



Lower Branch Road, New Germany - (photo A. Wentzell)

MUNICIPALITY OF THE DISTRICT OF LUNENBURG MUNICIPAL CLIMATE CHANGE ACTION PLAN

Adopted by Municipal Council: 10 December 2013.

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Introduction

The purpose of a Municipal Climate Change Action Plan [“MCCAP”] is to identify how local government is:

[1] prepared to respond to future climate hazard events in an effective way; and

[2] prepared to alter existing policy, programs and municipal infrastructure decisions, so as to mitigate against increased risks, resulting from the hazards associated with climate change.

1. PREPAREDNESS FOR FUTURE HAZARDS

Objective #1 is straightforward. Climate -related hazard incidents - be it a flood, a major blizzard, a heat wave - will inevitably occur in the future. Local communities will be affected. That fact is undisputed. What happens then?

How well prepared a community can manage and respond to the impacts of a particular hazard event can be separated into [a] the preparedness of individual citizens (*to include voluntary collective actions*) and [b] what can be expected in support from their governments. Council considers that an individual’s own actions, and an individual’s awareness of related risks, are important inputs - as critical as any decision that may be committed to by a government. That concept needs to be strengthened, and consistently re-affirmed, in present-day culture.

As for government action: there is a responsibility placed on municipalities in existing provincial legislation to be prepared to the extent of its own capabilities (see: chapter 6 of [NS-EMO Plan](#) & p.3 of REMO Emergency Plan) to meet the threats that can emerge from emergency situations, including climate hazards. In the Province’s graduated response model: preparedness is considered a shared responsibility, starting first with citizens themselves, and escalating through the three levels of government, as the scope and magnitude of any particular hazard widens.

Ensuring local government has - *to the extent of its capabilities* - the required resources in place to take effective action, means there needs to be a continued focus on improving services charged with first response and emergency management. It also means effective liaison with particular agents in provincial government is required, where their authority and assets impact on EMO and First Responder capacity. Improved intra-government collaboration on issues is vital - e.g. the future vulnerability of existing provincial road infrastructure to floods, rural residents accessing health services in a major heat wave - given the impacts of climate change on existing local emergency plans.

A number of the adaptation priority actions identified in Section 6 of this MCCAP, consequently deal with proposed improvements to strengthen the existing community’s **preparedness and capacity for effective response**.

2. AVOIDING FUTURE RISKS

Objective #2 is less straightforward. It deals with the question of directing a community’s future development, and with the provision of future municipal services. While the first objective is to anticipate an effective response; the second is to determine where communities can attempt to avoid the costly impacts of potential climate hazards on life and property, largely through future policy changes, or by making appropriate, informed infrastructure decisions.

Avoidance of potential impacts requires the proposed use of government power and resources in measures that are considered precautionary, rather than responding with resources when/after a specific incident occurs. It can involve proscriptive regulations that deter residents from proceeding with individually-determined development plans. It can involve incorporating additional assessment procedures, and allocating more investment, in protecting existing public infrastructure. While some decisions result in increased costs to government now, it looks to reduce costs incurred in the future, when the anticipated climate -related hazards are experienced. A number of adaptation priority actions in Section 6 therefore deal with proposed methods of **hazard avoidance**.

TERMS / ACRONYMS

Terminology used throughout this planning document includes words that can be used to mean more than one thing, (e.g. “Mitigation” can potentially refer to two different types of actions) as well as a number of government acronyms. The following list covers a number of repeated terms used in this MCCAP:

Avoidance	Measures deliberately aimed at removing the potentiality of a future event occurring, or impacting as severely / negatively on a person (or community, or infrastructure). <u>In Adaptation Planning:</u> Avoidance generally means not allowing new developments or re-developments in identified areas considered high risk to hazard events.
Capacity	The resources available to a person (or an organization) and the capability to use such resources effectively, so as to meet intended ends.
Contingency planning	Additional measures undertaken by emergency management officials in determining an effective response to a particular type of hazard incident, as opposed to using a non-specific set of plans / procedures.
Mitigation	<u>In Emergency Response:</u> Pre-emptive actions that look to remove risks, or reduce the impacts associated with specific anticipated hazards. <u>In Adaptation Planning:</u> Actions to reduce greenhouse gas emissions, so as to reduce the potential negative impacts associated with long-term climate change. <i>(adapted from Guidebook)</i>
Preparedness	A measure accorded to a person (or community's) awareness of the potential risks of identified hazards, and any set of policies or operational procedures aimed at protection from, responding to, or enduring the associated negative impacts.
Risk	A combination of the probability of occurrence, and the associated impacts (or consequences) of a hazard event occurring. <i>(adapted from Guidebook)</i>
Vulnerability	A measure accorded to population subsets, or physical structures that, in a hazard event, are more susceptible to the risks (specified impacts or outright destruction / damage) that may occur during that particular type of incident.

ACASA	Atlantic Canada Adaptation Solutions Association
CNSIS	Canada Nova Scotia Infrastructure Secretariat
HRVA	Hazard Risk Vulnerability Assessment
ICSP	Integrated Community Sustainability Plan
LIDAR	Light Detection and Ranging (mapping)
LUB / SPS	Land Use By-law / Secondary Planning Strategy
MCCAP	Municipal Climate Change Action Plan
MFA	Municipal Funding Agreement
NSE	Nova Scotia Department of Environment
NSTIR	Nova Scotia Department of Transportation & Infrastructure Renewal
REMO	Regional Emergency Management Organization
SNSMR	Services Nova Scotia & Municipal Relations (Provincial Department)

Throughout the document, “**the Municipality**” is used to refer to the Municipality of the District of Lunenburg.

Also: “**Provincial Guidebook**” refers to the [Municipal Climate Change Action Guidebook](#), first published by CNSIS in November 2011. This Guidebook has been used by all municipal units in Nova Scotia, as guidance in preparation of their individual MCCAP documents. MCCAPs are a condition found in the 2010-2014 **Canada/Nova Scotia Gas Tax Agreement** (and related *Municipal Funding Agreements*) that provides municipalities with federal gas tax revenue. This federal funding helps municipal units carry out (eligible) municipal infrastructure projects.

This Municipality initiated work on its MCCAP in December 2011. Support from Services Nova Scotia Municipal Relations allowed for a private sector consultant ([Elemental Sustainability](#)) to engage directly with staff in reviewing the proposed sections of a “draft” Guidebook, from December 2011 to April 2012. Much of the staff assessment and related analytical work that has gone into producing this particular strategic planning document was greatly aided by findings and the support provided by Elemental Sustainability.

Over the first six months of 2012: assessment work was completed through the coordinated efforts of a staff working group that included the Municipality’s Director of Planning & Development; Municipal Engineer; EMO Coordinator and Regional Emergency Management [“REMO”] Coordinator. The Municipality’s Planner and Planning Technician were also involved, and responsible for the majority of written and mapping product. The working group’s efforts culminated in organizing a multi-day workshop with respective counterparts from three other units in June 2012, who partner under the Lunenburg County REMO framework. Following elections in October, and over the course of 2013: production of a final document, per the Provincial Guidebook, was compiled by the Municipality’s planning staff.

In terms of governance: Municipal Council established a three-member MCCAP Committee, so as to provide for Council direction and input during the drafting and review of the document. Since inception in 2012, the Committee met a total of ten times, and reported on progress to the Municipality’s Planning Advisory Committee. A copy of its Terms of Reference and a list of MCCAP Committee meeting dates are found as **Appendix A**.

The MCCAP Committee will dissolve with Council’s formal adoption of an MCCAP, and its acceptance by the Province. Ongoing implementation of identified Actions ultimately rests with Council and the Chief Administration Officer. No identified staff member is exclusively responsible for implementation of all the Actions proposed in this particular strategic planning document. It may be recognized that the proposed activities and initiatives cross multiple departmental lines, and can include various staff in either the capital and/or operational phases of administration.

For each proposed MCCAP Action (**in section 6**), a lead department has been identified. The expectation is that each will provide updates to Administration as necessary, in fulfillment of / consistency with the proposed item. It is anticipated that the Municipality’s CAO will evaluate progress on activities on a yearly basis, similar in fashion by which Council has undertaken evaluations of its Integrated Community Sustainability Plan, since its adoption in 2010.

The selected number of Priority Actions that have been identified in this planning document is considered work that can be initiated by this Municipality over the next 5-10 years, either independently, or with the active involvement and leadership of key provincial stakeholders. A select number of Actions allows for continued focus and evaluation. The list of Actions includes:

- future policy changes that will require development by regulatory staff and approval by Council;
- proposed changes to the Municipality’s administration of ongoing operational commitments (e.g. the level of resource being provided, so as to undertake specific activities, or in support of REMO); and
- proposed changes in existing municipal processes, particularly as it pertains to staff’s internal assessment and Council’s review of capital infrastructure priorities in the future.

One item, outlined in the Provincial Guidebook’s checklist, identified the creation of a stakeholder list during the Municipality’s MCCAP plan development. This Municipality has subsequently determined that there needs to be a Priority Action specifically to improve the current engagement processes with particular Departments around how they are planning to respond to future climate change hazards. Following municipal staff’s initial consultations with NS Transportation officials on MCCAP, and a review of information that could be shared by that Department, it was concluded that it is NSTIR’s own ongoing decision-making and determination re: roads, which is the vital concern. Any adaptation planning for local communities requires this Municipality’s own ongoing and long-term engagement on - and a better awareness of - provincial Departmental decisions affecting the transportation network.

Section 2

Climate Change Issues & Hazards

This section identifies which anticipated climate hazards are expected to impact this Municipality over the next number of decades. For this identification process: nine Hazard Risk Vulnerability Assessments - or “HRVA Models” - were completed at a workshop in 2012, involving officials from this Municipality, Bridgewater, Mahone Bay and the District of Chester. The workshop was led by the REMO Coordinator. The workshop included this Municipality’s EMO official, planner, mapping technician and Municipal Engineer.

The rationale in using an existing REMO hazard assessment template was twofold. First: there was overlap in the questions the provincial MCCAP Guidebook asks municipalities to consider, and questions that a completed HRVA Model would identify, for REMO-oriented emergency response purposes. Completing two near-similar objectives through the use of one report mechanism was considered an appropriate and efficient use of time. Secondly: the review process brought together those officials considered responsible for municipal land use planning and policy development, with those officials who are responsible for emergency response. Increased coordination of these two (generally-separated) divisions of government activity may be seen as a positive outcome from the process.

Scoring in the HRVA Model is based on classic hazard assessment of Probability x Impacts, (*mirroring the matrix that is identified in the MCCAP Guidebook*), allowing for a maximum score of 25. A score over 10 places the specified Hazard into the “High Vulnerability” category. The scoring rationale allotted to each of the perceived climate hazards is based on information collected in applicable charts found in each of the related HRVA Models. **See Appendix B.**

Lunenburg REMO-HRVA Model - Probability & Impact Scoring Matrix

Probability Score (*Considering historical and predicted probability, rate the likelihood of occurrence in years*)

5	Highly Probable to occur (within 5 years or less)
4	Likely to occur (generally occurring every 5-7 years)
3	Might occur (once every 20 years)
2	Not expected to occur (could occur once every 100 years)
1	Rare chance of occurrence (every 500 or more years)

Overall Impact Score (*Considering the impacts identified, against related guidelines below*)

5	Catastrophic , over 100 people affected; multiple fatalities; injuries, long term health effects; prolonged displacement; extensive environment & property damage; long term effects to environment; serious infrastructure disruption; community unable to function without significant support
4	Significant ; 51-100 people affected; multiple serious injuries; long-term hospitalization required; displacement for 6-24 hours; significant impact to environment- medium to long term effects; external resources required; community only partially functioning, some services unavailable
3	Moderate ; 11-50 people affected; no fatalities, some hospitalization and treatment required; localized small numbers displaced for 6-24 hours; no long term environmental or property damage; localized damage rectified by routine arrangements; normal community functioning with some inconvenience, no resources required outside of mutual aid agreements
2	Minor ; less than 10 people affected; no fatalities, small number of injuries requiring first aid only; small numbers displaced for less than 6 hours; no external resources required; minor localized disruption to community services for less than 6 hours
1	Insignificant ; no fatalities, injuries or impact on health; no persons displaced; no damage to properties or environment; no disruption to community services or infrastructure; no mutual aid resources required

Climate Hazard ranking scores were as follows. There is a noted variance between the six hazards that were given a “High Vulnerability” ranking by this particular method of assessment:

HRVA/MCCAP Climate Hazard Threat Analysis

Hazard	Hazard Risk Vulnerability			
	Ranking	Rating Score	Probability	Impacts
Hurricane	High	25	5	5
Coastal Flooding	High	20	5	4
Inland Flooding	High	20	5	4
Winter Storm / Blizzard	High	15	5	3
Wildland Fire	High	14	4	3.5
Heat Wave / Hot Days	High	12	4	3
Drought	Moderate	10	2.5	4
Animal Disease Outbreak	Moderate	9	3	3
Thunderstorm /Tornado / Hailstorm	Moderate	6	3	2

Pertinent details within each HRVA Model can be revised over time. A review of evidence, following from any climate hazard events experienced in the next decade, is considered a necessary monitoring activity, with an assessment of the current Models' validity occurring at ten year intervals. Completion of the HRVA Models has subsequently led to one important follow-up: as part of the MCCAP process, REMO Operations proposes to undertake the completion of a contingency plan (an emergency response plan) for each climate hazard, rather than see to their continued use of an "All Hazards Response Plan" as the default method for handling all potential crises.

Identified questions outlined in Section 2 of the Provincial Guidebook have been correlated below, with relevant information collected from the related HRVA Model for each climate hazard that scored a High Vulnerability:

HURRICANE

Hurricanes bring damaging winds, heavy rains, storm surges, and flooding, leading, at times, to catastrophic loss. These impacts can be spread across the entire Municipality, and affect many communities simultaneously, meaning the resources required for coordinating an effective emergency response are stretched at the moment of most immediate need. Given repeated [hurricane and tropical storm events](#) in the near past - and the likelihood that such events will continue to occur at intervals in the foreseeable future - a hurricane is placed above all other identifiable climate hazards that may have as equally dramatic or as consequential an impact on society's functionality, but are considered to be far less probable to occur on a regular or repeated basis. (e.g. drought)

anticipated trend

Environment Canada's Canadian Climate Change Scenarios Network models (See: [CCCSN](#)) currently predict warmer temperatures and increased precipitation for this region of the province during autumn, when hurricanes have historically occurred. The models also predict warmer temperatures and increased precipitation for regions of the Atlantic Ocean adjacent to the Municipality, suggesting the generation of tropical storms may increase.

community preparedness

Given their acknowledged severity, the Municipality / REMO has already drafted a Hurricane Contingency Plan. One of the identified "information gaps," found when undertaking the HRVA assessment, was to note that an important partner has historically remained outside municipal-level emergency response planning. **The role of utilities (electrical and telecommunications) is considered crucial in ensuring an effective local response.** Heavy winds and flooding disrupt delivery of these services. When utility infrastructure is brought down, affected sites become life-threatening hazards, and potential barriers to emergency vehicles.

mapping information

Hurricanes can strike across the entirety of the Municipality. Low-lying areas are recognized as being most prone to flooding, and potentially most at-risk during a hurricane event, given the impacts of heavy rainfall. Identified coastal areas affected by storm surges are also considered at-risk. Relevant elevation mapping (see: **Appendix D**), produced for assessing the coastal flooding hazard, is therefore identified as being pertinent in identifying which particular geographic areas of the Municipality may be most vulnerable to the Hurricane hazard as well.

COASTAL FLOODING (to include SEA LEVEL RISE)

The implications of future sea level rise can be considered an unavoidable risk, due to the ongoing natural forces of subsidence and erosion. Eventually, portions of the Municipality's coastline that is now land will become sea. The question is: at what rate such a transition may be expected to occur, and whether there is an incentive to defend the existing line between land and sea from such forces. For MCCAP purposes: it is noted that the incidence of overland coastal flooding events is expected to increase, as the anticipated rise in sea level allows for accompanying storm surges to reach areas further inland during significant storm events.

anticipated trend

Predictions on anticipated sea level rise over the next century is a subject researched extensively and with identified support from senior governments (see, as example: [Natural Resources Canada](#) , [NS Fisheries](#), also: [Climate Scenario Development in ACAS Nova Scotia Communities](#) - hereafter identified as: "Daigle"). Municipal governments rely on these assessments, in determining any potential regulatory actions at the more local level.

community preparedness

Many existing homes and critical pieces of infrastructure are already located within the five metre elevation contour from the current coastline. A 2012 estimate as to the number of civic addresses (properties that may be considered "developed") located within this particular "zone of interest" was approximately 1,300. Residing in proximity to the ocean is a prevalent cultural norm for many citizens, some of whom have multi-generational roots in long-standing communities. The ocean's devastating powers are known and well-acknowledged. Alternatively: the attraction of owning a coastal residence for seasonal or retirement purposes has brought a number of new citizens to the Municipality in the last three decades. An outcome from this varied demographic composition is that there is a wide spectrum of local residents - some of whom are, some of whom are not - well aware as to the potential erosion and flooding hazards linked with living in close proximity to the ocean.

mapping information

With its involvement in the Atlantic Canada Adaptation Solutions (ACASA) initiative: the Municipality was successful in acquiring LIDAR mapping data for the majority of its coastline. The Municipality has since used its own financial resources to complete mapping coverage. A more accurate assessment of the implications of potential coastal flooding scenarios is now possible. This outcome particularly serves to interpret which areas are susceptible to future storm surges, for purposes of emergency response. Related research work undertaken by Dalhousie University [has documented existing infrastructure](#) that may be at risk from coastal flooding events.

INLAND FLOODING

This Municipality has been particularly affected by the consequences of severe inland floods in the last decade. Two fatalities occurred on a public highway in 2003 near to Pinehurst; 100 citizens were evacuated from homes in 2005 in an incident around Fancy Lake; and damages were incurred at the Municipality's central wastewater treatment facility in 2010 in New Germany. Inland floods are generally caused by intense precipitation falling in a very short window of time. Such incidents may also be generated, or greatly contributed to, by a combination of weather-related conditions. (i.e. spring melt / ice jams / heavy precipitation preceding over a number of days)

anticipated trend

There is inconclusive evidence to confirm whether there will be an increase in intensity or frequency of localized short period rainfalls, as an associated impact of anticipated climate change. (see: [Daigle](#). *His report cites inconclusiveness is due to the lack of any standard methodology to determine how sub-daily extreme rainfalls can be expected to change within any one specified geographic area.*) That said: the Daigle report also concluded that the volume of water expected to fall in a 20-year storm will be more in 2050, than what was historically the case in 2000. There is also some difficulty in determining where, exactly, future inland flooding events may occur, given the extensive size of this Municipality, and the localized nature of the hazard. There has been - and is - no central record documenting such issues. The HRVA workshop was the first review undertaken to denote where particular events occurred. Identified events were all very well known, as these events had involved emergency management, or required a municipal staff response. It is assumed that other inland floods have occurred in the same timeframe, but have not been recorded by any government, due to their smaller size (i.e. affecting a few residents, any resulting property damage not associated with any public safety response.)

INLAND FLOODING (cont'd)

community preparedness

Inland flooding can be very destructive, but also very localized. As an area is hit with intense precipitation, local watercourses and any public (or private) infrastructure systems built to move water are overwhelmed beyond capacity. Property is quickly inundated. While a heavy rainfall due to a hurricane may be anticipated (and certain precautionary response activities undertaken, before the event strikes), there is, in many instances, little forewarning of such a hazard occurring. Re-design of public infrastructure to handle potential increases in storm water flooding capacity may be identified - but can also be seen as a costly and unlikely adaptation response for rural communities. One ACASA study [reviewed the suitability](#) of rainfall intensity-duration-frequency (IDF) curves presently used for infrastructure design. This study also identified new Environment Canada rainfall data stations, developed coincidental to the ACASA project. It included a new station for Lunenburg (Town).

mapping information

The size of the Municipality, and the amount of local lakes and rivers, renders some prediction as to the possible location of inland flooding events difficult, without further extensive study. In 2013, the Municipality is undertaking further analysis of selected areas along the LaHave River, so as to identify likely future flood risk potential.

BLIZZARD / WINTER STORM

Winter blizzards are endemic to communities throughout Nova Scotia. Restricted transportation, and possible periods of resident isolation caused by an intense snowfall, is expected to occur with some regularity every year. Along the coast: a winter storm can generate a risk of storm surge similar to that of hurricanes. Depending on the time of season and temperatures when a particular blizzard strikes, the resulting run-off from a mixed precipitation event can also generate ice jams, and related flooding concerns for inland areas.

anticipated trend

Predicted warmer temperatures during winter months (see: [Daigle](#)) may result in the Municipality seeing increased levels of variable precipitation, producing a combination of rain-freezing rain-snow events throughout the entire season, rather than having such events occur only at the shoulder portions of winter. A blizzard that generates significant precipitation, coupled with a variance of temperatures, might require modifications to current public works operational procedures (i.e. road clearing and infrastructure maintenance), so as to take into consideration the anticipated freeze-thaw conditions that can be associated with such variances.

community preparedness

Culturally, Nova Scotians are acclimatized to accepting the reality of annual blizzards affecting their communities, and causing personal disruption and periodic isolation. Provided there is sufficient warning communicated from meteorological agencies - "snow days" bring normal working activities to a relatively quick halt. Residents are expected to stay out the way of emergency, police, and public works crews responsible for public safety, and for restoring normalcy. As with hurricanes, certain segments of the population are more vulnerable to any winter storm hazard, in that temporary isolation - due to impassable roads and possible power outages - threatens those who require ongoing medical attention or immediate assistance.

mapping information

Blizzards share similarities with Hurricanes, in that both hazards can be related to the flood mapping information relevant to the possibility of storm surges and inland flooding events.

WILDLAND FIRE

With its maritime location and relatively wet climate: the number of wildland fires that (typically) occur in Nova Scotia in an average year can be considered low, when compared to drier geographical regions of North America. Wildland fires are recorded by the Department of Natural Resources as part of its [annual statistics](#). It is evident from recent record-keeping that most wildland fires are the result of human activities, and are most prevalent in areas where human populations and forest land intersect. In this Municipality: much of the forest remains privately-owned, and residential settlements are dispersed in small communities throughout the entire area. These two facts suggest that there is - and should be - some continued concern, as to the potentiality of human-initiated small fires becoming larger and far more consequential hazards, within identifiably drier seasons.

WILDLAND FIRE (cont'd)

anticipated trend

Predicted increases in temperatures over the next century will generate hotter, drier summers. The additional precipitation that regional climate studies have identified for Nova Scotia will not result in wetter summers - rather, it is the one season of the year where projections identify less precipitation, or near-equal to present levels, with potentially drier conditions between rainfall. (see: [Daigle](#)) Changes in temperature and summer precipitation might compromise existing stocks found on forested land, and increase risk of its susceptibility to fire - although it should be re-iterated that most incidents originate from human activity, and not from a natural occurrence.

community preparedness

Fire prevention programs are initiated annually so as to increase public awareness, through both local fire departments and provincial offices. Burn permits are required during fire season. The Province posts a daily "Fire Weather Index" that gauges local conditions, and dedicates human resources in observation towers, to locate fires as quickly and accurately as possible. Generally: rural Nova Scotia has had a longer history of being collectively prepared to fight fire hazards than, comparatively speaking, the hazard of overland floods. There are some potential questions going forward as to the degree of future voluntary capacity that rural communities can provide for local firefighting response, given age demographics and ongoing population decline of rural areas.

mapping information

Those areas considered most at-risk from the potential damages of wildland fire are those areas within the Municipality where the density of residential settlement has encroached upon identified resource lands. Existing municipal mapping would identify that - using the above statements as parameters - the great majority of the northern part of this Municipality would fall into this category, being both accessible to low-density rural residential developments, and remaining close to those identified woodlands being used for forestry purposes.

HEAT WAVE / HOT DAYS

Definitions of "Hot Days" vary according to source. People of different ages and situated in different geographic regions also hold conflicting perspectives on what constitutes a heat-related hazard event. Environment Canada, in its scoring of a [Humidex](#) rating, uses 30 degrees Celsius as the standard point where some level of personal discomfort is initially felt. A "Heat Wave" is defined as three consecutive days in which the daily temperature reaches 30 degrees Celsius or higher. Since 2000, using Environment Canada's [Daily Data Archive](#), it can be identified that there were three occasions where there has been three consecutive days of temperatures reaching at least 30 Celsius at its Halifax weather data station. (Aug 2002, Aug 2009, Aug-Sep 2010)

anticipated trend

Climate projections indicate that Atlantic Canada will experience drier, hotter summers. By 2050, it is proposed that average summer temperatures will increase by upwards of 2 degrees Celsius (see: [Daigle](#)) This projection further identifies that the number of hot days within summer months could increase, by a factor of four to six, in turn increasing the community's risk of experiencing several consecutive days of extreme heat. By 2050: the "exceptional" three-day heat wave previously experienced once perhaps every few years at the beginning of this century, may begin to recur on a regular monthly basis during the summer months.

community preparedness

More frequent and severe heat waves can lead to heat-related illnesses; particularly for those populations affected by respiratory & cardiovascular disorders. Such a climate hazard can also generate issues in workforce performance, as employees in certain industry sectors find themselves not able to perform efficiently, if at all, given heat conditions. From an infrastructure perspective: there are potential stressors regarding energy use and water availability, as both air conditioning and water is used in greater volumes during heat wave events.

mapping information

Heat Waves tend to drive citizens from more heavily populated urban centres to rural environments, as shade, wind, and water are sought. It is anticipated that residents of those areas of the Municipality which are more densely developed (i.e. near to the town of Bridgewater; the village of New Germany), will have greater issues in experiencing this particular hazard. In particular: it can be noted that local temperatures are found to be generally cooler for those communities along the coastline of the Municipality, than are found further inland.

Section 2 Conclusions

Hazard Event.	Priority Ranking.	Community Preparedness.	Can affect Municipal Infrastructure	Identified lead Provincial Stakeholder.	Proposed Local Adaptation Approach.
Hurricane	Highest	Heightened public interest in any potential storm event.	Yes - all.	REMO / NS-EMO	Preparedness
Coastal Flooding (incl. Sea Level Rise)	High	Low to moderate: generally tied to a potential storm event.	Some. (note: Recreational waterfront assets)	Transportation (Roads)	Avoidance & Preparedness
Inland Flooding	High	Low: flood events can occur with little warning.	Some. (note: Wastewater Treatment)	Transportation (Roads)	Avoidance & Preparedness
Blizzard	Medium	Heightened public interest, repeated historical experience.	Yes - all.	REMO / NS-EMO (& Transportation)	Preparedness
Wildland Fire	Medium	Response network coordinated through local fire depts & Natural Resources.	Yes - all. (note: location-dependent)	Natural Resources	Avoidance & Preparedness
Heat Wave	Less	Less awareness of potential issue.	Less direct a concern.	Health & Wellness	Preparedness

The Municipality recognizes it does not have unlimited resources at its disposal to respond to all possible concerns associated with these potential climate hazards. In section 6 of this document: it has been identified that alleviating the related impacts of anticipated climate change hazards requires priority setting.

In particular: it is concluded that concerns around the proposed impacts of certain climate change issues, considered beyond the capacity of any one municipal unit, requires senior governments to identify resources, and its own leadership role. This requirement for provincial leadership was particularly identified with the potentiality of ensuring there is an appropriate, coordinated response to the potential impacts of any future Drought the Province may experience. As such, the identified priorities of this Municipality was to propose a set of initial Actions that can address each of the climate hazards that scored a "High Vulnerability" HRVA ranking.

It was also concluded that the Municipality must look to strengthen its local preparedness to a potentially increasing number of future hazard events, through improved coordination and capacity of the existing First Response and REMO frameworks. The potential impacts associated with any future incidents - in particular Hurricanes, Blizzards, and Wildland Fire incidents - on existing residents and structures within the Municipality will not be easily avoided. The comprehensive nature of these types of hazards, and the threat they pose to existing residents, dictate that a proposed strategy identifying adaptation measures focus on ensuring Public Preparedness and Public Safety from related impacts is suitably carried out and coordinated at the regional level.

Protection of existing municipal infrastructure assets from future climate hazard incidents, is recognized as a fundamental priority. Identification of assets and further risk assessment can be found in Section 4.

Finally, the Municipality would note there is recognized potential in its developing preventative policy actions that would look to avoid the negative impacts of both coastal and inland flooding in local communities.

Sections 3

Affected Locations

In follow-up to the HRVA workshop, mapping was specifically developed for MCCAP assessment purposes. Critical public infrastructure and various private structures were denoted in a 70-page “HRVA Map Atlas.” (See: Atlas Index, and some map sheet examples, as **Appendix C**) The Municipality’s purpose in creating the Atlas was to allow for individual mapping sheets to be quickly generated for use by local emergency management officials for response purposes, so as to locate and highlight the relevant facilities and structures found in geographic locations anticipated to be severely impacted during a specific hazard incident. Per the Provincial Guidebook: a listing of the various types of location-specific physical assets that were considered relevant for inclusion within the HRVA Atlas, based on the type of anticipated climate hazard that may be experienced, is found below.

Location -specific Assets found in potentially -affected Areas.	Hurricane	Coastal Flooding	Inland Flooding	Blizzard	Wildland Fire	Heat Wave / Hot Days	Inclusion in HRVA Map Atlas
Regional Hospitals	X	X		X	X	X	M (<i>*located in encircled Towns</i>)
Emergency Infrastructure (EHS & Police Stations; Evacuation & Comfort Stations; Fire Departments)	X	X	X	X	X		M (<i>*some sites located in encircled Towns</i>)
Roads, Bridges & Culverts (Provincial, municipal, private)	X	X	X	X	X		M - <i>culverts for provincial roads are <u>not mapped</u></i>
Ferry Terminals (Chester-to-Tancook, LaHave River)	X	X		X			M
Water & Wastewater Treatment plants, including related sub-stations & pipes.	X	X	X	X	X		M
Municipal Water Supply watersheds					X	X	M
Dams	X		X	X	X		Only Utility-related dams mapped. <i>Others are <u>not mapped</u>.</i>
Public Works Garages	X			X	X		M
NS Power Offices, substations, and main transmission lines	X	X	X	X	X		M
Telecommunications infrastructure (Cell towers, Switching stations, Scotia Business Centre, Radio & related)	X			X	X		<i>Not all have been identified and mapped</i>
Schools	X	X	X	X	X		M
Petroleum & Gas Storage sites.	X	X	X	X	X		M
Working Waterfronts (To include wharves & boat launches)	X	X		X			M
Seniors & Long-term Residential care facilities		X	X			X	M
Industrial sites (Fuels, Chemicals) at risk to cause environmental / health impacts.	X	X	X	X	X		<i>Not all have been mapped (200+ non-residential sites)</i>
Cemeteries		X	X				M
Landfill site					X		M
Wells		X	X				M - Associated with residential civic points in at-risk flood areas.

Section 4

Facilities and Infrastructure

This section describes existing municipal infrastructure, and identifies how impacts associated with future climate change -related hazards may affect related services. It offers conclusions on where future investment for adaptation may take initial priority. A principal objective of an MCCAP is to determine (and consider measures to reduce) the vulnerability of municipal infrastructure, so that existing services will not be greatly compromised in any future hazard incident. The related CNSIS worksheet, outlining municipal infrastructure assets, is attached as **Appendix E**.

Being a rural Municipality, there are aspects pertinent to asset ownership within the rural landscape that make the Municipality's consideration of potential climate change risks somewhat different to scenarios in urban jurisdictions. Specifically: the amount and type of assets that are publicly owned, as well as the (comparatively speaking) low population density that can generally be associated with a reliance on such public assets. (e.g. *the size of any central sewage treatment systems; the number of landowners that reside along a municipally-owned street; as well as the Province's ownership of all major road infrastructure, which acts as the connecting arterials between communities, and provides access into those town centres, where provincial health facilities are predominantly-located.*)

The Municipality's assessment of critical infrastructure includes the following

Administration

The building currently used for administrative and governance purposes is located in Bridgewater, at 210 Aberdeen Road. (Constructed 1970.) Structural and systemic upgrades have been done in the last decade, including energy efficient measures within its HVAC system. A 2009 Building Study identified that the Municipality's effective use of the structure is likely constrained, by both its age and lack of space. The building's location is at a reduced risk from any LaHave River -associated flooding event. The site's potential vulnerability to extreme weather events, should such a hazard hit Bridgewater directly, may be considered comparable to the dozen other institutional buildings in town, although it is important to note that the municipal administration building is considered an important priority, as it serves as the Regional Emergency Operational Centre (REOC) for Lunenburg County during an emergency.

Water Supply Sources

A very limited number of properties located in the Hebbleville and Cookville areas of the Municipality are connected to central water supply services delivered by the Bridgewater Public Service Commission Water Utility. The majority of the Municipality's residences and businesses rely on their own private well systems to supply safe drinking water. The various risks to these thousands of private drinking water supply sources being compromised from any future climate hazard can be associated with whatever related risks can be identified for each individual land parcel on which each well sits.

The Municipality recognizes that determining the potential scale of compromise or contamination of private wells is beyond the scope of this MCCAP's initial infrastructure assessment. It would wish to note, however, as part of its MCCAP, that there is a potential public health issue, should a large number of private systems be quickly reduced from any significant hazard event occurring. For those two small sections where water is provided to residents by the Public Service Commission: the Municipality would only be made aware of pertinent infrastructure decisions, and any related adaptation or asset protection priorities, through communications undertaken by the public utility.

The Municipality would also note that within its geographic area are the three municipal water supply sources (to include both the surface water lakes and surrounding designated watershed) for the Towns of Lunenburg, Mahone Bay, and Bridgewater. The risks associated with future climate hazards to these water supply sources were identified during the HRVA workshop. Communication on possible vulnerabilities (e.g. safety of any related dams functioning during a flooding incident; issues of possible contamination during a wildland fire) and cooperation between the three towns and Municipality on possible responsive actions, can be more properly identified in future REMO contingency plans that pertain to each of the specific hazards.

Wastewater Treatment Systems

- Cookville: Constructed less than a decade ago, the Cookville Treatment Plant is located at 401 Highway 10, includes 2 pumping stations, and approximately 4 km of piped system. There are presently 17 commercial connections. Current system capacity is not considered to be at the same stress as is found on the other municipal systems. The infrastructure was built to serve an emerging commercial hub (Osprey Village), although the pace of development activity has slowed within the last five years. Sited at a relatively high elevation to the adjacent LaHave River, and in close proximity to the Highway 103 Exit 12 interchange, the Cookville Treatment Plant is considered to be at less potential risk to any LaHave River -related flooding events, than are any of the other older treatment systems currently operated by the Municipality.
- New Germany: The New Germany Treatment Plant, located at 23 Chesley Lane, is the Municipality's oldest and largest sewer system. (Built in 1980.) There are 6 submersible pump stations; 12 km of pipes, and 244 connections to residents and businesses in the village. The facility was most recently compromised in an inland flooding incident in 2010, and has experienced other flooding events over its thirty year history. It is anticipated that major repairs to the existing system will be a necessary expense to the Municipality at some time over the next decade. As with the recent improvement projects involving the Riverside sewer system, it is the Municipality's intent to compile evidence that assesses the current amount of inflow and infiltration negatively affecting sewage treatment. The suspected amount of inflow and infiltration places the existing Treatment Plant - at times - at near-capacity to over-capacity levels.
- Riverside: Initially constructed as a privately-managed treatment system, the Municipality responded to a resident-led petition in the 1980s, and took over management and operations. Repeated documented failures at the treatment site began to recur in the early 1990s. In 2010: the Municipality undertook to re-design and re-build the existing system. The Riverside Treatment Plant serves 23 residential connections, with approximately 1.5 km of pipes.
- Shore Drive: is a small system also served by the Riverside treatment facility. It was completed as a federally funded "pilot project" in the early 2000s, to consider alternative treatment options suitably designed for small subdivisions. The Shore Drive system has approximately 1 km of pipe for 10 connections. Both the Shore Drive and Riverside systems are located in Conquerall Bank, along that section of the LaHave River south of Bridgewater potentially affected by coastal flooding events and related storm surge activities.
- Hebbville: A small area of the Village of Hebbville is connected and serviced by the adjacent Bridgewater wastewater treatment system, under an agreement between the two municipalities. The Municipality owns and operates 3 above-ground pump stations; approximately 2 km of piped system, and services 35 connections (both commercial and residential) before connecting in with the Town's system. The location of the Hebbville sewer system follows along Highway 3 and Jubilee Road, and is not considered to be proximate to any of the associated inland flooding hazard events that have been historically experienced in that area of Hebbville surrounding Fancy Lake.

Approximately 3% of the Municipality's built lots are currently connected to the above-cited central systems - all other developed properties rely on on-site wastewater treatment. As with private wells: vulnerability to future climate hazard is diffused, based on the location and the type / condition of private treatment facilities that may be in place on a lot. Identification of those developed areas at-risk to coastal and inland flooding may be considered the most vulnerable.

In the related CNSIS Infrastructure Risk Assessment worksheet: consideration of the ongoing risk of future flooding incidents overwhelming the capacity and functionality of the New Germany Treatment Plant is considered to be a moderate risk. The implications of flooding events on the New Germany and Riverside systems may be identified as a higher priority for any future corrective adaptive measures undertaken by the Municipality, than would be the flooding risks associated with either the existing Cookville or the Hebbville sewer systems.

Solid Waste Management

The Lunenburg Regional Community Recycling Centre (LRCRC) facility is located within the geographic jurisdiction of the Municipality. The land and facility are governed and owned by a Joint Services Board, of which the Municipality is one of three participating units. The facility provides a site for local solid waste management services, to include: recycling, organic composting, septage waste disposal and treatment, construction and demolition debris collection and household hazardous waste collection. The LRCRC also acts as a landfill transfer station, before any separated items are shipped to Kaizer Meadow in the District of Chester. The LRCRC is also the site of a closed landfill, and has ongoing attendant monitoring functions, as provincial environmental regulations require. The location of the facility (908 Mullock Road, Whynotts Settlement) is considerably removed from any potential coastal flooding or LaHave River -related inland flooding risks. A number of existing buildings on the site may be considered to be at a moderate risk during an extreme weather event (e.g. extreme winds during a hurricane).

Also found in the Municipality: the remnants of two hundred years of settlement include a number of local dump sites that were used prior to the organization of the LRCRC facility in the 1970s. The exact location of many - if not most - of these former sites is generally unknown. This fact is noted in this MCCAP, as there is the potential for future environmental hazard resulting from an abandoned dump site (or illegal dump site) in a flood or wildland fire incident.

Roads

Despite its size, the Municipality owns less than 10 km of public roadway: 8.4 km of municipal roads are gravel, less than 1 km is asphalt surfaced. These 24 municipal roads can be considered functioning as “residential subdivision” roads. But for one exception: all these roads were built (to an acceptable standard) by private developers at the time of initial construction for the purposes of serving a small number of residents, and then transferred to the Municipality. None of these existing roads can be considered arterials, or as essential routes for through-travel for emergency access, but are used only for the purposes of the (proportionately) small number of residents who live on them. Location is scattered. A greater concentration of municipal roads can be found in the community of Pine Grove. Most roads are generally no more than 1000 feet in length; the longest municipal road is 4100 feet.

The Municipality has no overall plan concerned with road acquisition; nor with where future public roadways may be most suitably placed. Nor is there any provincial-municipal joint transportation planning being done, so as to identify the long-term development and maintenance of existing (or future) public transportation networks. Provincial road standards are currently used by the Municipality for the purposes of their annual maintenance and clearing.

Flooding incidents along identified municipal roads has occurred in the past. Repeated infrastructure improvements to alleviate potential flooding issues along these identified roads in Pine Grove was undertaken in the 2000s. As the location of certain municipal roads may be considered as having greater potential for inland flood risk than other roads, the Municipality’s completion of the CNSIS risk assessment was broken out by specific roadway identification.

Protective Services

The Municipality contracts policing services from the RCMP. Two Detachments (Cookville and Lunenburg) serve the area. Decisions regarding policing capacity in a hazard event, and pertinent infrastructure used by police protection services, are not under municipal control.

Local fire protection consists of the coordinated efforts and resources of [volunteer fire departments](#), who act as the First Responders to any emergency calls from their respective community. The facilities and equipment of these local Departments are determined and maintained directly by each association, with the Municipality playing a secondary role of area rate tax collection, so as to maintain an effective volunteer-based service. The Municipality recognizes that should climate hazard incidents increase in the future, there is a corresponding burden placed on these volunteer services to respond more frequently, as well as an increase in their operational costs. The Municipality identifies that the issue of tracking the potential increased frequency of climate hazard incidents is a function that can be incorporated within the Municipality’s Fire and Emergency Services Committee.

Recreation and Open Space Assets

Unlike other rural units in Nova Scotia: most of the land base in the Municipality is privately owned. There is a small percentage of public lands, and a good portion of such is specifically designated for municipal water supply watershed protection. The predominance of private landownership has created a dispersed pattern of low density settlement. This complex and segmented pattern of land tenure has shaped many of the subdivision and development decisions made by citizens in the last 50-100 years, in that there is not necessarily any great connectivity incorporating new residential developments, nor are there many public open space components that are generally considered to be the identifiable, definable elements of a “community.”

Such conclusions helped in forming the strategic intent behind the (2003) Municipal Open Space Strategic Plan. This Plan looks to identify and secure open space that can accommodate traditional public uses, including related recreational activities. The majority of existing recreational assets supported by the Municipality concentrate on ensuring public access to water, or public access to wilderness areas. There is one municipal site that can be considered comprehensive (the “MARC”), in that it also includes buildings to house recreation programs.

Principal Municipal Open Space & Recreational Assets

Day Parks.	Comment	Water Access.	Comment
Municipal Activity & Recreation Complex (MARC)	150 acre site: playgrounds, trails, fields, and buildings used for recr. programming.	Westhavers Beach	Enables access only.
Miller Point Peace Park	30 acres: picnic and trails	Sand Dollar Beach	Access, Parking.
Indian Falls	60 acres: picnic and trails	Hirtle's Beach	Access, Parking.
Fire Brook Falls	Enables access only.	Masons Beach	Enables access only.
Molega Lake	Community day park.	Mushamush	Access, Parking, Playground
United Communities Marine Park	Parking, Picnic. (located on oceanfront)	Saw Pit Wharf	Parking, Wharf for boaters

The Municipality supports local non-profit trail groups, who provide for over one hundred kilometres of multi-use rail trail, to serve as the spine of the Municipality’s active transportation network. These community groups operate and maintain a series of connecting rail trails on provincial land, with agreement from Natural Resources.

The Municipality would conclude that those recreational assets located immediate to the coast are most at risk to damage from future climate hazards, to include storm surge and related extreme weather events. The inherent costs for repair and restoration of damaged waterfront facilities may be considered to be expensive. The risk of their destruction in any future incident might also risk the public’s continued use and enjoyment of water access sites. At this time: there is no strategic reserve that the Municipality has in place for replacing recreational infrastructure, save for its use of the Open Space Reserve, which is also identified with new acquisition and land development.

Given that it is the principal site for municipal recreational programming services, and includes existing buildings; an assessment of the MARC facility has been included within the CNSIS Infrastructure Risk Assessment worksheet.

Public Schools

Authority over all public school sites and operations rests with the South Shore Regional School Board (*or the Conseil Scolaire Acadien Provincial*). The current trends of both local demography and school board policy make any new school infrastructure unlikely, unless as a result of the consolidation of existing sites.

Hospitals

The two hospitals that serve area residents are located in the Towns of Bridgewater and Lunenburg.

Section 4 Conclusions

Infrastructure Asset	Identified Vulnerability	Importance in Emergency	Note
Administration Building	Low	High - serves as REOC	
Riverside / Shore Drive Wastewater (WW) Treatment	Moderate - Flooding (both Inland & Coastal)	Moderate, due to relative low number of service connections	A
New Germany WW Treatment	Moderate - Flooding		A
Cookville WW Treatment	Low		
Hebbville WW Treatment	Low		
Wastewater Treatment - private	Risk is location dependent.	Low - Risk is diffused to 1000s of private individual households.	
Solid Waste Treatment (Landfill)	Low	Low	
Municipal Roads	Risk is location dependent.	Low	
Provincial Roads - Arterials	Risk is location dependent.	High	B
Provincial Roads - Local	Risk is location dependent.	Low	
Private Roads	High - Lack of any Standards and related flood risk may be generally identified.	Low	B
Water Supply Sources - private	Risk is location dependent.	Low - Risk is diffused to 1000s of private individual households.	
Water Supply Sources - public	Low to Moderate - Watersheds are large: contamination risk possible in a flood or fire event	High - density of town population dependent on continued source water protection.	C
Recreational infrastructure / Open Space assets	Risk is location dependent - Sites located along coast identified being at a higher risk	Low	
Protective Services - Police	Not under Municipality's authority.	High	
Protective Services - Fire	Location dependent - Not under Municipality's (direct) authority to administer.	High	C
Public Schools & Hospitals	Location dependent - Not under Municipality's authority	High	

A: Given both the related vulnerability and functional importance of existing central wastewater systems, these municipal systems are considered to be at moderate risk to climate -related hazards - specifically: the increased risk of future flooding. As these assets are exclusively within the Municipality's control, they are afforded a priority ranking for any proposed adaptation measures that the Municipality would undertake in the near-term re: infrastructure.

B: The importance of secure connectivity during any future hazard incident rests on protecting / suitably upgrading the existing provincial road network. Municipal and private roads - while potentially vulnerable in certain locations - are not substantive in terms of volume, nor considered vital arterials, in terms of acting as thoroughfares. For those residents who do live on private roads: there is some question of their vulnerability / potential isolation in a hazard incident, given the respective lack of standards involved in their roadway's development.

C: The Municipality can look to act in a cooperative partnership with other agents (local volunteer Fire Departments and the three Towns, respectively) so as to [1] improve the level of preparedness (First Response) to any increasing number of future climate hazard incidents, and [2] suitably protecting the municipal water supply watersheds from identified risks as part of REMO contingency planning.

Section 5

Social, Economic and Environmental Considerations

This section considers the impacts of climate change hazards on [a] identified populations, [b] economic sectors, and [c] selected aspects of the natural environment. Unlike with the assessment process found in previous sections, which considered identified geographic locations, or an assessment of critical infrastructure assets, it is recognized that any consideration of these components changes dynamically. (i.e. population mobility, local economic volatility)

Part A: Social Considerations - Affected Local Populations.

As part of the ACASA initiative, a particular study that was done for the Municipality by Dalhousie University focused on [Social Vulnerability to Climate Change](#). It highlighted that:

“...the Municipality has **significant challenges** to overcome, in order to reduce social vulnerability to natural hazards. Lack of land use planning controls, and differing views about the Municipality’s role in planning and adaptation, **limit its ability to prevent** residents from placing themselves at risk. Similarly, municipal planning documents show various levels of awareness of issues related to social vulnerability, as well as **uncertainty about the appropriate role** for the Municipality in responding to these issues.”

In short: the 2012 Vulnerability Report concluded there was sufficient evidence of two pre-existing shortcomings that impacted on the degree of social vulnerability within local communities to any future climate hazards:

[1] There was a lack of any municipal policy framework that would act to diminish or deter the number of people who may be placing themselves at-risk to future climate hazards. (There is an inherent difficulty in adopting pro-active regulations over residents and businesses so as to AVOID future risk.)

[2] There was, as well, “uncertainty” of the Municipality’s responsibility in ensuring that prior to, or during, any hazard event, the Municipality was prepared to protect particular segments of the population who may be identified as being more vulnerable to such types of issues. (There were few identified procedures in place that sought to PROTECT particular population subsets within its emergency response planning.)

These shortcomings are - it is assumed - not unique to this particular Municipality. These aspects may be found, to varying degrees, in other rural units within Nova Scotia, who share both a culture of limited local regulation, and a reality of limited resource capacity. It may be noted these two findings have been subsequently incorporated into the Municipality’s MCCAP assessment process, and within the determination of two potential Adaptation actions.

In terms of the identification process of which individuals may be considered particularly vulnerable to identified climate change hazards: within each HRVA Model, particular populations segments considered to be “susceptible” were identified as an aspect of the Impact evaluation measure. This demarcating of susceptible populations was then linked with potential communications activities purposed to inform, or to better define, that particular population subset, for emergency management planning purposes.

A concern noted during this assessment / population identification process is whether or not, during a hazard event, EMO personnel can be expected (or has capacity) to connect successfully with all institutional partners and related stakeholders, so that identified populations considered more at-risk can be suitably protected. It may be re-iterated that municipal units have largely used an “All Hazard Response Plan” as the default technique to handle past crises. While the Provincial Guidebook asks municipalities to undertake the necessary identification and consideration of at-risk populations to climate change, there is concern whether there are sufficient resources within the current EMO framework to take on activities aimed at protecting population subsets during a hazard event. The current NS-EMO [emergency response plan](#) specifically notes: “All levels of government have an obligation in their emergency planning process to make provisions for the protection and care of persons with disabilities.” Some consideration may be put towards determining if other vulnerable populations can be so incorporated, to allow provincial-wide consistency.

Below are the related “susceptible populations” that were identified during the initial HRVA Model development process in 2012. It is noted not all categories of “vulnerable populations” that are listed in the related 2012 ACASA study are also found on this list.

Susceptible Populations considered at Higher Risk to Identified Climate Hazards

Population subsets	Hurricane	Coastal Flooding	Inland Flooding	Blizzard	Wildland Fire	Heat Wave / Hot Days	Identification process / Communications process during a particular Hazard Event
Campground residents - to include Summer Camps	X				X		Identified through mapping. includes: Kadima, Long Lake, Mush-a-Mush, Wohelo, Sherbrooke Lake, Rissers, other sites
Drug-dependent individuals	X	X	X	X			To be sourced through Health Services.
Elderly populations						X	General marketing.
Farms / Livestock owners	X	X	X	X	X		Sourced through NS Agriculture.
Homeless populations	X	X	X	X			Sourced through Community Services. Or related programming (e.g. Inn from the Cold)
Infants / Young children						X	Sourced through Health Services + General marketing.
Medical equipment dependent individuals	X	X		X			Sourced through Health Services.
Mobile home residents	X			X			Identified through mapping. includes: Center, Wileville, Dayspring, Eisenhouer, LaHave Heights, Eisners, Tanners
Outside workers / Public Works personnel	X			X		X	Sourced through Employer + General marketing re: awareness.
Residents in communities with restricted accessibility (e.g. Tancook, Second Peninsula, Kingsburg)		X	X		X		Identified through mapping.
Residents in coastal dwellings	X	X		X			Identified through mapping.
Residents in identified flood risk areas	X		X	X			Identified through (*potential*) mapping.
Residents in Senior complexes	X	X	X	X			Sourced through Health Services.
Residents with Mobility issues	X	X	X	X	X	X	General marketing.
Residents with pre-existing health / respiratory conditions					X	X	Sourced through Health Services + General marketing.
School populations					X		Sourced through SSRSB.
Tourists	X				X		General marketing.
*All Residents that are without a 72 hour preparedness plan / shelter-in-place ability	X	X	X	X	X		General marketing.

Proposed actions aimed at Hazard Avoidance cannot reduce potential risks to existing vulnerable populations. (e.g.: *the geographic location of current dwellings will place existing residents at-risk to coastal flooding incidents, short of mandating the structure's removal.*) The Municipality would conclude that it is through making proposed changes to existing emergency operational procedures that will allow for the Municipality to protect those identified portions of the existing population base from the perils of future climate hazard incidents.

During REMO's assessment and determination of the severity of any impending hazard event: the Municipality can help compile information to denote which geographic areas may be more at risk. The HRVA Atlas can thus be used as an ongoing information resource by those officials responsible for emergency response before anticipated events occur, to aid in their assessment of possible actions pertaining to communicating with above-identified populations.

In addition: the basis for doing additional contingency planning, specific to each type of climate hazard, allows REMO Operations to consider adding specific communications actions that look towards protecting susceptible populations within its response plan. In the current REMO planning framework, there is an "Action Plan - Alert Phase" to be found in each contingency plan: This "Alert Phase" process can specify to emergency personnel particular actions (*to include communications with identified stakeholders*) that will help reduce potential risk to populations. Through early and targeted communications, REMO can look to ensure that those citizens are informed (and thereby more prepared), and, if necessary, removed from where the anticipated impacts of a hazard event are expected to occur.

Information taken from the above table as to which susceptible populations are most vulnerable to a specific type of climate hazard incident, can potentially lead to more constructive actions focused on communications within this "Alert Phase," prior to a community actually experiencing any hazard. Beyond volunteer Fire Departments, and the affiliated government agencies highlighted in the table above, there are also local social support organizations known to the Municipality's Recreation Department that can act as a conduit / potential communications provider in the event of a specific climate -related hazard incident.

Part B: Economic Considerations - Critical Local Economic Sectors

The impacts of any climate hazard on a local community will have a unique economic cost inherent in its experience. e.g. A hurricane / storm surge causes property damage, equated to a measurable cost to affected property owners. (*or the insurance sector, or a government relief program, should the incident be so recognized*) The incurring of such costs may be beyond the capacity of some individuals to recover, while other residents might be able to - or choose to - re-build successfully. As another example: recurring heat waves result in a business losing a measure of their employee efficiency (from absenteeism, or work slowdown) and can be equated with production costs. A competitor can exploit this loss in efficiency. In both cases: what *might* happen is entirely speculative on individual response.

Considerations, then, as to what can be identified as the important economic sectors for this Municipality, and how the specified impacts of climate change (through various hazards) will impact the local economy, are balanced with the reality that communities are in a constant state of economic flux. Present-day decisions made by individuals, businesses and governments that generate local economic activity are based on a myriad of factors. Future climate events, the associated environmental impacts, and their additional costs: all may be considered as possible inputs influencing an individual's economic status, their decisions in the market, or a business's continued success.

In terms of what particular industries are strategically important to this Municipality, as of 2013: the most recent survey completed by Statistics Canada documenting local labour force by industry (see: NS Community Counts, [2011 information](#)) corresponds consistently with data collected for an Economic Development Strategy [study](#) that was completed for the Municipality five years ago. That is: certain sectors are far more crucial in sustaining local employment and the regional economy, than is the comparative case, found in provincial-wide statistics. The following chart documents the variances, in terms of the percentage of the Municipality's labour force involved with either the manufacturing sector, or with traditional resource industries (Agriculture, Fishing and Forestry):

Local and Provincial Labour Force by Industry, 2011

Taken from 2011 Statistics Canada National Household Survey

Industry Sector	Lunenburg District		Nova Scotia		Variance
	Total (#)	(%)	Total (#)	(%)	
Agriculture, Fishing, Forestry	790	6.2	18,340	3.8	+2.4
Manufacturing	1,727	13.6	33,875	7	+6.6
Retail Trade	1,791	14.1	60,900	12.6	+1.5
Education services	871	6.8	38,895	8	-1.2
Health Care & Social Assistance services	1,391	10.9	59,670	12.3	-1.4
Other services	710	5.6	20,230	4.2	.1.4
Public administration	556	4.4	47,075	9.7	-5.3

Further comparison with historical statistics, again identifying the breakdown of the local labour force by industry, highlights the Municipality's relative slow economic growth over time. It may be estimated that the Municipality's labour force has grown by approximately 800 individuals in a period of twenty years. (For comparison: Halifax Regional Municipality's labour force grew by over 42,000 in the same time period.)

This stagnation in local employment is a result of an absolute decline occurring in the resource and manufacturing industries. There has been limited local growth in the service-based sectors to offset the decline. It is important to note that there is still a marked difference in local percentages, when compared with provincial figures. The decline within the manufacturing and resource sectors of the rural Nova Scotian economy is [well documented](#), and has been a repeated subject for consideration in policy discussion papers developed by the Province for decades. (see, as the most recent example: the Nova Scotia Commission on [Building Our New Economy paper](#), released May 2013).

Local Labour Force by Industry, Comparison between 1991 and 2011

Taken from 2011 Statistics Canada National Household Survey and 1991 Census - via NS Community Counts

Industry Sector	2011 Lunenburg District		1991 Lunenburg District	
	Total (#)	(%)	Total (#)	(%)
Agriculture, Fishing, Forestry	790	6.2	1,180	10.0
Manufacturing	1,727	13.6	2,879	24.4
Retail Trade	1,791	14.1	1,879	15.9
Education services	871	6.8	635	5.4
Health Care & Social Assistance services	1,391	10.9	880	7.4
Other services	710	5.6	567	4.8
Public administration (<i>cited as: Government services in 1991</i>)	556	4.4	583	4.9
ALL INDUSTRIES	12,580		11,815	

The data presented above is provided in consideration of the Provincial Guidebook's questions, asking to identify what are the important economic sectors for this Municipality at the present-day, as well as what is likely to be the expectations of economic changes in the future.

Clearly: the role of traditional resource industries, and the perceived "anchor" manufacturing businesses in existence, will continue to play an important - if not dominant - role in ensuring that there are local opportunities and related prosperity for any working-age residents in this Municipality. Gauging the impacts of future climate change hazards on these two particular industry sectors is important. That said: the well-documented, ongoing decline in local employment within these two particular sectors highlights the degree of economic vulnerability that this Municipality faces, should trends continue down the present path, regardless of potential climate change hazards.

It may also be noted that those two service-based industry sectors that have shown consistent provincial-wide growth over the last two decades - education and health care services - can be tied closely with government policy and spending. It is uncertain how future public policy decisions might lead to change within these identified “growth” sectors, in terms of being able to sustain related employment, if the Province becomes increasingly unable to pay for the maintenance of such, without increased taxation of a declining private sector employment base.

The specific locations of most of the major employers within the specified industry sectors considered crucial to the regional economy are located within the three towns which the Municipality envelops. This fact is not uncommon for many rural municipal units. Towns generally provide the central treatment and municipal water supply distribution systems attractive to both commercial and institutional (i.e. health care) development.

Impacts to local Economic Sectors from Identified Climate Hazards (Geographically -centric)

Industry sector (Identified drivers)	Hurricane / Blizzard	Coastal Flooding	Inland Flooding	Wildland Fire	Heat Wave / Hot Days	Comments
Agriculture	X		X	X	X	>Possible benefits: allowance for longer growing season for identified crops. >Increased rainfall may generate localized flooding risks to agricultural landowners.
Forestry	X			X	X	>Changes in temperature and local precipitation can lead to variations in natural forest stock. >Land is held by many private landowners - not directly managed as Crown land, as is found elsewhere: requires diverse management policy.
Fishing >Highliner Fisheries, Public Wharves	X	X				>Location of major factory immediate to coast; vulnerability of many small public wharves used for small commercial vessels.
Manufacturing >Michelin, Composites Atlantic, RPS Composites	X	X			X	>All three major employers are located in towns: potential inaccessibility for employees living in Municipality in extreme weather, flood events.
Retail Trade & Local Services >Towns, Osprey Village, New Germany, Hebbville	X		X	X		>Diverse geographic locations of local Trade and Services sector diffuses potential risks.
Education	X			X		>Vulnerability of older public infrastructure to major damage in any extreme event.
Health Care / Social services						>Sites all concentrated in towns - potential issues re: accessibility for residents.

The loss of any of the existing manufacturing facilities to a climate hazard incident would greatly distress the local economy. Past experience in this Province (e.g. [Sheet Harbour](#)) illustrate the limited means of rural communities to recover with the loss of an “anchor” employer. One strategic option for government is to commit to *greater economic diversification* on a regional basis, so that there is not as great a variance between local labour force sectoral percentages and provincial-wide totals. This Municipality has already gone forward, in limited fashion, to financially support [investigations](#) that assess the potential benefits of increased temperatures in local agriculture. This support may be considered as a small but necessary step at encouraging economic diversification in that particular sector.

Part C: Environmental Considerations: Threats to the Local Natural Environment

As previously described, the Municipality has a dispersed pattern of low density settlement, which was enabled by the extensive degree of land divested at the time of historical settlement. Any consideration of how potential issues to the natural environment may be exacerbated or avoided will ultimately involve the input and decisions of thousands of private landowners, as to what potential activities or land use can or does occur on their properties.

A more general evaluation of how the local natural environment will be affected, and what issues will be generated by future climate change, can be separated into the categories of **[a]** environmental issues initiated by specific incidents and **[b]** environmental issues identified with the expected increases in local temperature and precipitation.

[A] Threats from specific hazard incidents: The HRVA Atlas identified the location of particular sites which, in a hazard event, may result in a risk of hazardous materials being introduced to the environment. These sites may be considered as only the “major” facilities found in the Municipality used for large-scaled industrial purposes (e.g. the Bulk Petroleum Storage facilities in Hebbville). It is recognized that identification of such is by no means exhaustive of all possible locations where hazardous materials may be stored. The Municipality considers that, as part of its development of separate contingency plans for each climate -related hazard, REMO will identify means to address, on a more local scale, those specific hazardous materials that are relevant to events in specific communities.

[B] Expectations of a warmer and generally wetter climate: Changes in local temperature and the amount (and frequency) of rainfall will result in changes to the range of species, and the diversity of natural eco-systems, that may be found within the Municipality. While such identified changes will also affect both the type and productivity of local agriculture and forest activities, it may be identified that further assessment is required, as to how the (non-human-interfered) natural environment is also threatened, and how best it may be protected from such hazards.

In terms of how communities can generally look to protect a sufficient portion of the “undisturbed” natural environment from ongoing threats, and preserve the distinct eco-systems and habitat that may be found locally: it is characteristic of governments to: [1] own land, so as to control activities and use and [2] designate, under some form of legislation, those specific areas set aside for wilderness preservation.

Through its Open Space Strategic Plan, the Municipality has purchased properties for the purposes of specifically restricting future development - the most notable cases being municipal purchase (or municipal financial support provided to a non-profit) of identified islands.

For protective legislation, the Municipality would look to leadership from the Province. The percentage of land found in the Municipality under protected legislation currently stands at 0%, in part due to the segmented pattern of landownership, and the traditional use of Crown parcels for resource harvesting purposes. Recent planning efforts by the Province, so as to successfully reach its 20-year target of [12% protection](#), included the proposed addition of a number of new sites found in the Municipality. It may therefore be considered that - should the Protected Areas Plan go forward by 2015, as is being proposed - a portion of the natural landscape found within the Municipality’s jurisdiction will finally be identified as being “significant” for environmental protection purposes.

The Municipality would also note the [environmental importance of wetlands](#), and their role in recharging groundwater, providing natural flood control, and in maintaining natural habitat. Changes in size and composition of any existing wetlands, under future climate scenarios, is considered likely over the course of the century. Specifics of where, and how quickly changes will occur, is unknown. Where the Municipality has created development controls in local Land Use By-laws, it is consistent with the intent of the Province’s comprehensive [wetland policy](#), which is to deter further development on provincially-identified wetlands. Ongoing consideration of the potential changes in both the exact location and size of provincially-identified wetlands will require the Province to assess how these identified areas may be substantially altered, due to natural forces, over time.

Section 6

Adaptation Priorities.

The previous sections identified the types of climate -related hazards the Municipality anticipates as being potential risks to public safety and local infrastructure in the first half of the twenty first century.

Section 2 specifically assessed the degree of probability and impact of identified climate hazard events, and considered relevant research - notably that identified in the Daigle research report and scenarios found via [CCCSN](#) - outlining the expected trends for the future. Sections 2 and 3 also identified where particular physical structures may be at-risk to future hazard incidents, due to their location. It included preparation of an HRVA Map Atlas, for use by EMO officials, in identifying which assets may be impacted in any specific event. Section 4 focused on assessing risk to existing municipal infrastructure. It outlined what are the potential adaptation priorities for the Municipality, in any efforts to reduce vulnerability of its current assets. Section 5 considered the implications of identifying who are vulnerable population subsets in the Municipality to particular hazard incidents, as well as gauging the related impacts of identified climate hazards on the local economy and natural environment.

In review of the conclusions found in previous sections, this section incorporates findings, and puts forward a list of 12 adaptation actions as initial priorities. It may be expected these priorities are what this Municipality will focus on for the next 5 to 10 years. This list of proposed actions evidently considers which issues need to be addressed by the Municipality as a “high” priority. The basis for their consideration includes the degree in which the related concerns of public safety; public preparedness; and potential avoidance of climate hazards can be satisfied.

All 12 of these proposed priorities seek to address the impacts associated with at least one of the six hazards that scored a “High Vulnerability” ranking in the HRVA assessment process.

Of these 12 actions:

- 2 actions concern Municipal Infrastructure Development. (**Avoidance & Preparedness**)
- 1 action is specific to First Response capacity and coordination. (**Preparedness**)
- 1 action recommends improvements in Public Communications. (**Avoidance & Preparedness**)
- 2 actions are specific to improvements within Regional Emergency Planning. (**Preparedness**)
- 3 actions concern new Policy Development. (**Avoidance**)
- 3 actions are pertinent to identified Provincial Infrastructure and/or Programs, and require the Municipality to work in partnership with identified provincial stakeholders. (**Avoidance & Preparedness**)

Of these actions, accountability in implementation is diffused across various municipal departments/committees:

- 1 - Senior Management
- 1 - Engineering
- 1 - Fire Services
- 3 - REMO/EMO
- 3 - Planning
- 3 - **led by Provincial Agents (to involve Planning/ Engineering, REMO, or Economic Development)

Of these actions, it is proposed that:

- 2 actions proceed immediately. (identified as an **Immediate** Priority)
- 5 actions can be incorporated in staff work plans as a **High** Priority.
- 5 actions can be identified as being a **Medium** Priority, and will commence in future work plans.

The chart below identifies each Action, its assigned accountability and priority, and the connection with identified climate hazards. Further details, pertaining to consideration on how each MCCAP Action looks to address specific issues, or what additional information may be necessary in pursuit of undertaking such Action, follows thereafter.

2013 list of Adaptation Priorities

Action	Related Climate Hazard	Departmental Accountability	Priority in Implementation	Updates
1. Identify capital improvements and mitigation measures so as to maintain existing municipal infrastructure.	Extreme Events, Coastal & Inland Flooding, Wildfires	Engineering	Immediate	
2. Develop an internal evaluation process for hazard risk assessment in any new municipal infrastructure proposal.	ALL	Senior Management	High	
3 Continue to work with Fire Services to identify and support the response capacity of volunteer fire departments.	ALL - specifically: Wildfires.	Fire Services & Natural Resources	High	
4. Complete emergency measures contingency plans for each identified climate hazard.	ALL	REMO	Immediate	
5. Partner with relevant agencies and not-for-profits in the Region on community education and communications on hazard preparedness.	ALL	REMO +identified partners	High	
6. Identify a public communications system for storm surge / at-risk flooding locations.	Coastal & Inland Flooding	REMO (+ Planning)	Medium	
7. Develop a coastal setback policy.	Coastal Flooding	Planning	High	
8. Identify areas at-risk of inland flooding. Work with neighbouring municipal units & provincial departments to alleviate any associated potential risks to citizens and infrastructure.	Inland Flooding	Planning	Medium	
9. Determine appropriate road standards in areas affected by / most at-risk to flooding.	Coastal & Inland Flooding	Planning (Engineering)	Medium	
10. Identify where local transportation infrastructure is most at-risk to climate hazards.	Extreme Events, Coastal & Inland Flooding, Wildfires	NS Transportation (Plan & Eng)	High	
11. Identify how current education and silviculture programs are supporting private woodlot owners address potential changes in the health of local private forested lands.	<i>*compromise of existing stock, with predicted increases in temperatures.</i>	Natural Resources (Economic Dev)	Medium	
12. Identify an appropriate "community check-up procedure" for populations susceptible to the impacts of particular climate-related hazards.	Heat Wave	Health & Wellness (REMO)	Medium	

Action #1	
Identify capital improvements and mitigation measures so as to maintain existing municipal infrastructure.	
Strategic Intent	
PROTECT existing municipal assets from the impacts of future climate hazards, to include the infiltration of storm water and risk of prolonged power outages at central waste water treatment facilities, during hazard incidents.	
Departmental Accountability	Timeline
Engineering.	Immediate - Start in 2014. (FY2014 Budget)
Action Plan Steps.	
<p>1. Develop and integrate identified capital projects associated with corrective actions / adaptation measures in annual budget priority process, starting from FY2014 - forward.</p> <p>2. Update Council annually on where any capital improvements and/or operational changes have altered the initial scoring found in the 2013 CNSIS Risk Assessment worksheet. (Appendix E)</p>	
<u>Associated Climate Hazards</u>	
Coastal Flooding, Inland Flooding, Hurricane, Blizzard, Wildland Fire	

The principal objective behind the development of an MCCAP is for each Municipality to identify to the Province what corrective measures need to be taken, to ensure that its portfolio of existing municipal infrastructure assets will be less vulnerable to climate hazards in the future, than is found currently.

The first rank of identified priorities is for the Municipality to focus on ensuring that essential municipal services are not compromised by prolonged periods of interruption / shutdown, or by outright destruction of an asset. The second-tier adaptation priority would be to mitigate the potential impacts of climate hazards on municipally-owned open space assets and recreational facilities. The third-tier adaptation priority would be to ensure continued integrity of any administrative properties, so that effective governance and regulatory activities can continue to be carried out.

“Essential” public services may be identified as being: transportation, water, and wastewater infrastructure. Police and fire protection services are also recognized for their functional importance. The total amount of infrastructure assets owned by the Municipality within these five categories is limited, most notably when compared in scale to urban jurisdictions.

The total kilometerage of existing municipal roads - when compared against the amount of provincial and private roads found in the Municipality - is, essentially, negligible. Nor can any of the municipal roads be considered as major corridors for transportation between communities. As well, those infrastructure assets associated with fire and police protection services are controlled by agencies external to the Municipality’s authority. Two subsequent actions propose that the Municipality consider interacting with other agencies (*specifically: NS Transportation & Volunteer Fire Departments*), so as to identify where particular actions may be considered as “institutionally-shared objectives” in sustaining an essential level of service to existing MODL communities in the face of any future hazard incidents.

Being a rural municipality, most existing water and wastewater systems are privately owned and operated. At present: support for private systems is ineligible under the Municipal Funding Agreement. Approximately 3% to 4% of the total number of developed properties in the Municipality are connected to central treatment facilities. An even smaller portion of property owners receive water utility services through the Bridgewater Public Service Commission.

Going forward, and following from this MCCAP's initial 2013 Risk Assessment worksheet's priority ranking, it is proposed that the Municipality's engineering staff will determine appropriately-scaled projects on an annual basis, and develop more detailed cost estimates, so as to correct for identified vulnerabilities to climate -related hazard events at municipal waste water facilities.

Identified projects can be subsequently implemented, as they are brought forward, and as they are approved by Municipal Council, through the annual budgeting priority process.

An initial consideration for corrective action, recognized during the MCCAP plan development process, is the identified need for capital improvements to the New Germany wastewater treatment system. These improvements would focus on mitigating the negative impacts of storm water inflow and infiltration during heavy rainfall events.

Infiltration of excessive amounts of storm water into the existing New Germany system has resulted in the inadequate treatment of wastewater for a short period of time, both during and following a major rainfall event. This scenario, in turn, can cause pollutants to enter the LaHave River. In the future, with expected increases in the amount of annual precipitation, it is anticipated this type of undesired impact on the LaHave might occur more frequently.

It is also proposed that as part of the annual monitoring process of the Municipality's MCCAP implementation, that the "Infrastructure Preliminary Risk Assessment" spreadsheet be used as an ongoing tool to determine the Municipality's progress on adaptation efforts concerned with existing infrastructure.

If no financial resources are put forward on an annual budgeting basis in support of proposed corrective adaptation actions and/or proposed mitigation measures, the inference may be drawn that the 2013 Infrastructure Risk Assessment will also not change accordingly, over time.

Action #2	
Develop an internal evaluation process for hazard risk assessment in any new municipal infrastructure proposal.	
Strategic Intent	
AVOID the impacts of anticipated climate change hazards by integrating an analysis prior to priority-setting and the approval of capital expenditure for any new (major or minor) infrastructure item in the Municipality.	
Departmental Accountability	Timeline
Senior Management.	High Priority.
Action Plan Steps.	
<p>1. Alteration of the current Request for Expenditure form, used by staff in the fiscal budgeting process, to answer various criteria & questions affiliated with the proposed capital budget item.</p> <p>This alteration would consider incorporation of a particular section, to address the potential impacts of climate hazards on the proposed item's development.</p>	
<u>Associated Climate Hazards</u>	
ALL	

The corollary in Infrastructure Adaptation Planning to undertaking corrective action so as to protect existing municipal assets from future hazards, is to ensure that any proposed or new infrastructure developments anticipate the possibility of these same specified risks, prior to their actual construction.

The total amount of municipally-owned infrastructure assets is not a large number. Decisions made by Municipal Council to construct new infrastructure projects of any substantive size (i.e. a new wastewater treatment plant, or a major recreational facility) may be considered as being a rare occurrence, happening approximately once or twice a decade, over the last half century.

That said: any major infrastructure decisions that Council makes in the 2010s-2030s will need to consider that many of the historical assumptions of a predictable regional climate are no longer valid, as they may have once been regarded, over the last fifty years.

For the development of any large-scale infrastructure project: it is proposed that within the analysis being presented to Council, that consideration of climate hazard -related impacts on the proposed new facility be specifically documented.

Determination if such an analysis can be accomplished by senior municipal staff, or is to be completed through an external consultant, can be evaluated as each major project is identified.

For any "minor" infrastructure projects considered less substantive in initial investment cost (i.e. improvements to an existing recreational site, ongoing replacement of culverts within municipal roadways, etc.): it is proposed that use of the current Request for Expenditure process by the Municipality be amended, so as to include a section specific to identifying possible climate -related hazards, and any proposed mitigation activities where appropriate.

Action #3	
Continue to work with Fire Services to identify and support the response capacity of volunteer fire departments.	
Strategic Intent	
PROTECT existing communities by supporting the capacity of volunteer fire departments to respond quickly, reducing, among other noted hazards, the likelihood of small fires escalating to become more severe emergencies.	
Departmental Accountability	Timeline
Fire Services (Committee).	High Priority.
Action Plan Steps.	
<ol style="list-style-type: none"> 1. Continue to identify the existing response capacity in cooperation with local volunteer Fire Departments. 2. Explore suitable mechanisms to provide for proposed continuous improvements in response ability. 	
<u>Associated Climate Hazard</u>	
ALL - (in their Capacity as First Response) - and particularly Wildland Fire.	

Climate projections suggest that over the course of the twenty-first century, the Municipality is likely to experience hotter, drier summer conditions, with more intense precipitation events appearing occasionally. Such a projection suggests that there will be longer periods of time when local environmental conditions are more susceptible to fire events. It can also be noted that the large majority of wildfires are initiated by human activities - i.e. a 'small' fire that grows quickly out of control and causes significant destruction.

The current framework for volunteer Fire Departments in the Municipality is largely based on rates determined by area ratepayers. The Municipality subsequently provides a small grant to all departments, based on a "reverse assessment" formula, to allow smaller fire departments to receive a measure of additional funds unrelated to the size of their assessment base. There is also a matching municipal grant program provided to departments who fundraise up to \$1500. A percentage-based insurance grant is also provided by the Municipality. The province, for its part, has a project-based matching grant program that all fire departments across the province can compete for, and obtain once every three years.

The adaptive capacity of existing communities in rural Nova Scotia to future climate hazard incidents - to include both protection against a potential increase in risk of wildland fires and First Response - must take into consideration the state of current protection services found in rural areas. The nature of how First Response is delivered to residents in rural communities in the Municipality is far different from that which is experienced by citizens in urban settings.

Fire protection may be considered as critical municipal infrastructure - as crucial to a rural community's long-term "sustainability", as are the conditions of local roads, or the construction of an underground sewer pipe. At the present time: the provision of capital funds through the Municipal Funding Agreement does not identify investment in local fire protection as an eligible category for expense.

It is proposed that, as part of its adaptation planning, municipal governments within a rural setting must consider: in what ways can it best assess and support ensuring a minimum level of First Response to future climate hazard incidents, including an increased number of potential fire risks. This assessment comes at a time when rural demographics are already placing significant pressure on the capacity of local volunteerism delivering such services.

Action #4	
Complete emergency measures contingency plans for each identified climate hazard.	
Strategic Intent	
PROTECT residents and property by developing specific emergency measures plans particular in mitigating and responding to the climate-related hazards that have been identified.	
Departmental Accountability	Timeline
REMO.	Immediate - Start in 2014. <i>(FY2014 Budget)</i>
Action Plan Steps.	
<ol style="list-style-type: none"> 1. Complete new (or revise any existing) Contingency Plans for each climate-related hazard, as analyzed in the priority sequence of the Hazard Risk Vulnerability Assessment Model scoring. 2. Share contingency plans with municipal staff involved in the delivery of essential services. 	
<u>Associated Climate Hazards</u>	
ALL.	

In spring 2012, as part of the MCCAP development process, nine Hazard Risk Vulnerability Assessment (“HRVA”) Models were completed. The HRVA Models and the considerations that were identified in the provincial MCCAP Guidebook contained a great deal of overlap.

While not considered one of the mandated functions of local emergency management organizations in the province, a hazard assessment is one of the principal means in which EMO/REMO officials can gather initial evidence that can determine appropriate actions that can mitigate and/or effectively prepare and/or properly respond to a disaster. As the hazard assessment evaluates different aspects of a community’s vulnerability, it can, in turn, lead to proposing a corrective (or “mitigative”) action before the specified hazard event occurs, as opposed to an EMO having to secure resources in place for “response.”

It is understood that EMOs across the province have generally adopted an all-hazards approach to their emergency planning. An all-hazards model provides a basic framework that defines how an EMO organization will respond to any given crisis. It is generally focused on the response and recovery activities more so than on those elements pertaining to possible preventative mitigation and preparedness. The development of an all-hazards plan provides for the necessary communication and collaboration framework in the event of an emergency, identifying who is in charge (authority); what needs to be done (responsibilities), and how decisions are to be made (procedures).

While the all-hazards approach provides an overall framework for effective response, there remains an identified need in EMO planning to determine how to best deal with specific hazard events. These types of EMO plans are called “contingency plans” and are based on a community responding to a particular type of hazard in a more adaptive fashion, so that particular activities associated with the hazard are considered.

Now that nine HRVA Models are completed, it is proposed that the Municipality, along with partnering municipalities, can continue to demonstrate leadership in its REMO operations by also completing specific contingency plans for each of the climate-related hazards. Ongoing related work in establishing suitable placed emergency shelters - comfort stations can also be assisted with the development of specific contingency plans.

Action #5	
Partner with relevant agencies and not-for-profits within the Region on community education and communications on hazard preparedness.	
Strategic Intent	
AVOID potential harm to individuals and property through increased and targeted communications efforts.	
Communication efforts will focus on individual residents becoming better educated on the potential impacts of climate hazards, and becoming better educated on individual preparedness for such hazards.	
Departmental Accountability	Timeline
REMO (and identified partners.)	High Priority.
Action Plan Steps.	
1. Draft public education and communications material specific to climate -related hazards in the priority sequence of the Hazard Risk Vulnerability Assessment Model scoring.	
<u>Associated Climate Hazard</u>	
ALL.	

As with many other aspects of public policy, forming an effective communications strategy to ensure that local citizens are well-informed, and have access to useful and practical information so that they can decide their own individual actions, is an important component to successful policy implementation.

Within the MCCAP framework: the primary communications strategy is to inform the general public how they may best prepare themselves for (or conduct themselves in) a climate-hazard emergency scenario. Plain-language documents that can provide guidance on a citizen's proper response to particular impacts (i.e. what to do when an overland flood isolates you from the rest of the community) is the fundamental first step in educating local residents.

A secondary strategy, complimenting this first objective, is to inform citizens as to what particular areas / particular population subsets may be more at-risk to identified types of climate hazards, and/or communicating why particular development activities should be avoided because of the potential impacts of climate hazards.

It is proposed that potential increases in communications activities and production of related information materials focused on climate hazards be incorporated on a regional level (through REMO Operations) so as to achieve better economies of scale, while remaining localized enough to provide relevant information to the Municipality's residents.

Action #6	
Identify a community warning system for storm surge / at-risk flooding locations.	
Strategic Intent	
AVOID potential harm to residents and property by providing improved communications of anticipated storm surge events.	
Departmental Accountability	Timeline
REMO. (supported by Planning)	Medium Priority.
Action Plan Steps.	
<ol style="list-style-type: none"> 1. Develop an ongoing working partnership with officials of Environment Canada responsible for any storm surge and flooding predictions. 2. Determine a suitable template for public communications of the predicted flooding hazard. Consider best ways to address the dissemination of any general warning of storm surge events. 	
<u>Associated Climate Hazard</u> Coastal Flooding, Inland Flooding.	

Through Environment Canada, storm surge projections are produced prior to any (predicted) major storm event in Nova Scotia. Information distilled from the projections is then made available to local emergency management officials, as part of the standard communications package sent to EMO offices, in anticipation of a major storm affecting the region.

With the Municipality's acquisition of LIDAR mapping for the majority of its coastline, the Municipality is now able to place a "storm surge prediction" onto local maps. This information can then be relayed back to REMO officials, so that rather than simply having a number that is identified by Environment Canada in a report, REMO have a better sense of what that predicted statistic means, as to what exists on the local ground. The related mapping and the storm surge prediction can now illustrate potential issues - in terms of emergency preparedness - based on a combination of the two pieces of information. This combination of data was first done for a predicted blizzard warning in February 2013.

While these predictions of storm surge by Environment Canada are only the *best estimated guess* of what is going to happen, it is proposed that through REMO's coordination, continued efforts address how Environment Canada forecasts (combined with mapping from Planning Services) can be incorporated into an effective communications tool that would warn the public of potential flooding hazards prior to the event occurring.

Action #7	
Develop a coastal setback policy.	
Strategic Intent	
AVOID private infrastructure damage in identified coastal areas by restricting new development.	
PROTECT residents already living in coastal areas, by informing them of the possible extent of future hazard.	
Departmental Accountability	Timeline
Planning.	High Priority.
Action Plan Steps.	
<p>1. Provide information to the general public as to the risks related to possible flooding / storm surge risks related to coastal development (existing and/or proposed)</p> <p>2A. Working with community area advisory committees (either collectively or independently), determine the suitability of a proposed coastal setback regulation, examining the implications of such on each respective community Plan Area. (Oakland, Princes Inlet, Riverport & District)</p> <p style="text-align: center;">or</p> <p>2B Following a consideration of the proper standard, engage MODL coastal communities in policy development / amendment. This public participation step would also be able to include the concurrent communications objective of providing to residents further information as to where existing developing properties may be at-risk.</p> <p>3. Determine the procedure / possibility of implementation of any equivalent policy for those coastal areas within the Municipality which do (or do not) have any current land use planning controls.</p>	
<u>Associated Climate Hazards</u>	
Coastal Flooding.	

There is an increased likelihood of risk in particular areas to coastal flooding incidents / erosion damage of the existing coastline. Where development has not yet taken place, precautionary measures can be taken on by the Municipality, so as to reduce or possibly avoid the loss of future public and private investment.

The proposed establishment of a coastal setback policy for new residential development is not new. Its most recent re-genesis can be traced to efforts made at creating a coastal policy for the Province. Work led by the Department of Fisheries identified the preponderance of existing residential settlement - and continued demands for settlement - near to or along the coast, in its 2009 State of the Coast Report, and the resulting consequences of that development pattern. Put simply: being near to the ocean is the reason why many people choose to live in Nova Scotia.

Suitable protection for residents and infrastructure investment along the coast from the hazards of coastal flooding and storm surges is also not new. The impacts of coastal flooding, and the consequences of storm surges during major hurricanes and blizzards, have been concerns for local citizens and governments for the last two centuries. The Municipality's shoreline is dotted with various man-made efforts to stop the sea. Existing efforts put to protecting communities and properties already cost significant resources to maintain. As new properties are developed, the natural vegetation along the coastline has been altered, or in some cases cleared, which in turn can result in increased rates of erosion. To battle individual erosion concerns, property owners often consider armour stone protection, resulting in further changing dynamics along the coastal landscape.

At some point, it can be recognized that continued development in areas considered to be at an increased risk to coastal flooding will only cost communities and individuals additional financial resources, beyond that which is already being paid.

The issue of what is the proper role of the Municipality in ensuring effective coastal management is also not new. It was identified during the integrated community sustainability plan development process, as residents from various local communities frequently voiced their concerns surrounding the subject, and the impacts of public policies that affect it. The current MODL ICSP notes that:

“...it is recognized that there will be subsequent activity for development of local plan policy, to adapt to possible changes that might result with the provincial adoption of a Sustainable Coastal Development Strategy.”

What is new is that there is some openness to public discussion of whether some level of government in Nova Scotia should step forward with regulatory measures aimed at effective coastal management. With improvements in relevant information about changes in shoreline conditions - to include predictions of future sea level rise and climate change hazard incidents might do, in terms of erosion - coastal management decisions in the twenty first century can become more precautionary, in a manner that might have been less evident in the twentieth.

Since 2008, this Municipality has repeatedly noted the link between climate change and the potential hazards of coastal flooding. The Municipality’s purposeful communications to be included as an ACASA study area - so as to secure more effective coastal area mapping - was linked to an anticipation that related policy development was a possible alternative for local government to need to consider in the future.

With the identified slowing of any efforts to establish a provincial wide regulatory strategy aimed at coastal protection, this Municipality is left with consideration of local land use regulation being an appropriate “stop-gap” measure in the interim. It is anticipated that the provincial government will re-consider the issue of a provincial-wide coastal policy at some future point. If and when that occurs, local government regulations can inevitably be compelled to conform to whatever expectations are identified in any related provincial wide policy statement.

Examples of various approaches to policies affecting coastal development can be found in Halifax, New Brunswick, and various New England states. Municipal planning staff considers that the debate on a local setback policy from the coast is not a matter of “if”, but more a question of “when, where, and how.”

Action #8	
Identify areas at-risk of inland flooding. Work with neighbouring municipal units and provincial departments to alleviate any associated potential risks to citizens and infrastructure.	
Strategic Intent	
AVOID damage in identified inland areas prone to flooding.	
PROTECT residents living in proximity to such areas, by determining appropriate response to potential hazard.	
Departmental Accountability	Timeline
Planning	Medium Priority.
Action Plan Steps.	
<ol style="list-style-type: none"> 1. Undertake appropriate mapping and research projects, so as to gain sufficient data and analysis in establishing any potential policy or response plan specific to inland flooding hazards. 2. Determine suitable policy response, based on any lessons learned with local coastal policy development. 3. Collaborate with other government stakeholders on identified issues concerned with inland flooding events. 	
<u>Associated Climate Hazard</u> Inland Flooding	

There have been repeated occurrences of serious inland flooding incidents, causing both personal tragedy and damage to existing infrastructure. Climate change predictions identify the likelihood of the Municipality experiencing increased precipitation in the future, which, in turn, can potentially generate more inland flooding hazard incidents.

At the present time: there has been little analysis undertaken, to either record the extent of damage in past inland flooding events, or to model what impacts may occur with predicted climate changes in the next century. An issue with the Municipality's consideration of undertaking inland flooding analyses is the extensive size of its jurisdiction, when compared to compact urban settlements.

The intent of any initial research is to provide the Municipality a more informed perspective on the potential vulnerabilities and risks of flooding events that can occur in the future along inland watercourses.

Starting in 2013, this Municipality has begun the process of obtaining additional background information, by commissioning a vulnerability analysis and flood risk mapping study through the Applied Geomatics Centre, for a selected area along the LaHave River. While the LaHave River watershed is only one of several watersheds that exist in the Municipality, it may be identified that there is a significant amount of public infrastructure (to include provincial Highway #10) and inland settlement along the River, to warrant the Municipality's consideration of the LaHave as an initial priority.

It is proposed that - similar in fashion to what has been accomplished by obtaining relevant information on coastal mapping, prior to proposing any development of an applicable policy - the priority action to be associated with inland flooding in the 2014-2019 time period, is to acquire useful data. Following that course: it may be anticipated the Municipality will pursue a path towards an avoidance policy similar to whatever is ultimately successful with residents in coastal areas.

Action #9	
Determine appropriate road standards in areas affected by / most at-risk to flooding.	
Strategic Intent	
AVOID allowing for the unsustainable development of new roadway infrastructure that can be considered vulnerable to the potential impacts of future coastal and inland flooding events.	
Departmental Accountability	Timeline
Planning.	Medium Priority.
Action Plan Steps.	
<ol style="list-style-type: none"> 1. Address public and private road standards in a revised municipal subdivision by-law, specifically to consider the issue of their accessibility in areas at-risk to flooding and storm surge. 2. Review the proposed regulation in a public forum prior to Municipal Council's consideration for adoption. 	
<u>Associated Climate Hazards</u> <i>Coastal Flooding, Inland Flooding.</i>	

For this particular Action: it should be noted that the acquisition of detailed mapping information by the Municipality through the ACASA initiative was linked to its potential basis in determining the validity of new climate change - associated regulations. The ability to use more precise data - as can be provided with more comprehensive LIDAR mapping - was considered a necessary pre-condition in providing to Municipal Council a reasonable basis of information, in their subsequent determination of any proposed municipal policy.

Identification of those areas most at-risk along the coast of the Municipality to repeated flooding and storm surge events is more specific than it was a decade ago. Continued progress on obtaining more detailed mapping information for inland areas (specifically: along the LaHave River) is anticipated to be a continued priority of planning staff's work plan. As such, the Municipality's ability to identify more precisely those land areas that will likely be vulnerable to repeated future flooding events, can in turn contribute to potential changes in current municipal land development policies.

Currently, the Municipality addresses the development of potential roads at point of subdivision. Proposed changes to the provincial subdivision legislation, expected to commence sometime in 2013-2014, will in turn lead to a necessary review and revisions to the existing municipal subdivision by-law.

As part of that municipal subdivision by-law review process, it is proposed that the Municipality consider introducing the imposition of new standards for roads located on properties identified as being vulnerable to future flooding and storm surge events. These new road development standards would address the concern that no proposed public (or private) road be created, where local fire services and other emergency responders would be unable to use such in an emergency during a flooding or storm surge event (of an identified scale).

The intent of such a policy is: to not enable an augmentation in the number of households that might become isolated, due to the impacts of flooding and storm surge events, affecting the local road network. There are already potential issues as to how sparsely-populated rural communities reliant on volunteer fire services can adequately respond to existing crises. It is identified that the ongoing addition of new roadway infrastructure, that will put new residents equally at-risk, can be strategically avoided.

Action #10	
(with Department of Transportation) Identify where local transportation infrastructure is most at-risk to climate hazards.	
Strategic Intent	
PROTECT against the destruction (or recurrent inoperability) of those provincial roadways that serve as necessary corridors between existing communities.	
Departmental Accountability	Timeline
Planning & Engineering (proposed)	High Priority.
Action Plan Steps.	
<p>1. Working with the Regional NSTIR Office, identify where existing transportation infrastructure is at-risk, and what alternatives can be presented in ensuring suitable maintenance. <u>It is proposed that the Municipality encourage that this infrastructure assessment be done on a regional level</u>, and include the District of Chester and Region of Queens.</p> <p>2. Presentation to Councils / communities on identified adaptation priorities for transportation improvements.</p>	
<u>Associated Climate Hazard</u> <i>Coastal Flooding, Inland Flooding, Hurricane, Blizzard, Wildland Fire, Extreme Weather Events.</i>	

The current road infrastructure that serves as the arterial core connecting communities throughout the Municipality is a collection of NSTIR assets. Protective measures to adapt and maintain this arterial core, so that it becomes more resilient to changing climate conditions, is fundamentally required.

Ongoing public demand for roadway improvements is a familiar subject to all citizens who live in rural Nova Scotia. It may be taken as fact that there is not - and likely never will be - sufficient funding to provide the Department of Transportation with the resources required to serve all citizens to the level of expectations that is demanded.

Rural municipalities are not interested - and likely never will be - in inheriting the financial obligations that are the responsibility of the Province for transportation infrastructure. That said: the fact this particular asset is owned and is controlled by another level of government does not mean that the Municipality does not recognize it as being a vital consideration in the community's well-being, per the MCCAP assessment process. In certain geographies within the Municipality, entire communities can be effectively isolated by having one provincial roadway being compromised.

It is in the Municipality's interest to work cooperatively with NSTIR, to ensure that there is a provincial plan identifying and prioritizing the most critical adaptation measures, so as to reduce potential instances of community isolation. The alternative scenario would be to allow for a response-driven assessment framework, to determine where any available resources - if any are at-hand - are to be allocated.

Consideration as to the long-term sustainability of the many scattered rural communities compels the Municipality to be purposeful in undertaking a cooperative approach with the Department, in order to recognize where priorities can be properly identified. Coordination on planning with the Department - and a willingness to provide what information is known to the Municipality - can potentially lead to a "shared institutional intent" as to what is the most effective plan to reduce future risk in particular areas to flooding and other particular hazards.

Action #11	
(with Department of Natural Resources) Identify how current education and silviculture programs are supporting private woodlot owners address potential changes in the health of local private forested lands.	
Strategic Intent	
AVOID the potential threat of resource loss / degradation, by ensuring that local private woodlots are managed in an approach that effectively minimizes the potential risks of diseases, insects, and wildland fires, resulting from future climate change.	
Departmental Accountability	Timeline
Economic Development (proposed)	Medium Priority.
Action Plan Steps.	
1. Working with the Regional DNR Offices, identify how their educative outreach, current silviculture and harvest tracking programs are supporting private woodlot owners, so as to include addressing any potential changes in the health and diversity of private forested lands, due to changing climactic conditions.	
<u>Associated Climate Hazard</u> <i>Long-term changes in climate conditions, possible Wildland Fire.</i>	

The diverse and segmented composition of rural landownership in the Municipality means that much of the forested land mass is held by thousands of individual woodlot owners. For many residents: continued use of their private woodlots as either a fuel source, or as an ongoing source for income, is an important economic component in sustaining their rural lifestyle. It is also an important cultural link that identifies their families' long heritage in local rural communities.

Sustaining the health of the forest through this type of distributed landownership pattern requires a far different perspective from the provincial government, than is the case with ensuring the ongoing management of Crown land. In the 2011 provincial Natural Resources Strategy, the Department of Natural Resources identified that "...healthy and diverse forests are less susceptible to natural and human-caused disturbances." Encouraging the use of private forest management plans as a vehicle to ensure that there is a healthy and diverse forest, is an integral component when the majority of the land is privately-owned.

It is proposed that the Municipality encourage the province in its continued delivery of various support programs associated with private woodlot management, as a means to address potential risks, including those associated with climate change. Specifically: how the potential risk of wildland fires is not augmented, due to degradation that may be caused by changes in future climactic conditions that can generate potential disease or new insect manifestations, or by changes in woodlot management.

Action #12	
(with Department of Health & Wellness / related community stakeholders) Identify an appropriate “community check-up procedure” for populations susceptible to the impacts of particular climate-related hazards.	
Strategic Intent	
AVOID unnecessary loss of life, personal injury and/or sickness, by ensuring additional attention is afforded to those populations considered to be at greater risk to identified hazards, including populations considered vulnerable to excessive heat/cold, and those identified as being vulnerable to isolation during extreme weather events.	
Departmental Accountability	Timeline
REMO (proposed)	Medium Priority.
Action Plan Steps.	
1. Working with provincial Public Health Officers, other municipal units & identified stakeholders, coordinate the development of effective community response services that look to inform and involve those populations considered most vulnerable to specified climate hazards.	
<u>Associated Climate Hazard</u> <i>Heat Wave/Hot Days, Hurricane, Blizzard, Extreme Weather Events.</i>	

The Municipality’s involvement in one of the 2012 ACASA studies focused on identifying the potential vulnerability of certain segments found within the resident population. Those consulted during this particular study understood the term of “social vulnerability” to mean: those who may have limited options to respond independently, so as to ensure their personal safety, when faced with an imminent hazard. Identified population segments included:

- those with limited mobility options;
- those lacking a supportive social network within their community; and/or
- those who may be unaware of particular hazards (i.e. heat wave warnings) due to their lack of knowledge about immediate hazard events.

These segments may evidently include: young children; senior populations; newly-arrived or temporary residents; and the developmentally disabled.

Identification and support of vulnerable population subsets during climate -related hazard events can itself be considered an ongoing “action.” For communities to ensure that they are generally more adaptive to climate hazards than they were previously, communities must consider the ways in which they can go about helping first those who may be more exposed to potential risks. As Public Health authorities are identified as being the appropriate front-line officials for ensuring the health and well-being of all citizens, this Municipality proposes that it is through their regional offices that any actions be coordinated. Public Health’s role can also ensure that there is a region-wide approach in addressing the issue, as opposed to having similar actions simultaneously developed for each local jurisdiction.

The Municipality’s role would be to successfully link community-based volunteer organizations that can assist Health officials with any pro-active plans aimed at vulnerable populations. As example: some large urban cities throughout Canada have established heat -health warning systems, to anticipate weather that is likely to be harmful to particular populations. A health warning is triggered by an Environment Canada forecast, in turn triggering public information alerts, in turn leading to response plans managed by staff of public health units. Within a rural context: such an approach might look to rely on/involve volunteer organizations, so as to identify and support the (relatively few) number of Public Health officials in their information dissemination and individual “check-ins.”

Climate Change Adaptation Priorities and Land Use Planning.

The Municipality currently has an issueless Municipal Planning Strategy, whose purpose is to provide for the creation of Secondary Planning Strategies in specific communities. This framework allows for the development of local Land Use By-laws, so as to regulate development activities in selected areas of the Municipality.

The Municipality intends to use information and such findings resulting from the completion of its MCCAP, as well as undertake those identified policy actions (listed above, as **Action Items #7-9**) in consideration of policy change in those identified Plan Areas where local land use controls have been developed. It may be specifically noted that for any proposed local policy pertaining to coastal flooding, three existing Secondary Planning Strategies (Oakland, Princes Inlet and Riverport & District) would be affected. Existing community plans for the community of Blockhouse and for the Village of Hebbville are sufficiently removed from consideration of that specific climate hazard.

For those areas of the Municipality that are currently without local Land Use By-laws: it is the intent of the Municipality to, at a minimum, communicate relevant findings to the greater community, as it pertains to potential climate hazards that have been identified within its MCCAP.

Mitigation Planning - Corporate Emissions

The Municipality initiated collection of corporate emissions data in 2009, through the use of the (*then - Jacques Whitford model v.1.6*) UNSM emissions spreadsheet, so as to detail emissions resulting from the Municipality's electricity use and heating fuel consumption. For the purposes of this MCCAP, municipal staff have since updated the inventory to spring 2013, meaning that there is now a six year+ collection of emissions data from which it can review its corporate totals. See **Appendix F**.

The Municipality also undertook an Energy Audit in 2009, which allowed the Municipality to consider particular infrastructure improvement projects that would result in increased energy efficiency. In particular: since that Audit, the Municipality has installed a new heating/ventilation system within the basement of its Administration Building. Such an improvement looked to purposefully reduce costs (and resultant emissions associated). It may be identified that, at the present time, the Administration Building is considered to be at capacity, or "beyond" capacity, and is certainly unable to expand without a further significant upgrade and re-modeling to the site.

Implementation of the Municipality's MCCAP - final note.

This MCCAP - as with this Municipality's Integrated Community Sustainability Plan - may be appropriately considered to be a corporate strategic planning document.

Its purpose is to affect the work plans of those identified departments responsible for municipal services, regulations and programs. Implementation of any particular MCCAP Actions, and progress on actions, will be filtered through the annual municipal budget and priority setting process that determines what resources and direction Council has provided to municipal staff.

As with the ICSP: an MCCAP can look to indirectly affect (where possible) the actions of other agents, to include provincial departments and the general public, but it is recognizably not assured that any objectives will be met.