

Municipality of Cumberland

Municipal Climate Change Adaptation Plan (MCCAP)

Adopted by Municipal Council, December 11, 2013

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MUNICIPAL CLIMATE CHANGE ADAPTATION PLAN (MCCAP)

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1. Introduction

This Plan has been prepared in accordance with the 2010 – 2014 Municipal Gas Tax Funding Agreement, and follows the MCCAP Guidebook published by Service Nova Scotia and Municipal Relations. It identifies, assesses and prioritizes threats to the Municipality arising from projected climate change trends and hazards. It describes how the Municipality will develop detailed plans to mitigate those threats, starting with top priorities, and eventually incorporating climate change considerations in all of our land use, emergency management, and infrastructure planning.

Climate Change Adaptation is a significant challenge for the Municipality, with its small population (approximately 16,000), its significant geography (2nd largest municipality, by area, in the Province, with six distinct eco-districts) and extensive coastline on the Bay of Fundy and Northumberland Strait.

2. Climate Change Adaptation Team

2.1. Membership

The Municipality's Climate Change Adaptation Team (the "Team") was (and is) made up of a broad cross section of staff and elected officials. Senior and technical staff responsible for strategic planning, land use planning, infrastructure planning and maintenance, and disaster preparedness, along with two Municipal Councilors, make up the team:

- Councilors from Districts 5, 8 and 10
- Director of Policy and Research
- Director of Planning and Development
- Director of Public Works
- Regional Emergency Management Coordinator
- GIS Analyst
- Municipal Intern

2.2. Mandate

The Mandate of the Adaptation Team will change over time, as its work will be done in stages. The overall objective is to enable the Municipality to adapt to anticipated changes in climate, particularly with reference to land use, disaster management and municipal infrastructure planning. The specific initial deliverable of the Team is our Municipal Climate Change Action Plan (MCCAP or Plan).

Each member of the Team will bring their own expertise and experience to the table, and will participate fully in all discussions and decisions. Decisions will be made by consensus.

Due to the large geographic area to be considered, and resource and time limitations, outside stakeholders will not be consulted during the preparation of the Plan. Instead, the Plan will provide for stakeholder consultation following adoption of the Plan, when detailed site specific work will be done with the benefit of highly accurate LIDAR based mapping (to be developed).

The completed MCCAP will be submitted to Municipal Council for approval before being submitted to the Province as required by the Gas Tax and Municipal Funding Agreements.

The MCCAP will contain an implementation plan. The need for an ongoing Climate Change Adaption Team or Committee will be considered as part of the implementation plan.

The Team will provide periodic updates to Council. These updates will serve to inform Council of issues, alert Council to potential requests for additional resources the Team may require, and, when appropriate, to ask for direction.

3. Climate Change Issues and Hazards and Affected Locations

3.1. Our Experience

The Team considered the various changes in our climate we have observed, and the resulting hazards, with reference to climate changes identified in the Richards and Daigle ACAS report. Sea level rise, coupled with storm surge (associated with more violent storms) is undoubtedly our number one concern. The impacts include increased coastal erosion and flooding (affecting marshland protected by dykes, “protected” shoreline, unprotected shoreline and lowland).

We have also experienced increased occurrences of freezing rain, due to warmer winters and more winter precipitation, leading to power outages and transportation issues.

The Municipality has also experienced extreme precipitation events, both rain and snow, which have caused some damage to property and infrastructure. This damage, although significant to those directly affected, has not been major from the regional perspective.

3.2. Current Preparedness

The Municipality is reasonably well prepared to deal with the emergency aspects of the hazards described above. Our Emergency Measures Coordinator (EMC) has been on staff for about ten years, and over that time the Emergency Measures Planning Committee, under the leadership of the EMC, has developed, exercised and revised a comprehensive all-risks response plan. Over the years our EMO has evolved towards a regional service, and as of October, 2013 all of the municipal units in Cumberland County (i.e. the Municipality, Oxford, Springhill, Parrsboro and Amherst) are part of a Regional EMO (Cumberland REMO) under the leadership of our EMC. As each new member has joined, the Organization has had to revise and update the Cumberland Regional Emergency Management Plan, and as a result it remains current.

Training is and has been a priority, and as a result many municipal staff and volunteers are well versed in the current Incident Command System, Telecommunications Systems, Public Information Management, and Emergency Operations Centre procedures. Lines of communication with Provincial, Federal, Volunteer and private organizations with responsibilities in the event of a disaster are well established and regularly maintained.

3.3. Climate Change Effects and Issues That Require Attention

The Municipality's Public Works Department has completed the MCCAP Infrastructure Risk Assessment Matrix, attached as Appendix "A". The MCCAP Team prepared a Climate Change Hazard Impact Matrix, attached as Appendix "B", in order to assess the relative priority of climate sensitive issues and hazards. Based on the results (qualitative rather than quantitative), the Team decided "Bay of Fundy Low Areas", in particular Advocate Harbour, is the number one priority, due to the potentially severe impact of a breach in the seawall, which, together with a dyke system, protects the community. The seawall is overtopped on a regular basis and recently required major repairs in one area. Other extensive sections of the seawall remain at risk due to sea level rise and storm surge.

The Team decided "erosion and flooding along the Northumberland Strait due to sea level rise and storm surge" should be treated as one inseparable issue. It is also our second priority due to the potential severity of its impact, the fact it is frequent and progressively becoming more so, and it affects a large area of the Municipality.

The Team spent considerable time examining the hazard posed by potential flooding of the Tantramar Marsh in light of the ACAS report “An Evaluation of Flood Risk to Infrastructure Across the Chignecto Isthmus” by Webster, Kongwongthai, and Crowell (Revised December 2012). Although initially this was seen as our top priority due to the significant assets in the area (particularly interprovincial highway and rail links), the team eventually decided that due to the responsibility of senior levels of government and the Canadian National Railway for the dykes and the transportation links, the Municipality will concentrate its efforts on protecting the people and businesses in the area, thus reducing this issue to our third priority.

The Team decided that our top two priorities require future action by the Municipality, and that the acquisition of LIDAR data and mapping for the affected areas would be invaluable in that regard. It was also decided that when that future action happens the involvement of local stakeholders will be essential.

A “marked up” map of the County showing areas that have been affected by climate and weather events is attached as Appendix “C” for illustration purposes.

The Team also took time to consider potential climate change benefits for Cumberland and concluded that, based on the Richards and Daigle ACAS report, an extended growing season with relatively stable precipitation could provide an opportunity for new crops and revived agriculture in general. The Municipality will keep a watch on developments in this regard and provide support where appropriate, but as this issue is largely outside municipal jurisdiction, it is not seen as a priority for the Municipality.

3.4. How the Priority Issues Will Affect the Municipality

(a) Bay of Fundy Low Areas

Breach or failure of the seawall and dyke system protecting the community of Advocate Harbour presents an obvious risk to residents and businesses. Most homes and places of business are at low elevation along the main road. The main road (Highway 209) is the only way in or out of the community, and it may be vulnerable, thus restricting access and potentially cutting off the community from the rest of the Province. Highway 209 is the only road providing access to the Cape Chignecto peninsula, which is seen as a developing tourist route and destination. Advocate Harbour is beginning to develop as a service center for the area. Threats to the road and community could hamper development of tourism all along the Fundy Shore of the Municipality. Similar concerns exist for other low-lying communities along this shore.

(b) The Northumberland Strait

The Northumberland Strait area of Cumberland County is characterized by relatively flat, low lying, highly erodible land. High tides in this area are typically in the 2.0 – 2.5 m range. Ordinary high water marks are established by normal high tides. Storm surges in the range of 1.5 meters have been experienced in recent years (1993 and 2010) and can be expected within the 20 year return period, and sea level rise in the range of 1.0 – 1.5 m by the end of this century is predicted. See ACAS study reports by Richards and Daigle (“Scenarios and Guidance for Adaption to Climate Change and Sea Level Rise – NS and PEI Municipalities” 2011), and Webster, McGuigan and MacDonald (“Lidar processing and Flood Risk Mapping for Coastal Areas in the District of Lunenburg, Town and District of Yarmouth, Amherst, Count Cumberland, Wolfville and Windsor [sic], 2011). Obviously flooding and erosion are majour concerns.

This area of the Municipality, in addition to being home to a number of long-standing communities, has been intensively developed over the years as prime cottage country, with long stretches of shallow, warm, sandy beaches. The cottage areas in particular are vulnerable to erosion and flooding, having typically been developed as close as possible to the beaches. The surficial geology of the area is highly susceptible to erosion (Stantec Environmental Planning Framework for the Municipality of Cumberland, 2012). In many areas the cottage development is several layers deep on very small lots. As a result, there is nowhere to go as the shoreline erodes, and many landowners have invested heavily in shoreline armoring, with various, and often unintended and harmful, results.

The cottage development is important to the Municipality as a significant source of property tax revenue. It is also important to the business community all along the shore, as many depend heavily on a busy summer season for survival. If climate change reduces the desirability of this shore as a recreational area, the effects will be significant.

Roads and bridges in the area may also be affected; however they are either private or owned and maintained by NSTIR.

The Municipality does own and operate two sanitary sewage systems in the Strait area; these will be discussed in the next section.

4. Facilities and Infrastructure

4.1. Key Facilities and Infrastructure Owned and Operated by the Municipality

See the MCCAP Infrastructure Risk Assessment Matrix, attached as Appendix “A”. The key infrastructure owned and operated by the Municipality includes the Municipal Office and seven sanitary sewer systems.

The Municipal Office is not in a location perceived to be at risk due to climate change.

Two of the sanitary sewer systems, Pugwash and Wallace, are in the Northumberland Strait area and will be examined in more detail in the future, with the benefit of LIDAR data and mapping, for exposure to sea level rise and storm surge. Each system includes a treatment facility near the shore; however neither has experienced damage as a result of that proximity in the past.

Three of the sewer systems, Fort Lawrence, River Hebert East and River Hebert West, are located on and near dyked marshland and will receive additional consideration in the future.

One system, Maccan, has a treatment facility still under construction. The treatment facility and part of the collection system are near dyked marshland. The potential for flooding in the area received consideration during the design of the new facility. The treatment building and tank, and the pumping station are considered safe for a 1 in 100 year event. There is a constructed wetland associated with the facility which may be subject to occasional flooding; however it has been designed with that in mind.

One sanitary sewer system, Joggins, is considered not to be at risk from climate change.

4.2. Other Key Infrastructure

The Municipality currently operates one small, well supplied, water system owned by the approximately 14 property owners served. This system is not believed to be susceptible to climate change, and other supply could be provided if it became compromised.

There are 14 Fire Stations in the Municipality. Thirteen of the Stations are owned and operated by Volunteer Fire Departments, and only one is considered to be at risk due to weather related events (flooding). That station is on the Municipality’s short list for replacement, and in the meantime the Fire District could be reasonably served by other

Departments in the area if necessary. The Municipality owns one fire Station, and it is not considered to be at risk due to climate change.

The Municipality only owns 1.5 k of public road. This is not considered to be a significant climate change issue.

5. (a) Who May Be Affected

5(a).1 General

The Municipality has negotiated an Agreement with the Canadian Red Cross to identify populations and groups in the Municipality who would be considered to be at elevated risk in the event of a disaster situation. The project is named “Enhancing Resiliency in Our Community”. The Red Cross will hire and train an individual to work under their supervision to produce a report that will assist in the Municipality’s Emergency Measures planning. The information gained will be used in our climate change priority areas in the near future, as well throughout the Municipality on an ongoing basis. The Red Cross has undertaken similar projects in other areas with great success. We expect the project to get under way in January, 2014 and be completed in approximately six months.

5(a).2 Advocate Harbour

The last Census shows Advocate Harbour as having a population of about 800, but this would include an area larger than the core of the community at risk due to climate change impacts. The total number of people in the potentially impacted area is roughly 200. Of particular concern are the Health Care Center, the School (P – 12), tourist accommodations, an aquaculture facility, and the store/service station, all of which are not at significant elevation. The Municipality will be making significant use of newly acquired LIDAR data and soon to be produced digital elevation mapping to review its Emergency Measures plan for the area in the near future, and will incorporate the results of the Red Cross project referenced above in due course.

5(a).3 Northumberland Strait Area

As previously mentioned, the Northumberland Strait area of the Municipality contains a large number of seasonal recreational properties. Assessment data indicates a number in the vicinity of 5,000, but this is only considered to be an indication, due to the difficulty in

distinguishing between a cottage or camp and a seasonal home, or a structure that was once a cottage but has now been converted to three or four season use.

A large proportion of the seasonal properties (we estimate more than half) are located on private lanes. There are more than 500 private lanes in the area. This fact complicates our emergency planning for the area, as large vehicles cannot travel some of the lanes, and many are impassible during the winter and/or spring.

This area also includes a number of long standing permanent communities: Tidnish, Northport, Port Howe, Pugwash, Wallace and Malagash, as well as many smaller hamlets. In addition, there are many year round residences along the shore or near tidal rivers, between the communities, as a result of past and present agricultural activity and, more recently, people seeing the more rural parts of this shore as a desirable residential area. The areas developed for year round use in the past have typically not been prone to storm surge, and the structures were not threatened by coastal erosion, but as sea level rises and storm surges increase, this scenario will probably change.

The situation described above will require detailed analysis with the benefit of accurate topographical mapping, local stakeholder knowledge, the Red Cross Enhancing Resiliency study, and the Stantec Environmental Planning Framework for the Municipality of Cumberland.

5(a).4 Emergency Response

Information regarding the agencies, organizations, government departments, corporations and other groups that can be called upon in the event of any type of disaster or other emergency is contained and maintained in the Cumberland Regional Emergency Management Plan.

5. (b) Economic Implications

5(b).1 Northumberland Strait Area

As previously referenced, the Northumberland Strait area of Cumberland County includes many intensively developed cottage and shoreline recreational areas. These areas are important to the Municipality's tax base. The entire shore is well populated in the summer and shoulder seasons with vacationers, cottagers, tourists and seasonal residents. This

seasonal influx of people brings with it significant demand for goods and local services, and is vital to many businesses.

If climate change and its effects make this area less desirable as a summer destination, the economic implications for the entire northern portion of the Municipality (for that matter, the entire Municipality) will be very significant. One effect of erosion and sea level rise will be an increase in the (already observed) inward (i.e. inland) migration of the coastline. In addition to the obvious loss of valuable land and damage to infrastructure (public and private), the disruption to established patterns of settlement and behavior will be harmful. In order to mitigate these effects the Municipality, along with the Province and other stakeholders, will have to become more knowledgeable with regard to shoreline protection measures – their effectiveness and cost, as well their other consequences on the environment and aquatic species. The Municipality will also have to consider other measures (in particular land use and subdivision regulation) to facilitate, where appropriate, the inland migration (a.k.a. retreat) of development.

It is possible the lengthening and warming of the summer season will in some ways make this shore an even more desirable residential and recreational area. In order to take advantage of this potential benefit, the Municipality will have to take all the steps it can to ensure that the single most valuable attraction in the area, warm, safe, sandy beaches, is not destroyed by the indiscriminate use of shoreline protection measures.

Extensive consultation with the public (as is required for all land use exercises) will be important as the Municipality attempts to deal with the foregoing issues.

Another effect of the warming of the climate in this area will be the warming of our coastal waters. The shallow waters of the Northumberland Strait will probably be particularly susceptible to this change, with unknown effects on aquatic life in general, and the existing fisheries in particular (lobster, scallop, herring). Fishing is still a very important aspect of the local economy, and warming waters, together with a changing shoreline, must be considered a threat to this industry; a threat that is largely beyond the power of the Municipality to mitigate.

There is also significant agricultural activity in this area; the effects of climate change in this regard are addressed in section 5(b).3 of this Plan.

5(b).2 Advocate Harbour

Advocate Harbour is the service and employment center for those living within a radius of about 25 Kilometers, with the Bayview Memorial Health Care Centre, a nursing home, the Advocate District High School (P-12), the Advocate Country Store (groceries, prepared food, gas, liquor), restaurants, tourist services and accommodations, an active fishery (lobster, scallops, flounder), and an aquaculture facility. Highway 209, the main trunk of the growing tourist industry, runs along the shore and through the center of the community.

If the community is threatened by sea level rise and storm surge overcoming the seawall and dykes, all economic activity in the area is at risk. The tourist activity all along Cumberland's Fundy Shore is in large part dependent upon there being a loop from Parrsboro to Joggins, it also would be at risk if the seawall and dykes fail.

The Climate Change Adaptation Team has not considered options for dealing with the threats to the economy in this area, other than lobbying the province and federal government to do whatever it takes to maintain, and to the extent necessary, improve, the flood protection measures now in place.

5(b).3 Agriculture

Cumberland County has more arable land than any other county in Nova Scotia. Agriculture, though in decline for decades, is still an important part of the economy. Blueberries, dairy, grain, hay, mixed vegetables and beef are some of the main products.

The information (mostly the Richards and Daigle ACAS report) considered by the Team (which included some significant agricultural expertise) did not disclose any obvious threats to the Municipality's agriculture, other than perhaps the potential for invasive pests due to milder winters.

There may be potential for growing some crops not now viable because of the length of the growing season. This issue is largely beyond the expertise and jurisdiction of the Municipality, and so was not pursued in any depth by the Adaptation Team.

5(b).4 The Tantramar Marsh and Chignecto Isthmus

The issue of risk to vital interprovincial transportation, energy and telecommunication links between Nova Scotia and the rest of North America is complicated and important. The risks to the links due to sea level rise, wave action and storm surge, leading to dyke overtopping

and/or failure, have been reported in ACAS studies by Webster, Kongwongthai, and Crowell (“An Evaluation of Flood Risk to Infrastructure Across the Chignecto Isthmus” Revised December, 2012), Richards and Daigle (“Scenarios and Guidance for Adaption to Climate Change and Sea Level Rise – NS and PEI Municipalities” 2011), and Lieske and Bornemann (“Coastal Dykelands in the Tantramar Area: Impacts of Climate Change on Dyke Erosion and Flood Risk” 2011). The potential resulting economic damages have been reported in an ACAS study by Wilson, Trenholm, Bornemann, and Lieske (Forecasting Economic Damages from Storm Surge Flooding: A Case Study in the Tantramar Region of New Brunswick”).

The Team spent considerable time discussing this issue, in large part due to the dramatic potential that Nova Scotia could be cut off from the rest of North America. The Team eventually came to two conclusions:

- (a) there is considerable uncertainty in the scientific community regarding storm surge return periods in the Upper Bay of Fundy, as illustrated by the following comment in the Webster report, after a review of other reports that considered high water return periods in this area: “Given that there have not been frequent dyke overtopping events or TCH/CNR flooding, we think these predicted water levels are too high.”, and
- (b) the potential damages resulting from flooding in this area are of far greater provincial and federal interest than municipal.

The Team speculated that some of the studies failed to fully consider the protective aspect of the extremely large and variable tides in the upper Bay of Fundy, in that a storm surge, even a very large one, is only a concern if it coincides with water levels near the upper limit of astronomical tides, a situation that only occurs occasionally and for relatively brief periods of time.

As a result of the foregoing, the Committee decided that it will not give this issue top priority other than emergency measures planning related to the residents, local businesses and municipal infrastructure in the area. Members of the Team will, however, actively participate in the cross border Tantramar Climate Change Working Group, which regularly holds meetings, teleconferences and workshops aimed at understanding this issue and, where appropriate, bringing attention to the potential risk.

The Team did note that, contrary to an apparently widely held misconception, the peak of the long term (18.61 year) astronomical tidal cycle did not occur in November, 2012, but rather is coming in the fall of 2015, and continuing in the spring and fall of 2016, when the peak tides will be some 30 cm higher than the peak tides in 2012 and 2013. The Team, in

particular those with EMO responsibilities, will be keeping a close eye on possible storm surges during the larger astronomical high tides associated with the long term cycle.

5. (c) Environmental Issues

In 2011 the Municipality retained Stantec Consulting Ltd. to develop a comprehensive Environmental Planning Framework. A pdf copy of the final report can be downloaded from a link on the third page of the “Homepage” of the Municipality’s website: <http://www.cumberlandcounty.ns.ca/Page-3.html>. As this framework will be fundamental to, and provide the foundation for, much of the Municipality’s future climate change adaptation planning, a copy is attached as Appendix “D”.

The Framework was awarded the 2012 “Comprehensive Policies and Plans” award by the Atlantic Planners Institute. It contains separate sections on land, water (including coastal vulnerability), air, natural resources, and governance, and each section includes recommendations for short term actions, long term direction, policy and engagement. The framework was developed with specific reference to developing and implementing the environmental protection goals and addressing the climate change concerns identified in the Municipality’s Integrated Community Sustainability Plan. The framework is supported by an initial background study and detailed groundwater study, which are not posted on the website, but are available if required.

The Municipality’s Planning and Development Department is currently developing an implementation plan for the Framework, the initial stages of which alone will require 3 to 4 years and a substantial commitment of the Municipality’s resources.

The Framework, together with the Cumberland Regional Emergency Management Plan, provides a comprehensive response to the requirement to address environmental considerations in this MCCAP.

The Municipality is fortunate in that, within memory, it has not experienced significant environmental issues related to climate.

6. Priorities for Action/Implementation Plan

As previously identified, the Municipality's top two priorities are to address the hazards that climate change poses, due to sea level rise and storm surge, to the community of Advocate Harbour, and the entire Northumberland Strait coast in Cumberland County. The first step in strategically addressing these priorities was to acquire LIDAR data for these areas, so the extent of the issues can be accurately determined. This acquisition was completed in August, 2013.

The next step will be to develop new, accurate topographical mapping for the areas of concern. For Advocate Harbour that should be accomplished by January, 2014, and for the Northumberland Strait it will be done in stages through the spring and summer of 2014. These maps will be used, together with relevant portions of the Environmental Planning Framework, in the consultations described below.

In the period February to April, 2014, the Municipality's Climate Change Team will meet with stakeholders in the Advocate Harbour area, and hopefully with representatives from superior levels of government, to fully assess the potential climate change threats to the community, and to develop plans to mitigate those threats through immediate changes and/or additions to the Emergency Management Plan, and eventually to the Municipal Planning Strategy (MPS) and Land Use By-Law (LUB). At the end of this exercise a brief report setting out the risks identified, plans for future action, etc., will be prepared for Council and the public. The Team will hold at least one meeting to assess the success of the exercise, and may attempt to solicit feedback from the community on this point. The results of this assessment will be used to help plan for consultation for the Northumberland Strait area.

In a similar fashion, meetings will be held in several locations (probably 3 or 4) along the Northumberland Strait to gain a detailed assessment of the threats in that area, so that immediate changes and/or additions to the Emergency Management Plan can be developed, and so that information necessary for eventual changes to the MPS and LUB can be gathered. This work will also include assessment of the risk to the Municipality's two sanitary sewer and collection systems in the area, so specific mitigation measures can be implemented, if necessary. Also, at the present time, the Municipality is in the initial stages of finding a source for a central water supply for the Village of Pugwash. That project as well will be put under the microscope of the climate change consultation process. The Municipality expects that understanding the erosion issue with reference to specific locations may be time consuming and require expertise beyond that possessed by the Team. Consideration will be given to retaining outside consultants if that appears advisable.

The Team will also report the results of these exercises to Council and the public, and conduct an assessment of the success of the process.

The Municipality will continue to participate in the cross border Tantramar Climate Change Working Group, so that developments in understanding the risk in that area can be included in the Municipality's Emergency, Land Use and infrastructure planning.

In addition, in 2014 the Municipality will move forward with the recommendations in the Environmental Planning Framework. Due to the age and status of the Municipality's current MPS and LUB, a complete overhaul of those documents is required. That overhaul, together with incorporation and/or acting on the Environmental Framework recommendations is expected to take at least three years.

On an ongoing basis the Regional EMO will participate in the actualization of the Environmental Planning Framework, as that process may disclose areas for proactive disaster planning.

7. Conclusion

This Plan is submitted to the Province of Nova Scotia in compliance with the Canada-Nova Scotia Agreement on the Transfer of Federal Gas Tax Funds and in fulfillment of the Municipality's obligations pursuant to the 2010 – 2014 Municipal Funding Agreement. The process and tasks outlined in this MCCAP will place some strain on the Municipality's resources for 2014 and onward, however we believe the Plan is realistic and achievable.

It cannot be overstressed it will be an enormous challenge for the Municipality of Cumberland to address the climate change issues for an area almost as large as HRM, with two distinct and extensive coastlines, and six distinct eco-districts, with a population less than 5% of that of HRM. This Plan sets a course to do just that, but additional support and assistance from the Province may be required.

MCCAP-MITIGATION

December, 2013

1. Introduction

This report has been prepared and dis submitted to the Province of Nova Scotia as part of the Municipality's MCCAP, as required in the 2010-2014 Gas Tax Agreement and the Municipal Funding Agreement.

The Municipality completed Energy and Emissions inventories in 2006 and 2007 and an Energy Audit in 2009. Some of the practical recommendations designed as a result of those studies have been implemented.

Other than incorporating Energy consumption and GHG emissions as important components of all future procurement and construction projects, the main mitigation activities of the Municipality in the foreseeable future will be conversion off streetlights to LEDs and development of the Cumberland Energy Authority.

2. Energy and Emissions Information

Copies of 2006 and 2007 UNSM corporate energy and emissions spreadsheets prepared for the Municipality are attached as Appendixes "E" and "F" respectively.

Energy and Emissions Inventory Summary

Cat	Energy Type	Consumption	Cost	Units	Emission Factor TC O2/Units	Emissions(tCO2EX)(t)	Notes
Buildings	Electricity	366,273.00	\$42,768.42	kWh	0.855	313.16	Includes 8 volunteer fire service buildings not owned by the Municipality; the Muncipal office has recently converted to natural gas.
	Fuel Oil	55,067.80	\$44,617.45	l	2.68	147.58	
Water and Sewage	Electricity	423,340.00	\$47,173.08	kWh	0.855	361.96	
Street Lights	Electricity	797,223.00	\$179,965.00	kWh	0.855	682	To be converted to LED
Vehicles	Regular Gasoline	13,756.00	\$15,484.00	l	2.33	32	
	Diesel	2,725.00	\$3,049.00	l	2.57	7	
Solid Waste	N/A	1.002439138		Wet t	0.58 Paper 0.40 Food	0.501219569	

3. Goals and Actions

Some of the Municipality's goals and actions are set out in the 2009 Energy Audit prepared by Jacques Whitford for the Municipality, and attached as Appendix "G". The main recommendations in the Audit can be found in table 3 on page 7.

In particular, the Municipality upgraded the office lighting on the lower level and began setting back the thermostats in 2009-2010.

As indicated in the Audit, upgrading the office windows at this time is not actually recommended, as the payback, 47 years, exceeds their life expectancy. This upgrade will only be done as the windows need replacement.

The Municipality converted to natural gas in 2012, so the recommendation regarding a geothermal energy system would no longer be valid.

The recommendations regarding an occupancy timer on HRV-1 and heat recovery on washroom exits have not yet been implemented. Those recommendations will be reviewed by the Municipality's new Director of Public Works/Municipal Engineer in due course.

In addition to the foregoing, the Municipality has installed a Solartron SolarBeam concentrating parabolic dish to preheat our domestic water, and the exterior lighting at the Municipal Building has been converted to LED.

As mentioned above, the Municipality has a new Director of Public Works/Municipal Engineer. This director will be providing leadership in the Municipality's ongoing climate change efforts. Unfortunately this position, as well as the Energy Officer position created through the former local RDA, had been vacant for most of the past two years. The Municipality is therefore not in a position at this time to quantify the results of the mitigation efforts that have been undertaken, or to articulate precise mitigation goals for the future. Those steps will be undertaken as time permits.

It should be noted that prior to the upgrades, the building energy performance index (BEPI) for the Municipal Building was 21.5 ekWh/yr/ft² compared to the average consumption for office space⁴ in a similar climate- 31.8 ekWh/yr/ft² (see section 4.0 of the report). In other words, the office used about 1/3 less energy than the average.

4. Future Mitigation Efforts

In the foreseeable future, the Municipality's most important Mitigation efforts will be focused in two areas; street lighting and the Cumberland Energy Authority.

The Municipality has decided it will own and maintain the LED streetlight system that will be installed in compliance with Provincial directives. The Municipality will develop its RFP for the conversion in concert with a number of other municipalities in the same position.

The Municipality, together with the Towns of Springhill and Parrsboro, has formed the Cumberland Energy Authority, an incorporated inter-municipal body. The purpose of the Authority is to pursue and promote green energy sources available in the County, in particular mine water geothermal, tidal and wind. The Authority will be used to help create one or more green energy industrial parks and will promote the region as a green energy leader. The Municipality has committed significant funding for a comprehensive study of the potential for mine water geothermal in the Springhill area.

Conclusion

The Municipality has collected energy and emissions information and had an Energy Audit completed. The Municipality has acted on some of the recommendations in the Audit and will move forward on others in due course. In addition, the Municipality has undertaken other mitigation initiatives including the installation of a Solartron concentrating parabolic dish and the creation of an Energy Authority.

In the future, with the benefit of a full staff complement, the Municipality will be increase its capacity to measure the effectiveness of mitigation efforts and set precise mitigation targets.