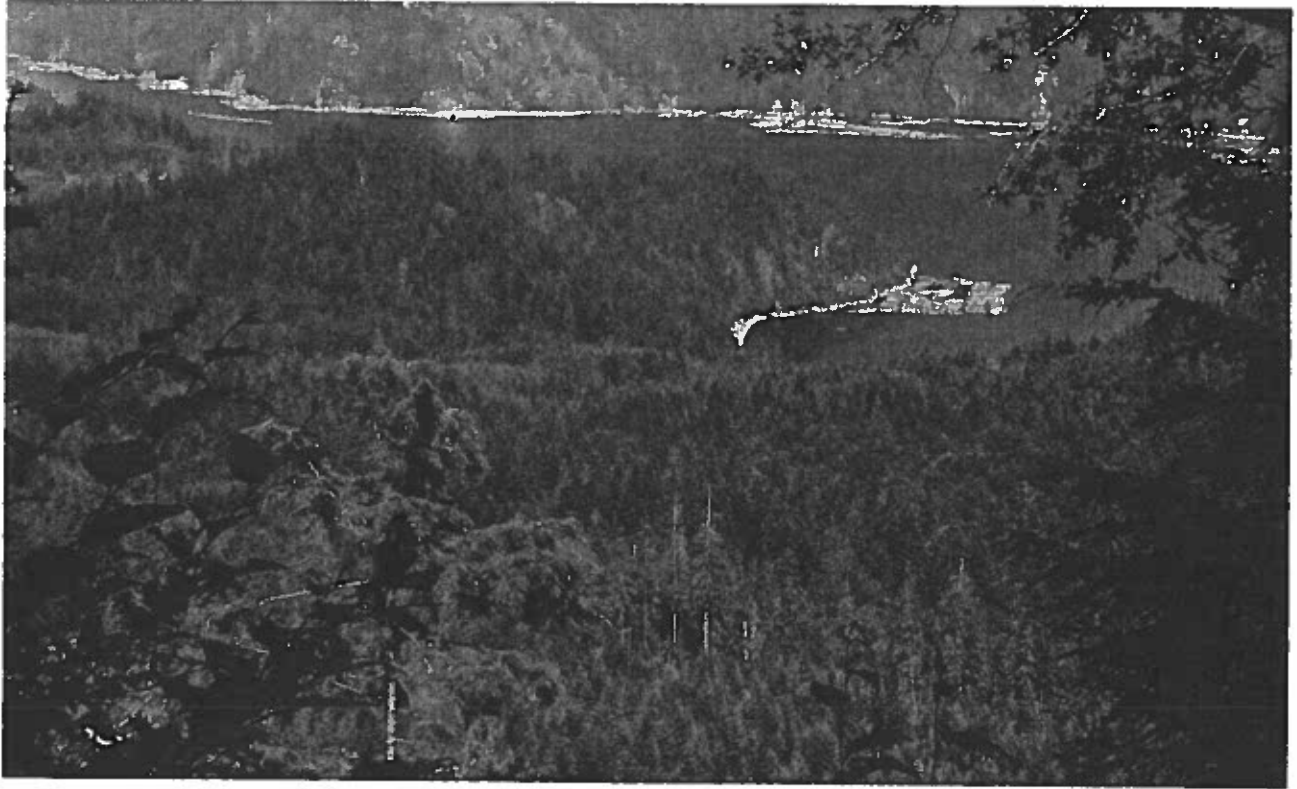


TWIN CREEKS AREA OFFICIAL COMMUNITY PLAN



July 21, 2005



Acknowledgements

Twin Creeks Area Official Community Plan Advisory Committee

The Twin Creeks Area Official Community Plan was drafted over a one year period by a volunteer advisory committee. The Sunshine Coast Regional District acknowledges the time and valuable contribution made by the following representatives in preparing the Twin Creeks Area Official Community Plan:

William Wright (Chair), Fred Gazely (Vice Chair), Michael Chamberlain, John Cosulich, Michael Gregory, Gord McLennan, Dave Lasser, Rob Liden, Ken Sneddon, Eric Strudwick, and Donald Townson.

Regional Board Director for West Howe Sound

This plan was prepared during the elected term of Bernie Mulligan, Director for Electoral Area F (West Howe Sound) and his Alternate Directors Bill Hubbs and Kathy McTaggart.

SUNSHINE COAST REGIONAL DISTRICT

TWIN CREEKS AREA OFFICIAL COMMUNITY PLAN

BYLAW No. 545

A bylaw to adopt an Official Community Plan for the Twin Creeks Area Plan Area.

WHEREAS Section 876 of the *Local Government Act* provides that the Regional District may by bylaw adopt an official community plan;

AND WHEREAS the Board of the Sunshine Coast Regional District deems it necessary to adopt an official community plan in order to ensure orderly development in the Twin Creeks Area Plan area;

NOW THEREFORE, the Board of the Sunshine Coast Regional District, in open meeting assembled, enacts as follows:

1. TITLE

This bylaw may be cited as the "Twin Creeks Area Official Community Plan Bylaw No. 545 2004."

2. APPLICATION

This bylaw is applicable to all land within the boundaries of the Twin Creeks Area Official Community Plan Area as shown on Map No. 1 Location Map.

3. ORGANIZATION

The official community plan is comprised of Schedule 'A' and Map Nos. 1 to 5 inclusive, which are attached to and form an integral part of the Bylaw.

4. SEVERABILITY

If any section, subsection, sentence, clause or phrase of this bylaw is held to be invalid by a court of competent jurisdiction, that section, subsection, sentence, clause or phrase, as the case may be, shall be severed and the validity of the remaining portions of the bylaw shall not be affected.

5. ADOPTION

READ THE FIRST TIME this 10th DAY OF NOVEMBER, 2004.

READ A SECOND TIME this 27th DAY OF JANUARY, 2005.

CONSIDERED IN CONJUNCTION WITH
THE SUNSHINE COAST REGIONAL DISTRICT'S
FINANCIAL PLAN AND SOLID WASTE
MANAGEMENT PLAN this 27th DAY OF JANUARY, 2005.

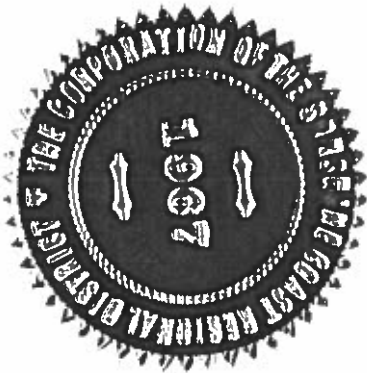
READ A SECOND TIME AS AMENDED this 30th DAY OF MARCH, 2005.

PUBLIC HEARING HELD this 13th DAY OF JULY, 2005.

READ A THIRD TIME AS AMENDED this 21st DAY OF JULY, 2005.

APPROVED BY THE MINISTER OF COMMUNITY,
SERVICES this 18th DAY OF SEPTEMBER, 2005.

RECONSIDERED AND FINALLY ADOPTED this 13th DAY OF OCTOBER, 2005.




Corporate Officer

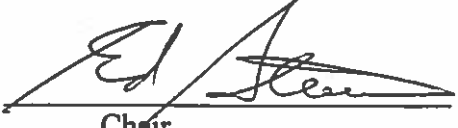

Chair

Table of Contents

Acknowledgements	2
Vision	7
Section 1 - Introduction	8
1.1 Introduction	8
1.2 Plan Area Description	8
1.3 Planning Process	9
1.4 Organization of this Plan	10
1.5 Abbreviations	10
1.6 Definitions	11
Section 2 – Create a Vibrant and Sustainable Economy	12
Objectives	12
General Policies	12
2.1 Industrial	13
2.2 Marine Industrial	14
Objectives	14
Policies	14
2.3 Temporary Industrial and Commercial Use Permits	15
2.4 Transportation, Utilities and Services	15
Objectives	16
Policies	16
Section 3 – Maintain Rural Integrity	17
Objectives	17
3.1 Private Forest Land	17
Objectives	18
Policies	18
3.2 Crown Forest Land	18
Objectives	19
Policies	19
3.3 Rural	19
Objectives	20
Policies	20
3.4 Rural Residential	20
Objectives	21
Policies	21
3.5 Marine General	22
Objectives	22
Policies	22
3.6 Aggregate Extraction	22
Objectives	23

Policies	23
3.7 Public Use, Recreation and Future Parks	23
Objectives	23
Policies	24
3.8 Institutional	24
Section 4 – Protect The Natural Environment	26
4.1 Objectives and Policies	26
Objectives	26
Policies	26
Section 5 – Improve Cooperation Among Jurisdictions	28
Objectives	28
Policies	28
Appendix 1 – Implementation Strategy	30
Appendix 2 – Development Permit Areas and Geotechnical Assessment Areas	33
DEVELOPMENT PERMIT AREAS	33
Development Permit Areas – General Policies	33
Development Permit Area 1: Streamside Habitats	33
GEOTECHNICAL ASSESSMENT AREAS	37
Geotechnical Assessment Areas – General Policies	37
Geotechnical Assessment Area 1: Creek Flood and Avulsion Hazards	38
Geotechnical Assessment Area 2: Debris Flood Hazards	38
Geotechnical Assessment Area 3: Debris Flow Hazards	39
Geotechnical Assessment Area 4: Precautionary Geotechnical Assessment Areas	39

Vision

The Twin Creeks Area Official Community Plan area is an area where managed forest lands, industrial operations, primarily related to the forest industry, and rural residential properties are all located in close proximity to one another. There is a strong desire by the residents, landowners and people who work there that the Plan area continues to provide a similar mix of land uses into the near future.

This combination of uses and natural attributes makes the Twin Creeks Area Official Community Plan area unique in many respects. It is a place that provides accessibility for industry to both ocean and land transport and is both close to the workers' places of residence yet not too close as to be right next door. The Plan area is also a place where industrial activity is expanding at the same time that fish habitat is being enhanced and improved. With the majority of the Plan area being used for the growing and harvesting of trees it also contains large contiguous forested areas right on the ocean in contrast to the shoreline to the north and south that has been highly modified by human activities. For this reason it is highly prized for its natural amenities.

The vision for the future is for the area to carry on developing along the same lines as it has in the past and to go on providing greenspace in the form of managed forest lands in amongst industrial operations. The Plan area will continue to be a place where forestry is practised that meets recognized environmental standards and provides economic opportunities for secondary industries such as value added forestry products. The regulatory regime will allow for flexibility with respect to the location and types of industry allowed while ensuring that important fish and wildlife habitat is maintained.

Section 1 - Introduction

1.1 Introduction

The Local Government Act defines an official community plan as a general statement of the broad objectives and policies of the local government respecting the form and character of existing and proposed land use and servicing requirements in the geographical area covered by the Plan.

The purpose of the Twin Creeks Area Official Community Plan is to provide a comprehensive set of guidelines and policies for managing existing and future uses of land and water surfaces within the Plan area. The objectives and policies contained in this OCP are a reflection of community values and the regulations of the local, provincial and federal agencies with interests in the Plan area.

The intent of this OCP is to provide direction on how the Plan area will grow and change over the next 5 to 10 years. However, with changes in legislation, possible changes to local government boundaries, and changing attitudes of residents and landowners, it is recommended that the Plan be reviewed, as necessary to reflect change.

This OCP recognizes the challenges to the community to balance the needs and desires of the residents and landowners with those of the surrounding area.

In its simplest form, an OCP is a document that describes an area's long-term plans for growth and how these plans will be realized. As such, it contains policies and program recommendations to guide future decisions of the Regional District Board. It informs the public about the Twin Creeks Area OCP area. It is a guide for business people, landowners and investors to assess the practical aspects of doing business in the Plan area and to discover the future potential of the area. Other levels of government may use the document to assess their priorities and focus.

Finally, the Plan can give a level of assurance and comfort to all, that something inconsistent with the Plan will have a full public review and plan amendment, before being allowed to proceed. This gives a measure of predictability for residents, businesses and neighbouring local governments in how the Board handles decisions in critical areas like land use and habitat protection. Plans are proactive as well as regulatory, meaning that they provide order and structure but are foremost open to creative, desirable proposals that foster positive change in the community.

1.2 Plan Area Description

The Twin Creeks Area OCP area covers approximately 1054 hectares including an offshore zone extending approximately 750 metres from shore that includes some Crown foreshore leases and licenses. The land portion of the Plan area is approximately 594 hectares with the ocean component covering approximately 460 hectares. The Plan area extends south to the

boundary of the West Howe Sound Official Community Plan area, north to the Hillside - Port Mellon Industrial Area Official Community Plan area, west along the slopes of Mount Elphinstone to include land within the Sechelt Provincial Forest and east to incorporate part of Howe Sound (refer to map 1 Location Map).

The Plan area is approximately 10 kilometres north of the Town of Gibsons and approximately 2 kilometres south of the Howe Sound Pulp and Paper Mill at Port Mellon.

This OCP area is different from other OCP areas in many respects. The first, and perhaps the most significant, is the mix of land uses here. Unlike other OCP areas where residential use is generally the dominant use, the primary uses in the Twin Creeks Area OCP are forestry and industrial uses. This means that the Plan area has relatively few residents. Approximately 12 people live in the Plan area at the present time. Also of note is that there are very few landowners at the present time. The majority of land in the Plan area, about 54% or 320 ha, is owned by only 4 different property owners. Another unique aspect of this Plan area is that the majority of the foreshore in Thornborough Channel is licensed for uses related to timber harvesting and processing activities. The foreshore and water fronting Witherby Beach Road is not currently under tenure and has been identified for public use.

An additional difference is that this will be the first OCP drafted by the SCRD that recognizes the role of the Gambier Island Local Trust Committee (GILTC) as outlined in the Protocol Agreement and Letter of Understanding between the GILTC and SCRD Board.

1.3 Planning Process

The process of preparing this Plan started with the compilation of a Technical Background Report (TBR). The TBR provides technical information about the physical attributes of the Plan area. The aim of the TBR is to facilitate development of the OCP by providing information to make decisions regarding goals, objectives and policies for future land use and development.

When the first draft of the TBR was completed an Advisory Committee was appointed by the Regional District Board. The Advisory Committee consisted of property owners and people who work in the Plan area as well as residents and property owners in other parts of the West Howe Sound Electoral Area. The Advisory Committee reviewed the TBR and provided comments on how the TBR could be improved. The Advisory Committee also assisted in developing a vision for the Plan area and reviewed and commented on the draft OCP document.

A first Draft of the OCP was sent to other agencies, the Gambier Island Local Trust Committee, the West Howe Sound Advisory Planning Commission, The Hillside Development Group (HIDEGRO) Advisory Committee and the Squamish First Nation asking for their input. The Draft OCP document was then revised to accommodate the comments and suggestions provided by the other agencies. After these changes were made and the bylaw to adopt the OCP was given first and second readings an Open House was held

so the community could view and comment on the Draft OCP. This document is the final result.

1.4 Organization of this Plan

The Twin Creeks Area Official Community Plan includes text and corresponding maps. The Plan is organized around the 4 goals that were derived from the Vision for the Plan area that was developed by the Advisory Committee. Sections 2 to 5 of the Plan correspond to the 4 goals.

The Twin Creeks Area OCP attempts to do the following:

1. Goal 1 – Create A Vibrant and Sustainable Economy
2. Goal 2 – Maintain Rural Integrity
3. Goal 3 – Protect The Natural Environment
4. Goal 4 – Improve Cooperation Among Jurisdictions

The OCP contains five maps:

- Map No. 1 Location Map
- Map No. 2 General Land Use Designations
- Map No. 3 Development Permit and Geotechnical Assessment Areas
- Map No. 4 Inventory of Natural Environment Features
- Map No. 5 Transportation, Utilities and Public Areas

The Twin Creeks Area Official Community Plan also contains two (2) appendices. These are:

- Appendix 1 - Implementation Strategy
- Appendix 2 - Development Permit Areas and Geotechnical Assessment Areas

Each section of the Plan contains objectives and policies. Objectives are the long-term aspirations that were identified by the Advisory Committee for the Plan area. They are the statements of what is important to the residents and landowners in the Plan area. Policies are the proposals to do something that relates directly to accomplishing an objective. The policies provide specific direction to the SCRD Board, the community, and the provincial and federal agencies on the future land and water surface uses in the Plan area.

1.5 Abbreviations

Abbreviations used in this Plan include the Following :

- ALC - Agricultural Land Commission
- ALR – Agricultural Land Reserve

FLR – Forest Land Reserve
F&OC – Fisheries and Oceans Canada
GILTC – Gambier Island Local Trust Committee
LWBC – Land and Water British Columbia
MOF - Ministry of Forests
MOT - Ministry of Transportation
MHS - Ministry of Health Services
MSRM – Ministry of Sustainable Resource Management
MWLAP – Ministry of Water, Land and Air Protection
OCP - Official Community Plan
SCRD – Sunshine Coast Regional District
SEI – Sensitive Ecosystem Inventory
VCHA – Vancouver Coastal Health Authority

1.6 Definitions

Community Sewer System means a system of sewers and sewerage works including sewage treatment facilities to serve one or more lots that is owned, operated and maintained by or on behalf of the Sunshine Coast Regional District

Community Water System means a system of waterworks including water treatment facilities to serve one or more lots that is owned, operated and maintained by or on behalf of the Sunshine Coast Regional District.

Regional District means the Sunshine Coast Regional District

Section 2 – Create a Vibrant and Sustainable Economy

This OCP supports the need for viable economic activities provided the environmental integrity of the Plan area is not compromised. This OCP recognizes that resource activities, industrial and commercial uses are economic generators and that the Plan area can be a suitable location for these activities to occur. The Plan promotes compatibility between these activities and other land uses in adjacent areas.

With respect to economic development, this Plan attempts to take advantage of some of the unique qualities of the Plan area which include:

1. Undeveloped waterfront industrial lands;
2. Physical attributes that are suitable for a possible transportation transfer point for moving between land and water and between water and land;
3. The Plan area is somewhat removed from the more densely developed parts of the SCRD;
4. It is accessible to markets by deep water vessels;
5. It has well established forest-related industry.

Objectives

1. *Capitalise* on the unique qualities of the Plan area with respect to economic development.
2. *Recognize* the needs of natural resource activities and *acknowledge* that forestry and extraction activities are important economic contributors to the local economy.
3. *Recognize* the importance of the Twin Creeks Area to accommodate future industrial growth in West Howe Sound and as a possible future transportation hub with respect to the transfer of goods and associated storage.
4. *Ensure* that economic activity is compatible with the surrounding area and will not have a negative impact on the natural environment.
5. *Recognize* that economic development needs to respond to the changing global and regional economy.
6. *Minimize* conflicts between industry, resource activities and other uses.

General Policies

1. Filling of foreshore to provide for additional industrial use may be supported subject to a report by a qualified professional(s) to show how all environmental protection measures of this Plan will be met and provided the proposal has support from the Department of Fisheries and Oceans.

2. Development Proposals for new or expanded industrial use in areas not currently zoned for industrial use may be supported provided the development is compatible with surrounding land uses, the natural environment and the road network.

2.1 Industrial

This land use designation is currently comprised of three separate areas. These three areas are located near the mouths of Ouillet, Twin and Bear Creeks. The present land use in these areas is primarily log sorting and log storage with some log processing taking place near the mouth of Bear Creek. The present zoning is the same for all three areas and allows for a variety of industrial uses including shake mills and sawmills. There are no community services available for this designation. The intent of this designation is to remain flexible with respect to future industrial and commercial land uses.

1. Lands designated as Industrial are shown on Map No. 2.
2. Industrial uses shall be permitted within this land use designation. Zoning implementation shall make provision for a wide variety of uses to allow for flexibility in the types of industrial uses to be accommodated and the range of parcels to be created by subdivision.
3. The following uses will not be permitted in the industrial designations: storage or disposal of hazardous, contaminated, biomedical and toxic waste including PCBs; chromium manufacturing and similar high impact chemical plants; petrochemical refining; explosives/ammunition manufacturing; battery manufacturing; metal smelting/electroplating; and uses that require significant emissions to the air or water;
4. The Regional District may consider a rezoning of lands in this designation to allow the development of a new marine terminal/deep sea dock with associated upland storage subject to the following conditions:
 - A. The SCRD and other interested agencies have had an opportunity to review a conceptual development plan and have determined the scope of studies and public consultation that should be provided as part of any rezoning application, including consideration of the following studies or reports:
 - i. A comprehensive traffic study to identify the potential impacts of increased vehicle volumes and the needed improvements to the existing road network to accommodate an increase in traffic. All traffic studies shall be referred to the Ministry of Transportation;
 - ii. A report by a qualified professional(s) to show how all environmental protection measures of this Plan will be met;

- iii. A report by a qualified professional(s) to show how new developments will be protected from natural hazards;
 - iv. A report by a qualified professional(s) to show that adequate water supply and a sewage disposal area is available for the proposed development;
- 5. The expansion, development or redevelopment of existing industrial sites shall consider the adequacy of the road pattern for traffic generated, and the buffering and screening of sites, if a site is adjacent to a major network road or highway or residential area.
 - 6. Where a building or structure including a roof area has been constructed or land has been developed to include a paved area, the owner must manage and provide for the ongoing disposal of surface runoff and stormwater in accordance with the *Land Development Guidelines for the Protection of Aquatic Habitat*.
 - 7. Community water or sewer may only be provided in cooperation with the Regional District to facilitate a more intensive land use than would otherwise be possible.
 - 8. A range of parcel sizes may be permitted in this designation subject to issues related to servicing, sewage disposal, zoning requirements and natural hazards being addressed to the satisfaction of the Regional District.

2.2 Marine Industrial

This land use designation covers the ocean surface in Howe Sound and includes the Crown tenures that are currently being used for industrial purposes. These Crown tenures have been issued for industrial and forestry uses that require a transfer of goods, including storage, from the water to the land and vice versa. The intent of this designation is to recognize its use for log booming and storage and other marine transportation purposes.

Objectives

- 1. *Recognize* that the foreshore areas within this designation are vital to the resource and industrial activities that take place on the adjacent uplands.
- 2. *Recognize* that these areas pose certain hazards to recreational boaters and that the general public should take extra care when using these waters.

Policies

- 1. Lands designated as Marine Industrial are shown on Map No. 2.

2. The conditions for rezoning outlined in policy 4 in section 2.1 with respect to proposals for a new marine terminal/deep sea dock shall also apply to the land or water within this designation.
3. For applications to expand existing Crown licenses, first consideration should be given to limiting the expansion to the Marine Industrial designation.
4. The Regional District does not support the siting of new aquaculture farms in the Marine Industrial Land Use designation.

2.3 Temporary Industrial and Commercial Use Permits

Temporary use permits may be considered within the Rural, Private Forest Land, and Crown Forest Land designations for the purpose of providing for temporary short term industrial or commercial use subject to the following criteria:

1. No permanent structures are to be constructed in conjunction with a temporary industrial or commercial use.
2. All temporary use applications must also conform with the requirements of other agencies including Ministry of Transportation, Vancouver Coastal Health Authority, Ministry of Water, Land and Air Protection, and Fisheries and Oceans Canada.
3. All environmental protection measures of this Plan are met.
4. Financial security may be required to ensure that temporary structures are removed upon expiration of a permit and that the land is restored to a satisfactory condition if it has been altered.
5. A natural vegetative buffer or berm of 300 metres in width is maintained between an asphalt batch plant operation and any dwelling not located on the subject parcel.
6. Certain uses will not be considered for temporary permits including: storage of toxic waste including PCBs, chromium manufacturing and similar high impact chemical plants, and fish/animal processing plants.

2.4 Transportation, Utilities and Services

This land use designation includes the Port Mellon Highway and the electrical transmission corridor located to the west of the Port Mellon Highway that runs the entire length of the Plan area.

Objectives

1. *Work* co-operatively with the Ministry of Transportation and the Ministry of Forests to plan for a road system that will effectively serve existing and future industrial and commercial uses, including the forestry oriented activities to be located inside and outside the Plan area.
2. *Minimize* the disruption on forestry uses by encouraging the location of transportation and utility right-of-ways on other lands where feasible.
3. *Support* the provision of utilities and services that will assist in achieving the goal of a vibrant and sustainable economy for the Plan area.

Policies

1. A detailed road network study should be undertaken to confirm future road requirements to serve the land uses within the Plan area. The study would consider the adequacy of the existing road network depicted on Map No. 5.
2. The development of future roads will be on an incremental basis with the Ministry of Transportation acquiring the necessary right-of-way or widening as land is subdivided or developed along the designated routes, and redeveloping/developing the road as warranted by usage and safety factors.
3. With the subdivision of DL 1405, DL 1439 and DL 1440, dedication of a highway right-of-way to provide public access to these parcels will be required.
4. The Regional District will continue to request that the Ministry of Transportation make upgrades to the Port Mellon Highway a priority to improve traffic safety and efficiency.
5. The Regional District will continue to request the Ministry of Transportation address the safety issues as outlined in the report from Thurber Engineering (2002). Specifically, these relate to:
 - A. Undersize culverts under Port Mellon Highway.
 - B. Deposition of sand and gravel in culverts under Port Mellon Highway.
 - C. Possible susceptibility of bridge over Twin Creek to damage from erosion or impact.
 - D. Public health and safety issues related to the highway crossings of Bear Creek, Twin Creek and Middle Ouillet Creek.
6. The Regional District supports the provision of natural gas to service the industrial designations in the Plan area.

Section 3 – Maintain Rural Integrity

Well over half of the land in the Plan area is used for forestry or forestry related purposes. A significant portion of the private forest lands is in Woodlot No. 10 and nearly all of the Crown land in the Plan area is under tenure for forestry purposes. These activities contribute to the economic viability of the Plan area and provide a source of income for people who reside outside the Plan area. Sustainable forest management is supported that balances economic benefits with community values and environmental protection.

The area has very few full time residents and at this time the Plan area is not required to accommodate future residential growth. Residential and other types of urban development should be encouraged to locate nearer to existing commercial, institutional and recreational facilities and where services are already available.

Objectives

1. *Acknowledge* that forestry activities are important economic contributors to the local economy.
2. *Recognize* the existing rural residential use in the Plan area and take measures to minimize the impact of industrial development on adjacent residences.
3. *Discourage* subdivision for the purpose of creating new residential parcels.
4. *Discourage* the intensification of residential use in the Plan area.
5. *Support* public access to the water where it is both safe and does not require passage across private land.
6. *Support* the goals and objectives of the Agricultural Land Reserve.
7. *Encourage* the retention of large land holdings to ensure the economic viability of forestry.
8. *Support and maintain* the long-term viability of the natural resource land base and protect it from activities and land uses which may diminish its resource value or potential.

3.1 Private Forest Land

This designation includes private lands that have a BC Assessment Authority assessment class of Managed Forest Land or Unmanaged Forest Land and which are not being used for other purposes. These lands are subject to the *Private Managed Forest Land Act* which protects the right to harvest and other forest management activities for those landowners in the Managed Forest Land class. Land within a woodlot license area is not subject to the

Private Managed Forest Land Act. This land is currently subject to the Forest Practices Code which is to be replaced by the *Forest and Range Practices Act*.

Objectives

1. *Ensure* the Plan area's private forest lands are managed on a sustained yield basis and are protected against activities that may disrupt their renewable resource potential.
2. *Preserve* the land base and encourage appropriately sized units for timber management based on productive capacity.
3. *Discourage* further parcelization for non-forest uses except as supported by Plan policy for alternative uses.
4. *Recognize* opportunities for multiple uses of land that do not reduce its primary forestry use.
5. *Protect* riparian zones, fish habitat and sensitive ecosystems.

Policies

1. The Private Forest Land is designated on Map No. 2 (General Land Use Designations).
2. The Regional District supports the preservation of productive forest lands with a managed forest land classification
3. The Regional District may consider temporary industrial use permits for lands in the Private Forest Land designation in accordance with the criteria for temporary Industrial and Commercial Use permits as outlined in Section 2.
4. Private forest land owners are encouraged to protect biodiversity through appropriate forestry practises and the protection of riparian zones and other sensitive ecosystems.
5. The Regional District may consider zoning amendments to permit forestry related industrial purposes within the Private Forest Land designation without amending the Official Community Plan where it would have no adverse impact on surrounding land uses.

3.2 Crown Forest Land

This designation includes all Crown lands in the Provincial Forest. For the vast majority of these lands a tenure has been issued for timber harvesting. This designation also includes Crown lands in the Agricultural Land Reserve in DL 3498. The Ministry of Forests has jurisdiction over land use in the Provincial Forest and harvesting on Crown lands. Use of

these lands is regulated by the *Forest Practices Code of BC Act* and starting in 2005 the *Forest and Range Practices Act*.

Objectives

1. *Recognize* the economic importance of a sustainable forest industry to the Plan area.
2. *Support* the public's use of Crown lands for recreational enjoyment.
3. *Minimize* the impact of residential settlement on land in the Provincial Forest.
4. *Minimize* the impact of timber harvesting activities on private land located downstream.
5. *Protect* riparian zones, fish habitat and sensitive ecosystems.

Policies

1. The Crown Forest Land is designated on Map No. 2 (General Land Use Designations).
2. The Ministry of Forests shall be encouraged to manage Provincial Forest lands so that they do not:
 - a) Pose a threat to the quality of fresh water within the drainage system of watercourses, lakes or wetlands;
 - b) Alter the aesthetic appeal and visual integrity of the Plan area;
 - c) Disturb riparian areas and other sensitive ecosystems;
 - d) Increase or contribute to soil erosion;
 - e) Pose a threat to private lands located downstream from lands in the Provincial Forest.
3. The Ministry of Forests shall be encouraged to ensure that outdoor recreation opportunities continue to be available on all lands in the Provincial Forest except for reasons due to the presence of hazards or where the need has been identified to protect environmentally sensitive features.
4. The Regional District does not support lands in DL 3498 being removed from the Agricultural Land Reserve except where it is determined by the Agricultural Land Commission that it supports an exchange for other lands of similar size and better agricultural quality to be added to the Agricultural Land Reserve.

3.3 Rural

The Rural designation applies to lands that are currently vacant, not being managed for forestry and not zoned for industrial use. This designation includes private lands in the Agricultural Land Reserve in DL 1463. The Rural lands are currently situated between lands that are designated for forestry or industrial uses.

Objectives

1. *Preserve* and *enhance* rural character and environmental quality.
2. *Minimize* conflict between residential development and industrial, forestry, and resource extraction activities.

Policies

1. Rural lands are designated on Map No. 2 (General Land Use Designation).
2. Maintain the existing subdivision district zoning which allows a minimum parcel size of 4 hectares (9.9 acres) for subdivision.
3. Permitted uses shall be rural uses, rural residential uses and uses accessory to rural and rural residential uses.
4. The Regional District does not support lands in DL 1463 being removed from the Agricultural Land Reserve except where it is determined by the Agricultural Land Commission that it supports an exchange for other lands of similar size and better agricultural quality to be added to the Agricultural Land Reserve.
5. Where land is within the ALR and is proposed for subdivision or non-farm use, including the placement of a second dwelling, approval must first be obtained from the Agricultural Land Commission, except where additional dwellings are necessary for farm purposes subject to the *Agricultural Land Commission Act*. All subdivision and non-farm uses within the ALR shall comply with the agricultural objectives and policies within this section of the Plan.
6. Where private land is removed from the ALR, the Rural designation shall remain and the permitted uses shall be generally limited to traditional rural activities.
7. Where land is proposed to be subdivided, the Approving Officer shall be encouraged to give due consideration to the protection of the adjacent forestry and/or farming land base, by encouraging buffers and subdivision road layout designs which minimize intrusive points of access.
8. The Regional District may consider zoning amendments to permit industrial uses within the Rural designation without amending the Official Community Plan where it would have no adverse impact on surrounding land uses.

3.4 Rural Residential

The Rural Residential designation applies to parcels that are currently being used for residential purposes or are generally considered to be too small for other uses. These lands

include the Parcels in DL 4457 and the waterfront parcels at the end of Witherby Beach Road.

Lands within the Rural Residential Neighbourhoods designation are typically self-sustaining. These lands are self-sustaining in that they typically have an adequate water supply and wastewater can be treated and disposed of on-site through ground disposal septic systems. Some properties within the Rural Residential Neighbourhood designation may currently be provided with domestic water from surface sources. The provision of community water service in these areas is not anticipated. Nor is it anticipated that community sewer service will be provided in Rural Residential Neighbourhoods.

Objectives

1. *Preserve* the rural character of these areas.
2. *Protect* the supply of groundwater and surface water for domestic use.
3. *Protect* development from hydrological and geotechnical hazards.
4. *Recognize* the importance of home based businesses.
5. *Recognize* that, due to the small size of parcels and topographical constraints within the Rural Residential Designation in DL 1637, consolidation of existing parcels may be required to allow for onsite sewage disposal.
6. *Minimize* conflict between residential development and agriculture, silviculture, and resource extraction activities.

Policies

1. The Rural Residential lands are designated on Map No. 2 (General Land Use Designations).
2. Despite the parcel size of some existing lots, the existing subdivision district zoning which allows a minimum parcel size of 4 hectares (9.9 acres) for subdivision shall be maintained to discourage further residential development in the Plan area.
3. Maintain the existing RU2 zoning as it requires larger parcels for most non-residential uses.
4. Permitted uses shall be rural residential uses, home based business uses, and uses auxiliary to rural residential uses.
5. The Regional District supports the consolidation of the small parcels in DL 1637 to a size that would allow for each parcel to be serviced onsite for both water supply and sewage disposal.

6. The Regional District does not support the development of community water or community sewer systems to service the small parcels in DL 1637.

3.5 Marine General

The Marine General designation covers the foreshore and ocean surface in the Plan area that is not within the Marine Industrial Designation. This generally covers the water area further from shore and the foreshore on the south side of Witherby Point. This area is important for both public use and for marine transportation associated with foreshore and upland industrial use in the Plan area and other parts of Howe Sound.

Objectives

1. *Identify* areas for public use that is compatible with surrounding industrial uses.
2. *Recognize* the importance of this area for marine transportation.
3. *Recognize* the importance of this area for water based recreation.
4. *Promote* marine safety.

Policies

1. The Marine General area is designated on Map No.2 (General Land Use Designations).
2. The Regional District supports continued public access to the water in West Howe Sound at the end of Rusty Scupper Road. Activities that prevent public access to the water in these locations will not be supported.
3. Additional public accesses to the water should be considered in accordance with the policies in Section 3.7 Public Use, Recreation and Future Parks.
4. Marine transport safety should be encouraged through recognition of Department of Transport and Canadian Coast Guard regulations.

3.6 Aggregate Extraction

The management of mineral resources falls primarily under the jurisdiction of the Ministry of Energy and Mines. However, processing activities are recognized as being subject to local government regulations. The Provincial Government, through the Sunshine Coast Aggregate Potential Mapping Project (2002), identified the parts of the Plan area with low, moderate

and high aggregate potential. The Project offers only a first approximation of aggregate potential and is not a substitution for independent exploration and assessment. It is meant to delineate areas that possess characteristics that are conducive for hosting natural aggregate deposits.

Objectives

1. *Protect* known viable resources from development that render the resource unviable or inaccessible.
2. *Minimize* conflicts between extraction activities and adjacent land uses.
3. *Minimize* the impact of extraction and processing activities on the natural environment.
4. *Encourage* site rehabilitation and reclamation of mined landscapes for subsequent productive use and environmental and aesthetic values.

Policies

1. Prior to allowing development in an area identified as a having high potential for aggregates, a more detailed assessment should be conducted and the feasibility of removing the resource should be adequately considered.
2. Processing of aggregate should take place where zoning allows this type of land use.
3. Processing activities, which are directly related to aggregate extraction and which are temporary in nature may be considered by the Regional District for a Temporary Industrial Use Permit in the Rural, Private Forest Land and Crown Forest Land Designations.

3.7 Public Use, Recreation and Future Parks

Parts of the Plan area are used by the public for outdoor recreation. Most of this use occurs on Crown lands and on the waters of Thornbrough Channel. The Plan area does not contain any parks nor are there any designated recreation sites. The establishment of a new community park(s) in the Plan area is not anticipated.

Objectives

1. *Support* continued use of Crown land for public recreation use.
2. *Support* public use of Crown foreshore and waters of Howe Sound.
3. *Recognize that* potential future park and public recreation sites may exist in the Plan area.

Policies

1. Existing public (Crown) lands and public accesses to the water are shown on Map No. 5 (Transportation, Utilities and Public Areas).
2. The Plan area currently contains seven highway right-of-ways that end at the high water mark of Howe Sound. At this time public access to the foreshore is only supported at the following location as shown on Map No. 5: Rusty Scupper Road. Prior to encouraging public use of the remaining six accesses to the water, (Woolridge Road, Timshell Road, Harbour Road, Shadow Rock Road, Witherby Beach Road and Noinu Road), the Regional District, in cooperation with adjacent landowners, should conduct an assessment to determine if these right-of-ways are suitable for public access and that safety concerns can be adequately addressed.
3. The Ministry of Transportation shall be encouraged to preserve road end water access points for the use, enjoyment, and viewscape of the community.
4. Should park be required as a condition of subdivision, acquisition of land for parks will be guided by one or more of the following preferred park criteria:
 - a) the land improves access to waterfront lands, including the sea and watercourses;
 - b) the land links or expands parks and greenways, forming interconnected natural corridors;
 - c) the land connects community focal features and the waterfront;
 - d) the land includes areas for the protection of environmentally sensitive lands to be retained in a natural, undisturbed state or archaeological features to be protected;
 - e) the land includes viewpoints and opportunities for nature appreciation;
 - f) the land is an area deemed to be a significant site by the Regional District's Parks Master Plan.
5. At the time of subdivision or development of land, the Regional District shall determine whether the applicant of the land being developed shall:
 - a) provide without compensation, park land equivalent to 5%; or
 - b) pay to the SCRD cash-in-lieu of park land dedication in an amount equal to the market value of the land to be determined pursuant to the *Local Government Act*; or
 - c) provide a combination of land and cash-in-lieu to the satisfaction of the Regional District Board.

3.8 Institutional

The Plan area currently contains no institutional uses such as fire protection, schools or other public facilities. As it is not anticipated that these types of facilities will be provided in the Plan area, this Plan contains no policies with respect to institutional uses. Industries in the Plan area are encouraged to coordinate fire protection on a volunteer basis to serve the Plan area.

Section 4 – Protect The Natural Environment

4.1 Objectives and Policies

The Twin Creeks Area is highly valued for its natural attributes. The Plan area's three main stream systems, Ouillet, Twin and Bear, all provide important fish habitat. The Plan area also contains other important natural features such as estuaries, shoreline, and woodlands.

The protection of environmentally sensitive features falls under the jurisdiction of federal, provincial and local governments. Fisheries and Oceans Canada and the Ministry of Water, Land and Air Protection are responsible for protecting fisheries and water resources through legislation such as the *Fisheries Act*, the *Water Act* and the *Environmental Management Act*. Local governments have been given greater responsibility for protecting fish habitat with the adoption of the Streamside Protection Regulation. The Regulation requires the establishment of streamside protection and enhancement areas the width of which is based on fish presence and vegetation conditions. Streamside protection and enhancement areas (SPEA) are to be established on all watercourses on private lands where residential, commercial and industrial uses exist (or will be developed). The Regional District has until January 2006 to incorporate the regulations into bylaws and plans or through intergovernmental agreements.

An inventory of environmentally sensitive features will continue to be refined as awareness increases and mapping data and other information becomes available.

Objectives

1. *Protect* valuable fish and wildlife habitat in environmentally sensitive areas associated with creeks and marine foreshore areas in the Plan area.
2. *Encourage* and support community and landowner stewardship of environmentally sensitive features.
3. *Satisfy* the requirements of the provincial *Fish Protection Act*, in particular the Riparian Areas Regulation, with respect to protecting fish habitat.
4. *Recognize* the fish habitat enhancement plans that have been developed between individual land owners and Fisheries and Oceans Canada.

Policies

1. That all new drainage works that are not intended to also serve as fish habitat are constructed in such a way as to prevent the future passage of fish.

2. That the policies in this Plan are consistent with the requirements of the provincial government's Riparian Areas Regulation.
3. An inventory of natural environment features is shown on Map No. 4.
4. The natural environment features include:
 - a) Watercourses identified in the Sensitive Habitat and Inventory Mapping process and by Fisheries and Oceans Canada in the Sunshine Coast Habitat Atlas, March 2003; and
 - b) Sensitive ecosystems identified by Environment Canada-Canada Wildlife Service and Ministry of Sustainable Resource Management in the Sensitive Ecosystems Inventory of the Sunshine Coast. The *Sensitive Ecosystems Inventory of the Sunshine Coast* is preliminary in nature. As such, new environmentally sensitive areas may be identified, and the location and boundaries of environmentally sensitive areas may be revised, as site-specific information becomes available.
5. Watercourses identified in the Sensitive Habitat and Inventory Mapping program and by Fisheries and Oceans Canada have been designated as a development permit area and are shown on Map No. 3.
6. Undertake a joint study with F&OC to determine where the most appropriate sites for additional accesses to the ocean for industrial uses should be located.
7. It is envisioned that the OCP will be amended to respond to the Sensitive Ecosystem Inventory once it is completed for the Sunshine Coast Regional District.
8. The protection of environmentally sensitive areas through the following means shall be supported:
 - a) dedication and/or purchase of the environmentally sensitive area for a park; and/or
 - b) dedication to, or purchase by, a private land trust (i.e. Nature Trust of British Columbia, Nature Conservancy of Canada) for conservation purposes; and/or
 - c) registration of a restrictive covenant for conservation purposes with the SCRD, the Province, and/or a non-governmental organization eligible to hold conservation covenants; and/or
 - d) creative development proposals which enhance watercourse and wetland protection or preserve other environmentally sensitive areas including clustering, density averaging and where appropriate, covenant protection and other methods.

Appendix 1 – Implementation Strategy

The Twin Creeks Area Official Community Plan has been prepared and adopted in accordance with the *Local Government Act*. The implementation of the policies outlined in the Plan is key to ensuring the Plan's goals can be met.

Proposed changes to the official community plan must follow the amendment procedures pursuant to the *Local Government Act*. Proposed changes will include a public consultation plan that would allow residents, landowners, and stakeholders of the Twin Creeks Area to provide comments.

The Twin Creeks Area Official Community Plan is intended to be implemented through a variety of actions including the amendment of the current zoning bylaw and working with the senior levels of government. Some actions are to be implemented immediately while others may require a long period of time to complete. In addition, other actions are intended as ongoing.

The administration of the Plan will require constant monitoring of federal and provincial policies and legislation as well as maintaining an understanding of changing views of the area landowners and residents and the pressures that may affect the desire to develop land.

The timing of implementing actions is broken down into the following four categories:

1. Immediate
2. Short term
3. Long term
4. Ongoing

Implementation Actions	Timing	Responsibility and/or Involvement Of:			
		Senior Gov't	Other Agencies	SCRD	Community
Initiate a zoning bylaw amendment to implement policy re flexibility in types of permitted industrial uses	Immediate	✓	✓	✓	✓
Initiate a zoning bylaw amendment for parcels in the Industrial designations to implement the land use policies related to prohibited uses in the OCP	Immediate	✓	✓	✓	✓
Initiate a review and possible zoning amendment to permit a new marine terminal deep sea dock	Long Term	✓	✓	✓	✓
Conduct an assessment of the adequacy of existing road network for new industrial commercial use	Short term	✓		✓	✓
Encourage new developments to follow <i>Land Development Guidelines for the Protection of Aquatic Habitat</i>	On going	✓		✓	
Initiate a zoning bylaw to allow for a range of parcel sizes for industrial use	On going	✓	✓	✓	✓

Implementation Actions	Timing	Responsibility and/or Involvement Of:			
		Senior Gov't	Other Agencies	SCRD	Community
Initiate a zoning bylaw amendment to prohibit the siting of aquaculture farms in the Marine Industrial Land Use Designation	Short Term	✓	✓	✓	✓
Encourage applicants and LWBC to only allow expansion of Crown tenures for industrial use in Marine Industrial Designation	On going	✓	✓	✓	✓
Work with the MOT and MOF to plan for a road system that will meet needs of future uses	On going	✓		✓	
Encourage provincial agencies to locate new infrastructure to minimize disruption to forestry activities	On going	✓		✓	
Continue to work with the MOT to address traffic safety issues in the Plan area	On going	✓		✓	
Encourage Terasen to provide natural gas service to the Plan area	Short Term	✓		✓	
Encourage private forest land owners to protect biodiversity	On going	✓			✓
Request MOF to manage Crown forest lands for habitat and public use	Short Term	✓		✓	
Work with the ALC and landowners to identify possible land for exchange with land in ALR	Long Term	✓		✓	✓
Encourage Approving Officer to locate new roads so that disruption to forestry and agricultural activities are minimized	On going	✓		✓	✓
Encourage owners of small lots in DL 1637 to consolidate small parcels	Short Term			✓	
Include Rusty Scupper Road on SCR D list of public access road ends	Short Term			✓	
Conduct an assessment of public road access to water	Long Term			✓	✓
Encourage industrial land owners to consider the potential for aggregate extraction prior to proceeding with new development	On going	✓		✓	
Assess the policies in this Plan to confirm that they are consistent with the BC Riparian Areas Regulation	Short Term			✓	
Update data re environmentally sensitive areas as information becomes available	On going	✓		✓	
Initiate a zoning bylaw amendment to implement the Development Permit Area	Short term			✓	
Conduct an assessment of potential new accesses to the ocean for industrial use	Short Term	✓	✓	✓	
Initiate an amendment to the Plan to incorporate updates to SEI	Short Term			✓	
Investigate options for protecting environmentally sensitive features	Short term			✓	
Work with other agencies to coordinate development approval process	Short term	✓	✓	✓	
Investigate opportunities for the SCR D to	Short term			✓	

Implementation Actions	Timing	Responsibility and/or Involvement Of:			
		Senior Gov't	Other Agencies	SCRD	Community
assist developers with the approval process and economic information					
Initiate a MOU with MWLAP & DFO to cover development approvals and service delivery	Short Term	✓		✓	

Appendix 2 – Development Permit Areas and Geotechnical Assessment Areas

DEVELOPMENT PERMIT AREAS

In addition to the objectives and policies stated in the Plan, the Regional District has, pursuant to the *Local Government Act*, designated some lands as development permit areas. The general purpose of the development permit requirement is to allow a review of a specific development project and to make limited alterations or variations to zoning and subdivision bylaw(s) where the Regional District considers that special conditions exist in accordance with one or more of the following categories:

1. protection of the natural environment, its ecosystems and biological diversity;
2. protection of development from hazardous conditions;

The Regional District must also describe the special conditions, which justify such a designation, and the guidelines indicating the manner by which the special conditions may be alleviated or the guidelines achieved.

Development Permit Areas – General Policies

1. Designated development permit areas are shown on Map No. 3.
2. An owner of land is required to obtain a development permit prior to the development or subdivision of land within a development permit area, except where exemptions are permitted.

Development Permit Area 1: Streamside Habitats

Justification

The special conditions or objectives that support the designation of Development Permit Area 1 for the protection of the natural environment, its ecosystems and biological diversity are:

To conserve existing watercourses and to allow development or redevelopment of adjacent properties in a manner that will conserve and restore riparian habitat along the watercourse.

Exemptions

Where an owner is proposing to alter the land, commence a subdivision, construct or alter a building or structure within this development permit area, the following activities are exempt from requiring a development permit:

1. Development or alteration of land proposed to occur outside the designated Development Permit Area as shown on Map No. 3, as determined by a BC Land Surveyor or by the SCRDC.
2. Fence building, growing, rearing, producing, and harvesting of agricultural products in accordance with recognized standards of the *Farm Practices Protection (Right to Farm) Act* on lands upon which Section 2(2) of the *Act* applies.
3. Emergency procedures to prevent, control, or reduce erosion, or other immediate threats to life and property including:
 - a) emergency flood or protection works;
 - b) clearing of an obstruction from bridge, culvert, or drainage flow; repairs to bridges and safety fences; and
 - c) the removal of hazardous trees.

Any emergency works are to be undertaken in accordance with the Provincial *Water and Wildlife Acts* and the Federal *Fisheries Act*.

4. A property owner may construct a single trail on lands identified on Map No. 3 as within this development permit area, subject to the following:
 - a) the trail provides the most direct route of feasible passage through the development permit area;
 - b) sensitive habitat will not be impacted by the presence of the trail;
 - c) the ground is stable, i.e. erodible stream banks or other erosion prone areas should be avoided;
 - d) no vehicles are permitted;
 - e) the trail is maximum 1.5 metres in width;
 - f) no trees, which are greater than 5 metres in height and 10 centimetres in diameter, are to be removed. Limbing, pruning and topping of trees should be done instead;
 - g) the trail's surface is pervious, and
 - h) an additional trail shall be permitted in the development permit area for every 50 metres of linear frontage subject to the above noted conditions.
5. The planting of trees, shrubs, or groundcovers for the purpose of enhancing the habitat values and/or soil stability within the Development Permit Area provided the planting is carried out in accordance with the guidelines provided in Stream Stewardship, 1993 and Land Development Guidelines, 1992 published by F&OC and MWLAP and the Environmental Objectives, Best Management Practices and Requirements for Land Developments, March 2001, published by MELP, or any subsequent editions.
6. The removal of invasive plants or noxious weeds on a small scale within the development permit area including; but not limited to: Scotch broom, Himalayan blackberry, morning glory, and purple loosestrife, provided that erosion protection measures to avoid sediment

or debris being discharged into the watercourse are taken. Replanting of the development permit area to occur immediately and in accordance with Exemption No. 5 above.

7. Works approved by the SCRD, F&OC, and/or MWLAP with respect to trail construction, stream enhancement, and fish and wildlife habitat restoration.
8. An application for subdivision where the following criteria can be met:
 - a) minimum lot sizes can be met exclusive of the development permit area; and
 - b) no development activities including grading, clearing, trenching, or installation of pipes, relating to the creation of all parcels will occur within the development permit area.
9. In respect of land that is private managed forest land as defined under the ***Private Managed Forest Land Act***, a development permit is not required if it would have the effect of restricting, directly or indirectly, a forest management activity.

Guidelines

Where an owner is proposing to alter the land, commence a subdivision, construct or alter a building or structure within this development permit area, and such activity is not exempt from requiring a development permit as outlined in the Exemptions section above, the following guidelines apply:

1. The development permit area includes land within 30 metres of the top of bank of the watercourse.
2. Land use and development should not unnecessarily encroach into the development permit area.
3. The applicant will work with the SCRD to consider possible variances to the land use and subdivision bylaw to minimize encroachment into the development permit area.
4. Where encroachment into the Development Permit Area is deemed unavoidable, the development or land/vegetation altering activity shall consider the site-specific natural features, functions, and conditions that support fish life history processes, wildlife and unique ecosystems. These include:
 - a) large organic debris that falls into the stream or on the forest floor, such as logs, snags and root wads;
 - b) areas for channel migration, including active floodplains;
 - c) side channels, intermittent streams, seasonally wetted continuous areas and floodplains;
 - d) the multi-canopied and ground forest cover that:
 - i. moderates air and water temperature;
 - ii. provides a source of nutrients and organic matter to the stream and forest floors;
 - iii. establishes root matrices that stabilize soils and stream banks thereby minimizing erosion; or
 - iv. maintains an effective visual and sound buffer around eagle and heron nesting sites;
 - e) natural sources of stream bed substrates; and
 - f) pervious surfaces that permit infiltration and moderate water volume, timing and velocity, and maintain sustained water flows in streams, especially during low flow periods.
4. All development activity shall take a form that minimizes the area of encroachment into the Development Permit Area.

5. If development or alteration of land is proposed within the Development Permit Area, it shall be encouraged to be located where it will cause the least impact on the environmental values of the DPA and will not have a negative impact upon the adjacent fish habitat.
6. Construction, at a time of year and using construction methods that minimize the impacts on the Development Permit Area, shall be encouraged.
7. In order to ensure that no encroachment occurs into the Development Permit Area at the time of construction, permanent or temporary fencing measures may be required.
8. The SCRCD may require an applicant to supply a sediment and erosion plan complete with recommendations for implementation to the satisfaction of the Regional District.
9. The SCRCD may require an applicant to supply a drainage plan, complete with recommendations for implementation, to the satisfaction of the Regional District.
10. The SCRCD may require the applicant to supply an assessment, prepared by a registered professional biologist or person with similar qualifications, which assesses the environmental impact of the proposed development and prescribes appropriate recommendations for mitigation and protection of habitat, to the satisfaction of the Sunshine Coast Regional District.
11. The SCRCD may require the applicant to supply a re-vegetation plan to the satisfaction of the Sunshine Coast Regional District.
12. On parcels where development (including tree and vegetation removal) is proposed for an area with a slope of 30% or greater, the SCRCD may require the applicant to supply a report, prepared by a professional geotechnical engineer, indicating that slope stability will not be jeopardized and soil erosion and site mitigation measures can be implemented, to the satisfaction of the Sunshine Coast Regional District.
13. All development proposals subject to a development permit shall use the *Stream Stewardship*, 1993 and *Land Development Guidelines*, 1992 publications by DFO and MELP and the *Environmental Objectives, Best Management Practices and Requirements for Land Developments*, March 2001 publication by MELP, or any subsequent editions.

Definitions:

Alteration of land includes removal, alteration, or disruption of vegetation, and soil deposit or removal. (***Fish Protection Act***)

Fish habitat means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes. (***Fisheries Act***)

Riparian Area means the area adjacent to a stream that may be subject to temporary, frequent or seasonal inundation, and supports plant species that are typical of an area of inundated or saturated soil conditions, that are distinct from plant species on freely drained adjacent upland sites because of the presence of water. (***Fish Protection Act***)

Top of bank means

- a) the point closest to the natural boundary of the stream where a break in the slope of the land occurs such that the grade beyond the break is flatter than 3:1 at any point from a minimum distance of 15 metres measured perpendicularly from the break, and
- b) for a floodplain, the edge of the active floodplain. (***Fish Protection Act***)

Watercourse means any natural depression with visible banks, or wetland with or without visible banks which contains water at some time; and includes any lake, river, stream, creek, spring, swamp, gulch or surface source of water, whether containing fish or not; and includes intermittent streams; and includes surface drainage works which are inhabited by or provide habitat for fish; (***Stewardship Bylaws: A guide for Local Government***)

Wetland means land that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal conditions that does support vegetation typically adapted for life in saturated soil conditions including swamps, marshes, bogs, fens, estuaries and similar areas. (***Fish Protection Act***)

GEOTECHNICAL ASSESSMENT AREAS

The general purpose of the Geotechnical Assessment Areas (GAAs) is to advise land owners, developers, and the community that naturally hazardous conditions exist in the Plan area in the form of land slip, erosion, flooding, debris flows and debris floods with the intent of protecting development from these hazards. Special precautions may be needed to protect development from the hazards.

There are several types of potential hazards in the Plan area. Those of primary concern are destructive channelized debris flows and large debris floods similar to those that have happened in the past on creeks within the Plan area. All of the steep upper creek channels west of the Twin Creeks Area OCP area appear to have debris flow potential.

Geotechnical Assessment Areas – General Policies

1. Designated Geotechnical Assessment Areas are shown on Map No. 3 as identified by Thurber Engineering and Northwest Hydraulic Consultants in their 2001 report titled *Twin Creeks Area Official Community Plan Geotechnical Reconnaissance Study* (Thurber, 2001).
2. Geotechnical Assessment Areas reflect areas of potential natural hazardous conditions which may require further assessment at the time of subdivision or building permit application at the discretion of the Ministry of Transportation or Regional District building inspection.
3. More detailed geotechnical and/or hydrological assessment is required to assess risks to residential, commercial or industrial buildings within the GAAs. Hazard probabilities and degrees of risk should be expected to vary within these areas. More detailed geotechnical and hydrologic work guided by the Thurber, 2001 report and in support of permit applications must be based on independent documentation of slope and creek conditions. Also, more detailed geotechnical and hydrologic hazard and risk assessment

must be based on ground reconnaissance or topographic surveys which may document topographic features not shown on Map No. 3.

4. Professional work in support of future development should be conducted by professional engineers or geoscientists with training or experience in geotechnical and/or hydrological hazard and risk assessment and related problem solving. Use of the Thurber, 2001 report can provide guidance for such work.

Geotechnical Assessment Area 1: Creek Flood and Avulsion Hazards

Justification

Map No. 3 shows the extent of the areas subject to flood and avulsion hazards. The main hazard on Ouillet Creek is overtopping of the Port Mellon Highway by Middle Ouillet Creek, causing surface flow along the road and down the west side of the creek below the highway. The creek also has the potential to avulse below the highway. On Twin Creek the main hazards are damage to the highway bridge and flooding and avulsion on the Twin Creek fan. Most of the Bear Creek complex is exposed to surface flow resulting from overtopping the highway or of creek banks further downstream.

Development Guidelines

In areas exposed to surface flow hazards, elevation of dwelling or habitable floors to a suitable distance above fan or floodplain surfaces, elimination of openings in foundation walls, and protection of foundations from scour of impact forces may provide suitable floodproofing measures.

Where avulsion hazards are present, detailed engineering studies will be needed to design either protective or flood control works along stream channels or floodproofing measures to meet the potential hazard. Avoidance of the hazard may be the preferred approach at most sites.

Geotechnical Assessment Area 2: Debris Flood Hazards

Justification

Map No. 3 shows the areas that may be subject to Debris Floods. This area includes North Pacifica, South Pacifica, Bear, Twin and branches of Ouillet Creek west of the Port Mellon Highway. A debris flood is a very rapid surging flow of water heavily charged with debris, in a steep channel. Unlike debris flows, objects impacted by debris flows, objects impacted by debris floods are buried or surrounded by debris but may be undamaged.

The November 1998 debris events on Middle Ouillet Creek and Twin Creek were debris floods by the time they reached the Port Mellon Highway. These creeks still have debris flood potential.

Development Guidelines

For the Bear Creek fan complex, the hazards range from debris flow to debris and water flooding. Detailed topographic mapping east and west of the highway and intensive field work is needed to determine the hazards and risks east of the highway.

For Ouillet Creek, Except for locally steep slopes along the creeks, development might be permitted with local flood proofing, including raised building foundations, scour protection for foundations or dike construction.

Geotechnical Assessment Area 3: Debris Flow Hazards

Justification

Map No. 3 shows the current most probable paths for possible debris flow activity. Creeks with a debris flood hazard and which are included in GAA 3 include Middle and North Ouillet, Twin, Bear, South Pacifica and North Pacifica. Bear and South Pacifica creeks are believed to present the most imminent and highest hazard along the Port Mellon Highway. Other less probable and uncertain areas that may be subject to debris flow hazards are included in GAA 4.

A debris flow is a very rapid to extremely rapid flow of saturated, non-plastic debris in a steep channel. The key characteristic is the presence of an established channel or regular confined path to carry surface water flow that can be incorporated into the debris and lateral confinement to maintain fairly large flow depths, longitudinal debris sorting and the development of debris surges. Although Bear Creek and South Pacifica Creek have different headwater valleys, their potential debris flow paths merge on a common fan system west of the Port Mellon Highway. Bear Creek debris may flow down South Pacifica Creek. Flow energies should dissipate on and below the highway but pre-highway flood debris is evident in a comparatively wide forested area along lower Bear Creek.

Development Guidelines

More detailed topographic mapping east and west of the highway, and intensive field work is needed to specifically determine hazards and risks to proposed development. Further investigation is required as per the Geotechnical Assessment Areas –General Policies.

Geotechnical Assessment Area 4: Precautionary Geotechnical Assessment Areas

Justification

There are other areas that may be hazardous that are not within Geotechnical Assessment Areas 1-3. These are shown on Map No. 3 and include:

1. The entire complex debris fan area of Bear, North Pacifica and South Pacifica creeks;
2. Areas where the ground slope is believed to be steeper than 50%. These areas mainly comprise forested ravine slopes, especially along Twin and Ouillet Creeks, and shoreline areas south of Witherby Point. The 50% gradient is important because it approximates an upper limit of fill retention on steep slopes. Landslides may occur on slopes with lesser gradients but they are increasingly likely to occur on slopes which are progressively steeper than 50%;
3. Shadow zones below steep slopes located between Bear Creek and Slot Creek and along the shoreline between Twin Creek and Ouillet Creek; and,
4. The alluvial and debris fan complex of Ouillet Creek west of the Port Mellon Highway between Twin Creek and Middle Ouillet Creek.

For the area in GAA 4 stretching from the south boundary of the Plan area north to south Twin Creek west of the highway, the debris hazard intensities will be variable but comparatively low. More detailed field work is likely to resolve potential hazard issues.

Development Guidelines

No development should occur within 15 metres of the top of bank adjacent to ravine areas. Any development proposed within the setback zones should be subject to professional geotechnical advice aimed at minimizing the risk of slope instability in the ravines. Caution should also be taken in the shadow areas below steep slopes located between Bear Creek and Slot Creek and along the shoreline between Twin Creeks and Ouillet Creek.

Further investigation should be conducted as per the Geotechnical Assessment Areas – General Policies.

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