CITY OF Grand Junction COLORADO

UTILITY & STREET SYSTEMS

November 18, 2014

Colorado Water Conservation Board
Attn: Ben Wade
1313 Sherman Street, Rm. 721
Denver, CO 80203

Purchase Order: ***(OE PDA 1400000066)***

Dear Mr. Wade:

The Grand Valley domestic water providers are pleased to provide the 50% Progress Report for Water Efficiency Grant-PO# OE PDA 14000000066. Also attached is an invoice for reimbursement and copies of three of the six commercial/industrial audits.

During July and August of 2014, the Brendle Group, on behalf of the City of Grand Junction, Ute Water Conservancy District and Clifton Water District, conducted Water Use Assessments for six commercial/industrial properties, two in each water district. Three of the audits and reports, including Dos Hombres Restaurant Clifton, CPC Solutions, and Central High School, are 100% complete and are attached to this report. The other three audits and reports are 60% complete.

As per the approved Request for Performance Extension, the Residential Audits will be scheduled for April and May of 2015 with a final completion of the project by December 31, 2015.

Thank you for the opportunity to further the community's water efficiency goals through this grant program.

Sincerely,

Rick Brinkman
Water Services Manager

Central High School
Water Use Assessment

Date of Assessment:
July 29, 2014

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Introduction

Clifton Water District partnered with the City of Grand Junction and the Ute Water Conservancy District to develop a Grand Valley Regional Water Conservation Plan. As part of this regional plan Clifton Water, along with the other water utilities, has committed to providing water audits for select customers in the commercial-industrial (C-I) sector. The utilities contracted with Brendle Group to conduct these water audits for the following water users:

- **Clifton Water District**
  - **Central High School:** a high school with approximately 1,500 students consisting of a main building with classrooms, offices, a full cafeteria and kitchen, gyms, locker rooms, and multiple restrooms; and three additional buildings housing classrooms and a library. There is limited potable water irrigation.
  - **Dos Hombres Mexican Restaurant:** a 242-seat restaurant with full kitchen, restrooms, and limited irrigation
- **City of Grand Junction**
  - **Alsco:** a large commercial laundry facility with restrooms, significant process water usage, and light irrigation usage
  - **Edgewater Brewing Company:** a 60-barrel-a-day brewery with a restaurant, restrooms, and limited irrigation
- **Ute Water Conservancy District**
  - **Colorado Printing Company:** a large commercial printing facility with offices, restrooms, and seasonally dependent process water usage
  - **Fruita Monument High School:** a high school with approximately 1,300 students consisting of a main building with classrooms, offices, a full cafeteria and kitchen, gyms, locker rooms, a pool, and multiple restrooms; and one separate building that houses the agricultural shop and classrooms. There is limited potable water irrigation.

The water audits included an analysis of water utility bills and a walk-through of the facilities to identify opportunities for water savings. Indoor end-use fixtures, outdoor irrigation, and process water were all considered during the analysis. The audit reports will be used to inform potential opportunities for water savings that can be implemented throughout the region.

Central High School

Central High School is located in Grand Junction, Colorado and consists of 172,628 square feet distributed amongst four buildings. The main building was originally constructed in 1959, and in 1987 Fetter Hall was added. The most recent additions to the complex were made in 1998. During the approximately 10-month school year, the building is occupied by 135 staff members and 1,500 students between 7:00am-4:00pm with occasional weekend and nighttime occupancy. The main offices, gym, and sporting fields are occupied at various frequencies year round.

Water Use Profile

Water utility services are provided to Central High School by Clifton Water District. Water use at Central High School can be broken into two categories: indoor and outdoor use.

Indoor water use includes four hot water boiler units and two swamp coolers for space heating and cooling. In addition, the school kitchen is equipped with two ice machines, a steam kettle, a steam table, a combination steamer, a steam oven, a walk-in cooler, a mop sink, a dishwasher, two pre-rinse valves, and eight sinks between the kitchen and the cafeteria. There are also two residential washer/dryer units that are only used occasionally. The school has a total of 58 toilets, 28 urinals, 77 wash sinks, 6 mop sinks and 26 showers.

Outdoor water use includes irrigation for the courtyard, one spigot for the baseball field, and one spigot for the practice field. The rest of the turf area is irrigated with raw, ditch water. There appear to be small leaks in both spigots where the hoses attach. Also, the grounds crew has noticed that the hoses for both fields are frequently left running when not in use.

Monthly water use and cost data for Central High School since 2011 are summarized in the table and figure below. While Central High School has two water meters, for the purposes of this report their usage has been combined because it is not clear exactly what uses are tied to each meter. Historical water use trends have been fairly consistent since 2011, with peak water use during September as a result of both outdoor irrigation and school being in session. The year 2012 had the highest usage, which may be attributed to warmer weather that year, though this has not been verified. Also, there was a significant leak at the high school in early 2013 as indicated with the red text in the table below. This peak has been removed from the data presented in the water use figure below.

In order to develop an informative water use model, estimates were established for water use during the school year (both school days and non-school days) and during the summer months when school is not in session. The school year is defined as August through May and, based on the 2013 school year, there are an estimated 168 school days and 136 non-school days during those 10 months. Summer is defined as June and July with a total of 61 days. The average water usage for a school day is 6,883 gallons, while that for a non-school day is 1,032 gallons. The average usage for a summer day is 4,383 gallons.

The average unit cost for water used to estimate potential cost savings for water conservation opportunities is $18.97 per thousand gallons (kgal), which includes both water and sewer costs. For the purposes of estimating the associated energy cost savings for some of the measures, a unit cost of $0.70 per therm for natural gas has been assumed.

Based on historical studies for the Front Range of Colorado[1], the typical school benchmarks for annual water use are 0.012 to 0.019 kgal per square foot and 1.7 to 2.7 kgal per student. Using the last 12 months of available data, Central High School is performing better than the typical school, at 0.009 kgal per square foot and 1.06 kgal per student.

[1] Industrial, Commercial, and Institutional Water Conservation. Benchmarking Taskforce. http://coloradowaterwise.org/Resources/Documents/ICI_toolkit/2006benchmarks.html

Table 1. Water Use and Cost Data – 2011 to 2014

Read Date	Usage (kgal)	Water Cost	Total Cost	$/kgal - Water	$/kgal - Total
1/24/2011	142	$ 786	$ 3,995	$ 5.54	$ 28.13
2/22/2011	166	$ 869	$ 4,078	$ 5.24	$ 24.56
3/22/2011	118	$ 731	$ 3,940	$ 6.20	$ 33.39
4/21/2011	155	$ 842	$ 4,488	$ 5.43	$ 28.96
5/23/2011	170	$ 893	$ 4,639	$ 5.25	$ 27.29
6/22/2011	153	$ 664	$ 4,310	$ 4.34	$ 28.17
7/20/2011	114	$ 579	$ 4,225	$ 5.08	$ 37.06
8/19/2011	150	$ 876	$ 4,522	$ 5.84	$ 30.15
9/20/2011	241	$ 1,126	$ 4,772	$ 4.67	$ 19.80
10/21/2011	235	$ 1,123	$ 4,769	$ 4.78	$ 20.30
11/18/2011	131	$ 788	$ 4,434	$ 6.02	$ 33.85
12/16/2011	129	$ 783	$ 4,429	$ 6.07	$ 34.33
1/18/2012	107	$ 725	$ 2,031	$ 6.77	$ 18.98
2/16/2012	149	$ 855	$ 2,275	$ 5.74	$ 15.27
3/19/2012	129	$ 801	$ 2,147	$ 6.21	$ 16.64
4/19/2012	150	$ 867	$ 2,287	$ 5.78	$ 15.25
5/21/2012	225	$ 1,138	$ 2,857	$ 5.06	$ 12.70
6/20/2012	148	$ 691	$ 2,287	$ 4.67	$ 15.45
7/20/2012	228	$ 988	$ 2,864	$ 4.33	$ 12.56
8/20/2012	236	$ 1,215	$ 3,417	$ 5.15	$ 14.48
9/19/2012	268	$ 1,287	$ 3,485	$ 4.80	$ 13.00
10/19/2012	221	$ 1,112	$ 3,103	$ 5.03	$ 14.04
11/19/2012	143	$ 639	$ 2,288	$ 4.47	$ 16.00
12/19/2012	127	$ 588	$ 2,166	$ 4.63	$ 17.06
1/18/2013	**429**	$ 1,945	$ 4,870	$ 4.53	$ 11.35
2/19/2013	**909**	$ 3,948	$ 9,002	$ 4.34	$ 9.90
3/20/2013	211	$ 1,091	$ 3,039	$ 5.17	$ 14.40
4/19/2013	124	$ 701	$ 2,262	$ 5.65	$ 18.24
5/20/2013	119	$ 681	$ 2,219	$ 5.72	$ 18.65
6/19/2013	129	$ 707	$ 2,290	$ 5.48	$ 17.75
7/17/2013	153	$ 806	$ 2,495	$ 5.27	$ 16.31
8/16/2013	164	$ 857	$ 2,596	$ 5.23	$ 15.83
9/17/2013	228	$ 1,141	$ 3,164	$ 5.00	$ 13.88
10/17/2013	129	$ 721	$ 2,304	$ 5.59	$ 17.86
11/18/2013	127	$ 716	$ 2,286	$ 5.63	$ 18.00
12/18/2013	94	$ 570	$ 1,993	$ 6.06	$ 21.21
1/17/2014	96	$ 777	$ 2,240	$ 8.09	$ 23.33
2/18/2014	124	$ 960	$ 2,553	$ 7.74	$ 20.59
3/20/2014	148	$ 891	$ 2,595	$ 6.02	$ 17.54
4/18/2014	75	$ 530	$ 1,896	$ 7.06	$ 25.27
5/20/2014	146	$ 884	$ 2,580	$ 6.05	$ 17.67
6/19/2014	110	$ 692	$ 2,220	$ 6.29	$ 20.18
Average	**180**	**$942**	**$3,248**	**$5.52**	**$20.13**
Last 12-Month Average	**133**	**$674**	**$2,410**	**$6.17**	**$18.97**

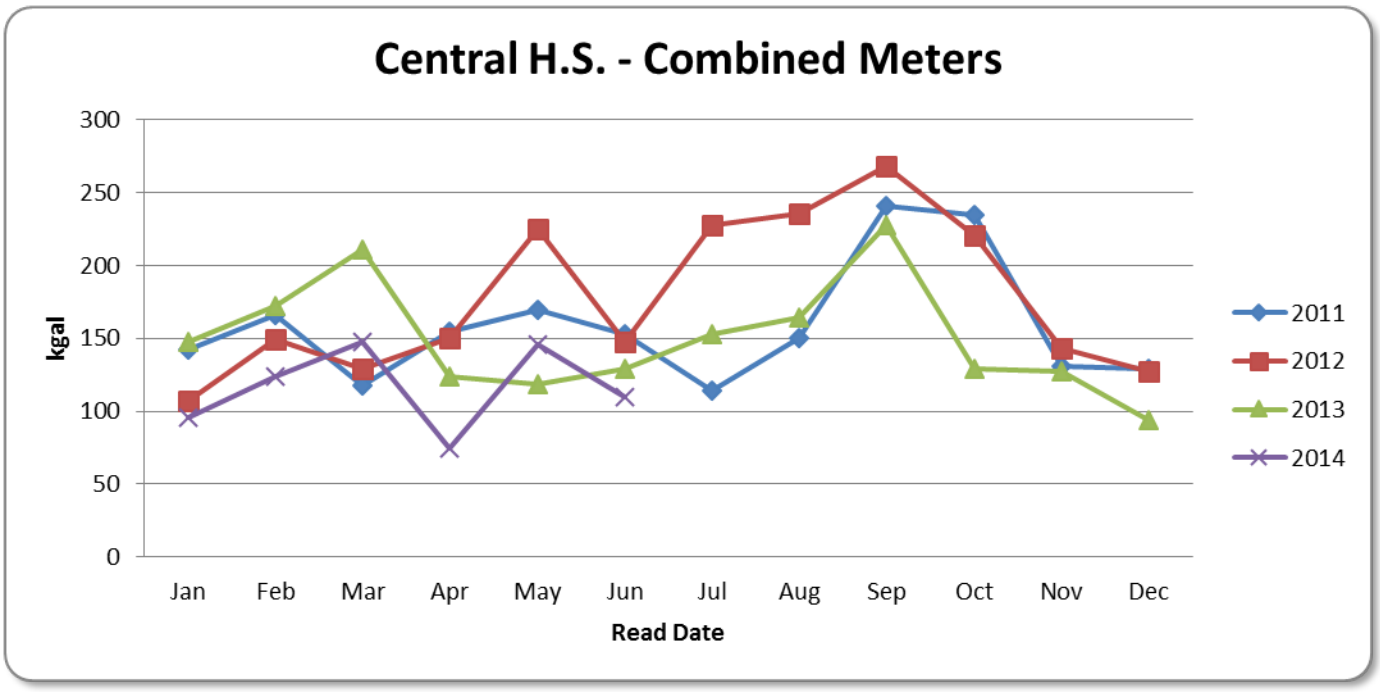

Figure 1. Central High School Water Use Data – 2011 to 2014

Water Model

During the site visit, an inventory of water use fixtures and estimates of usage patterns were collected to develop a water balance model for the facility. A general chart indicating the estimated breakdown of water uses at Central High School is provided below. This chart includes estimated uses from the inventory, and well as unidentified uses. Unidentified uses are calculated as the difference between estimated water use from the inventory and reported use from the water utility. The subsequent table summarizes the observed inventory. Based on data collected during the site visit, approximately 18 percent of reported water use is unaccounted for and could include inaccurate estimates in the water use inventory, leaks in the water supply system, and other potential losses.

The water use inventory table below represents an average day over the course of a calendar year. In other words, it is a weighted average of total school day and non-school day use during the school year, in addition to the total use for a summer day. Water use for a school day is based on a population of 1,550 people.

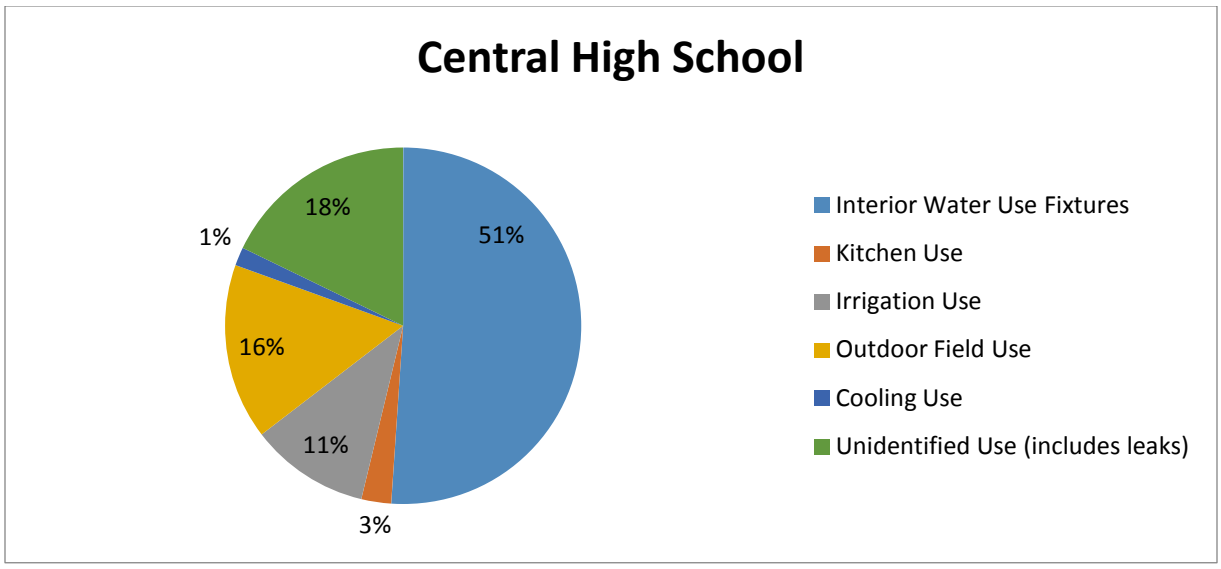

Figure 2. Water Use Allocation by Type/Activity

Table 2. Water Use Inventory for Modeling

	QTY	Flow Rate		Uses/Day		Total Use (GPD)
Toilets/Urinals						
Toilets	58	1.6	gpf	979	flushes	1,566
Urinals	28	1.0	gpf	587	flushes	587
TOTAL	**86**			**1,566**		**2,153**
Other Restroom Fixtures						
Faucets	83	1.8	gpm*	270	minutes	475
Showers	27	1.6	gpm	57	minutes	92
TOTAL	**110**			**382**		**566**
Kitchen						
Dish Washer	1	0.94	gal/rack	40	loads	17
Ice maker	2					91
Pre-rinse Spray Valve	2	1.5	gpm	32	minutes	44
TOTAL						**153**
Irrigation						
90-degree Sprinklers	12	0.86	gpm	140	minutes	89
180-degree Sprinklers	12	1.82	gpm	140	minutes	188
TOTAL	**24**			**280**		**277**
Cooling						
Evaporative Cooler – Kitchen	1	0.86	gal/ton	4	hours	107
Evaporative Cooler - Gym	1	1.82	gal/ton	5	hours	124
TOTAL	**2**			**9**		**231**
Sport Fields						
Baseball Field – Improper Use	1	10	gpm	10	minutes	41
Baseball Field – Leak	1	0.5	gpm	130	minutes	35
Practice Field – Improper Use	1	10	gpm	65	minutes	359
Practice Field – Leak	1	0.5	gpm	515	minutes	140
TOTAL						**574**
Drips, Leaks, and Other Undisclosed Uses						***498***

* Hand sink aerator flow rates range from 0.5-5 gpm

Key Findings

The table below summarizes the estimated savings for conservation opportunities identified at Central High School. Each opportunity is discussed following the table. Appendix A outlines the analysis details for each opportunity.

Water Savings Opportunity		Estimated Water Savings (kgal/yr)	Estimated Energy Savings	Estimated Annual Cost Savings ($)	Estimated Capital Cost ($)	Simple Payback (Years)
1	**Sport Fields Water Use Improvement**	1,600	0	$31,000	N/A	< 1 year
2	**End-use Water Fixtures**	140	290 therms	$2,800	$1,700	< 1 year
3	**Landscape/Irrigation Improvements**	1,100	0	$20,000	$24,000	1 year
4	**End-use Water Fixtures – Toilets & Urinals**	300	0	$5,700	$52,000	9 years
5	**Additional Water Savings in Kitchen Operations**	Not quantified				
6	**Educate Students, Faculty, and Staff**	Not quantified				

Opportunity 1: Sport Fields Water Use Improvement

The baseball field and practice field both have spigots that are used to varying degrees throughout the year, with the practice field spigot used much more than the baseball field one. According to the grounds crew, there are frequent leaks associated with each spigot and the hoses that are attached to them. They are able to fix the leaks when detected, though they are not able to regularly check for leaks. In addition, the water is frequently left running during and sometimes after the fields have been used.

The combination of leaks and poor water use result in an estimated waste of 1,600 kgal per year. The greatest loss results from the water spigots being left on when not in use. The school should implement an internal education campaign with coaches and other instructors and staff that may use the field spigots to reduce water waste and save money. Saving 1,600 kgal of water each year could result in $31,000 of savings, when considering the high sewer utility costs realized at the school.

Opportunity 2: End-use Water Fixtures – Aerators, Shower Heads & Pre-Rinse Spray Valves

Interior water use fixtures at Central High School include faucet aerators, shower heads, and pre-rinse spray valves. Replacing these fixtures with lower flow models could save water as well as reduce the energy required for water heating. In total, there are 77 hand sinks, 6 mop sinks, 27 shower heads, and 2 pre-rinse spray valves in the school. The hand sinks have a variety of aerators with flow rates ranging from 0.5-gpm to 5-gpm and averaging 1.76-gpm. Twenty-one shower heads are rated at 1.5-gpm and 6 are rated at 1.8-gpm. Lastly, the 2 pre-rinse spray valves are rated at 1.5-gpm.

Replacing the 49 hand sink aerators with low flow, 0.5-gpm models; upgrading the 6 higher flow rate shower heads to 1.5-gpm models; and upgrading to 1-gpm pre-rinse spray valves could save 140 kgal, 290 therms, and $2,800 annually. With a combined installed cost of $1,700, the payback for this opportunity is less than 1 year.

Opportunity 3: Landscape/Irrigation Improvements

Conducting an irrigation audit each year will help ensure sprinkler heads are functioning properly and are distributing water uniformly at times and intervals that maximize effectiveness and at rates suited to landscape needs. Watering for multiple, shorter periods will reduce runoff since the local area's clay soil can only absorb about 0.5 inch of water per hour. For example, watering every 3 days and watering each zone twice for 10 minutes with time in between will allow the ground to absorb the moisture.

Another option Central High School may want to consider is replacing some of the existing turf area in the courtyard with xeric landscaping that can be irrigated with drip systems. If half the turf area is converted to xeric landscape, it is estimated that the school could save approximately 1,100 kgal and $20,000 annually. At an assumed installation cost of $4 per square foot, the cost for this replacement would be $24,000, which would pay back in just over 1 year.

Other irrigation strategies to consider include smart controllers for the irrigation system that have weather sensors and adjust the irrigation schedule accordingly, or considering the potential for irrigating with grey water from the restroom sinks.

Opportunity 4: End Use Water Fixtures – Toilets & Urinals

Interior water use fixtures at Central High School that do not use energy for heating water include toilets and urinals. In total, there are 58 toilets and 28 urinals installed at the school. All of the toilets are estimated to be 1.6-gpf and all urinals are estimated to be 1-gpm.

Replacing all 58 toilets with 1.28-gpm models and all urinals with 0.125-gpf models would save 300 kgal and $5,700 annually. With a combined installed cost of $52,000, the payback is 9 years.

Opportunity 5: Additional Water Savings in Kitchen Operations

Kitchen equipment that can use water and should be considered when evaluating water conservation options are listed below:

- Commercial ice machines
- Combination ovens
- Steam cookers
- Steam kettles
- Dipper wells
- Pre-rinse spray valves
- Food disposals
- Commercial dishwashers
- Wash-down sprayers

For more information about each of these items and guidance for effectively reducing water use, visit www.epa.gov/watersense/commercial/docs/watersense_at_work/#/94/.

Opportunity 6: Educate Students, Faculty, and Staff

Central High School is an ideal place to educate both students and employees about water conservation. Science classes offer a great opportunity to engage students and encourage water conservation practices. Student clubs can also be formed to encourage not only water conservation, but also energy conservation and other green practices. Employee engagement is also critical, in particular given the poor water use management in the practice field. There are resources available to further improve the education and awareness efforts at Central High School, including the following:

U.S. EPA: http://www.epa.gov/region1/eco/drinkwater/water_conservation_schools.html
CoolCalifornia: http://www.coolcalifornia.org/article/save-water-schools
National Clearinghouse for Educational Facilities: http://www.ncef.org/rl/water.cfm

Appendix A: Water Savings Estimates

	QTY	Flow Rate	Uses/Day	Total Use (GPD)	Annual Savings				Implementation Cost ($)	Payback (years)
					Water (kgal)	Natural Gas (therms)	Electricity (kWh)	Cost ($)		
Toilets/Urinals										
Toilets	58	1.28 gpf	979 flushes	1,253	114	0	0	$2,169	$34,800	16.0
Urinals	28	0.125 gpf	587 flushes	73	188	0	0	$3,558	$16,800	4.7
TOTAL	**86**		**1,566**	**1,326**	**302**	**-**	**-**	**$5,727**	**$6,000**	**9.0**
Other Fixtures										
Faucets	49	0.5 gpm	93 minutes	88	117	243	0	$2,387	$1,470	0.6
Showers	6	1.5 gpm	5 minutes	42	8	18	0	$173	$180	1.0
Pre-rinse Spray Valve	2	1.0 gpm	32 minutes	44	12	24	0	$239	$60	0.3
TOTAL	**57**		**129**	**175**	**137**	**285**	**-**	**$2,799**	**$1,710**	**0.6**
Outdoor Uses										
Irrigation					1,059	0	0	$20,080	$23,750	1.2
Field Use Improvement					1,617	0	0	$30,683	n/a	immediate
TOTAL					**2,676**	**0**	**0**	**$50,763**	**$23,750**	**0.5**

CPC Solutions
Water Use Assessment

Date of Assessment:
July 28, 2014

Customer Contact:
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Patrick Flynn, Sustainability Analyst
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  - **Colorado Printing Company:** a large commercial printing facility with offices, restrooms, and seasonally dependent process water usage
  - **Fruita Monument High School:** a high school with approximately 1,300 students consisting of a main building with classrooms, offices, a full cafeteria and kitchen, gyms, locker rooms, a pool, and multiple restrooms; and one separate building that houses the agricultural shop and classrooms. There is limited potable water irrigation.
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The water audits included an analysis of water utility bills and a walk-through of the facilities to identify opportunities for water savings. Indoor end-use fixtures, outdoor irrigation, and process water were all considered during the analysis. The audit reports will be used to inform potential opportunities for water savings that can be implemented throughout the region.

CPC Solutions

CPC Solutions (CPC) is located in Grand Junction, Colorado and provides a wide range of marketing and printing services for customers throughout the Western U.S. The business occupies a 146,000 square foot manufacturing facility originally constructed in 1985, however CPC has only occupied the building since 2006. The facility operates 24 hours a day and there are typically 75 employees on each shift. Temporary employees are also brought in during busier months.

Water Use Profile

Water utility services are provided to CPC by Ute Water Conservancy District. Water use can typically be broken into three categories: indoor, process, and outdoor. Only indoor and process water uses are applicable to this assessment since raw water is used for irrigation at CPC. Water use for CPC is also highly dependent on production and weather because humidity is monitored and controlled on the shop floor using a misting system.

Indoor water use includes both interior water fixtures and mechanical equipment. The facility has a total of 6 restrooms and 2 locker rooms, which contain a total of 15 faucets, 21 toilets, 10 urinals, and 2 showers. The break room has a faucet as well. All of CPC's end use fixtures are considered standard flow – 2.0-gallons-per-minute (gpm) faucet aerators, 1.6-gallons-per-flush (gpf) toilets, 1.0 gpf urinals, and 2.0 gpm showerheads.

Mechanical water use includes both heating and cooling equipment. CPC has one 190 ton chiller that is used to cool the building using a glycol cycle. There are also two large steam boilers that provide space heating. All of CPC's hydronic mechanical equipment is closed loop so it does not represent significant water usage and therefore is not represented in the water use model presented in this report.

Process water use at CPC includes printing presses, humidity control, and equipment cooling. The printing presses and humidity control both require filtered water, provided via an on-site reverse osmosis treatment system. Water for both processes is completely consumed at the facility and not discharged to the sanitary sewer. Humidity is controlled in the printing area using fans with water nozzles equipped on each blade; sensors are used to achieve a target relative humidity of 44% for the printing area. Equipment cooling for the printing presses is achieved using a 110-ton chiller. This cooling system is also closed-loop and is therefore not represented in the water use model presented in this report.

Monthly water use and cost data for CPC since October 2012 are summarized in the table and figures below. Two meters serve the CPC facility. The majority of water use, including all indoor end-use fixtures, is on the 5/8" water meter, #70249595. The 3" water meter, #3070012350, is considered the process water meter as it solely serves the reverse osmosis system which provides water for the printing presses and humidity system. Water use and cost data for the last two years were provided by Ute Water Conservancy District. The cost data for some moths have very high unit costs due to fees associated with unauthorized fire meter use. The combined unit cost for the two meters for the last 12 months ranges from $4.26 to $5.59 per kgal with an average unit cost of $4.95 per kgal. This average unit cost was used for all cost estimates in this report.

There was a spike in usage on both meters in January 2013. The domestic water meter spike is thought to be the result of a running toilet leak in an unused portion of the building that was not immediately identified. The reason for the spike on the process water meter is unknown. Similarly, a high spike was observed on both meters in the summer of 2013 but after conversations with facility staff the reason for this spike is unknown.

Table 1. Water Use and Cost Data – 2012 to 2014

Read Date	3" Meter		5/8" Meter		Total		$/kgal Total
	Use (kgal)	Cost	Use (kgal)	Cost	Use (kgal)	Cost	
10/4/2012	7	$76	66	$684	73	$759	$10.38
11/6/2012	15	$144	160	$1,552	174	$1,696	$9.73
12/6/2012	10	$191	72	$1,352	82	$1,543	$18.74
1/7/2013	82	$763	405	$3,777	486	$4,539	$9.33
2/6/2013	65	$567	266	$2,307	332	$2,873	$8.66
3/6/2013	12	$125	184	$1,868	196	$1,993	$10.17
4/4/2013	12	$52	193	$821	206	$873	$4.24
5/6/2013	12	$49	182	$774	193	$823	$4.25
6/6/2013	15	$62	179	$762	194	$825	$4.25
7/5/2013	57	$257	419	$1,886	476	$2,143	$4.50
8/6/2013	52	$235	454	$2,051	506	$2,286	$4.52
9/6/2013	167	$767	474	$2,176	641	$2,943	$4.59
10/4/2013	57	$245	257	$1,107	313	$1,352	$4.32
11/6/2013	16	$67	173	$738	189	$805	$4.26
12/5/2013	10	$42	140	$604	149	$646	$4.33
1/7/2014	14	$75	79	$409	93	$484	$5.18
2/6/2014	10	$57	64	$356	74	$413	$5.56
3/6/2014	51	$242	80	$382	131	$624	$4.75
4/4/2014	10	$52	67	$367	76	$420	$5.52
5/6/2014	10	$55	63	$354	73	$409	$5.59
6/5/2014	11	$62	67	$365	78	$428	$5.47
7/7/2014	13	$68	76	$399	89	$466	$5.26

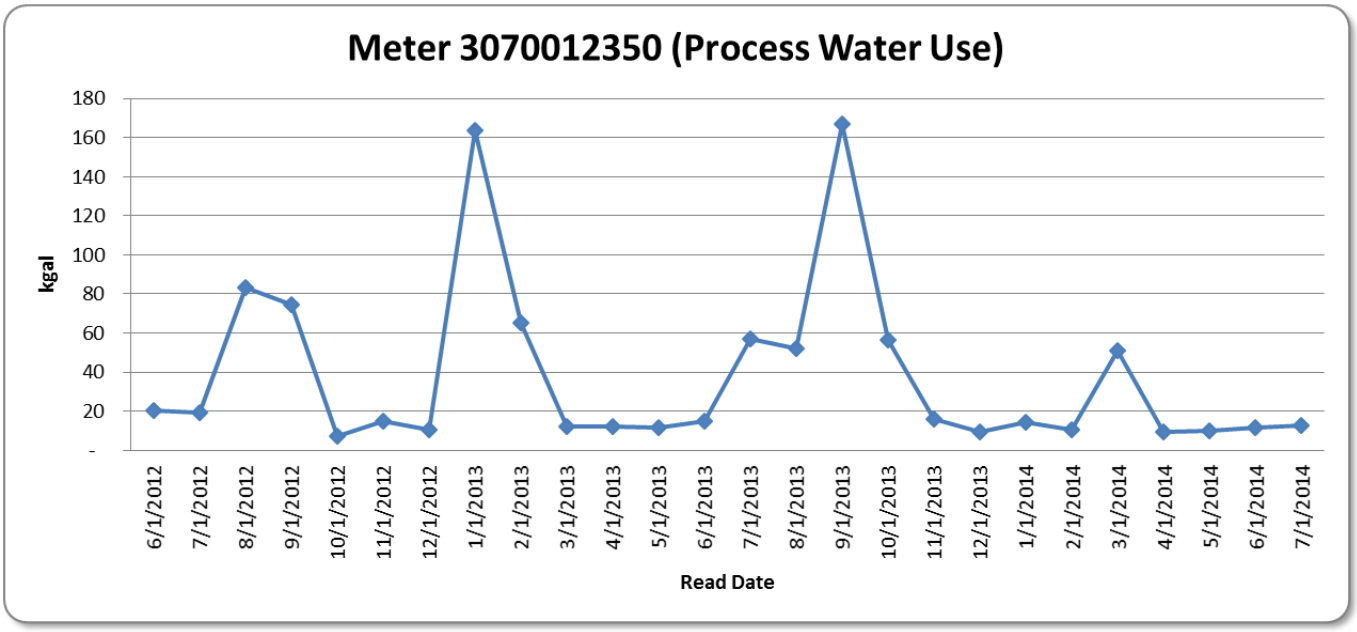

Figure 1. Water Use Data, Meter 3070012350 – 2012 to 2014

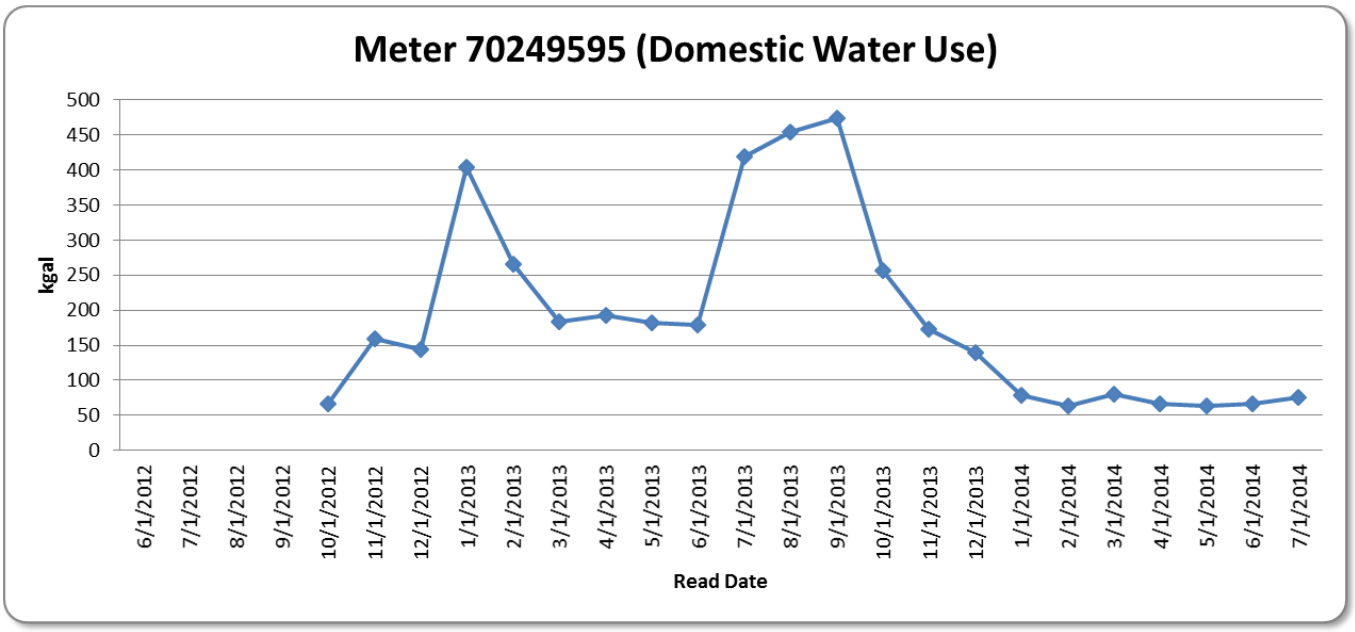

Figure 2. Water Use Data, Meter 70249595 – 2012 to 2014

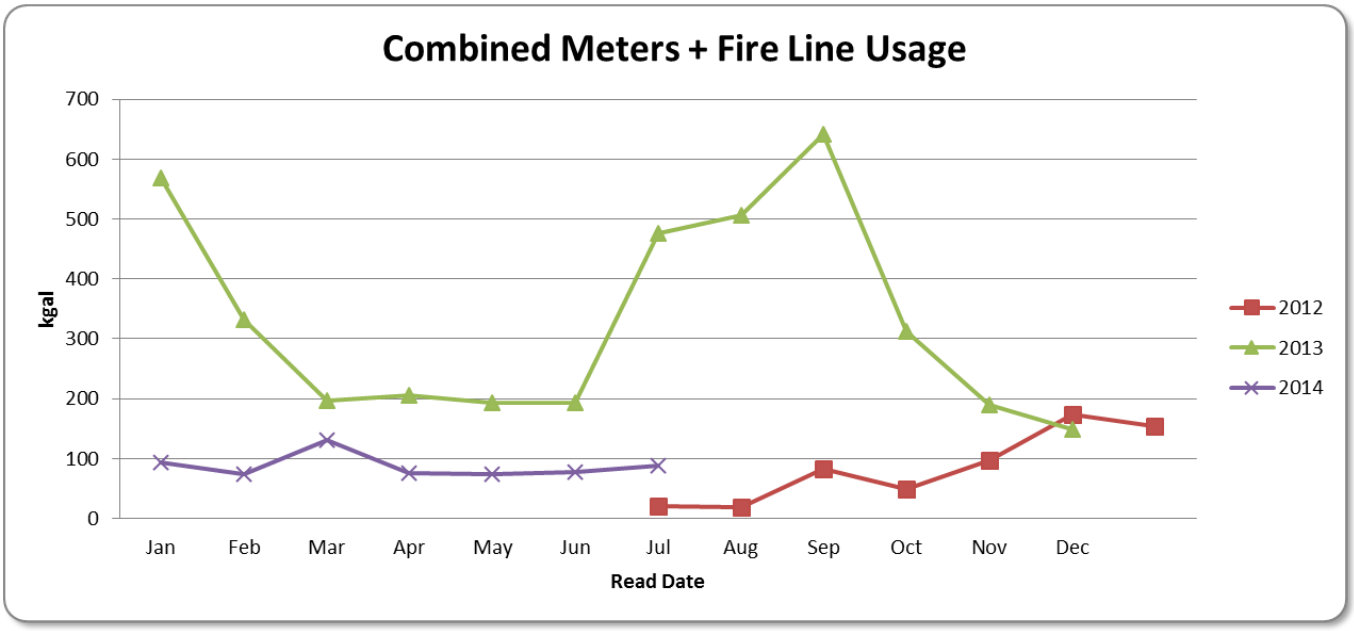

Figure 3. Water Use Data, Combined Meters – 2012 to 2014

Water Model

During the site visit, an inventory of water using fixtures and equipment as well as estimates of usage patterns were collected to develop a water balance model for the facility. A general chart indicating the estimated breakdown of water uses at CPC is provided here. This chart includes estimated uses from the inventory, as well as unidentified uses. Unidentified uses are calculated as the difference between estimated water use from the inventory and reported use from the water utility. The subsequent table summarizes the observed inventory. Based on data collected during the site visit, approximately 5 percent of reported water use is unaccounted for and could include inaccurate estimates in the water use inventory, leaks in the water supply system, and other potential losses. Consumption data for 2013 were not used to inform the model due to inconsistent data seen in both meters.

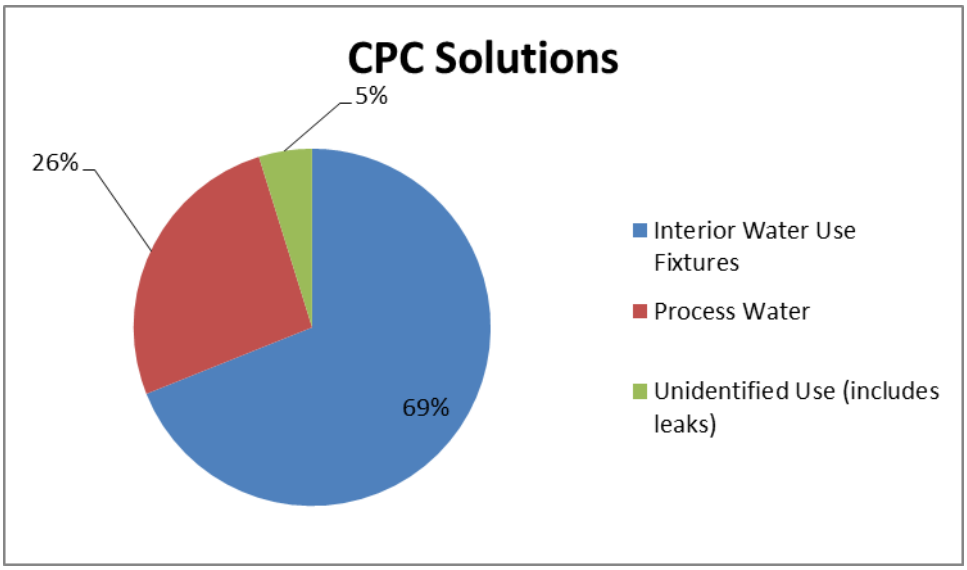

Figure 4. Water Use Allocation by Type/Activity

Table 2. Water Use Inventory for Modeling

	QTY	Flow Rate	Uses/Day	Total Use (GPD)
Toilets				
Women's Restrooms	4	1.6 gpf	110 flushes	177
Women's Locker Room	3	1.6 gpf	83 flushes	133
Women's Office Restroom	4	1.6 gpf	110 flushes	177
Men's Restrooms	4	1.6 gpf	122 flushes	194
Men's Locker Room	3	1.6 gpf	91 flushes	146
Men's Office Restroom	3	1.6 gpf	91 flushes	146
TOTAL	**21**		**608**	**972**
Urinals				
Men's Restrooms Urinal	3	1.0 gpf	101 flushes	101
Men's Locker Room Urinal	3	1.0 gpf	101 flushes	101
Men's Office Restroom Urinal	4	1.0 gpf	135 flushes	135
TOTAL	**10**		**338**	**338**
Bathroom/Wash Sinks				
Women's Restrooms	3	2.0 gpm	77 minutes	154
Women's Locker Room	2	2.0 gpm	51 minutes	103
Women's Office Restroom	2	2.0 gpm	51 minutes	103
Men's Restrooms	4	2.0 gpm	80 minutes	160
Men's Locker Room	2	2.0 gpm	40 minutes	80
Men's Office Restroom	2	2.0 gpm	40 minutes	80
Break Room	1	2.0 gpm	20 minutes	40
TOTAL	**16**		**360**	**720**
Showers				
Women's Locker Room	1	2.0 gpm	67.5 minutes	135
Men's Locker Room	1	2.0 gpm	67.5 minutes	135
TOTAL	**2**		**135**	**270**
Process Water				
Printing Presses				526
Humidifying System				
Humidity Control Nozzles	80	0.028 gpm	3 hours	349
Drips, Leaks and Other Undisclosed Uses				***161***

Key Findings

The table below summarizes the estimated savings for conservation opportunities identified at CPC. Each opportunity is discussed in detail below. Appendix A outlines the analysis details for each opportunity.

Table 3. Cost/Savings Analysis for Water Conservation Opportunities

Water Savings Opportunity		Estimated Water Savings (kgal/yr)	Estimated Thermal Savings (th/yr)	Estimated Annual Cost Savings ($)	Estimated Capital Cost ($)	Simple Payback (Years)
1	Faucet Aerator Upgrades	190	400	$1,200	$480	0.4
2	Low Flow Toilets and Urinals	280	0	$1,400	$18,600	14
3	Reverse Osmosis System	Not quantified				

Opportunity 1: Faucet Aerator Upgrades

CPC has standard flow restroom faucets with measured flow rates of 2.0-gallons-per-minute (gpm). Replacing all of the aerators with models rated at 0.5 gpm would produce water savings as well as energy savings from reduced hot water demand. Installing low flow aerators would reduce water use by 190 kgal and energy use for heating water by 400 therms annually, saving approximately $1,500 per year. This project would cost approximately $480 installed, giving it a payback of less than one year.

The savings estimates presented here are calculated based on an occupancy of 225 staff per day and a unit cost of $0.70 per therm for natural gas.

Opportunity 2: Low Flow Toilets and Urinals

In addition, most of the toilets and urinals are standard flow models, 1.6-gallons-per-flush (gpf) and 1.0 gpf, respectively. Retrofitting or replacing all standard flow toilets could reduce water use by 280 kgal, saving approximately $1,400 per year. This project would cost approximately $18,600 installed, giving it a payback of 14 years. These estimates include replacing toilets with 0.8 gpf models and urinals with pint flush (0.125 gpf) models. When combined with the faucet aerator opportunity, the overall water fixture upgrade project has a payback of 6-7 years.

The savings estimates for this opportunity are also calculated based on an occupancy of 225 staff per day.

Opportunity 3: Reverse Osmosis

Reverse osmosis is used to provide filtered water for the humidity controls and printing presses at CPC. According to the EPA's WaterSense at Work[1], commercial reverse osmosis processes can reject between 25 and 50%[1] of water that initially enters the system. Depending on the equipment that is installed, there could be an opportunity to reduce or repurpose this rejected water.

[1] Environmental Protection Agency, WaterSense at Work, Chapter 7.2: Water Purification. http://www.epa.gov/watersense/commercial/docs/watersense_at_work

Recovery rates within the reverse osmosis process is defined as the ratio of filtered water produced to total water consumed. More efficient processes have a higher recovery rate. Water savings could be realized by evaluating and potentially increasing the recovery rate at CPC.

The first step is to assess the water quality that is required for the printing process and evaluate options to adjust the reverse osmosis recovery rate as appropriate. Any adjustments could reduce the amount of water and energy that is ultimately consumed during the treatment process. Another strategy to increase the recovery rate would be to increase the number of pressure chambers within the process, achieving higher pressures to more effectively overcome the natural osmosis process.

In addition to direct refinements to the reverse osmosis system, another opportunity to consider is the reuse of the rejected water. Opportunities for reuse toilet flushing and landscape irrigation.

Appendix A: Water Savings Estimates

	QTY	Flow Rate	Uses/Day	Total Use (GPD)	Annual Savings				Implementation Cost ($)	Payback (years)
					Water (kgal)	Natural Gas (therms)	Electricity (kWh)	Cost ($)		
Toilets										
Restrooms	21	0.80 gpf	608 flushes	486	174	0	0	$859	$12,600	14.7
Urinals										
Restrooms	10	0.125 gpf	338 flushes	42	105	0	0	$522	$6,000	11.5
Bathroom/Wash Sinks										
Restrooms	16	0.5 gpm	360 minutes	180	193	401	0	$1,235	$480	0.4

Dos Hombres Restaurant - Clifton Water Use Assessment

Date of Assessment:
July 28, 2014

Customer Contact:
Spike Howard
970-434-5078

Utility Contact:
Dave Reinertsen, Assistant Manager
Clifton Water District
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Introduction

Clifton Water District partnered with the City of Grand Junction and the Ute Water Conservancy District to develop a Grand Valley Regional Water Conservation Plan. As part of this regional plan Clifton Water, along with the other water utilities, has committed to providing water audits for select customers in the commercial-industrial (C-I) sector. The utilities contracted with Brendle Group to conduct these water audits for the following water users:

- **Clifton Water District**
  - **Central High School:** a high school with approximately 1,500 students consisting of a main building with classrooms, offices, a full cafeteria and kitchen, gyms, locker rooms, and multiple restrooms; and three additional buildings housing classrooms and a library. There is limited potable water irrigation.
  - **Dos Hombres Mexican Restaurant:** a 242-seat restaurant with full kitchen, restrooms, and limited irrigation
- **City of Grand Junction**
  - **Alsco:** a large commercial laundry facility with restrooms, significant process water usage, and light irrigation usage
  - **Edgewater Brewing Company:** a 60-barrel-a-day brewery with a restaurant, restrooms, and limited irrigation
- **Ute Water Conservancy District**
  - **Colorado Printing Company:** a large commercial printing facility with offices, restrooms, and seasonally dependent process water usage
  - **Fruita Monument High School:** a high school with approximately 1,300 students consisting of a main building with classrooms, offices, a full cafeteria and kitchen, gyms, locker rooms, a pool, and multiple restrooms; and one separate building that houses the agricultural shop and classrooms. There is limited potable water irrigation.

The water audits included an analysis of water utility bills and a walk-through of the facilities to identify opportunities for water savings. Indoor end-use fixtures, outdoor irrigation, and process water were all considered during the analysis. The audit reports will be used to inform potential opportunities for water savings that can be implemented throughout the region.

Dos Hombres Fine Mexican Food and Cocktails

Dos Hombres Fine Mexican Food and Cocktails (Dos Hombres), is a Sonoran-style Mexican food restaurant located in Grand Junction, Colorado. The business has occupied its 7,200 square-foot building since 2002. Typically, there are 14 employees working afternoon shifts, and 25 employees onsite during evening shifts. The business serves an estimated 14,000 patrons daily. Dos Hombres' operating hours are from 11:00 a.m. to 9:00 p.m. Sunday through Thursday, and 11:00 a.m. to 10:00 p.m. Friday and Saturday.

Water Use Profile

Water utility services are provided to Dos Hombres by Clifton Water. Water use at Dos Hombres can be broken into two categories: indoor and outdoor.

Indoor water use includes a 12-year-old ice maker, dishwasher, glass washer, strainer sink, and a steam table with a single filling faucet. There are two server stations, both include a hand sink, pitcher filler, and 8-head Pepsi machine. One of the stations has a coffee machine. Additionally, the business has two make-up air units with evaporative cooling that are turned on in April. The facility has five restrooms on the premise – four in the dining area and one staff restroom in the kitchen.

Outdoor water use is limited to irrigation. The business has four outdoor spigots, three of which have been decommissioned. The business irrigates its lawn four days a week (Monday, Tuesday, Thursday, Friday) for 20-minute periods and runs drip lines for an additional 17 minutes. It is believed that sprinklers are also turned on after the lawn is mowed on Sundays. Due to an increase in water use over the last three months, there are also concerns that the water trucks may be filling up at the spigot during off-hours.

Monthly water use and cost data for Dos Hombres since 2011 are summarized in the table and figure below. Historical water use trends have been fairly consistent since 2011, with higher water use in the summer months as a result of increased customer traffic as well as water use for irrigation and building cooling. In order to develop an informative water use model, estimated winter and summer consumption were projected by averaging months of consumption from November through April for winter, and from May through October for summer. The winter average is 121 thousand gallons (kgal) per month while the summer average is 188 kgal per month.

The average unit cost for water used to estimate potential cost savings for water conservation opportunities is $8.49 per kgal, including both water and sewer costs. The water only rate is $4.70 per kgal. For the purposes of estimating the associated energy cost savings for some of the measures, a unit cost of $0.08 per kilowatt-hour was assumed for electricity and $0.70 per therm for natural gas.

Based on historical studies for the Front Range of Colorado[1], the typical restaurant benchmarks for water use are 0.17-0.21 kgal per square foot and 10.6-14.3 kgal per seat based on annual water consumption. Using the last 12 months of available data, Dos Hombres is slightly above the square footage benchmark at 0.26 kgal per square foot (assuming 7,200 square feet) and below the seating capacity benchmark at 7.7 kgal per seat (assuming 242 seats).

[1] Industrial, Commercial, and Institutional Water Conservation. Benchmarking Taskforce. http://coloradowaterwise.org/Resources/Documents/ICI_toolkit/2006benchmarks.html

Table 1. Water Use and Cost Data – 2011 to 2014

Read Date	Usage (kgal)	Water Cost	Total Cost	$/kgal - Water	$/kgal - Total
1/18/2011	157	$340	$560	$2.17	$3.57
2/15/2011	122	$301	$521	$2.47	$4.27
3/15/2011	121	$299	$519	$2.47	$4.29
4/14/2011	132	$326	$576	$2.47	$4.36
5/16/2011	178	$439	$689	$2.46	$3.87
6/15/2011	178	$439	$689	$2.46	$3.87
7/14/2011	188	$463	$713	$2.46	$3.79
8/15/2011	229	$564	$814	$2.46	$3.55
9/15/2011	220	$542	$792	$2.46	$3.60
10/17/2011	198	$488	$738	$2.46	$3.73
11/14/2011	133	$328	$578	$2.47	$4.35
12/12/2011	103	$255	$505	$2.47	$4.90
1/13/2012	98	$259	$576	$2.64	$5.88
2/13/2012	113	$298	$629	$2.64	$5.57
3/15/2012	122	$321	$661	$2.63	$5.42
4/16/2012	147	$386	$750	$2.63	$5.10
5/16/2012	159	$418	$792	$2.63	$4.98
6/15/2012	183	$480	$877	$2.62	$4.79
7/16/2012	228	$597	$1,036	$2.62	$4.55
8/15/2012	204	$535	$951	$2.62	$4.66
9/14/2012	193	$506	$912	$2.62	$4.73
10/15/2012	194	$509	$916	$2.62	$4.72
11/14/2012	157	$412	$785	$2.63	$5.00
12/14/2012	137	$360	$714	$2.63	$5.21
1/15/2013	122	$530	$954	$4.34	$7.82
2/14/2013	112	$485	$890	$4.33	$7.94
3/15/2013	116	$503	$915	$4.33	$7.89
4/15/2013	134	$584	$1,031	$4.36	$7.69
5/14/2013	159	$696	$1,191	$4.38	$7.49
6/13/2013	179	$786	$1,319	$4.39	$7.37
7/12/2013	202	$890	$1,467	$4.40	$7.26
8/13/2013	244	$1,079	$1,736	$4.42	$7.11
9/12/2013	217	$957	$1,563	$4.41	$7.20
10/11/2013	190	$836	$1,390	$4.40	$7.31
11/12/2013	155	$678	$1,165	$4.38	$7.52
12/13/2013	102	$440	$826	$4.31	$8.09
1/13/2014	102	$440	$892	$4.31	$8.74
2/13/2014	85	$435	$838	$5.12	$9.85
3/14/2014	92	$474	$896	$5.15	$9.74
4/15/2014	102	$529	$980	$5.18	$9.61
5/15/2014	165	$875	$1,510	$5.30	$9.15
6/13/2014	191		$1,728		$9.05
7/14/2014	209				
Average	**157**	**$514**	**$919**	**$3.37**	**$6.09**
Last 12-Months Average	**155**	**$674**	**$1,229**	**$4.70**	**$8.49**

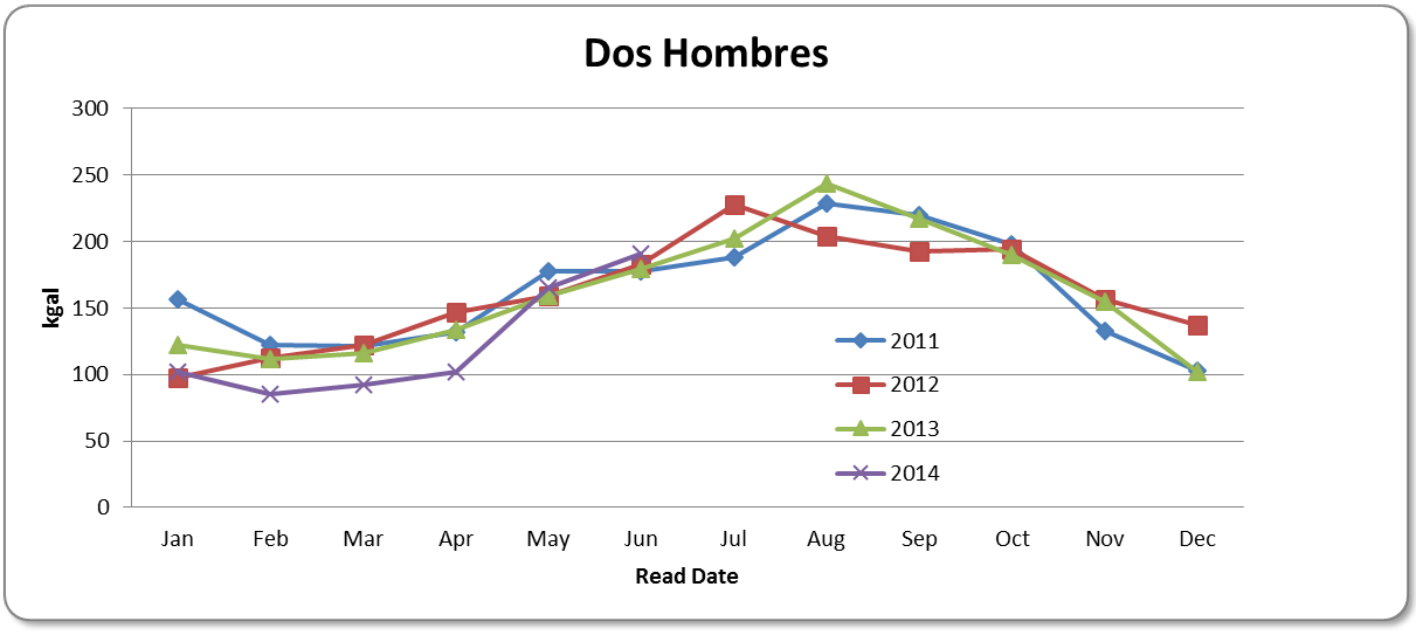

Figure 1. Water Use Data – 2011 to 2014

Water Model

During the site visit, an inventory of water use fixtures and estimates of usage patterns were collected to develop a water balance model for the facility. A general chart indicating the estimated breakdown of water uses at Dos Hombres is provided below. This chart includes estimated uses from the inventory, as well as unidentified uses. Unidentified uses are calculated as the difference between estimated water use from the inventory and reported use from the water utility. The subsequent table summarizes the observed inventory. Based on data collected during the site visit, approximately 25 percent of reported water use is unaccounted for and could include inaccurate estimates in the water use inventory, leaks in the water supply system, and other potential losses such as the suspected collection by water trucks during off-hours.

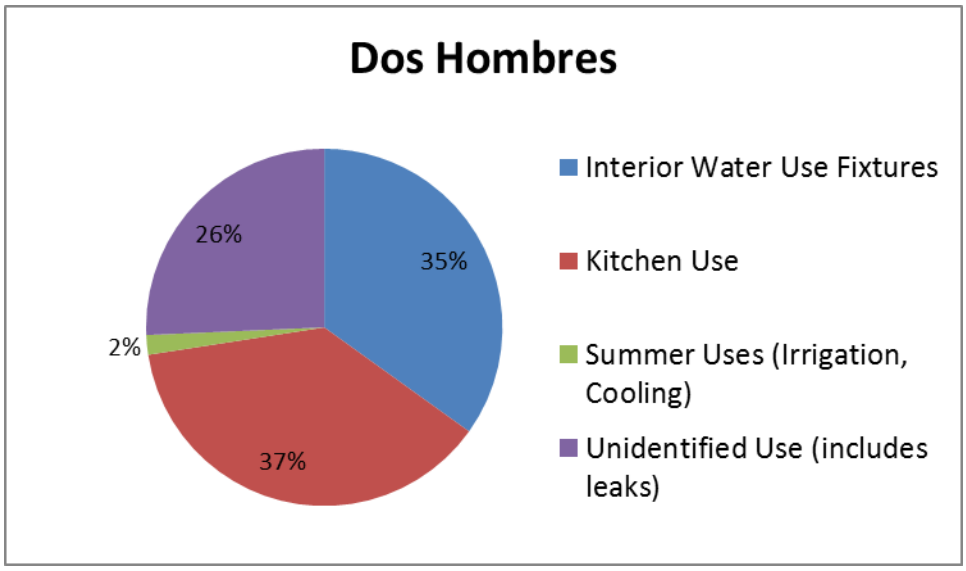

Figure 2. Water Use Allocation by Type/Activity

Table 2. Water Use Inventory for Modeling

	QTY	Flow Rate	Uses/Day	Total Use (GPD)
Toilets				
Women's Restroom	4	1.6 gpf	188 flushes	300
Men's restroom	2	1.6 gpf	47 flushes	75
Men's restroom (urinals)	3	1.0 gpf	141 flushes	141
Staff restroom	1	1.6 gpf	73 flushes	117
TOTAL	**10**		**448**	**632**
Bathroom/Wash Sinks				
Women's restroom	1	0.5 gpm	23 minutes	12
Women's restroom	3	2.0 gpm	70 minutes	141
Men's restroom	4	2.0 gpm	94 minutes	188
Staff restroom	1	2.0 gpm	37 minutes	73
Kitchen hand sinks	2	2.0 gpm	10 minutes	19
Server Station	1	5.0 gpm	10 minutes	49
Server Station	1	2.0 gpm	10 minutes	19
Prep Sink	2	5.0 gpm	129 minutes	643
TOTAL	**15**		**382**	**1,143**
Drinks				
Pepsi Machine	2	0.1 gal/cstmr	500 customers	31
Pitcher filler	2	0.1 gal/cstmr	500 customers	67
TOTAL	**4**			**98**
Kitchen				
Dish Washer	1	0.94 gal/rack	43 loads	81
Glass Washer	1	0.9 gal/rack	27 loads	24
Ice maker (water for ice)	1			212
Ice maker (cooling water)	1			1,326
Steam Table	2			46
Pre-rinse Spray Valve	1	2 gpm	64 minutes	129
TOTAL				**1,817**
Summer Uses				
Make-up Air Unit	2			8
Sprinklers	6	1 gpm	7 minutes	43
Sprinklers	6	2 gpm	7 minutes	86
Sprinklers	1	3.5 gpm	7 minutes	25
Drip Irrigation	36	0.08 gpm	6 minutes	18
TOTAL				**180**
Drips, Leaks and Other Undisclosed Uses				***1,307***

Key Findings

The table below summarizes the estimated savings for conservation opportunities identified at Dos Hombres. Each opportunity is discussed in detail below. Appendix A outlines the analysis details for each opportunity.

Table 3. Cost/Savings Analysis for Water Conservation Opportunities

	Water Savings Opportunity	Estimated Water Savings (kgal/yr)	Estimated Energy Savings	Estimated Annual Cost Savings ($)	Estimated Capital Cost ($)	Simple Payback (Years)
1	**Air-cooled Ice Maker**	480	2,400 kWh	$4,300	$1,000-4,000	<1 year
2	**Interior Water Use Fixture Upgrades**	300	330 therms	$2,700	$6,400	2 years
3	**Landscape/Irrigation Improvements**	50	n/a	$450	$3,600	8 years
4	**Additional Water Savings in Kitchen Operations**	Not quantified				
5	**Educate Employees and Customers**	Not quantified				
6	**Xcel Energy On-Site Assessment**	Not quantified				

Opportunity 1: Closed-loop Ice Maker

The facility's water-cooled ice machines uses a once-through cooling system in which the water used to cool the machine is subsequently discharged down the drain. These types of machines use between 100 and 180 gallons, or more, of water per 100 pounds of ice produced. Compared to 20 gallons of water used for an air-cooled machine, this significantly increases a building's water consumption and costs (both water and wastewater). Due to the age of the existing unit (12 years old) and the amount of water used, Dos Hombres should consider replacing this unit with an ENERGY STAR rated air-cooled unit[2]. Based on the specifications for the existing unit and the assumption of 1,100 pounds of ice production per day, this upgrade could potentially save 480 kgals of water and 2,400 kilowatt-hours (kWh) of energy annually, for a cost savings of about $4,300. A new water-cooled condenser (keeping the same bin and other components) could cost about $1,000, resulting in a payback of less than one year. To replace the ice maker with a complete new unit, the cost would be about $4,000.

For more information on ENERGY STAR rated ice machines, visit
www.energystar.gov/products/certified-products/detail/commercial-ice-makers

Opportunity 2: Interior Water Use Fixture Upgrades

Interior water use fixtures at Dos Hombres include two sets of restrooms in the dining area and a staff restroom in the kitchen area. In total, there are 9 restroom hand sinks with an average rated flow rate of 2 gallons per minute (gpm)[3], 7 flush valve type toilets with a flow rate of 1.6 gallons per flush (gpf), and 3 urinals with a flow rate of 1.0 gpf. Additionally, there were 2 hand sinks in the kitchen each with a 2 gpm flow rate and 2 3-basin prep sinks with a flow rate of 6 gpm, one in the kitchen, and another in the bar area. Finally, there are 2 server prep stations in the restaurant and each has a hand sink; the average

[2] There were concerns by the business owner that an air-cooled unit would not be able to keep up with demand at the facility, but if the unit is appropriately sized this should not be an issue.
[3] There was one faucet with a flow rate of 0.5 gpm

flow rate of these two sinks is 4 gpm. There is also a 2 gpm pre-rinse spray valve in the kitchen. The table below summarizes this water use fixture inventory.

Table 4. End-Use Fixture Inventory

Fixture Type	Restrooms	Kitchen/Service Area
Faucet Aerators		
0.5 gpm	1	0
2.0 gpm	8	2
>2.0 gpm	0	4
Toilets/Urinals		n/a
1.6 gpf toilet	7	
1.0 gpf urinal	3	

Replacing all the standard flow hand wash sink aerators with models rated at 0.5 gpm as well as replacing the pre-rinse spray valve with a lower flow, 1.0 gpm model would produce water savings and energy savings from reduced hot water demand. Replacing the toilets with low flow, 0.8 gpf models and replacing the urinals with pint flush models could realize additional water savings.

Retrofitting or replacing all standard-flow fixtures could reduce water use by 300 kgals and energy use for heating water by 330 therms annually, saving approximately $2,700 per year. This project could cost approximately $6,400 installed, giving it a payback of just over 2 years. These estimates include replacing sink aerators, toilets and urinals, and spray-rinse valves using standard industry installed costs.

The savings estimates presented here are calculated based on an average of 15,000 patrons per month as well as 37 staff split between two shifts each day.

Opportunity 3: Landscape/Irrigation Improvements

Conducting an irrigation audit each year will help ensure sprinkler heads are functioning properly and are distributing water uniformly at times and intervals that maximize effectiveness and at rates suited to landscape needs. Watering for multiple, shorter periods will reduce runoff since the local area's clay soil can only absorb about 0.5 inch of water per hour.

Another option Dos Hombres may want to consider is the replacement of the existing turf areas with xeric landscaping that can be irrigated with drip systems. If the two turf areas were converted to xeric landscape, it is estimated that Dos Hombres could save approximately 50 kgal and $450 annually. At an assumed installation rate of $4 per square foot, the cost for this replacement would be $3,600 for a payback of approximately 8 years.

Other options for Dos Hombres to consider would be smart controllers for the irrigation system that have weather sensors and adjust the irrigation schedule accordingly, or considering the potential for irrigating with greywater from the restroom hand wash sinks.

Opportunity 4: Additional Water Savings in Kitchen Operations

In the restaurant sector, commercial kitchen equipment can account for nearly half of total water use. Kitchen equipment that can use water and which should be considered when evaluating water conservation options includes:

- Commercial ice machines
- Combination ovens
- Steam cookers
- Steam kettles
- Wok stoves
- Dipper wells
- Pre-rinse spray valves
- Food disposals
- Commercial dishwashers
- Wash-down sprayers

For more information about each of these items and guidance for effectively reducing water use, visit www.epa.gov/watersense/commercial/docs/watersense_at_work/#/94/

Opportunity 5: Educate Employees and Customers

Dos Hombres already has programs in place to encourage water conservation including educating employees about the importance of water efficient practices such as asking customers if they would like water before bringing it to the table. For additional information about water conservation awareness and education, visit cliftonwaterdistrict.org/drip.html

Opportunity 6: Xcel Energy On-Site Assessment

During the site assessment, various opportunities for improved energy efficiency at Dos Hombres were observed, most notably the opportunity to upgrade lighting at the facility. As an Xcel Energy customer, Dos Hombres is eligible for an on-site assessment to identify potential energy saving opportunities similar to the process conducted for this water assessment.

To find out more about the on-site assessment program, visit www.xcelenergy.com/Save_Money_&_Energy/Business/Energy_Audits_&_Studies/Energy_Analysis_-_CO

Xcel Energy also offers a small business lighting program that Dos Hombres may benefit from. To learn more, visit www.xcelenergy.com/Save_Money_&_Energy/Business/Energy_Audits_&_Studies/Copy_of_Small_Business_Lighting_-_CO

Appendix A: Water Savings Estimates

	QTY	Flow Rate	Uses/Day	Total Use (GPD)	Annual Savings				Implementation Cost ($)	Payback (years)
					Water (kgal)	Natural Gas (therms)	Electricity (kWh)	Cost ($)		
Toilets										
Women's Restroom	4	0.80 gpf	188 flushes	150	55	0	0	$465	$2,400	5.2
Men's restroom	2	0.80 gpf	47 flushes	38	14	0	0	$116	$1,200	10.3
Men's restroom (urinals)	3	0.125 gpf	141 flushes	18	45	0	0	$381	$1,800	4.7
Staff restroom	1	0.80 gpf	73 flushes	5	21	0	0	$181	$600	3.3
TOTAL	**10**		**448**	**263**	**135**	**-**	**-**	**$1,143**	**$6,000**	**5.2**
Bathroom/Wash Sinks										
Women's restroom	1	0.5 gpm	23 minutes	12	-	0	0	$-	$-	n/a
Women's restroom	3	2.0 gpm	70 minutes	141	38	80	0	$383	$90	0.2
Men's restroom	4	2.0 gpm	94 minutes	188	51	107	0	$511	$120	0.2
Staff restroom	1	2.0 gpm	37 minutes	73	20	42	0	$199	$30	0.2
Kitchen hand sinks	2	2.0 gpm	10 minutes	19	5	11	0	$53	$60	1.1
Server Station	1	5.0 gpm	10 minutes	49	16	33	0	$159	$30	0.2
Server Station	1	2.0 gpm	10 minutes	19	5	11	0	$53	$30	0.6
Prep Sink	2	5.0 gpm	129 minutes	643	-	0	0	$-	$-	n/a
TOTAL	**15**		**382**	**1,143**	**136**	**284**	**-**	**$1,357**	**$360**	**0.3**
Drinks										
Pepsi Machine	2	0.1 gal/cstmr	500 customers	31						
Pitcher filler	2	0.1 gal/cstmr	500 customers	67						
TOTAL	**4**			**98**						
Kitchen										
Dish washer	1	0.94 gal/rack	43 loads	81						
Glass Washer	1	0.9 gal/rack	27 loads	24						
Ice maker (water for ice)	1			212						
Ice maker (cooling water)	1			1,326	484	0	2,409	$4,301	$4,000	0.9
Steam Table	2			46						
Pre-rinse Spray Valve	1	2 gpm	64 minutes	129	23	49	0	$233	$30	0.1
TOTAL				**1,817**						

	QTY	Flow Rate	Uses/Day	Total Use (GPD)	Annual Savings Water (kgal)	Natural Gas (therms)	Electricity (kWh)	Cost ($)	Implementation Cost ($)	Payback (years)
Summer Uses										
Make-up Air Unit	2			8						
Sprinklers	6	1 gpm	7 minutes	43	15	0	0	$123	$3,600	7.9
Sprinklers	6	2 gpm	7 minutes	86	30	0	0	$256	See above	See above
Sprinklers	1	3.5 gpm	7 minutes	25	9	0	0	$76	See above	See above
Drip Irrigation	36	0.08 gpm	6 minutes	18						
TOTAL				**180**						
Drips, Leaks and Other Undisclosed Uses				***1,307***						

CITY OF Grand Junction COLORADO

PUBLIC WORKS, UTILITIES & PLANNING

October 24, 2014

Request for Performance Extension – Water Efficiency Grant-PO# OE PDA 14000000066

Dear Mr. Wade:

The domestic water providers of the Grand Valley – The City of Grand Junction, Clifton Water District, and Ute Water Conservancy District, request a time extension to complete the identified activities of the Colorado Water Conservation Board's awarded Water Efficiency Grant to the entities that was to be completed by December 31, 2014. The request for the performance extension is due to the fact that the residential irrigation audits (to be performed by The Center for Resource Conservation [CRC]) have not yet been completed.

It took several months to finalize the contractual performance requirements between the City of Grand Junction's Procurement Department and representatives of CRC. By the time the contract was approved, staff scheduling did not accommodate performance of the audits in August and September. Additionally, several of the candidate residential customers contacted the entity representatives to express their desires to not have the audits performed this late in the year as their summer irrigation needs and schedules had been changed.

The Commercial Water Use Audit portion of the Grant deliverables has been completed and we are anticipating the arrival of the final reports from The Brendle Group to submit as per the Grant requirements.

Therefore, the Grand Valley domestic water providers respectfully request a deliverable extension for the Residential Audit portion of the Grant to December 31, 2015, by which time the audits and findings will be complete. The candidate residential customers have been notified that the audits are being scheduled for April and May of 2015. This time frame will provide the customers with meaningful data and information that can be considered for the 2015 irrigation season.

Thank you for considering this request. If you have any questions or need additional information, please contact either myself at (970)244-1429, or David Reinertsen (Clifton Water) at (970)434-7328, or Joe Burtard (Ute Water) at (970)242-7491.

Sincerely,

Rick Brinkman
Grand Junction Water Services Manager

Residential Audits

1. Pre-audit Preparation and Marketing

The pre-audit preparation will consist of conference calls with the Consultant and Project Manager to discuss the details of the audits and resource materials to be included in the marketing and outreach. The marketing campaign to solicit interest in the program will be developed by the Consultant with the Project Manager. The Consultant will work with the customers to schedule the audits.

2. On-site Audits

The on-site audits will be performed by the Center for ReSource Conservation staff. The audit includes gathering customer information, visual inspection, catch cup tests, pressure readings, soil and root depth tests, landscape measurements, determine watering schedule and sharing test results and recommendations. It's anticipated that the 100 audits would be completed over a two week period in Summer, 2015. One month after the audits, customers will be asked to complete a satisfaction survey.

3. Reporting

Following the on-site audits, the Consultant will prepare an overall report summarizing the findings and trends of the audits. The report will be available by the end of the year 2015.

4. Monitoring

Monitoring of monthly and annual water use will be tracked and compared to prior month and year values to determine if the audits have resulted in lower water usage. The Consultant will complete an Impact Analysis of all audited properties one year after the audit comparing pre and post audit water use.

5. Project Deliverables and Timelines

Task	Schedule	Consultant	In-kind
Task 1: Pre-audit Preparation and Marketing Marketing is ongoing starting in March. In-kind hours include compilation of water use history and marketing assistance with utility bill inserts, website and event promotions—40 hours @ $75/hour	Start March 1, 2015—16 weeks	$ 2,312.5	$ 3,000
Task 2: On-Site Audits (includes in-kind assistance with field work of 30 hours @ $75/ hour	Start May 1, 2015—2 weeks	$10,425	$ 2,250
Task 3: Reporting ((includes in-kind review of 8 hours @ $75/hour)	Start August 1, 2015—2 weeks	$ 2,312.5	$ 600

Task 4: Monitoring	Start September 1, 2015—1 week and into following year.	$ 1,000	
Project Management and Grant Reporting (in-kind of 40 hours @ $75/hour	On-going		$ 3,000
Total	31 Weeks*	$16,050	$ 8,850

*Total Billable Hours. Consultant will complete an Impact Analysis of audited properties one year after the audit.

It is estimated that audits will begin in March 1, 2015 and will be completed by the end of September 2015. The 50% completion report will be submitted to the CWCB by the end of September 2015, the 75% completion report submitted to the CWCB by the end of January 2015 and the final report submitted to the CWCB not later than March 1, 2016. All reports will be developed by the Project Manager.