 753	$ 729	$ 809
11125		$ -	$ -	$ 143	$ 210	$ 203	$ 128	$ 168	$ 123	$ 54	$ 54	$ 92	$ 78	$ 153	$ 138	$ 87	$ 145	$ 145	$ 123	$ 161	$ 145	$ 145	$ 129	$ 77	$ 105
12280		$ -	$ -														$ 75	$ 82	$ 75	$ 79	$ 79	$ 58	$ 144	$ 246	$ 350
		$ 91,351	$ 32,900																						

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Facility ID	Water Cost Nov '09	Water Cost Dec '09	Water Cost Jan '10	Water Cost Feb '10	Water Cost Mar '10	Water Cost Apr '10	Water Cost May '10	Water Cost Jan '08 - May '10	Water Cost June '09 - May '10	EUI (kBtu/sqft)	EUI (kWh/sqft)	ECI ($/sqft)	Blended Electricity Rate ($/kWh)	Blended Natural Gas Rate ($/CCF)	Blended Water/Sewer Rate ($/kgal)	ESID
205	$ 198	$ 87	$ 174	$ 230	$ 166	$ 286	$ 238	$ 5,718	$ 2,318	188	55	$ 2.35	$ 0.108	$ 1.12	$ 14.22	1008901023802584950100
340	$ 322	$ 221	$ 216	$ 206	$ 216	$ 216	$ 216	$ 6,511	$ 2,711	104	30	$ 3.21	$ 0.105		$ 14.73	1008901019147049369100
526	$ 48	$ 49	$ 47	$ 41	$ 47	$ 42	$ 41	$ 362	$ 362	211	62	$ 1.16	$ 0.114	$ 1.18	$ 14.94	1008901020631902285100
720	$ 372	$ 385	$ 236	$ 173	$ 217	$ 195	$ 210	$ 10,866	$ 6,374	321	94	$ 2.87	$ 0.105	$ 1.10	$ 9.79	1008901020193874929100
4202	$ 237	$ 213	$ 144	$ 197	$ 173	$ 181	$ 214	$ 5,368	$ 2,308	395	116	$ 2.39	$ 0.103	$ 1.14	$ 9.09	1008901019191730014100
4410	$ 711	$ 623	$ 544	$ 539	$ 583	$ 879	$ 727	$ 16,862	$ 7,419	338	99	$ 3.59	$ 0.099	$ 1.04	$ 9.04	1008901023809457490100
4500	$ 741	$ 482	$ 439	$ 413	$ 325	$ 582	$ 590	$ 19,058	$ 7,750	98	29	$ 2.94	$ 0.102		$ 5.78	1008901000146740014100
6225	$ 221	$ 213	$ 269	$ 1,394	$ 373	$ 1,434	$ 485	$ 9,604	$ 6,580	292	86	$ 2.48	$ 0.105	$ 1.13	$ 8.23	1008901019191799540100
6447	$ 185	$ 169	$ 105	$ 161	$ 169	$ 153	$ 177	$ 2,654	$ 1,808	268	78	$ 1.94	$ 0.117	$ 1.19	$ 9.00	1008901016190832579100
6515								$ -	$ -	83	24	$ 2.73	$ 0.113			1008901016190829729100
6565	$ 596	$ 740	$ 532	$ 445	$ 548	$ 580	$ 565	$ 15,192	$ 6,106	100	29	$ 3.28	$ 0.112		$ 8.35	1008901023810312340100
6959	$ 1,304	$ 905	$ 873	$ 370	$ 769	$ 378	$ 1,010	$ 25,325	$ 9,290	67	19	$ 2.21	$ 0.113		$ 9.17	1008901023811875020100
9655	$ 937	$ 945	$ 1,000	$ 873	$ 689	$ 254	$ 866	$ 23,156	$ 9,999	63	18	$ 2.07	$ 0.113		$ 8.95	1008901023813194210102
11125	$ 169	$ 209	$ 92	$ 177	$ 137	$ 121	$ 177	$ 3,884	$ 1,680	59	17	$ 1.94	$ 0.111		$ 9.49	1008901016191078502100
12280	$ 437	$ 205	$ 173	$ 322	$ 301	$ 213	$ 230	$ 3,068	$ 2,758	47	14	$ 1.68	$ 0.123		$ 10.33	1008901001900312150109
								$ 147,628	$ 67,463	185	54	$ 2.77	$ 0.105	$ 1.09	$ 8.71	