



# Comprehensive Energy Audit For Venetie Head Start Building



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Prepared For  
**Venetie Village Council**

**May 30, 2018**

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## **PREFACE**

The purpose of this report is to provide guidance in reducing facility operating costs and enhance the sustainability of this community. The report assesses the current energy usage of the facility, provide options for reducing the amount of energy used, and evaluate the cost vs. benefit of each option.

Discussions of site-specific concerns, financing options, general facility information, and an energy efficiency action plan are also included in this report.

## **ACKNOWLEDGMENTS**

The Alaska Native Tribal Health Consortium (ANTHC) Rural Energy Initiative gratefully acknowledges the assistance of Patrick (PJ) Hanson, First Chief, the members of the Venetie Village Council, and Donna Erick, the former Council administrator.

## **LIMITATIONS OF THIS STUDY**

The building modeling software AkWarm© was used to create a virtual representation of the Venetie Head Start Building. The model is then used to test the cost effectiveness of different energy efficiency measures (EEMs) like LED lighting and pump improvements. The AkWarm© software calculates the annual cost savings and payback period for the investment, and then ranks all EEMs based on their payback period.

There are limitations using this software, which may affect the accuracy of the EEMs cost savings. This report should serve as a guide when deciding which EEMS to pursue further. All EEMs and installation costs should be verified with a certified professional in that field before construction begins.

## OVERVIEW

This report was prepared for the Venetie Village Council. The scope of the audit focused on the Venetie Head Start Building, and includes an analysis of building occupancy schedules, building shell, heating systems, lighting, and other electrical loads. The Venetie Head Start Building was renovated in the 2000s, and was selected to participate in a flush/haul pilot project through ANTHC in 2001. The building is approximately 1,020 square feet. It has a main room for Head Start events, an office, a kitchen, and a storage area. Data was gathered on a site survey and an interview with the Head Start coordinator.

## ENERGY BASELINE

Based on unsubsidized electricity and fuel oil prices in effect at the time of the audit, the total predicted energy costs are about \$6,244 per year. This includes \$4,904 for unsubsidized electricity and an estimated annual cost of \$1,341 for cord wood. The Monitor Stove installed in the Head Start Building was not working at the time of the site visit and fuel usage during the previous year was minimal, so the fuel cost was assumed to be \$0.

The State of Alaska Power Cost Equalization (PCE) program provides a subsidy to rural communities across the state to lower electricity costs and make energy affordable in rural Alaska. The Venetie Head Start Building receives a PCE subsidy, reducing the cost of electricity from \$0.90 per kWh to about \$0.52 per kWh.

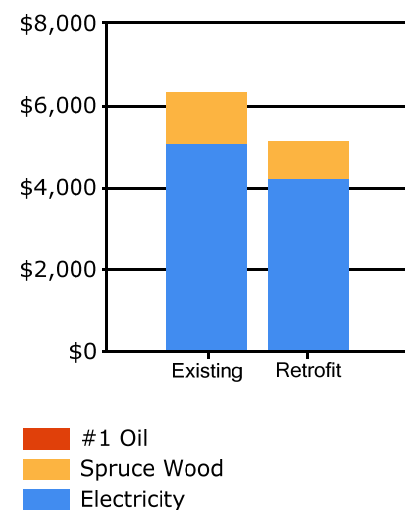
Table 1 lists the predicted annual energy usage before and after the proposed retrofits for the Venetie Head Start Building.

**Table 1: Predicted Annual Energy Use for the Venetie Head Start Building**

Predicted Annual Fuel Use		
Fuel Use	Existing Building	With Proposed Retrofits
Electricity	5,449 kWh	4,694 kWh
Spruce Wood	8.94 cords	6.08 cords
#1 Fuel Oil	0.0 gallons	0.0 gallons

*Note: One of the recommendations in the Table 2 below is to repair the Monitor Stove and maintain it as a backup heat source. This improvement may increase the Proposed Retrofits fuel consumption in Table 1.*

**Annual Energy Costs by Fuel Type**



## PROPOSED ENERGY EFFICIENCY MEASURES (EEM)

Table 2 below summarizes the energy efficiency measures analyzed for the Venetie Head Start Building. Listed are the estimates of the annual savings, installed costs, and two different financial measures of investment return: the Savings Investment Ratio (SIR) and the retrofits' Simple Payback. Green highlighted cells are high priority measures, yellow are medium priority, and orange highlighted cells are the lowest priority recommendations.

**Table 2: Priority List – Energy Efficiency Measures**

Rank	Feature	Recommendation	Annual Energy Savings <sup>1</sup>	Installed Cost	Savings to Investment Ratio, SIR <sup>2</sup>	Simple Payback (Years) <sup>3</sup>
1	Lighting: Overhead Fixtures	Replace with lighting with direct wire, energy efficient LED bulbs.	\$698 + \$25 Maint. Savings	\$3,100	3.65	4.3
2	Monitor Stove	Troubleshoot the Monitor Stove and repair as a backup heating source. Program the stove to reduce the set temperature to 60°F when the building is not occupied. Cost estimate includes materials, shipping, and travel costs for a specialist from Fairbanks.	\$198	\$1,350	1.74	6.8
3	Heating and Domestic Hot Water	Replace existing stove with a higher efficiency model. The total includes estimated costs for the stove, freight, miscellaneous materials, and installation.  Insulate all hot and cold water piping in the Kitchen. Cost estimate includes construction materials, shipping, and installation costs.	\$183	\$2,610	1.05	14.3
4	Air Sealing	Fill any gaps in the wood wall chinking, and around windows and doors. Install weather-stripping around door and window frames as needed. Energy savings reflect a 5% reduction in draft.	\$19	\$500	0.32	26.7
5	Window: Bathroom	Replace the broken window with low-E, argon-filled fiberglass or insulated vinyl framed window.	\$10	\$545	0.29	51.9
<b>TOTAL for all measures</b>			<b>\$1,108 + \$25 Maint. Savings</b>	<b>\$8,105</b>	<b>2.06</b>	<b>7.2</b>
<b>TOTAL for high priority measures</b>			<b>\$1,079 + \$25 Maint. Savings</b>	<b>\$7,060</b>	<b>2.32</b>	<b>6.4</b>

**Table Notes:**

<sup>1</sup> Maintenance savings were calculated by determining the approximate number and cost of fluorescent bulbs that would need to be replaced over the lifetime of an equivalent LED bulb, and then adding that subtotal to the cost of labor for changing each bulb. The total was divided over the lifespan of the LED equivalent bulb. Note: the LED lifespan is capped at 30 years.

A value of \$25 per hour was estimated for local labor. The length of time for changing each bulb was estimated at 10 minutes.

<sup>2</sup> Savings to Investment Ratio (SIR) is the total savings over the life of a project (for example: changing a light bulb) divided by its investment costs (materials, labor, shipping, etc.). The SIR shows how profitable a project will be; the higher the SIR, the more profitable the project. An SIR greater than 1.0 indicates a cost-effective project (i.e. more savings than cost). Note: the project's SIR is related to the rest of the Energy Efficiency Measures (EEM) above and the calculation assumes that projects are completed in the same order as in the table.

<sup>3</sup> Simple Payback (SP) is the estimated length of time needed to recoup the initial investment cost of the project. Note: this does not account for accrued interest from loans or any future changes in energy prices.

The wood stove upgrade recommended above is one solution to balance residents' needs, fuel efficiency, and improved air quality. There are numerous models available that will serve this purpose, and still meet or exceed the building's current heating requirements.

*Note: Wood stoves may contribute to poor indoor air quality. Long-term exposure to poor indoor air quality may increase the risk of developing respiratory conditions, particularly in young children and elders. Steps should be taken to properly monitor and ventilate buildings with woodstoves, regardless of any potential improvements to the building shell. Burning dry, cured wood whenever possible will reduce particulate emissions at its source.*

**Additional Recommendations (not included in Table 2)**

Appliances: Combine the contents of the refrigerators and freezers, and unplug the appliances when not needed.

Window film: Applying shrink-wrap film may reduce air/heat loss through the windows.

Thermal curtains: Installing thermally insulating or heavy curtains may reduce air/heat loss through the windows.

# FACILITY DESCRIPTION

## Building Occupancy Schedules

The building is used as an office and Head Start event space Monday through Friday 9:00 AM to 7:00 PM. There is usually only one person in the building unless a special event is planned.

## Building Shell

The exterior walls are log construction. Each log is approximately 12 inches in diameter.

The building has a cathedral ceiling with about 9.5 inches of R-30 fiberglass batt. The cathedral roof cavity and exterior appears to be well sealed.

The floor of the building is constructed on short pilings above an insulated crawlspace. There is an estimated 9.5 inches of R-30 fiberglass batt between the exterior and interior subfloors. The crawlspace is well sealed.

Typical windows throughout the building are double paned, low-E windows with an insulated fiberglass or vinyl frame.

The Venetie Head Start Building has a main entrance door and a rear exit. Both doors are fiberglass with a polyurethane core. Neither door has a window.



**Head Start Building wood stove.**

## Heating Systems

The heating systems used in the building are:

### **Wood Stove**

Nameplate Information:	Kimbak Products, Inc. barrel-style stove
Fuel Type:	Cord wood (spruce)
Input Rating:	32,292 BTU/hr. (approximate)
Steady State Efficiency:	40 - 60 % (depending on the cord wood moisture)
Idle Loss:	10 %
Heat Distribution Type:	Air

### **Monitor 2400 Oil-Fired Furnace**

Fuel Type:	#1 Oil
Input Rating:	43,000 BTU/hr.
Steady State Efficiency:	86.5 %
Idle Loss:	0 %
Heat Distribution Type:	Air

### Electric Space Heater

Fuel Type:	Electricity
Input Rating:	1500 W
Steady State Efficiency:	100 %
Idle Loss:	0 %
Heat Distribution Type:	Air

### Electric Hot Water Heater

Nameplate Information:	American Water Heaters ProLine Water Heater
Fuel Type:	Electricity
Input Rating:	1500 W
Steady State Efficiency:	100 %
Idle Loss:	0 %
Heat Distribution Type:	Water
Boiler Operation:	Used infrequently

### Lighting

There are a total of 16 light fixtures in the building. The lights use an estimated 2,666 kWh annually.

**Table 3: Lighting in the Venetie Head Start Building**

Lighting	Number of Bulbs	Fixture Type	Location(s)
4' 4-bulb Fluorescent Fixtures	36	Overhead lighting	Throughout building
LED Christmas Light Strands	Approximately 6 strands	Christmas lights	Main event room and office area
BioCube Fish Tank Light	1	Appliance	Main event room

### Major Equipment

Below is a list of the major equipment in the Venetie Head Start Building. The appliances and equipment use an estimated 2,422 kWh annually.

**Table 4: Major Appliances and Equipment in the Venetie Head Start Building**

Equipment	Rating (Watts)	Annual Usage (kWh)
GE Top-Freezer Refrigerator	650 (maximum)	480
Kenmore Chest Freezer (assumed 15.6 cu. ft.)	-	306
Kenmore Side-Freezer Refrigerator	817 (maximum)	642
Kenmore Stove Hood	216	39.4 (estimated)
Electric Range and Oven	9,500	62
Sharp Microwave	1,200	156.5
Kenmore Microwave	1,700	44.4
Hamilton Beach Coffee Maker	950 (maximum)	123.9



HP Desktop Computer and Monitor	53	138.3
HP Photosmart 7520 Desktop Printer	27.7	3.6
Sony Clock Radio	15	39.1
Cordless Phone and Walkie Talkie	3.8	33.2
Aquarium Pump	2	17.5
Aquarium Submersible Tank Heater	1	19.6
Miscellaneous Audio Equipment and Instruments	20 (estimated)	0.5
Ceiling Fan	36	0.1
Ametek 2-stage Transfer Tank Blower	1,032	26.9
Sewage Tank Heat Trace	105 (estimated)	229.6
Sewage Discharge Pipe Heat Trace	18 (estimated)	59

## PROJECT FINANCING

The total estimated cost of the recommended EEM's is \$8,105. The payback for the implemented EEM's is approximately 2.06 years. ANTHC is willing to assist the community with acquiring funds to complete the scope of work recommended in this energy audit.

There are several options for financing energy efficiency projects within the State of Alaska. These include the use of grants, loans, and other funding opportunities. Below is some information on potential funding opportunities.

**Energy Efficiency Revolving Loan Program** – This is a loan administered by the Alaska Housing Finance Corporation (AHFC) for use by any applicant who is also the owner of the building where the work will take place. It provides a loan for permanent energy-efficiency projects with a completion window of one year.

**Sustainable Energy Transmission and Supply Program** – This is a loan administered by the Alaska Energy Authority (AEA) for a government, business, or other organized body of people. It provides a loan for energy-efficiency or power transmission or distribution projects.

**USDA-RD Communities Facilities Direct Loan & Grant Program** - This is a loan or grant provided by the US Department of Agriculture – Rural Development (USDA-RD) for any essential community facility in a rural area. It provides a loan or grant to develop essential community facilities with upgrades or equipment for improvement.

## **MEASUREMENT AND VERIFICATION**

The actual results of these recommendations can be measured by collecting and monitoring energy use. This information is available on the monthly bills provided by the local electric utility and the local fuel oil supplier. Collecting data and performing a historical comparison is the simplest method of validating the energy and cost savings seen by the measures. Additionally, active remote monitoring systems are available that can collect and store data regarding energy and fuel usage. These systems allow the user to track the usage in real time and can be shared more easily with partners across the state.

# APPENDICES

## ***Appendix A – Energy Billing Data***

### 1. Electricity Billing Data

Electric Utility: Venetie Village Electric

Date	Reading	Usage (kWh)	Charge
January 2017	31556	4	\$3.60
February 2017	31649	93	\$83.70
March 2017	31707	58	\$52.20
April 2017	31708	1	\$0.90
May 2017	No reading	-	-
June 2017	No reading	-	-
July 2017	No reading	-	-
August 2017	No reading	-	-
September 2017	No reading	-	-
October 2017	31509	203	\$182.70
November 2017	31509	0	\$0.00
December 2017	No reading	-	-

*Note: The charge above is the cost of electricity before the PCE subsidy is applied.*

### 2. #1 Fuel Oil (Diesel) Billing Data

Fuel Company: Venetie Village Council

Year	Gallons	Price per Gallon	Total
2017	4.5	\$9.00	\$40.50

### 3. Spruce Cord Wood Usage (estimated)

Date	Usage (cord)	Charge
January 2017	1.33	\$199.50
February 2017	1.33	\$199.50
March 2017	1.33	\$199.50
April 2017	0.67	\$100.50
May 2017	0	-
June 2017	0	-
July 2017	0	-
August 2017	0	-
September 2017	0.67	\$100.50
October 2017	1.33	\$199.50
November 2017	1.33	\$199.50
December 2017	1.33	\$199.50

## Appendix B – Energy Audit Report – Project Summary

ENERGY AUDIT REPORT – PROJECT SUMMARY	
General Project Information	
PROJECT INFORMATION	AUDITOR INFORMATION
<b>Building:</b> Venetie Head Start Building	<b>Auditor Company:</b> Alaska Native Tribal Health Consortium
<b>Address:</b> Venetie	<b>Auditor Name:</b> Kevin Ulrich
<b>City:</b> Venetie	<b>Auditor Address:</b> 4500 Diplomacy Drive
<b>Client Name:</b> Patrick (PJ) Hanson	Anchorage, AK 99508
<b>Client Address:</b> P.O. Box 8119 Venetie, AK	<b>Auditor Phone:</b> (907) 729-3237
<b>Client Phone:</b> (907) 849-8212	<b>Auditor FAX:</b> (907) 729-3509
<b>Client FAX:</b> (907) 849-8097	<b>Auditor Comment:</b> Assistant auditor: Kelli Whelan, MS Environmental Eng. (907) 729-3723, kmwhelan@anthc.org.
Design Data	
<b>Building Area:</b> 1,018 square feet	<b>Design Space Heating Load:</b> Design Loss at Space: 30,278 Btu/hour with Distribution Losses: 30,278 Btu/hour Plant Input Rating assuming 82.0% Plant Efficiency and 25% Safety Margin: 46,156 Btu/hour Note: Additional Capacity should be added for DHW and other plant loads, if served.
<b>Typical Occupancy:</b> 1 person	<b>Design Indoor Temperature:</b> 70° F (building average)
<b>Actual City:</b> Venetie	<b>Design Outdoor Temperature:</b> -49.4° F
<b>Weather/Fuel City:</b> Venetie	<b>Heating Degree Days:</b> 15,409° F-days
Utility Information	
<b>Electric Utility:</b> Venetie Village Electric	<b>#1 Fuel Oil (Diesel) Provider:</b> Venetie Village Council
<b>Average Annual Cost/kWh:</b> \$0.900/kWh	<b>Average Annual Cost/gal.:</b> \$9.00/gallon

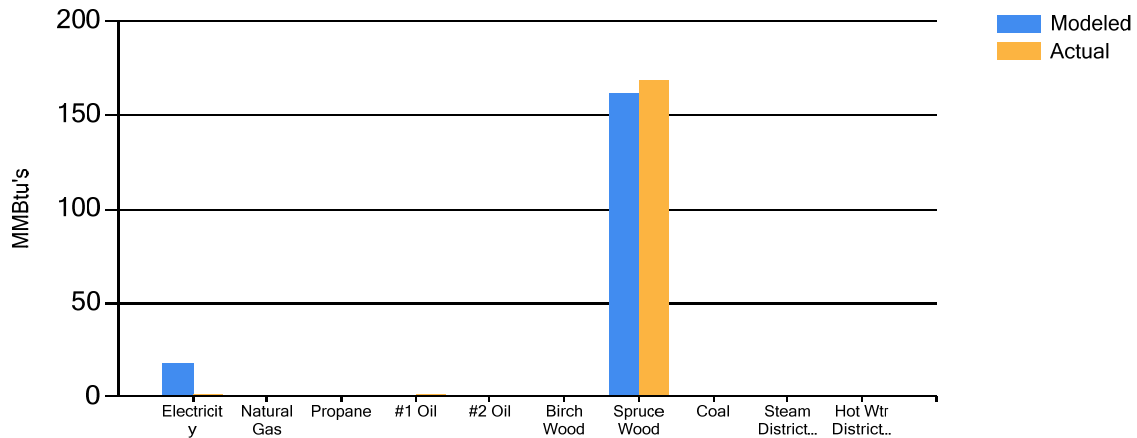
Annual Energy Cost Estimate							
Description	Space Heating	Water Heating	Ventilation Fans	Lighting	Refrigeration	Other Electrical	Total Cost
Existing Building	\$1,550	\$145	\$5	\$2,400	\$1,285	\$860	<b>\$6,244</b>
With Proposed Retrofits	\$1,179	\$106	\$5	\$1,701	\$1,285	\$860	<b>\$5,136</b>
Savings	\$371	\$39	\$0	\$698	\$0	\$0	<b>\$1,108</b>

Building Benchmarks			
Description	EUI (kBtu/sq. ft.)	EUI/HDD (Btu/sq. ft./HDD)	ECI (\$/sq. ft.)
Existing Building	177.1	11.50	\$6.13
With Proposed Retrofits	123.8	8.03	\$5.04
EUI: Energy Use Intensity - The annual site energy consumption divided by the structure's conditioned area. EUI/HDD: Energy Use Intensity per Heating Degree Day. ECI: Energy Cost Index - The total annual cost of energy divided by the square footage of the conditioned space in the building.			

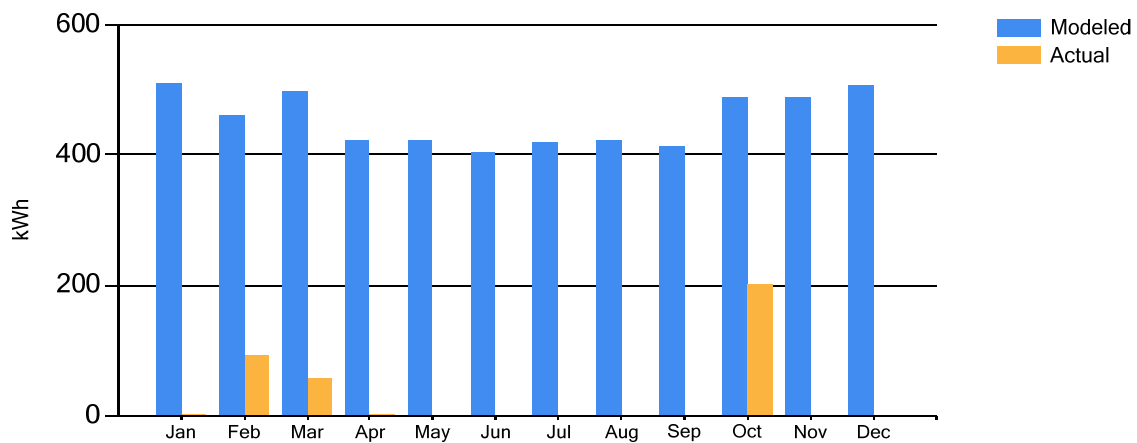
## Appendix C – Actual Fuel Use versus Modeled Fuel Use

The graphs below show the modeled energy usage results of the energy audit process compared to the actual energy usage report data. The model was completed using AkWarm modeling software. The orange bars show actual fuel use, and the blue bars are AkWarm’s prediction of fuel use.

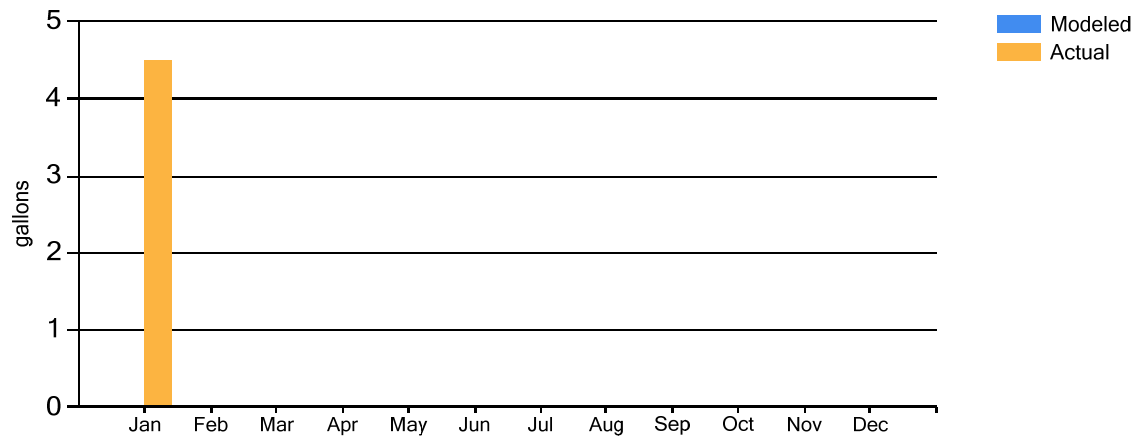
**Annual Fuel Use**



**Electricity Fuel Use**

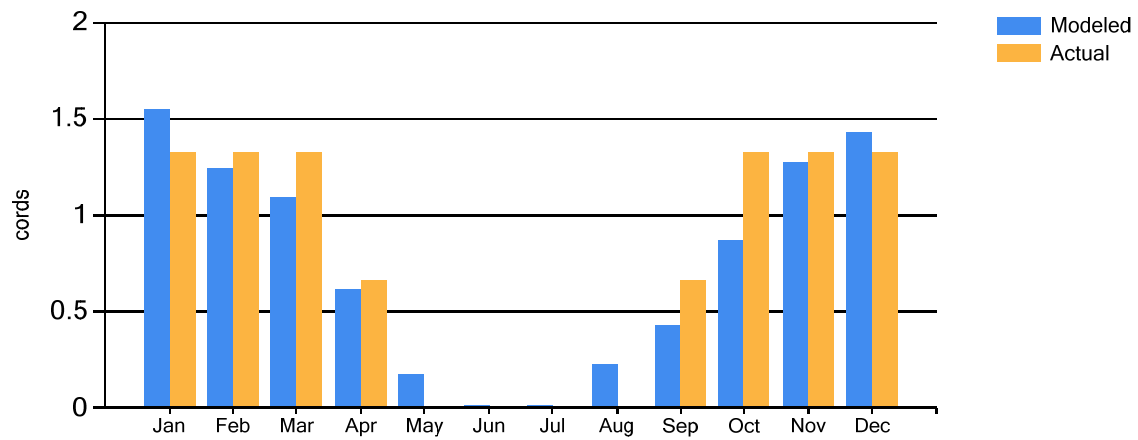


### #1 Fuel Oil Fuel Use



*Note: The yellow bar represents the total amount of fuel purchased in 2017.*

### Cord Wood Fuel Use



*Note: The cord wood usage was estimated based on an interview with the Head Start coordinator input.*

## Appendix D - EUI Calculation Details

Venetie Village Electric currently provides electricity to the residents of Venetie as well as to all commercial and public facilities. The Venetie Village Council is the local fuel distributor.

The average cost for each type of fuel used in this building is shown in Table D-1 below. This figure includes all surcharges, subsidies, and utility customer charges:

**Table D-1: Energy Cost Rates for each Fuel Type**

Average Energy Cost (as of March 2018)	
Description	Average Energy Cost
Electricity	\$ 0.90/kWh
#1 Oil	\$ 9.00/gallons
Cord Wood (Spruce)	\$150/cord

Table D-2 shows the calculated results for the building Energy Use Index (EUI), which determines the total energy usage for a type of building for comparison with other buildings of the same type. This allows the user to determine the relative energy use of a building in relation to others of the same type or use.

**Table D-2: EUI Building Calculations for the Venetie Head Start Building**

Energy Type	Building Fuel Use per Year	Site Energy Use per Year, kBTU	Source/Site Ratio	Source Energy Use per Year, kBTU
Electricity	5,449 kWh	18,596	3.340	62,111
Cord Wood (Spruce)	8.94 cords	161,767	1.000	161,767
#1 Oil	0 gallons	0	1.010	0
Total		180,362		223,877
BUILDING AREA		1,018	Square Feet	
BUILDING SITE EUI		177	kBTU/Ft²/Yr.	
BUILDING SOURCE EUI		220	kBTU/Ft²/Yr.	
* Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued March 2011.				

Table D-3 shows information on common energy use benchmarks used to characterize the efficiency of a building.

**Table D-3: Building Benchmarks for the Venetie Head Start Building**

Building Benchmarks			
Description	EUI (kBTU/sq. ft.)	EUI/HDD (BTU/sq. ft./HDD)	ECI (\$/sq. ft.)
Existing Building	177.1	11.50	\$6.13
With Proposed Retrofits	123.8	8.03	\$5.04
EUI: Energy Use Intensity - The annual site energy consumption divided by the structure's conditioned area. EUI/HDD: Energy Use Intensity per Heating Degree Day. ECI: Energy Cost Index - The total annual cost of energy divided by the square footage of the conditioned space in the building.			

## Appendix C – Materials List and Labor Estimation

**Tables E-1 and E-2: ANTHC Materials List and Cost Estimation for the Venetie Head Start Building EEM's**

Energy Retrofit	Required Materials	Quantity <sup>a</sup>	Cost per Item	Total Materials Cost	Total Project Cost <sup>b</sup>
Shell Improvement: Bathroom Window	Low-E, argon-filled insulated vinyl window	1	\$148.00	\$300.00	\$545
	Additional shims, insulation, finishing materials	Order as needed	-		
Lighting	LED T-8 equivalent light bulbs with one tombstone per bulb	40	\$16.74	\$669.50	\$1,670
Air sealing	Weather stripping, caulking	-	-	\$200.00	\$560
	Insulating foam sealant	5	\$4.95	\$24.80	
Heating and Domestic Hot Water	New wood stove	1	\$1,249.00	\$1,249.00	\$2,800
	Additional flue pipe, flooring materials for stove replacement	Order as needed	-	\$750.00	
	Troubleshoot and repair Monitor Stove as a backup	Order as needed	-	\$50.00	\$583
	Foam pipe insulation and foil tape	Order as needed	-	\$50.00	\$108

<sup>a</sup> 10% surplus included.

<sup>b</sup> Project costs include materials, freight (15% of materials cost, and labor)



	<b>Contractor (LED installation and Monitor repair)</b>	<b>Local Labor</b>
<b>Category</b>	<b>Cost (\$)</b>	<b>Cost (\$)</b>
Labor	2,200	1,075
Materials	720	2,574
Freight	108	386
Travel <sup>c</sup>	1,160	-
Indirect <sup>d</sup>	1,256	-
<b>Subtotal</b>	<b>\$5,444</b>	<b>\$4,035</b>
<b>Grand Total</b>		<b>\$9,480</b>

<sup>c</sup> Travel costs for a certified electrician and a heating specialist: airfare from Fairbanks, two nights lodging, and per diem (\$80 per day).

<sup>d</sup> Indirect rate is 30% (of the total estimated labor, travel, materials, and freight costs). This represents an estimate of contractor profit, insurance, and bonding costs.

## Appendix D – Example Materials

### Window

Example: [Jeld-Wen 23.5 in. x 35.5 in. V-4500 Series Single Hung Vinyl Window](#)

#### 1. Dimensions

Grid Width (in.)	None	Product Width (in.)	23.5
Jamb Depth (in.)	3.25	Rough Opening Height (in.)	36
Product Depth (in.)	3.25	Rough Opening Width (in.)	24
Product Height (in.)	35.5	Width (in.) x Height (in.)	23.5 x 35.5

#### 2. Details

Exterior Color/Finish Family	White	Number of Locks	1
Features	Argon gas insulated, integrated nail fin, low-E glass, screen included, tilt-in cleaning	Privacy Glass	No
Frame Material	Vinyl	Product Weight (lb.)	30 lb.
Glazing Type	Double-pane	Solar Heat Gain Coefficient	0.34
Grid Pattern	None	Tinted Glass	No
Hardware Color/Finish Family	White	U-Factor	0.29
Interior Color/Finish Family	White	Window Type	Single Hung
Lock Type	Lift handle	Window Use Type	New construction, replacement

#### 3. Warranty/Certifications

Energy Star Qualified	Northern	Manufacturer Warranty	Lifetime limited
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## Lighting

### [EarthLED T-8 or T-12 Equivalent Bulbs](#)

EarthLED Total Product Insight	
Performance Specifications	
REPLACEMENT FOR:	T8 OR T12 4 FOOT FLUORESCENT TUBE
BRIGHTNESS (LUMENS):	2000
COLOR TEMPERATURE:	4000K   5000K
COLOR ACCURACY (CRI):	80
DIMENSIONS	1.02" X 47.2"
POWER CONSUMPTION:	18 WATTS
VOLTAGE:	120-277 VOLTS
DIMMABLE:	NO
Dimensions / Additional Data	
CERTIFICATIONS:	UL, DESIGNLIGHTS (DLC)
PRODUCT/ORDER CODE:	4000K - 18WT8P-4F-40K-BYP 5000K - 18WT8P-4F-50K-BYP
Lifespan / Cost To Run	
PROJECTED LIFE: @3 HRS/DAY	50,000 HRS
YEARLY ENERGY COST: 3 HRS/DAY @ .11 KWH	\$2.17
WARRANTY	5 YEAR THINKLUX LIGHTING LIMITED WARRANTY <a href="#">EARTHLED PRODUCT PROTECTION PLAN IS AVAILABLE</a>

## Heating

Example Wood Stove: [Osburn Freestanding 1600 Wood Stove](#)

Maximum log length:	17"
Log positioning:	Over width
Chimney diameter:	6"
Flue outlet diameter:	6"
Minimum chimney height (feet):	12'
Baffle type:	C-Cast
Approved for a mobile home installation:	Yes
Shipping Weight:	360 lb (163 kg)
Door type:	Single, glass with cast iron frame
Glass type:	Ceramic glass
Glass surface – dimensions (Width X Height):	15" X 8 3/8"
Glass air-wash system:	Yes
Overall dimension (Height):	32 3/8"
Overall dimension (Width):	25"
Overall dimension (Depth):	26 1/2"
Door opening – dimension (Height):	8 3/8"
Door opening - dimension (Width):	15 5/8"
Firebox – dimension (Height):	12 7/8"
Firebox – dimension (Width):	18 1/8"
Firebox – dimension (Depth):	14 3/4"
Firebox lined with refractory bricks for better heat distribution:	Yes
Stainless-steel secondary-air system improving gas combustion:	Yes
Model:	Pedestal
Steel thickness – body:	3/16"
Steel thickness – top:	5/16"
Centre line of flue outlet to the side:	12 1/2"
Centre line of flue outlet to the back:	7 7/8"
Easy-to-access ash drawer:	Yes
USA standard (emissions):	EPA

Canadian Standard (emissions):	CSA B415.1-10
USA standard (safety):	UL 1482
Canadian standard (safety)	ULC S627
Tested and listed as per applicable standards:	By an accredited laboratory (CAN/USA)
Warranty:	Limited lifetime

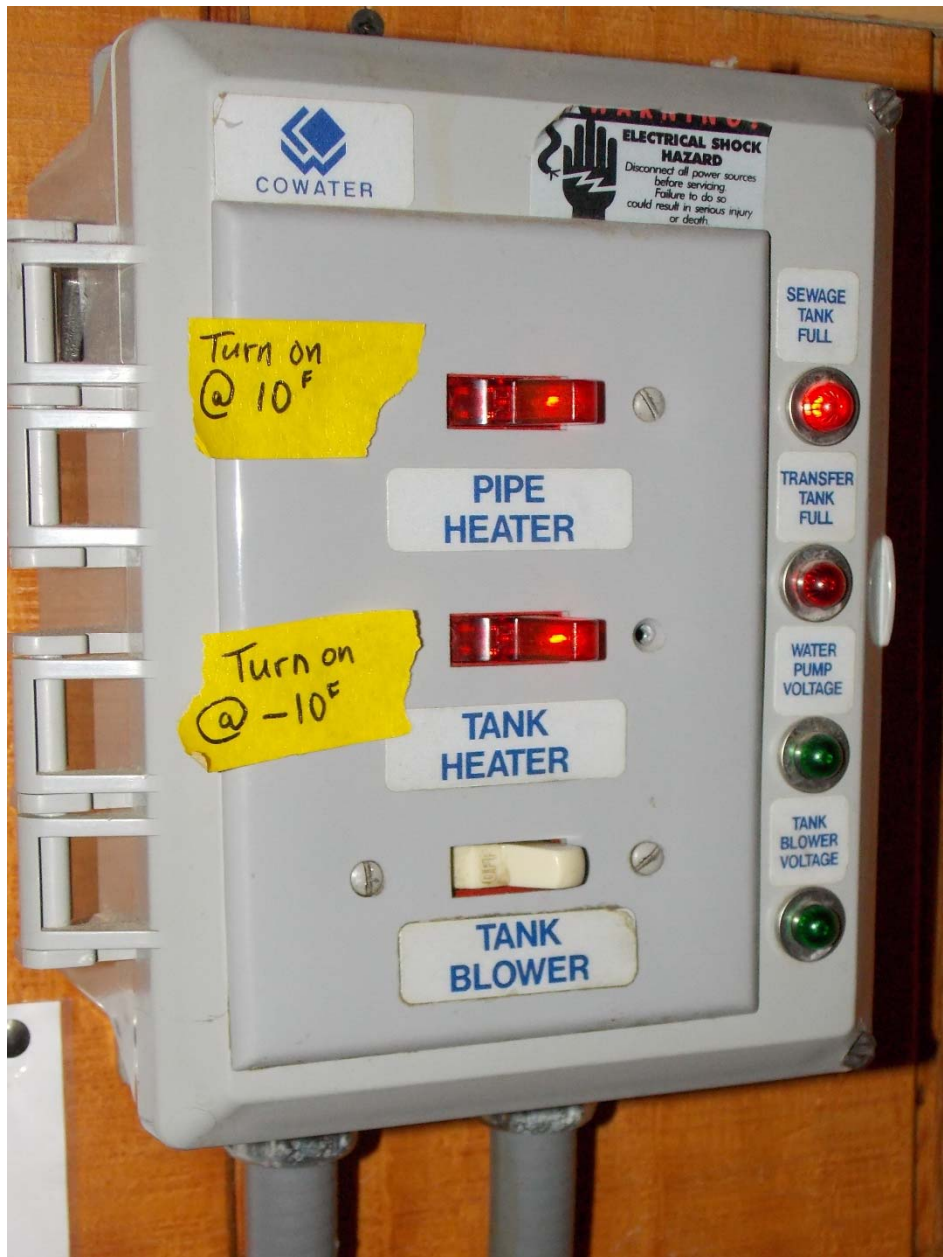
## ***Appendix G – Additional Photos of the Venetie Head Start Building***



**Flush/haul system “dog house” sewage tank on the exterior of the Head Start Building. Electric heat trace runs down through the discharge pipe and along the bottom of the holding tank.**

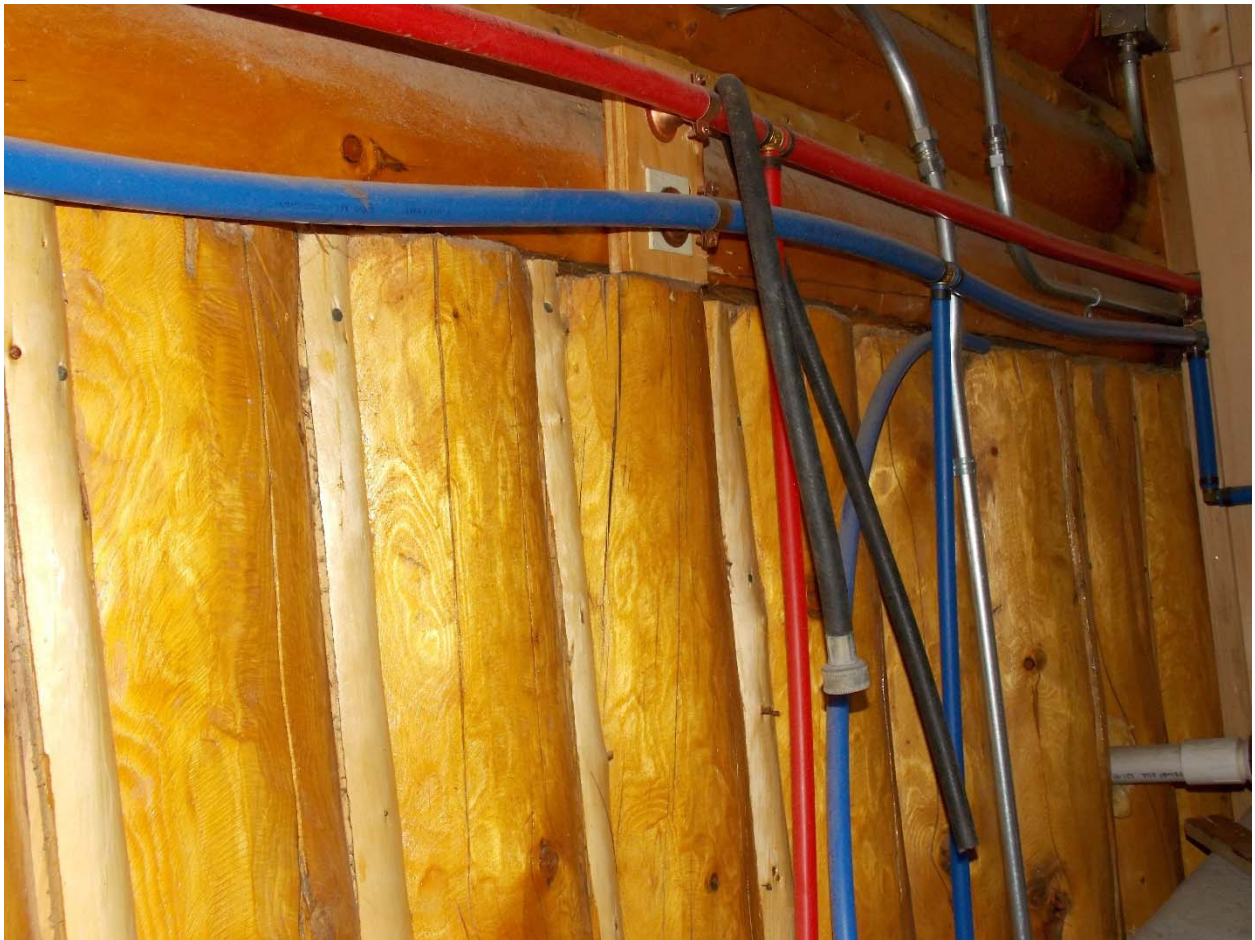


**Sewage tank outlet and exterior insulation.**



COWATER flush/haul system controls.



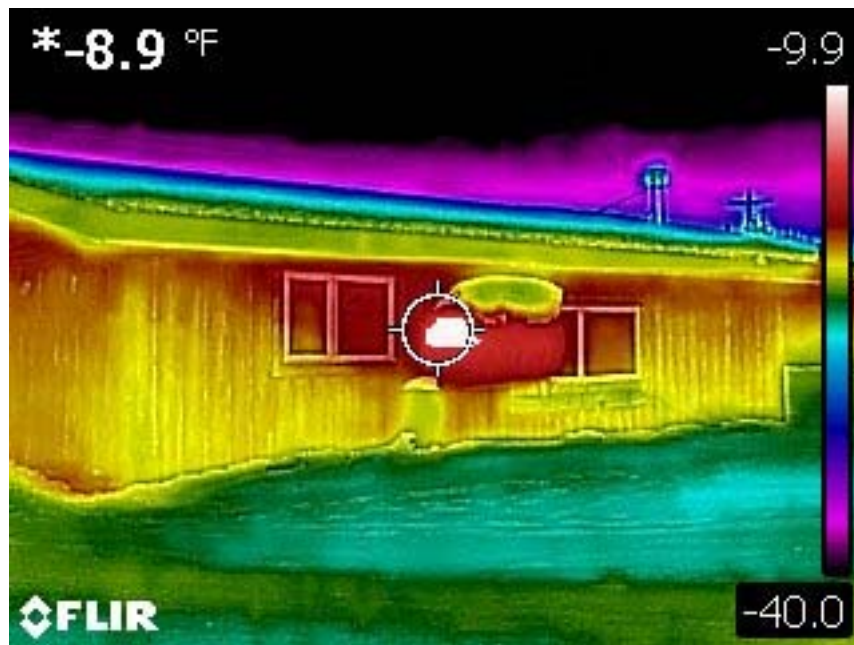


Uninsulated plumbing in the Head Start kitchen.



FLIR thermal imaging of the building main entrance. The color gradient on the right depicts the temperature range of the photo (-40° F to -7° F). Colors in the higher end of the gradient indicate where heat is being lost. The red spot on the ground in front of the building is a cat.





FLIR thermal imaging of the side of the building (where the fuel oil tank is). The color gradient on the right depicts the temperature range of the photo (-40° F to -9.9° F). The highest temperature in the photo a reflection off of the fuel tank.



FLIR thermal imaging of the building rear exit. The color gradient on the right depicts the temperature range of the photo (-40° F to -9.3° F).



Close up thermal image of the building's rear exit. The color gradient on the right depicts the temperature range of the photo (-40° F to -1.2° F). Note the areas of heat emission (white) at the roof and the left corner of the wall.



FLIR thermal imaging of the side of the building. The color gradient on the right depicts the temperature range of the photo (-40° F to -9.9° F). The window sashes are not well-insulated (white areas above the window panes).