

CONSERVATION & DEMAND MANAGEMENT PLAN

July 2019 -June 2024



JULY 1, 2019
MUNICIPALITY OF NORTH PERTH
330 Wallace Ave S, Listowel

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Background on O.Reg. 507/18

O.Reg. 507/18 was created under the Electricity Act, 1998 on December 12, 2018. It was Filed on December 14, 2018 and Published on e-laws the same day. This Ontario Regulation was developed to replace the revoked O. Reg. 397/11, which was filed under the repealed Green Energy Act, 2009.

This Ontario Regulation requires that every municipality, municipality service board, post-secondary education institution, public hospital and school board (public agencies), update their previous Conservation and Demand Management Plans by July 1, 2019, and update it every five years afterwards.

The Conservation and Demand Management plans should include two sections. The first section should discuss the public agency's annual energy consumption and the emissions associated with their operations. The second section must provide a description of previous, current and proposed ways to conserve or reduce energy that is consumed by the operations of the public agency. This in turn assists in the management of the public agency's demand for energy and will forecast the results of current and proposed measures.

Each report must include:

1. The address at which the operation is conducted
2. The type of operation
3. The total floor area of the indoor space in which the operation is conducted and, in cases where subsection (4) applies, the total indoor floor area of the building or facility in which the operation is conducted
4. A description of the days and hours in the year during which the operation is conducted and, if the operation is conducted on a seasonal basis, the period or periods during the year when it is conducted
5. The types of energy purchased for the year and consumed in connection with the operation
6. The total amount of each type of energy purchased for the year and consumed in connection with the operation
7. The total amount of greenhouse gas emissions for the year with respect to each type of energy purchased and consumed in connection with the operation
8. The greenhouse gas emissions and energy consumption for the year from conducting the operation, calculating,
 - a. The annual mega-watt hours per mega litre of water treated and distributed, if the operation is a water works
 - b. The annual mega-watt hours per mega litre of sewage treated and distributed, if the operation is a sewage works, or
 - c. Per unit of floor space of the building or facility in which the operation is conducted, in any other case

Validity Period

This report is valid between the dates of July 1, 2019 – June 30, 2024. According to O.Reg. 507/18, it will need to be updated before or on July 1, 2024.

Commitment

In the 2014 Energy Conservation and Demand Management Plan, North Perth committed to a 5% reduction in energy by 2016, compared to their 2011 baseline year. The municipality was able to make an approximate 20% reduction in their energy between the years of 2011 and 2016.

North Perth was able to reach their target for 2016, however, they have increased their energy consumption within their municipally owned facilities over the two year period of 2016 to 2018. North Perth consumed a total of approximately 7,255,928.94ekWh in 2018, which is about a 10% increase from 2011's consumption total. Despite the increase in energy consumption, the energy intensity of the facilities in North Perth reduced by approximately 4%. With the new solar panel installation on the Steve Kerr Memorial Complex, the energy intensity of the Steve Kerr Memorial Complex will reduce significantly and will aid in energy cost reductions.

As a member of the Carbon Footprint initiative, North Perth has committed to a 25% reduction in emissions by 2025, using 2015 as their baseline year. Based on the current emissions (2018) from North Perth, that means they must reduce their emissions by 451,250 kg over the next seven years. North Perth can do this through reduction of energy consumption, or by investing further in energy efficient or renewable projects.

North Perth continues efforts to search for energy efficient projects, where feasible. We recognize the importance of reducing our energy consumption and moving towards more renewable sources of energy.

Strategic Planning

North Perth has a Procurement By-Law that references the importance of procuring products that preserve the natural environment, encourage the use of sustainable goods and services, and have regard for the accessibility of persons with disabilities.

North Perth is currently developing a new Strategic Plan which will speak to the importance of sustaining and preserving the quality of agricultural land, which is a huge industry within the municipality. There will also be priority set on the importance of sustainably managing our resources through greenhouse gas reduction, promotion of waste diversion practices and encouraging the reduction of resource consumption. The past Strategic Plan also ensured that energy conservation and renewables would be considered.

Resources Planning

The Customer Service Associate, is responsible for recording the monthly consumption data to ensure the municipality is keeping track of their energy consumption within each facility. The Finance Department is in charge of updating the Broader Public Sector portal, yearly, to ensure compliance with the Ontario Regulation.

Each department is responsible for implementing energy efficiency projects. All municipal employees must contribute to the municipal energy management goals and objectives. Where feasible, we will provide training for employees whose jobs directly deal with energy consumption systems, so that they are able to improve energy efficiencies within the facilities.

Municipally Owned Operations

Building Name	Address	Operation Type
Administration Office ¹	330 Wallace Ave N., Listowel	Administrative offices and related facilities, including municipal council chambers
Wallace Former Municipal Office ²	5983 Line 88, Gowanstown	No longer in Operation
Perth Meadows ³	710 Nelson Ave S., Listowel	Administrative offices and related facilities
Atwood Fire Hall ⁵	141 Arthur St, Atwood	Fire stations and associated offices and facilities
Listowel Fire Hall ⁶	620 Wallace Ave S., Listowel	Fire stations and associated offices and facilities
Monkton Fire Hall ⁷	215 Nelson St, Monkton	Fire stations and associated offices and facilities
New Monkton Fire Hall ⁸	215 Nelson St, Monkton	Fire stations and associated offices and facilities
Elma-Logan Arena ⁹	200 Nelson St, Monkton	Indoor ice rinks
Wallace Arena ¹⁰	6670 Perth County Line 88, Gowanstown	Indoor ice rinks
Listowel Memorial Arena ¹¹	380 Maitland Ave N., Listowel	Indoor ice rinks
Steve Kerr Memorial Complex ¹²	965 Binning St., Listowel	Indoor ice rink and recreational facility
Elma Memorial Community Centre (EMCC) ¹³	Highway 23, Atwood	Community centre
Listowel Library ¹⁴	260 Main St W., Listowel	Public libraries
Atwood Library ¹⁵	218 Main St, Atwood	Public libraries
Monkton Library ¹⁶	216 Winstanley, Monkton	Public libraries
Listowel Public Works ¹⁸	580 Main St, Listowel	Storage facilities where equipment or vehicles are maintained, repaired or stored
Wallace Public Works ¹⁹	5882 Line 88, Gowanstown	Storage facilities where equipment or vehicles are maintained, repaired or stored
Elma Public Works ²⁰	171 Monument Rd, Atwood	Storage facilities where equipment or vehicles are maintained, repaired or stored
Cemetery Shed ²¹	875 Davidson Ave N., Listowel	Storage facility where equipment is stored
Landfill ²²	7080 Road 166, Atwood	Administrative offices and related facilities
North Perth Wastewater Treatment Plant ³⁵	6115 Line 84, Elma Township	Facilities related to the treatment of sewage
Septage Receiving Station ³⁶	6115 Line 84, Elma Township	Facilities related to the pumping of sewage

Total Consumption 2018

Type of Energy Source	Consumed by Municipality?	Energy Source Supplier	Unit of Measurement	Total Amount of Energy Source Consumed
Water	Yes	The Municipality of North Perth	Mega Litre (ML)	4,657,411
Electricity (Hydro)	Yes	Hydro One	Kilowatt Hour (kWh)	4,451,440
Natural Gas	Yes	Union Gas	Cubic Meter (M ³)	253,124
Propane	Yes	Sparlings Propane Core Fuels	Litre (L)	25,594
Fuel Oil (#1 & #2)	Yes	Foxton Fuels	Litre (L)	27,549
Fuel Oil (#4 & #6)	No	N/A	Litre (L)	0
Coal	No	N/A	Mega Tonne (MT)	0
Wood	No	N/A	Mega Tonne (MT)	0
District Heating	No	N/A	Giga Joule (GJ)	0
District Cooling	No	N/A	Giga Joule (GJ)	0

Consumption Costs 2018

Energy Type	Total Cost
Hydro	\$986,743.25
Natural Gas	\$66,596.02
Propane	\$29,849.52
Furnace Oil	\$28,090.11
<i>TOTAL</i>	\$1,111,279.90

Facility Consumption 2018

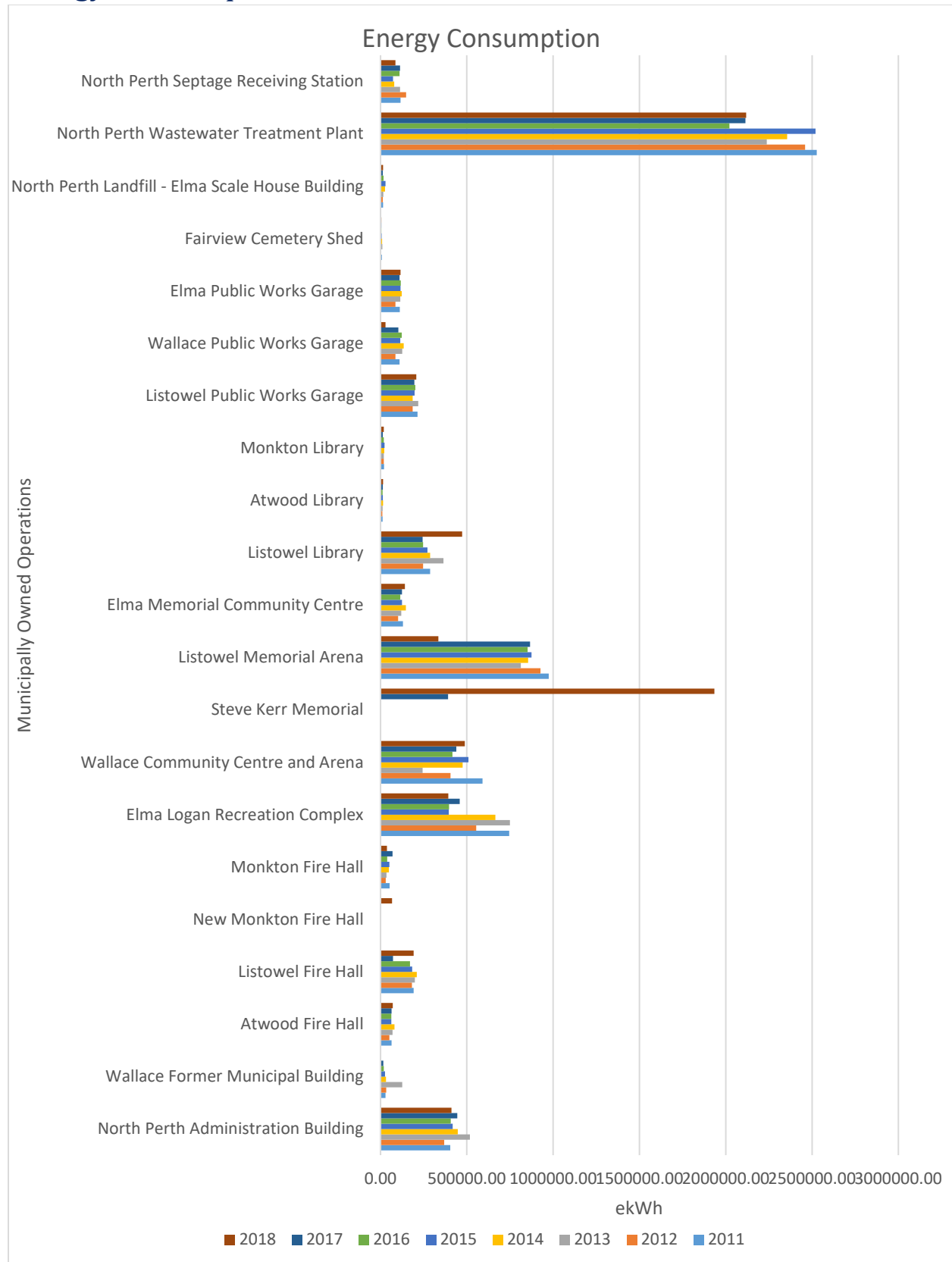
Common Facility Name	Furnace Oil		Electricity (Hydro)		Natural Gas		Propane	
	L	%	kWh	%	M ³	%	L	%
Administration Office	0	0	201,840	4.53	20,263	8.01	0	0
Wallace Former Municipal Office	0	0	0	0	0	0	0	0
Atwood Fire	0	0	11,357	0.26	5,781	2.28	0	0
Listowel Fire	0	0	62,191	1.4	12,483	4.93	0	0
Monkton Fire	3,016	11	5,278	0.12	0	0	0	0
New Monkton Fire Hall	0	0	13,804	0.31	0	0	7,454	29
Elma-Logan Arena	0	0	274,430	6.16	0	0	16,663	65
Wallace Arena	24,553	89	224,280	5.04	0	0	0	0
Listowel Memorial Arena	0	0	92,400	2.08	23,514	9.29	0	0
Steve Kerr Memorial Complex	0	0	799,808	17.97	109,804	43.38	0	0
EMCC	0	0	121,016	2.72	1,948	0.77	0	0
Listowel Library	0	0	89,017	2	37,183	14.69	0	0
Atwood Library	0	0	3,468	0.08	1,103	0.44	0	0
Monkton Library	0	0	7,899	0.18	0	0	1,478	6
Listowel Public Works	0	0	95,486	2.15	10,798	4.27	0	0
Wallace Public Works	0	0	16,298	0.37	11,442	4.52	0	0
Elma Public Works	0	0	21,283	0.48	9,181	3.63	0	0
Cemetery	0	0	4,863	0.11	0	0	0	0
Landfill	0	0	14,053	0.32	0	0	0	0
WWTP	0	0	2,019,261	45.36	9,625	3.8	0	0
SRS	0	0	85,784	1.93	0	0	0	0
Streetlights	0	0	287,624	6.46	0	0	0	0
TOTAL	27,549	100	4,451,440	100	253,124	100	25,594	100

Associated Emissions 2018

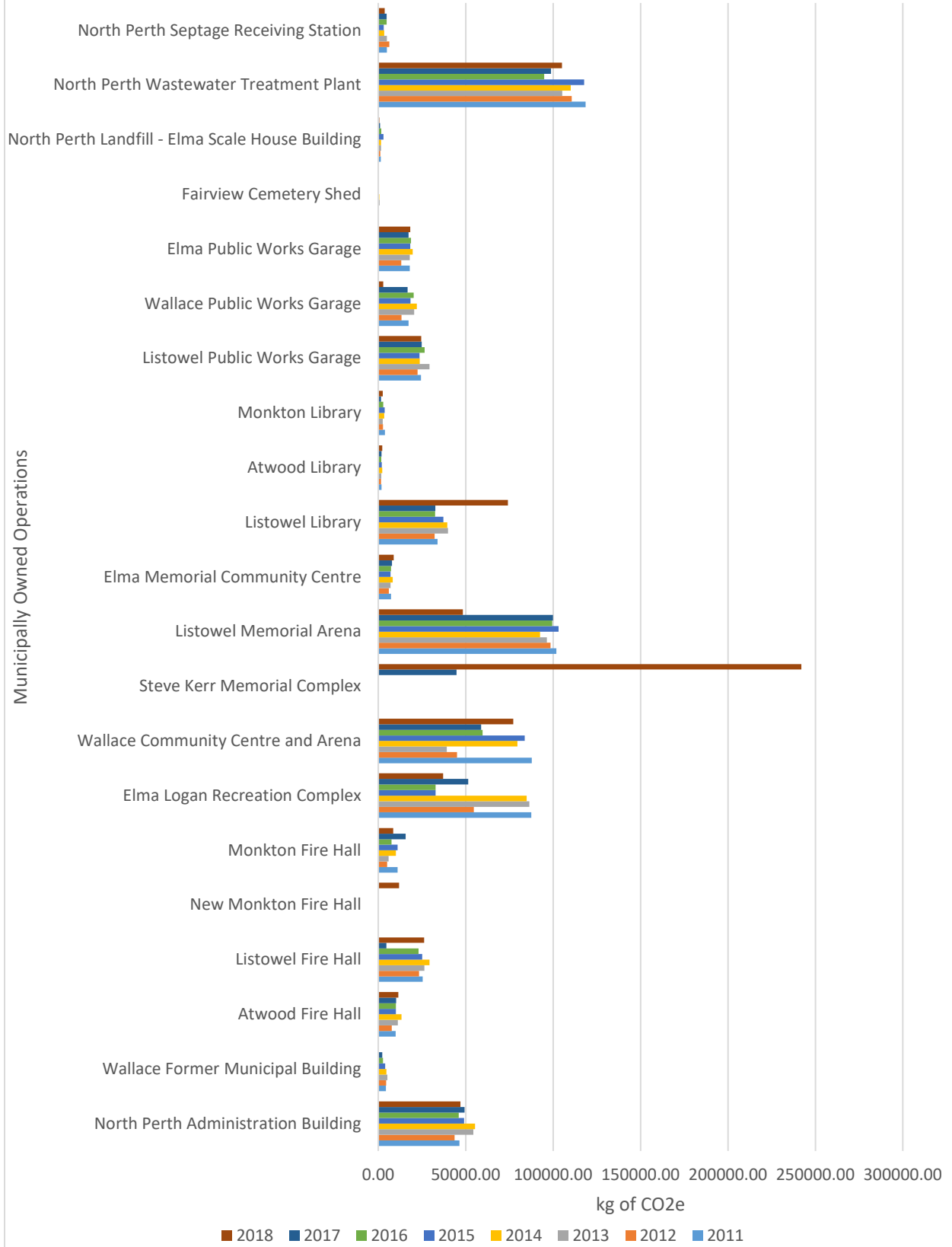
Common Facility Name	Total Floor Area (sq./ft.)	GHG Emissions		Energy Intensity			
		KG CO ₂ e	%	ekWh/sq.ft	%	ekWh/ML	%
Administration Office	13,724	46,995.79	5.989	29.96	6.576	0	0
Wallace Former Municipal Office	3,200	0	0	0	0	0	0
Atwood Fire Station	3,120	11,421.13	1.455	22.78	5.001	0	0
Listowel Fire Station	16,320	26,278.85	3.349	11.71	2.571	0	0
Monkton Fire Station	1,700	8,530.17	1.087	22.16	4.864	0	0
New Monkton Fire Hall	5,830	11,886.93	1.515	11.43	2.509	0	0
Elma-Logan Arena	37,000	37,047.34	4.721	10.61	2.329	0	0
Wallace Arena	25,500	77,185.06	9.836	19.13	4.199	0	0
Listowel Memorial Arena	31,000	48,437.93	6.173	10.82	2.374	0	0
Steve Kerr Memorial Complex	63,500	242,031.06	30.844	30.46	6.686	0	0
EMCC	8,000	8,887.49	1.133	17.64	3.873	0	0
Listowel Library	8,300	74,140.41	9.448	57	12.512	0	0
Atwood Library	600	2,234.48	0.285	24.77	5.436	0	0
Monkton Library	1,000	2,578.42	0.329	18.38	4.033	0	0
Listowel Public Works	6,000	24,524.86	3.125	34.50	7.574	0	0
Wallace Public Works	9,500	22,337.69	2.847	14.16	3.109	0	0
Elma Public Works	2,700	18,275.59	2.329	43.01	9.44	0	0
Fairview Cemetery Shed	96	209.11	0.027	50.66	11.119	0	0
Landfill	532	604.28	0.077	26.42	5.798	0	0
WWTP	0	105,029.53	13.385	0	0	906.3356	57.5
SRS	0	3,688.71	0.47	0	0	668.8029	42.5
Streetlights	0	12,367.83	1.576	0	0	0	0
TOTAL	237,622	784,692.66	100	455.58	100	1,575.1385	100

EMISSION FACTORS FROM [Environment Canada \(PCP\)](#) NATURAL GAS), [NIR](#) (PROPANE, DIESEL, FURNACE OIL) AND [TAF](#) (HYDRO)

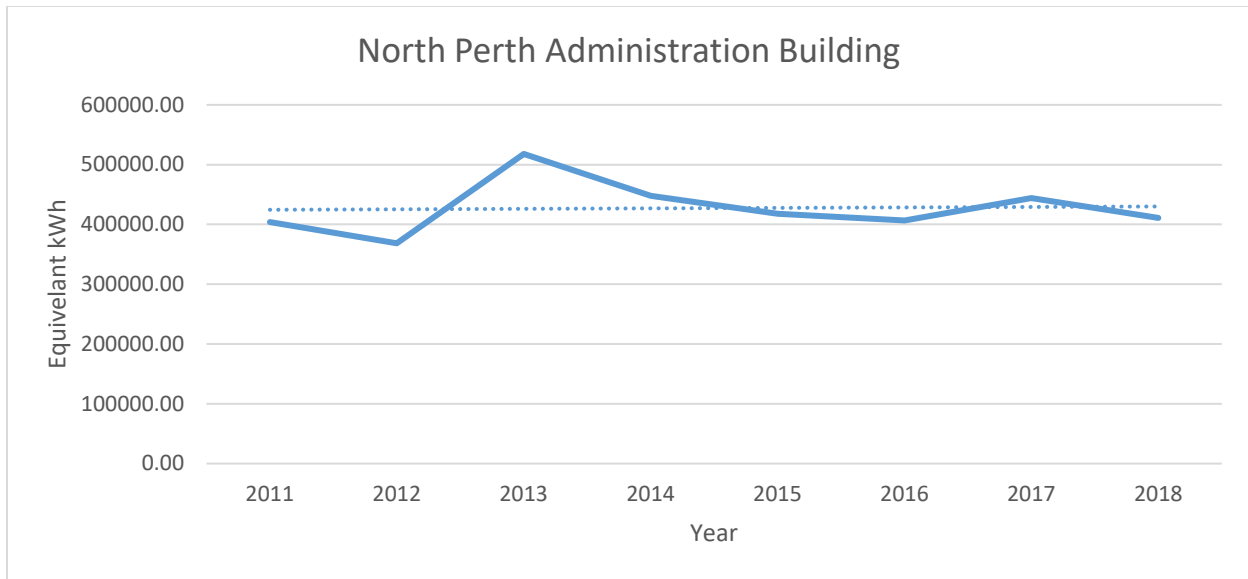
Energy Consumption and Emissions 2011-2018



Greenhouse Gas Emissions



Administration Office

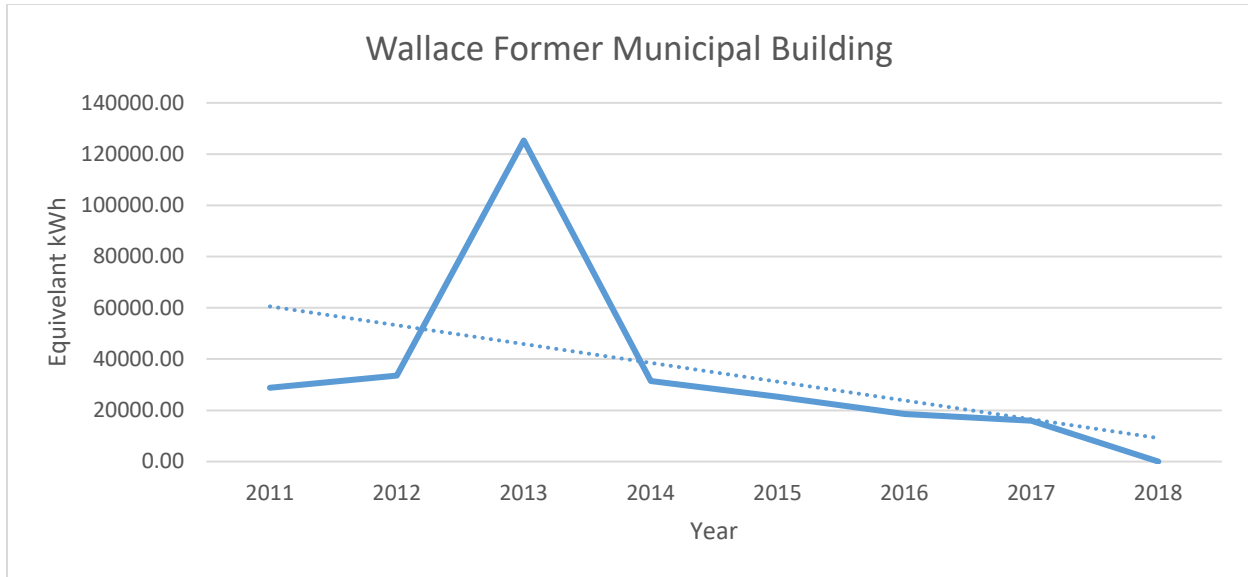


The Administrative building is located in Listowel and is an office building for the municipal staff, council meetings, as well as the Ontario Provincial Police. The building has mostly administration office spaces, meeting areas and storage areas. The building occupies approximately 13,724 square feet. The hours of operation can vary week to week, but the typical hours of operation are Monday to Friday with approximately 50 hours a week.

The facility was built in 1968, and renovations were completed in the building between June 2010 and January 2011. The renovations included new wiring for electrical, new heating and cooling technology, a new roof, new windows and doors, energy efficient lighting and siding replacement. Occupancy sensors have been installed in the washrooms that turn the lights on and off, depending if the room is occupied or not, and also have low flush toilets and tap aerators installed.

In 2018, the Administration Building used about 7,312ekWh more energy, or about 2% over the baseline year of 2011, with a total consumption of approximately 411,153.17ekWh. The administration building emitted a total of 46,995.79 kg of CO₂e in 2018, which is about 513 kg more than 2011.

Wallace Municipal Office

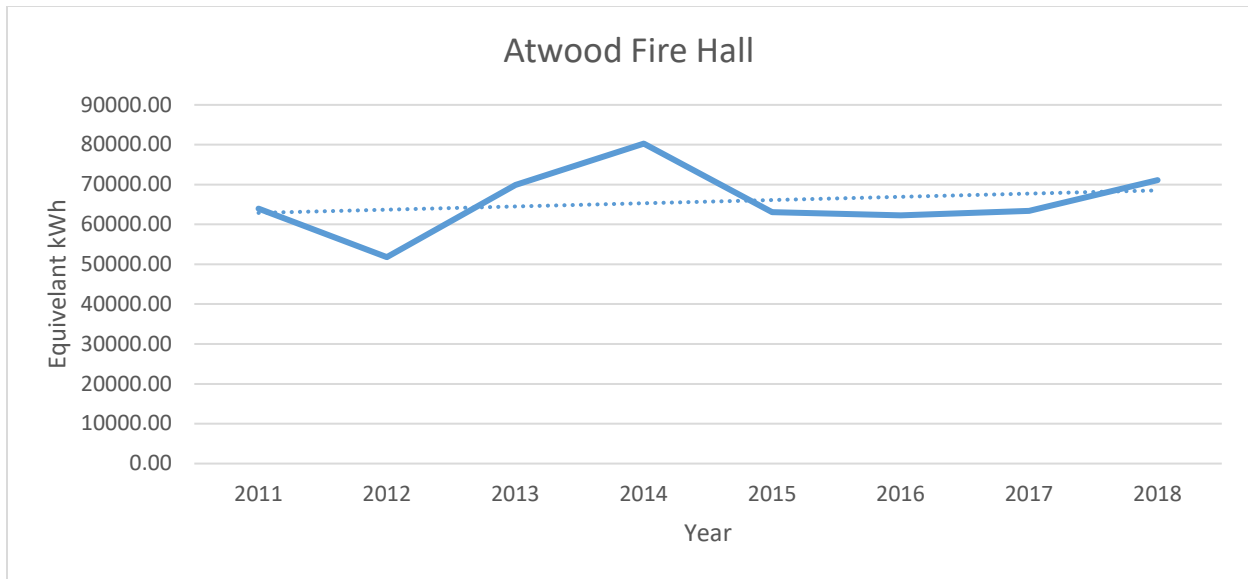


The emissions associated with the Old Municipal Building were reduced by 4347.13 kg of CO₂e, with a 0ekWh consumption.

The Wallace municipal building is located in Gowanstown, just north of Listowel. It has been used occasionally as an office building and for meetings as well. This building is approximately 3,200 square feet. The front portion of the building was used as a post office which totaled 40 hours a week of use. The back portion of the building was used for rentals and the basement was used for archive storage.

The building was sold, and is now used as a residential space. This building will no longer be included in future reports.

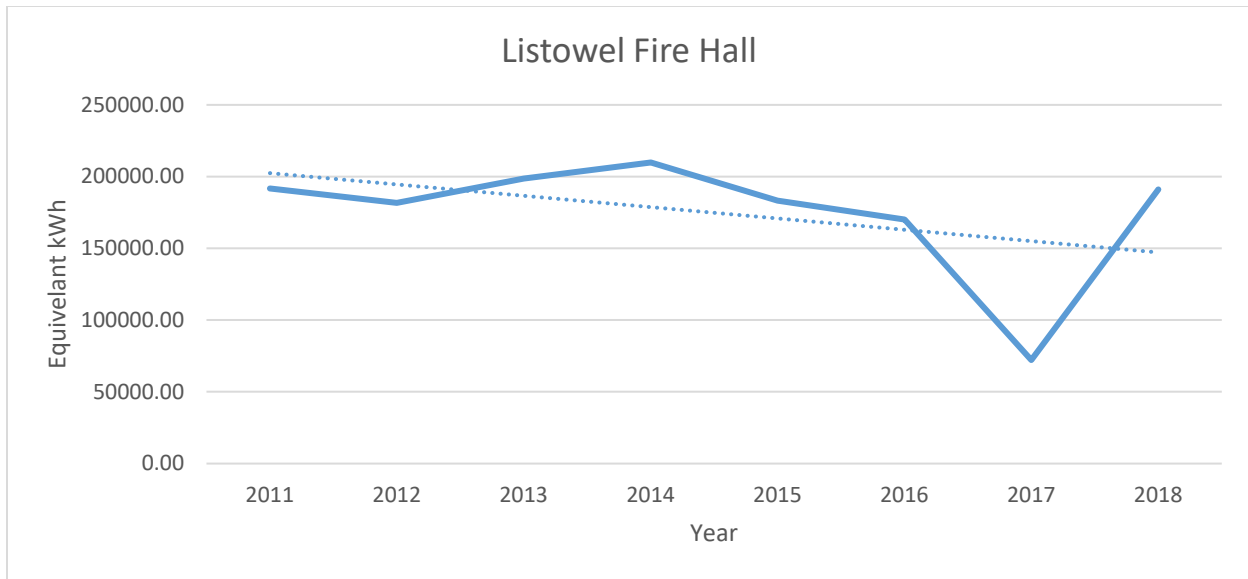
Atwood Fire Hall



This facility is mainly used to house fire equipment and vehicles. It is located in Atwood, and was built in 1974 as a single-storey facility that takes up approximately 3,120 square feet, which is split between office and garage space. The operating hours vary from week to week, however it is usually in use for about 6 hours a week. The Fire Hall had new lighting installed in approximately 2010, and has had its windows and doors replaced, as well as the weather stripping redone. The outdoor lighting uses a photocell sensor lighting that turns on at dusk and turns off at dawn to avoid unnecessary lighting during the daytime. There were renovations done on the interior of the building to reconfigure the layout of the small interior space, and new appliances were added to the building.

The fire hall has increased their energy consumption by 7,114.66ekWh, or about 11% over the baseline year of 2011, to a total of approximately 71,079.69ekWh. The building emitted a total of 11,421 kg of CO₂e in 2018, which is an increase in about 1400 kg.

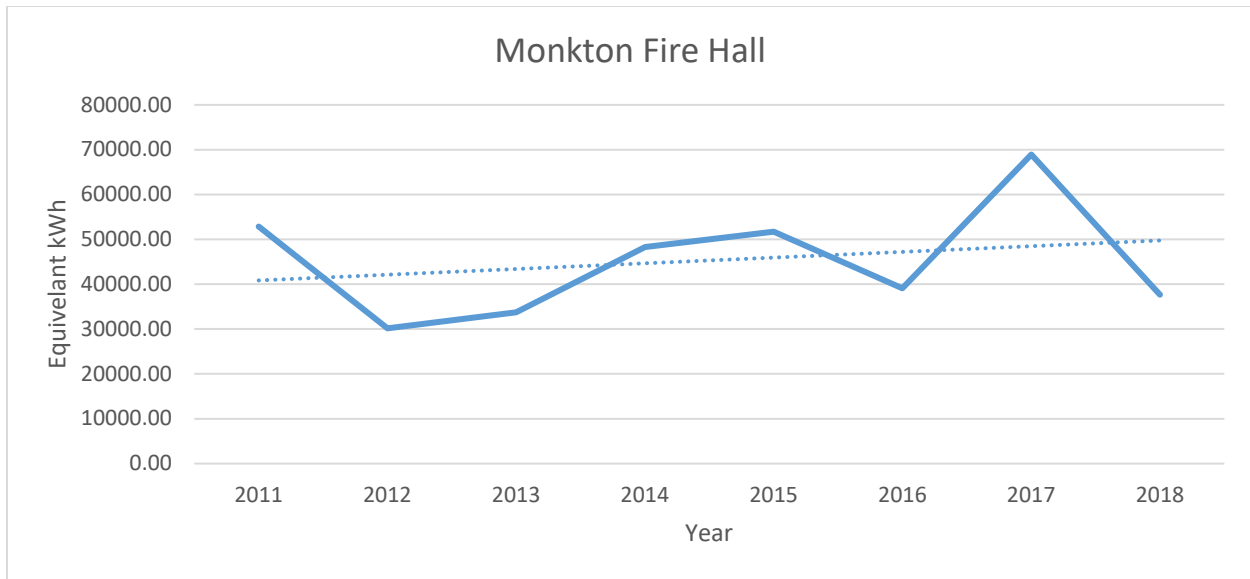
Listowel Fire Hall



This facility was built in 2010 and is much larger than the previous facility. There is more space for increased facilities and storage. There is an expanded dispatch centre, office space, training room, exercise room, washroom, conference room and kitchen which takes up approximately 16,320 square feet. The hours of operation vary from week to week, but it is typically in use 45 hours each week. The facility was built with energy efficiency in mind, as it has all energy efficient fluorescent lighting, however half of the lights in the building must be on 24/7 as required by the engineers of the building. In other areas of the building, there are occupancy sensors that turn lights on and off based on whether the area is occupied. The washrooms have low flush toilets and low flow taps. The building is heated by a natural gas hot water tank. The outside of the building is lit with fluorescent outdoor photocell sensors that turn on at dusk and turn off at dawn. This will help to ensure outdoor lighting is off during daylight hours.

The fire hall has decreased its energy consumption by about 583ekWh, or about 0.3% below the baseline year of 2011, with a total consumption of approximately 191,136.46ekWh. The emissions associated with the building, however, have increased by about 830 kg of CO₂e, to a total of 26,278.85 kg of CO₂e. Emissions increased due to an increase in natural gas usage for 2018, as temperatures were a bit lower on average than in 2011.

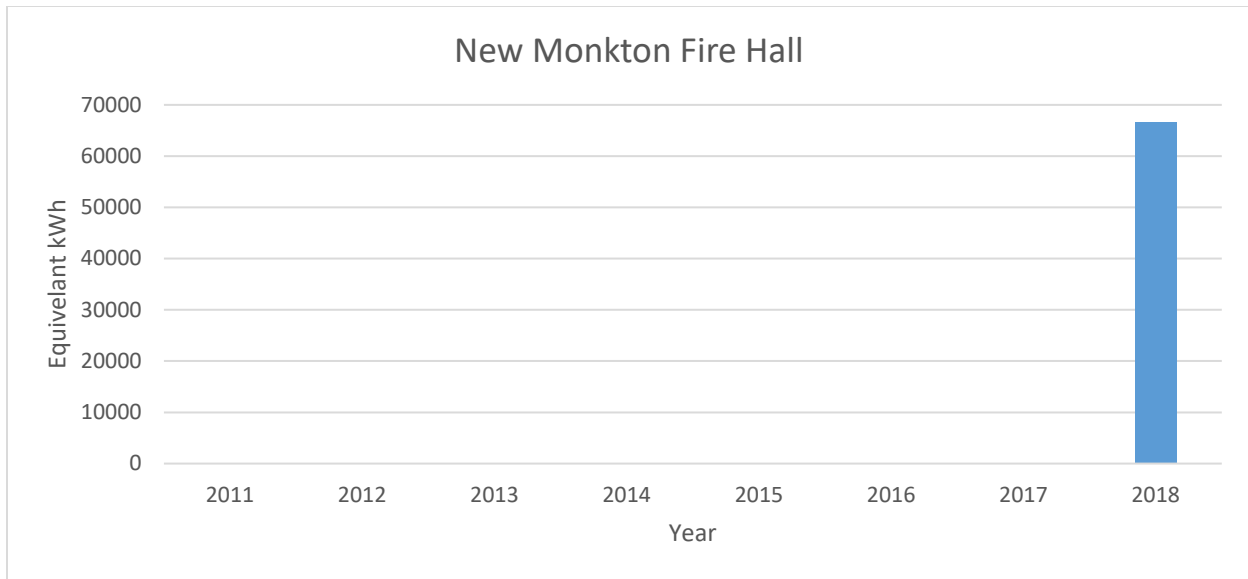
Monkton Fire Hall



This is a small facility that houses fire equipment and vehicles in the village of Monkton. It is a single-storey building with mezzanine flooring, and no basement, which takes up approximately 1,700 square feet. The space is split between office and garage space. Operating hours vary between weeks. The facility was built in 1962 and has gone through many upgrades and repairs, which includes: a new roof, new metal siding, new overhead doors and new windows, and weather stripping around windows and doors. The thermostat is turned down in the winter and turned up in the summer when the building is not occupied. Photocell sensor lighting was installed outside of the fire hall, which turns on at dusk and turns off at dawn. The old Monkton Fire Hall is used mainly for training and storage purposes now that the new Monkton Fire Hall was in full use in 2018.

The fire hall saw a decrease in energy consumption of about 15,196.26kWh, or about 28.7% from the 2011 baseline year, with a total consumption of 37,669.84kWh. The fire hall reduced its emissions by about 2,520 kg of CO₂e, with an emission total of about 8,530 kg of CO₂e.

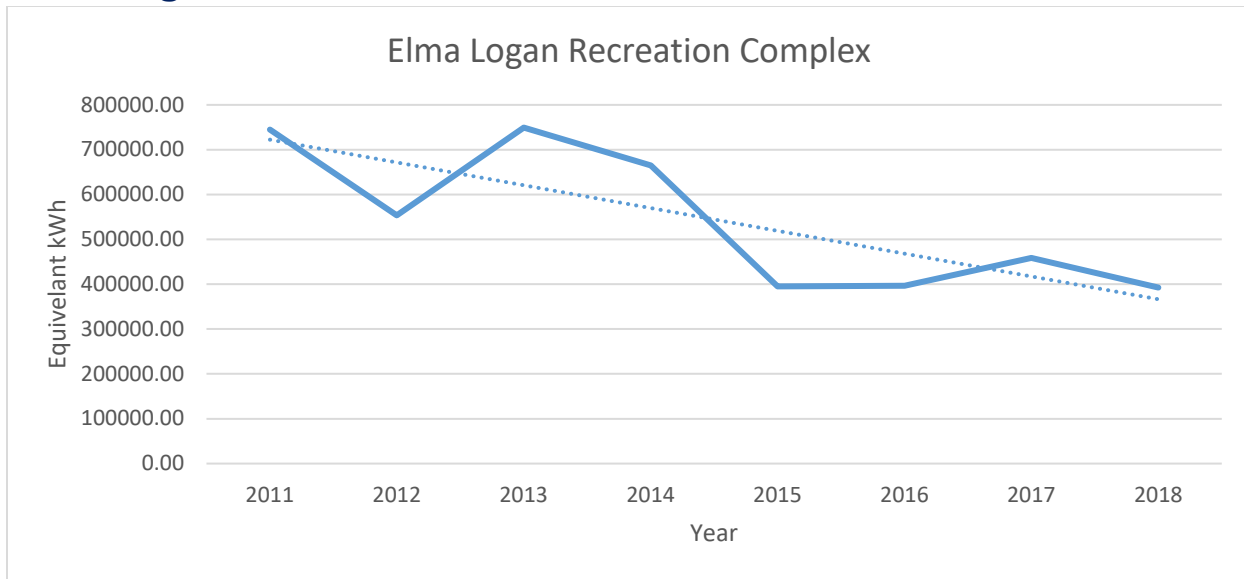
New Monkton Fire Hall



The new fire hall in Monkton was built due to the difficulty in usability for the firefighters in the old fire hall. This new fire hall has more office space, and a space where training can more easily occur. The bays in the new fire hall are up to standard sizes, so the fire trucks can easily fit into the bays. LED lighting was installed throughout the building to ensure that hydro is reduced.

The first year it was open and fully running was 2018, and the consumption total of the facility was 66,650.73ekWh, with a total emission count of approximately 11,886.9 kg of CO₂e.

Elma-Logan Arena



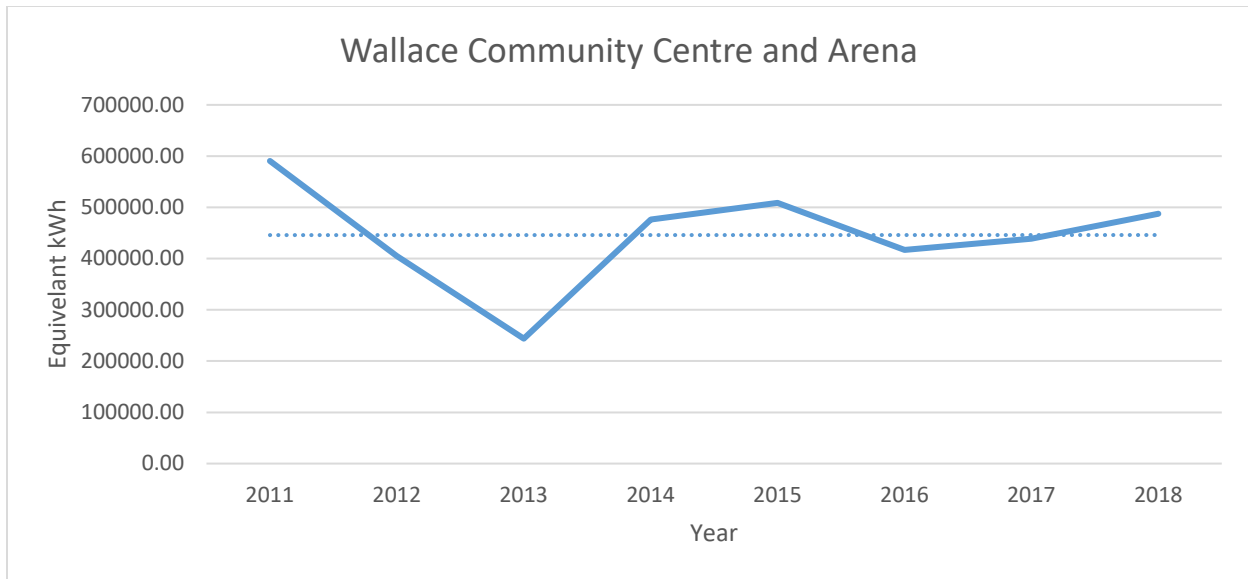
The arena is located in Monkton and is the centre for on-ice programs, which includes sports like hockey, curling and figure skating. The facility also hosts dances, weddings, shows, indoor soccer and lacrosse. It is a single-storey centre that takes up approximately 30,000 square feet. It is used approximately 68 hours a week, on average. The arena was built in 1990, and has received upgrades such as improving the dehumidification system, replacements of the arena glass and furnace. In 2010, the dressing room and service areas' lighting was replaced with T8's, and the following year saw a lighting replacement over the ice service to T5 lighting. In 2011, an LED score board was purchased. The first phase of renovations was completed in 2010, which included items such as ground source heat pump technology, geothermal floor heating and geothermal water heating. The lighting outside of the arena uses photocell sensors, while inside lighting uses occupancy sensors throughout the building, particularly in meeting rooms, hallways, dressing rooms and washrooms. Washrooms also have low-flow shower heads and tap aerators. The exterior doors and most of the windows are thermo-double-pane. There is a large roll up door that is an insulated sectional door. The arena also use Energy Star appliances, which includes a stove and three freezers. Majority of the exit signs use LED lighting, those that are not will be replaced with LED lights when needed. Any toilets that are not low-flow toilets in the arena will be replaced when needed. The second phase of the building was completed in 2013. The kitchen in the community centre was updated, and runs a more efficient system.

The chiller from the Listowel Memorial Arena will be moved into this arena to increase efficiency and reduce maintenance costs within the complex.

There are future plans for the Elma Logan Arena to consolidate the library, and a daycare. This will create a stronger community centre for the residents of Monkton, and will help reduce energy consumption and waste.

The arena has reduced its energy consumption by 352,433.14ekWh, or about 47% from the baseline year of 2011, after its completed renovations and increased efficiency measures. It consumed a total of about 392,571.38ekWh, and emitted about 37,047 kg of CO₂e, which is a reduction of 50,412 kg from 2011.

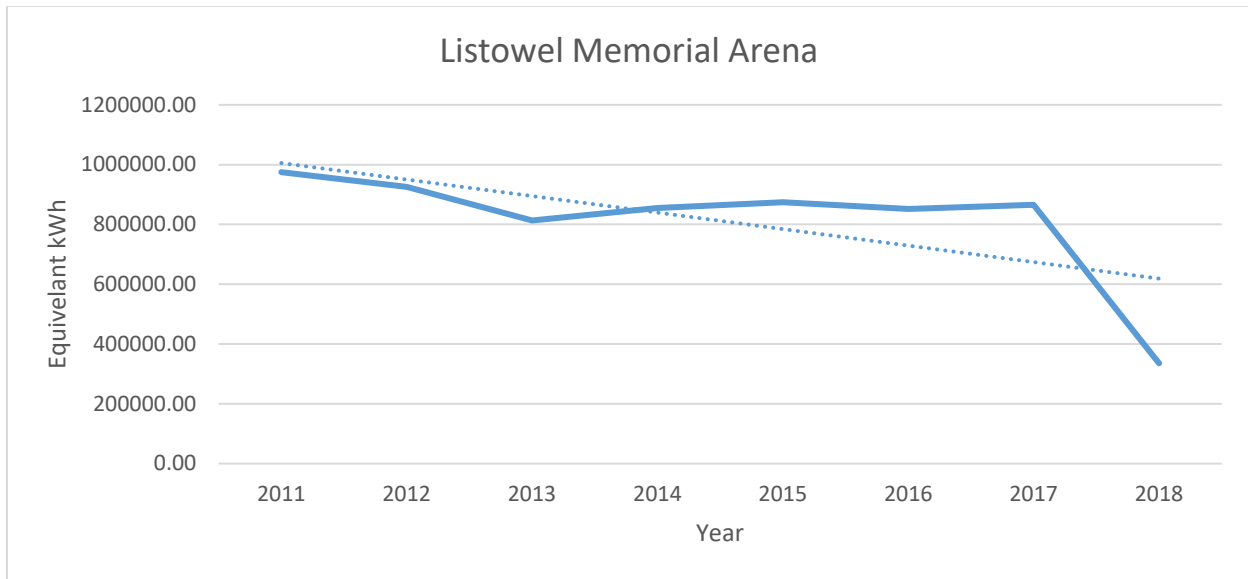
Wallace Arena



The facility is located in Kurtzville and occupies approximately 25,500 square feet. It is operated 49 hours a week for hockey, curling, figure skating, dances, weddings, shows, indoor soccer and lacrosse between the months of October to March. This is a single-storey facility that has received a number of upgrades since it was built in 1977. Upgrades have included things like repairing and replacing the refrigeration and dehumidification system, lighting, furnaces and flooring. All of the exit signs are LED, and there are occupancy sensors installed in the dressing rooms and auditorium washrooms. The washrooms also have tap aerators and low flow shower heads. Outdoor lighting on the arena uses photocell sensors that turn on at dusk and turn off at dawn, while the lighting on the community centre are on timers that have the same function. The lighting in service areas and dressing rooms use T8 lighting, and the ice surface is lit by 18 400W metal halide fixtures. The windows and doors were replaced within the last five years. The kitchen in the arena has been updated to use more energy efficient appliances.

The Arena decreased their energy consumption by 102,812.32ekWh, or 17% compared to their 2011 baseline, with a total of 487,765.5ekWh in 2018. In 2018, the facility emitted 77,185 kg of CO₂e, and reduced their emissions by approximately 10,642 kg.

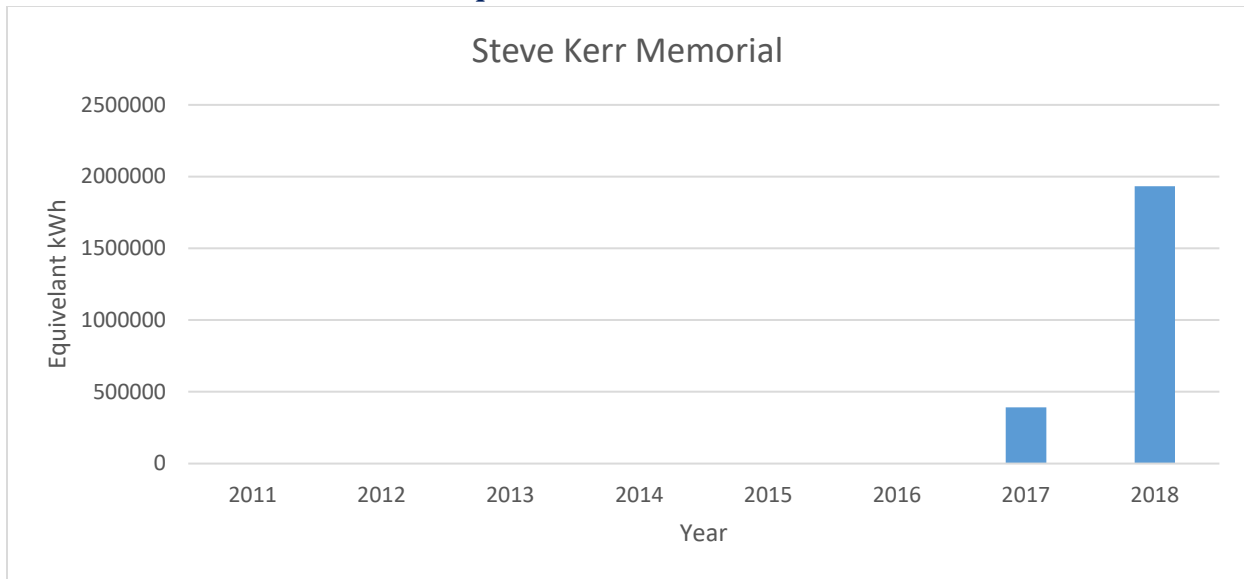
Listowel Memorial Arena



This arena is located in Listowel and was built in 1952. It is a single-storey facility with a two-storey front entrance. The arena is approximately 31,000 square feet and was used approximately 68 hours a week. The arena was used for hockey and figure skating between August and April, and throughout the rest of the year, the arena was used for indoor soccer, lacrosse and other local events. In 1959 the roof collapsed and was replaced in 1961, along with the ice surface. In 2011, an energy efficient ice rink chiller system was installed. The washrooms use tap aerators. All of the exit signs use LED lights, and there are occupancy sensors in the dressing rooms and refrigeration room and outdoor lighting uses photocell sensors and timers. The photocell sensors turn on at sunset and turn off at dawn, while the timers turn the lights off at midnight until 6am. The chiller that was installed will be moved into the Steve Kerr Arena, as the Listowel Memorial Arena is no longer able to maintain ice within the facility. The Listowel Memorial Arena has most recently been used occasionally for summer camp services, and some local events, such as Paddy Fest. The heating for the arena has been turned down as it has only been in use for maintenance purposes lately, and most lights are kept off unless maintenance is being done within the facility. The future of this arena is being decided upon, and a decision will be made with the contribution of public consultation.

Due to the decrease in usage of the facility, energy consumption has dropped by about 639,576.6kWh, or 65.6% from 2011, to a total consumption of 335,298.3kWh. The emissions associated with the Memorial Arena totaled 48,437.9 kg of CO₂e, which is a decrease of 53,414.2 kg from 2011.

Steve Kerr Memorial Complex

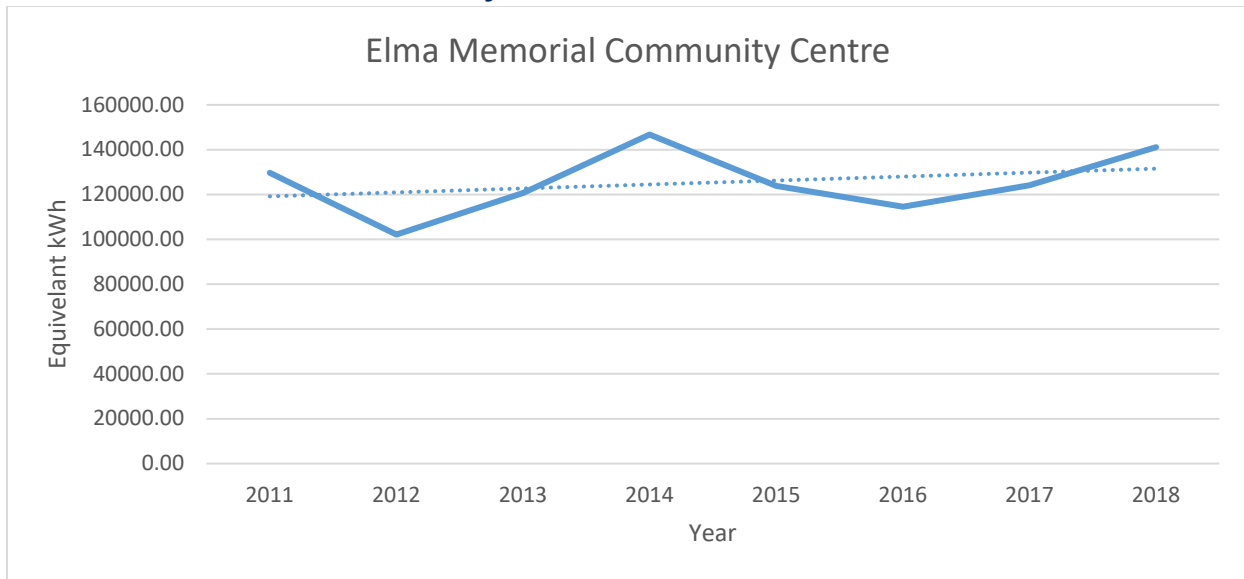


The solar panel on the Steve Kerr Memorial Arena, generated 3,357 kWh in 2018, while it was in operation at the end of 2018. Moving into 2019, the solar panels have already generated over 100,000kWh. This will help in offsetting the total kWh of the Steve Kerr arena, and reduce the cost and associated emissions during peak usage of the arena.

After completing its first full year of operation, the Steve Kerr Arena increased its energy consumption by 1,542,933.18ekWh from 2017's consumption, leading to a total energy usage of 1,934,082.86ekWh. The emissions associated with this total consumption are 242,031 kg of CO₂e.

Emissions and energy consumption will be expected to decline in the future as the capacity of the solar panels increases with continuous use.

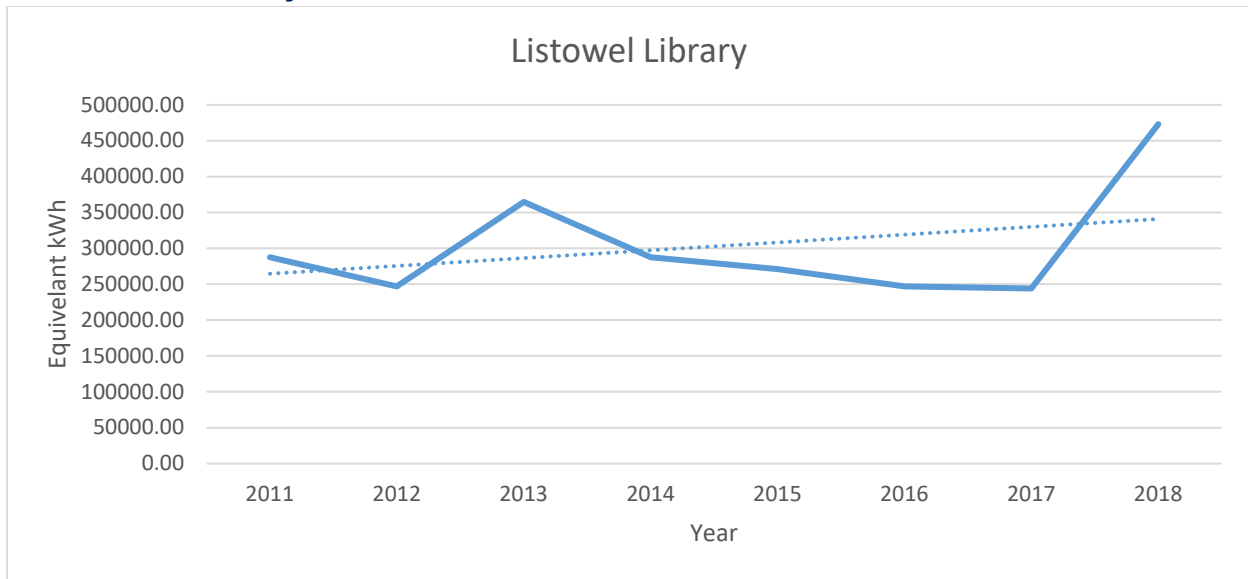
Elma Memorial Community Centre



This community centre was originally constructed in 1971 and is located in Atwood. It is a single-storey facility, which occupies about 8,000 square feet. It is used approximately 20 hours a week, on average. Majority of the interior lighting was replaced with fluorescent T8's in 2010. Some outdoor lighting uses photocell sensors and some are on timers. There is hope to improve the facility's efficiency while also increasing the occupancy per year of the community centre, with upgrades to the interior and future development plans. The community centre has some leaks in the roof that need to be addressed to increase the efficiency of the building. Proposals for improvements will continue to be brought to council.

Due to the current inefficiencies, the building has increased its energy consumption since 2011, by about 11,373ekWh, or approximately 9%, to a total of approximately 141,139.6ekWh. The emissions associated with this increase totaled 8,887.5 kg of CO₂e, which is an increase of about 1,650 kg over 2011.

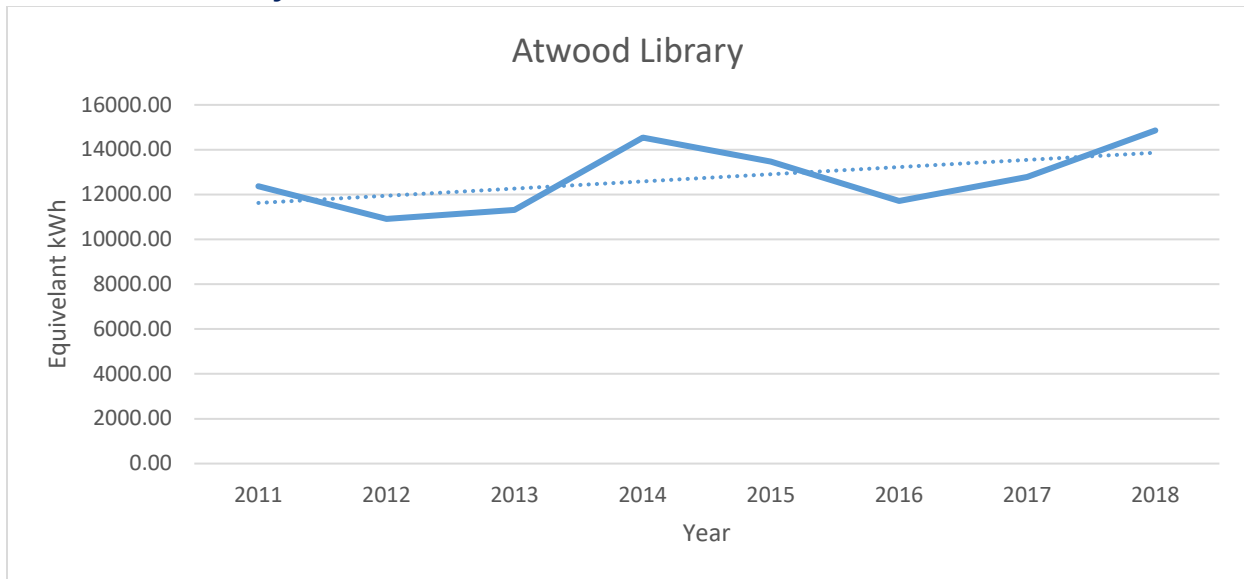
Listowel Library



The library was constructed in 1907. It is a one-storey building with a basement. The building was renovated and restored in 2000 as a heritage building. The original building was 1,800 square feet, and with the new addition, the total square footage equaled to 8,300. The hours of operation are Monday to Thursday, 10 AM to 8 PM, Friday 10 AM to 5 PM and Saturday 10 AM to 3 PM, which totals 52 hours a week. In 2000, double pane windows with the original wood frames were installed. In 2010, when the addition was added, the entire building was reinsulated. The addition has new windows, fluorescent energy efficient lighting and double doors at the entrances so heat loss could be minimized. The whole building has low flush toilets, low flow taps and uses LED exit signs. A programmable thermostat turns the temperature down in the winter and up in the summer at night, but returns to normal temperatures in the morning. There are photocell sensors on the building that turn on at dusk and turn off at dawn, and the appliances within the building are Energy Star rated. Due to the age of the heritage portion of the building, there are inefficiencies that will be difficult to address. There are leaks between the new addition and the original portion of the library, which have been recently repaired. Heating has been turned up higher over the winter to compensate the heat loss in the older portion of the library. The windows that have been installed have been a cause of heat loss within the library as well, with noticeable leaks occurring. Facility leaders are actively looking to improve efficiencies where possible.

The library has increased its consumption by 185,725.9kWh, or nearly 65% since 2011, with a total energy consumption of 473,115kWh. Emissions associated with this increase totaled 74,140.4 kg of CO₂e, which is approximately a 40,300 kg increase in emissions.

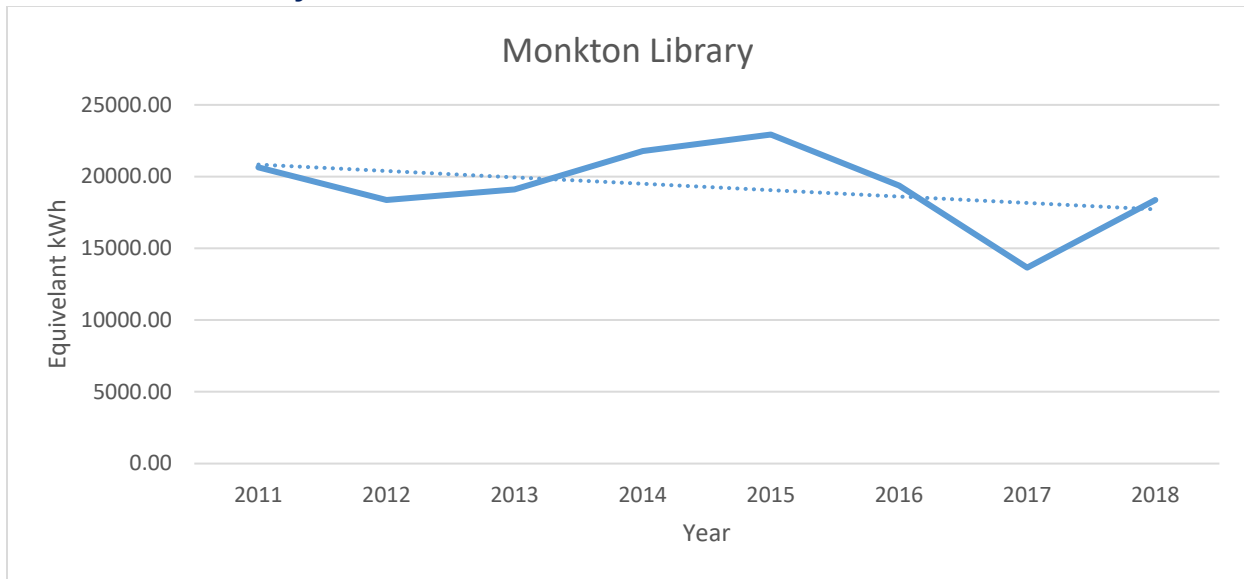
Atwood Library



This building was built in the 1900's and was renovated in 1990 to become a library. The library has two storeys with no basement and covers approximately 600 square feet. The library's operating hours are Tuesday and Wednesday 3 PM to 8 PM, and Thursday 10 AM to 2 PM, and Saturday 1 PM to 3 PM, which totals 16 hours per week. In 2010, lighting was replaced with T8 fluorescent lighting. The washroom has a low-flow toilet and low-flow tap installed. There are photocell lighting outside to turn the lights on at dusk and off at dawn. There are proposals to move the Atwood library. Discussions and decisions are yet to be finalized, and details on the facility are to come in the near future.

Energy consumption within the library has increased by approximately 2,486.53ekWh, or about 20%, from 2011 to 2018, to a total consumption of 14,859.7ekWh. The emissions associated with the increased energy consumption are about 2,234.5 kg of CO₂e, which is an increase of about 324 kg.

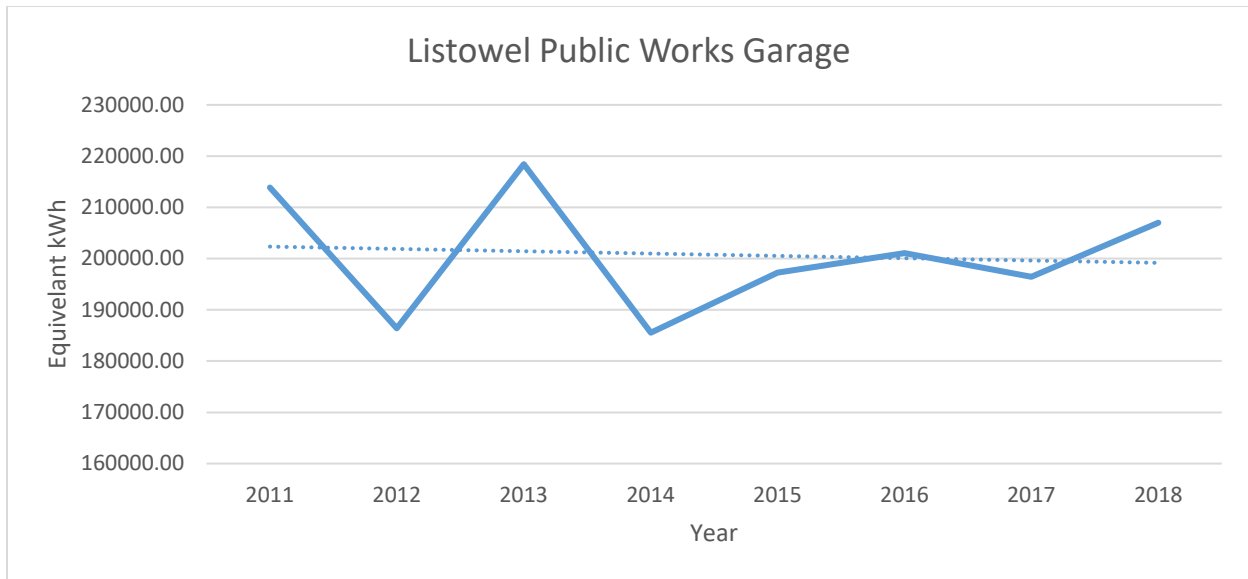
Monkton Library



The Monkton library was converted into a library in 1985. It is approximately 1,000 square feet, and has only one storey with no basement. The hours of operation are Monday and Thursday 3 PM to 8 PM, Wednesday 10 AM to 2 PM and Saturday from 10 AM to 12 PM. In 2010, the lighting was replaced with T8 fluorescent lighting. Photocell lighting is installed outside so the outside lights are not on during daylight hours. The layout of the library aids in energy efficiency, there is a storage room located between the back entrance and the library portion of the building. There are four computers, one desktop and two laptops that are used for public access and one staff computer. The washroom uses a low-flush toilet and the building has a programmable thermostat. There are plans in place to move the Monkton Library to the Elma-Logan Arena, along with a daycare facility. The hope is to increase the efficiency of the library, and increase the space to better house the community within Monkton.

The library has decreased their energy consumption by 2,260.48ekWh, or approximately 11%, from 2011, to a total consumption of approximately 18,375ekWh. The library has also reduced its emissions by about 1,283.5 kg CO₂e, to a total of 2,578.4 kg.

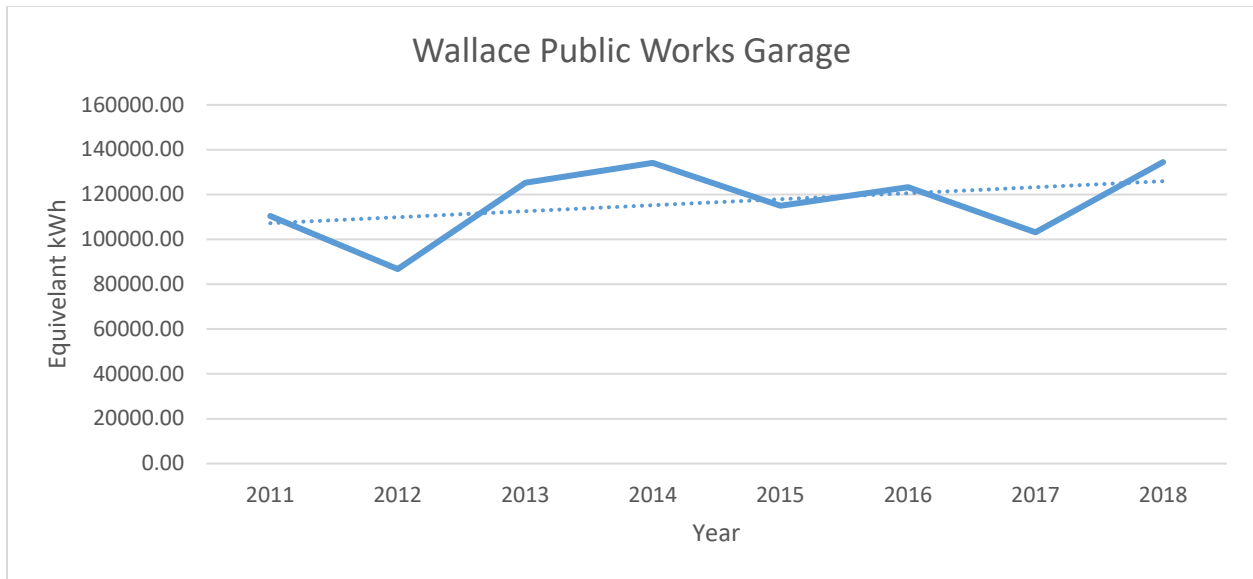
Listowel Public Works



This facility was constructed in 1903 and is designated as a heritage building. The garage portion is a single-storey building with a basement sump pit and mechanical mezzanine flooring. The front of the facility is rented out for office space. Between the months of May and August, the garage is in use from 7:00 AM to 4:30 PM on Mondays through to Fridays. Between September and April, the garage is open Monday to Friday 7:00 AM to 3:30 PM. The garage is in operation approximately 44 hours a week, on average. In 1991 the building received a renovation, which increased the area from 2,400 square feet to 6,000 square feet. At this time, repairs to the exterior brick walls was done, a cedar shingle roof was installed, and the suspended ceiling and drywall ceiling were replaced. Windows have also been replaced. Lighting has been replaced to be more efficient and outdoor lighting is set on a timer to turn off during daylight hours. Inside lighting is controlled by occupancy sensors so the lights turn off when a room is unoccupied. A new low-flow urinal was installed in the facility washroom.

This public works garage decreased its energy consumption by 6,870.02kWh, or about 3%, compared to the 2011 baseline, with a total consumption of 207,029kWh. Despite the decrease in energy consumption, the emissions associated with this facility did increase slightly over the baseline emission count. The emissions increased by about 42 kg of CO₂e, to emit an approximate total of 24,524.86 kg, and this is associated with the increase in usage of natural gas.

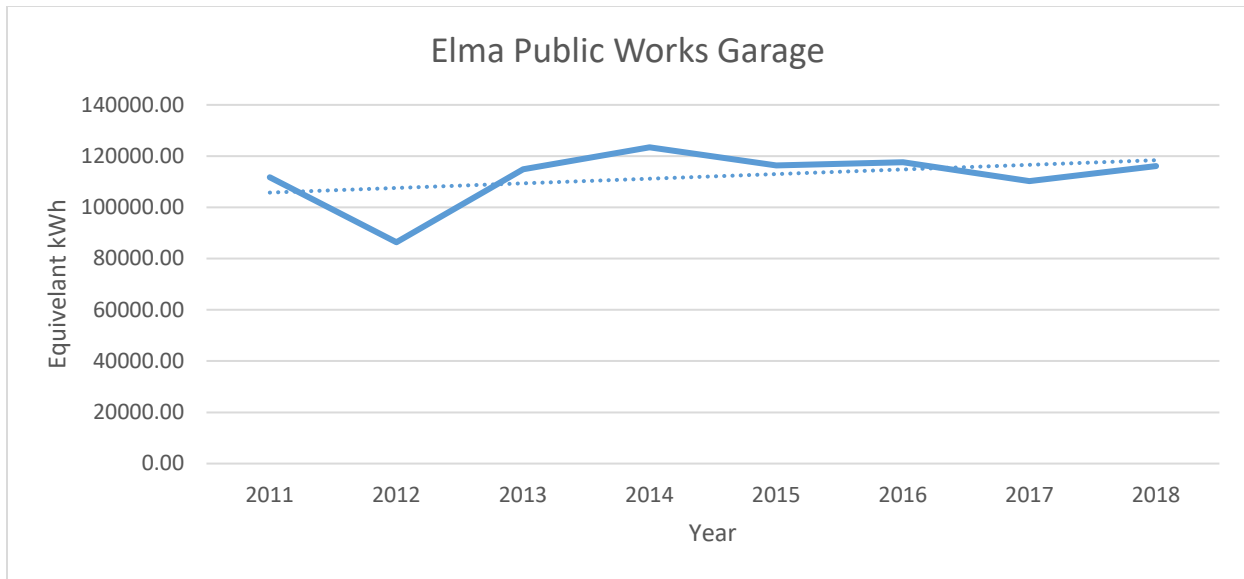
Wallace Public Works



The garage was constructed in 1995 in Gowanstown, and is a single-storey building that occupies about 9,500 square feet. The Public Works facility has office space and six parking bays that are used for storage and maintenance of heavy equipment and vehicles. The hours of operation are from Monday to Friday between the hours of 7:00 AM to 3:30 PM, and totals 42.5 hours a week in operation. The lighting was replaced with energy efficient lighting, and outdoor lighting uses photocell sensors to ensure lights are off outside during daylight hours.

The Wallace Public Works Garage has decreased its energy consumption by 23,997.19kWh, or about 22% from 2011, to a total consumption of 134,494.17kWh. The emissions also increased by about 4,955.24 kg of CO₂e, to emit a total of 22,337.69 kg of CO₂e.

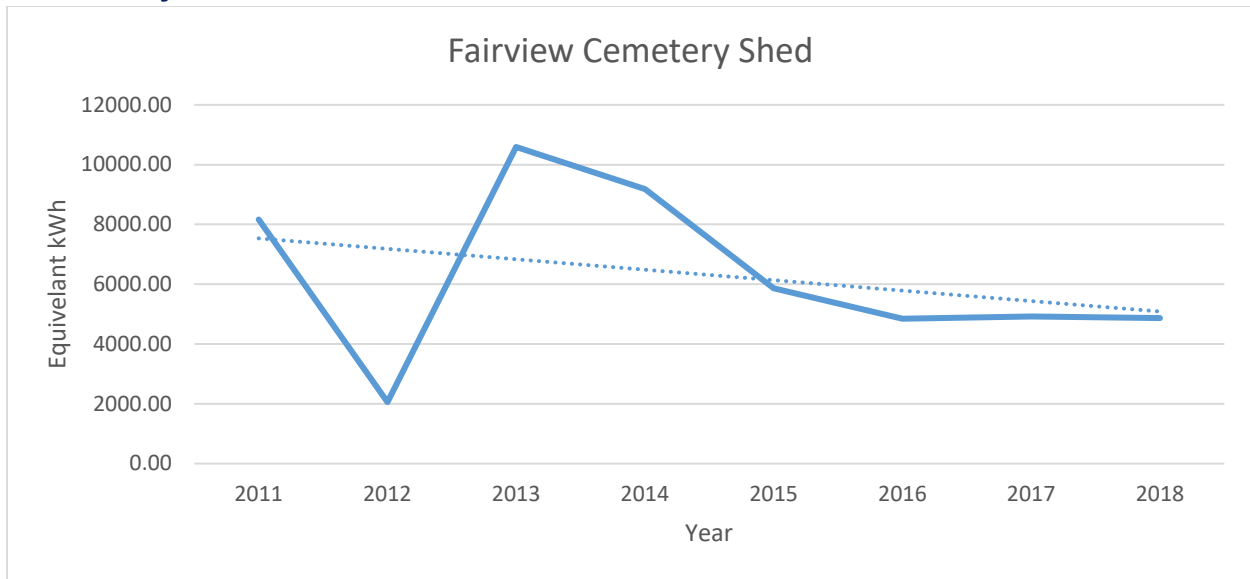
Elma Public Works



This Public Works garage is located in Atwood, and is approximately 2,700 square feet, and was built in 1966. This facility is one storey that is separated into office space and three parking bays that are used as storage and a maintenance area for heavy equipment and vehicles. Typically, this building is used Monday to Friday from 7:00 AM to 3:30 PM, for a total of 42.5 hours a week. An insulated main door was installed within the past ten years. The water tank was replaced with a small electric hot water tank, and the lighting in the garage was replaced to have energy efficient lighting.

The garage increased its energy consumption by approximately 4,403.74ekWh, or about 4%, to a total of approximately 116,118ekWh. This increase in energy also increased the associated emissions of this garage, to emit a total of 18,275.6 kg of CO₂e, which is about 255.5 kg more than 2011.

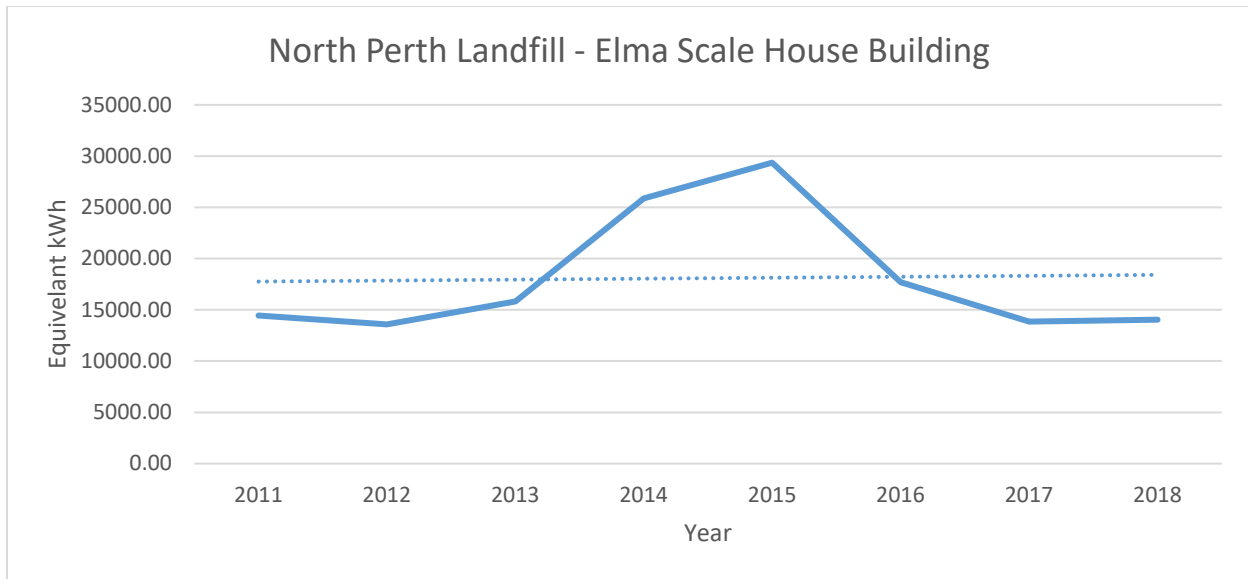
Cemetery Shed



The shed is across the road from the Fairview Cemetery in Listowel. The shed was built in 1981 and is used as office space and a garage. The garage portion stores cemetery equipment and supplies and has two large doors, with one located at the front and the other at the rear of the building. The building has energy efficient fluorescent lighting installed, and has a steel insulated man door that was installed within the past ten years. The toilet is a low flush toilet and the building uses an energy efficient electric five gallon water heater. The outside lighting uses photocell sensors to turn the lights on at dusk and off at dawn.

The energy consumption of the cemetery shed has decreased by 3,302.58ekWh, or by about 40% in 2018, compared to the 2011 baseline year, to consume a total of 4,863ekWh. The emissions associated with this shed have reduced by about 142 kg of CO₂e to emit a total of 209 kg of CO₂e.

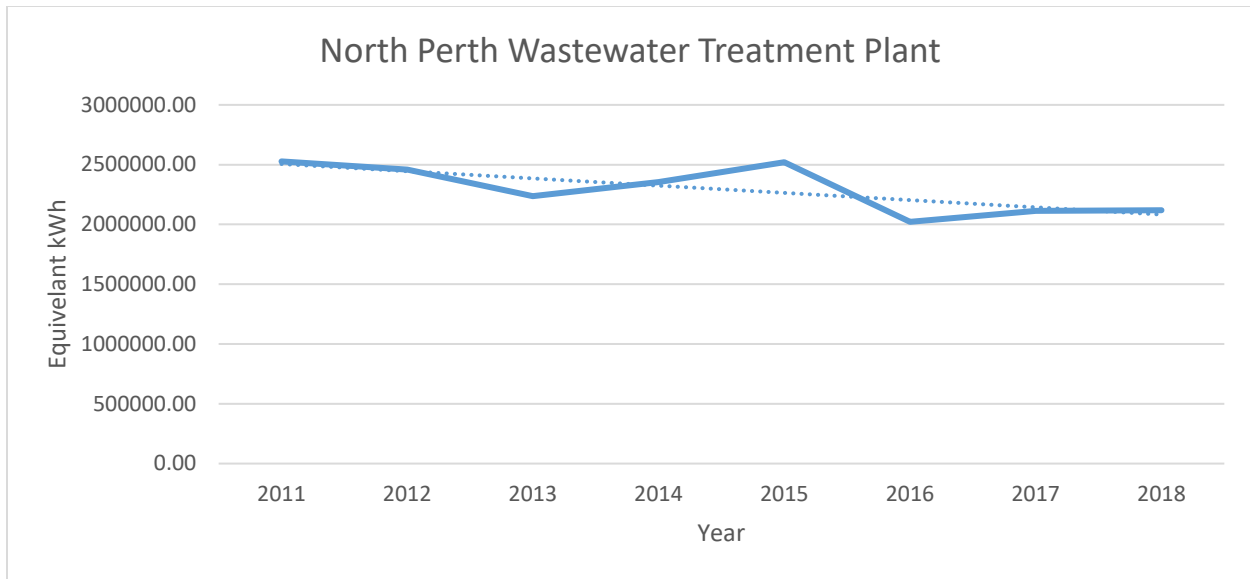
Landfill



The Elma Scale House at the North Perth Landfill began being used in 2009. It takes up 532 square feet. The hours of operation are, Tuesday to Friday, 10:00 AM to 1:00 PM and Saturday 8:30 AM to 2:00 PM. Average of 17.5 hours a week. The scale house has energy efficient fluorescent lighting and as well as LED exit signs. The washroom is a low-flow toilet and has a low-flow tap. The building is equipped with a programmable thermostat which has the feature to override temperature changes after one hour in case the staff forget to reset the temperature. There is a tankless hot water heater installed at the facility, and a propane furnace was installed in 2009, and an air conditioner that was installed in 2010.

The Scale House building has decreased its energy consumption by approximately 389.1kWh, or by about 3%, to a total consumption of 14,053kWh. The Scale House emitted a total of 604.28 kg of CO_{2e}, which is a reduction of about 827 kg.

Wastewater Treatment Plant



The Wastewater Treatment Plant had a total of 2,337.644 Mega Litres of effluent in 2018.

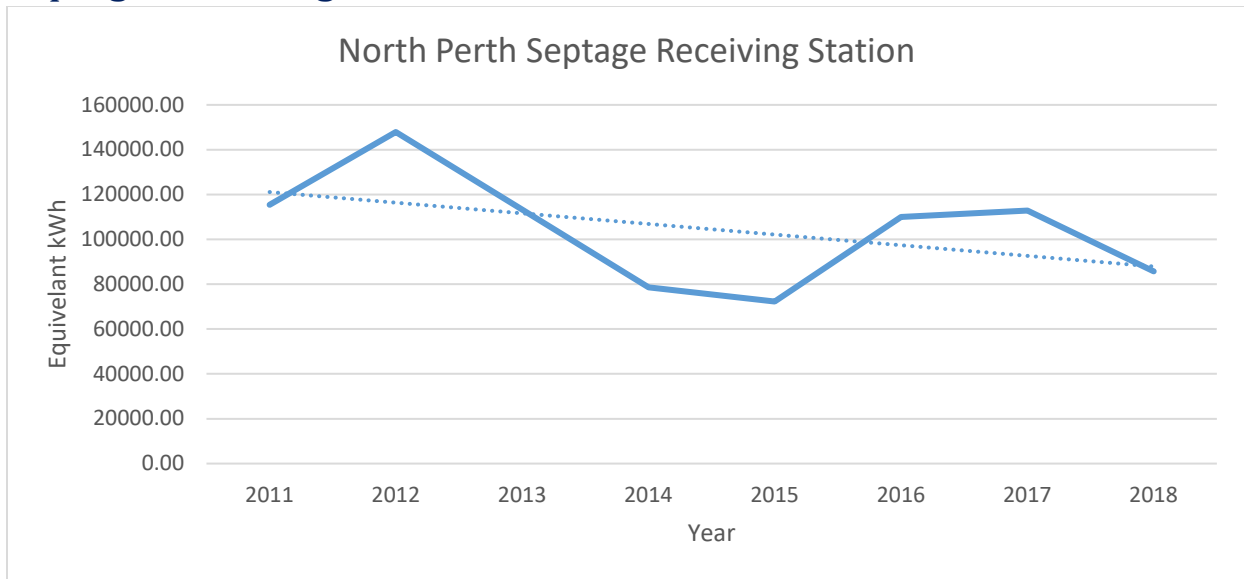
The wastewater treatment plant occupies approximately 40,255 square feet and was built in 1959.

The Wastewater treatment plant has decreased its energy consumption by 408,609.5ekWh, or about 16% from their baseline year of 2011, to consume a total of 2,118,689ekWh in 2018. Emissions also decreased by approximately 13,589.86 kg of CO₂e to emit a total of 105,029.5 kg.

There are many updates being done to the wastewater treatment plant to improve energy efficiencies. New LED lighting has been installed throughout the facility. The new lighting is all new DesignLights Consortium (DLC), which indicates a high level of energy efficiency. 62/73 of the lighting fixtures that were installed were DLC listed, as those were the appropriate locations for those lights, as the remaining fixtures are in hazardous locations which would make the installation difficult and expensive. A new HVAC unit was installed on the rooftop, which is Energy Star Certified, the heating portion of this system is supplied by natural gas. A new UV system was installed, which uses a fraction of the energy of the previous system. It is anticipated that the continued updates will aid in reducing hydro consumption.

There is hope that the field next to the treatment plant will, in the future, be home to a solar farm to offset the high hydro consumption of the facility.

Septage Receiving Station

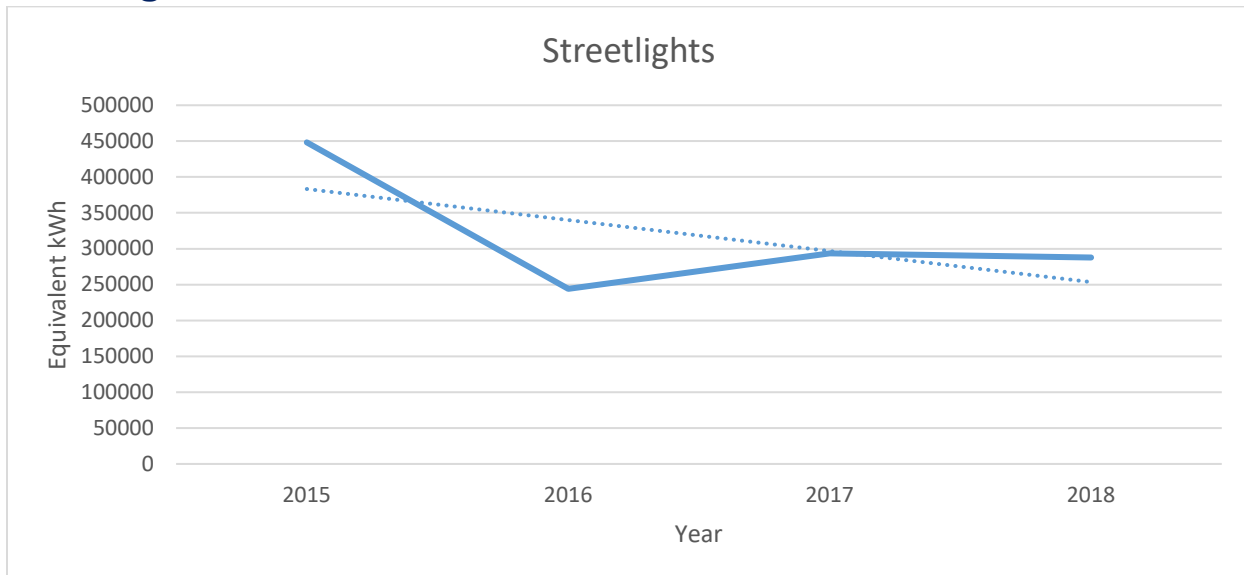


The total flow through the Septage Receiving Station in 2018, was 128.265 Mega Litres.

The facility is about 1,350 square feet and was built in 2006.

The septage receiving station has decreased its energy consumption by 29,622.54ekWh, or by about 26%, for a total of 85,784ekWh. The emissions associated with the facility have also reduced by about 1,273.8 kg of CO₂e, to emit a total of 3,688.7 kg of CO₂e.

Streetlights



Streetlights in North Perth have decreased energy consumption by about 54% from 2015. They have also decreased their emissions to a total emission count of 6907.87 kg of CO₂e in 2018.

Future plans

The Municipality of North Perth consumes a significant amount of energy. This plan will be used to aid in the reduction of energy and to aid in the implementation of impactful strategies, retrofit management, as well as monitoring and tracking consumption patterns. Future energy plans and goals will be considered on a regular basis. The goals need to be annually established along with the Council's approval of the municipal budget.