

Water Resources Management - Study Recommendations and Action Plan 2008

BU = HRM Business Unit
 EMS = Environmental Management Services
 CD = Community Development
 HW = Halifax Water
 IAM = Infrastructure & Asset Management

No.	Recommendation	Action Plan	Progress 2008	Lead BU
Chapter 5.0 Watercourse, Wetland and Coastline Protection				
5-1	It is recommended that HRM provide protection for lands adjacent to watercourses, wetlands, lakes and coastlines through the use of planning and development controls where appropriate. These would provide riparian buffers to be defined in by-law in riparian areas, shoreline areas and around wetlands. In these adjacent lands, vegetation will be retained, and development, soil removal, excavation and infilling will be prohibited. The intent of the protection of riparian buffers would include the general prohibition of the infilling and channelization of watercourses.	Municipal Planning Strategy and By-Law This will be considered through the Regional Plan. Further to public consultation, staff will look for opportunities to do early implementation.	Regional Plan Policy E-10 to E-13	CD
5-2	It is recommended that the general width of the riparian buffer be 20 m from high water mark along each bank or shore or wetland edge. It is recommend that, where the land within the 20 m buffer zone has an average slope of greater than 20%, the riparian buffer width will be increased and the riparian buffer designation will be extended by 1 m for each additional 2% of slope to a maximum of 60 m in width.			
5-3	It is recommended that where there are valid reasons to modify the riparian buffer width, or infill a wetland or watercourse, policy and by-law should provide flexibility where appropriate.			
5-4	It is recommended that, where natural systems have been modified, natural channel design be incorporated (to the extent practical) into the storage, flow and quality improvement of storm runoff, while seeking to remediate and enhance the watercourse conditions.	Municipal Service Systems Design Guideline HRM does not have a program to pro-actively restore channels. However, staff will capitalize on any practical possibilities where remedial works are undertaken. This will be addressed during the next amendment of the Design Guideline.	Regional Plan Policy SU-28 Pending next Design Guideline review	CD HW
Chapter 6.0 Service Boundaries				
6-1	It is recommended that development boundaries in HRM be defined based on population and employment forecasts for a defined planning period (minimum of 20 years). Population should be allocated to settlement areas based on a range of environmental, social and economic criteria as set forth in Section 6.4.4. Allowable lot sizes should be increased significantly to discourage high density development outside the settlement/ service centres and to make efficient use of existing and planned infrastructure. It is recommended that external boundaries of urban development areas be defined to follow roads, environmental features, rights-of-way, railways, transmission lines, lot lines, concession lines, and	Municipal Planning Strategy and By-Law Most of these policies already exist in current Community Planning Strategies.	Regional Plan Chapter 3: Settlement & Housing	CD

	watercourses.	This recommendation is currently being implemented in the Master Plan Studies in priority growth areas, and the Greenfield Study will help implement the recommendation on a Regional scale as part of the Regional Plan.		
6-2	It is recommended that HRM prepare detailed plans for significant urban centres and rural service centres in HRM that define the sequence and pattern of proposed development in detail including servicing provisions.	<p>Municipal Planning Strategy and By-Law</p> <p>This is being implemented in urban areas through Master Planning Process. The Greenfield Study will help implement the recommendation on a Regional scale as part of the Regional Plan.</p> <p>A Study has been completed on Options for On-site and Small Scale Wastewater Management, which will help in the development of settlement patterns for the rural areas.</p>	<p>Regional Plan</p> <p>Chapter 3: Settlement & Housing</p> <p>Policies S-1 to S-19 define urban and rural settlement designations and servicing provisions.</p>	CD
6-3	<p>It is recommended that for the defined urban development areas, full municipal services be required for all new development. Priority should be given to the provision of municipal services within urban areas which produce an intensive and compact form of development. HRM will direct that sufficient municipal water and sanitary sewerage facilities should be provided to urban areas, within the financial capability of the municipality to accommodate anticipated growth for a specified period of time. Council should ensure that at least a 20 year supply of serviced lands in the urban development area will be maintained at all times. Servicing capacity can be reassigned in some urban areas (outside the urban core) if a plan of subdivision is not registered within three years of draft approval. Provision of partial services should be discouraged to reduce potential for wastewater system failures.</p> <p>For rural settlements/service centres a hierarchy approach to defining service priorities should be applied as defined in Chapter 7.0.</p> <p>The feasibility of the options in order of priority should be based on an evaluation of:</p> <ul style="list-style-type: none"> • the scale and form of development; • physical or environmental constraints; • potential cumulative impacts to ground and surface water resources; • comparison of costs and benefits of the alternatives including costs associated with planning, construction, start-up, operation, maintenance, financing and replacement; • funding availability. 	<p>Municipal Planning Strategy and By-Law, Municipal Service Systems Design Guideline, Business Plans and Budgets , Capital Cost Contribution Policy</p> <p>Through the Multi Year Financial Strategy and the Capital Cost Contribution Policy, this recommendation is achieved now in some areas. There is more to do.</p> <p>Regional Planning is directing this recommendation and considers it a high priority. The initial step is a study to examine the feasibility of the various in-ground management options (see Recommendation 6-2) and the criteria around them. This study is complete. Service centres are established in Regional Plan policies.</p>	<p>Final Draft Regional Plan Policies S-1 to S-19</p> <p>Chapter 3: Settlement & Housing</p> <p>Regional Plan Policies S-6 to S-8</p>	CD

	<p>In rural resource areas, individual on-site systems are recommended for wastewater service.</p> <p>Regular surveys and forecasts should be undertaken to implement this policy (e.g. 5 year updates).</p>			
6-4	<p>It is recommended that the following criteria be considered when reviewing requests for extensions of services or changes to the urban development area:</p> <ul style="list-style-type: none"> • Municipal sewers or water may be extended outside the urban area where required to correct an existing health problem; • Extensions may be permitted for necessary operating purposes, such as the looping of existing mains, the replacement of existing mains and the interconnection of urban areas; • Where full servicing is being discouraged for areas adjacent to urban areas policies can be developed to state that expansions on individual water and septic is not allowed except for once per settlement area in order to "round" the area, and add a maximum of 5 residential units; • Amendments to boundaries may be considered to implement the results of reviews of municipal population and housing forecasts; • Delete designation if total land available for urban area does not show a need for additional lands to be designated; • Consideration and evaluation of alternative/expansion development policies must include analysis of impacts on natural heritage and availability of existing or committed infrastructure, impacts of increased densities, agricultural capability, financial capability of the municipality as well as population/employment forecasts; • Consideration of other matters deemed necessary by Council; • Compliance with buffer and distance separation policies/regulations such as those for aggregate and sand deposit extraction, forestry and fishing in rural and coastal areas; • Consideration of fiscal impacts including property assessments; • That alternatives to the provision of piped municipal water and sewer services have been thoroughly investigated; • The development is in compliance with the desired pattern of development within the local area and the region; 	<p>Municipal Planning Strategy and By-Law, Municipal Service Systems Design Guideline, Capital Cost Contribution Policy</p> <p>Existing policies cover some of the criteria in this recommendation. Staff have the general authority to implement most of the recommendation.</p>	<p>Regional Plan</p> <p>Chapter 7: Water, Wastewater, Utilities and Solid Waste</p> <p>Policy SU-5</p>	<p>CD</p>

<ul style="list-style-type: none"> • That the development is within a reasonable distance of existing infrastructure; • That the development is contiguous to an existing subdivision serviced with water and sewer; and • That there are sufficient community services in the area capable of servicing the development. <p>In addition, where full servicing is expected to be supplied in the future, HRM should consider encouraging lot development that will allow for subdivision in the future to increase densities and compact settlement form (e.g. buildings placed on side of lots).</p>			
Chapter 7.0 Wastewater Management			
<p>7-1 It is recommended that HRM develop a hierarchy of wastewater management forms to be used for new development in designated rural settlement/service centres as designated through the Regional Plan.</p> <ul style="list-style-type: none"> • Central collection and treatment with surface water discharge is the preferred form of servicing for designated rural settlement/service centres. These systems should only be permitted at locations designated by the Municipality as a focal point for the provision of a mix of commercial, residential, community facility, entertainment and employment services to the surrounding rural settlement area. Lot creation will be permitted only if sufficient sewage treatment plant capacity will be available to accommodate it; • Communal system with subsurface discharge is the preferred means of servicing multiple lots/units in rural settlement/service centres where it is not feasible to implement a central collection and treatment system, where conditions are suitable over the long term and appropriate management plans are in place for system maintenance, and where lot sizes can be reduced to allow the clustering of development on a small portion of the site; and • Rural settlement/service centres may be serviced by individual on-site systems where the use of communal systems is not feasible and where conditions are suitable over the long term. <p>The preferred method of servicing for the rural settlement/service centres would be determined through a study of the options available. The selection of the preferred method would consider capital and operational financial aspects of the potential service options.</p> <p>In low density resource-based areas, outside of the designated rural settlement/service centres, individual on-site systems will continue to be the form of wastewater servicing.</p>	<p>Municipal Planning Strategy and Land Use By-Law</p> <p>Through the Multi Year Financial Strategy and the Capital Cost Contribution Policy, this recommendation is achieved now in some areas.</p> <p>The initial step was a study to examine the feasibility of the various in-ground management options (see Recommendation 6-2) and the criteria around them. This study is complete. Service centres are established in Regional Plan policies.</p>	<p>Regional Plan</p> <p>Policies SU-1 to SU-19</p>	<p>RP</p>

7-2	<p>It is recommended that HRM develop a hierarchy of wastewater management forms to be used when remediating failed individual on-site systems. Remediating on-site wastewater treatment systems should recognize that:</p> <ul style="list-style-type: none"> • when single failures are identified it is preferred that they be remediated or replaced with individual on-site systems where there is space available; • communal services are the preferred means of servicing multiple lots/units in areas where multiple failures have been identified, where conditions are suitable over the long term; and, • central collection and treatment with surface water discharge is to be provided where there is a large number of failures and/or where the above methods cannot be utilized. 	<p>Environmental Policy</p> <p>This policy will be developed using in part the conclusions of the study identified in 6-2: Options Study for On-site and Small Scale Wastewater Management.</p>	<p>Regional Plan Policies SU-1 to SU-19</p>	<p>CD HW</p>
7-3	<p>It is recommended that HRM consider the use of Wastewater Management Districts or condominium agreements for communal systems with subsurface discharge.</p>	<p>Municipal Planning Strategy and By-Law</p> <p>This will be considered as part of the Options Study for On-site and Small Scale Wastewater Management as identified in 6-2 and 6-3.</p>	<p>Final Draft Regional Plan Policies SU-18 to SU-20</p>	<p>CD</p>
7-4	<p>It is recommended that methods of public education and information dispersal be implemented on septic system operation and management. The program should be prepared in cooperation with other levels of government and based on improving public awareness of septic system management, operation and maintenance requirements and other matters of environmental and public health concern.</p>	<p>Environmental Policy</p> <p>This is part of a management system, however, a Level I education plan can begin immediately and at little cost to the Province and HRM via distribution of data. It is important to insure a long-term view of education and develop a partnership with the Province on this. This can be done through the Environmental Education Committee. Future costs will be identified in the Business Plan.</p>	<p>Flush-Less Program implemented 2003-2004 in Kingswood and Fall River areas. Partnership with Clean Nova Scotia and Environment Canada.</p>	
7-5	<p>It is recommended that HRM request that NSDEL use the on-site system data base to evaluate system failures.</p>	<p>Environmental Policy</p> <p>Regional Planning will attempt to acquire the data for analysis and Environmental Management Services will determine if the data base will be helpful to evaluate and avoid future problems.</p>	<p>Ongoing discussions with NSDEL.</p> <p>Regional Plan Section 7.3.2</p>	<p>CD IAM</p>
7-6	<p>It is recommended that HRM cooperate with NSDEL to undertake a study to evaluate failures of on-site systems with central water servicing. It is further recommended that if there is a trend of failures identified, HRM request that NSDEL review the requirement for larger capacity on-site sewage disposal systems when approving lots to be serviced with on-site wastewater treatment and central water services.</p>	<p>Environmental Policy</p> <p>The Province is the lead with on-site systems. However, HRM has a vested interest. To meet the aims of the recommendations, HRM shall start discussions with the Province.</p>	<p>Ongoing discussions with NSDEL.</p>	<p>IAM</p>

7-7	It is recommended that HRM encourage homeowners to install water conservation devices.	Environmental Policy HRM now pursues this through the Development Agreement process and will partner with the Halifax Regional Water Commission and the Province to pursue further.	Requires further action with HW Final Draft Regional Plan Section 7.5.1	HW
7-8	It is recommended that the existing infrastructure be prioritized by watershed for the purposes of I/I evaluation. The watersheds should then be examined to determine sources of I/I and action plans developed to either eliminate the source of I/I or expand collection and treatment facilities.	Environmental Policy, Capital Budget Staff will develop a priority list and identify in the capital budget as necessary.	HW 25-Year Capital Plan and annual capital budgets.	HW
7-9	It is recommended that HRM perform wet weather flow studies to evaluate the merits of separating sewers and/or reducing CSOs.	Environmental Policy, Capital Budget Funds have been provided in the Capital Budget for the sewershed of the Halifax STP. Funds will be provided for other sewersheds through the budget process.	Ongoing sewershed studies, Halifax and Dartmouth. HHSP has undertaken some sewer separation in downtown Halifax, to eliminate CSOs.	HW
7-10	It is recommended that when sanitary sewers are to be installed, the design must include provision for stormwater management, including the management of stormwater from roof leaders and foundation drains.	Municipal Service Systems Design Guideline The next amendment of the Design Guideline will allow for this requirement.	Consideration for implementation through Stormwater Guidelines (see 8-1).	HW
Chapter 8.0 Stormwater Management				
8-1	It is recommended that HRM develop stormwater management guidelines to be used throughout the Municipality.	Municipal Planning Strategy, Environmental Policy Need interpretative guidelines for drainage works approvals now due to Nova Scotia Department of Environment and Labour policy. Must develop more comprehensive guidelines and recommend a study to develop this be started immediately.	Consulting study completed, Guidelines published. Regional Plan Section 7.5.2 Policy SU-28	CD HW
8-2	It is recommended that, where HRM has identified particularly sensitive watersheds, a watershed approach to stormwater management be applied.	Municipal Planning Strategy and By-Law Done in Master Plans now. Under Regional Planning, will be required in all community plans. Regional Planning will map any sensitive areas.	Final Draft Regional Plan Section 2.3 Policy E-17	CD

8-3	<p>It is recommended that the stormwater management guidelines require:</p> <ul style="list-style-type: none"> • pre-development hydrology be maintained or enhanced to the extent practical, keeping in mind the potential for basement flooding, groundwater contamination and inflow and infiltration to the sanitary sewer. It is also recommended that natural systems should be preserved and maintained; • the volume of sediments and contaminants being discharged into the storm sewer system and eventually into a receiving water be reduced to levels that are not harmful to the intended use of the receiving waters and shall not exceed current limits under the wastewater discharge by-law; • peak storm discharges be reduced through a hierarchy of source, conveyance, and end-of-pipe control measures to reduce the risk of flooding and stream bank erosion in a watershed approach; • emerging technologies be considered for water resource management with an emphasis on the importance of natural systems; and • developers be required to investigate the cumulative effects of existing and future developments on the downstream environment. 	<p>Municipal Planning Strategy and By-Law</p> <p>Need interpretative guidelines for drainage works approvals now due to Nova Scotia Department of Environment and Labour policy.</p>	<p>See 8-1</p> <p>Regional Plan</p> <p>Stormwater Guidelines</p> <p>Section 7.5.2</p> <p>Policy SU-28</p>	CD
8-4	<p>It is recommended that a public education plan be instituted to inform storm sewer users of their potential effect on the environment.</p>	<p>Environmental Policy, Business plans and Budgets</p> <p>The source control program is now underway with focussed education as a significant part of the program.</p>	<p>Ongoing campaign – “Only Rain in the Storm Drain”; By-Law W-101 enforcement.</p> <p>Regional Plan</p> <p>Section 7.5</p>	HW
8-5	<p>It is recommended that erosion and sediment control shall be applied to all development and construction approvals through the development of policy that includes lot level erosion and sediment control.</p>	<p>Municipal Planning Strategy and By-Law</p> <p>The study identified in 8-1 and 8-3 will determine the resources required for this.</p>	<p>Regional Land Use By-Law</p> <p>See also 8-1</p>	CD
8-6	<p>It is recommended that a Floodway designation in Zoning mapping be established that reflects the 1:20 year floodways and a Floodway Fringe designation of the 1:100 year floodway fringe of the Sackville River and the Little Sackville River as defined by mapping of the Canada-Nova Scotia Flood Reduction Program, and adjacent to other rivers where similar conditions are recognized.</p>	<p>Municipal Planning Strategy and By-Law</p> <p>Analysis to establish mapping priorities is presently being carried out under the Regional Plan.</p> <p>The cost of floodplain mapping which is required in large development areas will be completed as part of a Master Plan, and can be recovered from developers</p>	<p>Regional Plan</p> <p>Policies E-14, E-15</p>	CD

		through the Capital Cost Contribution Program.		
		Floodplain mapping which may be required in existing developed areas will be costed and carried out separately as part of a community plan.		
8-7	It is recommended that for watercourses which have not been mapped under the Canada-Nova Scotia Flood Damage Reduction Program, the provisions of designated floodplains be applied. Mapping will be undertaken on a watershed basis. Watersheds will be prioritized based on environmental sensitivity, historical flooding and development pressure.	Municipal Planning Strategy and By-Law	Regional Plan Policies E-14, E-15	CD
8-8	It is recommended that within the Floodway designation a Floodway Zone be established, encompassing the 1:20 year floodway, in which conservation related uses, public and private parks and playgrounds, recreation uses, roadways, utility and service corridors, parking lots, temporary uses and uses of a similar nature shall be permitted. Notwithstanding that these uses shall be permitted, any structures intended for human habitation, whether permanent or temporary, shall be prohibited, and the placement of off-site fill shall be prohibited.	The master planning process will identify the need for floodplain protection in the priority growth areas.		
8-9	It is recommended that the redevelopment of existing uses within the 1:20 year floodway be permitted through the development agreement process, subject to the proponent agreeing to maintain, or enhance where possible, the water retention capabilities of the floodway			
8-10	It is recommended that the 1:100 Floodway fringe be identified on the Zoning map. Permitted uses within the floodway fringe should be determined by the underlying zones. Further to the applicable zone requirements, require floodproofing of structures erected within the 1:100 floodway fringe and regulate the placement and stabilization of fill necessary for the floodproofing of permitted structures unless the structures have been specifically designed to accommodate water flow and storage.	Further analysis which is presently being done under the Regional Plan will determine large new development areas that require flood- plain mapping and protection.		
8-11	Notwithstanding the uses permitted within the zones underlying the Floodway fringe, it is recommended that any use associated with the warehousing or the production of hazardous materials be prohibited. Prohibit the placement of off-site fill except as required for flood proofing or flood risk management.			
8-12	It is recommended that where existing uses are established within the floodway, the expansion of any structures that increase the area of the structure at or below the flood proof elevation be prohibited.			
8-13	It is recommended that a proponent for a development be required to complete a hydrotechnical study to determine the 1:20 year Floodway and the 1:100 year Floodway fringe, where there is a known floodplain.			
8-14	It is recommended that development contrary to these Floodplain Protection policies be considered, provided a hydrotechnical study, carried out by a qualified person, shows that the proposed development will not contribute to upstream or downstream flooding or result in a change to flood water flow patterns. On the basis of such a study, the rezoning of Floodway Zone lands to Floodway Fringe Zone or to the abutting zone be allowed. Also consider the rezoning of Floodway Fringe Zone to the abutting zone.			
8-15	It is recommended that within the Floodplain Designation a mixed use designation be applied to those lands beyond the 1:20 year floodplain but within the 1:100 year floodplain. Consider only permitting buildings within the 1:100 year floodplain by development agreement and according to the provisions of the <u>Municipal Government Act</u> . In considering any such agreement, have regard to the following:			

	<p>(a) that adequate flood proofing measures are undertaken for any building;</p> <p>(b) that the type of residential development is consistent with that permitted by the zone within which the lands are located and that the minimum standards for such developments are no less than those required by the zone unless necessary for reasons of safety; and</p> <p>(c) the environmental protection of the watercourse with respect to proper storm drainage.</p>			
8-16	It is recommended that, to minimize the effects upon natural stormwater flows, control be exercised over the placement and stabilization of fill necessary for the floodproofing of structures permitted within the Floodplain Designation. Further, through the review of subdivision applications, co-operate with the Department of Transportation and Public Works to ensure that any roadways proposed within the Floodplain Designation meet the requirements.			
Chapter 9.0 Performance Measurement				
9-1	<p>It is recommended that all development agreements should include the following elements:</p> <p>requirement for a water quality monitoring plan addressing pre -development, development and post development periods;</p> <p>monitoring to include a basic level of monitoring to be established in by-law, and additional measures specific to the site and development conditions as appropriate;</p> <p>requirement for baseline water quality information;</p> <p>long-term monitoring to include community volunteers as appropriate;</p> <p>sampling, analysis and monitoring procedures to follow valid methods;</p> <p>results to be provided promptly to HRM and the appropriate WAB; and</p> <p>HRM to retain database of monitoring results.</p>	<p>Municipal Planning Strategy and By-Law</p> <p>The study identified in 8-1 will set the requirements of a monitoring program that will identify the effectiveness of our requirements for storm water management. The recommendations in the Halifax Watershed Advisory Board's report "Recommendations for Monitoring Freshwater Quality to Assess Impact of Development in the Halifax Regional Municipality" will be considered when these requirements are developed.</p>	<p>Regional Plan</p> <p>Section 2.4.1</p> <p>Policy E-18</p>	<p>CD</p> <p>IAM</p>
9-2	It is recommended that HRM undertake a water quality monitoring program in the order of 50 to 70 sites per year, 3-4 times per year for 4 physical chemical base parameters and occasional more complex analyses including bioindicators. In addition to this HRM will undertake lake based or watershed based studies to establish community based water quality objectives, targets and monitoring parameters and to establish comprehensive development criteria. These studies will be phased over time and be implemented based on need and when funding is available.	<p>Environmental Policy, Business Plans and Budgets</p> <p>Identify through the business plan and budget process.</p>	<p>Regional Plan</p> <p>Policy E-18</p>	<p>IAM</p>

9-3	<p>It is recommended that performance measures be developed in cooperation with other levels of government and organizations, to include:</p> <p>Review the adoption of fundamental parameters and targets with other levels of government, specifically NSDEL and DFO.</p> <p>Negotiate with NSDEL and Environment Canada in the development of a water quality monitoring program consistent with those in other provinces.</p> <p>Cooperate in the adoption of the CABIN bio-indicators program, with the adoption of sites in HRM.</p>	<p>Environmental Policy</p> <p>The Province is now considering defining objectives for Nova Scotia. HRM will confer with the Province and consider using or adapting theirs.</p>	<p>Studies undertaken through NSDEL Water Quality Objectives and Model Development Steering Committee 2004 – developed process to establish water quality objectives, and developed a standard lake phosphorus model for general use.</p>	CD
9-4	<p>It is recommended that water quality monitoring/ performance measures data be reviewed as it becomes available in HRM on an annual basis and to assess the effect of development as measured against the objective standards established for water quality. As established water quality standards/targets are approached, consider further actions to avoid exceeding water quality targets and performance measures.</p>	<p>Environmental Policy</p> <p>Identify priorities through the business planning process.</p>	<p>Ongoing data collection and compilation. Purchase of a compiled water quality database is complete.</p>	IAM