



**MUNICIPALITY OF THE COUNTY OF
ANTIGONISH
MUNICIPAL CLIMATE CHANGE ACTION
PLAN**

December 2013.

For further information contact

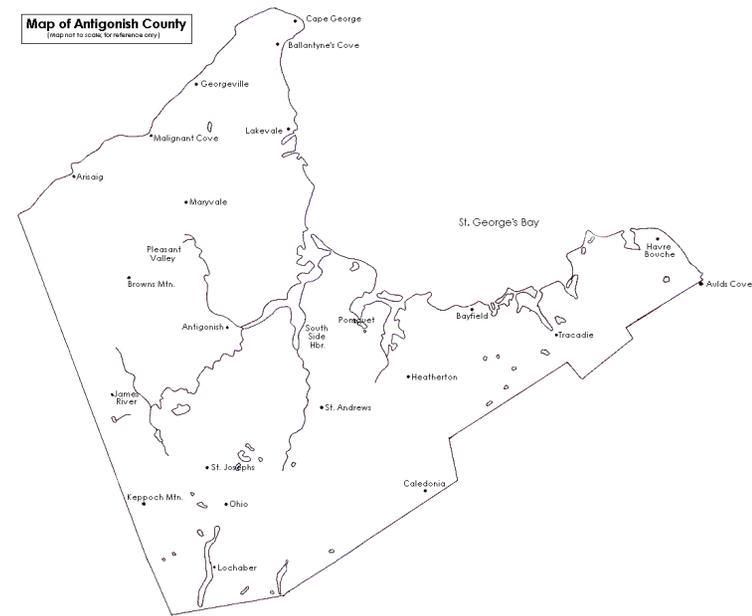
Municipality of the County of Antigonish
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Introduction

In 2010 The Municipality of the County of Antigonish (The Municipality) completed an Integrated Community Sustainability Plan (ICSP). The Municipal Climate Change Action Plan (MCCAP) is an amendment to the ICSP that describes how the Municipality will begin to respond to climate change. There is recognition that the MCCAP, like the ICSP, must be reviewed and adjusted regularly to stay relevant and respond to local needs. Success with climate change adaptations must happen concurrently across the region as well as at a provincial level. When possible, the Municipality is open to working in partnership with neighbouring municipalities on mitigation and adaptation efforts to increase efficacy and efficiency.

In January 2012, the municipality engaged St. Francis Xavier University (StFX) in a service learning project to start a broad scan of climate change impacts and adaptations for our region. This research project was in partnership with the Earth Sciences Department and Dr. David Risk. The Town of Antigonish, Town of Mulgrave, Town of Port Hawkesbury, Municipality of the County of Inverness, Municipality of the District of St. Mary's, Municipality of the District of Gusborough, Municipality of the County of Richmond and the Municipality of the County of Victoria were approached by the County of Antigonish to work in partnership on a regional plan. At the completion of the broad scan by the Earth Sciences class, the municipal units decided to continue individually on their MCCAP development, but were each provided a paper and digital copy of the research compiled.

The Municipality of the County of Antigonish's MCCAP follows the template outlined in the Canada Nova Scotia Infrastructure Secretariat's Municipal Climate Change Action Plan Guidebook, and is a necessary requirement for accessing federal gas tax revenue. This plan was developed to be action focused, with most information contained in table form to increase accessibility. As actions are completed and issues continue to be identified, the plan will be adjusted.



The Municipality has an ICSP, municipal planning strategies, source water protection plans, as well as a capital investment plan and operating budgets all which impact the MCCAP. The success of the adaptations outlined in the MCCAP need to be reflected and integrated into each of these existing plans to be successful. The MCCAP is not about adding to work load, or creating yet another plan, it is about making decisions and identifying opportunities within current plans to implement adaptations that mitigate the long term risk to property and community as result of climate change.

1. MCCAP Advisory Committee/ Adaptation Committee

The Municipality of the County of Antigonish's ICSP Committee has taken on the role of the MCCAP Advisory Committee. Individual and group consultations with stakeholders who represent various sectors of the community involved with climate change adaptation and planning were part of the plan development and will continue during the implementation.

This ICSP Committee is comprised of four elected officials, Municipal Councillors Donnie MacDonald, Mary MacLellan, Angus Bowie and Pierre Boucher and the Director of Environmental, Safety and Community Affairs. In addition to this committee which meets bimonthly, there was an action group brought together to share insight, knowledge and expertise through meetings and interviews. This group consisted of Debbie Neilsen, UNSM Sustainability Coordinator; John Bain, Eastern District Planning Commission Director; Bill Dinn, Regional Emergency Management Office (EMO) Coordinator; Dr. David Risk, Professor/ Researcher, StFX University. This working group stressed the need for education, public engagement and involvement in implementation as well as the need for guidelines and legislation from both the provincial and municipal level. At a municipal level there is recognition that with development of guidelines and policies the approach should be one that is incentive based, rather than restriction-based, in combination with education. For example, tax incentives and decrease in service fees/ building fees for sustainable builds.

With the MCCAP being approved as an amendment to the ICSP, the role of the ICSP Committee will be to monitor and report its progress.

2. Climate Change Issues & Hazards

Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. Global climate patterns are shifting; this impacts local climate patterns, often demonstrated by changes in local weather events and, here in Nova Scotia, an increased vulnerability to our coastline. There are many impacts associated with these shifts.

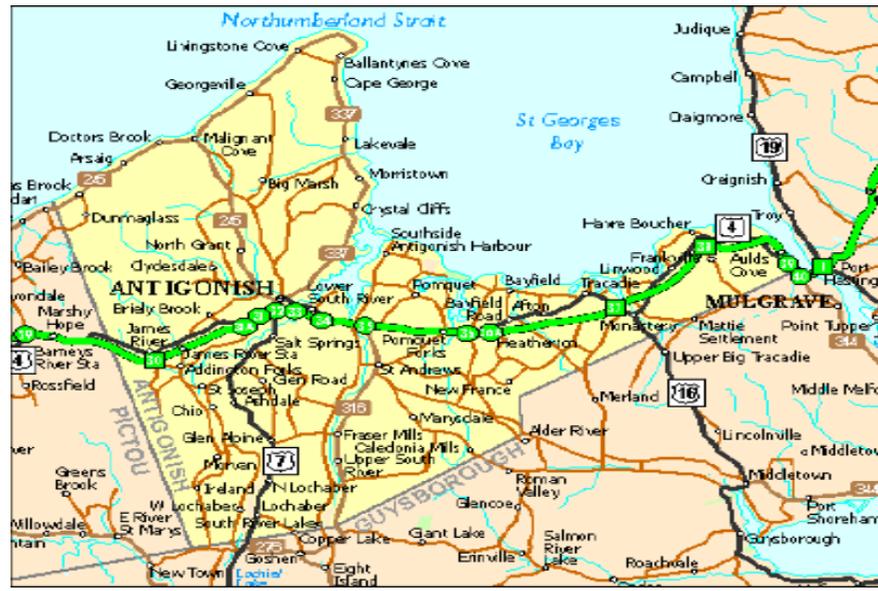
Impacts expected in Nova Scotia include:

- Sea level rise of approximately 1m by 2100;
- Increased precipitation in Winter months;
- Less precipitation in summer and an increase in summer temperatures, which can lead to water shortages;
- Increase in storm surges, both in frequency and intensity;
- More hurricanes or hurricane-like storms and increase in severity of winter storms;
- Increase in temperature variations leading to more requirements for air cooling and heating;
- Growing season could increase up to 50 days each year.

Impact areas at the municipal level and on municipal operations include:

- Land use planning and development;
- Water and sewer;
- Emergency management;
- Municipal roads and transportation;
- Public safety;
- Recreation and parks;
- Solid waste management; and,
- Infrastructure maintenance.

The Municipality of the County of Antigonish



The Municipality of the County of Antigonish is a rural community nestled along Hwy 104 in northeast- mainland in the Pictou-Antigonish Highlands of Nova Scotia, bordering the Northumberland Strait and St. George's Bay. The Municipality has a land mass of 1457.82km² with varied terrain including a dynamic coastline and fresh potable water sources that need monitoring and protection.

The Municipality has a population of 15,296 (2011 Stats Can Census). This population includes the First Nations community of Paq'tnkek; an Acadian community, Pomquet; a high percentage with Scottish and Dutch heritage; an African Nova Scotian community and a growing immigrant population. Of this population approximately 25% are under the age of 20 years, and about 16.6% of the population are 65 years or older. This diversity contributes to a rich cultural history and a strong sense of community. A large percentage of the population lives coastally.

Within the 1457.82 km² there are five protected areas including Arisaig, Bayfield, Beaver Mountain and Pomquet Provincial Parks, and the Eigg Mountain –James River Wilderness Area.

The Municipality has a strong reliance on its' natural resources, with economic investments in agriculture, fisheries and forestry. This reliance, in addition to our dependence on groundwater sources for drinking water makes adapting and planning for climate change vital. StFX University, the Guysborough Antigonish Strait Health Authority and a relatively stable number of retail stores are the backbone of the area's service sector. In addition, there is a vibrant artisan community, and a multitude of festivals and celebrations; all of these sectors must be engaged in creating change and in the implementation of adaptations.

The Municipality has been relatively fortunate with limited number of climate-related events that have had impacts on the community. Two examples, Hurricane Juan in 2003 and White Juan in 2004, brought the reality of the impact of strong winds, snow and ice combined with the resulting prolonged power outages to Nova Scotia. The immediate impact on the community was less than in other parts of the province, but Juan and White Juan provided an example for reflection. Of note, the recovery from Hurricane Juan exceeded \$100 million provincially.

Aging infrastructure is a reality facing local government in Nova Scotia; most infrastructures were historically built without climate change considerations. This approach to development requires a fundamentally change in mindset. What was once considered a rare event, a 100 or 150-year event, now must be considered a real possibility. Infrastructure and plans must be adapted to include climate change impacts. As new residential, industrial and commercial development and growth is encouraged it must be approached sustainably with recognition of our ecological wealth. Fortunately in Antigonish County, much of our infrastructure is relatively new. It is important at this point for a proactive approach to continue with all planned residential and commercial development across the County to be developed with recognition of the impacts of climate change.

Climate Change Issues, Impacts and Hazards

Adapting to Climate Change involves developing priorities and actions to reduce the impact, the consequences of Climate Change. To do this we have to look at the issues and hazards that are specific to the municipality of the County of Antigonish. The ICSP and MCCAP Committee looked at the issues and hazards that specifically impact the Municipality, reflecting upon the impacts as well as the opportunities associated with each. Given the size of the County most issues/ hazards were understood to have a county wide

impact, with understanding that specific communities within will have to respond or plan accordingly. The issues and hazards identified by the Committee are outlined in the following table.

Climate Change Issues, Hazards and Impacts Table

Issue &/or Hazard	Impact	Opportunity	Affected Area/ Location
Warmer Temperatures	<ul style="list-style-type: none"> • Extended growing season • Potential for new pests or invasive plant and animal species to arrive. • Requirement for cooling systems. • Soil depletion resulting in changes to soil management, classification and conservation techniques. • Infrastructure changes; the construction of buildings both residential and commercial, bridges and roads change which influences building codes and requirements. • Water shortages 	<ul style="list-style-type: none"> • Crop diversification, food security. • Academic opportunity for research and studies. • Employment opportunity for pest management. • Renewable energy technology jobs and training. • Land management/ land use planning • Soil management research, employment. • General Contracting positions on the rise with retrofits, and new builds. • Tourism • Active living and outdoor recreation opportunities. 	County wide, 10.4% of County land is designated as agricultural.
Extreme Weather Events, including high winds, snow and rain.	<ul style="list-style-type: none"> • In combination can cause wide-spread damage • Impact road conditions and maintenance, which impacts budget. • Public safety. • Power outage. 	<ul style="list-style-type: none"> • Strong partnership between municipal staff and REMO. • Educate on shelterbelts and landscaping techniques and species that are wind resistant, and adapt well to fluxuations in temperature water. 	County Wide

		<ul style="list-style-type: none"> • Solar and Wind Energy • Public Education 	
Private wells and a municipal system rely on groundwater for potable water supply.	<ul style="list-style-type: none"> • Loss of water supply 	<ul style="list-style-type: none"> • Public education on water systems & conservation. • Source water protection plans offer base for introducing water use policies. • Need for partnership with neighboring municipalities on well development and water processing facilities. 	County Wide, with focused concern in Districts 2, 3, 4, 5, & 6 as these districts have municipal wells.
Wetlands being damaged by climate change and development.	<ul style="list-style-type: none"> • Loss of groundwater recharge. • Loss of natural erosion control. • Loss of rich diverse wildlife habitat. 	<ul style="list-style-type: none"> • Engage province's Wetland Conservation Policy. • Monitor and work with NSDTIR on Wetland Conservation Project, especially with respect to new highway development in County. 	County wide, with specific attention on Districts 2, 5, 8 and 10.
Rivers, lakes and inland waterways impacted by high wind and rain.	<ul style="list-style-type: none"> • Localized flooding • Shoreline and bank erosion • Habitat loss • Decline in recreational fishing. • Pollution increase 	<ul style="list-style-type: none"> • Watershed protection work in partnership with local organizations and university. • Public Education • Living Shorelines workshop 	County wide
Erosion	<ul style="list-style-type: none"> • Land loss • Infrastructure is put at risk • Soil content is altered. • Public safety 	<ul style="list-style-type: none"> • Living Shorelines workshop. • Erosion mitigation education and workshops such as Living Shorelines techniques. • Introduction of new plants • Replanting and reforestation. • Research and education partnerships with university to understand why soil is breaking down and development of control practices. 	County wide

Fire, specifically forest fires, due to warmer temperatures, less consistent rainfall, seasonal drought and increase in deadfall due to forestry practices and pest infestations.	<ul style="list-style-type: none"> • Loss of natural resource • Increased erosion • Economic impact • Habitat loss • Public safety 	<ul style="list-style-type: none"> • Forestry management programs. • Public Education. • Increase biodiversity through sustainable forestry practices. 	County wide The County has 67.02% land designated as forest.
Coastal flooding and coastal erosion	<ul style="list-style-type: none"> • Infrastructure damage-most builds were designed to withstand weather events less extreme and less frequent than we are now experiencing or are old. • Habitat loss • Tourism industry negatively impacted 	<ul style="list-style-type: none"> • Include recommendations and requirements in land-use planning documents and municipal planning strategies. • Support responsible development through permit allocation. • Public education. 	County wide with specific concern of the affects in District 1, 2, 5, 7, 8, 9, & 10.
Flooding (inland)	<ul style="list-style-type: none"> • Habitat loss • Damage to roads • Residential property damage • Economic impact due to insurance increases and associated costs. 	<ul style="list-style-type: none"> • Public education regarding floods • Public education regarding insurance and liability. • Support responsible, sustainable builds through permit allocation and permit fees. 	

Of note, there is a need for additional mapping as actions and adaptations are advanced. Mapping needs include coastal and inland flooding, many of which are available with the Eastern District Planning Commission and with the Nova Scotia Department of Natural Resources. LiDAR mapping of parts of the Municipality has been completed. Further mapping and analysis of existing maps will be required on specific adaptations.

3. Affected Locations

Severe weather events have the potential to cause severe property damage. As they become more common the potential for compounded damage becomes a factor. Included in the table above are specific areas in the County identified by district where the issue or hazard has been identified as an issue.

The MCCAP Committee spent a great deal of time discussing the impacts on the coastline in Antigonish County. This is an area of concern for community members and they are bringing their concerns to Councillors. There are ongoing discussions how to best approach this issue.

Affected areas were identified by reviewing NS Department of Natural Resources research and reports, examining municipal inventories of infrastructure, invaluable input from the group, both individual expertise and collective knowledge. The Committee had insight based on experience specific to the county. This was greatly augmented by Dr. Dave Risk of Earth Sciences, StFX University, Debbie Neilsen of UNSM, John Bain, Eastern District Planning Commission and Bill Dinn of EMO who brought varied perspectives and investments in the conversation. The group completed the Hazard Impact Matrix and then spent more time with maps illustrating the results on enlarged maps and by referring to digital maps and images.

4. Facilities & Infrastructure

Municipal infrastructure such as waste water and water treatment facilities and conveyance systems, water supplies, buildings and municipally maintained roads all become increasingly vulnerable by climate change. Facilities and infrastructure are identified against their associated risks and potential impacts in the Adaptation Actions Tables in section six (6).

Highway 104 is an important infrastructure component for the County that is not included in the Adaptation Table. The Department of Transportation and Infrastructure Renewal is responsible for this infrastructure and ongoing dialogue with them is crucial to share information and plans.

Protection of the County's municipal water supply is crucial. Source water protection plans are in place for Wrights River Aquifer, Lower South River and Gasperaux Lake and will be adapted/ updated as required. These plans have public education components that should be expanded.

Climate hazards with the potential to harm the health and safety of residents are covered by emergency response plans. EMO plans are updated annually, the EMO coordinator is part of the MCCAP team and EMO training for municipal staff is ongoing.

5. a. Who will be affected?

All residents of the Municipality will be affected by the effects of climate change to varying degrees. Vulnerable populations, including those living in poverty, those socially isolated and a portion of the population living with mobility and health issues will face additional challenges. The impact on these individuals is most evident during extreme weather events, and during power outages. Local agencies and resources need support to help mitigate this vulnerability when possible. The Guysborough Antigonish Strait Health Authority, Victorian Order of Nurses, EMO, Red Cross, special care homes, community food banks and community centres all play a role in responding to the needs of this population when the need arises.

The Municipal role can be a direct service, or limited to providing financial and logistical support to these organizations.

Extreme weather and temperatures becomes a challenge for the elderly and young children, especially when they may not have options for increasing heating or cooling of homes. School age children are also vulnerable as temperatures rise; schools in Antigonish County do not have air cooling systems. With emergency response plans, heating and cooling centres could be identified, promoted and easily accessible. Existing resources, like those identified in the EMO plan may need to be supplemented. The pandemic plans developed in 2009 are a good resource for developing a response to these issues.

EMO is an invaluable resource in planning a response to climate change and particularly in responding to the health and safety of the residents of the County. The expertise, the plans and the training available through this organization is vital to having a thorough, comprehensive response.

5. b. Economic Implications

Economically, the effects are often immediate after a catastrophic event such as forest fire, pest infestation or hurricane. In many cases the impact of climate change will be more gradual, for example: as seasonal workers are affected as the work cycle changes based on climate and environmental shifts.

An economic development plan that recognizes the impacts of climate change is important; one that promotes opportunities for new agricultural products, the renewable energy industry, pest management, general contracting, and tourism. These are the areas identified for the County as potential growth areas. With the development of an economic development plan an economic impact study related specifically to the impact of climate change would be an advisable step.

Completing the adaptations and actions outlined in this plan will have direct economic implications on the Municipality. By being proactive, planning for the impacts and including the actions in annual budget development, the municipality will save money long term. At this stage not all impacts can be mitigated; there is a need to have emergency funds available to meet unforeseen needs. A percentage of the federal gas tax revenue should be eligible to be set aside for this purpose.

5. c. Environmental Issues

Most environmental issues related to climate change and municipal operations are identified in the risk and impact columns of the Adaptation Table. Environmental threats such as those travelling through our community by road or rail are addressed in our REMO plan.

6. Adaptation

There are several approaches to adaptation that should be considered and incorporated into the MCCAP. The following approaches from The MCCAP Assistant (2012 by Elemental Sustainability Consulting Ltd) are important to consider throughout implementation. These include:

Preserve and enhance lands for natural resource and habitat values (e.g., the preservation of land surrounding wetlands and beaches to allow for their inland migration as the seas rise).

Avoid developing in areas considered at moderate to high risk to a hazard. Avoidance measures are typically limited in application to future development or redevelopment (e.g., setbacks, zoning that aligns land use with flood risk).

Protect areas considered at moderate to high risk to a hazard from development. Avoidance measures are typically limited in application to future development or redevelopment.

Accommodate climate change effects by adapting land based structure and activities to tolerate an impact (e.g. warning and evacuation protocols, rolling easements).

Managed Retreat is defined as any strategic decision to withdraw, relocate or abandon private or public assets that are at risk of being impacted by coastal hazards.

“Adaptation at the municipal also involves new ways of thinking about infrastructure design, renewal and maintenance. It involves adaptive land-use planning and neighborhood design and also adaptive water and energy management, in addition to other adaptive measures that will help to ensure that our communities are prepared and will be resilient.” -Municipal Climate Change Action Plan Guidebook, November 2011, prepared by Graham Fisher, Planner, SNSMR.

The following table represents a summary of the climate change adaptation plan for the municipality. Included are affected areas & infrastructure, the risks and impacts based on the issues and hazards identified. Some activity has already occurred as a result of the ICSP, other items require implementation and both are reflected in the following Adaptation Table. Adaptations have begun at the municipality, many as a result of the ICSP and land use planning.

Adaptation Table

Municipality of the County of Antigonish Water Utilities & Wellheads Adaptation Table

Location	Risk Factor	Potential Impacts	Actions Taken to Date	Planned Actions
Gasperaux Lake, Wrights River, Lower South River Water Utilities.	<ul style="list-style-type: none"> • Extreme Rain • Extreme Snow • Storm Surge • High Winds • Extreme Temperature variance 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • Decrease in aquifer recharge- due to high runoff as result of severe weather/ intense rain event • Contamination of water supply • Increase of chemical use for water treatment 	<ul style="list-style-type: none"> • Source water protection (SWP) plans are completed, adopted and submitted for each source water area in the County. Implementation of plans and regulation of development in SWP areas is ongoing, • Basic educational programming has started with bill inserts, info in County Quarterly • Regular inspection and maintenance of sites • Regular water samples and testing complete • Communication with NSTIR re emergency response in source water 	<ul style="list-style-type: none"> • Ongoing SWP Plan review and update • Inclusion in Business Continuity Plan • Ongoing public education programs for youth as well as property and business owners/ operators. • Website component focusing on public education and water preservation • Water utility and rate study • Back- up power sources for utilities planned for 2014

Municipality of the County of Antigonish Lift Station Adaptation Table

Location	Risk Factor	Potential Impacts	Actions Taken to Date	Planned Actions
14 Lift Stations in the County including: Havre Boucher #1 Heatherton #1, #2, #3 Pomquet Lift Station #1, #2, #3 South River Rd Williams Pt #337 #316 Mt. Cameron Hurst	<ul style="list-style-type: none"> • Extreme Rain • Extreme Snow • Sea Level Rise • Storm Surge • High Winds • Erosion • Flooding 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • Offensive odor • Sewer back up • Raw sewage leak • Break or blockage between station and treatment facility 	<ul style="list-style-type: none"> • Inventory of stations complete. • Regular inspection and maintenance schedule. 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Review access road(s) to ensure long term plan includes accessibility plan. • Look at erosion control methods site specific • GPS mapping of all lift stations since they do not all have civic addresses.

The Waste Water Treatment Facilities (WWTF) in the County of Antigonish all have similar risk factors. The Havre Boucher WWTF is built on the coast and therefore has the added risk factor of sea level rise and storm surge. However, it is a new facility and was built to mitigate these risks, but they still need to be recognized and monitored. As well, the Heatherton WWTF is in an area more susceptible to flooding therefore requires different monitoring and or action when flood conditions are present.

Municipality of the County of Antigonish Adaptation Priorities for Waste Water Treatment Facilities				
Location	Risk Factor	Potential Impacts	Actions Taken to Date	Planned Actions
Havre Boucher WWTF @ 1808, Havre Boucher Rd.	<ul style="list-style-type: none"> • Extreme Rain • Extreme Snow • Sea Level Rise • Storm Surge • High Winds • Erosion 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • WWTP capacity reached 	<ul style="list-style-type: none"> • New level 2 plant built on site. • Ongoing monitoring of site and of Waste Water to ensure everything is on target • Purchase of Dewatering Truck 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Review access road(s) to ensure long term plan includes accessibility plan • Review impact of Dewatering Truck, ongoing monitoring use schedule and adjustments to dewatering schedule accordingly • Create natural landscaping on ocean side to help with erosion.
St. Andrews WWTF @ #47, Blacksmith Valley Rd.	<ul style="list-style-type: none"> • Extreme rain • Extreme snow • Temperature variance 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • WWTP capacity reached • River intrusion 	<ul style="list-style-type: none"> • Ongoing monitoring of site and of Waste Water to ensure everything is on target • Purchase of Dewatering Truck 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Review access road(s) & Bridge to ensure long term plan includes accessibility plan • Review impact of Dewatering Truck, ongoing monitoring use schedule and adjustments to dewatering schedule accordingly
Heatherton WWTF @ #6438, Hwy 104, Heatherton.	<ul style="list-style-type: none"> • Flooding • Extreme rain • Extreme snow • High winds • Temperature variations 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • WWTP capacity reached • River intrusion 	<ul style="list-style-type: none"> • Ongoing monitoring of site and of Waste Water to ensure everything is on target • Purchase of Dewatering Truck 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Review access road(s) to ensure long term plan includes accessibility plan • Review impact of Dewatering Truck, ongoing monitoring use schedule and adjustments to dewatering schedule accordingly

Pomquet WWTF @1046 Pomquet Monks Head Rd.	<ul style="list-style-type: none"> • Extreme rain • Extreme Snow • Temperature variations • 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • WWTP capacity reached 	<ul style="list-style-type: none"> • Ongoing monitoring of site and of Waste Water to ensure everything is on target • Purchase of Dewatering Truck 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Review access road(s) to ensure long term plan includes accessibility plan • Review impact of Dewatering Truck, ongoing monitoring use schedule and adjustments to dewatering schedule accordingly
Lower South River WWTF @ 5306 Dunmore Rd.	<ul style="list-style-type: none"> • Flooding • Extreme rain • Extreme snow • High winds • Temperature variations 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • WWTP capacity reached • River water intrusion 	<ul style="list-style-type: none"> • Ongoing monitoring of site and of Waste Water to ensure everything is on target • Purchase of Dewatering Truck • Sewer Assessment Report completed in 2013 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Review access road(s) to ensure long term plan includes accessibility plan • Review impact of Dewatering Truck, ongoing monitoring use schedule and adjustments to dewatering schedule accordingly

Municipality of the County of Antigonish Adaptation Plans for Municipal Buildings & Operations				
Location	Risk Factor	Potential Impacts	Actions Taken to Date	Planned Actions
Municipal Administration Building @285 Beech Hill Rd.	<ul style="list-style-type: none"> • Extreme Rain • Extreme Snow • High Winds • Erosion 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • Damage or destruction of buildings 	<ul style="list-style-type: none"> • Contingency plans developed with REMO • Ongoing inspection and maintenance schedules in place. • New roof to be completed in 2014. • HVAC, heating and electrical system under review. • Solar study completed. • New IT system to protect municipal documents and info. 	<ul style="list-style-type: none"> • Development of Business Continuity Plan. • Review access road(s) to ensure long term plan includes accessibility plan • Plan landscaping to include natural barriers/ low scale shelterbelts; highly adaptable plants. • Further review of energy use as outlined in mitigation plan, renewable options i.e.Solar

Municipal Public Works building @ 261 Beech Hill Rd	<ul style="list-style-type: none"> • Extreme Rain • Extreme Snow • High Winds • Erosion 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • Damage or Destruction to buildings or equipment 	<ul style="list-style-type: none"> • Contingency plans developed with REMO • Back-up generator on site. • Ongoing inspection and maintenance schedules in place. • Fuel Storage on site for use in equipment. 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Review access road(s) & Bridge to ensure long term plan includes accessibility plan • Plan landscaping to include natural barriers/ low scale shelterbelts; highly adaptable plants
Buildings at Solid Waste Management Facility Site @1356 Beech Hill Rd	<ul style="list-style-type: none"> • Flooding • Extreme rain • Extreme snow • High winds • Temp variations 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • Capacity reached of solid waste; soil contamination. 	<ul style="list-style-type: none"> • Fuel storage on site. For use in equipment. • Confirmed use of all-terrain vehicles to access site through trail system. 	<ul style="list-style-type: none"> • Include in Business Continuity Plan • Investigate planting options for site.

Roads, Trails and Access Points

Location	Risk Factor	Potential Impacts	Actions Taken to Date	Planned Actions
Post Rd.- Market Street, Antigonish	<ul style="list-style-type: none"> • Extreme Rain • Extreme Snow • High Winds • Erosion • Flooding 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • Damage or destruction of infrastructure 	<ul style="list-style-type: none"> • Contingency plans developed with REMO • Ongoing inspection and maintenance program to be as proactive as possible. 	<ul style="list-style-type: none"> • Identify alternative routes to critical locations, communities and resources and identify resources for access (ie vehicle) • Plan landscaping to include natural barriers/ low scale shelterbelts; highly adaptable plants. • Continue to work with NSTIR and Eastern District Planning Commission
Mount Cameron Estates	<ul style="list-style-type: none"> • Extreme Rain • Extreme Snow • Erosion • Flooding 	<ul style="list-style-type: none"> • Loss of Power • Access to site limited • Damage or 	<ul style="list-style-type: none"> • Contingency plans developed with REMO • Road repairs have taken place in hope of mitigating possible damage. 	<ul style="list-style-type: none"> • Review access road(s) & Bridge to ensure long term plan includes accessibility plan • Plan landscaping to include natural

	<ul style="list-style-type: none"> High Winds 	<ul style="list-style-type: none"> Destruction of infrastructure 	<ul style="list-style-type: none"> Ongoing inspection and maintenance program to be as proactive as possible. 	<ul style="list-style-type: none"> barriers/ low scale shelterbelts; highly adaptable plants Continue to work with NSTIR and Eastern District Planning Commission
Appleseed Dr.	<ul style="list-style-type: none"> Flooding Extreme rain Extreme snow High winds Erosion 	<ul style="list-style-type: none"> Loss of Power Access to schools on this road limited. Damage or destruction of infrastructure 	<ul style="list-style-type: none"> Ongoing inspection and maintenance program to be as proactive as possible. Contingency plans developed with REMO with consideration for the fact that Elementary and junior schools are at this site. 	<ul style="list-style-type: none"> Plan landscaping to include natural barriers/ low scale shelterbelts; highly adaptable plants. Review access road(s) & Bridge to ensure long term plan includes accessibility plan Continue to work with NSTIR and Eastern District Planning Commission

Mitigation

The Municipality of the County of Antigonish is committed to reducing green- house gas emissions. In November 2013 Council passed a resolution to become a member of Partners for Climate Protection with the Federation of Canadian Municipalities and ICLEI (Local Governments for Sustainability). Being part of Partners for Climate Protection will provide a framework, guidance and resources to the municipality in the implementation of its mitigation plan.

The Municipality has been working to increase energy efficiency and decrease GHG emissions through general operations. An energy audit was completed at the Municipality in 2008, which included completion of the UNSM corporate energy and emissions spreadsheet. The following table reflects the GHG emissions calculated at that time.

Cost and Tonnes of eCO2 / Energy Type

Energy Type	Total Cost	Total eCO2
Electricity	205865.49	1537.44
Natural Gas	0.00	0.00
Compressed Natural Gas	0.00	0.00
Diesel	121114.88	370.81
District Energy	0.00	0.00
Ethanol Blend	0.00	0.00
Fuel Oil	70928.62	669.04
Gasoline	23461.03	46.47
Propane	0.00	0.00
Waste	-	0.00
Totals	421370.02	2623.77

Since that time there has been new municipal development formulas for calculation a review of the audit, and the emissions calculated is timely.

The mitigation plan will be developed concurrently with departmental budget development.

Municipality of the County of Antigonish Mitigation Table (Implementation Plan to be developed Spring 2014)

Mitigation Activity	Actions Taken to Date	Planned Actions	Additional Information or Comments
Energy Audit of Municipal Buildings and Operations followed up with retrofits	<ul style="list-style-type: none"> Completed in 2008- many recommendations are completed with regard to lighting retrofits; blower door tests New windows installed in Municipal Admin building Maintenance and cleaning of HVAC system 	<ul style="list-style-type: none"> A complete review of Energy Audit, identify gaps and respond where needed. 	Recognition that there have been huge advances in energy efficiency technology and that even with the lighting and operational changes made since

	<ul style="list-style-type: none"> ongoing to ensure optimum efficiency. Blower Door test completed and insulation increased in areas identified. 		the audit there are additional options now available.
Partners for Climate Protection & Greenhouse Gas inventory	<ul style="list-style-type: none"> Resolution passed by Council November 2013 to join Partners for Climate Protection. GHG inventory completed with Energy Audit in 2008 New GHG Inventory being completed using UNSM's Energy & Emissions Spread-sheet with data from 2010-2012 	<ul style="list-style-type: none"> Set goals to meet each of the milestones of the program. With Partners for Climate Protection need to set GHG reduction targets for Municipal operations Development of an Energy Plan for Municipal Operations to include many of the mitigation strategies outlined here. Student Project- Complete a more in-depth GHG inventory for the County 	
Streetlight Conversion to LED	<ul style="list-style-type: none"> June 2013 provided the Province and NSPI with indication that the Municipality will be working with NSPI on the LED conversion. 	<ul style="list-style-type: none"> Follow process of NSPIs conversion. Revisit our Streetlight Policy to ensure principles of Sustainability are included. 	
Promote 'green' fleet management practices	<ul style="list-style-type: none"> The Safety Administrator by QDS- safety and maintenance software management program purchased and being populated to track and increase efficiency of fleet. Anti-idling training, and drive wiser session held for all staff. Anti-idling Policy in place. 	<ul style="list-style-type: none"> With Sustainable Purchasing Policy framework make recommendations for future vehicle purchases; set efficiency targets for fuel consumption with Municipal Fleet. Review, highlight and re-commit to anti-idling policy. 	
New municipal buildings and developments planned & constructed to meet high environmental	<ul style="list-style-type: none"> Recommendations from Energy Audit used in new Havre Boucher Waste Water treatment Facility build as well as individual research into standards required and 	<ul style="list-style-type: none"> Development of a Green Development/ Building Checklist & policy to support future building and development. 	This policy would be developed with expertise from the Eastern District Planning Commission and used to support planning

standards	recommended for a level 2 facility were considered.	and development agreements with the County and partners.
Green Office Operations and Procedures	<ul style="list-style-type: none"> • As outlined above in promotion of green fleet. • Purchase of a water cooler with refillable bottles to reduce plastic consumption 	<ul style="list-style-type: none"> • Sustainable Purchasing Policy will provide some guidance for current and future purchases; including recommendations for Energy Star, Water Sense certified products • Implement an employee education and engagement program to increase awareness of energy use and promote conservation. • Use UNSM’s Green Office Procedures Toolkit.
Renewable Energy Options	<ul style="list-style-type: none"> • The Municipality has adopted a Land Use Bylaw for the regulation of Wind Turbine Development to support Wind Development in County. • Solar Energy Feasibility Study completed December 2012. 	<ul style="list-style-type: none"> • Further investigation of Solar Energy for the Municipal Administration Building’s Energy use in 2014. • Review of the Land use Bylaw for Wind Turbine Development. • Advocate for solar to be included in COMFIT
Public Engagement/ Community Energy Use	<ul style="list-style-type: none"> • Links on website to local and provincial resources and programs. • Information included in County Quarterly publication and in mail-outs, bill inserts. • Information on energy efficiency is provided by Building Inspector with building permits. • Energy Café- community event June 2013 to 	<ul style="list-style-type: none"> • Create a resource page / section on municipal website that is interactive and relevant to provide information, resources and programs for community members to access and apply to their individual or organizations practises.

	investigate and share programs, and resources.	<ul style="list-style-type: none"> • Increase awareness of Source Water Protection and Water Conservation by including new educational information in bills and in County Quarterly. • Development of a Water Conservation Policy that includes both potable water and treatment of waste water. • Include green development ideals and guidelines in Land Use Policy development, and in area planning document revisions. • Develop an efficiency package to accompany building and planning permits to increase efficiency in residential units. • Investigate options for Energy Monitoring Program
Active Transportation	<ul style="list-style-type: none"> • AT workshop in June 2010 for stakeholders and another in November 2012 for elected officials. • Active Transportation Plan currently being developed in partnership with Town of Antigonish. • AT components are reflected in Municipal ICSP, and Recreation Plans 	<ul style="list-style-type: none"> • Implementation of approved action items from AT Plan being developed. • Ensure mapping and trail development incorporates climate change consideration. • Linkages to other MCCAP activities including educational and public engagement opportunities.
Planning- Land use and Building	<ul style="list-style-type: none"> • Information on Energy Efficiency is provided by Building Inspector with building permits. • Municipal Planning Strategies completed or in development for many areas in County. 	<ul style="list-style-type: none"> • Investigate options for incentive program for developers and homeowners to exceed new energy efficiency standards. (i.e.:

- Land use planning bylaws are in place.
- reduced building permits)
- Develop green development guidelines to include in planning documents.

Conclusion

The compilation of the MCCAP has proven a useful exercise. It has brought a team together and provided an opportunity to assess the reality of climate change on a local scale. Recognition exists that this is a plan, a framework for action. The adaptation and mitigation actions outlined in this plan are not conclusive. This is a beginning. Through staff and public engagement the plan will change and adapt to local reality, needs and municipal mandate. There is recognition that The Municipality of the County of Antigonish is fairly fortunate in its geographical location. With that recognition comes a responsibility to work in partnership with neighboring municipalities, educational institutions, community organizations and the general public, to ensure the benefits of the adaptation and mitigation actions taken are maximized. Climate change does not recognize political boundaries.