Greater Vancouver Regional District

Greater Vancouver Regional District

Liquid Waste Management Plan

February 2001

BRITISH COLUMBIA

APR 0 4 2002

Reference: 61900

George Puil, Chair, and Director
Greater Vancouver Regional District
4330 Kingsway
Burnaby BC V5H 4G8

Dear George Puil and Directors:

I am writing further to Deputy Minister Derek Thompson's letter of May 11, 2001, regarding your letter of March 30, 2001, which included the regional district's liquid waste management plan (LWMP) submission, the board resolutions for adopting the LWMP and a draft addendum. Your July 19, 2001 letter enclosing a summary of member municipality resolutions ratifying the addendum is also noted.

Ministry staff has reviewed your submission and accompanying documentation. The technical aspects of the proposed LWMP are supported and I am satisfied that there has been adequate public review and consultation. However, the LWMP as submitted does not fully meet my requirements. Therefore, I hereby impose the following changes to the Greater Vancouver Regional District's (the district) LWMP as outlined in the document entitled *Greater Vancouver Regional District Liquid Waste Management Plan*, dated February 2001. The district shall:

1. Provide an opportunity for the public to have meaningful input into the implementation of the LWMP. Within two months of the publication of the biennial report referred to on page 55 of the LWMP, the district will notify the public of the existence of the report and receive comments and submissions at a special meeting of the district's Sewerage and Drainage Committee. The district will forward the minutes of this meeting, and copies of any submissions made, to Douglas Pope, Regional Environmental Protection Manager (the manager).

2. Develop the environmental "triggers" used in the monitoring process by January 31, 2004, recognizing that the environmental monitoring process in the LWMP is based on discharge indicator trend analysis such that action will be implemented before Water Quality Objectives or other criteria are met or exceeded. The monitoring program shall include sediment quality, bioaccumulation of contaminants in marine life forms and structure of biological community, in addition to water quality parameters;

3. Establish a linkage between biosolids quality and the effectiveness of source control programs;

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Ministry of
Water, Land and
Air Protection

Office of the Minister

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4. Eliminate chronic sanitary sewer overflows at Cloverdale and Maillardville by January 31, 2005 and eliminate all sanitary sewer overflows in the district that occur during storm or snowmelt events with less than a 5-year return period, by January 31, 2012;

5. Modify C8 and C11 contained in the Policy and Commitment Document relating to upgrading schedule and toxicity as follows:
   a) Commitment C8 of Addendum No. 1 shall include a requirement that the district will upgrade Iona Island and Lions Gate sewage treatment plants to full secondary treatment no later than 2020 and 2030, respectively;
   b) Third paragraph of Commitment C11 shall be revised to read, "...The district will determine whether the cause of failed bioassay toxicity tests on effluent from Lions Gate and Iona Island treatment plants is only due to ammonia. The district shall, in consultation with the Environmental Monitoring Committee, evaluate options to address non-ammonia-related toxicity, and prepare and submit to the manager within 90 days an action plan to significantly reduce non-ammonia-related acute toxicity at the point of discharge. The action plan shall include a repetitive process for continuous improvements both upstream and to treatment if acute toxicity has not been significantly reduced once the original action plan is implemented."

6. Complete, by January 31, 2007, each of the following:
   a) cost/benefit studies directed at implementing effective water conservation measures, including evaluating implementation of a universal water metering system throughout the district;
   b) reclaimed water projects at the treatment plants and elsewhere within the district; and
   c) a biosolids management plan.

7. By January 31, 2003, establish a program to study endocrine disrupting chemicals (EDCs), persistent organic pollutants (POPs) and other microcontaminants such as pharmaceutical drugs found in regional (the district) liquid waste, and their potential environmental impacts. This should include, but not be limited to, effluent characterization to identify and quantify the contaminants and biological assays using new techniques such as gene chip arrays to determine their sublethal impacts. It would be coupled with determining the environmental fate of priority contaminants and be carried out in consultation with the district LWMP Environmental Monitoring Committee. The district will work with the Capital Regional District on such studies if the Capital Regional District undertakes similar work.

Pursuant to Section 18(7) of the *Waste Management Act*, I hereby **approve** the Greater Vancouver Regional District's Liquid Waste Management Plan as outlined in the document entitled *Greater Vancouver Regional District Liquid Waste Management Plan*, dated February 2001 and with changes noted above. You may now implement the liquid waste management plan as adopted in the board resolution on March 30, 2001, and as approved by this letter.

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GREATER VANCOUVER REGIONAL DISTRICT

LIQUID WASTE MANAGEMENT PLAN

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LIQUID WASTE MANAGEMENT PLAN DEVELOPMENT

Summary

The Greater Vancouver Regional District (GVRD) and its member municipalities have developed a Liquid Waste Management Plan (LWMP) in accordance with the Province of British Columbia's Waste Management Act.

The Liquid Waste Management Plan was developed in accordance with the Ministry's *Guidelines for Developing a Liquid Waste Management Plan*, which specifies a three-stage process. This document, ***Greater Vancouver Regional District Liquid Waste Management Plan, February 2001*** completes the final step in the process.

The Liquid Waste Management Plan is fully described herein by a series of Policy and Commitment statements and Implementation Schedules for the initiatives to be undertaken in accordance with the commitments. Ongoing, long term initiatives are identified as well as the initiatives to be undertaken during the first five years of the Plan's implementation. The LWMP will undergo a review of its performance five years after its adoption and initial approval, and on a five-year basis thereafter, to determine if the Policies, Commitments, and Implementation Schedules need to be updated or revised.

The supporting documents associated with the Liquid Waste Management Plan include the documents for Stage 1 and Stage 2 of the Plan as well as the numerous scientific and engineering reports undertaken and completed as part of the Plan's development.

Liquid Waste Management Plan – Stage 1

A LWMP Stage 1 report was submitted to the Minister of Environment, Lands and Parks in 1989. It was approved by the Minister on March 8, 1990 with several conditions. Following Stage 1 the GVRD commenced work on several initiatives, including the upgrading of the Annacis and Lulu Island wastewater treatment plants to secondary treatment. Since these were significant projects that required substantial human and financial resources, much of the work to complete the Stage 2 planning process was deferred until the secondary treatment projects were well underway.

Liquid Waste Management Plan – Stage 2

In 1996 there was a significant expansion of the environmental studies and technical analysis associated with the assessment of numerous options, for the wide range of liquid waste management issues that were being considered. A formal committee structure to undertake development of the Stage 2 LWMP was put in place. As the environmental and technical studies were completed the findings were summarized in a discussion document, *Caring for Our Waterways*, which was broadly circulated to obtain stakeholder and public input on the options under consideration. Upon completion of a comprehensive public consultation process a draft Liquid Waste Management Plan was developed and concisely presented in the form of a *Policies and Commitments* document. This Plan was also broadly circulated for input and comment, further revised, endorsed by municipal councils, adopted by the GVRD Board on June 30, 2000 and submitted to the Minister for approval. The Stage 2 Plan was approved by the Minister on October 27, 2000.

Liquid Waste Management Plan – Stage 3

The Stage 2 *Policies and Commitments* document, *March 2000 (Amended)*, defines the Liquid Waste Management Plan to be implemented by the GVRD and its member municipalities. This Stage 3 document, *Greater Vancouver Regional District Liquid Waste Management Plan, February 2001* provides the implementation schedules associated with the LWMP commitments and their specific initiatives. The terms of reference for both the Environmental Monitoring Committee and the Stormwater Interagency Liaison Group, the draft operating certificates for the wastewater treatment plants, and a summary of Stage 3 stakeholder and public consultation were also part of the Stage 3 work.

Liquid Waste Management Plan Documents

The Liquid Waste Management Plan to be implemented by the GVRD and its member municipalities is defined in the following documents:

Greater Vancouver Regional District Liquid Waste Management Plan February 2001	Defines the Liquid Waste Management Plan to be implemented by the GVRD and its member municipalities.
Greater Vancouver Regional District Liquid Waste Management Plan Stage 2 Policies and Commitments March 2000 (Amended) Volume 1 through 6 inclusive.	Supporting documents including the listing in Appendix B of scientific, engineering, and other studies undertaken as part of the Plan's development.

Greater Vancouver Regional District Liquid Waste Management Plan Stage 1 February 1989 Six Volumes	

Liquid Waste Management Plan Geographic Area

This Liquid Waste Management Plan is specific to the geographic area of the Greater Vancouver Regional District (GVRD) as shown in Figure 1. The municipalities and electoral areas that comprise the GVRD geographic area include:

City of Burnaby	**Corporation of Delta**
City of Coquitlam	**District of Langley**
City of Langley	**District of Maple Ridge**
City of New Westminster	**District of North Vancouver**
City of North Vancouver	**District of Pitt Meadows**
City of Port Coquitlam	**District of West Vancouver**
City of Port Moody	Village of Anmore
City of Richmond	Village of Belcarra
City of Surrey	Village of Lions Bay
City of Vancouver	Bowen Island Municipality
City of White Rock	**Electoral Area A (portion of)**

Bold indicates municipalities that are members of the Greater Vancouver Sewerage and Drainage District (GVS&DD). The GVS&DD sewerage areas and facilities are shown in Figure 2.

The three villages (Belcarra, Anmore, and Lions Bay), Bowen Island Municipality, and portions of Electoral Area A, which are not members of the Greater Vancouver Sewerage and Drainage District but are within the GVRD geographic area, did not participate formally in the development of this Liquid Waste Management Plan. They have addressed their local liquid waste management issues individually according to their specific issues and needs. As such, this Liquid Waste Management Plan is only applicable in these jurisdictions to the extent of defining policies associated with non-point source pollution issues specifically being addressed by the Plan, namely pleasure craft sewage and on-site disposal systems.

Implementation Schedules

The Implementation Schedules identify specific initiatives being undertaken in accordance with the Plan's commitments, both long term and those identified during the first five years of the Plan. Budget categories include the following:

Included in annual budget	Less costly initiatives that will be undertaken using funding sources identified in annual budgets. Work is generally completed using existing staff resources.
Specific budget amounts ($xxx,xxx)	More costly initiatives that may have specific one-time budgets or be funded as capital initiatives that are debt financed.
Specific annual amounts ($xxx,xxx / year)	More costly, long-term, commitments for which an annual budget will be established.

Figure 1. Municipalities within the Greater Vancouver Regional District

See Attached File

Figure 2. GVRD Municipalities and Sewerage Areas/Facilities

See Attached File

LIQUID WASTE MANAGEMENT STRATEGY

The District and its member municipalities have prepared a Liquid Waste Management Plan (LWMP) in accordance with the provincial Waste Management Act. The Liquid Waste Management Plan process, as defined in the Act, allows municipalities and regional districts to tailor plans for managing liquid waste to each area's unique economic, social, and environmental conditions.

In addition to the above requirements, the other key legislation that must also be considered when addressing the liquid waste issues identified in the Plan include:

Federal Legislation:

- The Canada Shipping Act;
- The Fisheries Act;
- The Canadian Environmental Protection Act;
- The Canada Marine Act;
- The Migratory Birds Convention Act

Provincial Legislation:

- The Health Act;
- The Water Act;
- The Fish Protection Act;
- The Municipal Act; and
- The Greater Vancouver Sewerage and Drainage District Act.

In preparing, adopting, and implementing the LWMP, the District's objective is to make all reasonable efforts to comply with all applicable legislation.

This Liquid Waste Management Plan addresses the following issues:

- wastewater treatment plant upgrading;
- combined sewer overflow management;
- sanitary sewer overflow management;
- infiltration and inflow management;
- emergency spill management;
- source control;
- residuals management;
- stormwater management; and
- non-point source pollution management (specifically, pleasure craft sewage, agricultural runoff, and on-site disposal systems).

The District has explored numerous options to address these issues and has undertaken detailed scientific and engineering investigations that form the basis of this Plan.

Overall Objectives

To protect the region's outstanding livability and environmental quality, the GVRD Board adopted in 1990, and readopted in 1993 and 1996, ***"Creating Our Future,"*** an agenda for regional and local action. Its vision is:

"Greater Vancouver can become the first urban region in the world to combine in one place the things to which humanity aspires on a global basis: a place where human activities enhance rather than degrade the natural environment, where the quality of the built environment approaches that of the natural setting, where the diversity of origins and religions is a source of strength rather than strife, where people control the destiny of their community, and where the basics of food, clothing, shelter, security and useful activity are accessible to all."

"Creating Our Future" also contains the following basic principle that is the foundation for liquid waste management in the region:

"The region will manage waste in a manner that enhances environmental quality."

Key Strategies

Within the overall objective, three key strategies form a framework for this Liquid Waste Management Plan - conserve resources, maintain infrastructure and stretch capacity, and focus effort to maximize environmental benefit per dollar spent.

Conserve Resources

Conservation of water resources involves three components:

- **Pollution Prevention**
  It is preferable to avoid the introduction of pollutants into water rather than to treat them after they are there. For example, the District's source control program identifies substances that may cause environmental or system damage and encourages the use of alternative substances or alternative means of disposal.

- **Water Conservation**
  Water conservation can provide savings for programs associated with water supply and wastewater treatment.

  The Greater Vancouver Water District (GVWD) has undertaken water conservation measures such as lawn sprinkling restrictions.

  The GVWD is in the process of developing a long-term water conservation strategy for the region, which will have the potential for reducing water consumption and dry-weather wastewater flow.

  More positive benefit is likely associated with water supply programs. Benefits are not as significant for wastewater programs given the high volumes of flow associated with unwanted infiltration and inflow of rainwater and given the benefit provided by higher priority programs.

  The District's water conservation program is focused on the reduction in demand for water and also explores augmenting potable water supply with non-potable water sources. The feasibility and cost-effectiveness of developing non-potable water sources to augment potable supplies will be explored. This includes the feasibility of wastewater treatment plant effluent reclamation and reuse. The key investigations that have been undertaken in the recent past or are currently in progress include:

  1) Seasonal Water Rate Study, May 1998
  2) Residential Water Metering Seasonal Pricing and An Enhanced Water Conservation Program: Cost and Feasibility Study, November 1999
  3) An Enhanced Water Conservation Program: Cost and Feasibility Study, November 1999
  4) Region-wide Residential Water Metering: Cost and Feasibility Study, November 1999
  5) Wastewater Treatment Plant Effluent Reclamation and Reuse Study, In Progress

- **Stormwater as a Resource**
  Stormwater flows are essential to the health of the smaller fish-bearing streams remaining in the region, to the restoration of "lost" streams, to maintain or create open channel amenities that enhance livability, and to the recharge of groundwater. These flows should be managed so that stormwater is available with adequate quality and quantity to serve these purposes where appropriate and feasible.

The conservation of financial capacity requires careful planning of capital and operating expenditure strategies to provide the maximum benefit within the overall framework of the region's ability to pay.

Resource conservation also implies that by-products be recycled or reused. A primary by-product of liquid waste treatment is biosolids, which are now beneficially recycled through application in land maintenance and restoration rather than disposed at sea or through incineration as in the past.

Maintain Infrastructure and Stretch Capacity

The present sewerage infrastructure within the region (District, municipal, and private) has a replacement value in the order of $12 billion. It is a critical asset that must be maintained so that it can provide adequate service, minimize risk of spills and avoid expensive future expenditures resulting from deferred maintenance and repairs.

The sanitary sewer system currently experiences a fairly high level of wet-weather inflow and infiltration of rainwater because of system deterioration. This results in the overloading of existing trunk sewers and treatment plants with capacity being reached well in advance of what the need would be if their use were confined to sanitary sewage. Consistent and prudent investment in maintenance and rehabilitation can stretch system capacity, thereby delaying expensive capital expenditure, and reducing the frequency of emergency spills and overflows.

Capacity can also be stretched by demand management programs that encourage households, businesses and industries to conserve water and reduce wastewater flows and loads discharged to the sewer system, thus postponing the need for costly capital investments. Examples include industrial pre-treatment, best management practices, codes of practice and public education programs.

Focus Effort to Maximize Environmental Benefit Per Dollar Spent

Priority should be given to initiatives and projects that will provide the maximum cost-benefit for the human and natural environment. These must be considered within the affordability framework in relation to alternative investments in transportation, drinking water, solid waste and other fields that will produce environmental and human health benefits. Only after these aspects have been fully considered should attention shift to which entity of local government has the jurisdictional responsibility for implementing and paying for projects and programs.

Management and Implementation Strategy

The Liquid Waste Management Plan will provide the framework for an ongoing process of research, monitoring, assessment and forecasting, tactical and operational planning, and implementation that must continue to involve all levels of government working in partnership. It is intended to build upon the positive results of the Agreements signed to implement the Burrard Inlet Environmental Action Program (BIEAP) and the Fraser River Estuary Management Program (FREMP). Upon approval of the Plan by the Provincial Minister of Environment, Lands and Parks in accordance with the Waste Management Act, an agreement will be signed by representatives of the pertinent federal and provincial agencies and of the District whereby the BIEAP/FREMP Management Committee will act as a senior level clearing house for much of the policy matters and assessment of the scientific work upon which the LWMP is based and it will become an important focal point for the management of the Plan. In particular, the inter-agency committee will provide a forum for the resolution, by mutual agreement, of any disputes that may arise among parties with respect to the LWMP.

Research, monitoring and planning activities that will be required on an ongoing basis to support Liquid Waste Management Plan implementation include the following:

- continuous monitoring and assessment of the receiving environment to measure the Plan's performance;
- intergovernmental agreement on the uses of specific waterbodies and establishment of appropriate physical, chemical and biological water quality objectives;
- establishment of effluent discharge criteria to measure attainment of water quality objectives at the edge of an initial dilution zone and to ensure impacts within this zone does not present public health or significant environmental problems;
- fate and effect studies to measure the impact of a particular discharge on the ecosystem in relation to water quality objectives;
- assessment of the pace of Plan implementation, through biennial reporting, in relation to established objectives and the overall affordability context; and

- focused, ongoing dialogue with the public and stakeholders on environmental stewardship, on the attainment of the Plan's objectives, and the issues related thereto.

- A review of the performance of the plan 5 years after adoption, and on a five-year basis thereafter, to determine if the Policies and Commitments need to be updated or revised. This work will be conducted in consultation with the Ministry of Environment, Lands and Parks, Environment Canada, and the public.

Taken together, these actions will ensure that liquid waste management is a continuous process capable of measuring progress towards clear goals by developing and using the best available information on the environmental, financial and political context in which the Plan must operate.

POLICIES, COMMITMENTS, AND IMPLEMENTATION SCHEDULES

Receiving Environment

Policies

P1. Designated Water Uses will be Protected
The District and member municipalities will manage wastewater and stormwater to protect receiving water uses which have been designated by the Ministry of Environment, Lands and Parks (MELP).

P2. Upgraded Service Levels will be Determined Based on Environmental Need, with Consideration to Cost and Benefit, Regional Priorities, and all Applicable Legislation.
Commitments included in this plan address infrastructure management needs and confirmed public health and environmental issues. Upgraded service levels will be provided in the future where an environmental need has been forecasted or demonstrated, with consideration to cost and benefit, regional priorities, and all applicable legislation. The following process and "triggering" mechanisms (Figure 3) will be used to determine environmental need.

Environmental monitoring conducted by the District and member municipalities will determine if, and where, wastewater or stormwater discharges are contributing to exceedances of water quality objectives. The Environmental Monitoring Committee (see Commitment C2 – Establishment of an Environmental Monitoring Committee) will assess the monitoring results and, where warranted, "trigger" an environmental risk assessment of the particular discharge(s). The assessment may involve more comprehensive receiving environment and laboratory analysis, modelling, and forecasting, to determine the degree of environmental risk. Options for managing the defined risks will be developed by the District and member municipalities and assessed according to cost and environmental benefit criteria. The Environmental Monitoring Committee will be responsible for guiding the assessment processes for both risk and the environmental benefits of options. When a "trigger" is identified the Environmental Monitoring Committee will suggest the time-line to complete the risk and options assessment processes.

When risks, options, costs and benefits have been adequately assessed the District Board, with consideration of costs and

benefits, regional priorities, and all applicable legislation, will select the appropriate response and actions. In their consideration the Board will consult with the Ministry of Environment, Lands and Parks and Environment Canada.

Environmental monitoring will be conducted following implementation of any option to determine the need for additional risk mitigation measures.

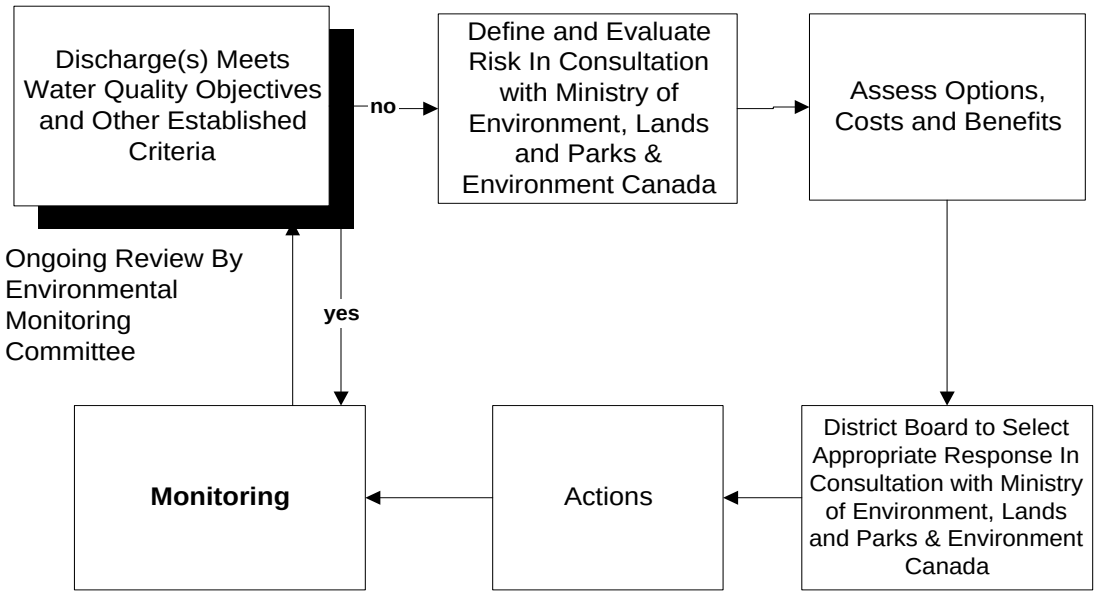

Figure 3 – Upgrading "trigger" mechanism

Commitments

C1. Official Designation for Water Uses

The District and municipalities will take an active role in providing information to the Ministry of Environment, Lands and Parks (MELP) so that appropriate water uses receive official designation from MELP through a consultative process for each of the major waterbodies within the region. A review of a designated water use may be initiated by the District or a member municipality. The consultative process will follow *Track 1 – Setting Guidelines from Principles* as documented in the Ministry of Environment, Lands and Parks *Guidelines and Standards Procedure*, dated October 7, 1997.

The process as outlined in Track 1 requires the preparation of a draft report by the Ministry.
The following process will apply to local government participation during the preparation of the draft report to be prepared by the Ministry under the *Guidelines and Standards Procedure*:

1. The Ministry will advise the District and its member municipalities, in writing, when a water use or water quality objective initiative is commenced.
2. The Ministry will develop the scope of work for their draft report in consultation with the Environmental Monitoring Committee. The Ministry will review the draft report work progress with the Environmental Monitoring Committee on a regular basis. The Environmental Monitoring Committee will play an active role in the development of the report and cost implications to the District and member municipalities will be provided for inclusion in the report.
3. The cost and benefit of designated water uses, or proposed changes to designated water uses, and their associated water quality objectives will be fully documented in the draft report and the GVRD Board and municipal councils will have the opportunity to review and comment on the draft report.

C2. Establishment of an Environmental Monitoring Committee

The District will establish an Environmental Monitoring Committee comprised of members from the District, municipalities, B.C. Ministry of Environment, Lands, and Parks, Environment Canada, Fisheries and Oceans Canada, research institutions, and public (dependent on interest). The committee will be responsible for reviewing the scope and design of monitoring programs, review of monitoring results, predictive modelling, and risk assessments of waste discharges. The committee's recommendations with respect to upgraded service levels will be considered by the District and member municipalities during an options assessment process.

C3. Development Of Discharge Indicators

The District will continue to develop and refine indicators of environmental effects related to wastewater discharges and stormwater runoff within the region. These indicators will be used to guide the collection and interpretation of environmental information by the District and municipalities. The District report, "Discharge Rating Measures for LWMP Discharges", included in Appendix C, will form an initial basis for this work.

C4. Monitoring Programs

The District and member municipalities will undertake monitoring,

assessment and forecasting to evaluate the effects of wastewater and stormwater discharges to receiving environments. Specific monitoring programs that will be undertaken include:

- Effluent quality monitoring at all treatment plants for selected physico-chemical and biological characteristics (e.g., BOD, TSS, ammonia, and trace metals as well as appropriate bioassays and fecal coliform). Detailed effluent characterization of trace organic contaminants will be conducted periodically at the recommendation of the Environmental Monitoring Committee.

- Routine monitoring of bacteriological water quality of beach areas within Burrard Inlet, Sturgeon Banks, Roberts Bank, and Boundary Bay. Sampling sites and frequency will be modified to provide a better understanding of point and non-point contaminant sources.

- Ambient receiving environment monitoring in areas where water quality (as indicated by water quality objective criteria) is potentially affected by wastewater and/or stormwater. The Iona Island deep-sea outfall receiving environment program will be maintained. The need for, and details associated with, additional programs will be determined in consultation with the Environmental Monitoring Committee.

- Occurrence and duration monitoring of CSO events at all District owned outfalls. Detailed effluent characterization of trace contaminants at a limited number of outfalls will be conducted periodically at the recommendation of the Environmental Monitoring Committee.

- Monitoring and assessment of sensitive receiving environments following the discharge of SSOs.

C5. Risk Assessment for Fraser River Irrigation Water Use

The District will undertake an analysis of risks associated with the use of Fraser River water for agricultural irrigation within the GVRD area. Options for managing the defined risks will be developed and assessed.

C6. Harmonization with Federal Legislation

The District will work with the Federal Government to harmonize approaches regarding municipal discharges. The District will assist in the development of a national municipal effluent strategy, which is being led by Environment Canada.

C7. Data Sharing and Communication

The District will share environmental information and knowledge with member municipalities, other agencies, and the public in an open and timely fashion. Moreover, the District will proactively seek out venues, technologies, and media through which to efficiently communicate environmental information to the public.

Implementation Schedule – Receiving Environment

Commitments / Initiatives	Budget	Year Completed
C1 – Official Designation for Water Uses		
Active participation in Ministry initiatives to review or designate water uses.	Included in annual budget	Ministry Initiative
C2 – Environmental Monitoring Committee		
Establish Committee and provide administrative support.	$10,000 / year	Ongoing
C3 – Development of Discharge Indicators		
Develop Discharge Indicators in consultation with the Environmental Monitoring Committee	$100,000 Included in annual budget	2002 and Ongoing
C4 – Monitoring Programs		
Annual monitoring program established in consultation with the Environmental Monitoring Committee	$1,148,000 (2001 budget)	Ongoing
C5 – Risk Assessment for Fraser River Irrigation Water Use	$50,000	2002
C6 – Harmonization with Federal Legislation		
Participation in development of national municipal effluent strategies.	Included in annual budget	Environment Canada Initiative
C7 – Data Sharing and Communication		
Environmental Program Summaries Provided on GVRD Web Site	Included in annual budget	Ongoing

Treatment Plants

Policies

P3. Treatment Plant Operations and Maintenance
The District will operate and maintain the regional treatment plants to minimize risks to public health and the environment.

P4. Base Levels of Treatment at District Plants
The District will size plant process components on the basis of established historical flows and loads and projected future changes in accordance with good engineering practice and treatment plant design standards that are periodically approved by the District Board. Plant performance will be measured against authorised levels for flow, concentrations, and loads established in the operating certificates. Maximum daily (flow proportioned 24-hour composite sample) concentration levels are:

	BOD (mg/l)	TSS (mg/l)
Iona Island	130	100
Lions Gate	130	130
Annacis Island	45	45
Lulu Island	45	45
Northwest Langley	45	45

If these maximum daily concentration levels are exceeded on an operational basis then:

- the District will investigate the cause and an incident report to determine the significance and probable cause will be prepared.

- the District will evaluate the significance against its treatment plant design guideline to determine if plant expansion, upgrading, or additional source control initiatives are justified. The determination of environmental significance will be undertaken in consultation with the Environmental Monitoring Committee.

Annual effluent loads will not exceed the following maximum annual loading levels:

	BOD (t/year)	TSS (t/year)
Iona Island	72, 600	55, 850
Lions Gate	5, 770	5, 770
Annacis Island	no limit	no limit
Lulu Island	no limit	no limit
Northwest Langley	no limit	no limit

At the Annacis Island, Lulu Island, and Northwest Langley Wastewater Treatment Plants the District will provide secondary treatment for flows up to two times measured dry weather sanitary flow. Wet weather management plans to manage infiltration and inflow and stormwater will be developed for flows in excess of secondary treatment capacity.

At the Lions Gate Treatment Plant the District will provide primary treatment for flows up to two times measured dry weather sanitary flow. Wet weather management plans to manage infiltration and inflow and stormwater will be developed for flows in excess of primary treatment capacity.

For the Iona Island Treatment Plant the District will provide primary treatment for flows up to a maximum of 17 cubic metres per second. This plant capacity will be reviewed every 5 years based on flow determinations arising out of progress in the combined sewer separation programs**.**

P5. Upgrading from Base Levels of Treatment

The District will upgrade the level of treatment, or initiate source control measures, if the base level of treatment is not adequate to protect the aquatic environment as defined by Policy P2 and determined by the receiving water environmental objectives and performance measures.

Commitments

C8. Upgrading of Iona Island and Lions Gate Treatment Plants

The District will upgrade the Iona Island and Lions Gate treatment plants by adding facilities for chemical addition (enhanced primary treatment) if necessary to maintain the established base level of treatment as defined by Policy P4.

The District will construct facilities for biological treatment in the following circumstances:

- if necessary to address environmental concerns in accordance with Policy P2.
- to maintain effluent concentration and loading levels which are beyond the capability of enhanced primary treatment.

C9. Treatment Plant Upgrading Projections

The District will monitor plant influent and effluent to determine plant performance and trends and maintain a minimum 10-year future projection to determine the adequacy of plant process components and to establish process component design capacities for operating certificates.

C10. Secondary Effluent Disinfection

The District will undertake engineering investigations examining the potential for effluent disinfection using ultraviolet light as an alternative to the use of chlorine at its Northwest Langley, Annacis Island, and Lulu Island wastewater treatment plants.

C11. Treatment Plant Effluent Toxicity Assessment

For treatment plant effluent the District will undertake toxicity assessments to determine the probable cause of effluent toxicity and its significance relative to the receiving environment as described by Policy P2.

The District will conduct monthly 96-hour acute bioassays on full strength effluent at each of the five wastewater treatment plants and review the results with the Environmental Monitoring Committee.

The District will examine the results of the bioassay tests at Lions Gate and Iona Island treatment plants to determine the cause of effluent toxicity. Within the limitations of the existing liquid waste management treatment process and infrastructure, the District will evaluate options for improving the results of the bioassay tests. The selection of any option by the District will be made in consultation with the Environmental Monitoring Committee.

Implementation Schedule – Treatment Plants

Commitments / Initiatives	Budget	Year Completed
C8 – Upgrading of Iona and Lions Gate Treatment Plants		
Iona enhanced primary treatment assessment	$300,000	2001
C9 – Treatment Plant Upgrading Projections		
Updated flow and loading projections (10 year forecast) for all five treatment plants	$20,000	2001
C10 – Secondary Effluent Disinfection		
Engineering Study	$100,000	2001
C11 - Treatment Plant Effluent Toxicity Assessment		
Monthly toxicity testing at all five treatment plants	$25,000 / year	Ongoing
Toxicity Investigation and Evaluation Study and options for improvement for Lions Gate and Iona effluents.	$125,000	2001

Combined Sewer Systems

Policies

P6. **Combined Sewer Overflows**

No new combined sewers will be constructed in the GVRD geographic area. Existing combined sewers will be replaced by separate sanitary and storm sewers through infrastructure replacement and sewer capacity upgrading programs. Private combined sewer service connections will be replaced with separate sanitary and storm sewer connections when a property is redeveloped or when substantive building or site renovations are undertaken.

The policy of the District is to eliminate all combined sewer overflows from its facilities. Priority will be given to reducing or eliminating those combined sewer overflows identified by the Environmental Monitoring Committee as having significant environmental impact.

P7. **Combined Sewer Overflow Monitoring**

Combined sewer overflow volumes will be monitored and trended at all outfalls under the District's jurisdiction to measure the effect and progress of combined sewer replacement programs. Environmental monitoring and assessment will determine risks and the need for any additional interim measures at combined sewer outfalls.

District Commitments

C12. **CSO Monitoring**

The District will install monitors at all 14 CSO outfall sites under its jurisdiction to determine depth and duration of combined sewer overflows and an estimate of volume.

C13. **Operational Improvements**

In respect to the Clark Drive Outfall, the District and municipalities will implement the following projects:

- Vernon Relief Drain CSO storage;
- Copley / Collingwood sanitary sewer extension to 8th Avenue Interceptor;

- Redirection of Columbia Pump Station discharges to downstream of Yukon Gate;
- City of Vancouver Thornton pump station and forcemain realignment (completed in 2000)
- City of Vancouver Hastings Park lost-stream daylighting (part of combined sewer separation – Commitment C15)
- Combined sewer separation programs (Commitment C15)

In addition, the District will, in consultation with stakeholders, investigate further site-specific CSO management options at the Clark Drive Outfall location. The District will also investigate further operational improvements for the Clark Drive catchment.

The District will complete feasibility studies and detailed cost-benefit analysis for the following projects that offer potential operational benefits, overflow frequency or loading reductions, or receiving environment improvements:

- Glenbrook Trunk Sewer separation;
- New Westminster Interceptor West Branch sewer separation;
- English Bay Outfall and Alma-Discovery Outfall storage and disconnection of storm inflow to Alma-Discovery outfall;
- Jervis and Chilco Pump Stations forcemain and control improvements;
- Operational Improvements – Fraser River North Arm;
- Operational Improvements – New Westminster Area;
- Operational Improvements – Westridge Area; and
- Source control initiatives targeting mercury and silver reductions.

Based on environmental data, which indicates that there are measurable near-field impacts at the Clark Drive outfall into Burrard Inlet, the District will undertake further environmental assessments at Clark Drive to assess the benefits of the improvements. This work will be conducted under the supervision of the Environmental Monitoring Committee (see Commitment C2). The municipalities of Vancouver and Burnaby and the District will also undertake a review of combined sewer separation and system upgrade schedules necessary to fast-track the elimination of Clark Drive CSOs earlier than 2050.

In addition to the ongoing monitoring program at the Glenbrook Outfall, the District and the City of New Westminster will undertake assessment of all other CSOs on the New Westminster waterfront for quality and environmental impact on a 5-year frequency, commencing in 2001, and thereafter as part of the 5-year plan review process, in order to evaluate program progress and effectiveness and determine

the need for further action by New Westminster in accordance with Policy P2.

C14. **Biennial Liquid Waste Management Plan Progress Report**
The District will summarize the CSO monitoring results, CSO environmental monitoring and assessment results, sewerage and drainage expenditures for CSO projects, and results of CSO operational improvement investigations and implementation in a Liquid Waste Management Plan biennial progress report. The biennial reporting period will end on December 31st of every second calendar year and the report will be due by the end of March (90 days to compile). The first reporting period will end in the second whole year (not less than 24 months and not more than 36 months) following the year a LWMP is approved. An interim annual report will be submitted in March and will summarize the key achievements that occurred in the previous year.

Municipal Commitments

C15. **Combined Sewer Overflow Elimination**
The cities of Vancouver, Burnaby, and New Westminster will implement combined sewer separation programs that will replace aging combined sewers with separate sanitary and storm sewers and lead to the elimination of combined sewer overflows based on the following targets:

1. The City of Vancouver will continue with the present combined sewer system separation program at approximately 1 percent of the system per year to target elimination of combined sewer overflows in the Vancouver Sewerage Area by 2050.

2. The City of Burnaby will implement a combined sewer separation program that proceeds on an annual basis, at a uniform rate, and that targets elimination of combined sewer overflows in the Vancouver Sewerage Area by 2050 and in the Fraser Sewerage Area by 2075.

3. The City of New Westminster is committed to implementation of Combined Sewer Overflow (CSO) reduction measures which meet or exceed 1% per year, resulting in long-term CSO elimination by means of sewer separation as well as by other means (e.g. detention storage, source controls, etc.). The city will complete the installation of storm sewers within 22 percent of the combined sewer area by 2012. This effort will focus on the lower Columbia catchment. Opportunistic sewer separation will

also occur in other areas where capacity is an issue with existing combined sewers. The entire sewer system will be video inspected by 2012 and infiltration and inflow reduction achieved through sewer rehabilitation. In addition, source control projects (such as removal of rainwater roof leaders from direct connection to the sewer system) will be implemented, and the effectiveness of these methods will be evaluated. Overall, this program will produce CSO reductions at a rate in excess of 1% per year.

C16. **Operational Improvement Investigations**

Municipalities will complete feasibility studies and detailed cost-benefit analysis for the following projects that offer potential operational benefits, overflow frequency or loading reductions, or receiving environment improvements:

- Cambie Pump station and outfall improvements (Vancouver);
- 1st and Boundary pump station realignment (Vancouver and Burnaby); and
- Stormwater redirection to Grandview Cut (Vancouver).

C17. **Best Management Practices**

The Cities of Vancouver, Burnaby, and New Westminster will continue with best management practices such as catch basin cleaning that reduce loads to combined sewers at source and rain barrel, impervious area reduction, or on-site storage that reduces peak flows or volumes of stormwater runoff to sewers.

C18. **Biennial Liquid Waste Management Plan Progress Report**

Every two years municipalities with combined sewers will summarize and forward to the District for inclusion in a biennial Liquid Waste Management Plan progress report the following information:

- Sewer system mapping that indicates the overall extent of combined, sanitary, and storm sewers, the extent of combined sewers replaced by separate sewers in the past two years, the location of new storm outfalls, and the extent of private property combined service connections replaced by separate service connections.

- A summary of sewerage and drainage system expenditures for the past two years.

The biennial reporting period will end on December 31st of every second calendar year and the report will be due by the end of March (90 days to compile). The first reporting period will end in the second whole year (not less than 24 months and not more than 36 months)

following the year a LWMP is approved. An interim annual report will be submitted in March and will summarize the key achievements that occurred in the previous year.

Implementation Schedule – Combined Sewer Systems

Commitments / Initiatives	Budget	Year Completed
C12 - CSO Monitoring		
CSO Monitors – 14 sites (12 sites installed to date)	$70,000	2002
C13 – Operational Improvements		
Projects specific to the Clark Drive Outfall location:		
Vernon Relief Drain CSO storage	$1,600,000	2002
Copley / Collingwood sanitary sewer extension to 8th Avenue Interceptor	$15,000,000	2004
Redirection of Columbia Pump Station discharges to downstream of Yukon Gate	$4,300,000	2002
City of Vancouver Hastings Park lost-stream daylighting (part of combined sewer separation – Commitment C15)		
Combined sewer separation programs (Commitments C15)		
Clark Drive Outfall site-specific management options and operational plan improvements	$150,000	2001
Feasibility studies for:		
Glenbrook Trunk Sewer Separation	$50,000	2003
New Westminster Interceptor West Branch Sewer Separation	$50,000	2004
English Bay Outfall and Alma-Discovery Outfall Storage and Disconnection of Storm Inflow to Alma-Discovery Outfall	$100,000	2002

Jervis and Chilco Pump Stations Forcemain and Contol Improvements	$50,000	2004
Operational Improvements – Fraser River North Arm	$150,000	2002
Operational Improvements – New Westminster Area	$150,000	2001
Operational Improvements – Westridge Area	$50,000	2002
Source Control Initiatives Targeting Mercury and Silver Reductions	$60,000	2002
GVRD, Vancouver and Burnaby – Review of Combined Sewer Separation and System Upgrade Schedules to Fast-track Elimination of Clark Drive CSOs Earlier than 2050	Included in annual budget	2002
Assessment of CSOs on the New Westminster Waterfront for Quality and Environmental Impact and Environmental Assessments at Clark Drive	$90,000 (2001 budget)	2006
C14 – Biennial Liquid Waste Management Plan Progress Report		
First Interim Annual Report	Included in annual budget	2002
First Biennial Report	Included in annual budget	2003
C15 – Combined Sewer Overflow Elimination		
City of Vancouver Combined Sewer Separation Program	$16,150,000 / year (2000 budget)	2050
City of Burnaby Combined Sewer Separation Program:	$3,000,000 / year (2001 budget)	
Vancouver Sewerage Area		2050
Fraser Sewerage Area		2075

City of New Westminster CSO Reduction Measures:		
Lower Columbia Catchment Storm Sewers	$300,000 / year	2012
Opportunistic Sewer Separation	varies $170,000 (2000)	ongoing
Sewer System Video Inspection and Sewer Rehabilitation	$700,000 (2001 budget)	ongoing
Source Control Projects	$25,000/ year	ongoing
C16 – Operational Improvement Investigations		
Cambie Pump Station and Outfall Improvements (Vancouver)	Included in annual budget	2002
1st and Boundary Pump Station Realignment (Vancouver and Burnaby)	Included in annual budget	2003
Stormwater Redirection to Grandview Cut (Vancouver)	Part of sewer separation program – see C15	2004
C17 – Best Management Practices		
City of Vancouver	$630,000 / year (2001 budget)	ongoing
City of Burnaby	$260,000 / year (2001 budget)	ongoing
City of New Westminster	$50,000 / year (2001 budget)	ongoing
C18 – Biennial Liquid Waste Management Plan Progress Report		
First Annual Report	Included in annual budget	2002
First Biennial Report	Included in annual budget	2003

Separate Sanitary Sewer Systems

Policies

P8. Infrastructure Management

The District and its member municipalities will establish sewer system infrastructure management programs that will maintain the regional trunks and interceptors, the municipal collection system, and the private service laterals in a state of good repair. The objective will be to ensure the sustainability of the collection system so that expensive repair and rehabilitation is not deferred to future generations and that the average daily infiltration and inflow will not exceed 11,200 litres per hectare per day as a result of a storm with less than a five year return period.

P9. Basic Sanitary Sewer Service Capacity

The District will establish a basic level of service capacity for all District sanitary sewers that provides for the conveyance of measured dry weather flows plus a wet weather allowance for infiltration and inflow of 11,200 litres per hectare per day, such that the hydraulic grade lines do not exceed established safe operating levels.

P10. Sanitary Sewer Overflow Documentation And Targets

The District will document all sanitary sewer overflows from the collection system under its jurisdictions and determine the cause of overflow. The District and its member municipalities will establish targets for sanitary sewer overflow reduction as part of their sewer system infrastructure management programs to target reduction and long term elimination of wet weather sanitary sewer overflows caused by storms of less than a five year return period. Areas experiencing high growth and chronic sanitary sewer overflows with associated health or environmental risks will receive the highest priority for elimination of sanitary sewer overflows.

P11. Sanitary Sewer and Combined Sewer Interaction

In parts of the collection system where both sanitary and combined sewer overflows are occurring due to the interaction of these sewer systems, and operational improvements are being considered to minimize overflows, the objective will be to minimize the total volume of sanitary sewage (contained in combined and sanitary sewer overflows as a component together with stormwater) that is discharging to the receiving waterways.

P12. **Consideration of Consequence**
When addressing sanitary sewer overflow issues, the District and its member municipalities will prioritize efforts and consider emergency spill locations to mitigate the consequence of overflows in the following priority:

1. Discharges that compromise public health;

2. Discharges that compromise public and private property damage; and

3. Discharges that have confirmed near-field environmental impacts.

P13. **Emergency Overflow Locations For Unavoidable Sanitary Sewer Overflows**
The District and its member municipalities will maintain a system of emergency overflow locations and prepare emergency spill contingency plans to minimize the consequence of unavoidable sanitary sewer overflows caused by extreme wet weather, system failures, and unusual events.

Commitments

C19. **Infrastructure Management**
The District and its member municipalities will establish ongoing sanitary sewer system evaluation programs to determine the condition of the regional trunk sewerage system, the municipal sewerage system, and private property service laterals. As required, legislative and legal authority will be sought to address infiltration and inflow originating from private property service laterals. These evaluation programs will be ongoing and determine the condition of the entire sewer system over a 20 year time cycle. The District and its member municipalities will develop and apply a consistent approach to sewer system evaluation surveys.

Repair and replacement programs will be established based on targets set for sanitary sewer overflow reduction and the severity of infiltration and inflow relative to the design allowance of 11,200 litres per hectare per day.

C20. **New Construction Objectives**
The District and its member municipalities will review engineering standards and guidelines for new sewer construction with the objective of ensuring a high standard for new construction to

minimize future infiltration and inflow problems.

C21. Wet Weather Facilities

The District will complete the conceptual designs and feasibility studies for the following wet weather facilities to reduce chronic sanitary sewer overflows:

Cloverdale storage and operational improvements; and
Maillardville sanitary sewer increased conveyance (growth pre-build).

C22. Flow Monitoring

The District will maintain a network of flow monitors that will continually monitor sewer flows and will determine the daily average flow by specific catchments, or by municipality where the flow monitoring configuration is appropriate.

C23. Biennial Liquid Waste Management Plan Progress Report

Every two years, municipalities will summarize and forward to the District for inclusion in a biennial Liquid Waste Management Plan progress report, the following information:

- Sewer system mapping that indicates the overall extent of the current cycle of the sanitary sewer system evaluation program and the condition of sewerage infrastructure.
- The extent of new sewer construction and sewer repair and replacement work over the past two years.
- A summary of the results of all flow monitoring work undertaken as part of the sewer system evaluation program.
- The location and frequency of sanitary sewer overflows occurring from the municipal collection system.
- A summary of sewerage system expenditures for sewer system evaluation work, and repair and replacement work.

The biennial reporting period will end on December 31st of every second calendar year and the report will be due by the end of March (90 days to compile). The first reporting period will end in the second whole year (not less than 24 months and not more than 36 months) following the year a LWMP is approved. An interim annual report will be submitted in March and will summarize the key achievements that occurred in the previous year.

Implementation Schedule – Separate Sanitary Sewer Systems

Commitments / Initiatives	Budget	Year Completed
C19 – Infrastructure Management		
Sewer System Evaluation Programs		
GVRD	$617,000 / year (2001 budget)	ongoing
City of Burnaby	$300,000 / year (2001 budget)	ongoing
City of Coquitlam	$36,000 / year (2001 budget	ongoing
City of Langley	$75,000 / year (2001 budget)	ongoing
City of New Westminster	Included in Commitment C15	ongoing
City of North Vancouver	$14,000 / year (2001 budget)	ongoing
City of Port Coquitlam	$100,000 / year (2001 budget)	ongoing
City of Port Moody	$60,000 / year (2001 budget)	ongoing
City of Richmond	$350,000 / year (2001 budget)	ongoing
City of Surrey	$300,000 / year (2001 budget)	ongoing
City of Vancouver	$200,000 / year (2001 budget)	ongoing

City of White Rock	$100,000 year (2001 budget)	ongoing
Corporation of Delta	$170,000 / year (2001 budget)	ongoing
District of Langley	$26,000 / year (2001 budget)	ongoing
District of Maple Ridge	$40,000 / year (2001 budget)	ongoing
District of North Vancouver	$100,000 / year (2001 budget)	ongoing
District of Pitt Meadows	$10,000 year (2001 budget)	ongoing
District of West Vancouver	$25,000 / year (2001 budget)	ongoing
Electoral Area A (University Endowment Lands)	Included in annual budget	ongoing
Sewer Repair and Replacement Programs		
GVRD	$500,000 / year (2001 O&M budget) $5,090,000 (2001 capital budget)	ongoing
City of Burnaby	$1,000,000 / year (2001 budget)	ongoing
City of Coquitlam	$340,000 / year (2001 budget)	ongoing
City of Langley	$184,000 (2001 O&M budget) $50,000 (2001 capital budget)	ongoing
City of New Westminster	Included in Commitment C15	ongoing

City of North Vancouver	$610,000 / year (2001 budget)	ongoing
City of Port Coquitlam	$734,000 / year (2001 budget)	ongoing
City of Port Moody	$168,000 / year (2001 budget)	ongoing
City of Richmond	$2,300,000 / year (2001 budget)	ongoing
City of Surrey	$1,500,000 / year (2001 budget)	ongoing
City of Vancouver	Included in Commitment C15	ongoing
City of White Rock	$400,000 / year (2001 budget)	ongoing
Corporation of Delta	$900,000 / year (2001 budget)	ongoing
District of Langley	$86,000 / year (2001 budget)	ongoing
District of Maple Ridge	$550,000 / year (2001 budget)	ongoing
District of North Vancouver	$198,000 / year (2001 budget)	ongoing
District of Pitt Meadows	$100,000 / year (2001 budget)	ongoing
District of West Vancouver	$200,000 / year (2001 budget)	ongoing
Electoral Area A (University Endowment Lands)	Included in annual budget	ongoing
C20 – New Construction Objectives		
Review of Engineering Standards and Guidelines	Included in annual budget	2002

C21 – Wet Weather Facilities		
Cloverdale Storage	$4,500,000	2003
C22 - Flow Monitoring		
Operation and Maintenance of Existing Flow Monitoring Network	$636,000 / year (2001 budget)	ongoing
C23 – Biennial Liquid Waste Management Plan Progress Report		
First Interim Annual Report	Included in annual budget	2002
First Biennial Report	Included in annual budget	2003

Source Control and Demand Management

Policies

P14. Control of Toxic Substances Discharged to Sewer
The District's Source Control Program will be consistent with the Canadian Environmental Protection Act (CEPA) control options for toxic substances. This will be in addition to the list of prohibited and restricted substances included in the Regional Sewer Use Bylaw.

P15. Promotion of Pollution Prevention
Control of the quality and quantity of discharges to sewer by applying the principles of pollution prevention will be emphasized and promoted in all sewer permits, codes of practices, waste management practices and education programs that are issued, developed and implemented by the District.

P16. Best Available Technology
Where pollution prevention fails to eliminate contaminants from discharges, the District will recommend Best Available Technology, which is proven and economically feasible, to be applied to remove contaminants of concern prior to discharge to sewer.

P17. Control of Peak Daily Demand from Industry
The District will control the peak daily demand from industry through a system of flow and load limits and fees.

P18. Usage of Capacity by the Users of the Sewer System
Any trend or projected demand that would affect the historical proportions of usage of system capacity (conveyance and treatment) will be brought to the attention of the District Board and its impact considered. The policy of business casing any new industrial demand for more than 3% of the system capacity will be continued.

P19. Promotion of Water Conservation
The District will encourage water conservation initiatives by recognizing reductions in water usage and wastewater generation.

P20. Elimination of Stormwater Discharges into Sanitary Sewers
The District will not permit new stormwater sources to be connected to its sanitary sewer system and will continue its current policy of eliminating stormwater discharges currently authorized by Authorizations and Permits. Any exception to this policy will be evaluated and considered in consultation with the affected

discharger, host municipality, and representatives of the senior level of governments in charge of environmental protection.

The District, in addition to not issuing new authorizations for discharges of stormwater into sanitary sewers, will continue the program of eliminating all stormwater contributions allowed under the existing industrial permits. Each industrial operation will be required to develop and implement a plan for removal of the stormwater components from their sanitary sewer discharge.

Commitments

C24. **Reduction of Copper**
The District will recommend that the Greater Vancouver Water District (GVWD) consider the benefit of copper reduction in wastewater effluent and biosolids and meet the current implementation schedule for construction of facilities for pH adjustment of drinking water.

C25. **Sewer Use Bylaw Review**
The District will update the Regional Sewer Use Bylaw to reflect the most recent scientific and technical knowledge about the impact of substances discharged to sewer on human health and safety, performance of collection and treatment systems, and the receiving environment.

C26. **Development of Peak Discharge Limits and Fees for Industry**
The District will develop, in co-operation with identified stakeholders, a system of limits and fees to be implemented across the District. Maximum daily loadings (limits) will be assigned to industrial operations that are discharging more than an established percentage of the annual loadings received by the wastewater treatment plant servicing the particular industry. Limits will be accompanied by a system of fees that will include additional charges for the difference between the average and maximum daily loadings and charges based on marginal costs for treating the loadings exceeding the assigned (authorized) maximum daily loadings.

C27. **Criteria for New Industrial Demand for More than 3% of Capacity**
The District will develop criteria to be used in development of a business case if a single industrial user proposes to exceed more than 3% of the system capacity.

C28. **Reduction of Demand for Treatment Capacity**
The District will investigate initiatives that have the potential to reduce the per capita demand for treatment from the 1998 levels. Demand management for all sewer user sectors (residential, industrial, and commercial/institutional) will be examined and considered through business case development.

C29. **Education Program**
The District will develop and implement an educational program for the residential, commercial, and institutional use targeting specific practices that have pollution prevention or demand management benefits. An education program on the use of food grinders will be developed.

C30. **Sewer Use Charges for Commercial and Institutional Sector**
The District will assist member municipalities in reviewing sewer charges for the commercial and institutional sector, given that user-pay charges are instrumental in cutting demand for service.

C31. **Evaluation of Current Industrial Pricing Strategy**
The District will evaluate the efficiency of the current BOD/TSS Industrial Pricing Strategy in reducing demand for treatment capacity.

C32. **Recognition for Water Conservation**
The District, in conjunction with the Greater Vancouver Water District (GVWD), will evaluate implementation of a recognition program that acknowledges reductions in water usage and wastewater generation.

The District will consider loading-based permit limits, in addition to the existing concentration-based permit limits, for operations that can demonstrate consistent reductions of more than 10% in their water consumption (expressed as volume of water per unit of production).

C33. **Notification to Environment Canada**
If, through environmental monitoring and assessment, a substance is identified as a potential concern in the aquatic environment but is not listed in the Canadian Environmental Protection Act, the District will notify Environment Canada and request that they commence a substance review in accordance with current process for such reviews.

Implementation Schedule – Source Control and Demand Management

Commitments / Initiatives	Budget	Year Completed
C 24 – Reduction of Copper		
PH Adjustment of Drinking Water	Greater Vancouver Water District Initiative	GVWD schedule indicates completion by 2004
C 25 - Sewer Use Bylaw Review		
Update the Bylaw	$170,000	2001
Adopt a Revised Bylaw	$120,000	2002
C 26 – Development of Peak Discharge Limits and Fees for Industry	$100,000	2003
C 27 – Criteria for New Industrial Demand for More than 3% of Capacity	$10,000	2001
C 28 – Reduction of Demand for Treatment Capacity		
• Investigate initiatives to reduce demand	$10,000	2001
• Business case the initiatives	$100,000	2002
C 29 – Education Program		
• Education program for the use of food grinders	$10,000	2001
• Education initiatives for the Residential, Commercial, and Institutional sectors	$50,000	2002
C 30 – Sewer Use Charges for Commercial and Institutional Sector	$100,000	2003

C 31 – Evaluation of Current Pricing Strategy	$60,000	2002
C 32 – Recognition for Water Conservation • Evaluate implementation of a recognition program • Consider loading-based permits for operations reducing water consumption	$20,000	2002
C 33 – Notification to Environment Canada		ongoing

Residuals Management

Policies

P21. **Cost Effectiveness and Recycling**
The District will manage its residuals in a cost-effective, environmentally sound, and reliable manner.

The District will manage its biosolids based on the principle of recycling, but will continue to evaluate cost-effective, non-recycling options.

P22. **Grit and Screenings Disposal**
Grit and screenings will continue to be sent to disposal facilities (landfill or incineration), both within the GVRD solid waste system and, when necessary, to other facilities within B.C. or outside of the province.

P23. **Recycling Program Cost Allocation**
It is intended that the District's Biosolids Recycling Program will continue to be funded annually as a regional program. Direct costs (those directly attributable to recycling projects) will be allocated to the four sewerage areas at the end of each year based on the tonnes of biosolids recycled for each sewerage area in that year. Indirect costs will be allocated to the four sewerage areas at the end of each year based on the tonnes of biosolids produced by each sewerage area during that year.

Commitments

C34. **Iona Island Treatment Plant Biosolids**
At the Iona Island Wastewater Treatment Plant site, the District commits, as a minimum, to recycling or disposing of ongoing biosolids production once the land area and lagoons are full.

C35. **Biosolids Growing Medium**
The District commits to produce and distribute biosolids growing medium which meet standards set out in the O*rganic Matter Recycling Regulation* Draft 2.0, dated July 1999. As currently drafted this regulation would allow distribution of Class A biosolids growing medium with no limit on quantity and without the need to obtain permits or approvals from the Ministry of Environment, Lands and Parks. Prior to the proposed regulation being passed the District will work with the Ministry of Environment, Lands and Parks to include the requirements for the distribution of biosolids in the operating certificates for the District's facilities.

Implementation Schedule – Residuals Management

Commitments / Initiatives	Budget	Year Completed
C34 – Iona Island Treatment Plant Biosolids		
Recycling or disposal of annual production	$1,000,000 / year commencing when lagoon storage no longer available	ongoing
C35 – Biosolids Growing Medium		
Production and distribution of biosolids growing medium	$140,000 / year (2001 budget) dependent upon new operating certificates or new recycling regulation	ongoing

Stormwater Management

Policies

P24. **Five Year Time-Frame**
The stormwater management policies and commitments will apply to all District municipalities, and as appropriate the District, for a period of five years after approval of the Liquid Waste Management Plan, at which time they will be reviewed and updated.

P25. **Integrated Planning Approach**
The member municipalities, in consultation with the District where appropriate, will undertake a proactive integrated planning approach to municipal stormwater management, in areas serviced by separated stormwater systems, thereby improving the efficiencies and effectiveness of regulatory approvals. This integrated planning approach will integrate watershed, catchment, master drainage plans, and stormwater plans into relevant municipal planning processes such as Official Community or Neighbourhood Concept plans, Recreation and Parks Master plans, Strategic Transportation plans, etc., in order to address the impacts of stormwater management on relevant community values. These values include recreation, agriculture, fisheries, greenways, heritage, archaeology, safety, transportation, economics, property values, flood protection, affordability, the environment, and related issues.

Stormwater management planning would strive to be consistent with the stormwater management guiding principles as referenced in Table 13-1 of the Liquid Waste Management Plan Discussion Document. One of the guiding principles is to strive to plan at a watershed scale even in non-urban (greater than 80% of watershed area is Green Zone as defined in the 1996 Livable Region Strategic Plan) watersheds where municipalities may have limited infrastructure.

Commitments

C36. **Interagency Liaison Group**
Stormwater management planning will build on the improved information on stormwater problems and solutions developed during the Liquid Waste Management Plan process. To facilitate

the ongoing exchange of information on stormwater issues, and implementation of the Liquid Waste Management Plan, municipalities and the District will participate in an interagency liaison group similar to the existing Stormwater Management Task Group. The group will provide advice to the District about stormwater issues.

C37. **Stakeholder Participation**
The community, senior and local government agencies, and other stakeholders will be invited to participate in the integrated planning process intended to proactively address issues on a long-term basis.

C38. **Policies and Bylaws**
Municipalities, in consultation with the District where appropriate, and the Stormwater Interagency Liaison Group, commit to adopting or updating, policies or bylaws related to improving stormwater management for at least two stormwater issues over the five year period of the stormwater plan. Issues to be considered may include, source control, flood protection, sediment and erosion control, soil conservation and topsoil removal, impervious area, and protection of riparian areas.

C39. **Rate of Watershed-scale Stormwater Planning Work**
Municipalities commit to undertake (or review) integrated stormwater management planning at a watershed scale for urban watersheds (less than 80% of watershed area is in the Green Zone as defined in the 1996 Livable Region Strategic Plan). Watershed-scale planning will be ongoing and evolving and proceed such that plans for all watersheds will be completed within the first twelve years following approval of the LWMP. Each watershed plan will be reviewed at least once every twelve years. The Stormwater Interagency Liaison Group will develop a terms of reference template for integrated stormwater management planning to facilitate the implementation of watershed-scale stormwater management plans in the municipalities. The District will participate in watershed-scale stormwater management plans as appropriate and where watersheds include two or more municipalities, a coordinated approach will be undertaken by appropriate municipalities.

Implementation Schedule – Stormwater Management

Commitments / Initiatives	Budget	Year Completed
C36 – Interagency Liaison Group		
Initiate Group and Provide Annual Support	$90,000 (2001 budget)	ongoing
C37 – Stakeholder Participation		
See Commitment C39		
C38 – Policies and Bylaws		
Adoption or Updating of Policies or Bylaws to Address Two Stormwater Issues		
City of Burnaby	$25,000	2005
City of Coquitlam	$60,000	2005
City of Langley	$10,000	2005
City of New Westminster	Included in annual budget	2005
City of North Vancouver	$7,500 – 2001 $5,000 – 2002 $5,000 – 2003	2003
City of Port Coquitlam	$40,000	2001
City of Port Moody	$3000 / year	2005
City of Richmond	Included in annual budget	2005
City of Surrey	$50,000	2002

City of Vancouver	$40,000	2003
City of White Rock	$10,000	2002
Corporation of Delta	$25,000	2003
District of Langley	$25,000	2004
District of Maple Ridge	$30,000	2002
District of North Vancouver	$16,000	2005
District of Pitt Meadows	Included in annual budget	2005
District of West Vancouver	$5,000	2005
C39 – Rate of Watershed-scale Stormwater Planning Work		
Integrated Stormwater Planning		
City of Burnaby	$100,000 / year (2001 budget)	ongoing
City of Coquitlam	$244,000 / year (2001 budget)	ongoing
City of Langley	$10,000 (2001 budget)	ongoing
City of New Westminster	Included in annual budget	ongoing
City of North Vancouver	$35,000 (2001 budget)	ongoing
City of Port Coquitlam	$50,000 / year (2001 budget)	ongoing
City of Port Moody	$100,000 (2002 budget)	ongoing

City of Richmond	Included in annual budget	ongoing
City of Surrey	$400,000 / year (2001 budget)	ongoing
City of Vancouver	Included in annual budget	ongoing
City of White Rock	$75,000 (2001 budget)	ongoing
Corporation of Delta	$120,000 / year (2001 budget)	ongoing
District of Langley	$81,000 / year (2001 budget)	ongoing
District of Maple Ridge	$30,000 / year (2001 budget)	ongoing
District of North Vancouver	$40,000 / year (2001 budget)	ongoing
District of Pitt Meadows	Included in annual budget	ongoing
District of West Vancouver	$95,000 (2001 budget)	ongoing

Non-Point Source Pollution Management

Pleasure Craft Sewage

Policies

P26. **Designation of No-Discharge Zones**
Where investigations have shown that discharges from pleasure craft is leading to waterway degradation or high bacterial levels, the District will request the province to nominate the waterway, or portion thereof, for designation as a no-discharge zone under the federal Pleasure Craft Sewage Prevention Regulation.

Commitments

C40. **Pump-Out Facility Inventory**
The District will complete an inventory of all available pump-out facilities in the region.

C41. **New Marinas and Major Renovations**
Municipalities will modify or adopt bylaws that require all new marinas, or marinas undergoing renovations that exceed 50 percent of their assessed value, to install pump-out facilities for access by pleasure craft. As appropriate, these facilities should be connected to the municipal sewer system or designed for handling by trucked liquid waste.

C42. **Existing Marinas**
The District, in consultation with municipalities, marina operators, boaters, and senior government agencies, will undertake a feasibility study to determine how existing marinas can accommodate pump-out facilities, the cost to install such facilities, and how they would be financed, maintained, and operated.

On-Site Sewage Disposal Systems

Policies

P27. **Sewer Extensions and the Green Zone**
Prior to extending sewers into the Green Zone, as defined by The Livable Region Strategic Plan, the District will request municipalities to examine local servicing and alternate advanced treatment systems.

P28. **On-site systems and disposal to waterways**
The following guidelines should apply regarding discharges from on-site disposal systems to adjacent waterways. Where there is a conflict between these guidelines and Provincial regulations, the regulations will apply:

- Property owners with BC Hydro service and road access should investigate all land based options including approved innovative technologies and demonstrate that such land based options are non-viable solutions prior to any consideration of sewage effluent discharge into an adjacent water body.

- Property owners in “isolated” locations without road access, should investigate conventional land-based options and demonstrate that such land-based options are non-viable solutions prior to any consideration of effective innovative technology or sewage effluent discharge into an adjacent water body.

- The minimum acceptable level of treatment for properties in “isolated” locations having neither BC Hydro service or road access, should be a properly designed septic tank that provides treatment of domestic sewage prior to effluent discharge required to be in accordance with standards stipulated in the new Waste Management Act Municipal Sewage Regulation.

- There should be no discharge of untreated domestic sewage to the marine/aquatic environment under any circumstances.

- Property owners discharging to the marine/aquatic environment should obtain discharge permits from the appropriate jurisdiction.

- Property owners discharging or proposing to discharge effluent into an adjacent water body should obtain a “water body” easement for the placement and maintenance of a discharge outfall pipe, from the appropriate jurisdiction.

- Where the authority having jurisdiction for sewage discharge or sewage disposal is other than the local government, and where the bylaws or policies of the local government stipulate standards or requirements higher than those of the authority having jurisdiction, then the authority having jurisdiction should make best efforts to issue approvals which comply with requirements of the local government.

P29. **Assurance Plans**
No innovative treatment systems will be installed in the GVRD unless an assurance plan is in place for the proper operation, maintenance, and performance of the facility. The assurance plan will be developed in accordance with guidelines being prepared under the Ministry of Environment, Lands and Parks Municipal Sewage Regulation.

Commitments

C43. **On-site Disposal Mapping**
The District and its member municipalities will complete an inventory map of areas containing on-site disposal systems on a watershed basis. The District and its member municipalities will also prepare mapping indicating projected on-site system densities to 2021.

C44. **Performance to be Considered by Ministry of Health**
The Ministry of Health will be requested to consider the performance of existing systems, known pollution issues, and projected on-site system densities in the watershed when approving new systems.

C45. **Performance to be Considered by Ministry of Environment, Lands and Parks**
The Ministry of Environment, Lands and Parks will be requested to consider the performance of existing systems and the projected density of on-site systems when assessing nitrate contamination levels in groundwater aquifers.

C46. **Environmental Monitoring and Assessment**
The District will undertake environmental monitoring and assessments in the region's waterways to identify and determine if on-site disposal systems are contributing to waterway degradation.

Agricultural Runoff

Policies

P30. **Stormwater Consideration by Municipalities**
Municipalities will consider stormwater runoff from agricultural lands when undertaking integrated stormwater management planning for their municipality.

Commitments

C47. **Compilation of Agricultural Watershed Water Quality Data**
The District will compile the monitoring information and findings from past scientific studies to determine the current base-line data associated with water quality in agricultural watersheds and in receiving waterways.

C48. **Environmental Monitoring and Assessment**
The District will include waterways in agricultural areas and the associated receiving waterways in its comprehensive water quality monitoring and environmental assessment program. This work will be coordinated with the Nutrient Management Action Plan for the Lower Fraser Valley under the Fraser Basin Council.

C49. **Identification of Water Uses and Water Quality Objectives**
Through their integrated stormwater management programs, municipalities will identify water uses and water quality objectives for waterways, or confirm the applicability of existing uses and objectives.

Implementation Schedule – Non-Point Source Pollution Management

Commitments / Initiatives	Budget	Year Completed
C40 – Pump-Out Facility Inventory		
Regional Inventory and Map	Included in annual budget	2001
C41 – New Marinas and Major Renovations		
Modification or adoption of bylaws		
City of Burnaby	Not Applicable	
City of Coquitlam	Not Applicable	
City of Langley	Not Applicable	
City of New Westminster	Bylaw in place	
City of North Vancouver	Bylaw in place	
City of Port Coquitlam	$5,000	2002
City of Port Moody	Included in annual budget	2005
City of Richmond	$10,000	2004
City of Surrey	Included in annual budget	2003
City of Vancouver	Bylaw in place	
City of White Rock	Not Applicable	
Corporation of Delta	$7,000	2005
District of Langley	Not applicable	

District of Maple Ridge	Not applicable	
District of North Vancouver	Included in annual budget	2004
District of Pitt Meadows	Included in annual budget	2005
District of West Vancouver	Not applicable	
C42 – Existing Marinas		
Pump-out Facility Feasibility Study	$50,000	2003
C43 – On-site Disposal Mapping		
On-site disposal inventory and density mapping	$50,000	2002
C46 – Environmental Monitoring and Assessment		
Monitoring program in consultation with the Environmental Monitoring Committee	Included in annual monitoring budget	2005
C47 -Compilation of Agricultural Water Quality Data	Included in annual monitoring budget	2004
C48 -Monitoring and Assessment, Agricultural Areas		
Monitoring program in consultation with the Environmental Monitoring Committee	Included in annual monitoring budget	2005

Finance

Policies

P31. **Funding Future Projects**
In its 10-year financial plan the District will include future projects for upgraded service levels that have been determined to be needed in accordance with Policy P2.

In accordance with Policy P2, upgraded service levels will be provided in the future where an environmental need has been forecasted or demonstrated, with consideration to cost and benefit and regional priorities. Figure 4 shows the probable range in future annual District expenditure. The upper range represents annual expenditures if additional secondary treatment plant upgrading projects are required at Lions Gate and Iona, in accordance with demonstrated need, and they are constructed over a 10 year period commencing after 2005. The lower range represents annual District expenditures assuming no secondary treatment upgrading projects are required at Lions Gate and Iona and that the water quality objectives and other established criteria continue to be met.

Figure 4

See Attached File

CONSOLIDATED REPORTING

The District will summarize the results of its Liquid Waste Management Plan commitments and initiatives and submit them to the Ministry of Environment, Lands and Parks in accordance with the following reporting schedule.

Monthly Reports

- Wastewater treatment plant monitoring and reporting, as defined in the Operating Certificates.

Annual Reports

- An interim annual report, to the full biennial Liquid Waste Management Plan progress report, will be submitted by March 31 of the following year. The annual report will provide an overview of progress for the given year but will not provide the full scope of detail that will be included in the biennial report.

- The District will summarize the results of the annual Beach Monitoring program and submit the summary report by March 31 of the following year. The geometric mean in a 30-day period of the samples for each beach will be presented in a graphic. Data for subsequent years, up to a maximum of 5 years, will be incorporated in the graphical representation.

Biennial Reports

A full progress report will be completed biennially and submitted by March 31 of the following year. The report will include:

- A summary of progress for each of the LWMP commitments and initiatives identified in the Implementation Schedule.

- The results of all receiving environment monitoring work, risk assessments, and other specific investigations undertaken and reviewed by the Environmental Monitoring Committee and completed during the reporting period.

- A summary from the Stormwater Interagency Liaison Group on initiatives undertaken during the reporting period.

- The municipal summaries associated with combined and separate sanitary sewer systems as defined in commitments C18 and C23.

Greater Vancouver Regional District
Liquid Waste Management Plan – February 2001

Addendum No. 1

1) Commitment C8, *Upgrading of Iona Island and Lions Gate Treatment Plants*, is revised as follows (revision shown **bold**):

   C8 Upgrading of Iona Island and Lions Gate Treatment Plants

   The District will upgrade the Iona Island and Lions Gate treatment plants by adding facilities for chemical addition (enhanced primary treatment) if necessary to maintain the established base level of treatment as defined by Policy P4. **When considering such upgrades the District will also evaluate the feasibility of commencing partial biological treatment as an alternative to enhanced primary treatment.**

   The District will construct facilities for biological treatment in the following circumstances:
   - *if necessary to address environmental concerns in accordance with Policy P2.*
   - *to maintain effluent concentration and loading levels which are beyond the capability of enhanced primary treatment.*

   In any event, the District will initiate the first phase of biological treatment at such time when growth and concentration and loading levels are approaching the limits of the capability of enhanced primary treatment to meet the requirements of Policy P4. This is anticipated to be reached between 2018 and 2028 at the Iona Island Treatment Plant and between 2030 and 2040 at the Lions Gate Treatment Plant. Growth and the concentration and loading levels will be monitored and these projected dates may be adjusted accordingly.

2) Municipal Commitment C15, *Combined Sewer Overflow Elimination*, is revised by adding the following:

   To expedite the resolution of combined sewer overflow impacts, the cities of Vancouver, Burnaby, and New Westminster will cooperate with the District to facilitate the work identified in District Commitment C13, *Operational Improvements*.