



REGIONAL  
DISTRICT  
OF NANAIMO

## **ENVIRONMENTAL SERVICES**

### **LIQUID WASTE MANAGEMENT PLAN (STAGE 3 REPORT)**

**NOVEMBER 1997**

# **REGIONAL DISTRICT OF NANAIMO LIQUID WASTE MANAGEMENT PLAN**

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# **REGIONAL DISTRICT OF NANAIMO LIQUID WASTE MANAGEMENT PLAN**

## **1.0 STATEMENT OF REGIONAL OBJECTIVE AND GUIDING PRINCIPLES**

The objective of the Regional District of Nanaimo (District) Liquid Waste Management Plan (LWMP) is the establishment of a region-wide long range (20 years and beyond) strategy that will provide a comprehensive approach to managing liquid waste reduction, treatment, utilization and disposal. The District acknowledges that Islands Trust has jurisdiction/responsibility over all aspects of planning for the Gulf Islands including Gabriola and that First Nations have jurisdiction/responsibility over all aspects of planning for Indian Reserves. Even though the Plan does not apply to their areas, as members of the community, these two jurisdictions were invited and participated in the development of this Plan. Guiding principles used to develop the Plan include the following:

1. The goals of the District environmental policies are to not exceed the capacity of the environment to assimilate waste, and to ensure protection of human health, with the strategies for achieving these goals being in accordance with the precautionary principle.
2. The regional liquid waste stream is reduced to the greatest extent possible, in accordance with the hierarchy of reduce, reuse, and recycle, while considering local resources and the nature of the Region liquid waste stream.
3. The LWMP for the District is developed in concert with the Regional Growth Management Plan (RGMP), adopted by the District and its member municipalities in January 1997. The LWMP is consistent with goals, policies and guidelines of the RGMP (RDN 1997) and its Vision Statement. The LWMP specifically recognizes and supports the RGMP goals of urban containment, protecting rural integrity, protecting the Agricultural and Forest Land Reserves (by not allowing the provision of a sewer system to facilitate development), efficient use and management of services and resources, and cooperation amongst jurisdictions.
4. Individuals, institutions and companies are enabled to make environmentally sound choices about consumption of resources and generation of liquid waste through provision of appropriate information and assistance with the development of appropriate codes of practices, policies and procedures. User-pay principles and market-based incentives will be used wherever possible to encourage participation.

5. Liquid waste policies and strategies are developed through an open and effective public consultation process in a cooperative manner between government, private enterprise and community stakeholders.
6. Sewage treatment facilities are located, designed and operated to minimize adverse impact on neighbouring development through provision of aesthetic and odour mitigation measures.
7. The evaluation of liquid waste management alternatives takes into account technical, life cycle cost, environmental and social factors in order to provide decision makers with a balanced perspective on the alternatives for consideration.
8. The overall program is flexible and can be modified to meet changing conditions such as future demands, new environmental criteria and evolving technologies.

# **REGIONAL DISTRICT OF NANAIMO LIQUID WASTE MANAGEMENT PLAN**

## **2.0 PLAN DEVELOPMENT PROCESS**

The District's LWMP has been developed in three stages, consistent with the process outlined in Ministry of Environment, Lands and Parks (MOE) guidelines. In this section, the Ministry guidelines are highlighted; a summary of the Stage 1 and Stage 2 work is presented and note is made of the public consultation report.

### **2.1 Ministry Guidelines**

Guidelines for developing a LWMP have been produced by BC Environment (BCE 1992). The guidelines require a three-stage process, each involving meaningful public consultation. Stage 1 identifies existing conditions, projects development and considers a range of treatment, reuse and disposal options. Those treatment, reuse and disposal options that have merit are advanced into Stage 2 for more detailed evaluation. Finally, the selected option is described and costed, the implementation schedule is developed and draft operational certificates are prepared in Stage 3.

When the Stage 3 Plan (subject of this report) is approved by the Minister of Environment, Lands and Parks, the District has the authority and a responsibility to implement the Plan.

To ensure broad representation in the LWMP process, the District is required to inform the following agencies that a Plan is being undertaken and to solicit their input.

- ? Ministry of Agriculture, Fisheries and Food
- ? Ministry of Health/Regional Health Board
- ? Regional Districts and Municipalities adjacent to Plan area
- ? Ministry of Municipal Affairs, Recreation and Housing
- ? Ministry of Tourism
- ? Ministry of Finance and Corporate Relations
- ? Regional Director of Parks
- ? Environment Canada

Advisory committees must also be established to represent community/stakeholder interests and technical interests. These committees may be combined, which is the approach taken by the District.

The District's LWMP was developed by the combined efforts of the project team, the Advisory Committee and the Public.

? Project Team: The Project Team is composed of RDN staff, an MOE representative and consultants. The objective of the Project Team is to undertake the work required to prepare and produce the LWMP.

? Liquid Waste Advisory Committee (LWAC): To facilitate communications between technical and public representatives, the technical and public Liquid Waste Advisory Committees were combined.

The objective of the LWAC is to provide public and technical input into the planning process. The LWAC reports directly to the District's Environmental Services Committee and is chaired by a Board Director. The LWAC is composed of representatives of various interest groups, geographic areas, stakeholders, municipal staff and senior government agencies. The LWAC Membership List is attached as Appendix 3.

? Public: The objective of the public is to become informed about the Liquid Waste Management Plan process and provide input.

The Stage 3 planning flow chart in Appendix 4 illustrates the study organization, summarizes the sequence of work tasks and outlines the public consultation process. Also shown on the chart is the relationship between the MOE, the District Board, the Project Team, the LWAC, and the public.

## **2.2 Stage 1 and Stage 2 Works**

In 1993 the District Board committed to prepare a LWMP to provide the framework for comprehensive, long-term management of the wastewater function within the District. Two LWMPs, one for the Southern Community (City of Nanaimo and Electoral Areas A, C and D) and the second for the Northern Community (City of Parksville, Town of Qualicum Beach and Electoral

Areas E, F, G and H), were prepared during Stage 1 and Stage 2. In Stage 3 the District has elected to combine both the Northern and Southern Community plans into a single Regional District LWMP. Figure 3-1 illustrates the Plan area.

The Northern Community LWMP also involved a two-phase process. Phase 1 (D&K 1993), prepared in 1993, addressed the immediate treatment expansion requirements at French Creek Water Pollution Control Centre (WPCC) that serves Parksville, Qualicum Beach and the French Creek area (that lies between these two communities). The Minister of Environment approved the Phase 1 LWMP in 1994, allowing the expansion and upgrading of the French Creek WPCC during 1995 through 1997.

Phase 2 of the LWMP for the Northern Community and the LWMP planning process for the Southern Community, both initiated in the spring of 1994, address the broader issues of source controls, volume reduction, beneficial uses of reclaimed water and biosolids, and the development and evaluation of sewage management options to accommodate growth and development. The Stage 1 reports (D&K 1995) were completed in November 1995 and were approved by the Regional Waste Manager in January 1996. The Stage 2 reports (D&K 1997), in which the selected options from Stage 1 were further developed and evaluated, were completed in July 1997 and approved by the Regional Waste Manager in September 1997.

Stage 1 of the LWMP process identified existing conditions, projected development and considered programs and a wide range of treatment, reuse and disposal options that can be used individually or in combination to address sewage management within the District. A summary of the Stage 1 report findings is presented in Appendix 5. Some of the Stage 1 findings and recommendations were modified or deleted in the Stage 2 work to reflect more up to date information or direction from the RGMP. Otherwise, the Stage 2 work involved the development of procedures for evaluating Village Centres and rural areas, and advanced the remaining Stage 1 recommendations to form the basis for the LWMP content presented in Section 3 of this report. A summary of the Stage 2 work is also presented in Appendix 5.

## **2.3 Public Consultation Process**

Public consultation is an essential element in the LWMP process. The importance of providing opportunities for public information and input into the LWMP is stressed in the Waste Management Act, requiring the Minister of Environment, Lands and Parks to be satisfied that there has been

adequate public review and consultation prior to approving the Plan. To assist in developing, guiding, and summarizing the public consultation process, the RDN retained Ostling & Associates Communications of Qualicum Beach.

The overall goal of the LWMP public consultation program was to foster support and acceptance for the Plan through meaningful public participation. The combined public/technical Liquid Waste Advisory Committee (LWAC) played a key role in this process. The LWAC's community, environmental, and business representatives had direct input into development of the LWMP and the Plan's public consultation program.

The Stage 1 public consultation program focused on introducing liquid waste management issues, planning concepts and options to stakeholders and the broader community. Key concerns and interests were identified through a Survey of Stakeholder Concerns. Stage 1 public consultation activities included producing a LWMP overview and brochure, a mobile display, news releases, newspaper ads, a newsletter, treatment facility tours, open houses, and treatment technology workshops. Stage 2 public consultations built on activities completed in Stage 1 and focused on the further development of the LWMP programs and projects. Stage 2 activities included public presentations, news releases, newspaper ads, an innovative treatment system tour, a workshop on composting toilets, a questionnaire, a region-wide newsletter mail out, a newspaper insert, and mall displays.

The Stage 3 public consultation program provided residents and stakeholders with the information they need to understand and comment on the Plan's programs, projects, implementation schedules and costs. Stage 3 consultations also included more specific information on the Plan's financial impact on residents and its application to rural areas. Components of the program included stakeholder presentations, the distribution of draft Stage 3 Reports to libraries, municipal offices and Improvement Districts, a questionnaire, newspaper ads in community and daily newspapers, community cable public service announcements, two stakeholder presentations, news releases, a brochure, a mobile display and five open house/public presentations throughout the region.

In Stage 3 a "Special Newsletter to First Nations Residents" was sent to the Nanaimo, Nanoose and Qualicum First Nations. A cover letter was sent with a request that the newsletter be posted and/or distributed to all residents. Nanoose First Nation copied the newsletter themselves for distribution to each household. Copies of the above are included in the Public Consultation Report. The public consultation reports prepared by Ostling & Associates Communications for Stage 1 (Ost 1995), Stage 2 (Ost 1997) and Stage 3 (Ost 1997) form a supplement to this LWMP report.



## **REGIONAL DISTRICT OF NANAIMO LIQUID WASTE MANAGEMENT PLAN**

### **3.0 LIQUID WASTE MANAGEMENT PLAN**

Outlines of the actions that will be taken by the District, its member municipalities, private businesses, community organizations, and non-profit organizations in partnering to implement the LWMP are presented in this section.

#### **3.1 Source Control Program**

The source control program will include the preparation and adoption of a District sewer use bylaw to regulate the admission of wastewater into the sanitary sewer systems. The program will also include the development of an educational program to support the bylaw and to inform both rural and urban residents within the District on the need and importance of effective source controls, both at home and in the work place. Some tasks to be undertaken to initiate the source control program include:

- ? Initially, a cost benefit study to evaluate the merits of various source control program elements and to prioritize recommended program elements. Budget \$20,000 for study.
- ? In the future, and conditional on the findings of the cost benefit study:
  - ? Inventory non-domestic discharges to sewer systems. Budget in the order of \$90,000.
  - ? Monitor discharges to characterize wastewater within District. Budget in the order of \$72,000.
  - ? Following inventory and monitoring programs determine contaminant limits to be contained in bylaw. Budget to be determined following inventory and monitoring program (in the order of \$60,000).
  - ? Initiate collection and development of educational material as part of District's overall education program to support bylaw and to advise both rural and urban residents on the importance of source control measures for both on-site and community sewer systems. Budget \$30,000 for initial inventory of materials (not including staff time or public presentations).

- ? Consider developing codes of practice, if warranted, following analysis of inventory results.
- ? The District will establish and maintain contact with knowledgeable representatives of other jurisdictions to share information on successful and unsuccessful source control regulatory strategies, educational approaches, and data collection and management programs.

### **3.2 Volume Reduction Program**

In order to reduce the quantity of flow that enters an on-site or community sanitary sewer system, the District will develop a volume reduction program to control inflow and infiltration (I&I) and to reduce water use within buildings. Program elements will include the following initiatives:

- ? Establishment of a committee to coordinate and oversee all water conservation activities within the District.
- ? Initially, undertake a cost benefit study to evaluate the merits of various volume reduction measures, to set priorities for recommended volume reduction measures and to define the program scope and budget. Budget \$35,000 for study.
- ? Continuation and expansion of ongoing I&I programs within Nanaimo, Parksville, and Qualicum Beach.
- ? Installation of flow monitoring equipment at Lee Road pumping station to allow I&I analysis in the French Creek area. Budget \$30,000.
- ? Continuation of flow analysis in the District's interceptor sewer system.
- ? Initiation of a comprehensive I&I investigative and analysis study program by the City of Nanaimo in its sewer collection system. Budget in the order of \$500,000 for a 35 yearlong study, to be financed under the Greater Nanaimo Service Area projects.
- ? Enhance District's existing water conservation education program. Budget \$30,000 for materials (not including staff time or public presentations).

### **3.3 Stormwater Management Program**

Initiatives currently underway will allow the District to take a more active role in stormwater management. The District's role will include the following activities:

- ? The District will approach its member municipalities, neighboring Regional Districts, and the appropriate federal and provincial agencies, to discuss the formation of a committee to coordinate stormwater management issues and to ensure that stormwater management planning is undertaken on a regional scale, with local control and enforcement by agencies, which already have jurisdiction over stormwater.
- ? The District will undertake a cost benefit study to determine its role in co-coordinating stormwater management activities within the District. Budget \$20,000.
- ? The District will include discharges to the storm drain system in its inventory of non-domestic discharges to the sanitary sewer system. Budget \$20,000 for initial work on inventory.
- ? The District, as part of its overall education program, will develop materials to inform domestic and non-domestic discharges to the storm drainage systems about the need for source controls, and what specific groups can do to ensure that the program results in reduced contaminant loadings to receiving waters. Budget \$20,000 for initial materials.
- ? The District will establish and maintain contact with knowledgeable representatives of other jurisdictions to share information on successful and unsuccessful source control regulatory strategies, educational approaches, data collection and management, and possible funding sources for water quality monitoring programs.
- ? The District will create a local service area to facilitate the construction, operation, and maintenance of stormwater facilities when deemed necessary. The District will undertake measures to protect or enhance watershed areas, riparian zones, identified areas of aquifer recharge, beaches and protect marshland from drainage or infill.
- ? The District will continue to monitor the effectiveness of the water stewardship initiatives within the District with a view to coordinating and supporting similar new initiatives elsewhere in the District.

### **3.4 Odour**

- ? The District is committed, when feasible, to eliminate odours emitted from its present and future wastewater treatment plants and associated interceptors and pump stations. The district will undertake to study past, current, proposed, and potential odour elimination measures and to establish an effective implementation plan.
- ? The District will initiate formal consultation and information sharing and exchange procedures, in continuum with all interested resident associations, or where there is no formal residents association, a group of interested residents living within a 3-kilometer radius, wherein a wastewater facility operates or is proposed.
- ? The District will approach and maintain contact with local, Provincial and Federal Government agencies and private sector companies knowledgeable in wastewater treatment and other odour emitting processes to discuss and evaluate past, present, proposed and potential odour eliminating measures. In the same context, through organizations such as Water Environment Federation and the American Waterworks Association and other related international public and private bodies, the District will identify and contact all sources for relevant information and/or exemplary modes or operation for odour elimination.
- ? The District will research and document studies, proven practices, procedures, and physical control facilities that are applicable to wastewater treatment plants, interceptors and associated pump stations.
- ? Following assessment of the foregoing, the District will evolve a plan which will immediately implement policies, procedures, processes, odour control monitoring and control works for the existing wastewater facilities as well as for future expansions, modifications, and new construction of relevant facilities.
- ? Related to the foregoing, the District will establish odour emission standards for all in plant process stages and within the contiguous communities, for both existing and future facilities.
- ? A budget of \$20,000, excluding staff time, will be established.
- ? The District, through the OCP updating process, will emphasize the need for maintaining appropriate zoning in the vicinity of wastewater treatment plants.

### 3.5 Rural Areas

The RGMP goal of protecting rural areas from urban type development is supported in the LWMP through implementation of the following initiatives:

- ? New sewage systems will be restricted to those determined to be necessary under the RGMP and updated OCPs, or to address problem areas (such as failed on-site septic tank systems) in existing development.
- ? The three phase procedure outlined in the Stage 2 LWMP will be used: to assess sewage treatment, reuse and disposal facility needs for future Village Centres that may be established under updated OCPs, to assess sewage system needs for problem areas in existing rural development, and to assess sewage system needs for existing MOE permitted discharges that require upgrading or expansion.
- ? The District will be the holder of the Permit or Operational Certificate for all new sewage systems processed under MOE jurisdiction. The District will review its role with respect to new sewage systems processed under Central Vancouver Island Health Region (CVIHR) jurisdiction.
- ? All existing discharges permitted by the MOE must comply with this LWMP. The District may elect to take over an existing permit.
- ? Minimum standards will be established by the District for sewage systems that are under jurisdiction of the MOE, to ensure the use of proven innovative technology, reliability, redundancy, and cost effectiveness.
- ? The District will proactively and cooperatively work with the CVIHR to monitor and to assess sewage system requirements and develop solutions for failed on-site systems that are under MOH jurisdiction.
- ? The District, in consultation with stakeholders and the CVIHR, will investigate alternate minimum standards for on-site systems to supplement existing Ministry of Health sewage disposal regulations.

- ? The District, at its option, may allow finance, design, build and/or operate by the private sector providing the District's minimum standards for sewage systems are met, and providing financial guarantees in the form of bonding are in place to ensure performance, including ongoing operation and maintenance.
- ? The District will establish septage receiving and treatment facilities in conjunction with the private sector.
- ? All sewage systems will be based on user pay, through establishment of a sewer local service area.
- ? The District will encourage marine operators and Federal small craft harbors to provide boat discharge facilities with a connection or trucking to a District approved sewer system or wastewater treatment facility.

### **3.6 Service Areas**

This section sets out the LWMP capital projects for the Greater Nanaimo, French Creek, Nanoose Bay and Duke Point Service Areas that will serve the urbanized development within the District. The capital cost estimates for these projects apply to the trunk sewers, the interceptor sewers, the treatment facilities, and the reuse/disposal facilities that will be constructed by the District as the Plan is implemented. Operating and maintenance costs associated with treatment plant upgrading and expansion projects are provided to enable both capital and operating cost impacts on the users to be determined. Trunk and collector sewers within the municipalities, and all collector sewers that are authorized under local service area initiatives, do not form part of this Plan's capital projects.

### 3.6.1 Greater Nanaimo Service Area

The Greater Nanaimo Service Area will include the City of Nanaimo Urban Area as defined by the RGMP and the Lantzville Sewer Local Service Area; and possibly future Village Centres and problem areas in some or all of Electoral Areas 'A', 'C' and 'D'. The Service Area is illustrated on Figure 3-1. The Service Area population connected to the sewer system is forecast to grow from about 80,000 people today to about 160,000 people when Plan Nanaimo and OCPs are fully developed (20 to 40 years). Important sewage management elements within the Greater Nanaimo Service Area include the following:

- ? Problem areas that require a sewage system and Village Centres determined through the OCP updating process to require a sewage system may be connected by trunk sewer to the District's interceptor sewer system.
- ? The District will work with the City of Nanaimo to ensure sewer system planning within the City allows capacity for possible future trunk sewer contributions to the District's interceptor sewers from Village Centres and problem areas in the Electoral Areas.
- ? Expansion to service a long term population of over 200,000 people and upgrading of the treatment process to secondary will form the basis for planning improvements to the Greater Nanaimo WPCC. The next stage of expansion and upgrading (needed in 3-5 years) will be capacity for up to 120,000 people, the provision of secondary treatment, on site use of reclaimed water for irrigation, process water and wash down water, discharge of the remainder of effluent through the existing marine outfall and possible pasteurization of biosolids to allow unrestricted environmentally responsible beneficial reuse. The estimated capital cost (1997\$) for expansion and upgrading of the Greater Nanaimo WPCC to service 120,000 people is \$35,000,000 and the associated operating cost is \$2,500,000/year. Completion of the pre-design work will identify the optimum capacity (105,000, 110,000, 115,000 or 120,000 people) for the next stage of expansion, the staging of work and will provide refined project costs.
- ? The estimated cost (1997\$) to parallel the Chase River Forcemain and to upgrade the pumping station is \$830,000. This work is scheduled for 1998.
- ? In the next 5-10 years, further upgrading and expansion of the Chase River pumping station, the Wellington pumping station and the Departure Bay pumping station are estimated to cost \$2,210,000 (1997\$) as follows:

Wellington Pumping Station	\$220,000	(2000-2005)
Chase River Pumping Station	\$790,000	(2000-2005)
Departure Bay Pumping Station	\$1,200,000	(2000-2005)

- ? The District will continue to investigate and promote additional opportunities for environmentally responsible use of reclaimed water and biosolids, including educational and marketing programs.
- ? The District will work with the City of Nanaimo to investigate locations and treatment requirements for septage receiving facilities.
- ? The District will install additional ferrous chloride (or alternate reactants) facilities to control corrosion and odor potential within the sewage system, as need arises.

### 3.6.2 French Creek Service Area

The French Creek Service Area includes the Town of Qualicum Beach, the French Creek Sewer Local Service Area and the City of Parksville; and possibly future Village Centres and problem areas in Electoral Areas 'F', 'G' and 'H'. Figure 3-1 illustrates the service area. When fully developed, the Service Area population connected to the sewer system is forecast to increase from 23,500 at present to about 64,000 (20-40 years). Liquid waste management within the Service Area will include the following initiatives:

- ? The School District 69 LWMP Phase 1, French Creek Service Area Sewage Treatment, and Disposal, that authorized the recent expansion of the French Creek WPCC, will be revoked when this Plan is approved.
- ? Problem areas that require a sewage system and Village Centres determined through the OCP update process to require a sewage system may be added to the French Creek Sewer Local Service Area.



- ? In the immediate future (5 to 10 years) upgrading of District owned facilities to match OCP growth and development will be limited to pumping station expansion and upgrading at an estimated cost of \$1,195,000 (1997\$) as follows:

Hall Road Pumping Station	\$170,000 (2000-2005)
Lee Road Pumping Station	\$230,000 (2000-2005)
Lee Road Forcemain	\$220,000 (2000-2005)
Bay Avenue Pumping Station	\$345,000 (2000-2005)
Isolate Low Lying areas to Parksville Interceptor	\$230,000 (2000-2005)

- ? A later stage of expansion (10 to 15 years) will include Stage 3 expansion of French Creek WPCC and paralleling of the outfall at an estimated capital cost of \$15,900,000 (1997\$) and associated operating cost of \$1,320,000/year.
- ? The District will work with the City of Parksville to review the current OCP growth projections and its distribution with the objective of eliminating the future need to parallel the upstream section of the interceptor sewer. In addition, and as an alternative, Parksville will be encouraged to investigate modifications to its sewer collection system to divert sewage flow from upstream to downstream sections of the interceptor at less cost than paralleling the interceptor.
- ? The District will continue to investigate and promote additional opportunities for environmentally responsible use of reclaimed water and biosolids, including educational and marketing programs.

### 3.6.3 Nanoose Bay Service Area

The Nanoose Bay Service Area includes the Fairwinds development, and the Delanice Way, Beachcomber, Dolphin Drive, Garry Oaks and Red Gap areas; and possibly Madrona, Wall Beach and other future areas to be identified in the OCP updating process. A second option for Madrona/ Wall Beach is to be serviced through the Pacific Shores Sewer Local Service Area and the City of Parksville trunk sewer system, to the French Creek WPCC. Madrona/Wall Beach has been included in the Plan as being serviced by the Nanoose Bay WPCC to include the necessary capital works in the Plan that would be required if that option is chosen. The final decision regarding the options will be made as part of the OCP. The review is currently under way (1997/1998) and Figure 3-2 illustrates the proposed Service Area. When fully developed, the Service Area population connected to the sewer system is projected to increase from about 500 at present to about 12,000 (20-40 years). Important liquid waste management elements within the Nanoose Bay Service Area include the following:

Upon completion of the updated OCP, those areas identified for eventual connection to a sewage system (the “Sewer Development Areas”) will be added to the Fairwinds Sewer Local Service Area. The estimated cost to extend trunk sewer service to these areas is \$4,203,000. The following trunk sewer extensions are included.

- Trunk sewer from Nanoose Bay WPCC to Madrona (serves Madrona, Wall Beach, Delanice Way, Beachcomber, and part of Dolphin Drive).
- Trunk sewer from Nanoose Bay WPCC to Red Gap (serves Red Gap and Garry Oak)
- ? The District will ensure sewer system planning within the Fairwinds development allows capacity and statutory right of way corridors for the future trunk sewer contributions from the remainder of the Service Area.
- ? Expansion to service 12,000 people and upgrading of the treatment process to secondary will form the basis for planning improvements to Nanoose WPCC. The next stage of future expansion and upgrading will be capacity for up to 6,000 people, the provision of secondary treatment, use of reclaimed water for irrigation, process water and wash down water, discharge of the remainder of effluent through the existing marine outfall and transport of biosolids to French Creek WPCC for treatment and beneficial reuse. The estimated capital cost (1997\$) of expansion and upgrading of the Nanoose Bay WPCC to service 6,000 people is \$3,210,000 and the associated operating cost is \$200,000/year

- ? Completion of pre-design work will identify the optimum capacity (3,000, 4,500 or 6,000 people) for the next stage of expansion and upgrading.

#### 3.6.4 Duke Point Service Area

The Duke Point Service Area includes the industrial development at Duke Point, and possibly future Village Centres and problem areas within Electoral Area 'A' that require community sewers. Important liquid waste management elements include:

- ? The Duke Point WPCC was financed and constructed by the private sector in 1997 and will be turned over to the District to own and operate. Operating costs (1997\$) are estimated at \$60,000/year.
- ? Problem areas that require a sewage system and Village Centres determined through the OCP updating process to require a sewage system may be connected by trunk sewer to the Duke Point WPCC.

## **REGIONAL DISTRICT OF NANAIMO LIQUID WASTE MANAGEMENT PLAN**

### **4.0 IMPLEMENTATION SCHEDULE, COSTS, FINANCING**

Implementation schedules, program and project cost estimates, and financing and cost recovery measures are presented in this section.

#### **4.1 Implementation Schedule and Costs**

This Plan outlines program and project elements and their associated costs that will provide liquid waste management for the residents of the District over the next 20 years or more. The District will construct Plan facilities involving expansion and upgrading of sewage system facilities in both rural and urban areas in a staged manner to match the demands for service dictated by implementation of the RGMP and the OCPs. Implementation of educational programs, cost benefit studies and the seeking of authority for source control and stormwater management programs were initiated during the Stage 2 work and will continue with the District Board's approval of the Plan.

The estimated costs (1997 \$) for program elements and capital projects along with a schedule for implementation are presented in Table 4-1.

As noted throughout the Plan, costs are presented in 1997 dollars. Actual costs will be dependent upon the cumulative impact of inflation between 1997 and the actual year of construction.

Every effort will be made to meet the objectives of the Plan at costs lower than those presented

**TABLE 4-1**  
**COST ESTIMATES AND SCHEDULE**

Programs and Projects	Cost Estimate (1997\$)	Schedule
1. Source Control Program <ul style="list-style-type: none"> <li>- Cost Benefit Study</li> <li>- Education</li> <li>- Inventory</li> <li>- Monitoring</li> <li>- Contaminant Levels</li> </ul>	\$20,000 \$30,000 \$90,000 \$72,000 \$60,000	1988 1998/ 1999 1998/ 1999 1998/ 1999 2000/ 2001
2. Volume Reduction Program <ul style="list-style-type: none"> <li>- Cost Benefit Study</li> <li>- Flow monitoring equipment for French Creek</li> <li>- Education</li> </ul>	\$35,000 \$30,000 \$30,000	1998 1998/ 1999 1998/ 1999
3. Stormwater Management Program <ul style="list-style-type: none"> <li>- Cost Benefit Study</li> <li>- Inventory</li> <li>- Education</li> </ul>	\$20,000 \$20,000 \$20,000	1998 1998/ 1999 1998/ 1999
4. Rural Areas <ul style="list-style-type: none"> <li>- Village Centres</li> <li>- Problem Areas</li> </ul>	Costs and schedule to be determined following OCP updates Need, costs and schedule to be determined	
5. Greater Nanaimo Service Area <ul style="list-style-type: none"> <li>- Chase River Pump Stn. and Forcemain</li> <li>- I&amp;I Investigation</li> <li>- Greater Nanaimo WPCC upgrade and expansion, (120,000 people)</li> <li>- Interceptor Sewer Expansion</li> <li>- Possible trunk sewer connection to Village Centres and problem areas</li> </ul>	\$830,000 \$500,000 \$35,000,000 \$2,210,000 Need, costs and schedule to be determined following OCP updates	1998 1998-2003 1998-2015 2000-2005
6. French Creek Service Area <ul style="list-style-type: none"> <li>- Qualicum Interceptor</li> <li>- Parksville Interceptor</li> <li>- French Creek WPCC expansion, 36,000 people</li> <li>- French Creek Outfall</li> <li>- Possible trunk sewer connection to Village Centres and problem areas</li> </ul>	\$620,000 \$575,000 \$11,800,000 \$4,100,000 Need, costs and schedule to be determined following OCP updates	2000 - 2005 2000 - 2005 2010 - 2015 2005 - 2015

Programs and Projects	Cost Estimate (1997\$)	Schedule
7. Nanoose Bay Service Area		
- Nanoose Bay WPCC upgrade and expansion (6,000 people)	\$3,210,000	2005 - 2010
- Trunk sewer extensions to Madrona, Wall Beach, Delanice Way, Beachcomber, Red Gap, Garry Oak	\$4,203,000	1998 - 2005

## 4.2 Proposed Financing

Financing requirements for Plan implementation are summarized in Table 4-2.

**TABLE 4-2**  
**FINANCING REQUIREMENTS (1997\$)**

Programs and Projects	1998-2000	2000-2005	2005-2015
1. Source Control, Volume Reduction, Stormwater Management Programs	\$367,000	\$60,000	--
2. Greater Nanaimo Service Area	\$10,000,000	\$12,000,000	\$15,710,000
3. French Creek Service Area		\$1,195,000	\$15,900,000
4. Nanoose Bay Service Area	\$2,000,000	\$2,203,000	\$3,210,000

The District will borrow funds required to implement the LWMP from the Municipal Finance Authority or from the private sector, to ensure the most favorable rates and repayment schedule. Funds for debt repayment will be raised through Development Cost Charges (DCC) to new construction, capital charges and from property taxes.

The impact of the Plan implementation to property taxes has been calculated assuming no construction grants, 8% interest rate and no DCC or capital charge revenue.

Table 4.3 identifies the estimated increase in tax charges to area residents.

**TABLE 4-3**  
**TAX REQUIREMENTS**

Service Area	Estimated Tax Increase (1997\$)	Year of Increase (Phased In)
Greater Nanaimo Service Area	\$100*	1998 - 2004
French Creek Service Area	0**	
Nanoose Bay Service Area	\$240	1999 - 2004

\* This is an average based on the total capital cost divided by the number of parcels in the benefiting area

\*\* No increase over 1997 levels

#### Operation and Maintenance Costs

Some of the capital costs authorized through the LWMP will result in increased operation and maintenance costs and therefore, the public should be informed of the overall cost associated with service. It is a requirement to include operating in costs in a Liquid Waste Management Plan, but not to obtain the authority to collect them as local government has the ability to gather revenue to cover these costs through authority provided in the Municipal Act.

## **REGIONAL DISTRICT OF NANAIMO LIQUID WASTE MANAGEMENT PLAN**

### **5.0 APPROVAL, MONITORING AND AMENDMENTS**

#### **5.1 Board Approval of Plan**

This Liquid Waste Management Plan was approved by the Regional District of Nanaimo Board of Directors on December 9, 1997.

The list of directors was:

- ? City of Nanaimo - Gary Korpan, Loyd Sherry, Larry McNabb, Doug Rispin, Jack Little, and Blake McGuffie
- ? City of Parksville - Jim Banks
- ? Town of Qualicum Beach - Bill Luchtmeijer
- ? Electoral Area 'A' - South Wellington, Cassidy Cedar - Frank Garnish
- ? Electoral Area 'B' - Gabriola and surrounding Islands - Ruth Loomis
- ? Electoral Area 'C' - Extension - Elaine Hamilton
- ? Electoral Area 'D' - Lantzville, East Wellington, Pleasant Valley - Ian Savage
- ? Electoral Area 'E' - Nanoose - George Holme
- ? Electoral Area 'F' - Coombs, Hilliers, Errington - Jack McLean
- ? Electoral Area 'G' - Dashwood, Englishman River, French Creek - Joe Stanhope
- ? Electoral Area 'H' - Shaw Hill, Deep Bay, Bowser - Jim Duncan

The resolution of the Board was:

"That the REGIONAL DISTRICT OF NANAIMO, LIQUID WASTE MANAGEMENT PLAN, STAGE 3 REPORT, dated November, 1997, be adopted and forwarded to the Minister of Environment, Lands and Parks for approval."



## **5.2 Monitoring and Reporting**

The District will track the implementation of its Plan by preparing a brief annual report summarizing the tasks proposed in the plan and the progress made. The report will summarize the effectiveness of its source control, volume reduction and stormwater management and odor control programs. Progress reports on expansion and upgrading of interceptor, treatment, reuse and disposal facilities will be provided in those years that include such works. Reports will compare connected population equivalents with design populations, compare effluent quality and quantity with permitted or operational certificate limits, quantify beneficial uses of reclaimed water and biosolids and will indicate the extent of I&I at the treatment plants.

A Plan Monitoring Committee, incorporating members from the general public, representatives of governmental and non-governmental agencies, and staff personnel, will be formed by the District to monitor progress in implementing the Plan. The Committee will report its findings to the District's Board.

## **5.3 Amendment Process**

Factors such as liquid waste quantity or composition variations, growth rates, demographic changes, technology improvements, private-public partnerships may make deviation from the approved Liquid Waste Management Plan desirable and/or necessary.

Failure to open or premature closing of major facilities, or the cancellation of entire programs will require major plan amendments. Schedule delays or lesser deviations will require only minor amendments. The MOE will determine whether a particular deviation requires a major or minor amendment, or any amendments at all.

Major Plan Amendments. The District will make major amendments to the Plan by documenting the changes and proposed amendment, including financial implications. District staff will provide all information to the following groups and give opportunity for input and comments before finalizing the proposed amendments for submission to the District's Board for approval.

- ? Appropriate Stakeholders
- ? Member Municipalities and adjacent Regional Districts
- ? The Plan Monitoring Committee
- ? The general public
- ? The Ministry of Environment, Lands and Parks
- ? Ministry of Health/CVIHR
- ? Ministry of Agriculture, fisheries and Food
- ? Ministry of Municipal Affairs, Recreation and Housing
- ? Ministry of Tourism
- ? Ministry of Finance and Corporate Relations
- ? Regional Director of Parks
- ? Environment Canada

Minor Plan Amendments. The District will make minor amendments to the Plan by documenting the changes and proposed amendment, including financial implications. District staff will provide all information to the following groups and give opportunity for input and comments before finalizing the proposed amendments for submission to the District's Board for approval.

- ? Appropriate Stakeholders
- ? Member Municipalities
- ? The Plan Monitoring Committee
- ? The Ministry of Environment, Lands and Parks
- ? Ministry of Health

The final documented and Board approved amendment would then be submitted to the Minister of Environment, Lands, and Parks for consideration and approval.

## **REGIONAL DISTRICT OF NANAIMO LIQUID WASTE MANAGEMENT PLAN**

### **6.0 DRAFT OPERATIONAL CERTIFICATES**

Discharges to the environment are authorized through the issuance of Operational Certificates by the Regional Waste Manager. The Operational Certificates establish the authorized discharge to the environment, outline general requirements relating to construction, operation, and maintenance of the Plan facilities, and specify monitoring and reporting requirements.

The draft certificates that follow allow for the estimated discharges that will occur in about 20 years. The actual certificate issued by the Regional Waste Manager will authorize a lesser quantity of discharge appropriate to the staging of expansion and upgrading of the treatment plants.

#### **6.1 Greater Nanaimo WPCC**

A draft outline for a certificate to authorize effluent discharge/reuse and biosolids reuse from a service area population of 120,000 is attached in Appendix 6.

#### **6.2 French Creek Water Pollution Control Centre**

A draft outline for a certificate to authorize effluent discharge/reuse and biosolids reuse from a service area population of 36,000 is attached in Appendix 6.

#### **6.3 Nanoose Bay Water Pollution Control Centre**

A draft outline for a certificate to authorize effluent discharge/reuse and biosolids reuse from a service area population of 6,000 is attached in Appendix 6.

#### **6.4 Duke Point Water Pollution Control Centre**

A draft outline for a certificate to authorize effluent discharge/reuse and biosolids reuse from an equivalent population of 2,200 is attached in Appendix 6.

**REGIONAL DISTRICT OF NANAIMO  
LIQUID WASTE MANAGEMENT PLAN - STAGE 3 REPORT**

**APPENDIX 1**

**REFERENCES**

BCE (1992)	Guidelines for Developing a Liquid Waste Management Plan, B.C. Environment, August 1992.
D&K (1993)	RDN, School District 69 LWMP, Phase 1, French Creek Service Area Sewage Treatment and Disposal, Stage 3 Report, Dayton & Knight Ltd., November 1993.
D&K (1995a)	Regional District of Nanaimo, Southern Community Liquid Waste Management Plan, Stage 1 Report, Dayton & Knight Ltd., November 1995.
D&K (1995b)	Regional District of Nanaimo, Northern Community Liquid Waste Management Plan, Phase 2, Stage 1 Report, Dayton & Knight Ltd., November 1995.
OST (1995a)	Regional District of Nanaimo, Southern Community Liquid Waste Management Plan, Stage 1 Public Consultation Report, Ostling & Associates Communications, November 1995.
OST (1995b)	Regional District of Nanaimo, Northern Community Liquid Waste Management Plan, Stage 1 Public Consultation Report, Ostling & Associates Communications, November 1995.
D&K (1997a)	Regional District of Nanaimo, Southern Community Liquid Waste Management Plan, Stage 2 Report, Dayton & Knight Ltd., July 1997.
D&K (1997b)	Regional District of Nanaimo, Northern Community Liquid Waste Management Plan, Phase 2 - Stage 2 Report, Dayton & Knight Ltd., July 1997
D&K (1997c)	Regional District of Nanaimo, Nanoose Bay Comprehensive Development Plan, Sewer system Concept Design, Dayton & Knight Ltd. October 1997, Draft
RDN (1997)	Regional District of Nanaimo, Regional Growth Management Plan, January 1997.
OST (1997a)	Regional District of Nanaimo, Southern Community Liquid Waste Management Plan, Stage 2 Public Consultation Report, Ostling & Associates Communications, July 1997.
OST (1997b)	Regional District of Nanaimo, Northern Community Liquid Waste Management Plan, Stage 2 Public Consultation Report, Ostling & Associates Communications, July 1997.
OST (1997c)	Regional District of Nanaimo, Southern Community Liquid Waste Management Plan, Stage 3 Public Consultation Report, Ostling & Associates Communications, November 1997.

**REGIONAL DISTRICT OF NANAIMO  
LIQUID WASTE MANAGEMENT PLAN - STAGE 3 REPORT**

**APPENDIX 2**

**GLOSSARY AND ABBREVIATIONS**

**Glossary**

Sewage Flow	A combination of water carried wastes originating from residential, commercial, institutional and industrial sources, together with any groundwater, surface and storm waters which may be present.
Sanitary Flow	Domestic, commercial, and industrial sewage flows at the point of source and not including extraneous infiltration or inflow amounts.
Domestic Sewage	Sewage principally derived from residential sources or produced by normal residential activities.
Commercial Sewage	Sewage generated in areas predominantly commercial in business nature includes sanitary wastes and wastes resulting from the activities of the business itself. Typically, commercial sewage may include wastewaters from Laundromats, restaurants, car washes, and garages.
Industrial Sewage	Wastewaters from manufacturing and industrial processes distinct from domestic or commercial sewage.
Peaking Factor	A factor to describe the peak instantaneous flow as a factor of ADWF. The peaking factor is a function of a number of contributors, or tributary area size.
Infiltration (I)	Groundwater movement into the sewage collection system from faulty construction, disrepair, or defective materials. High groundwater tables or saturation of the soil from rains or irrigation waters may add to the infiltration in a sewage collection system.
Inflow (I)	Rain, which enters the sewage collection system through direct connections or available openings in the sewer system. Entry may originate from illegal storm connections, manhole lid submergence, or catch basin connections. Direct storm inflow is distinct from infiltration and is observed as a peak sewerage flow during a rainstorm. In contrast, infiltration would be observed as an extended period of inflow
Average Dry Weather Flow (ADWF)	Sewage flow measured during periods of little or no rainfall. Rates of flow exhibit typical hourly and daily variations.
Average Wet Weather Flow (AWWF)	Sewage flow during periods of extended or heavy rainfall. Inflow and infiltration may increase the wet weather flow to rates many times larger than the dry weather flow.
Peak Wet Weather Flow (PWWF)	Wet weather flow during an instantaneous peak sanitary sewage flow. The peak wet weather flow is derived by adding the I & I to a peaked sanitary flow.

Biochemical Oxygen Demand	The quantity of oxygen needed to satisfy biological oxidation of the degradable fraction of organic matter contained in sewage. Usually referred to as BOD <sub>5</sub> , this oxygen requirement is often used to determine in part the degree of treatment, which must be used to produce an acceptable effluent quality. Values for five days used in this report and refer to the oxidation of organic wastes (carbon) only. Biochemical oxygen requirements for conversion of ammonia to nitrates are termed Nitrogenous Oxygen Demand and are not included in this BOD <sub>5</sub> value.
Suspended Solids	The suspended matter transported in sewage. Suspended solids and BOD <sub>5</sub> are two basic criteria used to grade the strength of sewage and quality of effluent. The quantity of suspended material removed during treatment is dependent on the type and extent of treatment used and has an important bearing on sizing of treatment components.
pH	The negative logarithm of the hydrogen ion concentration ( $\text{pH} = -\log [\text{H}^+]$ ). pH expresses both the acidity and alkalinity of water on a scale from 0 to 14, with 7 representing neutrality (numbers less than 7 denote increasing acidity, and numbers greater than 7 denote increasing alkalinity).
Cost Benefit Study	A study that, in addition to cost factors, will include environmental, social and the 5 R's hierarchy as factors in the evaluation process.
Sewage System	The collection, transmission, treatment, reuse and disposal facilities that are used for the collection, treatment, utilization and disposal of sewage
Problem Areas	Two or more properties within existing development where the failure of on-site sewage systems (typically septic tank or package treatment plant with ground disposal tile field) are causing an unacceptable risk to human health or to the environment and where the problem cannot be reasonably corrected on-site.

### **Abbreviations**

ha	hectare
m	metre
L/S	litre per second
m <sup>3</sup> /d	cubic metres per day
L/ha/d	litres per hectare per day
mg/L	milligrams per litre
District	Regional District of Nanaimo
RDN	Regional District of Nanaimo
RGMP	Regional Growth Management Plan
OCP	Official Community Plan
MOH	Ministry of Health
MOE	Ministry of Environment, Lands and Parks
CVIHR	Central Vancouver Island Health Region

**REGIONAL DISTRICT OF NANAIMO  
LIQUID WASTE MANAGEMENT PLAN - STAGE 3 REPORT**

**APPENDIX 3**

**LIQUID WASTE ADVISORY COMMITTEE MEMBERSHIP LIST**

# **Regional District of Nanaimo Liquid Waste Management Plan** **Liquid Waste Advisory Committee Membership List – Stage 3**

Organization	Representative	Address/Phone/ Fax
<b>Residents Associations</b>		
Cedar Residents Association ?	Joan van der Goes	RR2, Site 619, 1624 Woobank, Nanaimo, B.C. V9R 5L2 Tel. 722-3261 Fax 722-7260
Chase River Community Association ?	Jan Arkell	RR2 Site A1 C25 Nanaimo BC V9R 5K2 Tel. 722-7221 Fax 756-4871
Eaglecrest Residents Association ?	Art Westaway	1093 Eaglecrest Drive, Qualicum Beach, B.C. V9K 1E7 Tel. and fax 752-3701
Ercohill Landowners Association ?	Don Fawthorpe	3040 Palmer Rd., Qualicum Beach, B.C. V9K 1W5 752-9822
French Creek Residents Assn ?	Glenn Cooper	568 Hawthorne Rise, Parksville, B.C. V9P 2K3 Tel. 752-3327
Gabriola Residents and Ratepayers Assoc. ?	Cynthia Hemsworth	RR1, Site 3, Box 17, 779 Berry Point Road Gabriola Island, B.C. V0R 1X0 Tel. 247-9545
Hammond Bay Residents Association ?	George Legg	3914 Gulfview Drive, Nanaimo, B.C. V9T 6B5 Tel. and Fax 751-0056
Lantzville Sewage Treatment Options Committee – Area D Alternate ?	Hans Larsen	7010 Owen Road Lantzville, B.C. V0R 2H0 390-2353
Nanaimo/Newcastle Residents Association ?	Rose Zajonskoski	553 Stewart Avenue, Nanaimo, B.C. V9S 4C8 Tel. 753-5328
Nanoose Peninsula Residents Assn. ?	Chuck Gahr	Box 81, 3391 Blueback Drive, RR2 Nanoose Bay, B.C. V0R 2R0 Tel. 468-5737 Fax 468-9110
Parksville Residents Association ?	Al Rupprecht	620 Chinook Street, Parksville, B.C. V9P 1A5 248-8680
Qualicum Beach Residents Association ?	Pat Hadley	766 Canyon Cresc. Qualicum Beach, B.C. V9K 1A6 Tel. 752-6304
San Pareil Shorewood Residents Assoc. ?	Lorrence Melnechenko	936 Ballenas Road, Parksville, B.C. V9P 1T1 Tel 954-1284
Southend Community Association ?	Hermine Hicks	216 View Street, Nanaimo, B.C. V9R 4N7 Tel. 753-2548
Spider Lake Residents Association ?	Jack Pipes, President	2925 Turnbull Rd., Qualicum Beach, B.C. V9K 1Z8 Tel. and Fax 757-8009
<b>Environmental Organizations</b>		
Arrowsmith Ecological Assn ?	Steve Chomolok / Alice Antonelli, Directors	C/O Box 179, 1227 Leffler, Errington, B.C. V0R 1V0 Tel. 248-2894
Envir. Friendly Wastewater Committee ?	Fred Karlzen	6626 Green Acres Way, Nanaimo, B.C. V9T 5R9 Tel. 390-3423
Environment Friendly Wastewater Committee ?,	Ian Natrass	7918 Lantzville Road, Lantzville, B.C. V0R 2H0 Box 1801, Parksville, B.C. V9P 2H6 Tel. PV 248-3437 Nanaimo 390-3663
Georgia Strait Alliance ?	Chuck Gahr	201-195 Commercial St., Nanaimo, B.C. V9R 2G5 Tel. 753-3459 Fax 753-2567
Nanaimo Field Naturalists ?	Ron Mambery	5984 Tweedsmuir Crescent, Nanaimo, B.C. V9T 5Y7 756-2659
Mid Island Wildlife Watch Society ?	Ray Schmidt	597 Dogwood Avenue, Qualicum Beach, B.C. V9K 1N7 Tel. and Fax 752-2493

? indicates voting member

...2



Organization	Representative	Address/Phone/ Fax
<b>Business Representation</b>		
Duke Point Development ?	Ron Fuller	201 Selby Street, Nanaimo, B.C. V92 2R2 Tel. 755-7712 Fax 753-0794
Greater Nanaimo Chamber of Commerce ?	Brian Anderson	P.O. Box 358, Nanaimo, B.C. V5R 5L3 Tel. 755-1108 Fax 755-1109
Parksville & Dist. Chamber of Commerce ?	Ron Maine, Second Vice President	215 Orchid Close Parksville, B.C. V9P 2G3 Tel. 248-8370
Fairwinds Development Corporation ?	Neil Scott, Project Director	P.O. Box 189, 3730 Fairwinds Dr. NanOOSE Bay, B.C. V0R 2R0 Tel. 468-7054 Fax 468-9840
BC Shellfish Growers Association ?	David Mitchell	Box 329, 1820 Lorna Lane, Errington, B.C. V0R 1V0 Tel/Fax 248-6609
<b>Institutional Representation</b>		
District 68 School Board ?	Peter Sabo, Tech. Asst.	395 Wakesiah, Nanaimo, B.C. V9R 3K6 Tel. 741-5265 Fax 754-6511
District 69 School Board ?	Ron Hazel, Properties Manager	Box 430, 497 West Island Hwy, Parksville, V9P 2G5 Tel. 248-4241 Fax 248-6822
<b>Community Representation</b>		
Parksville Healthy Communities ?	Perry Perry	Box 1390, Parksville, B.C. V9P 2G3 Tel. 248-6144 Fax 248-6650
<b>Technical Representation</b>		
City of Nanaimo ?	Scott Crane	2020 Labieux Road, Nanaimo, B.C. V9S 5S9 Tel. 758-5222 Fax 756-2659
City of Nanaimo ?	Harriette Rueggeberg, Environmental Planner	455 Wallace Street, Nanaimo, B.C. V9R 5J6 Tel. 755-4483 Fax 755-4440
City of Parksville ?	Greg Scott, Municipal Engineer	Box 1390, Parksville, B.C. V9P 2G3 Tel. 248-6144 Fax 248-6650
Electoral Area H Advisory Planning Commission ?	Ben Mellin, Area H - APC	Box 29, 6919 West Island Hwy Bowser, B.C. V0R 1G0 Tel. 757-8623 Fax 757-8619
Environment Canada, Pollution Abatement Pacific and Yukon Branch ?	Phillip Wong, Sr. Program Engineer	224 West Esplanade, North Vancouver, B.C. V7M 3H7 Tel. 666-2699 Fax 666-7294
Islands Trust ?	Sandra Smith, Mgr. of Local Planning	2 <sup>nd</sup> Floor, 1627 Fort Street, Victoria, B.C. V8R 1H8 Tel. 952-4185 Fax 952-4185
Lantzville Improvement District ?	Russell Dyson, Administrator	7192 Lantzville Road, Lantzville, B.C. Tel. 390-4006 Fax 390-5188
Ministry of Health ?	David Coombe, Environmental Health Officer	1665 Grant Ave., Nanaimo, BC . V9S 5K7 Tel. 755-6200 Fax 755-3372
Ministry of Municipal Affairs, Municipal Engineering Services ?	George Buble, Senior Engineer	800 Johnson St., 4 <sup>th</sup> Floor, Victoria, B.C. V8V 1X4 Tel. 356-7255 Fax 356-1873
Regional District of Nanaimo ?	Natalie Cielanga, Engineering Technologist	Box 40, Lantzville, B.C. V0R 2H0 Tel. 954-3792 or 390-6560 Fax 390-1542
Town of Qualicum Beach ?	Bob Weir, Dir. of Dev. and Engineering Services	Box 130 141 West 2nd Avenue Qualicum Beach, B.C. V9K 1S7 Tel. 752-8800 Town 6921 Fax 752-1243 8806

? indicates voting member

Organization	Representative	Address/Phone/ Fax
<b>Political Representation</b>		
City of Nanaimo	Loyd Sherry (LWAC Chair), Councilor	104 Ranchview Drive, Nanaimo, B.C. V9X 1C4 Tel. 754-5167 (Res) 722-4293 (bus)
City of Nanaimo	Larry McNabb, Councilor.	2555 Stobart Road, RR 3, Nanaimo, B.C. V9R 5K3 Tel. 753-2792 751-4007 (Cell)
City of Parksville	Jim Banks, Councilor	Box 1390 194 Memorial Avenue Parksville, B.C. V9P 2G3 Tel. 248-6144 Fax 248-6650
Lantzville Improvement Dis. Trustees	Bill Nelson, Trustee	C/O Lantzville Improvement District 7192 Lantzville Rd., Lantzville, B.C. V0R 2H0 Tel. 390-4006 Fax 390-5188
RDN Electoral Area A Cranberry, North Cedar	Frank Garnish, Director	2522 Barnes Road, RR2, Site H, C-11 Nanaimo, B.C. V9R 5K2 Tel. and Fax 722-2887
RDN Electoral Area B Gabriola	Ms. R. Loomis, Director	Box 178, 1775 Mussel Heights Gabriola, B.C. V0R 1X0 Tel. 247-8685 Fax 247-8116
RDN Electoral Area C Extension	Elaine Hamilton, Director	Site V, RR1, 2049 Midora Road Nanaimo, B.C. V9R 5K1 Tel. 754-4828 Fax 754-4621
RDN Electoral Area D Lantzville, East Wellington, Pleasant Valley	Ian Savage, Director	7428 Chataway Place Lantzville, B.C. V0R 2H0 Tel. 390-2687 Fax 390-0610
RDN, Electoral Area E NanOOSE	George Holme, Director	Box 4 Dolphin Dr. and Park RR2 NanOOSE Bay, B.C. V0R 2R0 Tel. 468-7237
RDN, Electoral Area F Coombs, Hilliers, Errington	Jack McLean, Director	P.O. Box 76, Coombs, B.C. V0R 1M0 Tel. 752-9974 Fax 752-2549
RDN, Electoral Area G Dashwood, Englishman River, French Creek	Joe Stanhope, Director	1025 West Island Highway Parksville, B.C. V9P 2E1 Tel. 248-6401 Fax 248-6403
RDN, Electoral Area H Shaw Hill, Deep Bay, Bowser	Jim Duncan, Director	C/O Bay Concrete, 210 Cochrane Road Qualicum Beach, B.C. V9K 1Z4 Tel. 757-8722 Fax 757-8011
Town of Qualicum Beach	Bill Luchtmeijer, Mayor	Box 130, 141 West 2nd Avenue Qualicum Beach, B.C. V9K 1S7 Tel. 752-6921 Fax 752-1243
<b>Project Team</b>		
Regional District of Nanaimo	Bob Colclough, Director of Operational Services	Box 40, Lantzville, B.C. V0R 2H0 Tel. 954-3792 or 390-6560 Fax 390-1542
Regional District of Nanaimo	Bob Lapham, Development Services	Box 40, Lantzville, B.C. V0R 2H0 Tel. 390-4111 or 248-5511 Fax 390-6511
Ministry of Environment, Lands and Parks	Al Leuschen, Environmental Protection Officer	2569 Kenworth Rd. , Nanaimo, B.C. V9T 4P7 Tel: 751-3100 Fax: 751-3103
Dayton & Knight, Consulting Engineers	Brian Walker, P.Eng. Principal	Box 91247, West Vancouver, B.C. V7N 3N9 Tel. 922-3255 Fax 922-3253
Ostling & Associates Communications	Roy Ostling	3557 W. Island Hwy., Qualicum Beach, B.C. V9K 2B7 Tel. 752-2439 Fax 752-2453
<b>LWMP Mailing List - Full Reports and Agenda</b>		
Nanaimo Indian Band ?	Viola Wyse, Band Administrator	1145 Totem, Nanaimo, B.C. V9R 1H1 Tel. 753-3381 Fax 753-3492
NanOOSE Indian Band ?	Wayne Edwards, Chief	209 Mallard, Lantzville, B.C. V0R 2H0 (NanOOSE Band Reserve) Tel. 390-3661

Updated October 22, 1997

**REGIONAL DISTRICT OF NANAIMO  
LIQUID WASTE MANAGEMENT PLAN - STAGE 3 REPORT**

**APPENDIX 4**

**PLANNING FLOW CHART**

[illegible]

**REGIONAL DISTRICT OF NANAIMO  
LIQUID WASTE MANAGEMENT PLAN - STAGE 3 REPORT**

**APPENDIX 5**

**SUMMARY OF STAGE 1 AND STAGE 2 REPORTS**

Stage 1 and Stage 2 reports were prepared for both the Southern and Northern Communities as follows:

Southern Community

- ? Regional District of Nanaimo, Southern Community Liquid Waste Management Plan, Stage 1 Report, Dayton & Knight Ltd. November 1995
- ? Regional District of Nanaimo, Southern Community Liquid Waste Management Plan, Stage 2 Report, Dayton & Knight Ltd., July 1997

Northern Community

- ? Regional District of Nanaimo, Northern Community Liquid Waste Management Plan, Phase 2, Stage 1 Report, Dayton & Knight Ltd., November 1995
- ? Regional District of Nanaimo, Northern Community Liquid Waste Management Plan, Phase 2, Stage 2 Report, Dayton & Knight Ltd., July 1997.

A summary of these reports follows. Stage 1 recommendations that were modified during the Stage 2 work to reflect more up to date information and direction from the RGMP process are noted in parenthesis.

Following the report summaries, the Stage 1 and Stage 2 Planning Flow Charts are attached to illustrate the plan development process.

## **1.0 SOUTHERN COMMUNITY**

### **1.1 Summary of Stage 1 and Stage 2 Reports**

There are an estimated 88,000 people in the Southern Community and an estimated 71,000 people are serviced by community sewers through the District's Greater Nanaimo or private systems under permit to the MOE. The remaining 17,000 people (6,800 homes) rely primarily on individual septic tank and ground disposal systems.

Existing Sewage facilities include the District owned interceptor, treatment, reuse, and disposal works within the City of Nanaimo and private systems under permit to the MOE, or authorized by the Ministry of Health (MOH).

In 1995 the draft RGMP forecasted a population of about 168,000 people in the long-term future (current projection is about 180,000). The RGMP, when implemented through amendments to Official Community Plans (OCP), will result in the majority of new development occurring within the Nanaimo Urban Area that will be serviced by the Greater Nanaimo Water Pollution Control Centre (WPCC). Within rural areas, new development will be limited to Village Centres (500-3,000 people) that will require community services, and to additional rural development requiring on-site treatment and disposal systems.

Source control programs that will regulate the entry of toxic and hazardous materials into the sewage collection systems will form a component part of the LWMP.

Measures to achieve waste volume reduction, in particular through coordination with water conservation programs, will form a component part of the LWMP. Emphasis will be placed on the beneficial use of effluent (reclaimed water) and biosolids where practical in order to minimize the need for disposal of these resources.

To protect the pristine nature of the Southern Community's water resources, the LWMP proposes no direct discharges be allowed to rivers, lakes, or streams (stream augmentation, when identified as beneficial by Fisheries officials, will be considered). To protect the groundwater resources, used by a majority of rural residents for drinking water, the LWMP proposes that any discharge of effluent into the ground must be supported by environmental studies that conclude aquifer contamination will not occur. Discharges to open marine waters will continue to be the primary method for disposal of effluent that cannot be beneficially reused.

The findings and conclusions from the development and evaluation of treatment, reuse and disposal options for the urban areas, the Village Centre developments and for rural development resulted in the following recommendations for further study in Stage 2 of the LWMP process.

1. Expand the Greater Nanaimo Service Area to include the Nanaimo urban area, Lantzville Extension and possibly Wheat Sheaf Villages. (Village servicing will be further evaluated as part of the OCP updating process to determine appropriateness of inclusion in Nanaimo Service Area.).
2. Develop a pre-design for expanding to 105,000 people and upgrading to secondary treatment the Nanaimo WPCC, including reuse opportunities for both reclaimed water and biosolids. (Pre-design evaluation has been completed and was based on 120,000 population with provision for staging).

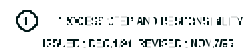
3. Develop a pre-design for the trunk sewer connections to serve Lantzville Village, Extension Village, and possibly Wheat Sheaf Village. (Deleted, to form part of OCP updates).
4. Initiate preliminary hydrogeotechnical and environmental impact investigations to a level necessary to confirm the feasibility of ground disposal for Wheat Sheaf and Yellow Point Junction Villages. Determine groundwater and surface water uses. Initiate discussions with land owners regarding use of reclaimed water for irrigation. Identify treatment plant and ground disposal sites that should be secured for the future. (Deleted, to form part of OCP updates).
5. Identify treatment plant sites for Folk Life and Silva Bay Villages on Gabriola Island. Initiate oceanographic data gathering to assess the suitability of marine discharges. Initiate discussions with Fisheries & Oceans and Environment Canada (Canadian Wildlife) to determine the resources that may be impacted by these discharges. Initiate preliminary hydrogeotechnical studies to a level needed to confirm the feasibility of a ground disposal option. Initiate discussions with landowners regarding seasonal irrigation. (Deleted, to be addressed by Islands Trust).
6. In areas that are planned remain rural, existing and new development should continue to rely primarily on on-site sewage systems assessed and approved by the Ministry of Health (MOH). District involvement should be limited to the possible provision of community sewage service in areas of existing development where a large number of failed on-site systems cause a human health or environmental concern; or if future changes to Official Community Plans dictate the development of new Villages that require a community sewage system. The District should proactively encourage the MOH to use proven alternate technologies to resolve septic tank and ground disposal problems.
7. The District should determine its role in stormwater management and initiate, in cooperation with the City, adjacent Regional Districts and Ministry of Transportation and Highways, some stormwater management tasks that affect all three jurisdictions.

As noted, some of the Stage 1 recommendations were modified or deleted during the conduct of the Stage 2 work. Modified work has resulted primarily from the development of the District's RGMP and the City's Plan Nanaimo. The specific location for Village Centres will be determined only when OCPs are updated; therefore, the development of concept level designs for sewage service to the Village Centres will be part of the OCP updates. A procedure to assess sewage service requirements for future Village Centres has been outlined as part of the modified Stage 2 work program. Deleted work includes Gabriola Island that has been removed from the LWMP because the Islands Trust is conducting a planning process for the Island.

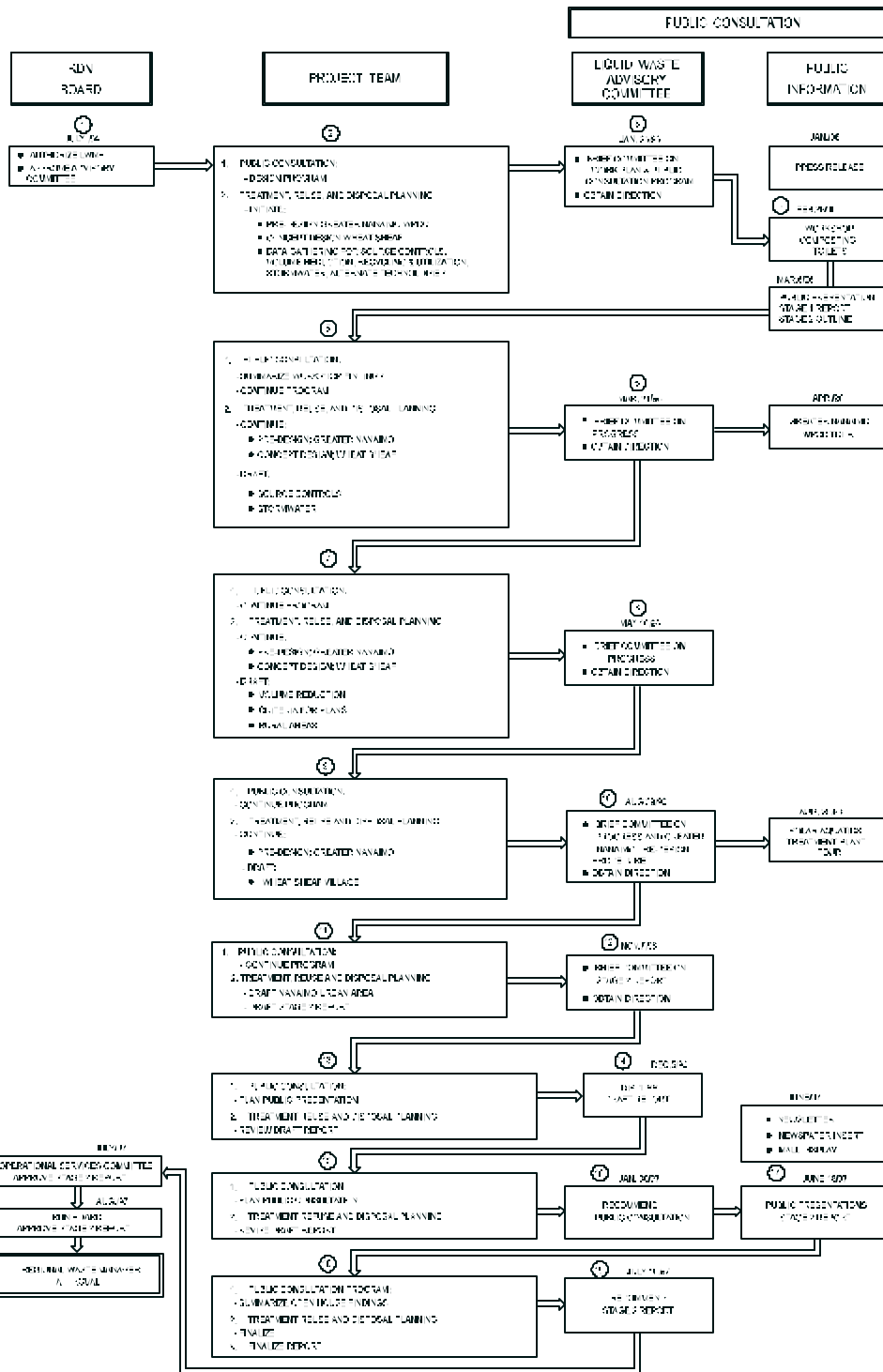
## **1.2 Planning Flow Charts**

The planning flow charts for Stage 1 and Stage 2 follow.

SOUTHERN COMMUNITY  
LIQUID WASTE MANAGEMENT PLAN  
STAGE 1 REPORT  
PLANNING FLOW CHART







## **2.0 NORTHERN COMMUNITY**

### **2.1 Summary of Stage 1 and Stage 2 Reports**

There are an estimated 36,000 people in the Northern Community and an estimated 17,000 people are serviced by community sewers through the French Creek, Nanoose, or private systems under permit to the MOE. The remaining 19,000 people (7,600 homes) rely primarily on individual septic tank and ground disposal systems.

Existing sewage facilities include the District owned interceptor, treatment, reuse and disposal works at French Creek and Nanoose Bay and private systems under permit to the MOE or authorized by the MOH.

In 1995 the draft RGMP forecasted a population of about 100,000 people in the long-term future. This projection remains valid. The RGMP, when implemented through amendments to OCPs will result in the majority of new development occurring within Urban Areas that will be provided community sewers that connect to either the Nanoose Bay or French Creek treatment plans. Within rural areas, new development will be limited to Village Centres (500-3,000 people) that will require community services and to additional rural development requiring on site treatment and disposal systems.

Source control programs that will regulate the entry of toxic and hazardous materials into the sewage collection systems will form a component part of the LWMP.

Measures to achieve waste volume reduction, in particular through coordination with water conservation programs, will form a component part of the LWMP.

Emphases will be placed on the beneficial use of effluent (reclaimed water) and biosolids where practical in order to utilize these resources and minimize the need for disposal.

To protect the pristine nature of the Northern Community's water resources, the LWMP proposes no direct discharges be allowed to rivers, lakes, or streams (stream augmentation, when identified as beneficial by Fisheries officials, will be considered). To protect the groundwater resources, used by approximately 90% of the residents for drinking water, the LWMP proposes that any discharge of effluent into the ground must be supported by environmental studies that conclude aquifer contamination will not occur. Discharges to open marine waters will continue to be the primary method for disposal of effluent that cannot be beneficially reused.

The findings and conclusions from the development and evaluation of treatment, reuse and disposal options for the urban areas, the Village Centre developments and for rural development have resulted in the following recommendations for further study in Stage 2 of the LWMP process:

1. Develop a pre-design for expanding and upgrading to secondary treatment the Nanoose Bay WPCC to serve 6,000 people, including the evaluation of either filtration or 60 days storage to allow the production of unrestricted use reclaimed water.

2. Develop a concept level design for expansion of the French Creek WPCC to serve 36,000 people. Pre-design work is best left until about 5 years before expansion is needed to defer expenditures for design and to better incorporate conditions at the time of expansion.
3. Within the Northern Community further investigate the opportunities for use of reclaimed water; on golf courses, pasture and cropland, forestland and for biosolids use; as an unrestricted product for reuse on land or as a soil amendments.
4. Develop a pre-design for possible trunk sewer connections to French Creek WPCC to serve the Coombs Village area (deleted, to form a part of OCP update) and the Madrona Point area; and to Nanoose Bay WPCC to serve the Beachcomber/Dorcas Point areas, Arbutus and West Bay Estates and possible the Madrona Point area.
5. Develop a concept level design to provide ground disposal and seasonal irrigation for Coombs Village, including treatment plant site selection; Preliminary hydrogeotechnical work should be included. (Deleted, to form part of OCP update).
6. Develop a concept level design to provide service to the combined Dunsmuir and Qualicum Bay Villages for two options: ocean disposal and ground disposal, including treatment plant site selection. (Deleted, to form part of OCP update)
7. In areas that are planned to remain rural, existing and new development should continue to rely primarily on on-site sewage systems assessed and approved by the MOH. District involvement should be limited to the possible provision of community sewage service in areas of existing development where a large number of failed on-site systems cause a human health or environmental concern; or if future changes to OCP dictate the development of a new Village that requires a community sewage system. The District should encourage the MOH to use proven alternate technologies to resolve septic tank and ground disposal problems on individual lots.
8. The District should determine its role in stormwater management and initiative in co-operation with the Municipalities, adjacent Regional Districts and the Ministry of Transportation and Highways some stormwater management tasks that affect all jurisdictions.

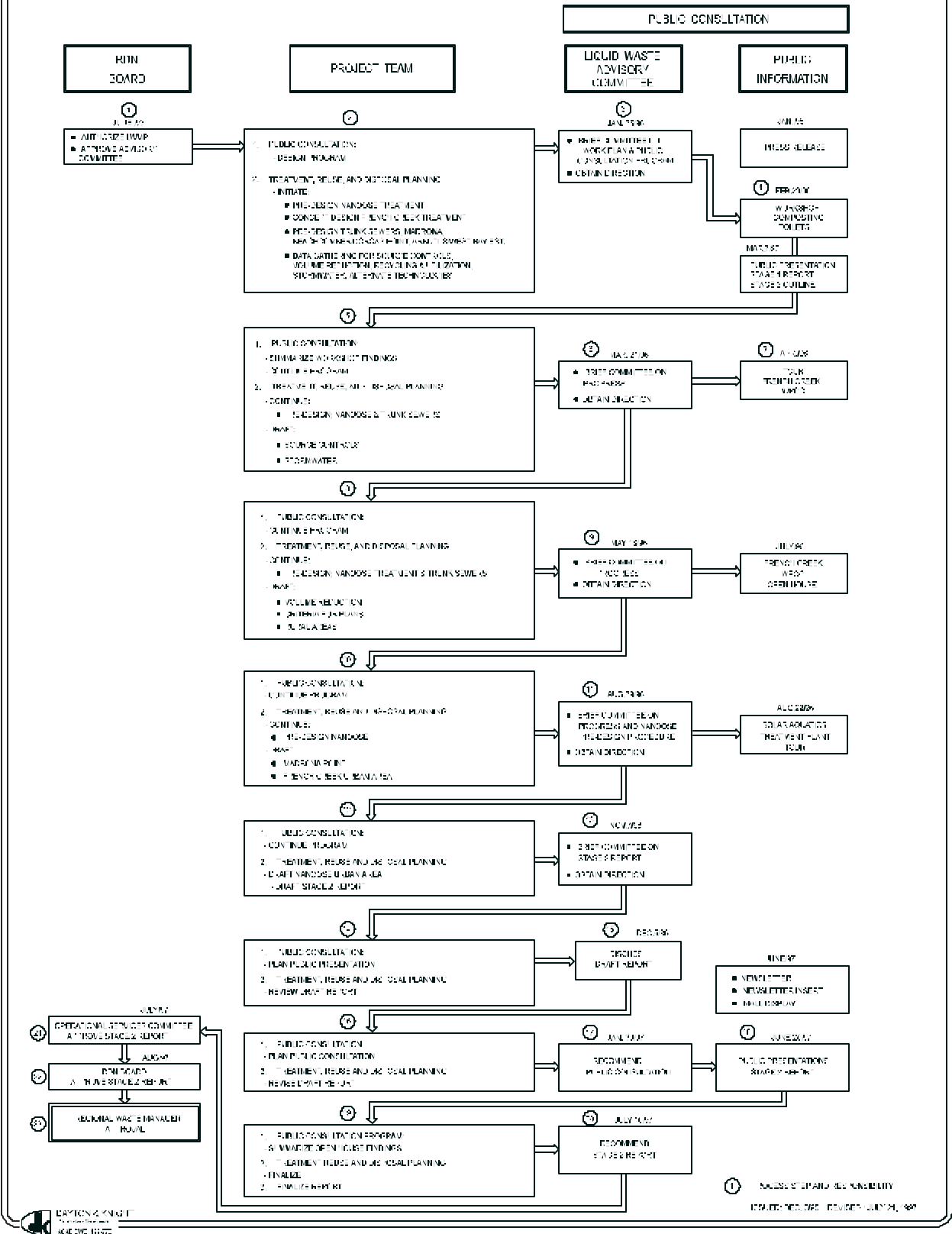
As noted and similar to the Southern Community some of the Stage 1 recommendations were modified or deleted during the Stage 2 work, primarily due to development of the District's RGMP. Because the specific location for Village Centres will be determined only when OCPs are updated, the development of concept level designs for sewage service to the Village Centres was deleted in favour of outlining a procedure to assess sewage service requirements for future Village Centres.

## **2.2 Planning Flow Charts**

The Stage 1 and Stage 2 planning flow charges follow.

NORTHERN COMMUNITY  
LIQUID WASTE MANAGEMENT PLAN - PHASE 2  
STAGE 1 REPORT  
PLANNING FLOW CHART





**REGIONAL DISTRICT OF NANAIMO  
LIQUID WASTE MANAGEMENT PLAN - STAGE 3 REPORT**

**APPENDIX 6**

**DRAFT OPERATIONAL CERTIFICATES**

1. Greater Nanaimo WPCC (120,000 people)
2. French Creek WPCC (36,000 people)
3. Nanoose Bay WPCC (6,000 people)
4. Duke Point WPCC (2,200 population equivalent)

**DRAFT OPERATIONAL CERTIFICATE**  
**FOR**  
**GREATER NANAIMO WATER POLLUTION CONTROL CENTRE**  
**DRAFT**

MINISTRY OF ENVIRONMENT,  
LANDS AND PARKS

OPERATIONAL CERTIFICATE  
PE-\_\_\_\_\_

Under the Provisions of the Waste Management Act and in accordance with the  
Regional District of Nanaimo's Liquid Waste Management Plan, the

**Regional District of Nanaimo**  
**6300 Hammond Bay Road**  
**Lantzville BC**  
**V0R 2H0**

is authorized to discharge effluent from a municipal wastewater collection and treatment system located at Nanaimo, British Columbia to the Strait of Georgia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

**1. AUTHORIZED DISCHARGES**

**1.1** This subsection applies to the discharge of effluent from the Greater Nanaimo Service Area that includes the City of Nanaimo and possibly future Village Centres and problem areas that require community sewers in some or all of the adjacent electoral areas.

**1.1.1** The maximum authorized rate of discharge is 121,000 m<sup>3</sup>/d.

**1.1.2** The average daily rate of discharge is 36,000 m<sup>3</sup>/d in 1998 to a maximum of 54,000 m<sup>3</sup>/d in the year 2018.

**1.1.3** The characteristics of the discharge shall be equivalent or better than:

5-day biochemical Oxygen Demand	45 mg/L
Total Suspended Solids	45 mg/L
pH	6-9 pH units
Toxicity (non-acutely toxic)	100% LC <sub>50</sub> at 96 hr

- 1.1.4 The authorized works are mechanical screens, grit removal tanks, primary sedimentation tanks, biological reactors, secondary clarifiers, anaerobic digesters, biosolids thickening and dewatering facilities, odour control facilities, an outfall with diffuser extending 2030 m from mean low water to a depth of 70 m below mean low water, standby power, and related appurtenances approximately located as shown on attached Site Plan.
- 1.1.5 The authorized works must be complete and in operation when discharge commences.
- 1.1.6 The location of the facilities from which the discharge originates is Lot 1, Plan 32351, and Lot A, Plan 48249, District Lot 41 and Lot 1, Plan 26263, District Lot 51, all of Wellington District.
- 1.1.7 The location of the point of discharge is the Strait of Georgia.

## **2. GENERAL REQUIREMENTS**

### **2.1 Maintenance of Works and Emergency Procedures**

The Regional District of Nanaimo shall inspect the pollution control works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the Regional District of Nanaimo, which prevents continuing operation of the approved method of pollution control, the Regional District of Nanaimo shall immediately notify the Regional Waste Manager and take appropriate remedial action.

### **2.2 Bypasses**

The discharge of effluent, which has bypassed the designated treatment works, is prohibited unless the approval of the Regional Waste Manager is obtained and confirmed in writing.

### **2.3 Process Modifications**

The Regional District of Nanaimo shall notify the Regional Waste Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

### **2.4 Plans**

Plans and specifications of works authorized in Subsection 1.1.4 shall be submitted to the Regional Waste Manager within \_\_\_\_\_ days of the date of this Operational Certificate. Plans of the authorized works shall be signed and sealed by a Professional Engineer licensed to practice in the Province of British Columbia.



## **2.5 Posting of Outfall**

The Regional District of Nanaimo shall erect a sign along the alignment of the outfall above high water mark. The sign shall identify the nature of the works. The wording and size of the sign requires the approval of the Regional Waste Manager.

## **2.6 Outfall Inspection**

The Regional District of Nanaimo shall inspect the outfall line every five years. An outfall inspection report shall be submitted to the Regional Waste Manager within 60 days from the date of inspection.

## **2.7 Biosolids Reuse and Disposal**

Biosolids from the treatment plant shall be reused in a manner approved by the Regional Waste Manager.

## **2.8 Standby Power**

The Regional District of Nanaimo shall provide auxiliary power facilities to insure the continuous operation of the treatment works and operations building during power outages.

## **2.9 Odour Control**

Should objectionable odours, attributable to the operation of the sewage treatment plant, occur beyond the property boundary, as determined by the Regional Waste Manager, measures or additional works will be required to reduce odour to acceptable levels.

## **2.10 Disinfection**

Although disinfection of the effluent is not required at this time, suitable provisions should be made to include disinfection facilities in the future. Disinfection by chlorination is not permitted; other methods such as ultra violet and ozone shall be used.

## **2.11 Facility Classification and Operator Certification**

The Regional District of Nanaimo shall have the works authorized by this operation certificate classified (and the classification shall be maintained) by the "Environmental Operators Certification Program Society" (Society). The works shall be operated and maintained by persons certified within and according to the program provided by the Society. Certification must be completed to the satisfaction of the Regional Waste Manager. In addition, the Regional Waste Manager shall be notified of the classification level of the facility and certification level of the operators, and changes of operators and/or operator certification levels within 30 days of any change.

Alternatively, the works authorized by this operational certificate shall be operated and maintained by persons who the Regional District of Nanaimo can demonstrate to the satisfaction of the Director, are qualified in the safe and proper operation of the facility for the protection of the environment.

## **2.12 Effluent Upgrading**

Based on receiving environment monitoring data and/or other information obtained in connection with this discharge, the Regional District of Nanaimo may be required to provide additional treatment facilities.

## **3. MONITORING AND REPORTING REQUIREMENTS**

### **3.1 Discharge Monitoring**

#### **3.1.1 Flow Measurement**

Provide and maintain a suitable flow measuring device and record once per day the effluent volume discharged over a 24-hour period.

#### **3.1.2 Sampling and Analysis**

The Regional District of Nanaimo shall install a suitable sampling facility and obtain samples of the effluent in accordance with the following schedule:

<u>Parameter</u>	<u>Frequency</u>	<u>Type</u>
5-day Biochemical Oxygen Demand	daily	24-hr composite
Total Suspended Solids	daily	24-hr composite
NH <sub>4</sub> -N	daily	24-hr composite
PO <sub>4</sub> =P	daily	24-hr composite
TP	daily	24-hr composite
Faecal Coliform	daily	grab
Toxicity	monthly	24-hr composite

The composite sample is to consist of four grab samples taken over an 8-hour period at maximum flow and mixed to form a single sample (or approved flow proportional continuous sampler may be used) for subsequent analysis. Proper care shall be taken in sampling, storing and transporting the samples to adequately control temperature and avoid contamination, breakage, etc.

### **3.2 Biosolids Monitoring**

A biosolids monitoring program shall be carried out by the Regional District of Nanaimo. The program shall be established in consultation with the Regional Waste Manager.

### **3.3 Receiving Environment Monitoring**

A receiving environment monitoring program shall be carried out by the Regional District of Nanaimo. The program shall be established in consultation with the Regional Waste Manager. Based on the results of this monitoring program, the Regional District of Nanaimo's monitoring requirements may be extended or altered by the Regional Waste Manager.

### **3.4 Monitoring Procedures**

#### **3.4.1 Sampling and Analytical Procedures**

Sampling and flow measurement shall be carried out in accordance with the procedures described in "Field Criteria for Sampling Effluents and Receiving Waters," April 1989, or by suitable alternative procedures as authorized by the Regional Waste Manager.

Copies of the above manual are available from the Environmental Protection Division, Ministry of Environment, Lands and Parks, 777 Broughton Street, Victoria, B.C., V8V 1X4, at a cost of \$20, and are also available for inspection at all Environmental Protection offices.

Analyses are to be carried out in accordance with procedures described in the latest version of "British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials (March 1994 Permittee Edition)," or by suitable alternative procedures as authorized by the Regional Waste Manager.

Copies of the above manual may be purchased from Queens Printer Publications Centre, 2nd Floor, 563 Superior Street, Victoria, B.C., V8V 4R6 (1-800-663-6105). A copy of the manual is also available for inspection at all Environmental Protection offices.

Effluent may be adjusted for ammonia toxicity prior to the 96-hour LC<sub>50</sub> toxicity test. Ammonia toxicity may be removed from a parallel set of test samples by lowering the pH of the water or by removing the ammonia. An additional 96-hour LC<sub>50</sub> toxicity test may also be required to be undertaken on one or more samples from the set with ammonia re-added where it is considered that other toxicants may have been removed during the ammonia removal process.

### **3.5 Reporting**

Maintain data of analyses and flow measurements for inspection, and each month submit the data, suitably tabulated, to the Regional Waste Manager for the previous month. All reports shall be submitted within 30 days of the end of the month.

**DRAFT OPERATIONAL CERTIFICATE**  
**FOR**  
**FRENCH CREEK WATER POLLUTION CONTROL CENTRE**

DRAFT

MINISTRY OF ENVIRONMENT,  
LANDS AND PARKS

OPERATIONAL CERTIFICATE

PE-\_\_\_\_\_

Under the Provisions of the Waste Management Act and in accordance with the  
Regional District of Nanaimo's Liquid Waste Management Plan, the

**Regional District of Nanaimo  
6300 Hammond Bay Road  
Lantzville, B.C.  
V0R 2H0**

is authorized to discharge effluent from a municipal wastewater collection and treatment system located at French Creek, British Columbia, to the Strait of Georgia and to storage ponds at Morningstar Golf Course, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

**1. AUTHORIZED DISCHARGES**

- 1.1** This subsection applies to the discharge of effluent from the French Creek Service Area that includes the City of Parksville, the Town of Qualicum Beach, the French Creek Sewer Local Service Area and possibly future Village Centres and problem areas that require community sewers in some or all of the adjacent electoral areas.

- 1.1.1** The maximum authorized rate of discharge is:

To Strait of Georgia	= 24,500 m <sup>3</sup> /d
To Morningstar Golf Course	= 1,370 m <sup>3</sup> /d

- 1.1.2** The average daily rate of discharge is 7,000 m<sup>3</sup>/d in 1998 to a maximum of 11,500 m<sup>3</sup>/d in the year 2018.

- 1.1.3** The characteristics of the discharge *to* the Strait of Georgia shall be equivalent or better than:

5-day biochemical Oxygen Demand	45 mg/L
Total Suspended Solids	45 mg/L
pH	6-9 pH units
Toxicity (non-acutely toxic)	100% LC <sub>50</sub> at 96 hr

- 1.1.4** The characteristics of the discharge to the Morningstar Golf Course storage ponds shall be equivalent or better than:

5-day biochemical Oxygen Demand	20 mg/L
Total Suspended Solids	30 mg/L
pH	6-9 pH units
Toxicity (non-acutely toxic)	100% LC <sub>50</sub> at 96 hr

- 1.1.5** The authorized works are septage receiving area, mechanical screens, aerated grit removal tanks, primary sedimentation tanks, biological reactors, secondary clarifiers, thermophilic aerobic digesters, biosolids thickening and dewatering facilities, odour control facilities, an outfall extending 2440 m from mean low water to a depth of 61 m below mean low water, an effluent pumping station and pipeline to convey effluent to the storage ponds at Morningstar Golf course, standby power, and related appurtenances approximately located as shown on attached Site Plan A.
- 1.1.6** The authorized works must be complete and in operation when discharge commences.
- 1.1.7** The location of the facilities from which the discharge originates is Lot 2, Plan 2570, DL 28, Nanoose Land District.
- 1.1.8** The location of the point of discharge is the Strait of Georgia off the mouth of French Creek and Morningstar Golf Course storage ponds located in the northern half of DL 83, Nanoose Land District, all located approximately as shown on the attached site plan.

## **2. GENERAL REQUIREMENTS**

### **2.1 Maintenance of Works and Emergency Procedures**

The Regional District of Nanaimo shall inspect the pollution control works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the Regional District of Nanaimo, which prevents continuing operation of the approved method of pollution control, the Regional District of Nanaimo shall immediately notify the Regional Waste Manager and take appropriate remedial action.

### **2.2 Bypasses**

The discharge of effluent, which has bypassed the designated treatment works, is prohibited unless the approval of the Regional Waste Manager is obtained and confirmed in writing.

### **2.3 Process Modifications**

The Regional District of Nanaimo shall notify the Regional Waste Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

### **2.4 Plans**

Plans and specifications of works authorized in Subsection 1.1.4 shall be submitted to the Regional Waste Manager within \_\_\_\_\_ days of the date of this Operational Certificate. Plans of the authorized works shall be signed and sealed by a Professional Engineer licensed to practice in the Province of British Columbia.

### **2.5 Posting of Outfall**

The Regional District of Nanaimo shall erect a sign along the alignment of the outfall above high water mark. The sign shall identify the nature of the works. The wording and size of the sign requires the approval of the Regional Waste Manager.

### **2.6 Outfall Inspection**

The Regional District of Nanaimo shall inspect the outfall line every five years. An outfall inspection report shall be submitted to the Regional Waste Manager within 60 days from the date of inspection.

### **2.7 Biosolids Reuse and Disposal**

Biosolids from the treatment plant shall be reused in a manner approved by the Regional Waste Manager.

### **2.8 Standby Power**

The Regional District of Nanaimo shall provide auxiliary power facilities to insure the continuous operation of the treatment works and operations building during power outages.

### **2.9 Odour Control**

Should objectionable odours, attributable to the operation of the sewage treatment plant, occur beyond the property boundary, as determined by the Regional Waste Manager, measures or additional works will be required to reduce odour to acceptable levels.

### **2.10 Disinfection**

Although disinfection of the effluent is not required at this time, suitable provisions should be made to include disinfection facilities in the future. Disinfection by chlorination is not permitted; other methods such as ultra violet and ozone shall be used.

## **2.11 Facility Classification and Operator Certification**

The Regional District of Nanaimo shall have the works authorized by this operation certificate classified (and the classification shall be maintained) by the "Environmental Operators Certification Program Society" (Society). The works shall be operated and maintained by persons certified within and according to the program provided by the Society. Certification must be completed to the satisfaction of the Regional Waste Manager. In addition, the Regional Waste Manager shall be notified of the classification level of the facility and certification level of the operators, and changes of operators and/or operator certification levels within 30 days of any change.

Alternatively, the works authorized by this operational certificate shall be operated and maintained by persons who the Regional District of Nanaimo can demonstrate to the satisfaction of the Director, are qualified in the safe and proper operation of the facility for the protection of the environment.

## **2.12 Effluent Upgrading**

Based on receiving environment monitoring data and/or other information obtained in connection with this discharge, the Regional District of Nanaimo may be required to provide additional treatment facilities.

# **3. MONITORING AND REPORTING REQUIREMENTS**

## **3.1 Discharge Monitoring**

### **3.1.1 Flow Measurement**

Provide and maintain a suitable flow measuring device and record once per day the effluent volume discharged over a 24-hour period.

### **3.1.2 Sampling and Analysis**

The Regional District of Nanaimo shall install a suitable sampling facility and obtain samples of the effluent in accordance with the following schedule:

<u>Parameter</u>	<u>Frequency</u>	<u>Type</u>
5-day Biochemical Oxygen Demand	twice per week	24-hr composite
Total Suspended Solids	twice per week	24-hr composite
NH <sub>4</sub> -N	twice per week	24-hr composite
PO <sub>4</sub> -P	twice per week	24-hr composite
TP	twice per week	24-hr composite
Faecal Coliform	twice per week	grab
Toxicity	twice per week	24-hr composite



The composite sample is to consist of four grab samples taken over an 8-hour period at maximum flow and mixed to form a single sample (or approved flow proportional continuous sampler may be used) for subsequent analysis. Proper care shall be taken in sampling, storing and transporting the samples to adequately control temperature and avoid contamination, breakage, etc.

### **3.2 Biosolids Monitoring**

A biosolids monitoring program shall be carried out by the Regional District of Nanaimo. The program shall be established in consultation with the Regional Waste Manager.

### **3.3 Receiving Environment Monitoring**

A receiving environment monitoring program shall be carried out by the Regional District of Nanaimo. The program shall be established in consultation with the Regional Waste Manager. Based on the results of this monitoring program, the Regional District of Nanaimo's monitoring requirements may be extended or altered by the Regional Waste Manager.

### **3.4 Monitoring Procedures**

#### **3.4.1 Sampling and Analytical Procedures**

Sampling and flow measurement shall be carried out in accordance with the procedures described in "Field Criteria for Sampling Effluents and Receiving Waters," April 1989, or by suitable alternative procedures as authorized by the Regional Waste Manager.

Copies of the above manual are available from the Environmental Protection Division, Ministry of Environment, Lands and Parks, 777 Broughton Street, Victoria, B.C., V8V 1X4, at a cost of \$20, and are also available for inspection at all Environmental Protection offices.

Analyses are to be carried out in accordance with procedures described in the latest version of "British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials (March 1994 Permittee Edition)," or by suitable alternative procedures as authorized by the Regional Waste Manager.

Copies of the above manual may be purchased from Queens Printer Publications Centre, 2nd Floor, 563 Superior Street, Victoria, B.C., V8V 4R6 (1-800-663-6105). A copy of the manual is also available for inspection at all Environmental Protection offices.

Effluent may be adjusted for ammonia toxicity prior to the 96-hour LC<sub>50</sub> toxicity test. Ammonia toxicity may be removed from a parallel set of test samples by lowering the pH of the water or by removing the ammonia. An additional 96-hour LC<sub>50</sub> toxicity test may also be required to be undertaken on one or more samples from the set with ammonia re-added where it is considered that other toxicants may have been removed during the ammonia removal process.

### **3.5     Reporting**

Maintain data of analyses and flow measurements for inspection, and each month, submit the data, suitably tabulated, to the Regional Waste Manager for the previous month. All reports shall be submitted within 30 days of the end of the month.

**DRAFT OPERATIONAL CERTIFICATE**  
**FOR**  
**NANOOSE BAY WATER POLLUTION CONTROL CENTRE**

DRAFT

MINISTRY OF ENVIRONMENT,  
LANDS AND PARKS

OPERATIONAL CERTIFICATE

PE-\_\_\_\_\_

Under the Provisions of the Waste Management Act and in accordance with the  
Regional District of Nanaimo's Liquid Waste Management Plan, the

**Regional District of Nanaimo  
6300 Hammond Bay Road  
Lantzville, B.C.  
V0R 2H0**

is authorized to discharge effluent from a municipal wastewater collection and treatment system located on the Nanoose Peninsula, British Columbia to the Strait of Georgia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

**1. AUTHORIZED DISCHARGES**

**1.1** This subsection applies to the discharge of effluent from the Nanoose Bay Service Area that includes the Fairwinds Sewer Local Service Area and possibly future Village Centres and problem areas that require community sewers in some or all of the adjacent areas.

**1.1.1** The maximum authorized rate of discharge is 3000 m<sup>3</sup>/d.

**1.1.2** The average daily rate of discharge is 420 m<sup>3</sup>/d in 1998 to a maximum of 1890 m<sup>3</sup>/d in the year 2018.

**1.1.3** The characteristics of the discharge shall be equivalent or better than:

5-day biochemical Oxygen Demand	45 mg/L
Total Suspended Solids	45 mg/L
pH	6-9 pH units
Toxicity (non-acutely toxic)	100% LC <sub>50</sub> at 96 hr

**1.1.4** The authorized works are mechanical screens, grit removal, primary sedimentation, biological reactors, secondary clarification biosolids thickening, truck transport of biosolids to French Creek WPCC for treatment and reuse, odour control facilities, an outfall with diffuser extending 600 m from mean low water to a depth of 30 m below mean low water, standby power, and related appurtenances approximately located as shown on attached Site Plan.

**1.1.5** The authorized works must be complete and in operation when discharge commences.

**1.1.6** The location of the facilities from which the discharge originates is Lot A, Plan 52451, District Lot 30, Nanoose Land District.

**1.1.7** The location of the point of discharge is the Strait of Georgia at Schooner Cove.

## **2. GENERAL REQUIREMENTS**

### **2.1 Maintenance of Works and Emergency Procedures**

The Regional District of Nanaimo shall inspect the pollution control works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the Regional District of Nanaimo, which prevents continuing operation of the approved method of pollution control, the Regional District of Nanaimo shall immediately notify the Regional Waste Manager and take appropriate remedial action.

### **2.2 Bypasses**

The discharge of effluent, which has bypassed the designated treatment works, is prohibited unless the approval of the Regional Waste Manager is obtained and confirmed in writing.

### **2.3 Process Modifications**

The Regional District of Nanaimo shall notify the Regional Waste Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

### **2.4 Plans**

Plans and specifications of works authorized in Subsection 1.1.4 shall be submitted to the Regional Waste Manager within \_\_\_\_\_ days of the date of this Operational Certificate. Plans of the authorized works shall be signed and sealed by a Professional Engineer licensed to practice in the Province of British Columbia.

### **2.5 Posting of Outfall**

The Regional District of Nanaimo shall erect a sign along the alignment of the outfall above high water mark. The sign shall identify the nature of the works. The wording and size of the sign requires the approval of the Regional Waste Manager.

### **2.6 Outfall Inspection**

The Regional District of Nanaimo shall inspect the outfall line every five years. An outfall inspection report shall be submitted to the Regional Waste Manager within 60 days from the date of inspection.

**2.7     Biosolids Reuse and Disposal**

Biosolids from the treatment plant shall be reused in a manner approved by the Regional Waste Manager.

**2.8     Standby Power**

The Regional District of Nanaimo shall provide auxiliary power facilities to insure the continuous operation of the treatment works and operations building during power outages.

**2.9     Odour Control**

Should objectionable odours, attributable to the operation of the sewage treatment plant, occur beyond the property boundary, as determined by the Regional Waste Manager, measures or additional works will be required to reduce odour to acceptable levels.

**2.10    Disinfection**

Although disinfection of the effluent is not required at this time, suitable provisions should be made to include disinfection facilities in the future. Disinfection by chlorination is not permitted; other methods such as ultra violet and ozone shall be used.

**2.11    Facility Classification and Operator Certification**

The Regional District of Nanaimo shall have the works authorized by this operation certificate classified (and the classification shall be maintained) by the "Environmental Operators Certification Program Society" (Society). The works shall be operated and maintained by persons certified within and according to the program provided by the Society. Certification must be completed to the satisfaction of the Regional Waste Manager. In addition, the Regional Waste Manager shall be notified of the classification level of the facility and certification level of the operators, and changes of operators and/or operator certification levels within 30 days of any change.

Alternatively, the works authorized by this operational certificate shall be operated and maintained by persons who the Regional District of Nanaimo can demonstrate to the satisfaction of the Director, are qualified in the safe and proper operation of the facility for the protection of the environment.

**2.12    Effluent Upgrading**

Based on receiving environment monitoring data and/or other information obtained in connection with this discharge, the Regional District of Nanaimo may be required to provide additional treatment facilities.

### **3. MONITORING AND REPORTING REQUIREMENTS**

#### **3.1 Discharge Monitoring**

##### **3.1.1 Flow Measurement**

Provide and maintain a suitable flow measuring device and record once per day the effluent volume discharged over a 24-hour period.

##### **3.1.2 Sampling and Analysis**

The Regional District of Nanaimo shall install a suitable sampling facility and obtain samples of the effluent in accordance with the following schedule:

<u>Parameter</u>	<u>Frequency</u>	<u>Type</u>
5-day Biochemical Oxygen Demand	weekly	8-hr composite
Total Suspended Solids	weekly	8-hr composite
NH <sub>4</sub> -N	weekly	24-hr composite
PO <sub>4</sub> -P	weekly	24-hr composite
TP	weekly	24-hr composite
Faecal Coliform	weekly	grab
Toxicity	monthly	8-hr composite

The composite sample is to consist of four grab samples taken over an 8-hour period at maximum flow and mixed to form a single sample (or approved flow proportional continuous sampler may be used) for subsequent analysis. Proper care shall be taken in sampling, storing and transporting the samples to adequately control temperature and avoid contamination, breakage, etc.

#### **3.2 Receiving Environment Monitoring**

A receiving environment monitoring program shall be carried out by the Regional District of Nanaimo. The program shall be established in consultation with the Regional Waste Manager. Based on the results of this monitoring program, the Regional District of Nanaimo's monitoring requirements may be extended or altered by the Regional Waste Manager.

#### **3.3 Monitoring Procedures**

##### **3.3.1 Sampling and Analytical Procedures**

Sampling and flow measurement shall be carried out in accordance with the procedures described in "Field Criteria for Sampling Effluents and Receiving Waters," April 1989, or by suitable alternative procedures as authorized by the Regional Waste Manager.

Copies of the above manual are available from the Environmental Protection Division, Ministry of Environment, Lands and Parks, 777 Broughton Street, Victoria, B.C., V8V 1X4, at a cost of \$20, and are also available for inspection at all Environmental Protection offices.

Analyses are to be carried out in accordance with procedures described in the latest version of "British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials (March 1994 Permittee Edition)," or by suitable alternative procedures as authorized by the Regional Waste Manager.

Copies of the above manual may be purchased from Queens Printer Publications Centre, 2nd Floor, 563 Superior Street, Victoria, B.C., V8V 4R6 (1-800-663-6105). A copy of the manual is also available for inspection at all Environmental Protection offices.

Effluent may be adjusted for ammonia toxicity prior to the 96-hour LC<sub>50</sub> toxicity test. Ammonia toxicity may be removed from a parallel set of test samples by lowering the pH of the water or by removing the ammonia. An additional 96-hour LC<sub>50</sub> toxicity test may also be required to be undertaken on one or more samples from the set with ammonia re-added where it is considered that other toxicants may have been removed during the ammonia removal process.

### **3.4     Reporting**

Maintain data of analyses and flow measurements for inspection, and every month, submit the data, suitably tabulated, to the Regional Waste Manager for the previous quarter. All reports shall be submitted within 30 days of the end of the quarter.



**DRAFT OPERATIONAL CERTIFICATE**  
**FOR**  
**DUKE POINT WATER POLLUTION CONTROL CENTRE**

DRAFT

MINISTRY OF ENVIRONMENT,  
LANDS AND PARKS

OPERATIONAL CERTIFICATE  
PE-\_\_\_\_\_

Under the Provisions of the Waste Management Act and in accordance with the  
Regional District of Nanaimo's Liquid Waste Management Plan, the

**Regional District of Nanaimo  
6300 Hammond Bay Road  
Lantzville, B.C.  
V0R 2H0**

is authorized to discharge effluent from a municipal wastewater collection and treatment system located at the Duke Point Industrial Park in the City of Nanaimo, British Columbia to Northumberland Channel, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

**1. AUTHORIZED DISCHARGES**

**1.1** This subsection applies to the discharge of effluent from the Duke Point Service Area that includes Duke Point Industrial Park and possibly future Village Centres and problem areas that require community sewers in some or all of the adjacent areas.

**1.1.1** The maximum authorized rate of discharge is 1800 m<sup>3</sup>/d.

**1.1.2** The average daily rate of discharge is 45 m<sup>3</sup>/d in year 1998 to a maximum of 1000 m<sup>3</sup>/d in the year 2018.

**1.1.3** The characteristics of the discharge shall be equivalent or better than:

5-day biochemical Oxygen Demand	- 30 mg/L
Total Suspended Solids	- 30 mg/L
pH	- 6-9 pH units
Toxicity (non-acutely toxic)	- 100% LC <sub>50</sub> at 96 hr
Fecal Coliform Bacteria	- 1000 colonies/100 mL

**1.1.4** The authorized works are mechanical screens, sequencing batch reactor secondary treatment, ultra violet disinfection, aerobic digester, biosolids trucking to Greater Nanaimo WPCC for treatment and reuse, an outfall extending 62 m from mean low water to a depth of 16 m below mean low water, and related appurtenances approximately located as shown on attached Site Plan A.

**1.1.5** The authorized works must be complete and in operation when discharge commences.

**1.1.6** The location of the facilities from which the discharge originates is Lot 15, Plan VIP63717, Section 3, Range 8, Nanaimo Land District.

**1.1.7** The location of the point of discharge is Northumberland Channel.

## **2. GENERAL REQUIREMENTS**

### **2.1 Maintenance of Works and Emergency Procedures**

The Regional District of Nanaimo shall inspect the pollution control works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the Regional District of Nanaimo, which prevents continuing operation of the approved method of pollution control, the Regional District of Nanaimo shall immediately notify the Regional Waste Manager and take appropriate remedial action.

### **2.2 Bypasses**

The discharge of effluent, which has bypassed the designated treatment works, is prohibited unless the approval of the Regional Waste Manager is obtained and confirmed in writing.

### **2.3 Process Modifications**

The Regional District of Nanaimo shall notify the Regional Waste Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

### **2.4 Plans**

Plans and specifications of works authorized in Subsection 1.1.4 shall be submitted to the Regional Waste Manager within \_\_\_\_\_ days of the date of this Operational Certificate. Plans of the authorized works shall be signed and sealed by a Professional Engineer licensed to practice in the Province of British Columbia.

### **2.5 Posting of Outfall**

The Regional District of Nanaimo shall erect a sign along the alignment of the outfall above high water mark. The sign shall identify the nature of the works. The wording and size of the sign requires the approval of the Regional Waste Manager.

### **2.6 Outfall Inspection**

The Regional District of Nanaimo shall inspect the outfall line every two years. An outfall inspection report shall be submitted to the Regional Waste Manager within 60 days from the date of inspection.

## **2.7 Biosolids Reuse and Disposal**

Biosolids from the treatment plant shall be reused in a manner approved by the Regional Waste Manager.

## **2.8 Standby Power**

The Regional District of Nanaimo shall provide auxiliary power facilities to insure the continuous operation of the treatment works and operations building during power outages.

## **2.9 Odour Control**

Should objectionable odours, attributable to the operation of the sewage treatment plant, occur beyond the property boundary, as determined by the Regional Waste Manager, measures or additional works will be required to reduce odour to acceptable levels.

## **2.10 Disinfection**

Although disinfection of the effluent is not required at this time, suitable provisions should be made to include disinfection facilities in the future. Disinfection by chlorination is not permitted; others methods such as ultra violet and ozone shall be used.

## **2.11 Facility Classification and Operator Certification**

The Regional District of Nanaimo shall have the works authorized by this operation certificate classified (and the classification shall be maintained) by the "Environmental Operators Certification Program Society" (Society). The works shall be operated and maintained by persons certified within and according to the program provided by the Society. Certification must be completed to the satisfaction of the Regional Waste Manager. In addition, the Regional Waste Manager shall be notified of the classification level of the facility and certification level of the operators, and changes of operators and/or operator certification levels within 30 days of any change.

Alternatively, the works authorized by this operational certificate shall be operated and maintained by persons who the Regional District of Nanaimo can demonstrate to the satisfaction of the Director, are qualified in the safe and proper operation of the facility for the protection of the environment.

## **2.12 Effluent Upgrading**

Based on receiving environment monitoring data and/or other information obtained in connection with this discharge, the Regional District of Nanaimo may be required to provide additional treatment facilities.

### **3. MONITORING AND REPORTING REQUIREMENTS**

#### **3.1 Discharge Monitoring**

##### **3.1.1 Flow Measurement**

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##### **3.1.2 Sampling and Analysis**

The Regional District of Nanaimo shall install a suitable sampling facility and obtain samples of the effluent in accordance with the following schedule:

<u>Parameter</u>	<u>Frequency</u>	<u>Type</u>
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TP	weekly	24-hr composite
Faecal Coliform	weekly	grab
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The composite sample is to consist of four grab samples taken over an 8-hour period at maximum flow and mixed to form a single sample (or approved flow proportional continuous sampler may be used) for subsequent analysis. Proper care shall be taken in sampling, storing and transporting the samples to adequately control temperature and avoid contamination, breakage, etc.

#### **3.2 Receiving Environment Monitoring**

A receiving environment-monitoring program shall be carried out by the Regional District of Nanaimo. The program shall be established in consultation with the Regional Waste Manager. Based on the results of this monitoring program, the Regional District of Nanaimo's monitoring requirements may be extended or altered by the Regional Waste Manager.

#### **3.3 Monitoring Procedures**

##### **3.3.1 Sampling and Analytical Procedures**

Sampling and flow measurement shall be carried out in accordance with the procedures described in "Field Criteria for Sampling Effluents and Receiving Waters," April 1989, or by suitable alternative procedures as authorized by the Regional Waste Manager.

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### **3.4     Reporting**

Maintain data of analyses and flow measurements for inspection, and every three months, submit the data, suitably tabulated, to the Regional Waste Manager for the previous quarter. All reports shall be submitted within 30 days of the end of the quarter.