SCREENING REPORT

HALIFAX HARBOUR SOLUTIONS PROJECT

HALIFAX, NOVA SCOTIA

Prepared By

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

January 2003

PROJECT INFORMATION

Project Name:	Halifax Harbour Solutions Project
Project Location:	Halifax Regional Municipality
Purpose of the Project:	To construct and operate three sewage treatment plants, collection systems, outfalls, a sludge management facility and ancillary works to reduce inflow of raw sewage and improve water quality in Halifax Harbour and surrounding waters
Responsible Authorities:	Infrastructure Canada Fisheries and Oceans Canada Department of National Defence Parks Canada Halifax Port Authority
Environmental Assessment Trigger:	Provision of funding, issuance of permits and transfer of lands to the proponent for the purpose of enabling the project
Environmental Assessment Process:	Screening of the project and preparation of a screening report, including consideration of public comments
Environmental Assessment Start Date:	March 2002
Project Proponent:	Halifax Regional Municipality

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ACRONYMS

Acronyms used throughout the document are listed below for the reader's convenience. Those acronyms used only locally in the document are referenced in the appropriate sections of the document.

ADWF	Average Dry Weather Flow
Ag. Canada	Agriculture and Agri-Food Canada
BOD	Biochemical Oxygen Demand
CEAA	Canadian Environmental Assessment Act
CLC	Community Liaison Committee
CSO	Combined Sewer Overflow
EPA	Environmental Protection Agency (U.S.)
FCR	Federal Coordination Regulation
HHSP	Halifax Harbour Solutions Project
HHTF	Halifax Harbour Task Force
HREP	Halifax Regional Environmental Partnership (the Company)
HRM	Halifax Regional Municipality
I/I	Inflow / Infiltration
NSDEL	Nova Scotia Department of Environment and Labour
RA	Responsible Authority
SCADA	Supervisory Control And Data Acquisition
SS	Suspended Solids
STP	Sewage Treatment Plant
UV	Ultraviolet Radiation
VEC	Valued Ecosystem Component
VOC	Volatile Organic Compound
VSC	Valued Social Component

SUMMARY OF THE ASSESSMENT

This document is intended to provide a summary description of the proposed Halifax Harbour Solutions Project (HHSP) and its potential interaction with the surrounding environment. As a result of their responsibilities in relation to the Halifax Harbour Solutions Project, Fisheries and Oceans Canada is considering issuing permits with respect to the Navigable Waters Protection Act. Parks Canada and the Department of National Defence are considering the transfer of interests in land to allow the project to proceed. The Halifax Port Authority is not currently a Responsible Authority (RA) for the project under the Canadian Environmental Assessment Act (CEAA). However, they may be involved in the transfer of interest in lands that would enable the project to proceed and have therefore participated in the assessment process as if they were a RA. Infrastructure Canada is considering the provision of funding for the project. Consequently, these departments are Responsible Authorities pursuant to the Canadian Environmental Assessment Act, and must ensure that an Environmental Assessment of the proposed project is carried out. In this regard, this screening report defines the scope of project, identifies project - environment interactions and specifies measures required to mitigate potential environmental effects to insignificant levels. Based on revised outfall and diffuser design, Environment Canada will not be required to issue a permit for Disposal at Sea, and consequently is not a Responsible Authority. Environment Canada has however provided ongoing expert advice during the course of this assessment. Advice regarding the environmental assessment process and procedures under the CEAA and it's regulations was provided by the Canadian Environmental Assessment Agency was provided throughout.

In 2001, a consultant prepared, on behalf of Halifax Regional Municipality (HRM), the proponent, an environmental screening report for the Halifax Harbour Solutions Project. Upon initial review of this document, *Halifax Harbour Solutions Project Environmental Screening (October 2001)*, it was determined that the project description was incomplete and would require inclusion of the sewage sludge management system and any potential effects of this process on the environment. Upon selection of a contractor, Halifax Regional Environmental Partnership (HREP), to form the Public - Private Partnership for the construction and operation of the project, additional detail on various components of the project, including the sewage sludge management system and modifications to the initial outfall and diffuser design was provided in the document *Halifax Harbour Solutions Project Environmental Screening Addendum 1 (March 2002)*.

Review of the assessment documents by the Responsible Authorities and expert departments identified concerns and items requiring further clarification that were addressed by the proponent in the documents *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* and *Halifax Harbour Solutions Project Environmental Screening Addendum 3 (September 2002)*. As a result of this review process and changes to the project over the review period, a revised project description was provided by the proponent in the document *Halifax Harbour Solutions Project Revised Project Description (October 2002)*.

This report summarizes the findings of the environmental assessment that has been carried out. A draft of the report was made available for public review and comment in December 2002. Responses were received from approximately twenty individuals and public interest groups. Their comments as well as previous correspondence from the public concerning the HHSP were taken into account in finalizing the report.

Upon review of the findings of the environmental assessment and consideration of comments received from the public, the Responsible Authorities have determined that the HHSP is not likely to cause significant adverse environmental effects, taking into account the implementation of mitigation, monitoring and follow-up measures. Accordingly, pursuant to subsection 20(1)(a) of the CEAA, the Responsible Authorities may exercise any power or perform any duty or function that would permit the project to be carried out.

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1.0 INTRODUCTION

Halifax Regional Municipality (HRM) proposes to develop a regional sewage treatment system to treat raw sewage currently discharged directly into Halifax Harbour. The project will involve the construction and operation of :

- three sewage treatment plants (Halifax, Dartmouth and Herring Cove);
- associated sewage collection systems;
- outfalls and diffusers;
- combined sewer overflows;
- a sludge handling facility; and
- ancillary works such as access roads.

HRM carried out an Environmental Impact Assessment of the project. This assessment included a physical oceanography component conducted by Coastal Oceans Associates and a transportation component carried out by Atlantic Road and Traffic Management. Additional component studies were carried out, including a human health risk assessment, an odour and noise background study, avifauna studies, commercial fisheries and marine benthic habitat studies, archaeological and geotechnical studies.

Federal authorities have been involved in reviewing this assessment, providing critical review and advice. The purpose of this document is to provide a summary of the results of the assessment and to outline any additional mitigation measures that may be required. This report is a summary of the results of the environmental assessment studies, public participation, mitigation and follow up that have been detailed in various reports prepared by HRM. It is provided in order to frame the CEAA, Section 20, decision to be made by the Federal Responsible Authorities for this project.

1.1 Purpose and Need for the Project

The purpose of the project is to provide enhanced primary level treatment with UV disinfection for the untreated municipal sewage discharges to Halifax Harbour. At present, a population of approximately 225,000 people discharge over 150 million litres of untreated sewage into Halifax Harbour daily and this is expected to increase substantially as the population of HRM grows. Currently, water quality and aesthetics are poor along the shoreline due to the presence of floatables, particulates and odours. Contaminated sediments exist in the vicinities of the existing outfalls and shellfish harvesting is prohibited in the harbour.

The Halifax Harbour Task Force Final Report (1990) proposed Environmental Quality Guidelines based on water quality objectives, which were used to adopt a water use classification system for various parts of the harbour. This classification was based on the importance of each part of the

harbour to primary user groups and the assimilative capacity of the receiving waters. The Outer Harbour was classified as being suitable for bathing and contact recreation, shellfish harvesting for direct human consumption, and for fish and wildlife habitat. The Middle Harbour and the Bedford Basin were identified as suitable for bathing and other primary contact recreational activities, shellfish harvesting for human consumption after depuration, and for fish and wildlife habitat. The Inner Harbour and the Narrows were deemed appropriate for boating and other secondary contact recreational activities, industrial cooling, good aesthetic value, and for fish and wildlife habitat. Since that time, the Halifax Harbour Solutions Advisory Committee has recommended upgrading the Northwest Arm from the lowest classification level to, as a minimum, that for the Middle Harbour and the Bedford Basin. The proposed project is intended to achieve the above-noted objectives and as such, will significantly improve the water quality of the harbour.

1.2 Project Proponent

The project proponent is the HRM.

1.3 Environmental Assessment of the Project

The environmental assessment of the HHSP is being conducted in accordance with the requirements of the CEAA. This screening report summarizes the environmental effects of the proposed project, including cumulative effects that could develop in conjunction with other proposed projects, and effects arising from accidents or malfunctions. Consideration is given to requirements for mitigation, monitoring and follow-up and comments from the public.

1.4 Sources of Information

The information contained in this screening report is based upon the review and analysis of the HHSP, including information from the reports listed below.

Halifax Harbour Solutions Project Environmental Screening (October 2001)
Halifax Harbour Solutions Project Environmental Screening Addendum 1 (March 2002)
Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)
Halifax Harbour Solutions Project Environmental Screening Addendum 3 (September 2002)
Halifax Harbour Solutions Project Revised Project Description (October 2002)
Halifax Harbour Solutions Project Screening Level Human Health Risk Assessment (April 2001)

Section 7.0 contains a list of reference material.

2.0 PROJECT DESCRIPTION

2.1 Project Overview

The regional sewage treatment Project for Halifax Harbour is proposed to include construction and operation of three Sewage Treatment Plants (STPs) (Halifax Peninsula; Dartmouth; and Herring Cove) and associated collection systems that will provide advanced primary level of treatment with UV disinfection. Initial average daily STP capacity flows for the STPs are estimated to total 2.85 m^3/s, with peak flows totaling 7.43 m^3/s. Future (2041) average daily flows are anticipated to reach 3.46 m^3/s with peak flows totaling 9.07 m^3/s (HRM 2000). Each STP will have a marine outfall and diffuser for the discharge of treated effluent. All STPs will include onsite sludge dewatering.

The STPs will be designed, built and operated by Halifax Regional Environmental Partnership (HREP) while the collection systems will be built by the HREP but operated by HRM. A sludge management facility will be constructed, owned and operated by the HREP. Plants and associated infrastructure are planned for construction over approximately a five-year schedule, with the timing and ultimate completion based on funding availability. The primary source of funding (two-thirds of the capital costs and all of the operating costs) for the project is a pollution control surcharge applied to HRM municipal water use charges. HRM is currently seeking the remaining one-third of capital funding required from federal and provincial levels of government. At the time this document was prepared, $30M in funding from both federal and provincial sources has been announced. The distribution of federal funds is conditional on the findings of the environmental assessment.

2.2 Project Location and Scope

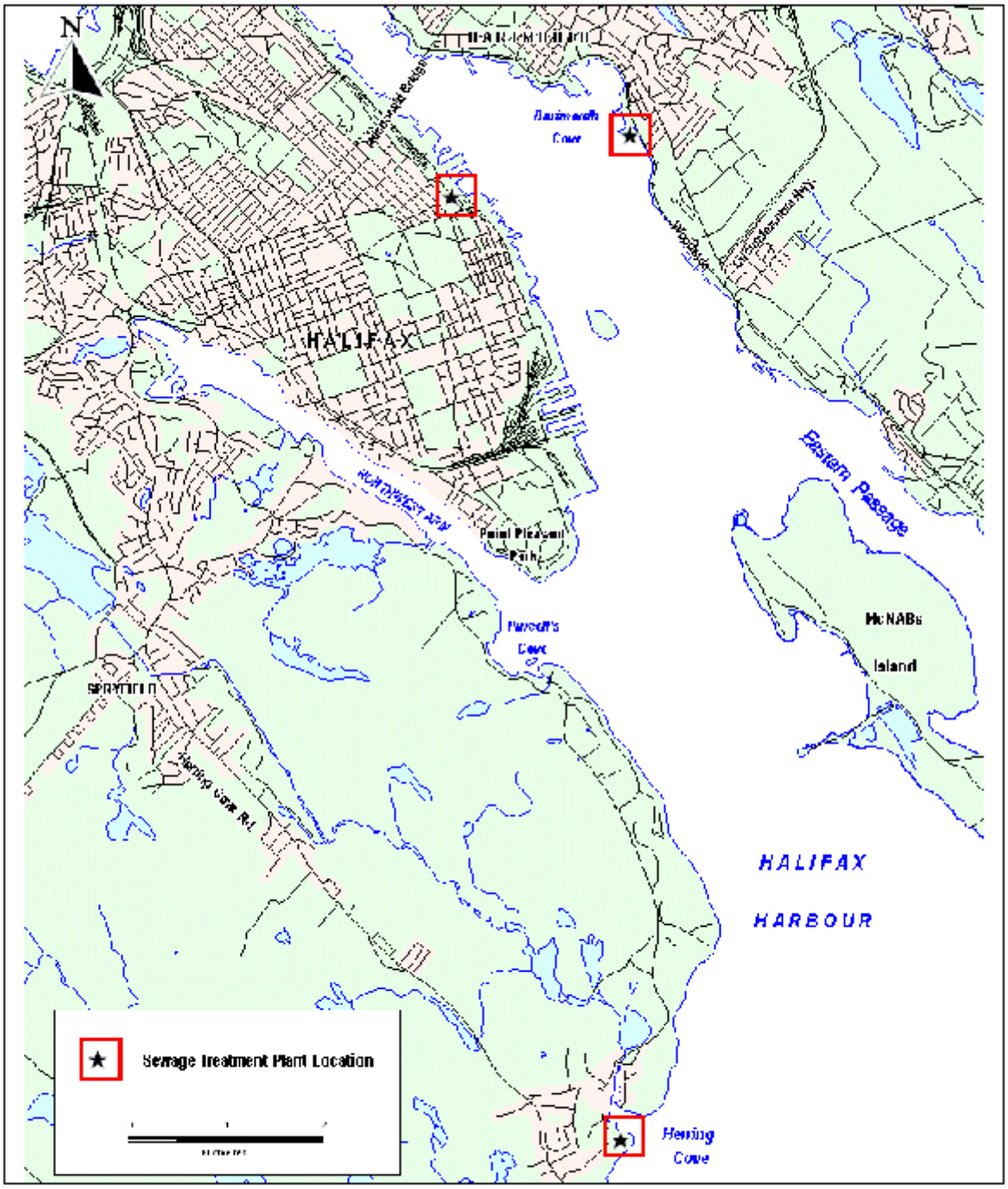
Major untreated outfalls exist along both the Halifax Peninsula and Dartmouth waterfronts from the Narrows to the harbour mouth, with an additional untreated outfall outside the harbour mouth near Herring Cove carrying sewer discharge from Mainland South Halifax. Approximately 85% of the untreated sewage currently entering the harbour is discharged from six major outfalls. The proposed concept involves: one STP to serve Dartmouth and be located on a portion of the Coast Guard base south of the downtown Dartmouth; one STP to be located south of the Harbour Narrows, on Barrington and Cornwallis Streets to serve the Halifax Penninsula; and a third STP located in Herring Cove to serve Mainland South. The locations of the STP's are shown in **Figure 1**. A sludge management facility will be located at a proposed site in the Aerotech Industrial Park near Halifax Airport, as indicated in **Figure 5.**

HRM currently owns or is in the process of acquiring land for the three STP sites. Outfall and diffuser locations are based on; sufficient depth and current to achieve adequate mixing of treated effluent, proximity to the STPs, and avoidance of conflicts with navigation and anchoring. HREP has developed site plans for the outfalls and diffusers to obtain pertinent approvals such as those required by the *Navigable Waters Protection Act*.

The collection system infrastructure is proposed to consist of a combination of limited tunneling, with the remainder of the sewage collection pipes installed in surface trenches. Some pumping with forcemains will be required, but gravity mains will be used whenever possible.

The STPs will be designed to initially provide advanced primary treatment. This level of treatment includes mechanical solids separation augmented by chemical treatment to enhance removal of suspended solids. Effluent will be disinfected with ultraviolet (UV) radiation prior to discharge. The proposed plant design and sites will provide for the possible future addition of secondary treatment processes should this become necessary, as well as future capacity expansion if this is required.

The STPs will be designed to restrict odour and noise. They will also be designed and landscaped to be compatible with surrounding land uses.



Halifax Harbour Solutions Project

Figure 1

Sewage Treatment Plant Locations

2.3 Project Schedule

Construction of the STPs and associated collector systems and outfalls will be phased over approximately five years, starting with Halifax and ending with Herring Cove. Site preparation work in Halifax is proposed to commence in late 2002, with construction beginning in 2003. Construction would begin in Dartmouth in the latter part of 2004 or 2005, and in Herring Cove in 2006. It is anticipated that each STP, related collection systems, and outfalls / diffusers will require approximately 18 to 24 months to construct.

The sewage collection systems will have a minimum design life of 60 years. The STPs, outfalls, and diffusers will be designed, constructed, and commissioned with a design life for structural components of at least 60 years, mechanical components of at least 25 years, and electrical instrumentation components of at least 15 years.

2.4 Project Design and Construction

Construction activities will be conducted in accordance with industry standards and practices and will conform to, or improve upon, requirements of all applicable legislation, codes, standards, specifications, and guidelines.

2.4.1 Sewage Collection Systems

New sewage collection systems are required to intercept and collect sewage from the existing sewer system, and deliver it to the STPs. Some of the existing outfalls will be consolidated in this process; others (15-20) will remain as combined sewer overflows (CSOs). The normal design flow will be 4 x average dry weather flow (ADWF) estimated by HRM for the year 2041 from the sewersheds of Halifax, Dartmouth, and Mainland South/Herring Cove. Excess flows will either be stored for treatment or will outfall to the Harbour through CSOs. Overflow effluent at the CSO locations will be highly diluted by the stormwater component. These discharges are not expected to conflict with the water quality objectives for the Inner Harbour. While discharges may cause occasional local deviations in water quality objectives for the Northwest Arm, overall water quality objectives are expected to be met. (HRM 2001, 2002a). CSOs will be equipped with screens to remove floatables.

The collection systems will include sections of conventional gravity collector sewers, pumping stations with back-up generators, dual forcemains, and tunnel sections. The collection systems will be designed and

constructed with specific entry (pick-up) points both for HRM's existing sewers and other sewers where feasible (*e.g.*, DND). Tunnels will have excess capacity which will serve to reduce overflow events. Where pumping stations and forcemains are constructed in lieu of tunnels, the system will be designed for 5 x ADWF to further reduce overflow events. Options for further reducing overflow events will be evaluated depending on the frequency and volume of the events and the system design options.

The principal interception point for the Northwest Arm combined sewer will be at the Atlantic School of Theology (AST). A pumping station will be located on AST property, with a forcemain running up to Pine Hill Drive and thence along city streets to Young Avenue, Atlantic Street, South Bland Street and Inglis Street to Barrington Street and on to Sackville Street. To collect inflows to the Northwest Arm sewer south of the AST property, a small pumping station is proposed near the northern limit of Point Pleasant Park on park property. This small pumping station will be primarily underground. In the north end of Halifax, the proposed collection system follows DND property to the STP site. In Dartmouth the proposed collection system north of the Macdonald Bridge follows CN lands. Additional pumping stations and forcemains will be located as necessary to convey sewage.

Sewage trenching and installation will generally proceed along established rights-of-way (*e.g.*, roads). Related undertakings include; excavation (*i.e.*, digging, ripping, blasting), sewer installation, backfilling and repair of roads. Sewer installation or repair may cause noise, traffic delays and restriction in access to some properties. These inconveniences will be temporary as the sewer installation proceeds, and would be managed through standard traffic and construction management procedures. This type of construction activity is typical for municipal infrastructure projects (*e.g.*, roads, water lines, sewers) and is generally well recognized by the public as necessary to maintain or improve vital components of municipal services.

Tunneling, where necessary, may be conducted using a tunnel boring machine. Blasting, if required, will be conducted in accordance with applicable regulations and guidelines. Blasting in or near fish bearing waters shall be conducted in accordance with the DFO Fact Sheet; Blasting - Fish and Fish Habitat Protection. Blasting will also be conducted in accordance with the *General Blasting Regulations* made pursuant to the Nova Scotia *Occupational Health and Safety Act*. The contractor performing the blasting will have a valid Blaster's License, obtain a blasting permit from HRM, and ensure that a pre-blast survey has been conducted as required by HRM.

2.4.2 Sewage Treatment Plants

Sewage treatment plants will be constructed at each of the three proposed sites. Existing STPs at Mill Cove (Bedford) and Eastern Passage will continue in operation. A phased approach is proposed for STP construction and operation with priorities for construction being Halifax, followed by Dartmouth and then Herring Cove.

Priorities have been determined by site availability, the need to address the most serious present outfall impacts, the need to provide treatment for both sides of the harbour, and options for consolidating outfalls. Project components will be phased in over approximately five years.

The minimum process requirements for the new sewage treatment plants will include:

- raw sewage pumping as required based on the hydraulic gradient, site elevation, and outfall conditions;
- screening;
- grit removal;
- chemical flocculation and settling followed by UV radiation to produce an effluent which consistently meets effluent standards; and
- biosolids handling and management (each facility will include onsite dewatering of biosolids, with transport to offsite processing facilities).

The treatment plants located on the Halifax Peninsula and in Dartmouth will utilize innovative design in order to minimize land requirements (maximum 1.5 to 2 ha). Designs will be used which have been proven and successfully applied in other locations, treating municipal sewage at similar flow rates. At the treatment plant site near Herring Cove, compact type plant design may be used depending on suitability of the selected site. Buildings will be designed to efficiently utilize land area and as well to provide for future expansions and possible upgrades to secondary treatment. The STPs will be designed to be aesthetically attractive and visually compatible with the surrounding area and land uses. The plant facilities will be completely enclosed under negative pressure, with full odour and noise controls. Power and other municipal services (*e.g.*, potable water, sewer connection) will also be provided.

Construction activities associated with an STP are typical for construction of a medium-sized industrial facility. This will include site preparation such as excavation and grading. A foundation will be installed and

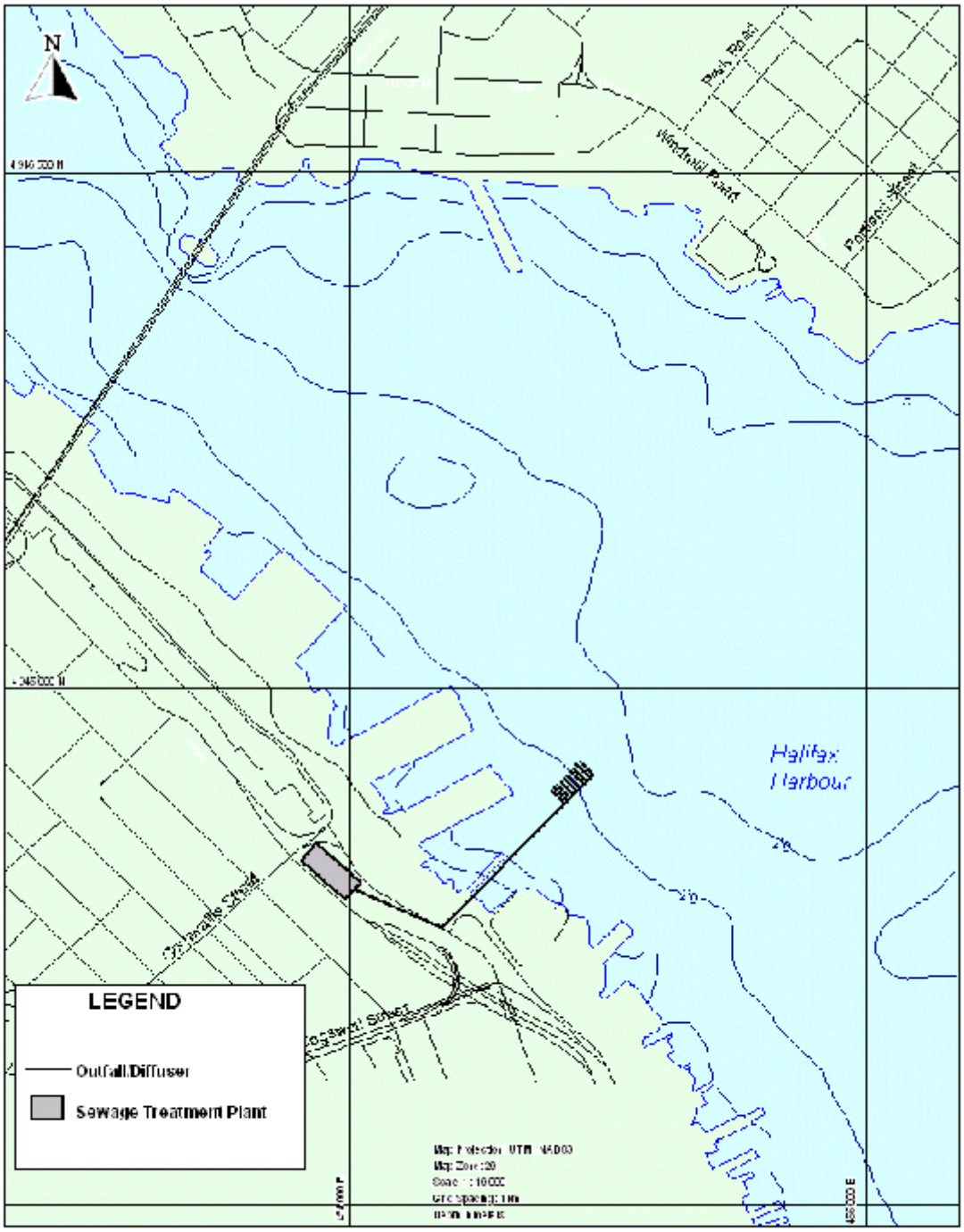
building components fabricated. Construction disturbance will include noise, dust and possible traffic delays. The construction of each STP will involve from 10 to 200 employees on site depending on the construction phase. Each site will attract from 15 to 20 (estimated maximum 40) heavy trucks and 20 to 25 lighter vehicle trips per day. A new dedicated access road will be constructed to the proposed Dartmouth treatment plant which will allow access to Pleasant Street without use of any local residential streets. The new access road will be used both during construction and operation of the plant.

The level of disturbance at each site will vary with the phase of construction. These disturbances are typical for construction projects in the metropolitan area and are managed through standard traffic and construction management practices. The total duration of construction for each STP is estimated to be from 18 to 24 months.

2.4.3 Outfall and Diffuser Design and Construction

Each STP will have a marine outfall to discharge treated sewage effluent terminating at an acceptable location in the harbour. Outfalls will be designed hydraulically to meet present and future design flows. Outfalls will be equipped with diffusers engineered to achieve initial dilution of 20:1 at the Inner Harbour outfalls and 50:1 at the Herring Cove outfall.

All existing municipal outfalls will be intercepted and disconnected, except for those which will continue to function as CSOs. Private outfalls will also connect into the new collector system at the responsibility of the private owner of the outfall. Outfalls and new CSO extensions (Young St., North St., and Lyle St. in Halifax) will be constructed by laying the pipe on a granular mattress and backfilling over the pipe with granular material. The outfall at Herring Cove will be laid on the bottom and secured with anchors. Outfalls will meet all the requirements of regulatory agencies, including but not limited to: Fisheries and Oceans Canada (Habitat and Coast Guard branches) and the Halifax Port Authority. The proposed outfall locations and diffuser designs are shown in **Figures 2**, **3 and 4** for the Halifax, Dartmouth and Herring Cove sites, respectively. Table 1 provides additional information on diffuser design and dilution rates.



Halifax Harbour Solutions Project

Figure 2
Halifax STP & Outfall Location

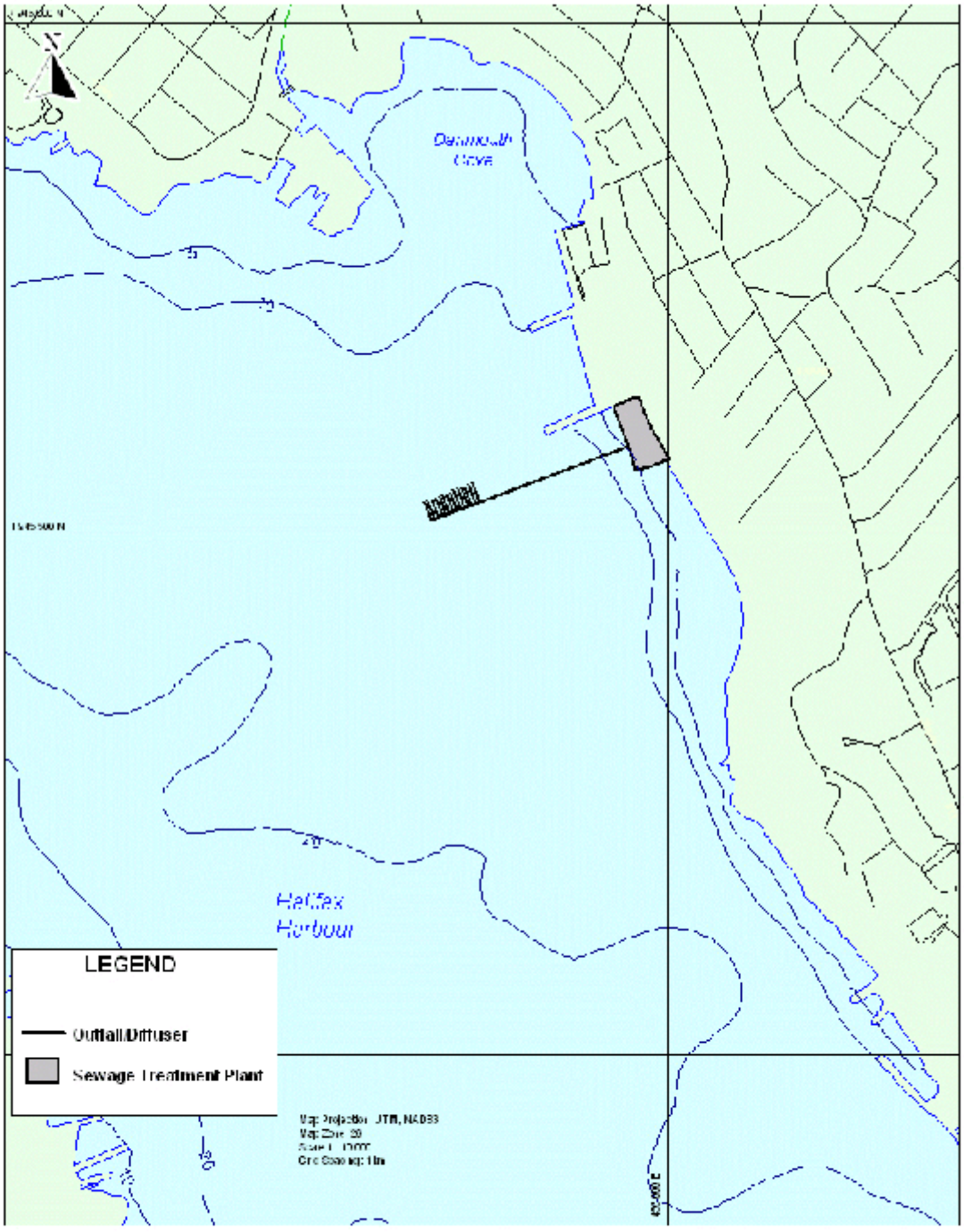


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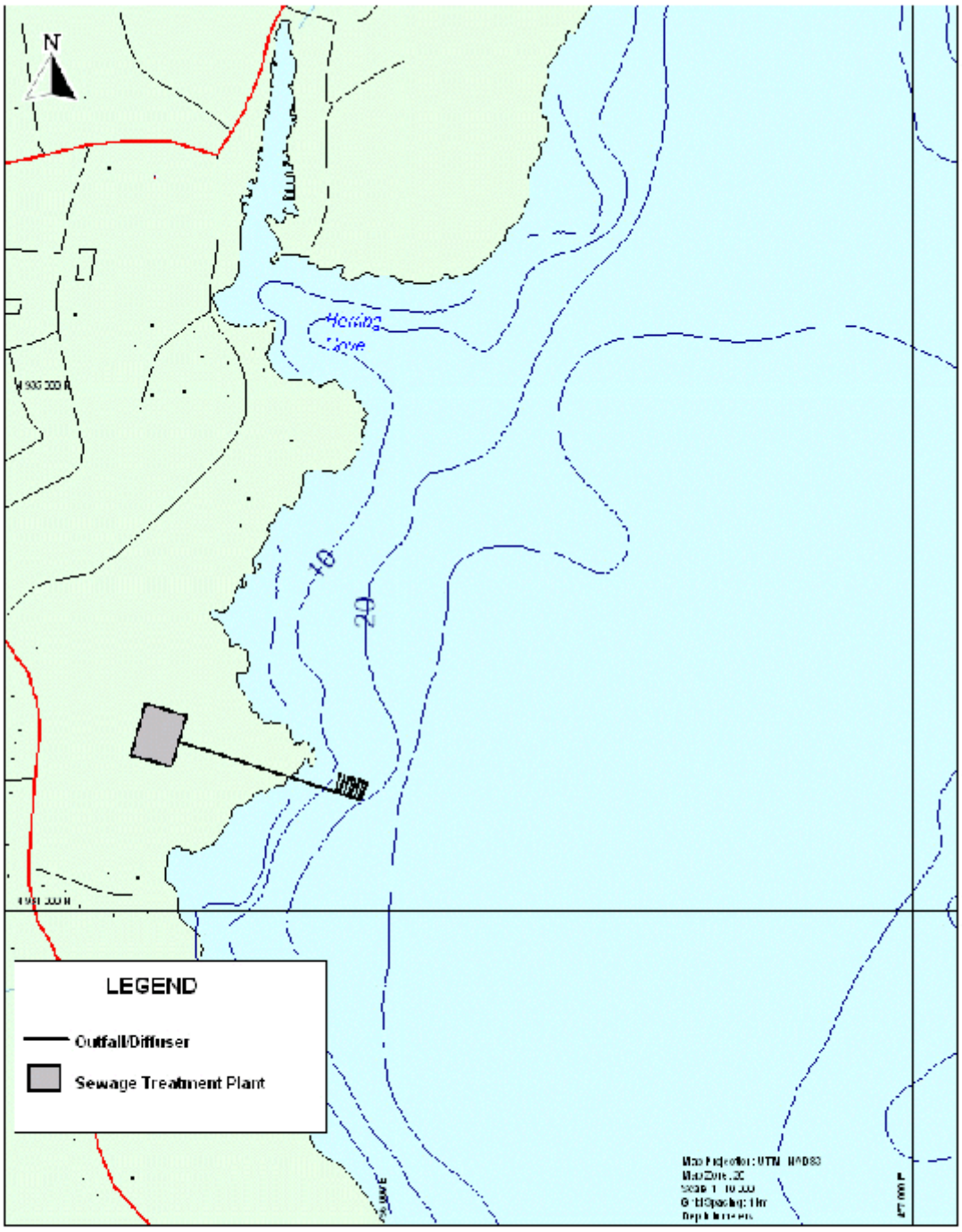
Figure 2
Dartmouth STP & Outfall Location



Halifax Harbour Solutions Project

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Figure 4
Herring Cove STP & Outfall Location

Diffusers, constructed of reinforced concrete or other similarly durable material such as high density polyethylene, will likely be fabricated onshore, then taken to location by barge and placed in position on a previously prepared bed of granular material. The outfall pipe would then be covered with clean granular material.

Table 1 Diffuser Design and Dilution Rates

Criteria / Results	Halifax	Dartmouth	Herring Cove
Length of Diffuser	75m	100m	50m
Minimal initial dilution rate	20:1	20:1	50:1
Average depth of diffusion zone	20m	17m	20m
Density structure	Uniform	Uniform	Uniform
Assumed current speed (windless conditions)	~0.01m/s	~0.01m/s	~0.01m/s
Number of nozzles	20	20	15
Modeling results	• Dilution rate of 5:1 attained while plume was rising to surface ~6.2m from nozzles • Dilution rate of 20:1 attained while plume was rising to surface ~16.7m from nozzles	• Dilution rate of 5:1 attained while plume was rising to surface ~5.8m from nozzles • Dilution rate of 20:1 attained while plume was rising to surface ~14.9m from nozzles	• Dilution rate of 25:1 attained while plume was rising to surface ~13.6m from nozzles • Dilution rate of 50:1 attained while plume was rising to surface ~19.0m from nozzles

Note: Information provided by HREP. Cormix model was used to predict dilution rates.
The detail design process will assess current conditions and required diffuser depth and configuration to meet the stipulated dilution ratios of 20:1 and 50:1 respectively for the inner (Halifax and Dartmouth) and outer (Herring Cove) harbour locations.

2.4.4 Sludge Management Facility

A central sludge processing facility will be constructed within the Aerotech Business Park in HRM as shown in **Figure 5**.

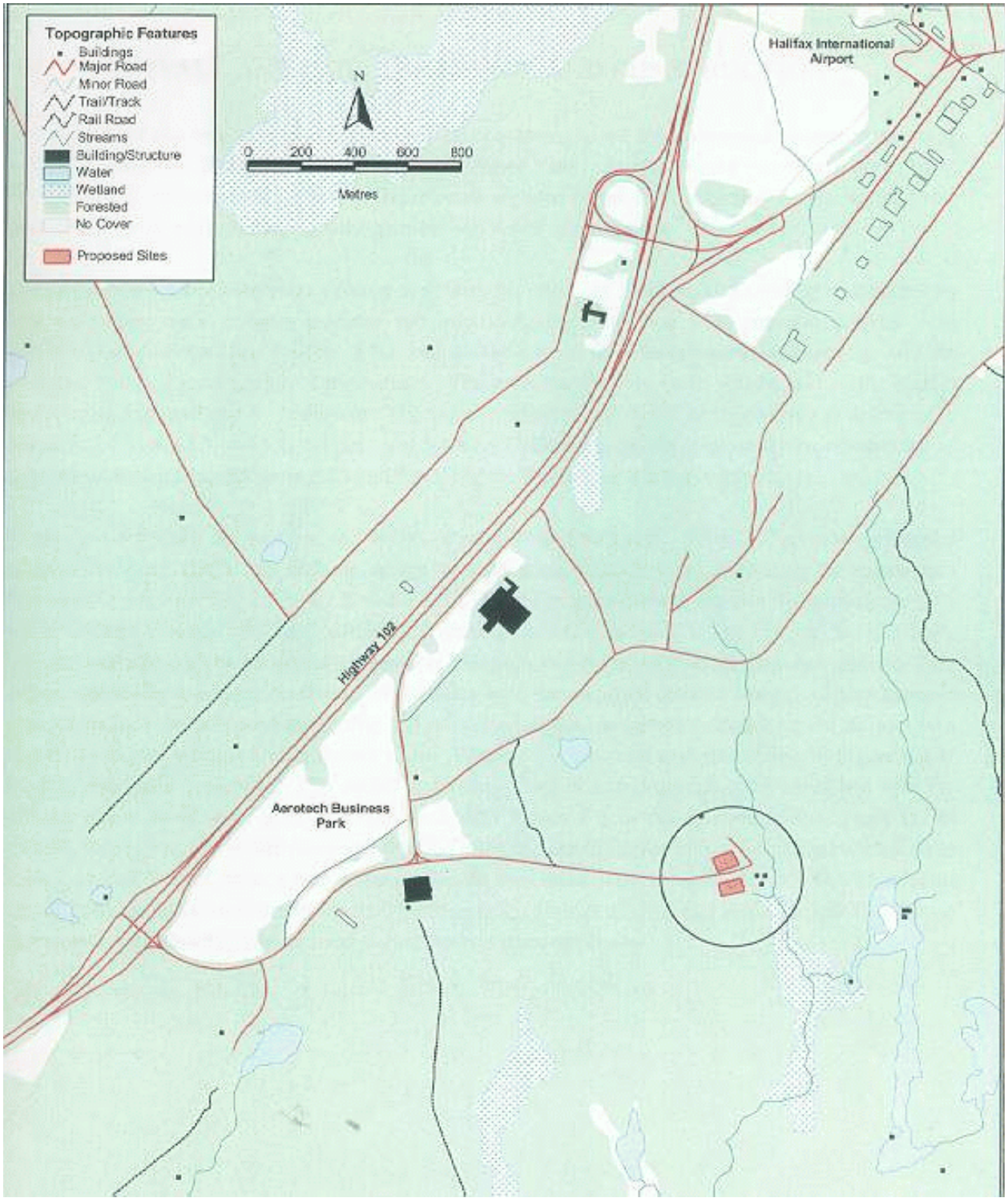

Figure 5: Location Map - Sludge Handling Facility

2.5 Operation and Maintenance

2.5.1 Commissioning

Initial hydrostatic testing of the STP will be carried out using clean water from the municipal water system. Only after meeting initial testing requirements will sewage be introduced to the system. Following a period of initial operation using raw sewage (approximately four weeks), HREP will conduct performance testing and, as necessary, correct any deficiencies identified.

2.5.2 Sewage Treatment

The STPs will meet or exceed Effluent Quality Requirements indicated in section 2.7.1 while treating not less than the flow rates for "Initial Construction" as shown in Table 2.

Table 2: Sewage Treatment Plant Capacity Flows (m3/s)

Plant Location	Initial Construction (Based on projections to 2021)			Ultimate Flows	
				Ultimate Capacity (2041)	Ultimate Peak Flows (2041)
	Avg. Daily Flow	Peak Flow	Min. Flow	Avg. Daily Flow	Peak Flow
Halifax	1.55	3.97	0.29	1.7	4.37
Dartmouth	0.97	2.58	0.19	1.15	3.06
Herring Cove	0.33	0.88	0.06	0.61	1.64
Total	2.85	7.43	0.54	3.46	9.07

Source: HRM (2000)

Notes:

1. Peak flow is equal to 4 X Average Dry Weather Flow (ADWF)
2. Average Daily Flow is 1.5 X ADWF
3. The ultimate capacity represents the ADWF that is expected when development of the applicable sewersheds is complete.

The HHSP plan provides advanced primary treatment of sewage with UV disinfection. Operation of the

advanced primary treatment facilities will include the following processes:

1. **Screening** of raw sewage through 10 mm openings or slots to produce a highly putrescible, segregated material including paper, fabric, plastic, and wood, all contaminated by human waste. The screenings will be washed to remove contaminants, prior to transport to a sanitary landfill site for disposal.

2. **Grit removal** will be accomplished in a chamber or channel in which the velocity of flow is controlled so that materials with a high specific gravity (1.2 or greater) are allowed to settle and are collected. These settled materials are sands and gravels which occur in the collection system as a consequence of street inlets, open joints, etc. The grit will be collected and washed to remove organic contamination. Grit will be disposed of at a landfill.

3. **Settling** of the wastewater in a tank or chamber will allow all remaining settleable solids to collect at the bottom of the tank and floatable materials (vegetable materials, oils and grease, small bits of plastic or wood) to collect as a scum on the top surface. The settled material drawn from the tank is a putrescible substance containing 60 percent to 80 percent organic materials, known as raw sludge. The floating scum material will be skimmed from the surface of the tank and disposed of separately or combined with the raw sludge for processing and disposal.

4. **Addition of flocculating agents** will "advance" the process beyond conventional primary treatment (Steps 1 to 3). These agents will enhance settling and also combine chemically to precipitate most of the phosphorus present in the soluble form. Advanced primary treatment will also involve lower hydraulic loading rates to increase the hydraulic retention periods. The result is that in addition to a fairly high degree of phosphorus removal, fine solids and colloidal matter not removed in simple gravity settling (conventional primary treatment) will be removed. Approximate removal efficiencies for conventional primary treatment of 65 percent for suspended solids (SS) and 35 percent for biochemical oxygen demand (BOD) will be increased in advanced primary treatment to 75 percent SS and 50 percent BOD removal.

5. **UV Disinfection** is the final step for the proposed HHSP advanced primary treatment plants. This will involve exposure to ultraviolet radiation (UV) for disinfection of human pathogens. With UV there is no potentially harmful residual product added to the effluent as with chlorine disinfection, and no hazard from accidental releases of chlorine due to a spill or fire. UV radiation has been used successfully as a disinfection method at several primary sewage treatment facilities to meet a regulatory faecal coliform limit

of 200/ml. Its proposed application following advanced primary treatment (*i.e.*, increased removal of suspended solids) is expected to also produce successful results. Advanced primary treatment plants in Quebec currently using UV disinfection include STPs in: Laval; Beloiel; Fabreville; La Malbaie; Beaupre; Boischatel; and Gaspe (B. Topp, pers. comm, 2001).

6. **Sludge management** will be accomplished by the following processes:

- onsite thickening or dewatering at the STPs followed by transport to the sludge facility;
- mixing dewatered sludge cake with alkaline admixtures;
- drying the product to a 60-65% solids content;
- heat pulse to induce exothermic hydration reaction to increase temperature and pH of the product; and
- beneficial end use of processed sludge (*e.g.*, soil amendment for agricultural or non-agricultural uses, depending on quality).

Details of the sludge management process are included in the *Halifax Harbour Solutions Project Environmental Screening Addendum 1 (March 2002)*.

2.5.3 Sludge and Residue Management and Disposal

At each STP, screenings, grit and biosolids will be produced. Plant design will include process equipment for biosolids collection, conveying, compaction, storage, mixing, pumping, thickening and dewatering as required. It is expected that dewatering will routinely achieve greater than 30% solids in the cake. It is proposed that each day's sludge production at an STP can be removed by one or two daily truckload(s). Additional loads will be removed as required. Dewatered cake in solid form will be transported in sealed trucks. These units will be entirely enclosed and sealed to prevent odour or leaks. The trucks will be loaded within the STP facility under controlled atmosphere and will be washed after loading and unloading. Routing to the sludge processing facility from the STP will be as direct as possible and transport will be arranged to avoid periods of heavy traffic as much as possible. All trucks will be equipped with the appropriate response materials and drivers will receive spill response training.

The sludge processing facility design is capable of handling the average annual sludge production in a six-day week, operating for approximately 10 hours per day initially, increasing to about 14 hours per day in

year 20. The processing facility will include approximately 929 m^2 of enclosed building and an additional 3,252 m^2 of covered and/or paved working area (including parking lot and loading areas).

Processing will involve mixing the dewatered sludge cake with alkaline admixtures. If the admixture does not contain enough free lime to give the necessary temperature and pH rise, CaO is added. Following the mixing step, the product is dried with the use of a rotary-drum dryer. The dryer discharge then goes to a "heat-pulse" cell. The combination of heat from the dryer and a chemical reaction between the alkaline materials and the moisture in the sludge cake raises the temperature to a controlled range between 52 and 62 C and the pH to slightly above 12. The material is held in the heat-pulse cell where the temperature is monitored for a period of 12 hours. The elevated pH is maintained for a total of 72 hours, after which the product is ready for distribution or storage.

Approximately 1,858m^2 of covered storage area will be provided, giving the storage facility about four month storage capacity at the maximum production rate. The final product of the process is a biologically stable, low-odour, safe, soil-like material that will have a solids content of approximately 60-65%. The product can be blended with composts to produce a material that can be used in horticulture and commercial landscaping. It can also be blended with soils and soil-like materials to produce manufactured topsoil which would have a broad range of applications. The quality of the finished product will be monitored to ensure that it meets the requirements of Nova Scotia Department of Environment and Labour (NSDEL), Agriculture and Agri-Food Canada (Ag. Canada) and generally, 40 CFR Part 503 US EPA Regulations. The end product meets the criteria of Ag. Canada for distribution as a soil amendment.

The sludge management facility does not meet the definition of a composting process according to NSDEL and the Solid Waste Guidelines are not applicable (HRM 2002a, 2002c). The finished product will be judged against standards for pathogen reduction, vector attraction reduction and pollutants (i.e. heavy metals) as noted above. The proposed treatment process is also expect to meet requirements for vector attraction reduction and Class A rules for pathogen reduction under U.S. EPA Sludge Use and Disposal Standards published at 40 CFR 503.

2.5.4 Effluent Quality Monitoring

The treated wastewater effluent will be measured in accordance with the test procedures, policies and all other requirements of NSDEL at the sampling points designated by NSDEL for each STP, and shall meet or exceed the Effluent Quality Requirements set out in Section 2.7.1.

2.5.5 Operational Traffic

The operation of the STPs will generate low volumes of traffic. Estimated vehicle movements related to each Plant's operation include:

- sludge haulers, average two tractor trailers per day;
- chemical delivery vehicle, average two per week;
- lighter delivery vehicles, two per day; and
- private vehicles for employees and visitors, 12 to 15 per day.

2.5.6 Maintenance

Routine maintenance includes regular operations that are required to obtain smooth and continuous operation of all aspects of the facilities including, but not limited to:

- cleaning;
- lubrication;
- calibration; and
- equipment adjustment.

Predictive maintenance is the measurement of physical properties of equipment performance and a comparison with engineering standards or limits. These measurements include, but are not limited to:

- vibration testing;
- lubricant analysis for wear particles or lubricant contamination;
- infrared thermography;
- performance monitoring;

- non-destructive testing; and
- ultrasonic testing.

2.6 Abandonment and Replacement

Provided the land serviced by the present collection system continues in residential, commercial, or industrial use, the sewage collection systems will not be abandoned. The system will be maintained and upgraded as necessary to provide the required service. Pipes are sized for projected population and type of development in the serviced sewersheds since there will not be an opportunity to replace or enlarge the tunnel after they are commissioned. The tunnel can be accessed for routine maintenance such as cleaning. Repairs which occur as a result of corrosion or material failure can also be undertaken as necessary. These might include replacement of ladders and reinstatement of concrete lining.

The STP differs from the collection system in that it is not initially designed for ultimate capacity; rather, it is designed to be expanded to ultimate capacity by addition of more treatment trains and/or higher levels of treatment. Sufficient land to upgrade to secondary treatment or to accommodate projected future flows will be provided at each STP site. These expansions would occur based on either hydraulic load generated in the service sewershed or by an environmental legislative need to improve treatment level. However, once STPs are established, they are seldom abandoned because sewage is delivered to that location by the collection systems. Normal maintenance such as replacement of equipment on a periodic basis and recoating of treatment tankage will be performed. No existing STPs will be abandoned in connection with this Project.

2.7 Effluents and Emissions

2.7.1 Effluent and Water Quality Standards

Based on a review of the previous four STP plan and oceanographic modelling conducted by HRM (COA 2000), NSDEL concluded that the following parameters for treated effluent will be acceptable (D. Hiltz, pers. comm. 2000):

- fecal coliforms of less than 5000/100 mls, as maxima;
- BOD_5 50 mg/L; and
- suspended solids of 40 mg/L.

HRM staff and consultants have concluded that these effluent quality criteria specified by NSDEL can be achieved on a consistent basis by advanced primary treatment in the current three STP concept. Environment Canada has also advised HRM that, based on the oceanographic modeling and assimilative capacity work carried out, the proposed system is justified and will meet the water quality objectives established by the Halifax Harbour Task Force (HHTF) and agreed to by the Halifax Harbour Symposium and Harbour Solutions Advisory Committee if proper design, operation and maintenance of the system takes place as well as proper siting of the outfalls (J. Kozak, pers. comm. 2000). Environment Canada also states that the acceptability of the system is predicated on the successful implementation of a source control program by HRM to reduce the input of toxics into the wastewater.

In general, given the current HHSP plan and the minimum requirement for advanced primary level treatment of sewage, it is expected that the HHTF water quality objectives for harbour regions can be met with prudent design and siting of outfalls and diffusers. The final criteria and monitoring requirements will be specified as a condition of the operating permit administered by NSDEL. NSDEL has granted HRM a permit to construct the three treatment plants and collection systems.

2.7.2 Air Emissions/Odour/Noise

The treatment plants will be designed, constructed and operated as atmospherically controlled systems to prevent the potential occurrence of objectionable odour in the community beyond the property limits of the STP site during routine operations. Highly effective odour control systems will be used for all process areas of each plant, as well as the pumping stations. Enclosed plant design will also serve to minimize noise beyond the site boundary.

HRM has required that odour from the STPs and pumping stations must not exceed 4 ppb (over a 5 minute rolling average) at the point of air exhaust during normal operating conditions. Pumping stations shall be equipped with odour and noise control systems to minimize odour and noise effects in the surrounding area and to ensure that there is no detectable odours off site, i.e beyond the physical boundaries of the pumping stations and of the CSO chambers (HRM 2002b). Compliance with this limit will ensure that there are no perceptible odours at the facility property line.

HRM has required that facility generated noise levels at each STP property line must not exceed the

following levels:

- 55 dBA Leq (between 2300 hours and 0700 hours);
- 60 dBA Leq(between 1900 hours and 2300 hours); and
- 65 dBA Leq (between 0700 hours and 1900 hours).

Individual noise sources which are tonal in nature will not exceed 45 dBA Leq when measured at the applicable property line.

2.8 Related Projects and Project Alternatives

2.8.1 Related Initiatives

2.8.1.1 Pollution Prevention Program

HRM's Pollution Prevention (P2) Program, formerly referred to as the Source Control Strategy was initiated in 1996. It is an important initiative aimed at reducing the levels of nutrients, metals, and toxins currently entering the wastewater system, and ultimately, Halifax Harbour.

The overall objectives of the Pollution Prevention Program are:

- protect the safety of the public and the health and safety of municipal staff;
- protect the physical integrity of the collection system, pumping stations and wastewater treatment plants;
- reduce potential operational problems related to the wastewater treatment process which may be caused by industrial, commercial or institutional discharges to the municipal sewer systems;
- reduce potential bio-solids management problems cause by excessive concentrations of prohibited materials; and
- reduce pollution of freshwater or marine ecosystems (in compliance with the *Fisheries Act*).

A new HRM by-law (July 2001) respecting discharge into public sewers (By-Law Number W-101, Wastewater Discharge By-Law), included as Appendix D of the *Halifax Harbour Solutions Project Environmental Screening (October 2001)* document, prohibits discharges of specified substances and

concentrations to sanitary and combined sewers, and storm sewers. The application of this by-law will be instrumental in the reduction of the discharge of toxic, hazardous or prohibited wastes into the municipal sewer systems. HRM has committed to periodically reviewing and updating the by-law as required.

The P2 Program is now an on-going operational activity of the HRM. Quarterly reports to HRM Council identify the progress of monitoring and enforcement. HRM staff are currently developing a database of all industrial, commercial and institutional locations which will assist in the management of regulating contaminant levels in the municipal systems. This will permit existing and new development to be included in procedures for compliance monitoring and enforcement of prohibited discharges. Best management practices for industrial and commercial sectors will be developed to assist these locations in achieving compliance. Educational material will also be developed for the residential sector to permit the direct participation of the public in the reduction of contamination released to our waterways. There are estimated to be approximately 5,000 institutional, commercial and industrial sites to be evaluated under the program within approximately 3.5 years. A detailed implementation plan for this program is currently being developed.

The P2 Program has been and will continue to be promoted through a number of media, including the Naturally Green Newsletter, water billing inserts, Burnside News, Enviro-Connect, Nova Scotia's Environmental News, Maritime Water and Wastewater publication, HRM's web site as well as the Canadian Centre for Pollution Control web site. Staff have made presentations to various groups and organizations including the various Watershed Advisory Boards, Nova Scotia Environmental Industry Association, Canadian Petroleum Products Association, open houses hosted by HRM. A new Environmental Management Services business unit was recently created to manage this initiative.

The implementation and continued maintenance of this program is key to the success of the proposed HHSP. As a source control strategy it complements the HHSP by increasing the effectiveness of wastewater treatment and improving quality of resulting sludge as a soil amendment.

Implementation of the P2 program will be coordinated with the development of the new STPs. HRM will work with dischargers in each of the STP sewersheds to ensure that they are in compliance within the timeframe for initiation of operation for the associated new treatment plant. Thus, dischargers within the Halifax sewershed will be brought into compliance with the by-law prior to the operational target for the Halifax STP, and similarly for dischargers within the Dartmouth and Mainland South STP sewersheds. All

dischargers will thus be expected to be aware of the by-law provisions and in compliance within the overall STP development timeframe. Inspections and unannounced monitoring will determine whether businesses are in fact in compliance with the by-law.

2.8.1.2 Inflow/Infiltration Reduction

In the year 1999/2000 HRM initiated Inflow/Infiltration (I/I) reduction plans to reduce the overall volume of wastewater entering the treatment system and the frequency of overflow events. This wastewater management program will complement the HHSP and increase its effectiveness.

The implementation of an I/I program is a two step process. The first step includes study and investigation to determine the sources and the location of infiltration/ inflow. The second step is the implementation of corrective and remedial works. Depending on the findings from the investigation, corrective and/or remedial works may range from minor repairs to major piping works.

HRM video inspects its sewer on an ongoing basis in the range of 40,000 to 50,000 m/year. From this inspection, sewers requiring repairs and /or replacement are identified and the remedial works are undertaken. These works have a net impact on the reduction of infiltration and inflow on the overall system. HRM also has an ongoing flow monitoring program to monitor the flow during wet conditions. Flow monitoring is also intended to verify the reduction in the rates of I/I and the performance of the corrective works after an area has gone through an I/I reduction phase.

2.8.2 Alternatives to the Project

Alternatives to the Project are functionally different ways of achieving the same end (CEA Agency 1994). The major alternative to the project (*i.e.*, the alternative to provision of wastewater treatment) would be to continue with the status quo (null alternative). This is generally acknowledged by regulatory agencies, the general public, as well as by HRM, to be an unsatisfactory alternative, both environmentally as well as socially.

Poor aesthetics, high nutrient concentrations, harmful algal blooms, high levels of suspended solids, organic matter enrichment, and depressed oxygen levels in sediments and water are some examples of current sewage-related conditions in Halifax Harbour. The harbour water is unacceptable for shellfish consumption

and primary contact recreation in most places in the Inner Harbour.

As the population serviced by the HRM sewershed grows, wastewater inputs to the harbour will increase in volume, with increasingly deleterious effects on the harbour, particularly in the absence of sewage treatment.

HRM's related pollution prevention initiatives complement the Project in that it will control discharges that cannot be effectively handled by sewage treatment systems. However, in the absence of the wastewater treatment project, the Pollution Prevention Program and I/I initiatives cannot achieve the desired water quality objectives set by the HHTF. Source control alone cannot, therefore, be considered a feasible alternative to the Project.

There is, therefore, no feasible alternative to the implementation of a sewage treatment system in order to achieve the basic water quality objectives of HRM.

2.8.3 Alternative Means of Undertaking the Project

Alternative means of carrying out the project are methods of a similar technical character or methods that are functionally the same (CEA Agency 1994). A number of important guidelines or constraints were considered in order to define the major alternative means for undertaking the project. The main guidelines were provided by:

- the General Principles from the Halifax Harbour Solutions Symposium including water use and water quality guidelines developed by the HHTF;
- recommendations of the Halifax Harbour Solutions Advisory Committee; and
- input from HRM staff and consultants.

Additional information regarding the evaluation of treatment technologies was obtained from the "Review of Halifax Harbour Clean-up Program" (CBCL 1996), which included a review of wastewater treatment technologies presented at the G-7 Summit in Halifax in June 1995.

Alternative means of carrying out the Project included consideration of:

- number and size of STPs;

- outfall siting;
- plant siting;
- level of sewage treatment (*i.e.*, primary, advanced primary, secondary and tertiary);
- collection systems (*i.e.*, separation or consolidation of stormwater and sewage; and trenching or tunneling of collection system); and
- treatment technologies (e.g., UV radiation, Solar Aquatics^{TM}).

Section 2.6.3 of the *Halifax Harbour Solutions Project Screening Report (2001)* includes a detailed description of the specific alternatives considered. Alternatives were evaluated based on various criteria, including environmental, technical, and economic considerations. The current HHSP proposal contains the preferred alternatives.

3.0 PROJECT - ENVIRONMENT INTERACTIONS

The environmental assessment methodology used in this assessment focused on assessing the project's environmental impacts of greatest concern. The determination of those environmental components to be assessed was determined through an issues scoping exercise that included: public, stakeholder and regulatory agency consultation; preliminary research and field investigations; review of the Halifax Harbour Clean-up Environmental Assessment Report; and the environmental assessment team's professional judgement (HRM 2001).

As a result of the issues scoping exercise, the following environmental components were selected to focus the environmental assessment: Atmospheric Resources; Marine Water Quality; Marine Sediment Quality; Marine Benthic Habitat; Terrestrial Resources; Commercial Fishery; Archaeological and Heritage Resources; Land Use; Transportation Network; and Public Health. For the purposes of this assessment, the selected environmental components were divided into Valued Ecosystem Components (VECs) and Valued Socioeconomic Components (VSCs).

Temporal and spatial bounds were determined for each VEC/VSC based on those areas and periods in which there is potential influence by, or interaction with the project. The existing conditions for each VEC/VSC are described in the document *Halifax Harbour Solutions Project Environmental Screening (October 2001)* within the boundaries established for the assessment.

3.1 Environmental Effects

An environmental effects assessment was conducted to determine the significance of post mitigation residual effects of the project on those environmental components (including social components) identified in the scope of the assessment. This assessment also considered the effects of the environment on the project, the cumulative effects of the project with other existing, planned and likely projects and potential environmental effects as a result of accidents and malfunctions.

Table 3 lists the sections of the supporting documents, as listed in Section 1.4, relating to these potential effects.

Table 3: Concordance Table of Project Environmental Interactions

Project / Environment Interaction	Document and Section
Effects of the Project on the Environment	
Atmospheric Resources	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 4.1 *Halifax Harbour Solutions Project Addendum to Environmental Screening (March 2002)* Sections, 2.6.1, 2.6.2, 2.6.3, 2.6.4 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 3.6.4
Marine Water Quality	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 4.2 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Sections 2.1.1, 2.1.2, 3.2.9

Table 3: Concordance Table of Project Environmental Interactions	
Project / Environment Interaction	**Document and Section**
Marine Sediment Quality	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 4.3
Marine Benthic Habitat	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 4.4 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 2.1 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 3.3.5
Terrestrial Resources	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 4.5
Commercial Fishery	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 5.1
Archaeological and Heritage Resources	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 5.2 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 2.3 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 3.5.1 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 3.6.1

Table 3: Concordance Table of Project Environmental Interactions	
Project / Environment Interaction	**Document and Section**
Land Use	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 5.3 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Sections 3.1.1, 3.1.2, 3.6.2
Transportation Network	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 5.4 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Sections 3.1.3, 3.6.3
Public Health	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 5.5 *Halifax Harbour Solutions Project Addendum to Environmental Screening (March 2002)* Section 2.6.5 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 3.2.2, 3.2.3 *Halifax Harbour Solutions Project Screening Level Human Health Risk Assessment (April 2001)*
Effects of the Environment on the Project	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 7.0

Table 3: Concordance Table of Project Environmental Interactions	
Project / Environment Interaction	**Document and Section**
Cumulative Environmental Effects	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 8.0 *Halifax Harbour Solutions Project Environmental Screening Addendum 2 (May 2002)* Section 3.1.1
Effects Related to Accidents and Malfunctions	*Halifax Harbour Solutions Project Environmental Screening (October 2001)* Section 6.0

3.2 Effects of the Environment on the Project

Consideration of environmental components that may have an effect on the project is discussed in Section 7.0 of the document Halifax Harbour Solutions Project Environmental Screening (October 2001). These potential effects include the impacts of sea level rise, climate change and storm events, waves and currents, sedimentation and seabed type, seismic activity and acid rock drainage. It is concluded that these effects can be avoided or mitigated through appropriate design of those project components likely to be affected.

3.3 Cumulative Environmental Effects

A cumulative effects assessment (CEA), as discussed in Section 10 of the *Halifax Harbour Solutions Project Environmental Screening (October 2001)* document, was undertaken by the proponent to consider the effects of the proposed HHSP in combination with other past, present or future likely projects or activities. This assessment considered both land and marine based projects and activities as well as policies and programs that could potentially interact cumulatively with the project. Based on this analysis, it is concluded that the proposed HHSP project is not likely to result in significant adverse environmental effects in a cumulative manner with other projects. The implementation of HRM's Pollution Prevention and Inflow / Infiltration Reduction Programs have the potential to result in positive cumulative effects with the HHSP.

3.4 Effects Related to Accidents and Malfunctions

Potential malfunctions and accidental events related to project construction and operational activities were considered during the course of the assessment and are discussed in Section 6 of the *Halifax Harbour Solutions Project Environmental Screening (October 2001)* document. The events considered include encounters with acidic rock and / or contaminated sites, hazardous material spills, breaks in the collection system or outfalls / diffusers, failures of effluent treatment or odour control systems, transportation accidents and fires or explosions. It has been determined that such events are unlikely to occur due to project pre-planning, system redundancy, emergency response planning and implementation of monitoring and maintenance procedures. Should accidents or malfunctions occur nonetheless, the effects would generally be temporary while corrective action is taken.

3.5 Summary of Mitigation

Mitigation measures and monitoring requirements associated with the HHSP construction and operational activities are identified in Table 4 below in relation to those Valued Environmental Components (VEC) and Valued Socio-economic Components (VSC) that are likely to be affected by these activities. This table summarizes and elaborates upon Sections 4 and 5 of the document *Halifax Harbour Solutions Project Environmental Screening (October 2001*. Additional details of measures that will be taken to mitigate potential adverse effects of the project are identified in the HHSP Environmental Screening (2001) are included and in other documents listed in section 1.4 of this report.

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
Environmental Management (General)	Ensure adequate plans and procedures are in place	Final Plans & Manuals including: • QA/QC Plan • Health & Safety Plan • Public Information & Involvement Program • Environmental Management Plan including emergency response • Effluent & Receiving Waters Management Plan • Commissioning Plan & Procedures • Operating Plan and Manual • Maintenance Plan and Manual • Sludge & Residue Management Plan and Manual • Risk Management Program	HRM ensures timely development of Plans & Manuals	HREP	HREP submits Plans & Manuals within stipulated time frames of Contract start date Immediate reporting of any spills or environmental emergencies to Regional Environmental Emergency Response line (1-800-565-1633) and HRM (426-6030)	Written Plans & Manuals
	Ensure accountability of contractor	HREP assures compliance with project requirements, and correction of deficiencies if applicable, Contractor and Subs will be informed of requirements	HRM ensures provisions in place prior to contract start date	HREP	HREP to provide performance bonds and guarantees of Parent Companies to assure compliance with project requirements and correction of deficiencies if applicable Regular meetings and progress reports	Bonds and guarantee documents Written progress reports
	Ensure standard methods and best practices during construction and operation	Project Requirements stipulate extensive codes and standards that HREP must adhere to during the Design and Construction Phases.	HRM monitors HREP activities	HREP		

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
		In case of conflicts, the more or most stringent shall apply				
Related Initiatives	Pollution Prevention (Source Control) - improve influent quality	Wastewater Discharge Bylaw - enforce compliance within each sewershed prior to treatment plant operation	HRM enforcement	HRM	HRM By-Law W-101	HRM pollution prevention program files
	Inflow & Infiltration Reduction - reduce influent quantity	Ongoing sewer remediation program to reduce I&I volumes		HRM	HRM Capital budget planning and allocation process	HRM Budget
	Sewer Separation - reduce stormwater influent component	Separate older combined sewers on a sewershed basis when practical, and as budget allows		HRM	HRM Capital budget planning and allocation process	HRM Budget
	Permits, Approvals and Authorizations - comply with all legislated requirements	Obtain all required permits, approvals and authorizations udner all applicable legislation	Regulatory agencies	HREP	Permit processes	Permits obtained
	Community Relations - enhance community acceptance	• Community Liaison Committees • Community Integration Funds • Public Information & Involvement Program • Complaints investigation and action procedures to be established	General Public	HREP (with HRM)	CLCs, public education, complaints investigation	CLC Newsletters, publications, regular project reporting including complaints investigations and action
Atmospheric Resources (noise and	Construction • Minimize dust from construction sites	• Dust control procedures (e.g. water application)	• On-site supervision and	HREP on-site personnel	Noise & odour requirements included in	Monthly reports and bi-weekly

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
odour)	• Minimize noise from construction activities and vehicles	• Timing restrictions on construction activities specified in contract • Adherence to municipal Noise By-Law • Adherence to NS Road Builders/Consulting Engineers Specifications for Municipal Services	monitoring by qualified personnel	HRM Owner's Engineer (contracted 3rd-party) reviews and assesses HREP performance and monitoring results for compliance, oversight by HRM staff HREP to record, investigate and respond to public noise complaints, immediate copy to HRM HREP action taken to ensure compliance with specs or regulations Complaint procedure as above	project agreements (contracts) between HRM and HREP	meetings of HREP/HRM staff during construction including discrepancies and corrective actions as per QA/QC Plan

	Operation
	• Minimize noise from pumping stations, CSO and STP facilities and vehicle movements
		• Noise control specs (pumping stations, STPs):
		  • 55dBA L_{eq} (2300-0700 hours)
		  • 60dBA L_{eq} (1900-2300 hours)
		  • 65dBA L_{eq} (0700-1900 hours)
		  • Tonal noise <45dBA L_{eq}
		• STP and pumping station design features to minimize noise emissions
		• Timing restrictions on vehicle movements
			• Compliance noise monitoring
			• Acoustic and vibration monitoring as part of routine equipment maintenance program
				HREP to implement noise monitoring program and will modify operations to ensure compliance.	HREP daily operating logs
					
					Quarterly Operations Report including details of all complaints

	• Minimize odour impacts to surrounding communities	• Odour control requirements for pumping stations and STPs: • <4ppb Total Reduced Sulphur at exhaust point (undetectable)	• Continuous odour monitoring at STP air discharge	HREP to implement odour-monitoring program On-site monitoring equipment, regularly	Odour monitoring system will be connected to the SCADA system and HRM will have permanent access to the measured

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
		• Enclosed pumping station, CSO and STP facilities • Negative air pressure in STPs • Sealed sludge transfer trucks • Trained sludge truck drivers		HREP provides driver training	tested and maintained Regular reporting HREP to HRM including SCADA	TRS levels
Marine Water Quality	Pre-Construction • Avoid resuspension of contaminated sediments • Design CSOs to minimize localized sediment build-up and maintain draught Construction • Avoid resuspension of contaminated sediments Operation • Avoid localized reduction in water quality during storm overflow events and in immediate area of diffuser • Avoid draught reduction due to sediment accumulation	• HREP shall obtain advice from DFO, Environment Canada and other relevant authorities regarding environmental effects and compliance monitoring protocols prior to actual in water construction • No dredging of sediments during outfall construction • Selection of locations for outfalls and diffusers within areas with sufficient depth and currents to promote dispersion, as well as to avoid sensitive areas (e.g. Narrows/Bedford Basin, Northwest Arm) • Collection system accommodates 4xADWF	Adherence to NSDEL effluent limits: • Fecal coliforms < 5000/100ml • BOD_5 50mg/l • Suspended solids 40mg/l	HREP responsible for selection of locations for outfalls and diffusers NSDEL responsible to enforce compliance HREP responsible for on-site effluent monitoring at STPs HREP to ensure no	On-site sampling and analysis of STP treated effluent as mandated by NSDEL HREP performance bonding as described, monthly payments are reduced if effluent does not meet project specifications	Regular compliance reporting from HREP to NSDEL, copied to HRM

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
	adjacent to CSOs			reduction in draught near DND CSOs		
Marine Sediment Quality	Pre-Construction • Avoid resuspension of contaminated sediments Construction • Avoid resuspension of contaminated sediments	• Regulatory agency advice as described under Marine Water Quality • No dredging of sediments during outfall construction			HREP monthly reports during construction and quarterly reports during operations HREP performance bonding as described	
Marine Benthic Habitat	Pre-Construction • Minimize disturbance of benthic habitat Construction • Minimize disturbance of benthic habitat Operation • Avoid localized habitat degradation at diffuser	• Regulatory agency advice as described under Marine Water Quality • No dredging of sediments during outfall construction • Compliance with DFO Fact Sheet; Blasting - Fish and Fish Habitat Protection if required • Select appropriate outfall locations for adequate effluent dispersion	Annual underwater survey (ROV video) for 3 years post-construction at each outfall	HREP	HREP Environmental Management Plan as described under General Environmental Management HREP performance bonding as described	Report to DFO

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
Terrestrial Resources	Pre-Construction • Establish baseline conditions for rare species, well water	• Consult with Atlantic Canada Conservation Data Centre for information concerning the potential for rare species to occur within a specified radius of the project site • Conduct rare plant, mammal and herpetile surveys at Herring Cove STP site prior to clearing • Conduct rare plant and breeding bird survey (in consultation with EC) at sludge management facility prior to clearing • Conduct well water survey to identify and characterize water wells in proximity to construction activities		HREP	Field surveys Review and action as required under QA/QC Plan	Copies of survey findings as requested by Environment Canada
	Construction • Minimize habitat loss and wildlife disturbance • Minimize effect on well water quantity or quality due to excavation	• Schedule construction activities to occur outside of bird breeding season at Herring Cove STP site and at the sludge management site to minimize the potential for direct disturbance of breeding birds. Provisions will also be made to avoid disturbing those species of migratory birds that nest during the winter • Retain natural vegetation around the Herring Cove STP		HREP responsible for all necessary authorizations and to settle all damage claims arising from construction.	HREP performance bonding as described	

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
		and sludge management facility for wildlife habitat • Adhere to regulatory blasting guidelines • Perform remedial action as necessary to restore any damaged wells				
	Operation • Beneficial end use of sludge • Assure quality of sludge fertilizer product	• Adherence to Class A requirements for pathogen reduction as per U.S. EPA under its Sludge Use and Disposal Standards published at 40 CFR 503, and federal Fertilizer Act and Regulations for metals	• Monitoring of pollutants in treated sludge to ensure that concentrations are within acceptable standards for agricultural land application	Regular monitoring by HREP of fertilizer product for land application, to ensure EPA Class A product and Agriculture& Agri-Foods Canada compliance Formal application by HREP to Ag. Canada for compliance certification HREP responsible for disposition of any off-spec sludge product in accordance with all legislation	Review of monitoring results by Ag. Canada, HRM and NSDEL Approval by NSDEL of any site applications of product, pending Ag. Canada certification	Regular monitoring reports from HREP to Ag. Canada and NSDEL, copied to HRM. Records will be stored electronically in spreadsheet format and summary monitoring reports submitted to satisfy Ag. Canada and NSDEL.
Commercial Fisheries	Pre-Construction • Minimize interference with	• HREP shall obtain advice from DFO regarding environmental				

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
	fishing activity	effects and compliance monitoring protocols prior to actual in water construction				
	Construction • Minimize interference with fishing activity • Minimize disturbance to fish and lobster	• Avoidance of fishing seasons for marine components	As required under any permits to be issued to HREP	HREP responsible for all permit requirements	HREP to prepare and implement Environmental Management plan for the construction period HREP bonds and guarantees as described	As required under the permits to be issued to HREP
Archaeological and Heritage Resources	Pre-Construction • Minimize disturbance of marine and terrestrial archaeological heritage resources	• Archaeological assessment of sludge management facility site and marine subsurface areas to be covered by fill • Pre-construction testing at selected locations • Site diffusers to avoid significant subsurface heritage / recreational dive sites	Work in accordance with NS Museum policies, procedures and requirements	HRM has conducted pre-construction surveys of STP sites including an intensive study of the Halifax STP site HREP to conduct intensive studies of other land and marine sites as appropriate		Consultations held with NS Museum staff Reports documenting results of surveys and studies
	Construction • Minimize disturbance of archaeological heritage resources	• Contingency plan as part of required Environmental Management Plan for discovery of resources • Archaeological excavation of resources which may be	Archaeological monitoring during construction		HREP to provide Archaeologist for monitoring during construction, if required under Special Places	Written reports by archaeologist when required

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
		disturbed			Protection Act or other relevant guidelines as required by NS Museum	
	Operation • Prevent inadvertent disturbance of previously undisturbed resources	• Contingency plan as part of required Environmental Management Plan for discovery of previously undisturbed resources - onsite personnel report discoveries to NS Museum and HRM for follow-up as required by NS Museum		HREP responsible for on-site monitoring at STP and collection system sites during construction as per provincial legislation, HRM responsible if archaeological discoveries made		
Land Use	Construction • Minimize disturbance of previously contained contaminated soils on DND property • Minimize disturbance of any other contaminated soils • Minimize operational disturbances to DND during construction and operation of CSO and Pumping Station • Minimize dust and	• DND, specifically the BComd will pre-approve HREP's environmental plan to address management of contaminated soils on DND land prior to any work being done, including sampling • Prior notification of Dockyard if blasting required • Handle contaminated soils as per applicable legislation • Contract incentives for rapid completion of construction • Noise and dust control procedures as described under Atmospheric Resources • Traffic management, including	As determined in consultation with DND	HREP to ensure noise, dust and traffic control	HREP to prepare and implement QA/QC Plan and manual and Public Involvement and Information Program HREP to provide designated phone contacts for public, follow up contact with complainants	Written HREP documentation to HRM of complaints and follow-up

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
	noise emissions • Minimize localized traffic delays and access restrictions • Manage increased traffic Operation • Minimize odour and noise • Ensure compatibility with surrounding land uses • Ensure appropriate use of sludge product (See Terrestrial Resources)	construction of dedicated access road for Dartmouth STP • Odour and noise controls as described under Atmospheric Resources • Community Integration Fund projects in host communities • Adherence to Class A requirements for pathogen reduction as per U.S. EPA under its Sludge Use and Disposal Standards published at 40 CFR 503 and the federal Fertilizer Act and Regulations for metals	• HREP complaint procedure as described under Atmospheric Resources	during all phases HRM and HREP to jointly implement community integration elements as agreed with CLCs	HREP on-site personnel, HRM project supervision, CLC process HREP establishes complaint response mechanism with input from CLCs and HRM HREP bonds and guarantees as described	CLC minutes and reports submitted to HRM

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
Transportation Infrastructure	Pre-construction • Avoid conflicts with other harbour uses Construction • Minimize site specific traffic congestion at areas with existing restricted traffic capacity • Maintain traffic flow to the extent possible near facilities • Minimize congestion / hazards for cyclists and pedestrians • Minimize conflict with rail activity • Minimize impact to traffic and operational requirements of DND Dockyard	• Meetings with the Harbourmaster, Queens Harbourmaster and Coast Guard regarding finalized locations of outfalls and diffusers • Follow-up with Harbourmaster concerning possible relocation of Anchorage #6 • Plan and operate work areas in accordance with the *Construction and Work Area Manual* • Advance public notification of activities • Schedule traffic impacting construction activities during non-peak traffic periods • Maintain two through lanes for peak flow direction in high traffic areas • Conduct rail crossing according to applicable guidelines • Construct dedicated access road for Dartmouth STP site • Consultations with DND to maintain access to Dockyard (Military Police for traffic issues, BComd and XO LCdr Gillis for HMCS Scotian access) • Notification of marine construction in Notice to	• On-site supervision and monitoring by qualified personnel	HREP responsible for approvals of outfall locations and construction from regulators HREP responsible for traffic control at all construction sites	Permitting processes (Port Authority, Navigable Waters) HRM monitors project Emergency Response Contingency Plan (part of Environmental Management Plan) in place for emergencies, including any spills or accidents HREP to implement Public Involvement and Information Program Roads to STP constructed prior to STP construction	Permits obtained Monthly reports and bi-monthly meetings during construction Immediate reporting of any spills or environmental emergencies to Regional Environmental Emergency Response line (1-800-565-1633) and HRM (426-6030)

Table 4: Summary of Mitigation and Monitoring Requirements

VEC/VSC	VEC Objective	Mitigation	Monitoring	Responsibility	Mechanism	Documentation
	Operation • Minimize operational vehicle traffic to facilities	Mariners • Consultations with Harbourmaster and Coast Guard regarding construction of outfalls/diffusers and Navigable Waters permit • Use of approved truck routes • Use of dedicated access road to Dartmouth STP • Restriction of trucks to off-peak hours in congested areas	• On-site supervision and monitoring by qualified personnel	HREP responsible for sludge transport trucks	Trained sludge truck drivers	
Public Health	Operation • Minimize release of VOCs from STP air discharge • Minimize discharge of pathogens from sludge management facility and/or application of sludge product See Atmospheric Resources for further detail on Noise & Odour controls	• Design features such as enclosed buildings under negative pressure • Air discharge from STP below guidelines for VOCs • Air scrubber system further reduces levels of VOCs • Adherence to EPA Class A requirements for pathogen reduction	• VOC analysis of STP emissions • Faecal coliform effluent meets NSDEL requirements • Compliance monitoring at sludge management facility to ensure EPA Class A and Ag. Canada approved product	HREP responsible for all compliance monitoring at STPs and sludge facility as per all permit requirements and project agreements	Regular written monitoring reports to NSDEL, HRM and Ag. Canada Continuous monitoring at STP discharge HREP bonds and guarantees as described HREP required to prepare Health & Safety Plan Complaint response mechanism as described	Written reports to HRM and regulators detailing - compliance - complaints & action - operations

3.6 Follow-up

Under the CEAA, a follow-up program:

- verifies the accuracy of the assessment; and
- determines the effectiveness of any mitigation measures that have been implemented.

The primary objective of the project is to meet the water quality objectives for Halifax Harbour as set by the Halifax Harbour Task Force (HHTF 1990) based on intended end use. Upon completion of the project, the proponent will verify that these water quality objectives have been attained.

4.0 PUBLIC CONSULTATIONS

There has been considerable opportunity for public input in the planning stages of the project to date. HRM adopted a community-based approach to enhance community support for the project. Related initiatives include: the 1996 Symposium on the HHSP; formation of the Halifax Harbour Solutions Stakeholder Committee; establishment of the community liaison program including establishment of community liaison committees in Dartmouth, Halifax and Herring Cove and funding to support the integration of STPs into the communities where they would be situated.

During the planning process, information concerning the project was also made available to members of the public through public meetings, newsletters and mailouts. Project related documents were available for review at local public and university libraries, the HRM project office and service centres, and electronically, through the HRM website.

As part of the federal environmental assessment of the HHSP, members of the public were invited to comment on the draft screening report. The announcement in the December 21st edition of the Halifax Chronicle - Herald indicated how copies of the documents could be obtained and comments provided. Comments were requested by January 13th.

Comments were received from a total of nineteen (19) individuals and representatives of community organizations. Of the submissions received, five (5) were generally supportive of the proposal while the rest expressed varying concerns. Among those opposed, there was broad support for the treatment of sewage into the harbour, but concern that the proposal under consideration is deficient in one or more

respects. A summary analysis of comments from members of the public on the draft screening report is attached in Annex A.

In addition to these comments, federal authorities have also considered issues raised in correspondence to federal departments and ministers regarding the HHP as part of the assessment. Concerns raised by representatives of the Halifax Dartmouth Citizens Coalition at a meeting with federal authorities on January 6, 2003 have also been taken into account.

5.0 SCREENING DECISION AND COURSE OF ACTION

Taking into consideration the screening reports and the review of comments received from the public, it is concluded that pursuant to subsection 20(1)(a) of the Canadian Environmental Assessment Act, the HHSP is not likely to cause significant adverse environmental effects taking into account the implementation of mitigation measures described in this report and in the screening documents listed in section 1.4. It is further concluded that public concern about the project is such that a referral to the Minister of the Environment for a review by a Mediator or a Panel is not warranted.

6.0 SCREENING CERTIFICATE

This document summarizes the results of an environmental assessment related to the Halifax Harbour Solutions Project that has been performed and completed by the Responsible Authorities in accordance with the *Canadian Environmental Assessment Act*.

Approved By _____ Infrastructure Canada _____ January 29.03
Keith Grady Date

Approved By _____ Fisheries and Oceans Canada Feb 3 03
Paul Boudreau Date

Approved By _____ Parks Canada _____ Feb 3 03
Linda Frank Date

Approved By _____ Department of National _____ 5 Feb 2003.
Capt (N) N. S. Greenwood Defence MARLANT Date

Approved By _____ Halifax Port Authority _____ 14 FEB 03
George Malec Date

7.0 REFERENCES

7.1 Literature Cited

Canadian Environmental Assessment Agency. 1994. Responsible Authority's Guide to the *Canadian Environmental Assessment Act*.

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Halifax Regional Municipality. 2001. Halifax Regional Municipality Harbour Solutions Project Environmental Screening. Prepared by Jacques Whitford Environment Ltd. October 2001.

Halifax Regional Municipality. 2002a. Halifax Regional Municipality Harbour Solutions Project Addendum to Environmental Screening. Prepared by Jacques Whitford Environment Ltd. March 2002.

Halifax Regional Municipality. 2002b. Halifax Regional Municipality Harbour Solutions Project Environmental Screening Addendum 2. Prepared by Jacques Whitford Environment Ltd. May 2002.

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Wright and Hopky. 1998. Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters. Department of Fisheries and Oceans Canada. Canadian Technical Report of Fisheries and Aquatic Sciences. 2107.

7.2 Personal Communications

Hiltz, D. Manager, Nova Scotia Department of Environment and Labour. Letter to M. Kroger, Halifax Regional Municipality. April 12, 2000.

Kozak, J.H. Manager, Toxic Management Division, Environment Canada. Letter to M. Kroger, Halifax Regional Municipality. June 1, 2000.

Topp, B. Regional Manager, Trojan Technologies, North America West. 2001.

Appendix A
Summary of Public Comments Regarding the HHSP Draft Screening Report

Correspondence from members of the public and interest groups regarding the draft screening report were review by federal authorities involved in this assessment. The following is a summary of issues raised in respect of the project proposal that is currently undergoing review. In some cases, the correspondence also referred to matters beyond the current proposal and/or outside the scope of issues relevant for consideration under the *Canadian Environmental Assessment Act*. Examples of the latter issues, which are not listed below, include — expanding the federal assessment to include an evaluation of the Request for Proposals and the public/private concept though, which the project would be undertaken.

Many of those submitting comments expressed the view that sewage entering Halifax Harbour should be treated. Of those, most went on to raise specific concerns regarding the proposal under review. These comments are summarized below.

Summary of comments received from the public regarding the draft screening report on the HHSP

Comment	Reference No.	Consideration in Relation to the Screening
Comments respecting the EA process or procedures		
Project should be referred for **review by a panel or mediator**	001, 006, 008, 014	Project requires a screening level of assessment under the *Canadian Environmental Assessment Act* (Act). Referral for public review would be required if the project is expected to cause significant adverse environmental effects that cannot be mitigated, or public concern warrants or if it is uncertain whether the project, taking into account mitigation, is likely to cause significant adverse environmental effects.
The proposal and report fail to follow the direction of the 1993 Panel Report on the Halifax-Dartmouth Metropolitan Wastewater Management System.	005	The current proposal differs in substantial respects from that considered by the former review panel. It must be reviewed on its own merits in accordance with requirements of the Act. HSSP Environmental Screening Report (October 2001), Appendix B compares the former Halifax Harbour Cleanup Project and the current HHSP.
There has been no effective **public involvement** in this	001, 002,	HSSP Environmental Screening Report (October 2001), section 9, refers to public consultation

project from the approval of the Advisory Committee''s Report by the HRM in April 1998 to present. Principles for site selection, WINBY and residents'' petition opposing the Dartmouth (and Halifax) STP sites has been ignored.	006, 011, 013, 014	activities of the HRM. With respect to the federal screening, responsible authorities have exercised the discretion granted them under the Act to seek public input on the draft screening report. HRM has agreed to establish a Public Information and Involvement Program following project approval. See the Mitigation and Monitoring section of this report.
The **period available for the public to review** and comment on the screening report, December 21 to January 13, was inadequate.	001, 002	The timing of the public comment period over the holidays was not preferred, but it was felt that the draft screening report should be made available as early as possible to give interested parties more time to review it. The document was available for 12 working days over a three-week period. This is generally consistent with the comment period provided for the review of some comprehensive study reports. Also, a number of key background documents have been publicly available for a much longer period.
The current documentation / proposal does not reflect the **previous findings, conclusions and commitments** expressed in reports and by HRM. Certain studies referenced in the documents, such as those relating to wind speed, are dated and should be re-done. Long term epidemiological studies are required of potential health impacts. Additional studies are required, such as effects of STP operations elsewhere.	001, 007	The proposal under review is the HHSP. There has been consideration of previous documents and technical studies to the extent considered appropriate to the current project design. See, for example, HSSP Environmental Screening Report (October 2001), section 3.2.1. Consideration has been given to the studies required in support of this review and to the adequacy of the information available for decision-making purposes. The studies and other information are considered adequate, taking into account that post-assessment monitoring during the construction, commissioning and operational phases of the project will aso be required.

Project description lacks financial details.	001, 002	The project description is intended to highlight aspects of the project that give rise to environmental concerns. Detailed financial data is typically not requested, nor required under the Act. Under the Act, the responsible authorities determine the scope of the project to be assessed.
The HRM Pollution Prevention Program should be considered part of the project.	001, 002	HRM has indicated its commitment to continue implementing this program. The Responsible Authorities and Environment Canada strongly support this initiative.
The use of a **Public-Private Partnership** will result in increased costs and loss of control.	003, 006	The purpose of the environmental assessment is to highlight aspects of the project that give rise to environmental concerns. The selection of contractors or other project management strategies is beyond the scope of assessment. However, as indicated in the Summary of Mitigation and Monitoring, such mechanisms are outlined.
Comments respecting potential environmental effects		
Health impacts of STPs have not been adequately assessed, following the Canadian Handbook of Health Impact Assessment (CHHIA). Noise and odour should be part of the assessment and part of the monitoring and follow-up	001, 002, 003, 006, 007, 009, 013 001	Consideration has been given to potential impacts of noise, odour and air emissions from STPs on human health. See HSSP Environmental Screening Report (October 2001), section 5.5, Report to HRM on Screening Level Health Risk Assessment HHSP (April 24, 2001) and related correspondence from Medial Officer of Health below **(Correspondence Ref # 010)**. In seeking expert advice, including advice respecting potential health impacts, the technical specialists should determine what methods and perspectives are relevant and applicable. It would be inappropriate to request that those specialists utilize the CHHIA or any other specific approach. Procedures for monitoring noise, odour and air emissions and for recording and responding to complaints respecting to plant operations will be established.

There has not been a **socio-economic/economic analysis** of alternatives to the proposed project and sites as required under the Act.	001, 002, 013, 014	Pursuant to subsection 16(1)(e), responsible authorities can determine any other relevant matters relevant to the screening that should be examined, such as alternatives to the project. The alternatives considered in this case are described in HSSP Environmental Screening Report (October 2001), section 2.6. The Act does not specify the level or type of analysis that should be applied to alternatives.
Opportunity for **sustainable operation** through the use of discharge water for heating and cooling are missed.	001, 002, 003	Although this may possibly be a beneficial use of the discharge water, its viability and implications are unclear. In accordance with the Act, the screening has therefore focused on whether the discharge of treated effluent into the harbour, as proposed, is likely to cause significant adverse environmental effects.
Alternatives of secondary treatment and Solar Aquatic Technology have not been adequately assessed. Advanced primary is not acceptable in view of the costs. Alternative STP sites in industrial areas should be considered. Previous reports concluded the Dartmouth Cove or Sandy Cove sites would be too close to residences.	001, 002, 003, 006, 008, 012, 014, 017	Advanced primary treatment is expected to meet effluent quality limits specified by the Nova Scotia Department of Environment and Labour and is expected to achieve the water quality objectives for Halifax Harbour. HRM has also committed to designing the system, and providing enough land at each treatment plant site, to accommodate additional treatment needs that may be required in the future (Sections 2.3, 2.6.3 & 2.10 October 2001 Environmental Screening document)(Addendum 2). The treatment system will also be complemented by the pollution prevention program and the inflow/infiltration reduction program managed by the HRM. The Pollution Prevention Program (Source Control Strategy) (Section 2.6.1 of the October 2001 Environmental Screening document) (Addenda 2 and 3) will serve to minimize the introduction of toxic chemicals into the collection and treatment system. It is expected that all relevant industrial, commercial and institutional facilities will be compliant with the Wastewater Discharge By-Law (W-101) before the project is

		completed. The program to reduce inflow and infiltration into the sewer system (Section 2.6.1 of the October 2001 Environmental Screening document) (Addenda 2 and 3) will serve to lessen the amount of wastewater requiring treatment and reduce the risk of overflow events. Alternatives including Solar Aquatics Technology (SAT), and technologies offering other treatment levels, were determined not to be economically feasible. SAT was also considered not to be a proven technology for this type of application. The identification of possible alternative sites depends on land availability, municipal planning and other considerations beyond the scope of project assessment. This screening has focused on assessing and managing potential environmental impacts of the sites proposed by HRM.
Sludge Management Facility has been casually dealt with in Addendum 1. The life cycle management of sludge should be part of the assessment. **Composting** is preferable to the proposed sludge management process. The regulatory regime for the SMF is outdated.	001, 006, 011, 014	Addendum (March 2002) provides a description of the sludge management program including the processing, facilities and related activities, provisions for the management of potential impacts, contingency planning and monitoring and reporting requirements. This information is considered adequate to evaluate this aspect of the project proposal, its potential environmental effects and measures to mitigate adverse effects. Arrangements for sludge processing and disposition and monitoring and approval have been reviewed and are considered adequate.
Quality of life and right of local residents Dartmouth) to peaceful enjoyment of property should be considered. Impact on **property values** and development of Dartmouth South as a family oriented community, should also be	001	In accordance with the Act, the screening has considered the potential effects of the project on the environment, including the effects of any changes to the environment caused by the project on other matters such as health and socio-economic conditions. The proposed Dartmouth STP is a conforming use of the site which is currently zoned as Harbour- oriented Industrial. As noted above,

considered.		the potential impacts of noise, odour and air emissions from STPs have been evaluated and, taking into account site standards and mitigation, their effects are not expected to be significant.
Archaeological and historical resources need to be addressed.	001, 004, 009	Potential impacts on these resources are addressed in HSSP Environmental Screening Report (October 2001), section 5.2 and Addendum 2, and the mitigation measures in section 3.5 of this report.
With regard to **land use**, the impact of the Dartmouth STP on the future use of the Canadian Coast Guard Base needs to be considered. Loss of the historic value of the CCG property. What are the **land uses** available following construction of the Halifax STP	010, 011	Future use of the site has not been determined so was not considered in the cumulative effects assessment (CEA) of this proposal. Refer to HSSP Environmental Screening Report (October 2001), section 8.0 for for details of other projects considered in the CEA. It is understood that the CCG site does not have historical designation A number of options are available with regards to end use of the building roof area, to be determined in consultation with the CLC.
Proposed **service road** to the STP site should be part of the assessment.	001	It is included in the scope of project under review.
Assessment of STPs must take into account the processing of **industrial, commercial, institutional as well as residential wastes**. Implications for the health and safety of local residents. Lack appropriate and available source controls of pollutants; ““no net degradation”” standard and ““zero toxic discharge”” levels should be applied.	001, 002, 006, 014	The assessment acknowledged these various waste streams. HSSP Environmental Screening Report (October 2001), section 2.6 and Addendum 2 (May 2002) refers to the Pollution Prevention Program/ Source Control Program that is intended to limit the introduction of contaminants into the waste stream. See previous comment regarding health implications. With respect to the quality of effluents, STP discharges will be monitored in accordance with NSDEL specifications and limits and corrective

		action taken in the event of non-compliance.
Emergency Measures Disaster Plan for the Dartmouth STP is a high priority	001	As indicated in the Summary of Mitigation and Monitoring Requirements, a number of manuals and plans would be produced. This will include contingency planning and response procedures.
Statistics on **STP worker health and safety** should be analyzed.	001	Applicable occupational health and safety guidelines and requirements will be met at these facilities.
The effectiveness of **UV radiation** should be clarified.	001	The effectiveness of this treatment method in relation to chlorination has been considered in the review.
Is the proposed **end use of the finished sludge product** safe?	001, 002, 011	Addendum (March 2002) describes the proposed end use and the standards and certification requirements that will be applied in order to ensure appropriate disposition of sludge products.
Permissible **noise levels** for STPs, including tonal noise, should be reduced.	001, 007	The proposed levels are consistent with provincial guidelines for this type of land use. Levels will be monitored and, as noted in the Summary of Mitigation and Monitoring, a procedure for addressing complaints would be established.
Assessment should take account of **projected make-up of waste in 60 years**.	001	It is difficult to make such long-term predictions with any degree of assurance of their accuracy. The project proposal provides for the expansion and upgrading of treatment facilities if regulations or level of demand warrant.
Separation of storm and sewer lines should be mandated and planned for in these documents.	006, 014	The important contribution that line separation can make to the overall success in achieving the project''s water quality objectives is recognized.
Nuisance effects of blasting and other construction and operational activities. (Traffic)	011	The assessment acknowledged these various potential impacts . HSSP Environmental Screening Report (October 2001), sections 5.3 and 5.4 and as indicated in the Summary of Mitigation and

		Monitoring.

Correspondence List

Reference No.	Date	From
1	Jan 8, 03	W.A. (Sandy) Hogan (Dartmouth Resident Petition Group/Halifax Dartmouth Citizens Coalition)
2	Jan 10, 03	John McCracken
3	Jan 11, 03	Joy Woolfrey
4	Jan 12, 03	Bill Campbell
5	Jan 13, 03	W. P. Shaw
6	Jan 13, 03	Howard Epstein (MLA, Halifax Chebucto)
7	Jan 13, 03	Marianne J. Feetham
8	Jan 13, 03	Halifax WaterWorks Group
9	Jan 13, 03	Trevor J. Kenchington
10	Jan 13, 03	Robert Strang, MD (Medical Officer of Health)
11	Jan 13, 03	Matthew Dubois
12	Jan 13, 03	Jean M. Chard
13	Jan 13, 03	Vincent Calderhead (Nova Scotia Legal Aid)
14	Jan 14, 03	David Wimberly
15	Jan 15, 03	Cam Rogers
16	Jan 15, 03	F. C. O'Neil
17	Jan 16, 03	Jennifer Robertson
18	Jan 16, 03	Walter Wells
19	Jan 16, 03	Jim Morrison