

APPENDIX F

**RESPONSIBILITIES FOR PROTECTION OF
STORMWATER QUALITY AND OTHER
STORMWATER RELATED ACTIVITIES**

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1.0 INTRODUCTION

This appendix provides a summary of the roles and responsibilities for the protection of stormwater quality by the different levels of government in the study area (Section 2.0). Also provided are some of the activities by government and community groups to assess or improve stormwater quality (Section 3.0).

2.0 RESPONSIBILITIES FOR PROTECTION OF STORMWATER QUALITY

The jurisdictions involved with stormwater quality, either directly or indirectly, in the survey area include the Juan de Fuca Electoral Area (JdF EA), District of Sooke, Capital Regional District (CRD), the Vancouver Island Health Authority (VIHA), the Ministry of Transportation (MOT), the Ministry of Environment (MOE), the Ministry of Forests (MOF), and Fisheries and Oceans Canada (DFO). The following sections discuss some of the responsibilities of these jurisdictions.

2.1 Municipalities

Municipalities are responsible for stormwater runoff (i.e., storm drains) and have powers to protect water quality through official community plans (OCPs) and bylaws. OCPs contain community goals and objectives and can state policies regarding protection of stormwater quality. The OCP can also designate areas requiring special management and guidelines to protect water quality. Bylaws can also be developed to protect stormwater quality by prohibiting the discharge of contaminants, protecting riparian areas, preventing an increase in stormwater flows and requiring treatment of stormwater under certain circumstances.

In 1988, the Sooke EA adopted the *Sooke Official Community Plan*. This OCP covers the area that includes the District of Sooke and part of the JdF EA. Four local area plans (Sooke Local Area plan, Sooke Harbour, Basin and Inlet Management plan, Otter-Shirley Local Area plan and East Sooke Local Area plan) were adopted as part of the Sooke OCP. The relevant sections in the Sooke OCP and the Sooke Local Area plan will be used by the District of Sooke. The following are some of the objectives listed in the OCP and local area plans related to stormwater quality in Sooke Harbour, Basin and Inlet, waterbodies shared by the JdF EA and the District of Sooke and their status.

The *Sooke Harbour, Basin and Inlet Local Area Plan* includes the following stormwater quality related objectives and their status:

- *Maintain established water quality objectives for the plan area in order to prevent incompatible development that may contribute to a decline in water quality—ongoing consideration.*
- *Protect fish and wildlife habitats in the Sooke Harbour, Basin and Inlet—ongoing consideration.*
- *Preserve vegetation cover on upland and foreshore areas around the Sooke Harbour, Basin and Inlet as much as possible—ongoing consideration.*
- *Protect Anderson, Roche, Hutchinson and Cooper coves, rehabilitate Whiffin Spit only as structurally necessary and encourage the restoration of its natural vegetation—ongoing consideration, Whiffin Spit rehabilitation occurs as repairs are made.*
- *Preserve the natural character of the marine environment in the Sooke Harbour, Basin and Inlet as much as possible—ongoing consideration.*
- *Encourage the prevention of excessive noise and air pollution in the plan area—ongoing consideration.*

The following provides some of the policies in the *Sooke Harbour, Basin and Inlet Management Plan* to prevent the deterioration of water quality in the harbour, basin and inlet.

- *The future development of marine commercial or marine industrial uses that would substantially contribute to loadings of heavy metals and hydrocarbons should not be permitted in or around Sooke Harbour, Basin and Inlet—ongoing consideration.*
- *No permit shall be issued by the District of Sooke for upland uses or uses within the plan area which would be likely to lead to direct or indirect discharge of deleterious substances into Sooke Harbour, Basin or Inlet. Other governments and agencies having jurisdiction are encouraged to restrict the issuance of permits in similar situations—ongoing consideration.*
- *The future impact on water quality should be examined as part of the consideration of proposals for upland development—ongoing consideration.*
- *Water quality assessment and monitoring programs for Sooke Harbour, Basin and Inlet and its drainage areas should be initiated and/or continued jointly by the federal, provincial and regional governments as soon as possible, as recommended in “A Water Quality Assessment and Provisional Water Quality Study for Sooke Harbour, Basin and Inlet” (Aquamatrix Research Ltd., 1989). Any such programs should be coordinated to prevent duplication—done, in part, by the CRD Stormwater, Harbours and Watersheds program (SHWP); however, further monitoring is required to meet this objective.*
- *The CRD shall take steps to encourage boat owners to install holding tanks in boats with a head, to encourage marinas to install pump-out facilities—not done.*
- *The Capital Regional Board, through the Health department, Environmental Protection division, should investigate the feasibility of setting regulations requiring that septic disposal fields and tanks be set back a minimum distance for the mean high water mark, and located, where feasible, on the upland side of any structures on a lot—not done.*
- *The CRD should initiate a public education program to inform the public and those selling pesticides, herbicides and chemical fertilizers that these substances should not be used along the waterfront and all waterways draining into the Harbour and Basin—ongoing by CRD SHWP and local environmental organizations.*
- *In regards to water quality objectives and monitoring, the CRD shall:*
 - (a) *Adopt Proposed Water Quality Objectives ... until the Ministry of Environment, Lands and Parks conducts a formal review of the proposed water quality objectives—adopted.*
 - (b) *Request that the Water Management Branch, Ministry of Environment, Lands and Parks conduct a formal review of the proposed water quality objectives—in process.*
 - (c) *Request the provincial and/or federal government(s) conduct a water quality objectives monitoring program or provide funds to conduct such a program—initiated; sampling program is planned for 2008.*

The plan also states that certain developments on commercial and industrial lands within 100 metres of the mean high water mark in the Sooke Harbour and Basin be carried out in a manner sensitive to the environment including retention of vegetation and minimizing soil erosion. This policy is a consideration.

The *East Sooke Local Area plan* was adopted in 1996 and is termed the *Official Community Plan (Sooke) Bylaw, Amendment Bylaw No. 29, 1996*. The following are some of the objectives of the plan relevant to stormwater quality and their status:

- *To ensure the protection of the marine shoreland environment through policies that are responsive to natural physical processes—ongoing consideration.*

- *To maintain water quality standards, as affected by land use in the Sooke Harbour, Basin and Inlet areas and Becher Bay area—ongoing consideration.*
- *To protect and enhance ponds, creeks, streams and wetland environments in their natural states by (ongoing considerations):*
 - *protecting and or preserving natural drainage features*
 - *ensuring the protection of their natural amenities*
 - *protecting and enhancing the fisheries in the area's ponds, creeks and wetlands*
 - *protecting the water quality streams and ponds*
- *To preserve the quality of air, land and water—ongoing consideration.*

The following are policy statements made in the plan relevant to stormwater quality issues:

- *Prohibit the construction of a septic tank within 15 metres from a watercourse or its source—ongoing.*
- *Prohibit the location of an absorption field within 30 metres from the source of streams—ongoing.*
- *Encourage the retention of vegetation cover on stream banks, including wetlands—ongoing consideration.*
- *Wherever possible, maintain streams and wetland areas as wildlife habitats or in as natural a state as possible and encourage recreation uses only when such uses are compatible with the habitat wetlands—ongoing consideration.*
- *Development and logging of steep hillsides with poor soil stability or steep slopes susceptible to erosion and landslide should be discouraged near wetlands—ongoing consideration.*
- *To ensure that there is no modification of stream channels and banks, the Capital Regional District [for the electoral area] will support the Ministry of Environment, Lands and Parks to prevent the removal or addition of gravel, sand, soil and vegetation to or from stream beds and adjacent uplands wetlands—partially included in the CRD soil removal bylaw.*
- *Prohibit development which requires the placement of fill or alteration or ponds or wetlands or activities which contribute to the discharge of deleterious material into same—ongoing, part of zoning regulation.*

The *Sooke Local Area Plan* provides land use policies and development guidelines on lands that contribute flows from the northern part of Sooke Harbour and Basin within the plan boundaries. The following are stormwater related objectives and policies from the plan and their status.

- *The Capital Regional District [District of Sooke] and the plan shall assist the Ministry of Environment, Lands and Parks, and Fisheries and Oceans Canada in protecting all creeks in the planning area—ongoing consideration.*
- *Encourage good forest practices consistent with the Forest Practices Code along all drainage systems to ensure that fish habitats are maintained and that erosion is minimized—ongoing consideration.*
- *Prohibit the construction of buildings within 30 metres (100 feet) horizontal distance from the top of bank/break of land of Ayum Creek, DeMamiel Creek and Sooke River or from the area below the 200 year flood level adjacent to these watercourses, when it can be determined—ongoing, enforced through zoning regulation.*
- *Prohibit the construction of habitable buildings within 15 metres (50 feet) horizontal distance from the top of bank/break of land of any watercourse or stream not mentioned in policy 3 (this section), or from the area below the 200 year flood level adjacent to these watercourses or water bodies, when it can be determined—ongoing, enforced through zoning regulation.*

- *Prohibit the construction of a septic tank within 15 meters (50 feet), from the source of domestic water (e.g., rivers, streams, lakes, watersheds, wells, shoreline)—ongoing.*
- *Prohibit the location of an absorption field within 30 metres (100 feet) from the source of domestic water (e.g., rivers, streams, lakes, watersheds, wells, shoreline)—ongoing.*
- *Dredging, filling, channelling or culverting of lakes, creeks, wetlands and streams, and any other activities that would adversely alter stream hydrology, or the shape of the channel, shall not be permitted—ongoing consideration.*

2.2 Regional Government

The regional level of government includes the CRD and the VIHA. The CRD Environmental Services department, Scientific Programs is responsible for managing a stormwater quality program which involves coordinating stormwater quality activities. The VIHA is responsible for investigating septic tank and fields. The following sections discuss each of these responsibilities.

CRD ENVIRONMENTAL SERVICES DEPARTMENT, SCIENTIFIC PROGRAMS

In 1997, the CRD Board adopted a bylaw titled *Sooke Stormwater Quality Management Extended Service Establishment Bylaw No., 1996*. The bylaw allowed the CRD to control pollution in *stormwater runoff from land by investigating, monitoring and reporting on stormwater quality, sediment quality nearshore marine waters and discharges to stormwater; prioritization of areas for investigation; public education; coordination of stormwater quality management programs; liaison with other government agencies and other related activities.*

In 2007-2008, the JdF EA director retained the services of the CRD SHWP to monitor for pollution in stormwater runoff from land. The CRD does not have the authority to directly implement any mitigative programs. This remains the responsibilities of the municipalities under the *Local Government Act* and First Nations.

Also, the CRD developed an enhanced model storm sewer and watercourse bylaw in 2000. The previous stormwater bylaw was updated to reflect recent regulative and legislative changes.

VANCOUVER ISLAND HEALTH AUTHORITY

The VIHA determines whether a lot is appropriate for onsite treatment and sets out requirements as per the *British Columbia Health Act, Sewage Disposal Regulation*. VIHA is also responsible for investigating complaints if septic tanks and fields with flows less than 5,000 gallons per day are not functioning properly. CRD and VIHA staff will work together to determine sources of high fecal coliform counts in areas with septic tanks and fields.

2.3 Provincial Government

In the JdF EA, the MOT, under the *Highway Act*, has authority over stormwater drainage from road rights-of-way only. The MOE is responsible for surface water allocation for use by the community and wastewater discharges into surface waters. The MOE is responsible for the allocation and management of Crown lands and Crown provincial foreshore. The Ministry of the Attorney General is responsible for the Provincial Emergency Program (PEP) which responds to reports of environmental and public health emergencies.

The following are the most pertinent pieces of provincial legislation related to stormwater quality. This information was taken from *Tackling Non-Point Source Water Pollution in British Columbia* (Ministry of Environment, Lands and Parks, 1998):

- The *Local Government Act* provides electoral areas with authority to adopt zoning, subdivision and other bylaws, permit construction, develop solid and liquid waste management plans, provide water and sewer services and address environment concerns. Electoral areas can enact bylaws to control surface runoff, prohibit pollution and obstruction of flows in watercourses and allow the development of environmental policies regarding protection and enhancement of the environment in official community plans.

- The *Water Act* provides for approval of all water use, storage and diversion of water and works in and about streams. This is important for preventing activities that may negatively impact a stream.
- The *Water Protection Act* confirms Crown ownership of surface and ground water and prohibits large-scale diversion or removal of water. This allows for the protection of the amount of flows being diverted from a creek or stream, which is vital for survival of aquatic life.
- The *Environmental Management Act* requires permits, approvals or operational certificates under a liquid and solid waste management plan for discharges to land, air and water, and handling of solid and toxic wastes; and prohibits dumping or discarding litter and sewage. The MOE regulates sewage treatment facilities with sewage flows greater than 5,000 gallons/day. The *Act* can also require the development of measures to prevent a spill of a potentially polluting substance by the person in possession of the substance. The PEP was initiated to protect people and property during disaster situations and is also the contact for reporting spills that can cause harm to public health and the environment such as oil spills. When an incident is reported to PEP, they will contact the agency responsible for investigating the problem. The phone number for PEP is 1-800-663-3465.
- The *Environmental Assessment Act* requires environmental impact assessment for specific development projects and activities. This will allow MOE to request proposed development projects to consider stormwater quality issues.
- The *Fish Protection Act* protects fish by ensuring healthy fish-bearing streams and plentiful stocks. Stormwater pollution can impact the health of streams and aquatic species.
- The *Pesticide Control Act* regulates the use and application of pesticides. Pesticides have the potential to contribute pollution to stormwater runoff if not applied properly.
- The *British Columbia Health Act* regulates approval of construction camps, public water supplies, sewage disposal, sanitation and food supply operations. This *Act* can be used to prevent pollution of stormwater from the mentioned operations.
- The *Fire Services Act* provides approval of onsite fuel storage and dispensing. Through this *Act*, proper installation of fuel storage and dispensing facilities can be ensured to protect stormwater quality.
- The *Soil Conservation Act* established permitting requirements for soil removal from an agricultural land reserve, and regulates use of land in agricultural land reserves. Some agricultural activities have the potential to contribute stormwater pollution, especially if soil erosion causes sedimentation in streams.
- The *Farm Practices Protection (Right to Farm) Act* ensures that farmers can farm in agricultural land reserves, adds specific powers to local governments, may regulate farm conduct and prohibit specific farm operations.

The *Riparian Areas Regulation (RAR)*, enabled by the *Fish Protection Act*, provides local government with the necessary tools to protect fish and fish habitat from the negative impacts of development. The RAR became effective March 31, 2005 and applies to streams, rivers, ditches, ponds, lakes, springs and wetlands. It sets out provisions to protect the stream-side vegetation and soils during new residential, commercial and industrial development on land under local government jurisdiction. The following key components of the regulation were taken from the *Riparian Areas Regulation Implementation Guidebook* (MOE, 2006):

- Local government may permit development within 30 m of the high water mark of a stream or top of bank of a ravine provided the prescribed riparian assessment methods have been followed.
- A qualified environmental professional (QEP), using the riparian assessment method, shall provide an opinion—in an assessment report—that the development will not result in a harmful alteration of fish habitat and will provide required measures to protect the riparian area during development.

- The assessment methodology in the Schedule of the Regulation ensures that the assessment has been conducted to a standard level and that the standard reporting format is followed.
- The Regulation is based on current science regarding fish habitat, while recognizing the challenges in achieving science-based standards in an urban environment.

Recently, the provincial government developed *Stormwater Planning: A Guidebook for British Columbia*. This guidebook is intended to provide a framework for effective stormwater management that is usable in all areas of the province. The guidebook explains how stormwater systems have traditionally been developed and promotes an integrated approach to stormwater management, which includes:

- identifying at-risk drainage catchments
- setting preliminary performance targets
- selecting appropriate stormwater management site design solutions

2.4 Federal Government

DFO is responsible for reviewing all foreshore development proposals which may affect fish habitat.

The following are the most pertinent pieces of federal legislation related to stormwater quality and most were taken from *Tackling Non-Point Source Water Pollution in British Columbia* (MELP, 1998):

- *The Fisheries Act prohibits harmful alteration of fish habitat and the deposit of deleterious substances.* This Act applies to creeks, streams and storm drains that flow into watercourses and the marine shoreline where fish are present. Polluters can be charged under this Act.
- *The Canadian Environmental Protection Act requires certain facilities such as manufacturing or processing business to report when a toxic substance has spilled into a watercourse or storm sewer.*
- *The Canadian Environmental Assessment Act requires environmental impact assessment of all projects funded or authorized by the federal government, or which take place on federal lands.* An environmental impact assessment usually includes impacts to water quality which will allow the awareness of a potential impact to stormwater quality and therefore, allow requirements to prevent the impact from occurring in advance.
- *The Canadian Wildlife Act and the Migratory Bird Conventions Act protects wildlife; migratory birds and associated habitats.* Associated habitats include wetlands and the marine shoreline which can be sensitive to stormwater pollution.
- *Canada Shipping Act regulates shipping, including ship-sourced pollution, and the designation of water bodies under the Pleasure Craft Sewage Pollution Regulations and Non-Pleasure Craft Sewage Pollution Regulations.*
- *Transportation of Dangerous Goods Act defines safety requirements for transport of dangerous goods.* This can prevent accidental spills of toxic substances from occurring in watercourses and the marine shoreline while being transported.

2.5 First Nations

First Nations are responsible for stormwater on their lands. The Band and Health Canada usually address stormwater pollution issues on First Nation land. Health Canada will carry out sampling investigations if requested by the Band.

There are opportunities for First Nations to adopt a bylaw that will allow for protection of stormwater quality similar to the CRD enhanced model storm sewer and watercourse bylaw (Humphrey, pers. comm.).

3.0 OTHER STORMWATER RELATED ACTIVITIES

This appendix discusses some of the stormwater related activities that have been carried out by government and community groups to assess or improve stormwater quality in the survey area.

3.1 Sooke Harbour and Basin Water Quality Monitoring Program

A water quality monitoring program in Sooke Harbour and Basin was carried out from 1988 to 1995 by Aquamatrix Research Ltd. for the CRD Municipal Services department.

In 1988 and 1989, an initial marine water quality assessment was completed as well as the development of provisional water quality objectives for Sooke Harbour and Basin. This initial study included an assessment of historical information, marine water quality, water uses of the harbour and basin, and sources and effects of potential contaminants. The data from the water quality assessment, as well as historical information, was used to establish provisional water quality objectives for the Sooke Harbour and Basin (Aquamatrix Research Ltd., 1990). These objectives were developed based on aquaculture since it is the most sensitive water use in Sooke Harbour and Basin.

The results of the 1988 and 1989 sampling program for the study indicate no exceedences (except for fecal coliform bacteria) of the provisional water quality objectives recommended in the document. The study also identified the main sources of contaminants to the harbour and basin are primarily marine oriented activities and non-point source pollution (stormwater) from the land. This initial document recommended continued sampling in Sooke Harbour and Basin. As a result, additional monitoring was carried out four times from 1991 to 1995. A report was produced for each year of monitoring. A final report was produced summarizing all of the monitoring completed for the study as well as an audit of the provisional water quality objectives development in the initial study (Aquamatrix Research Ltd., 1996).

The five-year monitoring program included water column profiles for temperature and salinity, seawater fecal coliform sampling, seawater trace metals and hydrocarbon sampling, as well as shellfish tissue bioaccumulation components. The sampling was done during the winter and summer to determine seasonal changes. Analysis of the data indicates the following:

- A seasonal trend was identified for fecal coliform levels which were very low during the summer sampling program, well below the 14 FC/100 mL standard for shellfish harvesting, and elevated during heavy precipitation.
- Seawater samples collected for trace metals and hydrocarbon analysis were generally all low with the exception of one station in the vicinity of Maywells weighs/marina (now called Sooke Marine Industries) on Billings Spit which consistently had concentrations of zinc and copper that exceeded the provisional water quality objectives for Sooke Harbour and Basin used by the study. The exceedences were primarily in the summer when there is minimal surface water movement due to a decrease in freshwater influence and an increase in boat repair activities. The study suggested that the primary sources for the zinc and copper were from vessel bottom paints, sacrificial anodes and other boat related activities and repair sources. These results demonstrate possible effects associated with marine commercial and industrial activities and the need to carefully consider any such future development within the foreshore.
- No significant trend was identified in the data during the eight year monitoring program as to improvement or degradation of water quality in the harbour and basin.

The study made the following statement regarding potential pollution:

Increased population is anticipated to contribute significantly to the impacts associated with municipal waste leachates (septic fields), and may eventually warrant installation of a sewage system with appropriate pre-discharge treatment for such wastes. Similarly, increased vehicular traffic in the region will result in measurable increase in the contaminant loads associated with road water runoff and plans for stormwater treatment may also be inevitable. Particularly for the Village core area (Aquamatrix Research Ltd., 1996).

This report also stated:

The baseline of environmental information provided by this five-year monitoring program has important implications to regional planning for the community of Sooke and its surrounding rural population. Sooke harbour and basin is a unique marine and estuarine system which is sensitive to chronic, long-term contaminant inputs. A continued environmental monitoring program for this system will ensure that the inevitable development within the region will proceed in such a way as to prevent any irreversible impacts to the marine/estuarine environment, thereby ensuring the protection of the valuable aquatic resources of the region. (Aquamatrix Research Ltd., 1996).

3.2 Environment Canada

The Environment Canada (EC) Shellfish Growing Area Surveillance program has undertaken saltwater and freshwater fecal coliform sampling in the Sooke Harbour and Basin to determine shellfish closures. The Sooke Harbour and Basin have been separated into six shellfish sectors by EC (Sooke Basin, Sooke Harbour, Sooke River Estuary, Anderson Cove, Roche Cove and Hutchinson Cove) to represent changes in environmental conditions. The criteria used by EC to determine shellfish harvesting closures is that the median value of samples collected cannot exceed 14 FC/100 mL and no more than 10% of the samples can exceed 43 FC/100 mL based on a minimum of five saltwater samples collected within 30 days. Shellfish closures automatically exist within 125 metres of any structure used for boat moorage or any permanently anchored floating structure such as float homes.

All six sectors in the Sooke Harbour and Basin are presently closed for shellfish harvesting based on EC sampling data. EC sampling surveys are done every three years, with the next sampling report scheduled for completion in 2009.

A summary of the most recent EC sampling data can be found in Section 4.1.4 of this report.

3.3 Ministry of Environment

In 1996, a Sooke Water Allocation Plan was developed by the MOE, Regional Water Management department, to identify water demands and to ensure *that water use is compatible with the goals of a sustainable environment* (Jackson and Blečić, 1996). The plan provides general watershed information including climate, geology and significant drainage areas, hydrology of drainage areas and an assessment of surface water resources available, instream requirements for fish, and existing and potential licensable water demand.

Flow rates were determined for most of the major flows using Water Survey Canada hydrometric stations. The plan recommends that *the minimum flow required to sustain the fisheries resources for spawning and rearing is 10% of the mean annual discharge.*

The following summarizes some of the conclusions and recommendations of the report:

- *Fish are present in the following significant drainage systems into Sooke Harbour and Basin as of 1996: Matheson Lake, Sooke River, Ayum Creek and Veitch Creek. The study indicates that all four drainage areas have flows during the summer months that are below the recommended minimum flow requirements for fish.*
- *Fish and debris screens are part of good intake design and shall be required on all intake or diversion works within identified fish habitat areas. Fish passage provisions for both juvenile and adult fish are required on all storage dams or diversion works constructed on sources frequented by fish.*
- *Instream works are to be constructed only during the period specified by the fisheries agencies to minimize impacts on the fish resources. Instream works will normally only be approved for construction during June–September.*

- *The licensed water demand within the Sooke Water Allocation Plan area consists of conservation [for enhancement of fish and wildlife], domestic, industrial, irrigation, land improvement, mining, residential power, storage and waterworks purpose licences. Domestic purposes hold the majority of the water licences within their area.*

3.4 Fisheries and Oceans Canada

In 1991, the DFO Habitat Management South Coast Division completed an inventory of the marine foreshore fish habitat characteristic of the Sooke Harbour and Basin to assist in the planning of future foreshore development (Feakins, 1991).

The following summarizes some of the results of the study.

- *The Sooke Harbour is extremely shallow in most areas and this combined with the gravel mud substrates and the high circulation of water, provide conditions suitable for vegetative growth such as eelgrass. Eelgrass beds exist in the harbour and the northwest end of the basin and are important shelter, feeding and mating areas for fish and shellfish.*
- *Most of the foreshore development exists along the harbour and the seaward end of the basin where important fish and shellfish habitats exist. Foreshore development consists of commercial wharves or marinas, parks or reserves, aquaculture and private moorage.*

The following provides some of the recommendations made in the study:

- *Leasing/licensing of dock and marinas construction should be strictly controlled and reviewed according to Fisheries and Oceans Canada policy for the management of fish habitat.*
- *Upland uses should be compatible with foreshore designations, since land-based and marine activities are necessarily interrelated.*
- *Extremely sensitive and valuable fish habitats such as the entire Harbour (especially the Sooke River Estuary), Cooper Cove Estuary, and the scattered tidal flats throughout Sooke Inlet should be protected from certain forms of development (industrial, manufacturing, etc.) deemed detrimental to the fisheries resource.*

4.0 REFERENCES

Aquamatrix Research Ltd., 1996. *Sooke Harbour and Basin Water Quality Monitoring Program*. Prepared by Cross, S.F. for the Capital Regional District, Municipal Services department.

Aquamatrix Research Ltd., 1990. *A Water Quality Assessment and Provisional Water Quality Objectives for Sooke Harbour and Basin*. Prepared by Cross, S.F., T.O. Morrison, L.A. Gregory, and F.A. Dobbs for the Capital Regional District, Municipal Services department.

Bennett, M. CRD Planning Department, pers. comm.

CRD Municipal Services department, 1991. Langford Official Community Plan.

CRD Municipal Services department, 1996. Otter Point and Shirley Local Area Plan.

Feakins, T.L., 1991. *Sooke Harbour and Basin Fish Habitat Inventory*. Prepared for the Department of Fisheries and Oceans. *Canadian Manuscript Report of Fisheries Aquatic Sciences* No. 2131.

Hull, J. CRD Water Department, pers. comm.

Jackson, C. and B. Blečić, 1996. *Sooke Water Allocation Plan*. Prepared for the Ministry of Environment, Lands and Parks.

Lightly, D and M. Lightly, 1999. *An Overview Assessment of the Sooke River Watershed*. Prepared for the Sooke Watershed Society.

MELP (BC Ministry of Environment, Lands and Parks), 1998. *Tackling Non-Point Source Water Pollution in British Columbia*.

Tyers, J. Environment Canada, pers. comm.