

# Coeur d'Alene Tribe Benewah Market Energy Efficiency Project Final Technical Report

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On Feb. 28, 2017, Office of Indian Energy Director Chris Deschene (second from right) joined the Coeur d'Alene Tribe to celebrate its upgraded Benewah Market in Plummer, Idaho. From left: Joe Peone (Bonneville Power Administration), Alfred M. Nomee (Coeur d'Alene Tribe), James Alexie (Coeur d'Alene Tribe), Chris Deschene, and Ken Johnston (Bonneville Power Administration). Photo from Jennifer Fletcher, Coeur d'Alene Tribe Council Fires Newspaper.

*December 2017*

*Prepared by Tiffany Allgood, Environmental Programs Manager*

*Coeur d'Alene Tribe's Environmental Programs Office*

*Natural Resources Department*

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## **Background**

The Coeur d'Alene Reservation has been the home of the Coeur d'Alene Tribe since time immemorial and it is fitting that the Tribe's name in the Coeur d'Alene language is *schitsu'umsh*, "the ones who were found here." The Reservation is located in northern Idaho, is approximately 345,000 acres and is comprised of forest land, agricultural land, several streams, Coeur d'Alene Lake and the St. Joe River and a small amount of developed land. The project area was conducted within the boundaries of the Coeur d'Alene Reservation (maps of the Tribe's aboriginal territory and Reservation are included in Appendix A). The population of the Reservation is 6,760 (2010 Census). Currently, there are approximately 2,463 enrolled Coeur d'Alene Tribal members (Coeur d'Alene Tribe Enrollment 2016).

The economy of the Coeur d'Alene Tribe has been based upon farming and timber harvesting for the past 100 years until the 1990's when the Tribe opened a successful gaming operation. The gaming operation, combined with U.S. government funding, has allowed the Tribe to decrease pressure on its natural resource extraction and increase the services that the Tribe can provide to Tribal members and Reservation residents. The Tribe considers the environment, natural and cultural resources in everything that it does and considers itself a caretaker of those resources. This project is an important part of the Tribe's caretaking duties. The land and its diverse natural resources supported the spiritual and physical needs of the Tribe for many thousands of years. This continues to be true.

## **Introduction**

The Benewah Market is a Tribally-owned and operated facility located at 1111 B St. Plummer, ID 83851. The Benewah Market is an approximately 23,500 square foot single-story structure. The majority of the building is occupied by a grocery store with a full meat department, deli, and bakery. Approximately 20% of the floor area at the northeast corner is occupied by an Ace Hardware retailer. The largest part of the building is approximately 17,000 square feet, is separately metered and houses the grocery store which was constructed in 1984. The market operates from 7am to 8pm during winter with evening hours extended to 9pm during summer. The market is the largest full service market serving the Coeur d'Alene Reservation and is the only full service market in a 35-mile radius.

### ***Long-Term Tribal Energy Vision***

The Coeur d'Alene Tribe has established goals to protect the cultural and environmental values for the Coeur d'Alene people. Specifically, the goals include preserving, protecting, and enhancing the natural resources, improving the quality of life and providing social and economic benefits across the Reservation. Research, development, and promotion of alternative energy and fuel sources such as wind, solar, hydrogen, and others have been identified as important by the Tribe (Coeur d'Alene Tribe Integrated Resource Management Plan 2012).

The Tribe has also developed and submitted an Energy Efficiency & Conservation Strategy to the U.S. Department of Energy as part of the Energy Efficiency & Conservation Block Grant that the Tribe completed in 2012.

### ***Energy Efficiency and Conservation Strategy Goals***

#### **Goal 1: Establish energy use benchmarks and monitoring protocols:**

1. Conduct electrical energy use audits in partnership with BPA
2. Establish benchmark for primary Tribal government facilities (EPA Portfolio manager)
3. Research energy performance goals for new or renovated Tribal facilities

#### **Goal 2: Increase organizational commitment to increasing energy efficiency and conservation:**

1. Develop an energy management plan
2. Develop a Tribal energy efficiency workgroup
3. Develop an employee energy efficiency awareness program

#### **Goal 3: Evaluate cost/benefit of distributed renewable energy production on the Reservation:**

1. Evaluate the potential for development of distributed renewable energy production
2. Integrate renewable energy infrastructure into community planning, if viable

The Tribe, with assistance from McKinstry energy consultants, completed Level 1 ASHRAE energy audits during the Energy Efficiency and Conservation Block Grant.

Next, the Tribe completed an Energy Efficiency Feasibility Study (EEFS) funded by the U.S. Department of Energy on all Tribal government buildings on the Coeur d'Alene Reservation. Part of the EEFS process was to complete Level 3 ASHRAE energy audits on all Tribal government buildings.

Energy audit data collected during the EEFS was analyzed using EPA Portfolio Manager. Several underperforming Tribal facilities were identified and targeted for energy efficiency improvements. Based on the cost/benefit results, the Benewah Market was chosen as a high priority facility.

The Tribe also completed installing a Bonneville Environmental Foundation (BEF) funded Solar 4R Schools project on the Coeur d'Alene Tribe's Natural Resources building. BEF provided the Tribe with a solar energy array (14.25 kW) to offset approximately 15% of the energy costs of the Tribe's Natural Resource building in Plummer. Additionally, BEF and the Tribe provided solar energy curriculum and teacher training so that the solar array and educational kiosk can be used to teach middle school students about solar and other alternative energy sources.

### ***Project Goals***

The Tribe anticipated several quantifiable benefits that will result from the installation of energy efficient equipment in the Benewah Market:

- 1) The new equipment will create vastly improved health and sanitary conditions for perishable food storage
- 2) Overall annual energy use by the facility will drop by 30.8%-45%
- 3) Energy costs for the facility will drop by at least \$16,065 annually
- 4) Modern, energy efficient equipment will lower annual maintenance and operational costs and increase the economic viability of the Market
- 5) The installation, maintenance and up-keep of the proposed equipment will provide jobs and bolster the local economy
- 6) The retrofitting of energy efficient equipment in the Benewah Market will provide an educational opportunity for the local and Tribal community members on the importance and benefits of conservation as well as providing a framework for Tribal managers for future retrofits/energy efficiency improvements.

### **Description of Project Tasks and Results Achieved**

The Tribe designed ten tasks to complete in order to achieve the project goals. Please see below for a description of the tasks and the results that were achieved for each task.

#### ***Task 1: Complete NEPA and THPO clearances***

The Benewah Market Energy Efficiency Project is expected to fall under the National Environmental Policy Act (NEPA) categorical exclusions (CEs) 23 CFR 771.117 35, 19 and complies with the definition of CE's contained in 40 CFR 1508.4. The Benewah Market Energy Efficiency Project; does not induce significant impacts to planned growth or land use for the area, does not require the relocation of significant numbers of people; does not have a significant impact on any natural, cultural, recreational, historic or other resource; does not involve significant air, noise, or water quality impacts; does not have significant impacts on travel patterns; and does not otherwise, either individually or cumulatively, have any significant environmental impacts. The Environmental Programs Office will coordinate with the Coeur d'Alene Tribe's Historic Preservation Officer to ensure that the Tribe is in compliance with The Tribal Historic Preservation Office's (THPO) rules and regulations for the Benewah Market Energy Efficiency Project.

### ***Task 1 Results Achieved***

The Tribe obtained its determination of NEPA compliance from the U.S. Department of Energy on February 18, 2014. The Tribe received clearance from THPO to proceed with equipment installation on February 25, 2016. In addition, the Tribe conducted a limited hazardous materials assessment on February 3, 2015 to determine if any of the paint or floor tiles that would be disturbed required special handling. There were no hazardous materials detected in the paint and floor tiles.

### ***Task 2: Hire Vendors and Contractors (per Tribe's approved Subcontract Plan)***

The process of hiring vendors and contractors will consist of:

- 1) The Tribe will prepare and advertise a request for proposals (RFP) for the mechanical contractor and licensed engineer and solicit bids.
- 2) Evaluation and scoring of proposals will be performed by Environmental Programs Office staff and the Chief Executive Office (CEO) of the Tribal Development Corporation.
- 3) The Tribe will select the mechanical contractor and the licensed engineer based upon the Tribe's selection criteria and the information submitted to the Tribe in the proposals.
- 4) Once the mechanical contractor and licensed engineer have been selected for the project, the Environmental Programs Office will obtain U.S Department of Energy (DOE) concurrence with the chosen contractor/engineer.

### ***Task 2 Results Achieved***

The Tribe solicited bids from three companies for the new equipment and installation (Refrigeration Unlimited, Zero Zone and Market Equipment). The Tribe selected Market Equipment because it could provide both the new equipment and installation as a package. The other two companies could provide the equipment but not the installation. All of the equipment costs were comparable but the installation costs were higher for those companies that would have had a subcontractor conduct the installation.

For the licensed engineer portion of the project, to conduct construction oversight and commission the equipment, the Tribe advertised a request for proposals and received four proposals by the deadline (DC Engineering, OurEvolution, GC Green and Energy 350). The Tribe selected DC Engineering because their cost was competitive and the company had strong experience with refrigeration.

The Tribe obtained U.S. Department of Energy concurrence on the equipment and engineering subcontractors.

### ***Task 3: Install New Energy Efficient Refrigeration Equipment***

The Coeur d'Alene Tribe's Environmental Health Specialist will oversee the pre-planning, installation and monitoring of equipment to ensure proper health and safety rules and regulations are adhered to

during the course of project implementation. Additional oversight of installation will be provided by the CEO of the Tribal Development Corporation and the Environmental Planner. A licensed engineer will also be onsite for a portion of the installation process to provide technical oversight.



### ***Task 3 Results Achieved***

The Tribe installed the new refrigeration equipment in May 2016 through mid-September 2016 (please see list of equipment in Appendix B). The oversight of the installation of the new equipment was primarily provided by the Tribe's Chief Executive Officer of the Tribe's Development Corporation and DC Engineering staff. The Tribe's Environmental Health Specialist left the position at the end of July 2016 during the equipment installation process so that there was not as much oversight from that part of the Tribe's operation as expected.

### ***Task 4: Third-party Verification of Successful Installation of Equipment***

A licensed engineer/energy consultant will conduct utility billing analyses as well as verify that equipment has been successfully installed and is operating to specifications. Measurement and verification of energy savings will be completed by comparing the average annual energy billing for the 12-months prior to the project to energy billing for the four quarters that immediately follow project implementation.

### ***Task 4 Results Achieved***

The billing analysis for energy costs was conducted by the CEO of the Tribe's Development Corporation. The energy analysis for energy usage was conducted by an engineer and will be discussed more below. DC Engineering staff conducted the equipment commissioning on the project during and immediately after the new equipment was installed in the Benewah Market.

### ***Task 5: Collect Data on Energy Use Savings***

Energy Use data will be collected from Plummer Power and compiled for one year to account for seasonal variations in usage.

### ***Task 5 Results Achieved***

Bonneville Power Administration's energy engineer collected energy use data from Plummer Power for several years (monthly billing data from September 2011 to August 2017 was used for this analysis) to

establish trends and also used computer programs to normalize for annual fluctuations in weather.

***Task 6: Verify Energy Use Savings***

Energy data collected and compiled for the first year after installation of energy efficient equipment in the Benewah Market will be analyzed and compared to use/cost records from 12-months prior to the project to determine actual energy use and cost savings.

***Task 6 Results Achieved***

Bonneville Power Administration's energy engineer completed an energy use savings report for use in the monitoring and verification for the energy incentives rebates (Appendix C). Overall, the Tribe saved 22.9% of energy use compared to pre-project energy use. The estimated savings was 30.8-45% energy use savings. The two main reasons for the decrease in energy use savings from the projected amounts are: 1) There was an over-estimation of the older equipment's inefficiency, and 2) The Tribe did not install a heat recapture system to replace the one that was installed on the old equipment.

***Task 7: Pursue Utility Incentives***

The Coeur d'Alene Tribe could not obtain assurance of utility incentives for this grant application because the schedule of incentives expires at the end of this fiscal year and does not begin a new cycle until October 2013. However, the Tribe intends to pursue incentives if awarded this grant. It would be a *custom* incentive package and the Tribe would request to utilize any of the incentives obtained during the project period as a partial substitute for the existing Tribal Cost Share. Custom incentives will be pursued throughout the entire course of the project period.

***Task 7 Results Achieved***

Prior to the start of the new equipment installation, the Bonneville Power Administration engineers developed a custom project plan with the Tribe to qualify the Tribe for utility incentives. Once the equipment was installed, BPA completed the monitoring and verification of the project's energy use savings and assisted the Tribe in obtaining utility incentives rebates from the Tribe's Benewah Market Energy Efficiency Project. The rebates from Plummer Power came too late to be used as a Tribal match for the project but did help offset the Tribe's share of the project.

***Task 8: Write Final Report***

A final project report will be drafted by the Tribe's Environmental Programs Office in conjunction with the Tribal Development Corporation and project engineer. The final report will consist of a summary of all project activities, documentation of equipment installation (photos and lists of equipment installed), summary and documentation of energy and cost savings from the project, documentation of NEPA and THPO clearances, and other pertinent information.



### ***Task 8 Results Achieved***

This is the final report for Task 8.

### ***Task 9: Request Tribal Council Approval of Final Report***

Once final reports are drafted and finalized for approval, they will be entered into an internal routing process. This routing process begins with the Natural Resource Director followed by the Chief Financial Officer, Legal Counsel, and Administrative Director. Natural Resource Committee concurrence is also requested. Once the routing process has been completed, the final report will be submitted to the Coeur d'Alene Tribal Council for approval.

### ***Task 9 Results Achieved***

This final report was routed to the CEO of the Development Corporation and to the Director of Natural Resources. Due to the straightforward nature of this report, it was not deemed necessary to route it to the Tribal Council for approval.

### ***Task 10: Submit Final Report to DOE***

If approved by the Coeur d'Alene Tribal Council, the final report will be submitted to the U.S. Department of Energy. The final report will contain affirmation of successful installation of energy efficient equipment in the Benewah Market as well as documentation and verification of a minimum 30% energy use savings for the facility.

### ***Task 10 Results Achieved***

This final report demonstrates that the Tribe successfully completed installation of new energy efficient refrigeration equipment into the Coeur d'Alene Tribe's Benewah Market. While the Tribe did not realize the 30% or more energy use savings that it had expected, the Tribe did verify a 22.9% energy use savings.

## **Discussion of Project Goals**

The Tribe has benefited greatly from the Benewah Market Energy Efficiency Project and will continue to do so for many years. Each of the Tribe's goals for the project has been reached, even if the amount of energy saved has been somewhat less than estimated:

1) The new equipment will create vastly improved health and sanitary conditions for perishable food storage

- The health and safety of the food has been improved greatly now that the refrigeration and freezer cases are at a constant and safe temperature on a monitoring and alarm system. There is no longer a thaw and freeze cycle that allows fluctuations in temperature. If the power goes out, there is an

immediate alarm and contact so that time may be tracked and food kept safe during an outage.

2) Overall annual energy use by the facility will drop by 30.8%-45%

-Overall annual energy use has dropped by 22.9% rather than 30.8-45% as explained above

3) Energy costs for the facility will drop by at least \$16,065 annually

-Energy costs for the Market decreased by an estimated \$11,620 in one year due to this project. The Tribe has seen an increase in the cost of energy from Plummer Power and this was offset by the reduction in energy consumed. This estimate assumes that the Tribe would have consumed the same amount of energy as the prior year (measurement periods for comparison: 9/2015 – 8/2016 and 9/2016 – 8/2017).

4) Modern, energy efficient equipment will lower annual maintenance and operational costs and increase the economic viability of the Market

-Maintenance costs are estimated to have decreased by \$10,000 in just the one year since installation in contract repair and maintenance. If it assumed that the Tribe will save \$10,000 per year, this could save the Tribe \$100,000 over a ten-year period, at a minimum. The savings over a ten-year period could be closer to \$150,000.

-The Tribe estimates that it has saved \$24,000 over a one-year time period in labor costs to maintain the older system. The labor costs are difficult to estimate but are based upon the need to manually defrost the old cases in the past. The labor cost savings could easily be higher than this. This is the annual cost of one employee. The Market also had to spend time replacing fans and other electrical components. The stocking/maintenance crew doesn't spend nearly the time on maintenance that it used to do.

5) The installation, maintenance and up-keep of the proposed equipment will provide jobs and bolster the local economy

-Due to having a more efficient store, with safer, more attractive display of food and lower energy and maintenance costs, the store is able to be more viable economically. The store has increased its sales and has been able to pass along operations and maintenance savings to its customers and employees.

6) The retrofitting of energy efficient equipment in the Benewah Market will provide an educational opportunity for the local and Tribal community members on the importance and benefits of conservation as well as providing a framework for Tribal managers for future retrofits/energy efficiency improvements.

-The Tribe hosted a ribbon-cutting ceremony on February 28, 2017 at the Benewah Market with Chris Deschene, then Office of Indian Energy Director, as well as representatives from the Coeur d'Alene

Tribe and Bonneville Power Administration. While the ribbon-cutting ceremony was going on, the Tribe's media outlets covered the ceremony and placed information about the project on the Tribe's Facebook page on two separate occasions (Appendix D).

## **Other Discussion**

The Tribe attended and gave presentations at two Tribal Energy Program Reviews in Denver, Colorado in 2015 and 2016 to discuss the Tribe's Benewah Market Energy Efficiency Project. The Tribal Energy Program Reviews are extremely important to continue because there is so much learning that is accomplished there. It opens up an entire new level of potential for tribes to learn from other tribes who have been navigating the energy industry.

## **Lessons Learned**

The Benewah Market Energy Efficiency Project provided a great opportunity for the Tribe to learn more about refrigeration and market operations. This project increased the Tribe's capacity in understanding how important heating and cooling operations are to the Tribe and its entities and highlighted the importance of increasing energy efficiency. Some of the lessons that the Tribe learned are that:

- Securing the commitment for energy incentives from utilities can be challenging due to the timing of your project not aligning with incentives schedules, competition for incentive funding and other complications
- Projects can be complex when they involve specialized technologies such as refrigeration and heating, aspects of construction such as plumbing and electricity, and renovation issues such as the potential for lead, asbestos, etc.
- Obtaining a third party engineer with specific expertise to commission new equipment as the Tribe's owner-representative is a good idea in order to ensure that the Tribe gets the best performance out of new equipment
- Sometimes your first bid is the best and lowest
- There is lot to learn about the refrigeration industry and technology
- It is amazing how fast time moves

## **Expression of Gratitude**

The Coeur d'Alene Tribe's Natural Resources Department and the Tribe's Development Corporation are thankful for the opportunity that the Benewah Market Energy Efficiency Project has afforded the Coeur d'Alene Tribal community. Without the U.S. Department of Energy's Indian Energy Program funding and its dedicated staff, this project would not have been completed. This has been a lot of work for all parties involved but has provided benefits to thousands of people for many years to come.

**Appendices (please go on to following pages)**

## Appendix A – Maps and photos

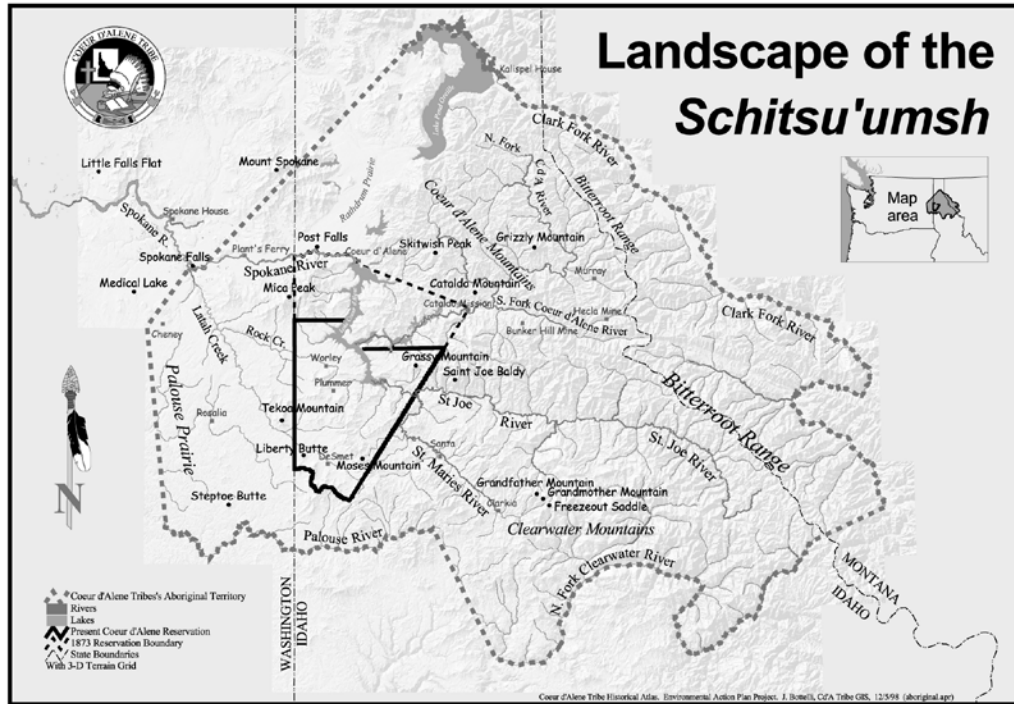


Figure 1. Coeur d' Alene Tribe Aboriginal Territory.



Figure 2. Coeur d' Alene Reservation Boundary.



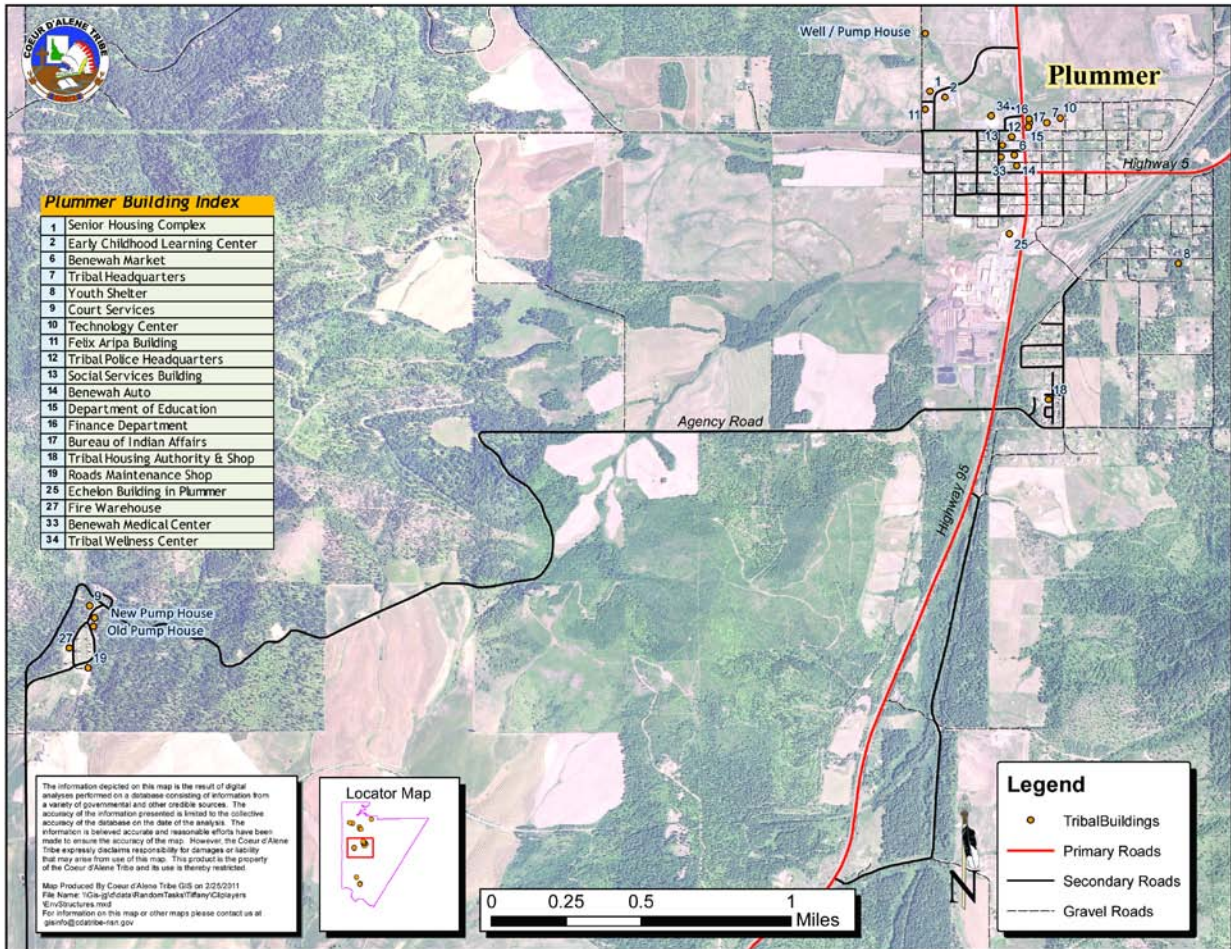


Figure3. Site map of the city of Plummer.





**Condensers**



**Evaporators**



Compressors





Produce Case



Produce Case from another angle



**Meat Case**



**Standing Meat Case**

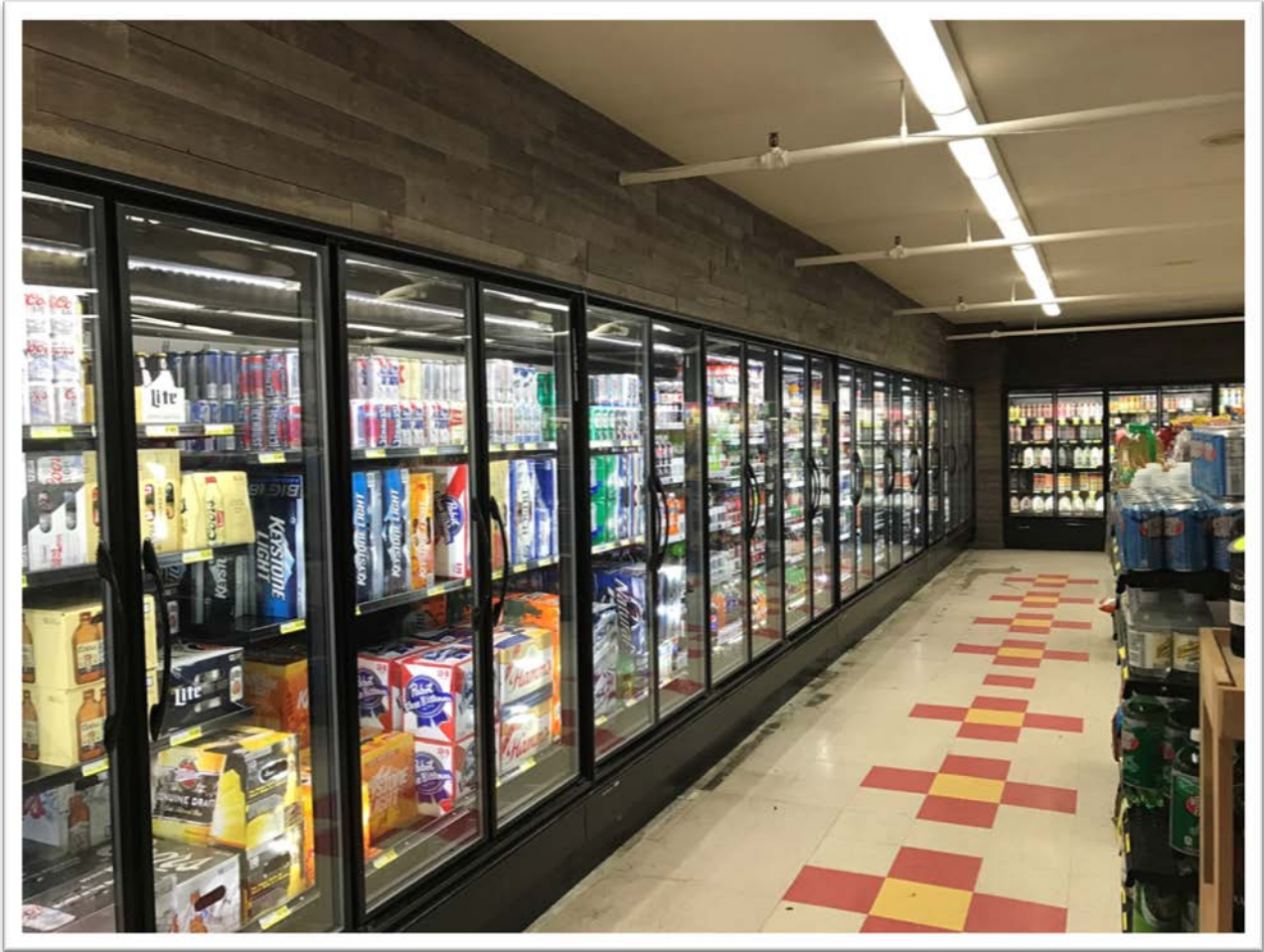




**Deli Case**



**Frozen Food Cases**



Beverage Cases



Frozen Meat Cases

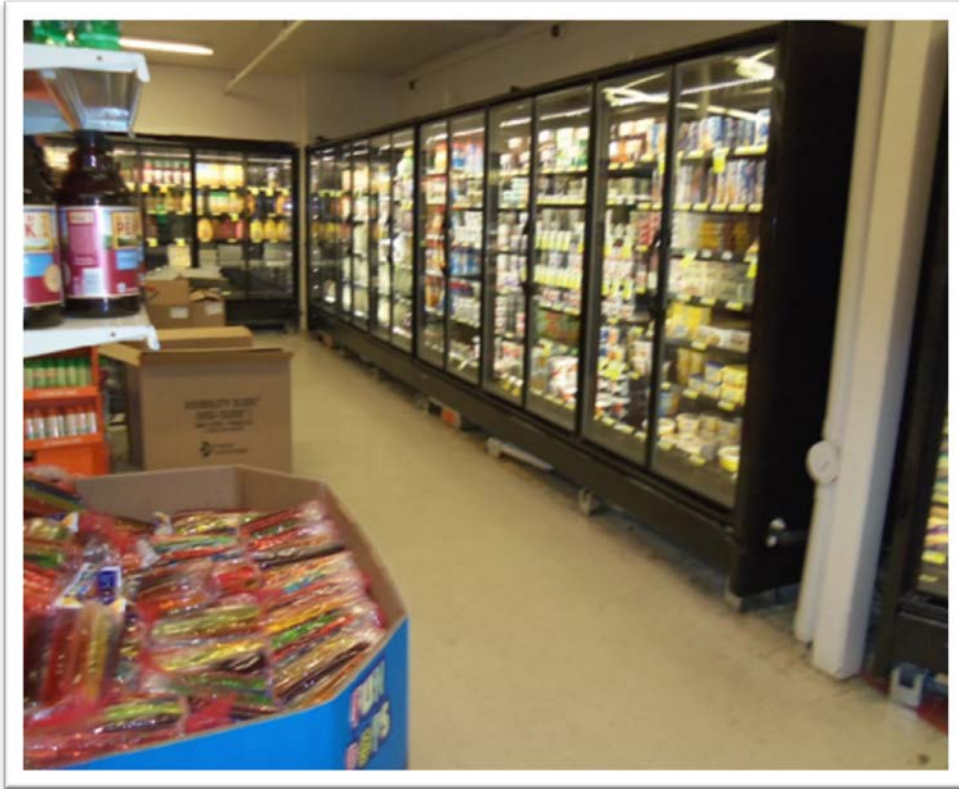




**Fresh Meat Case**



**Deli Case**



**Dairy Cases**



**A Second Deli Case**



**Appendix B – List of Equipment Installed (also includes equipment that cost under \$5,000)**

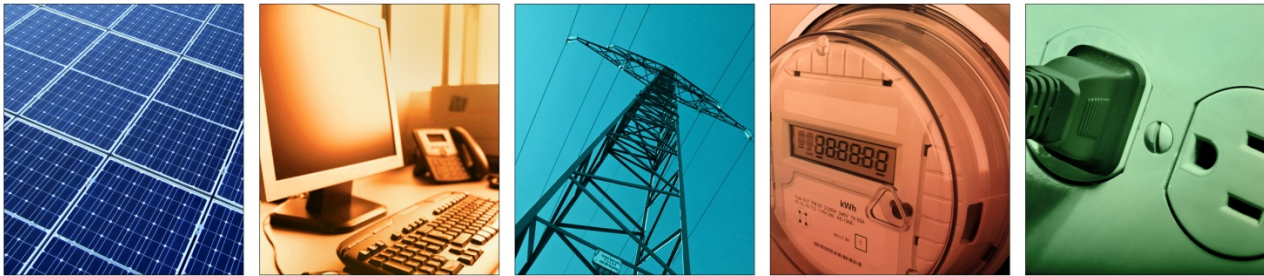
<b>System</b>	<b>Equipment</b>	<b>Qty</b>
HillPhoenix	Medium Temp System Compressor Rack	1
HillPhoenix	Medium Temp System Condenser	1
HillPhoenix	Low Temp System Compressor Rack	1
HillPhoenix	Low Temp System Condenser	1
HillPhoenix	Medium Temp System Evaporator	12
HillPhoenix	Low Temp System Evaporator	3
HillPhoenix	Fresh Meat Case	1
HillPhoenix	Frozen Food Line-up	2
HillPhoenix	Beverage Line-up	2
HillPhoenix	Frozen Food End Caps	1
HillPhoenix	Fresh Meat Line-up	1
HillPhoenix	Dairy/Deli Line-up	1
HillPhoenix	Bulk Produce Line-up	1
HillPhoenix	Frozen Bakery Case	1
HillPhoenix	Deli Meat Case	1
HillPhoenix	Frozen Meat Coffin	1
HillPhoenix	Fresh Meat Coffin	1
HillPhoenix	Deli Case	1
HillPhoenix	Produce Mister System	1

## **Appendix C - Benewah Market Monitoring and Verification Analysis**

# Benewah Market

## M&V Analysis

August 29, 2017



Prepared for

City Of Plummer, Plummer, ID

Prepared by

TJ Sharkey, currently under contract to BPA



**Project Summary from CPP:****Baseline System:**

The existing market is 23,500 SF. It consists of 16 individual compressor/case/walk-in units with associated rooftop condenser units. There are 15 evaporators in the walk-in coolers and freezers. There are T12 fixtures in the stock room. Multiple floor cases are used throughout the market.

**Proposed/Post System:**

The proposed upgrades include: 1. Reducing the total volume and thermal capacity of refrigeration cases on the sales floors. 2. Replace the existing aging floor cases with high efficiency cases with doors and controls. 3. Replace the 16 compressor/case/walk-in pairings with low temperature compressor racks with parallel configuration and controls. 4. Replace existing roof top condensers with two high efficiency units and controls. 5. Replace 15 evaporators in the walk-in coolers and freezers with high efficiency units with ECM fans and controls. 6. Reconfigure refrigerant lines. 7. Replace T12 lamps with T8. 8. Install Vending Misor on Vending machine. 8. Install pipe insulation on hot water piping. Refer to Energy proposal provided by Ourevolution, on file with the engineer.

.

**Savings estimates:**

The savings estimates and calculations are provided in the energy proposal provided by Ourevolution. The savings is based on the proposed load reductions, compressor performance, and DHW offsets. The average energy usage for the market between August 2009 to December 2012 is 1,281,033 kWh annually. The savings estimate for the measures is 376,651 kWh.

**M&V Plan:**

The M&V for this project shall be based on BPA's Standard Protocol, Verification by Energy Modeling Protocol and will be conducted by a BPA engineer with the coordination of the utility, and facility (if needed). The protocol is a whole building based analysis comparing pre/post actual utility energy data with respective actual local weather data using regression analysis. The pre/post regression curves are normalized using long-term average weather. The post-project performance period for this project is expected to be 6-9 months which is anticipated to provide statistical results of <50% fractional savings uncertainty @ an 80% confidence level. If this threshold is not met then the performance period will be extended until a statistical significance is deemed appropriate by the reviewing BPA engineer. [\*It is also anticipated that deemed measures (ie. lighting, computer network management, etc.) will be conducted during the same period as the CPP measures. If this is the case then the deemed energy savings from the upgrades will be subtracted from the whole building energy savings to determine the savings specifically from the measures in this CPP.] In addition, project invoices will be provided at the completion of the project.

\*Post Project Note: No deemed measures were installed

This a summary analysis for the Whole Building Regression Measurement and Verification (M&V) analysis for the Benewah Market located in Plummer, ID. The M&V method uses ECAM+ to correlate metered data and site-specific weather data to develop an energy-use model for pre-retrofit and post-project conditions based on observed temperature. Historical average temperatures are then projected onto each of these models, in order to remove the effect of extreme weather events in the data set (e.g., record-breaking heat in post-year). Calculated energy savings are derived from the difference between the ECAM+ statistical model weather-normalized pre- and post-values. This report covers the baseline (09/20/2011 to 8/21/2014) and Post (09/30/2016 to 8/21/2017) period.

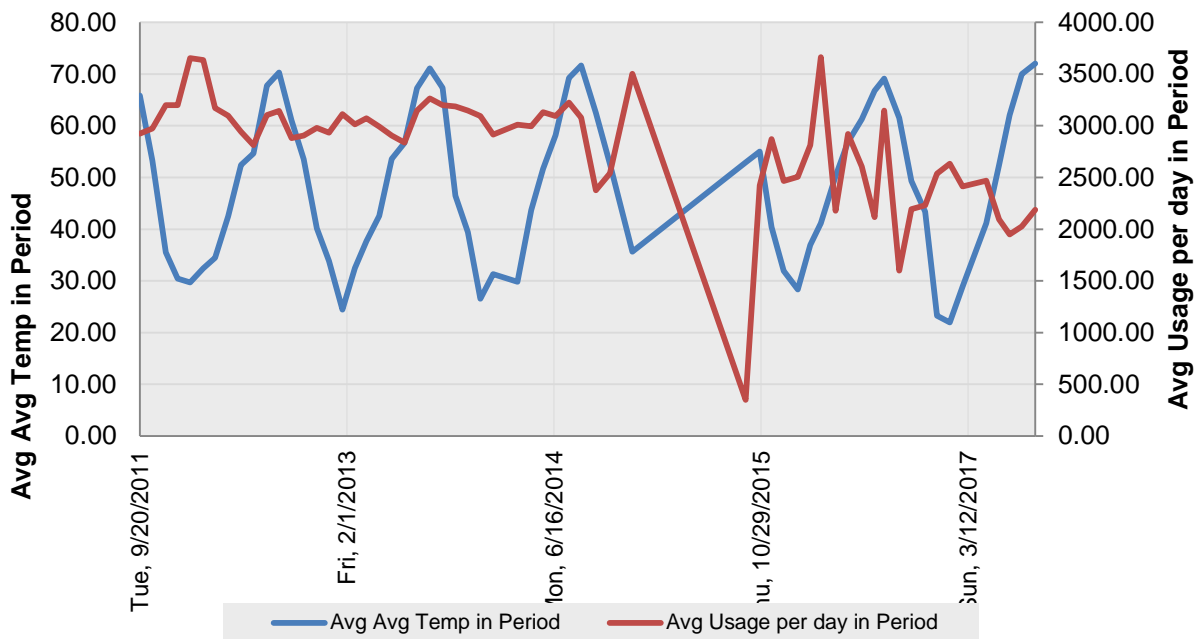
**Regression Analysis**

Monthly billing data from September 2011 to August 2017 was used for this analysis.

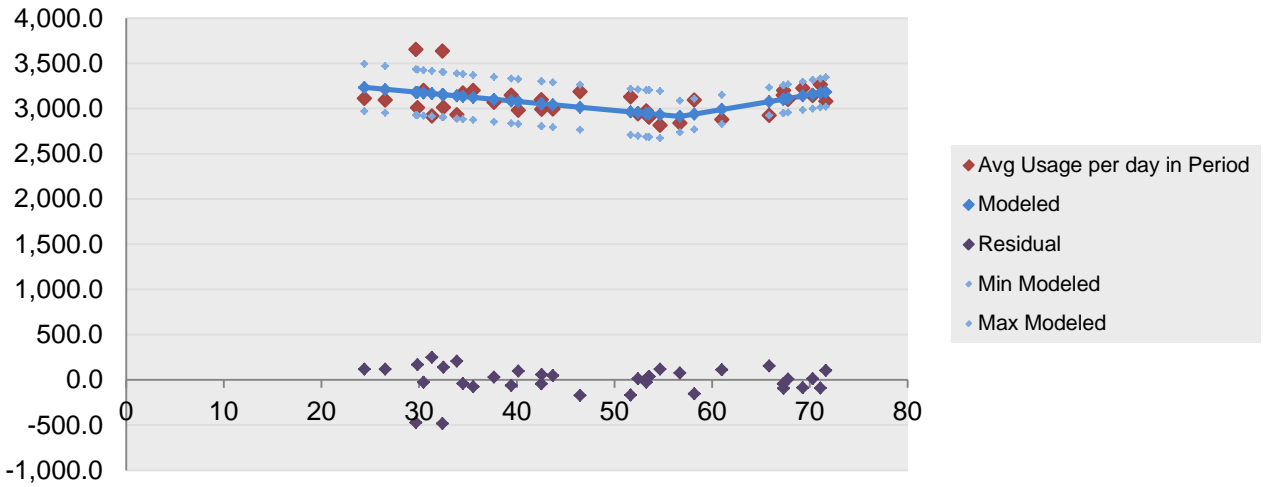
Energy data was correlated with site-specific weather data from the Couer D’alene, ID using ‘WeatherUnderground’ website. Site ID: KCOE  
[https://www.wunderground.com/history/airport/KCOE/2017/08/29/DailyHistory.html?req\\_city=Coeur d'Alene&req\\_state=ID&reqdb.zip=83814&reqdb.magic=1&reqdb.wmo=99999](https://www.wunderground.com/history/airport/KCOE/2017/08/29/DailyHistory.html?req_city=Coeur d'Alene&req_state=ID&reqdb.zip=83814&reqdb.magic=1&reqdb.wmo=99999)

A time series chart of energy and temperature is shown below. A construction and Commissioning period was from 8/21/14 to 9/30/16.

**Time Series**



**Baseline Regression Model: Energy Use vs. Temp**



Model Regression Statistics	Baseline
Model Type	4P
R <sup>2</sup>	.258
CV RMSE	5.4%

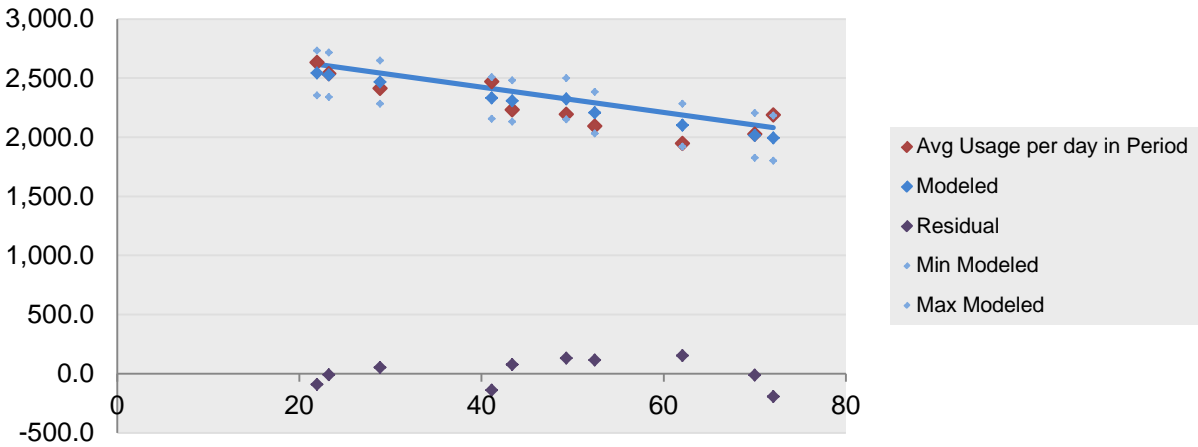
These models were correlated with energy usage to develop energy-use models. This model was then projected onto average year data (supplied by the Western Regional Climate Center) from the closest available site (CDA, ID) to develop a baseline energy usage, in order to remove the effect of extreme weather events in the data set.

The calculated normalized baseline is **1,128,909** (compared to an average usage of 1,157,897 kWh/yr for baseline years).

ECAM Calculated Baseline Period Annual Energy	1,128,909	kWh/yr
Billed Annual Average Energy (3 year average)	1,157,897	kWh/yr
ECAM Projected Baseline ±Uncertainty @ 80% Confidence Level	0.6%	kWh/yr
ECAM Projected Baseline ±Uncertainty @ 80% Confidence Level	19,077	kWh/yr

**Post Summary:**

**Post Regression Model: Energy Use vs. Temp**



Model Regression Statistics	Baseline
Model Type	2P
R <sup>2</sup>	.728
CV RMSE	5.6%

These models were correlated with energy usage to develop energy-use models. This model was then projected onto average year data (supplied by the Western Regional Climate Center) from the closest available site (CDA, ID) to develop a post period energy usage, in order to remove the effect of extreme weather events in the data set.

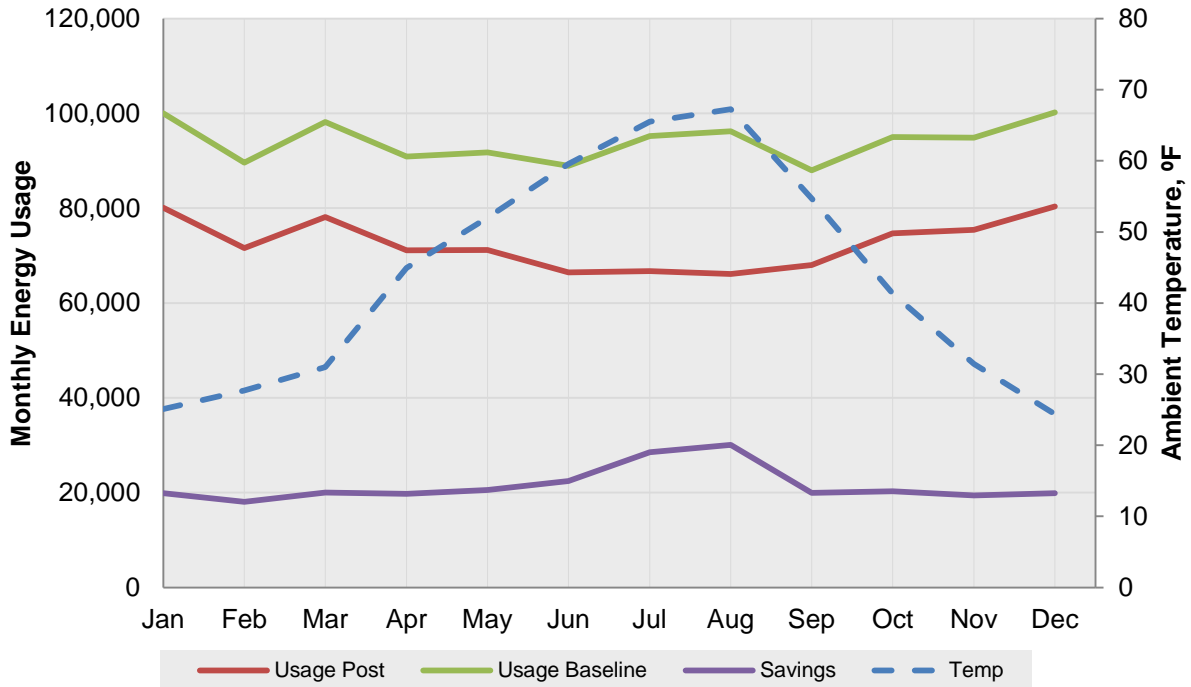
The calculated normalized post usage is **869,952 kWh**. A 10 month post period of energy usage was used for this post model.

ECAM Calculated Post Period Annual Energy	869,952	kWh/yr
ECAM Projected Post ±Uncertainty @ 80% Confidence Level	3.8%	kWh/yr
ECAM Projected Post ±Uncertainty @ 80% Confidence Level	33,066	kWh/yr

**Final Project Savings Summary**

**Normalized Use and Savings:**

**Normalized Use and Savings**



Adjusted Baseline Energy	1,128,909 kWh
Adjusted Post Energy	869,952 kWh
<b>Normalized Savings</b>	<b>258,958 kWh</b>
Normalized Savings Percentage	22.9%

**Total Project Savings: 258,958 kWh**

**Reference:**

“ECAM Benewah Pre and Post Analysis 090517” Excel File in the project folder



**Appendix D - Excerpts from the Coeur d'Alene Tribe's Facebook page**



The Coeur d'Alene Tribe @cdatrIBE

- Home
- About
- Photos
- Events
- Reviews
- Videos
- Posts
- Community
- Create a Page

Liked Following Share

The Coeur d'Alene Tribe February 28

A couple of years ago, the Benewah Market received a grant from the US Department of Energy and the Office of Indian Energy Policy and Programs to replace all of the old compressors, outdated evaporators, and refrigeration units. Most of the new units are in place and as a result, we have increased the health and safety of the food sold at the market and also decreased the market's energy usage by 30-45%. The Market is working to complete the remodel being completed in conjunction with the refrigerator upgrades.

A big thanks and congrats to the US Department of Energy and the Office of Indian Energy, Bonneville Power, our Tribal Natural Resources Department, the staff at the Market, and everyone else who was involved in this project!



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The Coeur d'Alene Tribe March 31

If you've been inside the Benewah Market lately, you know that big changes are happening. The upgrades are about more than just looking good - the new coolers, freezers, and displays are also helping to cut energy usage. You can read more about the project here: <https://energy.gov/.../efficiency-upgrades-help-coeur-dalene-...>



Efficiency Upgrades Help Coeur d'Alene Tribe Save Energy and Costs at its Benewah Market

Efficiency Upgrades Help Coeur d'Alene Tribe Save Energy and Costs at its Benewah Market

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The Coeur d'Alene Tribe March 14

Today is the day to weigh in on the Supplemental Levy Election. The Plummer-Worley School District is asking residents to continue the supplemental levy to help pay for full-time kindergarten, athletics, elective classes, smaller class sizes, and maintain the basic education programs at Lakeside Schools. Polls are open until 8 p.m. today, so get out there and vote YES to keep our schools running!

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