

Recreational Activity and Operational Management Plan: Squamish Windsport Society

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Executive Summary

The Squamish Windsport Society is a registered non-profit society (*Certificate of Incorporation No. S-0023554*) providing sailors with access to high performance sailing where the Squamish River meets Howe Sound. Sailors have used the spit for sailing since the early 1980's. The Squamish Windsport Society was originally conceived in response to the liability concerns expressed by the landowners (BC Rail) with regards to sailors launching from the Squamish Spit. Although the society has operated under different names and under different presidents and boards, the goal of the society has remained the same.

The Squamish Windsport Society (SWS), manages windsport activities within the Squamish River Estuary providing a valuable outdoor recreation experience enjoyed by a wide range of people. SWS offers its members and guests access to high wind sailing with prime windsurfing launch areas, while continuing to provide a comprehensive, safe, supervised, and fun activity area available to a broad range of people, who are both visiting, and living in the Sea to Sky Corridor.

With the development and formalization of operational procedures and implementation of environmental impact mitigation measures described in this management plan, windsport participants and spectators will be provided with safe and enjoyable experiences while ensuring that they are not negatively impacting sensitive fish and wildlife resources contained within the Windsport Activity Area. The management plan considers how the DOS and the SWS will operate within the constraints imposed by WMA, environmental resources, and adjacent land uses. Where potential conflicts or impacts to environmental values or other recreational users are identified, specific management actions are proposed for avoidance or mitigation. This SWS MP represents a commitment to professionalism, safety, responsible land stewardship, and co-operation with the stakeholders and other recreational users within Skwelwil'em Wildlife Management Area.

The Windsport Facility diversifies the local economy by providing a destination for windsport enthusiasts to come ride, practice, race and enjoy windsports in the District of Squamish. It is not uncommon for windsport participants to travel from as far away as the United States, Europe and eastern Canada to enjoy the reliable wind and sailing provided in Squamish. The certainty and opportunity associated with the operational / management agreements between BC MOE, the DOS and the SWS and the LOO held by the DOS allows the DOS to expand its tourism product offerings, thereby providing a lasting contribution to both the local and provincial tourism economies.

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identified, specific management actions are proposed for avoidance or mitigation. This SWS MP represents a commitment to professionalism, safety, responsible land stewardship, and co-operation with the stakeholders and other recreational users within Skwelwil'em Wildlife Management Area.

1.1 Windpark Location and Activity Areas

The Squamish Spit is located in the Squamish Estuary, where the Squamish River meets the Howe Sound (see Operating Area Map). The Squamish Spit is perfectly situated to take advantage of regularly occurring thermal winds. The warming air in the late spring, summer and early fall seasons north of Squamish causes the southerly "thermal inflows" to draw cool marine air from the south. The winds accelerate up Howe Sound through the valleys of the Sea-to-Sky Corridor, reaching peak speeds through the Squamish narrows consistently at strengths between 15 and 25 knots. The more the sun shines, the stronger the winds blow. Easy access, sunshine, coupled with reliable, consistent and warm winds are a blessing to all those people familiar with cold and blustery storm fronts which power windsurfing and kite sails in most other places across the country.

The Squamish Windpark collectively refers to the Squamish Windsport Facility and the Squamish Windsport Recreation Area. The Squamish Windpark is located at the southern end of the Squamish spit.

Windsport Recreation Area

The windsport activity area as defined in the Skwelwil'em Wildlife Management Area Management Plan includes the southern most end of the Wildlife Management Area (WMA). The eastern boundary of the activity area is defined by the Squamish deep sea port transportation corridor, with the northern boundary extending west from the northern boundary of the transportation corridor and the southern boundary of the East Marsh to the southern boundary of the West Delta. The western boundary is defined by the extent of the intertidal zone along the western edge of the WMA. The location of the Squamish Windsport Park is illustrated in *Map 1: Squamish Windpark Location Map*, and the Windsport activity area is illustrated in *Map 2: Squamish Windpark Recreation Area*.

Windsport Facility

The windsport facility includes a base / administration area, emergency vehicle turnaround, parking areas, spectator areas, rigging areas, ecologically sensitive areas and launching areas. The windsport base / administration area is the headquarters for the Squamish Windsport Society and their onsite representatives, the site attendants.

1.2 Planning Process

As a result of the Squamish Estuary Management Committee (SERC) and the Ministry of Environment (MOE) protected areas section approving the proposed 2007 spit improvement works, the District of Squamish (DOS) in partnership with the Squamish Windsport Society (SWS) agreed to prepare a Recreational Activity and Operational Management Plan (MP). The objective of preparing this MP was to review planning initiatives recently undertaken within the Squamish estuary and produce a specific windsport activity management plan to ensure that management of windpark operations and windsport activities will result in minimal impacts to fish and wildlife within the WMA.

The Terms of Reference for the MP were developed by MOE and Cascade Environmental Resource Group in consultation with the Squamish Estuary Review Committee (SERC), the Squamish Estuary Management Committee (SEMC), the District of Squamish (DOS) and the Squamish Windsport Society (SWS). The MP outline and Table of Contents was presented to the SEMC on June 14, 2007 for review and comment. Additional planning meetings with the SWS and DOS have occurred through the fall 2007 to refine the vision, goals and management strategies of the MP

1.2.1 Planning Context

The Squamish Estuary has been subject to development pressure from the actively growing community contained within the municipal boundaries of the District of Squamish. As a result there have been a number of initiatives undertaken by local, provincial and federal governments to find a satisfactory balance between protecting the Squamish Estuary's biological productivity and achieving its economic potential. Planning in the Squamish Estuary was originally commissioned by the Federal Minister of Fisheries and Oceans and the Provincial Minister of Environment in 1979.

The 1982 Squamish Estuary Management Plan (SEMP) resulted in the formation of the Squamish Estuary Coordinating Committee (SECC) whose purpose it was to guide land and water uses in the Squamish Estuary by balancing government, industry and private interests. In 1992 the SECC revised the 1982 plan, however the revisions were not implemented, and the estuary continued to be managed under the 1982 plan. In 1999 the 1982 SEMP was again revised, endorsed, and accepted by the SECC, First Nations and the community of Squamish. The 1999 SEMP included an increase in the areas designated for conservation, and a decrease in development areas originally identified in the 1982 SEMP (B.C. MOE, 2006).

The 1999 Squamish Estuary Management Plan resulted in the establishment of the Skwelwil'em Wildlife Management Area (WMA), a designated Wildlife Management Area under the Wildlife Act. The WMA encompasses 555 hectares and provides good quality habitat for fish and wildlife, as well as recreational opportunities for the residents and visitors to Squamish. It is understood that the primary goal of the WMA is to maintain and enhance fish and wildlife species and their habits in the highly productive Squamish Estuary. Therefore, management of recreational activities in the WMA must focus on minimizing recreational impacts to fish and wildlife (B.C.MOE, 2006).

1.2.3 Relationship to Other Planning Processes

The Squamish Estuary Management Plan (SEMP) has divided the entire Squamish Estuary into three zones: a conservation area; an industrial / commercial area; and a transportation corridor. The Skwelwil'em WMA is part of the conservation zone of the estuary. The Windsport Recreational Activity and Operational Management Plan will manage windpark operations and windsport activities within the windsport activity area contained within the Skwelwil'em Wildlife Management Area. The objective is to manage windpark operations and windsport activities in a manner consistent with the Skwelwil'em WMA Management Plan and the Squamish Estuary Management Plan.

1.3 Land Ownership

1.3.1 Squamish Nation

The Squamish Nation is comprised of descendants of the Coast Salish Aboriginal peoples who lived in the present day Greater Vancouver Area, Gibson's Landing and the Squamish River watershed (Squamish Nation Network, 2007). The Skwelwil'em WMA and windsport facility is within the the Squamish Nation's traditional territory, thus having significant historical and cultural value to it's people.

The Squamish Nation is currently involved in treaty negotiations with the Federal and Provincial Governments. Until the treaty negotiations are resolved, the Province and the Squamish Nation have an agreement to cooperatively manage the Skwelwil'em WMA in a manner consistent with the 1999 Squamish Estuary Mangement Plan (B.C. MOE, 2006). By conforming with the management goals described in the Skwelwil'em WMA MP, windsport activites described in this management plan should not interfere with the traditional uses or cultural value of the Squamish Nation's territory.

1.3.2 Land Management Agreements

Access to the Windpark through the Skwelwil'em Wildlife Management Area is provided by the Squamish training dyke. Originally constructed in 1972 by BC Rail the entire dyke (toe to toe) will be transferred to the district of Squamish with a covenant attached pertaining to public access and management of the dyke (B.C. MOE, 2006). The area defined as the Windpark area has been leased to the District of Squamish under two separate Licences of Occupation issued by the Province of British Columbia

The District of Squamish was issued Head Licence and Licence of Occupation, (LOO) No. 239692 from the Province of British Columbia for a 0.79 ha piece of land legally described as District Lot 7956 Group 1 New Westminster District for and commonly referred to as the Windsport Park (Appendix 1). The licence was issued for a term of 5 years commencing December 1, 2005 for the purpose of public recreation. The legal boundary is defined as the surface of the dyke extending south from emergency car turnaround, bound to the south east and west by the high-water mark.

The District of Squamish was issued a second LOO from the Province of British Columbia for east side of the dyke extending from the emergency turnaround to the wood pilings, covering lands below the high-water mark to the toe of the existing dyke.

The Squamish Windpark is operated under Sublicence and Management Agreement between the District of Squamish and the Squamish Windsport Society dated June 2006 (Appendix 2). The Sublicence and Management Agreement acknowledges that the SWS have received and read a copy of the Head Licence and agrees to perform all obligations of the district under the Head Licence / LOO and the Sublicence and Management Agreements. In addition the Sublicence and Management Agreement between the DOS and the SWS requires the SWS to carry out its activities upon the Land in accordance with all Laws, Acts and Legislation.

1.0 Introduction

The Squamish Windsport Society is a non-profit society providing sailors with access to high wind sailing where the Squamish River meets Howe Sound. Squamish has more high performance sailing days on the water than most other places in North America during the spring and summer months.

The Squamish Windsport Society (SWS) is dedicated to managing windsport activities and windsport facility commonly referred to as the Squamish Windpark. The club is managed by a board of directors as chosen by the club membership. All windsport activities are managed under Sublicence and Management Agreement between the District of Squamish and the Squamish Windsport Society. The society operates the Squamish Windpark located at the end of the Squamish Spit, within the Squamish Estuary, at the head of Howe Sound.

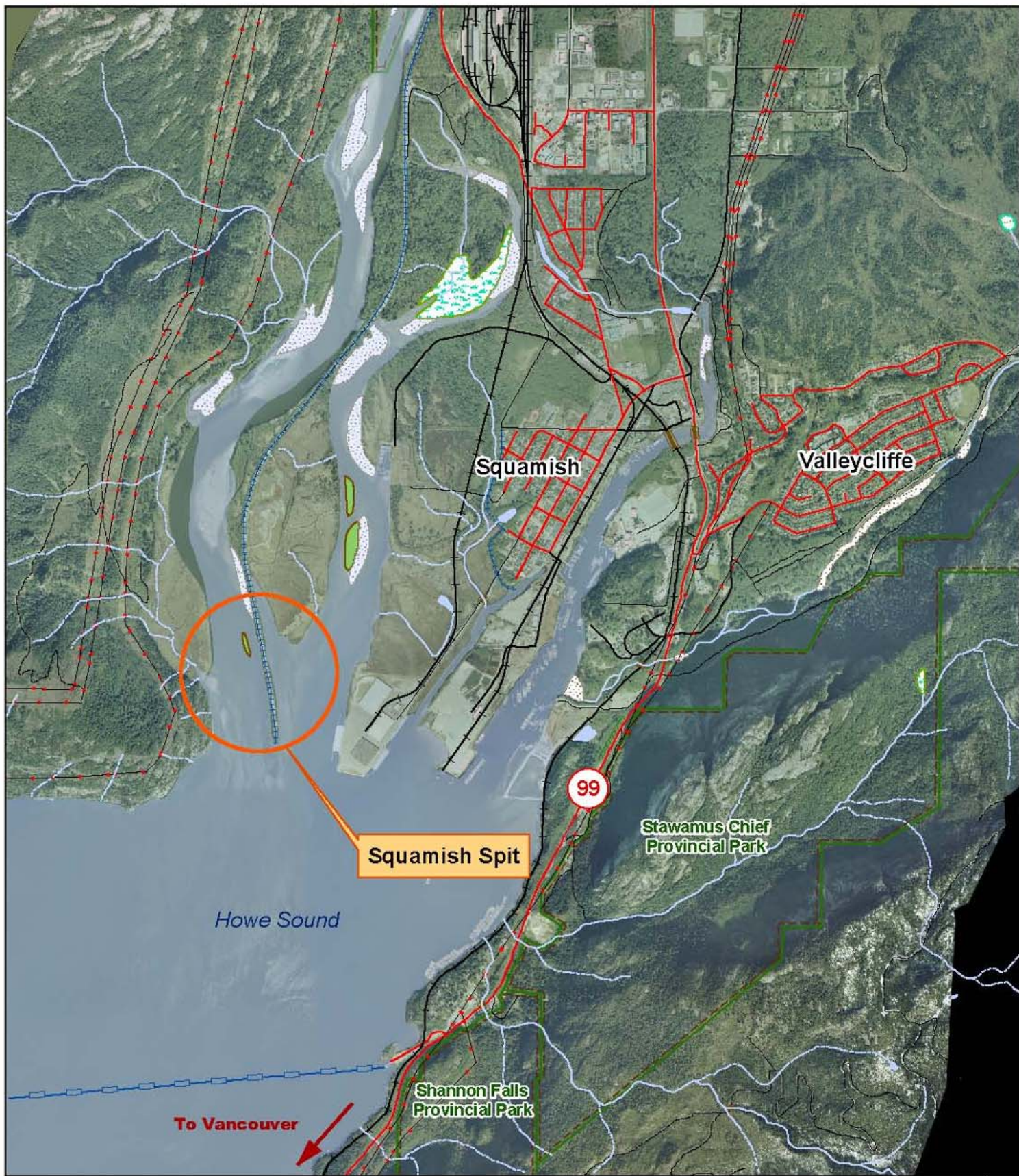
As a result of the Squamish Estuary Review Committee and the Ministry of Environment protected areas section approving the proposed 2007 spit improvement works, the District of Squamish (DOS) in partnership with the Squamish Windsport Society (SWS) agreed to prepare a Recreational Activity and Operational Management Plan.

The Recreational Activity and Operational Management Plan (MP) identifies the long term vision, goals and objectives of the SWS, as well as incorporating the objectives, and strategies identified in the Skwelwil'em Wildlife Management Area Management Plan (WMAMP) and the 1999 Squamish Estuary Management Plan (SEMP). The MP assesses potential impacts and identifies how impacts will be mitigated through operational procedures with regards to the Wildlife Management Area (WMA) values including physical and natural environments. Specifically the MP will address the list of issues provided by MOE including;

- > Impacts to waterfowl and migratory birds during nesting season
- > Impacts to birds during winter migration
- > Monitoring use outside of season
- > Impacts to mudflats
- > Use outside of identified area, put-in take-out education & stewardship initiatives
- > Cleanliness and sanitation.
- > Impacts to herring spawning and rearing on east side of spit

The DOS and the SWS are pleased to provide MOE with the assurance that they will exercise all environmental stewardship and due diligence through the management of windsport activities and the Windport Park. In addition to commitments and assurances previously identified, the MP describes the recreational and associated operational activities conducted by the Windsport Society, their members and visitors to the Squamish spit. Supporting maps and figures are used to illustrate the windsport activity area, parking, rigging and launching areas associated with windsport activities, as well as other land, recreation or resource users of the WMA.

The management plan considers how the DOS and the SWS will operate within the constraints imposed by WMA, environmental resources, and adjacent land uses. Where potential conflicts or impacts to environmental values or other recreational users are



**- Location Map -
Windsurfer Spit**








Kilometers

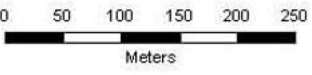


Projection : UTM Zone 10 N
 Datum : NAD 83
 Date : August 28, 2007
 CERG File # : 064-17-03
 Revision: 1
 Ortho: DOS 20cm Pixel

GIS Mapping:

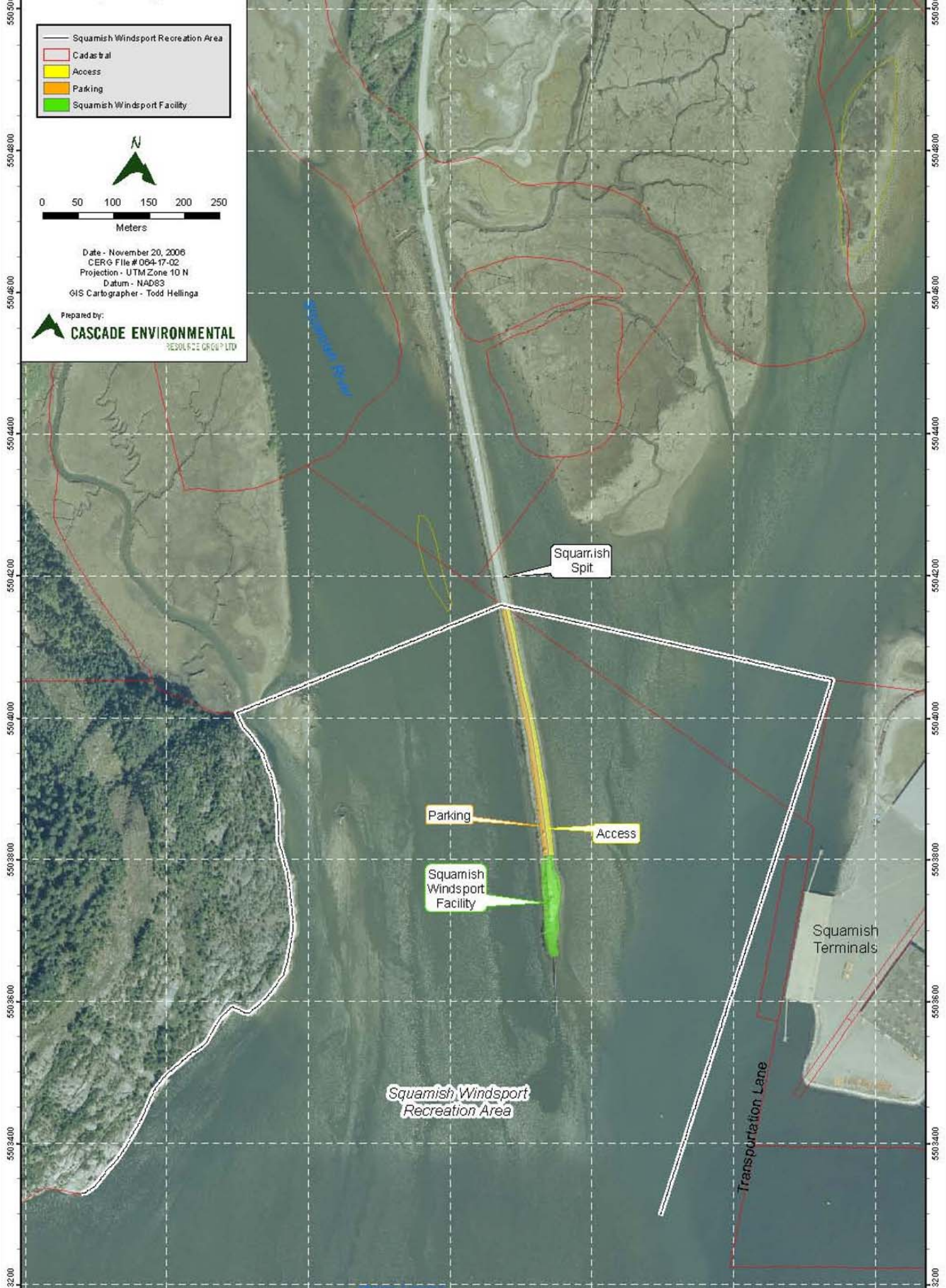


-  Squamish Windsport Recreation Area
-  Cadastral
-  Access
-  Parking
-  Squamish Windsport Facility



Date - November 20, 2006
 CERG File # 064-17-02
 Projection - UTM Zone 10 N
 Datum - NAD83
 GIS Cartographer - Todd Hellinga

Prepared by:
CASCADE ENVIRONMENTAL
 RESOURCE GROUP LTD



Squamish Spit

Parking

Access

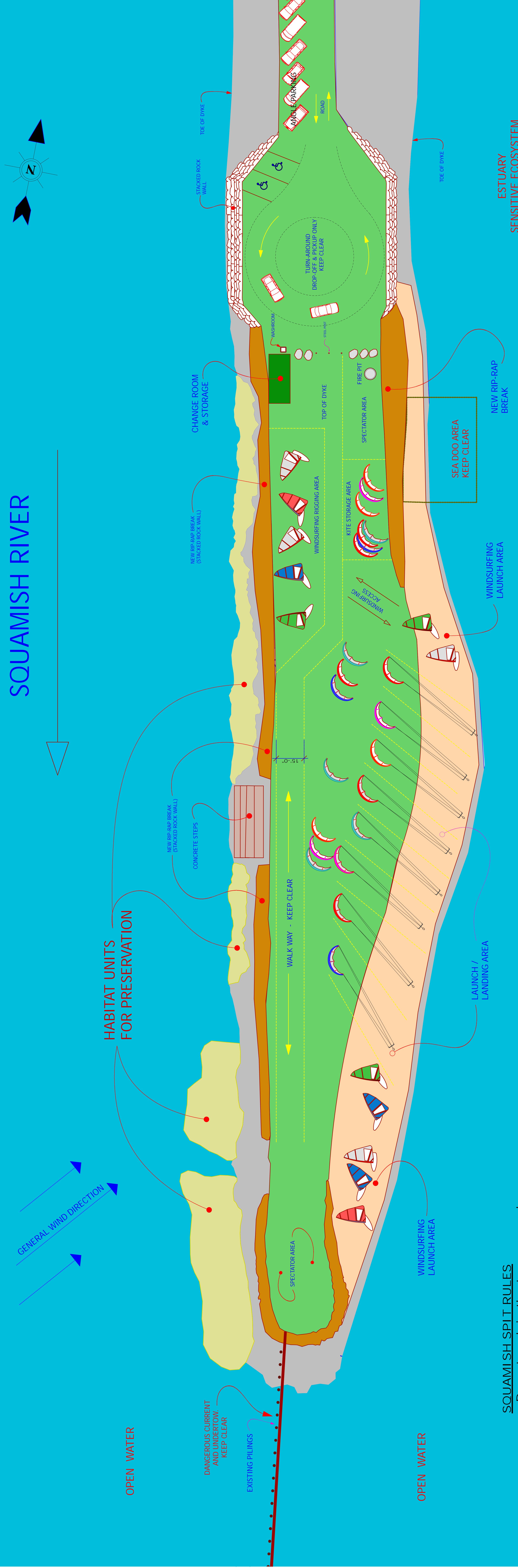
Squamish Windsport Facility

Squamish Terminals

Squamish Windsport Recreation Area

Transportation Lane

SQUAMISH WINDSPORTS SOCIETY



SQUAMISH RIVER

GENERAL WIND DIRECTION

HABITAT UNITS FOR PRESERVATION

OPEN WATER

DANGEROUS CURRENT AND UNDERCAY
KEEP CLEAR

EXISTING PILLINGS

WALK WAY - KEEP CLEAR

TURN AROUND
DROP-OFF & PICKUP ONLY
KEEP CLEAR

CHANGE ROOM & STORAGE

WINDSURFING RIGGING AREA

KITE STORAGE AREA

SPECTATOR AREA

SEA DOO AREA
KEEP CLEAR

WINDSURFING LAUNCH AREA

NEW RIP-RAP BREAK

TOP OF DYKE

FIRE PIT

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

WINDSURFING LAUNCH AREA

SQUAMISH SPIT RULES

- Do not park in the turn-around area.
- If unfamiliar with the Spit, ask the staff about safety issues
- Beginners are required to notify staff prior to heading out on the water
- The water is cold, wear a wetsuit / drysuit.
- Helmets, PFD's, and a whistle, are all recommended.
- Sail with a buddy or if you are alone, tell the staff.
- The wind may be weak in the Estuary, and far upwind of the Spit. Late in the day the wind may shut down suddenly.
- When sailing downwind of kites or close to windsurfers, look before doing tricks or jibing. Obey standard sailing regulations.
- Watch for other sailors in distress, and report them to the staff immediately.
- Never trespass on the restricted Squamish Terminal property (across the bay).

WINDSURFING

- Keep clear of kites and do not step on kite lines.
- If you are in need of assistance, wave your arms, call out and use your whistle.
- Do not leave your rig in the launching or landing areas.

KITEBOARDING

- Never fly your kite while on top of the spit.
- Do not obstruct the pathway for windsurfers.
- Lay out your lines only after you are in your wetsuit and your kite is inflated.
- Use the thumbs up signal to "launch" and not voice commands which can be misinterpreted.
- Launch while standing in the water, unless you are launching from the sand bar at low tide.
- To land your kite, tap the top of your head (international "catch my kite" signal).
- Do not leave your kite or lines in the launching or landing area.

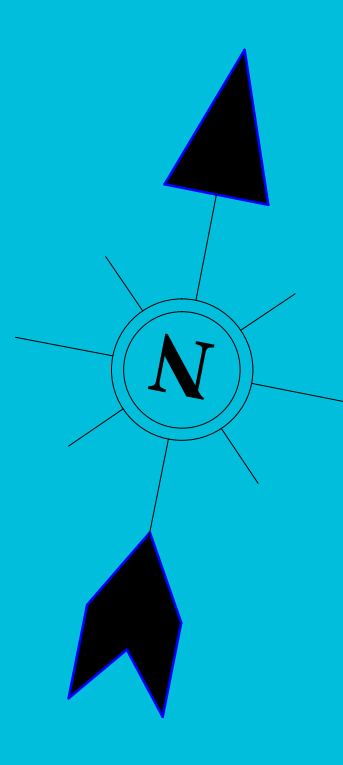
SEADOO RETRIEVAL

- Never expect a retrieval, the seadoo may be unavailable, be self sufficient.
- Kiteboarders must have their lines rolled up. Loose lines floating around are dangerous. Staff cannot assist you until you have rolled up your lines. On the retrieval seadoo, sit backwards, and hold your kite while you ride, or follow directions of staff. If you are stranded on the far shore, you can remove your lines from your kite and deflate it before your retrieval.
- Windsurfers sit backwards on the seadoo. Hold your mast across your lap with your hand on the front of the boom and with the board planing alongside the seadoo (unless otherwise instructed.)

Safety Rules for Spectators

- Keep clear of windsurfing rigs, kites and kite lines.
- Supervise children at all times.
- Dogs must be on a leash. Please clean up after your dog.

ESTUARY
SENSITIVE ECOSYSTEM



2.0 Management Objectives

With the development and formalization of operational procedures along with the implementation of environmental impact mitigation measures described in this management plan, windsport participants and spectators are provided with safe and enjoyable experiences while ensuring that they do not negatively impact the sensitive fish and wildlife resources contained within the Windsport Activity Area

The Squamish Windsport Society (SWS), manages windsport activities within the Squamish River Estuary providing a valuable outdoor recreational experience while continuing to provide comprehensive, safe, supervised, and fun activities to a broad range of people visiting, and living in the Sea to Sky Corridor.

2.1 Vision

A high quality Windsport Facility sustainably managed by the District of Squamish and the Squamish Windsport Society, to protect natural values associated with the Skwelwil'em Wildlife Management Area, enhance recreational experiences and ensure the safety of windsport participants and spectators.

2.2 Scope

Cascade Environmental Resource Group Ltd., acting as agent for the District of Squamish and the Squamish Windsport Society, has prepared this Recreational Activity and Operational Management Plan (MP) in response to MOE approving the proposed spit improvement works encroaching past the legal boundary of District Lot 7956 GP. 1, N.W.D. and into Skwelwil'em WMA. The MP incorporates the objectives and strategies identified in the Skwelwil'em Wildlife Management Area Management Plan and the 1999 Squamish Estuary Management Plan, as well as identifying the long term vision, goals and management objectives of the SWS.

This management plan describes the recreational activities and operational procedures conducted by the SWS and their members within the windsport activity area and at the Squamish Spit. The supporting maps illustrate the windsport activity area, and the windsport facility. The MP considers how the SWS will operate within the constraints imposed by existing environmental conditions in the WMA, adjacent land uses and property owners. Where potential conflicts are identified, specific management actions are proposed for avoidance or mitigation. This management plan represents a commitment to professionalism, safety, responsible land stewardship, and the spirit of co-operation with other land users.

2.3 Management Goals

As stated in the vision statement the management goals for the Squamish Windsport Society are to provide both a high quality facility for its members and visitors, and to ensure that the facility is sustainably managed. The stated management goals are defined as;

- **High Quality Facility** - Operate a High Quality Facility – for the facility to meet the definition of high quality, it will be accessible, flexible, integrated, and safe
- **Sustainable Facility** - Manage the Facility under the sustainability framework - Facility must consider Environmental, Social, and Economic Conditions

MANAGEMENT GOALS	OBJECTIVES
Quality Facility	<p>Flexible → Proposed facilities, operational plans, and management strategies will be flexible, allowing them to evolve over time to accommodate new windsport preferences, new user groups, new events, and or modify operational plans and management strategies to address future impacts or issues.</p>
	<p>Accessible → Windpark facility is designed to accommodate the wide range in abilities of windsport participants and spectators.</p>
	<p>Integrated → Management and operation of the windsport facility and the windsport society will follow integrated land management principals. The Windsport Society will continue to work with the District of Squamish, Squamish Estuary Management Committee, and the BC Ministry of Environment to operate the windsport facility and manage the windsport activity areas.</p>
	<p>Safe → Facilities will provide a safe experience for the wide range of age groups, user abilities and user types that may visit the spit. Society to develop and implement a risk management plan, emergency response plan and conduct annual operational reviews of these plans.</p>
Sustainable Facility	<p>Environmental → Provision of environmental mitigation measures to reduce impacts and protect fish and wildlife species, their habits and habitat in the highly productive Squamish Estuary will ensure environmental sustainability of the facility.</p>
	<p>Social → Provision and creation of socio – community benefits to the residents and visitors to Squamish will ensure social sustainability of the Windsport Facility.</p>

MANAGEMENT GOALS	OBJECTIVES
	<p>Economic → Provision and creation of Socio – Economic benefits for the residents and businesses will ensure the economic sustainability of the Windsport Facility.</p>

3.0 The Squamish Windsport Society

3.1 The Society

The Squamish Windsport Society is a registered non-profit society (*Certificate of Incorporation No. S-0023554*) providing sailors with access to high performance sailing where the Squamish River meets Howe Sound. Sailors have used the spit for sailing since the early 1980's. The Squamish Windsport Society was originally conceived in response to the liability concerns expressed by the landowners (BC Rail) with regards to sailors launching from the Squamish Spit. Although the society has operated under different names and under different presidents and boards, the goal of the society has remained the same.

Gary Smith is the President of the 11 member Board of Directors. The previous president of the board is Jamie Martin. The SWS holds an annual general meeting every fall, where board members resign and new board members are elected. As part of their commitment to sitting on the board, directors are assigned specific tasks to ensure that the society and the windpark are properly managed.

The Squamish Spit represents the only sanctioned Windpark in British Columbia able to host national and international level windsport competitions. The Society has a long and successful history of windsport activity management at the spit. The Society is comprised of a variety of members mostly residing in the Sea to Sky Corridor and the Lower Mainland.

Squamish Windsport Society Business Address:

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Contact Telephone Numbers:

Club President - Gary Smith
604.588.4161

3.1.1 History of the SWS

Over the past four years, the SWS has grown from an organization with no funds, no lease with the District, no employees, no insurance and no contact with anyone offering insurance, no rescue boat, and access that included a rusty container and a few odds and

ends, to the organization it is today. The SWS has now secured insurance, have \$17,600.00 on hand, a Sea Doo (paid for), a Sea Doo Dock (paid for), insurance for the club as well as directors insurance, a new turnaround and Windsport Park. The society has also been promised a \$10,000.00 donation as soon as the Redpoint Development gets municipal approval. Other assets include promotional clothing, as well as one rusty old container, a bunch of mats and a few small items.

The current SWS president, Gary Smith, credits people like Jamie Martin, the only former director for staying on and revitalizing the Society. The former executive was intending to shut down the society due to an inability to secure insurance. The other directors involved in the rescue operation were Jamie Dunwoody, who hosted meetings and fundraisers, Mark Godley who paid for the toilets for the first year just to keep the place open and who bought his own jet ski (which did many rescues). Jean Michel ran the Spit for a period of time and Keith Borg secured the funding from the District for the SWS projects as well as lined up the funds from Redpoint. A group of dedicated volunteers also contributed to the present success of the society, such as; Ross Peaty, who secured permission and placed the Wind Talker (I Windsurf/kitesurf wind sensor) and the Skypilot webcam at the Terminals. Rob Mulder conducted annual repairs on the hulls of the society's Sea Doos; and the people from Skypilot do innumerable free rescues, and paid for moorage on SWS's Sea Doo this year and loaned the SWS a Sea Doo when the society's was broken down. Colin's Kiteboarding also helped us out when the SWS was short of staff.

Now that the organization has matured the SWS executive feel it should stand on its own feet and pay its own way. The SWS has to deal with the issue of full-time staffing with well-trained staff. Major capital projects will need funding from the District and they need to secure other funding sources to continue to improve what is becoming a successful society.

3.1.2 Membership Numbers, Visitor Numbers and Daily Use.

The Squamish Windsport Society has maintained a membership base for over 20 years. Membership of the Windsport Society peaked in 1997-98 with 350 members. In recent years the annual membership has dropped to as low as 105 members in 2005; however membership has been steadily climbing back up to 250 members last year. With the recent improvements to the spit, it is expected that membership will continue to increase up to 300 members this year, and it is expected that the membership numbers will continue to climb.

On average, 30% of daily windsport participants at the Squamish spit are visitors, paying a day use fee. 40% of the day use fees are collected from windsport schools using the windsport facility. During the windsport season (May 15 to September 15), 50-75 windsport participants use the windsport facility during the week and 75 to 150 participants use the facility on the weekends. In addition to windsport participants, between 25-50 spectators commonly visit the spit during the week, and 50-100 spectators commonly visit the spit during weekends and holidays.

The windsport facility receives very little use outside of the windsport season. As part of this management plan the windsport society has agreed to monitor use outside of the season with respect to how it may affect wildlife habitat, specifically over wintering habitat for migratory birds.

3.1.3 Demographic Profile of Membership

Membership to the Squamish Windsport Society is divided between residents of the Sea to Sky Corridor and residents of the Lower Mainland. In the Sea to Sky corridor, 80% of the members live in Squamish, with the remaining 20% of members living in Whistler. The majority of members are between the ages of 25 to 55 years. 10% of the membership is aged youth to 25, with 50% of the membership aged 25 to 40, and the remaining 40% of the membership greater than 40 years old.

Work vocations for the Squamish Windsport Society membership includes trade professionals, service industry, teachers, outdoor guides, engineers, planners, pilots, professionals, entrepreneurs, and self employed folks. The majority of these members participate in other adventure sports commonly practiced in the sea to sky Corridor including skiing, mountain biking, sledding, dirt biking, cross country skiing, and local team sports. Furthermore the membership provides great value on the type of recreational experience enjoyed while sailing at the Squamish Windpark.

3.1.4 Anticipated Economic Benefits Realized from the Windsport Facility.

The Windpark diversifies the local economy by providing a destination for windsport enthusiasts to come ride, practice, race and enjoy windsports in the District of Squamish. It is not uncommon for windsport participants to travel from as far away as the United States, Europe and eastern Canada to enjoy the reliable wind and sailing provided in Squamish. The certainty and opportunity associated with the operational / management agreements between BC MOE, the DOS and the SWS, and the LOO held by the DOS, allows the DOS to expand its tourism product offerings, thereby providing a lasting contribution to both the local and provincial tourism economies.

Although no formal economic or social impact studies have been commissioned to determine what type of impact the Windsport Facility and Windsport Society have in Squamish and surrounding areas, the society believes that the windsport facility attracts both new residents and businesses to Squamish. A couple of kiting schools, locally owned and operated through the summer season, provide 8 jobs for the residents of Squamish. In addition, a website and online community called Skypilot Kiteboarding is operated locally by a Squamish resident.

The Squamish Windsport Society regularly hosts National and World Cup level windsurfing and kiting events. It is anticipated that these events spin off significant economic benefits to the District, businesses and residents of Squamish. The Squamish Windsport Society intends on commissioning an economic impact assessment in the near future, to quantify what level of economic benefit is provided for Squamish from the Windpark.

3.2 Windsport Society Staff

As defined in the Windsport Sublicence and Management Agreement, the Squamish Windsport Society agrees to provide a full time site attendant for the Windpark during the

Windsport Season (May to September). Responsibilities of the site attendant include meeting, greeting and orienting windsurfers, kites, and spectators to the facilities contained within the Windpark. Daily responsibilities of the Windpark site attendant include;

- Distributing waiver forms, collecting user fees, and maintaining daily records receipts and deposits of user fees;
- Keeping the Windsport Facility clean, removing garbage and maintaining portable toilets;
- Providing first aid kit and supplies;
- Carrying out daily safety inspections of the Windsport Facility;
- Taking inventory and monitoring Windsport Facility equipment and signage;
- Enforcing rules and regulations;
- Recording expenses, submitting time sheets, recording statistics and making weekly reports to SWS;
- Locating and maintaining the availability of a retrieval craft at the Windsport Facility, and operating it as required;
- Providing daily weather conditions and Windsport Facility conditions on an information board.

The Windpark operating season extends from May to September annually. The Windpark site attendant will be present 7 days a week including holidays during July and August. The site attendant will work a minimum of 5 days a week, including weekends and holidays during the months of May, June and September. The Windsport Society employs 2 full time staff and 2 part time staff throughout its operating season.

3.2.1 Qualifications of Staff

It is understood that in order to qualify as a site attendant for the windsport park, prospective staff be over 19 years old and be able to undertake basic tasks with minimal supervision. Upon being hired as a Windpark Site Attendant, attendants will be trained by the society to:

- Handle Hazardous material including the application of safe storage techniques, fuel spill avoidance techniques and fuel spill emergency response procedures,
- Implement the Emergency Response Plan and
- Basic conflict resolution strategies.

In addition staff members will be expected to have a basic level first aid certification, and be comfortable working around water.

3.3 SWS Risk Management Planning

The Squamish Windsport Society developed a basic risk management plan to minimize risk to the windsport society, to windsport participants, and risk of impacts to the environment from regular windsport operations. The practice of risk management does not intend to eliminate risks, but instead to identify, reduce and manage the level of risk in order to decrease risk to the user, risk to the environment, and manage liability to the Windsport Association.

There is no one simple solution to managing risk and thus minimizing exposure to liability. Managing risk and minimizing exposure to liability will be accomplished by employing a multi-faceted approach to reduce exposure to people, the society and the environment through the incorporation of the following strategies;

- Development, implementation and adoption of facility operational standards.
- A comprehensive signage program.
- A coordinated risk management effort.

It is expected the Windsport Facility attendant will be responsible for implementing the risk management plan on a daily basis, with the Board of Directors to review the plan on an annual basis. A copy of the risk management plan will be stored at the spit, and available for use by the Windpark attendant or members of the Windsport Society when needed.

3.3.1 Liability Insurance

Squamish Windsport Society maintains an insurance policy as required by the Sublicence and Management Agreement. This comprehensive general liability insurance covers \$5,000,000 per occurrence for bodily injury and property loss and damage, as well as advertising injury liability up to \$25,000.00. The policy names the District and the Province as additional insured. All windsport members and guests are required to sign a waiver prior to using the windsport facility.

Should an incident occur during regular operations the windsport attendant will be required to document the incident using written descriptions, diagrams, and/or pictures, as well as taking witness statements from all parties involved in the incident and / or witnesses to the incident. Documentation of all incidents will be stored at the Squamish Windsport headquarters indefinitely.

3.3.2 Signage Plan

Signs are a critical component to ensure that all users and visitors to the Squamish Windpark make informed decisions. Signs ensure users have the information they need to make informed choices about their recreation experience. Adequate and informative signage also constitutes a necessary component of a comprehensive risk management program. By clearly explaining risk associated with using the windpark and adequately marking those risks at the entrance, the windsport society will protect visitors, spectators and participants and minimize the society's exposure to potential liability.

Squamish Windsport Society will place signage at the facility to display information regarding membership, rules and regulations, policies, fees, waiver forms, rules while inhabiting the water and any other information that the District or SWS considers to be appropriate. Signage will also be used to inform spectators, visitors, and non participants of the potential risks they may encounter at the windpark, as well as direct them to the designated safe viewing area.

Signage Hierarchy

Adequate signage must be provided at Windpark entrance, in the vicinity of the launch areas and at strategic points within the facility to warn visitors of a hazard or significant environmental feature. Each type of signage must balance the need for the appropriate amount of information while respecting the need to maintain the integrity of outdoor recreation experiences by minimizing signs.

Entrance / Greeting Signage

Network entrance signs, typically associated with parking lot kiosks, provide users with a variety of information about the facility, designate use or zoning of areas contained within the facility and additional information relating to the environmental setting and the surrounding Wildlife Management Area. The signage must provide at a minimum, enough information for a prospective user, visitor and or spectator to make an informed choice about the activity they are going to undertake. Entrance signage can also provide information regarding current issues, community involvement, stewardship, and or provide recognition of local sponsors.

Network / entrance signage should be located at the beginning of the spit (yellow gate) and at the Emergency Vehicle Turnaround, welcoming visitors, spectators and users to the windpark. Network / entrance signage should include:

- Map of Windsport activity areas / facility area
- Description of areas, including zoning or allowable uses to occur within each area
- Locations of site office, washrooms, equipment drop-off, launching and parking areas
- Map scale
- Windsport / facility etiquette / rules
- Safety information
- Permitted use(s)
- Environmental considerations (environmentally sensitive areas (section 4.4.4), Wildlife Management Area boundaries, waste management)
- Emergency Contact Information
- Trail community information (sponsors / or programs offered at the facility / camps / recreational social functions) - could be a bulletin board area

Windpark Signage

Facility signage is used to mark the designated use areas, inform users, spectators, and visitors of potential hazards and provides users with adequate information to make informed decisions regarding their activity, the facility and the designated activity areas. Facility signage should be categorized into two types, signage intended to provide information / designation of the specific activity / use zoning, and signage intended to warn people of a hazard / risk. Warning signs should be distinguished from information signage by both shape and color. Facility signage should include:

- Zoned use, identified hazard or specific information to be communicated to user, visitor or spectator.
- Use at your own risk disclaimer.

- Warning of hazard if present (such as fishing boat season)
- Applicable logo(s).
- Simple direction as to how user, visitor or spectators should react, what they should expect, or how they respond to minimize their risk.
- Hazard signs should be triangular.
- Information signs should be rectangular.
- There is an opportunity to incorporate messages and information about the Squamish nation's use of the area.

3.3.3 Hazardous Materials Storage/Handling Plan

The objective of the Hazardous materials storage and handling is to minimize the potential for hazardous materials spills during storage, servicing and or refueling of mechanical equipment. It is expected that the windpark attendant will take all necessary precautions to reduce the likelihood of spills during regular operational activities such as refueling the emergency Jet-skis or generators that may be used for events. If, however, a spill should occur on the site, the site attendant will be provided with site specific emergency response procedures for both spills to water and land. Additional instructions for disposal of hazardous waste and spill clean materials are also included in this plan.

All windsport board members and people working at the windsport facility will be familiar with the hazardous materials storage and handling at the windsport facility.

General best practices for hazardous materials storage and handling include:

- Propane storage, lubricant storage, storage of other petroleum products and fuel storage associated with diesel and/or gasoline generators shall be designed to meet or exceed the existing safety regulations of the appropriate Provincial Petroleum Association, the National Fire Code and the Workers' Compensation Board. All storage facilities associated with the Project will be installed and operated in compliance with CCME Environmental Code of Practice.
- Underground storage of hazardous products shall not be permitted.
- No equipment servicing will be conducted at the windpark facility other than routine maintenance such as re-fuelling or checking the oil of equipment. All equipment servicing will be required to occur off site.
- Where possible the refueling and lubrication of equipment will be conducted at a designated area near the container or the proposed windsport facility storage structure.
- All mechanical equipment is to be in good operating condition and free of any leaks, excessive oil and grease.
- Waste fuel, oil, solvents, and other petroleum products shall be disposed of off-site at a location designated for hazardous materials disposal
- Any spill of petroleum products greater than 10,000 ml (10 liters) shall be reported immediately to the Environmental Coordinator with the District of Squamish. Clean up of such spills shall commence immediately. Reporting of petroleum spills to authorities shall be as set out in the appropriate legislation and regulations. Such reporting is the responsibility of the Windsport Society. The Windsport Society is also responsible for reporting all spills larger than 100

liters of flammable liquids to the Provincial Emergency Program (PEP) of the Ministry of the Solicitor General. Where it is not practical to report to PEP within a reasonable time, the spill shall be reported to the nearest detachment of the Royal Canadian Mounted Police.

- No long term fuel storage facilities will be allowed on site.
- The spill response plan to deal with spillage or leakage of fuel shall include an on-site spill response kit with a supply of oil absorbent material.
- The Windsport Facility will be responsible for providing an emergency spill kit with a supply of oil absorbent material.

Prevention of Spills and Preparedness

During operations, The Windsport facility operator and windsport facility board members will:

- 1 Ensure all equipment operating at the Windpark is equipped with absorbent spill pads.
- 2 Ensure all employees are familiar with spill response protocol and ensure a copy of this Spill Response Plan is accessible to all persons on-site.
- 3 Ensure proper spill containment material is in place (i.e., spill pallets for drums, absorbent pads, diapers, etc.).
- 4 Ensure a spill response kit capable of containing and absorbing spills be made available and maintained at the site where hazardous materials are stored and/or used.
- 5 Ensure all employees are familiar with spill kit locations, function, and use.

3.3.4 Emergency Response Plan

The Emergency Response Plan (ERP) was created to address general emergency response priorities, objectives, and strategies. The ERP is designed to serve as a general plan to guide emergency response actions by the site attendant, windsport members and visitors to emergencies at the Windsport park. The purpose of the the SWS emergency response plan is to;

- Reduce the risk of exposure to individuals and the environment.
- Clearly define the course of action in the event of an emergency.
- Ensure Windsport facility staff is aware of the correct emergency response action to respond to an emergency.

In general the objective of emergency response planning is to develop a clear set of emergency response procedures to protect human life, protect sensitive environmental resources in the vicinity of the windpark facility and protect District of Squamish or Squamish Windsport Society infrastructure. It will be the responsibility of the Windsport Society to develop site specific emergency response procedures and protocols to respond to emergencies at the Windpark.

3.3.5 Waste Management Plan

The Waste Management Plan is based upon three common waste management principals, “*reduce, reuse, and recycle.*” The goal of the Waste Management Plan is to ensure that waste materials are being used efficiently and only disposed of after consideration is given to reusing, or recycling them. In general, Windsport facility should adhere to the following solid waste best management principles:

- Maximize the use of materials that have recycled content or materials that have been previously used
- When building temporary or permanent structures, use methods and materials that will last and ensure that they are built so that they can be disassembled and reused for future events.
- Provide clearly labeled receptacles, describing types of materials that can and cannot be deposited into the receptacle. By organizing the waste, materials to be reused will remain stockpiled on site, and recyclable materials will be picked up by designated recycling companies. By minimizing the amount of waste generated from the site, the society will realize a cost savings in waste disposal.
- Ensure that packing materials such as crates / palletes, or materials that can be reused by materials suppliers are returned rather than disposed of.
- Ensure that potentially hazardous waste materials such as oily rags or used spill pads are separated from regular waste.
- Ensure that hazardous waste, such as lubricants, fuels, chemical, and their receptacles are properly disposed of.
- Separate food waste from regular waste. Food waste should only be stored in designated wildlife proof receptacles and emptied regularly. It is preferable that all food waste is composted
- The site attendant should conduct regular visual inspections of the waste receptacles to ensure that recyclable materials are not being deposited into waste receptacles, and waste is not being deposited into the recycling receptacles.

Through the implementation of the Solid Waste Management Plan, Windpark waste will be organized, where recycling and reusing of materials will be maximized, and waste requiring disposal will be minimized. Waste receptacles should be emptied and secured on a daily basis to prevent people from dropping off waste after operating hours.

3.3.6 Human Waste Management Plan

The Squamish Windsport Society will provide and service port-a-potties to be located at the end of the Squamish Spit. During busy times such as long weekends, events or summer season additional port-a-potties will be ordered and positioned on the spit, to ensure accessibility to the port-a-potties for all visitors. In general port-a-potties will be emptied and sanitized on a weekly basis. However, if needed, the frequency of servicing port-a-potties will be increased.

4.0 Windpark Site Management

4.1 General Location Description

Located at the head of Howe Sound Inlet on a constructed spit, where the Squamish River meets the Howe Sound (see Map 2: Windpark Overview Map and Map 3: Site Map). The SWS main base is located at the southern end of the spit at the Windsport Park. The base area will function as a parking, staging and administration area for SWS members and guests.

4.2 Access Through the WMA to the Windpark

Squamish Windsport Society members access the spit parking lot directly from the dyke road, passing through the Squamish Estuary. Parking is located at the southern end of the spit on the west side. From the parking area, access to the water is gained through the staging area at the south end of the spit. On a busy day, participants are forced to park a long way from the designated windsport launch area. To facilitate accessing the launching area, there is a pick-up / drop-off turnaround area at the southern end of the spit. This area also provides emergency access should emergency or maintenance vehicles require access to the Windsport launch area.

4.3 Windsport Activity Area

The windsport activity area as defined in *Figure 6* of the Skwelwil'em Wildlife Management Area Management Plan includes the southern most end of the Wildlife Management Area (WMA). The eastern boundary of the activity area is defined by the Squamish deep sea port transportation corridor, with the northern boundary extending west from the northern boundary of the transportation corridor and the southern boundary of the East Marsh to the southern boundary of the West Delta. The western boundary is defined by the extent of the intertidal zone along the western edge of the WMA. The location of the Squamish Windsport Park is illustrated in *Map 1: Squamish Windpark Location Map*, and the Windsport activity area is illustrated in *Map 2: Squamish Windpark Recreation Area*.

4.4 Windpark Intensive Use Areas

Table 1. Squamish Winsport Facility Intensive Use Areas –

Zone	Dedicated Activity
1	Parking
2	Equipment Drop-off and Emergency Vehicle Turnaround
3	Rigging and Launch Area
4	Spectator Accommodation Area
5	Environmentally Sensitive Areas

4.4.1 Parking

Windsport facility parking is located at the west side of the spit. Cars are encouraged to park diagonally along the spit to allow room for emergency vehicles to pass on the eastern side of the spit. During busy summer weekends, or planned events, the windsport society will hire additional staff to manage parking at the spit. In addition the Windsport Society will dedicate and manage two disabled parking spots at the south end of the parking area adjacent to the emergency vehicle turnaround.

4.4.2 Pick up/Drop off, Emergency Vehicle Turnaround

The emergency vehicle turnaround separates the rigging and launching area from the parking area at the southern end of the spit. Part of the emergency vehicle turnaround area is dedicated to equipment pick-up and drop off, to facilitate members and visitors accessing the launch area with the large amount of gear required for both kiting and windsurfing. Providing the pick-up drop off area encourages all participants to launch from the designated area, minimizing impacts to environmentally sensitive areas adjacent to the parking area.

4.4.3 Rigging and Launching Areas

The rigging and launching is defined as both the surface of the spit and gently sloping beach on the eastern side of the spit. This area will be reserved for rigging kites and windsurfing sails. Because of the nature of rigging and launching kites and windsurfers, this area can be very dangerous to spectators and young children who are not familiar with windsports. Therefore this area will be intensively managed through the signage program and by the on duty site attendants, to ensure that people are rigging, launching and storing gear in the designated areas.

In addition a dedicated path will be maintained for spectators to access the spectator area at the south end of the spit. Signage will be erected along the path to ensure that the path remains free of windsport gear, and to warn visitors of the hazards associated with high winds and the potential for windsport gear to become airborne.

4.4.4 Environmentally Sensitive Areas

Because the windsport facility and windsport recreation area is contained within the Skwelwil'em WMA, the entire site is considered an environmentally sensitive area. However for the purpose of this section, environmentally sensitive areas are defined as the salt grass / sedge habitat areas located in the upper inter-tidal zone along the western edge of the Squamish Spit (Map 3). It is expected that the Squamish Windsport Society will erect signs, to educate users as to the locations of these areas. This inter-tidal vegetation is to be protected from impacts resulting from windsport activities at the Squamish Windpark

4.5 Windsport Facility Improvements

4.5.1 2006 / 2007 Improvements

The District of Squamish and the Squamish Windsport Society undertook improvements during the spring seasons of 2007 and 2008 to improve the rigging, launching and

spectator accommodations at the spit. Specifics of the works included widening the surface of the spit towards legal boundary along the western edge of the spit, expanding the launching area on the east side of the spit, and creating a new spectator / viewing area at the south end of the spit. All sensitive works were conducted in the presence of an environmental monitor provided by Cascade Environmental Resource Group Ltd.. All improvements were conducted according to construction mitigation measures provided by CERG and additional measures provided by the Squamish Estuary Management Committee provided in a Letter of Advice authorized by Brian Naito.

4.5.2 Future Improvements

The Windsport Society intends to continue improving the Windsport Facility in the future. Proposed works recently discussed by the Windsport Society Board of Directors include:

- The construction of a permanent building to house the Windsport Society headquarters and store equipment required for operations.
- The improvement of access and accommodation for viewing and spectating at the south end of the spit.
- The construction of a ramp and dock near the emergency vehicle turnaround along the eastern edge of the spit to moor *emergency use* jet-ski during operational hours.
- Improving the signage in and around the Windsport Facility.

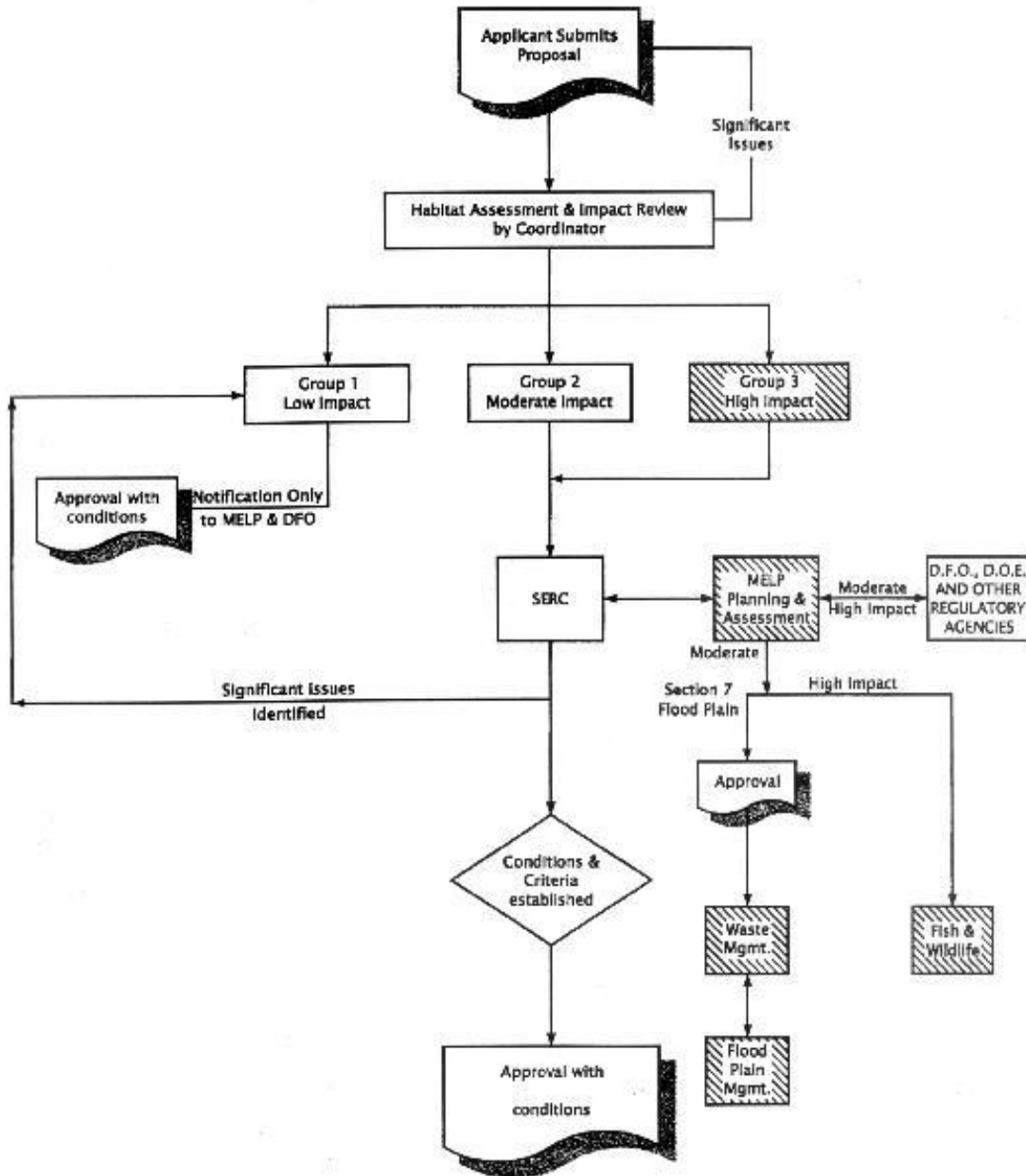
As part of ongoing improvements, the Windsport Society intends to undertake semi-annual maintenance activities prior to closing the spit for the winter, and prior to opening the spit for the spring sailing season. Repairs conducted as part of the semi annual maintenance will ensure that the spit is protected from the winter high tides and associated severe weather events, as well as for the safe operation of the spit during the sailing season.

4.5.3 Approval Process

Administration of the Squamish Estuary Management Plan (SEMP) is undertaken by the Squamish Estuary Management Committee (SEMC). The function of the SEMC is to coordinate planning and management of environmental and developmental activities in the SEMC area. The Windsport facility and windsport activity areas are contained within the Skwelwil'em WMA which under the SEMC is zoned as a conservation area, thus dedicated to the maintenance and enhancement of fish and wildlife habitat. Therefore any new activities, development, or improvements to the spit will be expected to protect fish and wildlife habitat and subjected to the coordinated project environmental review process defined within the SEMC and conducted by the SERC .

The project review process as illustrated in *Figure 10: Squamish Estuary Management Plan Environmental Review Process*, defines the process under which future windsport society projects will be reviewed. The process defines 3 levels of environmental review based upon the level of perceived environmental impact that may result from future works. It is recommended that the Squamish Windsport Society retain an environmental consultant to review any future projects before they are submitted to SERC for review. Please refer to the Squamish Estuary Management Plan (SEMP, 1999) for more detailed explanation of the environmental review process.

Figure 10 - Environmental Review Process



5.0 Natural Values Management

The primary objective of the Skwelwil'em Wildlife Management Area is to maintain and enhance fish and wildlife habitat. Because the Windsport Activity Area and the Squamish spit area are contained within the Skwelwil'em Wildlife Management Area, the purpose of this section is to identify the environmental features and wildlife habitat contained within the Windpark and Windsport Activity Areas, and provide suggested mitigation measures to reduce impacts to these environmental features.

5.1 Physical Environment

5.1.1 Climate

The Windpark lies within the Southern Pacific Ranges Ecoregion in southern British Columbia. The area located east of Georgia Strait, is known for its steep, rugged mountains and high precipitation (Campbell et al., 1990). Summers are usually cool, although hot dry spells are common, and winters are mild (Meidinger and Pojar, 1991).

The meteorological records from the Squamish Weather Station record an annual total precipitation of 2,367 mm, which mainly falls as rain (Canadian Climate Normals 1971 - 2000). The total precipitation peaks in the month of November, and is least in the month of August, with averages of 378.9 and 59.6 mm of precipitation, respectively. The mean annual temperature is 9.0°C at the Squamish Weather Station. August is the warmest month, with a mean daily maximum temperature of 24.5°C, and a mean daily temperature of 17.8°C. Conversely, January is the coolest month with a mean daily minimum temperature of -2.5°C, and a mean daily temperature of 0.2°C.

The area is buffeted by strong katabatic winds outflowing down the Squamish and Cheakamus Valleys to Howe Sound and Georgia Strait. In fact, the name Squamish means "strong wind" in the local native dialect. The strongest of these winds usually occurs in winter months, when a cold, high pressure area develops in the interior of the province, and outflows to low pressure areas on the coast. In addition to these seasonal winds, the Squamish area is subject to diurnal air movements (thermal winds) typical of mountainous areas. Winds typically blow off shore, to the south, in the morning, and change to onshore winds, to the north, in the afternoon.

5.1.2 Geology

The Windpark is located within the Coast Plutonic Complex of the Cenozoic-Mesozoic eras. The bedrock geology in the Squamish Estuary areas is Mid-Cretaceous granodioritic intrusive rock in the low lying areas with Late Jurassic quartz dioritic intrusive rock on the adjacent hillsides (BC Ministry of Energy and Mines, 2004). Quaternary deposits in the area appear to be composed of glacial tills, and outwash, overlain by recent alluvial deposits from the Mamquam and Squamish Rivers.

5.1.3 Geomorphology

The Squamish Estuary is located on the ancestral Mamquam / Squamish River flood plains. The historic geomorphic activity of fluvial deposition as a result of seasonal or periodic flooding of the Mamquam and the Squamish Rivers was halted with the construction of training berm/dykes along these rivers. Thus, existing conditions represent ancestral floodplains recently modified through the construction of the training berm / dykes along the southern and eastern sides of the Mamquam and Squamish Rivers

5.1.4 Hydrology

Local hydrology at the end of the spit is tidally influenced by the marine waters of Howe Sound, and the freshwater systems draining into the Squamish River. The Squamish Estuary or the marine freshwater interface found at the end of the Squamish spit results in brackish water from the mixing of freshwater and saltwater environments. All estuaries contain a semi-enclosed body of water, where an open connection to the ocean exists which is diluted by fresh water originating from the land, and landward freshwater habitats are altered by the tidal influence of the ocean (Stewardship Canada, 2008).

Freshwater influences from the Squamish River include increased river levels during spring and summer snow melts, along with fall and winter heavy rain events. The river levels are reduced during times of prolonged dry cool weather in the fall, winter and early spring.

Saltwater influences from Howe Sound result both from daily tidal activity, and seasonal weather influences, with 2 low tides and 2 high tides occurring daily in the marine environment of Howe Sound. Lowest of the low tides generally occur during the spring and early summer months, whereas the highest of the high tides occur during late fall early winter. In the winter extreme weather, including high winds, rainfall and high winter tides combine to produce the highest annual water levels in the vicinity of the Squamish Spit.

5.1.5 Habitat Area Descriptions

The Windsport Facility and Windsport Activity Area as defined in the Skwelwil'em Wildlife Management Area contain mostly altered shore and rocky shore habitat types. Although the estuary and mud flat habitat types contained within the Skwelwil'em WMA are located outside of the designated Windsport Activity Area, they are located adjacent to the windsport activity area, and may be impacted by windsport activities.

Rocky Shore Habitat Type

Rocky shores are located along the western shore of the Windsport Activity Area, consisting of mainly steep bedrock extending below the low tide line. Rocky shore habitats provide opportunities for species of animals and plants that attach to the rocky substrates or use crevices for cover. Important features associated with rocky shore habitat types include the preservation of micro habitats including rocky crevice areas and structure forming species such as rockweed and kelp that provide habitat complexity, and shelter for both predators and prey species important in the ecosystem. (Stewardship Canada, 2008)

Because of the steep nature of the rocky shore habitat within the WMA, tired or broken down windsport participants are prevented from landing in this habitat type. Impacts to this habitat area therefore are expected to be minimal to nil from windsport activities.

Modified Shores

Modified shores contained within the Windsport Activity Area include the Squamish Spit and the Squamish Terminals Deep Sea Port located to the east of the Windsport Activity Area. Altered shore habitat types found within the windsport areas include coarse rock / rip-rap types and cobble/gravel types.

The coarse rock / rip-rap altered shore habitat types provide both erosion protection and structure to the spit. This altered shore habitat type provides habitat characteristics that contribute to habitat diversity by increasing the surface area and complexity of habitat through increasing the amount of crevices. Crevices are important intertidal zone habitat features in that they promote colonization of algae, invertebrates, barnacles, rock weed, and provide shelter from predators during high water. In addition, during the low tides, the crevices provide dark moist environments that support species that are susceptible to desiccation during low tide periods. During the spring of 2007, herring were documented spawning in the coarse rip-rap areas along the eastern edge of the spit. Eggs attached to the underside of rock out of direct sunlight stayed moist much longer than those attached to the exposed surfaces of the rip rap.

Cobble / gravel altered shore habitat types are located along the toe of the Squamish Spit defining the interface between the native sand/mud estuary bottom and the structural rip-rap of the Squamish spit as well as the constructed launching area along the eastern edge of the southern end of the spit. Since the launching area receives high traffic during the spring and summer operating times, this habitat is regularly disturbed by windsport participants, thus providing little in the way of habitat for intertidal species. The launch area was constructed on the leeward side of the spit to minimize erosion from wave action and erosion from the Squamish River. In addition the launch area was constructed using coarse cobbles to minimize the erosion potential of cobble substrate onto mudflats and into rip-rap crevices.

Estuary and Mud Flats Areas

Because the brackish nature of the water within the windsport activity area, the entire windsport activity area is described as an estuary under its formal definition. However, for the purpose of this section, the estuarine habitat type is described as large delta areas made up of fine sand and silt sediments, tidal channels and intertidal salt marsh areas dominated by grasses, sedges and rushes located to the north of the identified windsport activity area. Estuarine habitat types are formed through natural physical processes associated with river flow, river sediment supply, tides, wind and long-shore sediment transport (Stewardship Canada, 2008)). Mud flat and estuarine habitat types are sensitive to disturbance when these processes are disrupted.

The complex habitat provided in the tidal channels, intertidal mud flats, and vegetated intertidal salt marshes provide cover, detritus and produce invertebrates used as food sources by fish and birds (Stewardship Canada, 2008). The mud flats provide important foraging areas for migrating shore birds, and important staging /overwintering habitats for

migrating waterfowl. In addition the majority of bird species regularly observed in the Squamish Estuary during the windsport season show preference for estuarine and mudflat habitat types (See Section 5.2.3)

Estuarine and tidal mud flat habitat types provide the greatest potential for disturbance from windsport activities. Although these habitat types are located outside of the Windsport activity areas, beginner sailors who cannot stay up wind or broken down sailors tend to drift outside of the windsport activity area and into the sensitive estuary habitats. To minimize impacts from these sailors walking back to the Squamish Spit across the vegetated intertidal areas, the Windsport Society has an emergency Jet-ski to rescue beginner and broken down sailors, bringing them back to the spit. In addition the Jet –ski will be used to patrol the windsport recreation area boundaries, and discourage expert sailors from sailing deep into the estuary, thus minimizing impacts to wildlife and sensitive estuarine habitat types from sailors.

5.2 Natural Environment

5.2.1 Vegetation

Vegetation communities contained within the Squamish Estuary are separated into aquatic and terrestrial species of vegetation. The District of Squamish actively manages terrestrial vegetation along the Squamish Spit in the vicinity of the Squamish Windpark, to protect the structural integrity of the spit.

Sensitive vegetation areas identified during site visits by Cascade Environmental during the fall of 2006, were pockets of salt grasses / sedges along the western side of the Squamish Spit and isolated pockets of rockweed along the southern tip and the north eastern edge of the windsport launch area. The small pockets of salt grass are important fish habitat features located in the mid-tidal area along the western edge of the spit.

Included as part of the letter of advice from SERC giving permission for the SWS to proceed with improvements to the spit in the spring of 2007, the SWS was to ensure that the areas of salt grass and rock weed were protected. It is recommended as part of the signage strategy, that the SWS erect signs, illustrating these environmentally sensitive vegetation areas, to educate users of their importance and help protect the areas impacts associated with windsport activities into the future.

5.2.2 Fisheries Values

The Squamish Estuary provides excellent habitat for a wide variety of fish species. The brackish water found throughout the Squamish Estuary helps both juvenile and adult species of fish transition between freshwater and marine environments during their seasonal migrations. It is not expected that windsport activities will disrupt seasonal migrations of fish through the Squamish Estuary, however operational windsport activities could impact fish habitat.

Herring were observed to spawn amongst the rockweed and coarse rip-rap on the eastern side of the spit during construction activities in early March 2007. Construction on the east side of the spit was immediately suspended for a period of two weeks, allowing time for the roe to hatch. The most abundant herring roe were documented in the crevice like habitat provided by the stacked rock wall of the emergency vehicle turnaround. As the

herring spawn occurred outside of the windsport season, and in protected areas away from the launch areas, regular windsport operations are not expected to interfere with the annual herring spawning activities at the Windsport Facility.

Mitigation measures described in this management plan to minimize impacts to fish habitat in the vicinity of the Squamish spit include;

- Providing a designated launching area for windsport participants to stage their activities from.
- Operating a emergency Jet-Ski to pick up beginner and broken down sailors, and prevent them from drifting deep into the estuary.
- Providing the society with proper hazardous material handling and storage proceduces, as well as providing an emergency spill response plan, should a spill occur.
- Protecting salt grass / sedge areas on the western side of the spit through recent spit improvement works. Erecting signage along the spit, to identify environmentally sensitive fish habitat areas.

With the application of the above mitigation measures, regular operational windsport activities at the Squamish Spit will have little to no impact on fish and fish habitat in the Squamish Estuary.

5.2.3 Wildlife Values

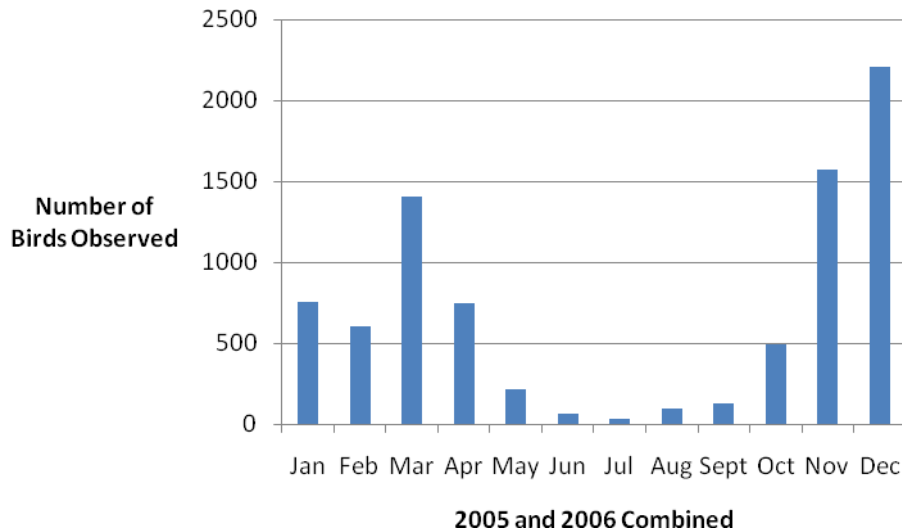
Types of wildlife known to frequent the Skwelwil'em WMA include birds, mammals, and herptiles. Because of the location of the Windsport Facility, and the windsport activity area, birds are the most likely wildlife type to be impacted by windsport activities. In addition the stated management objective in the Skwelwil'em WMA Management Plan is to "*maintain and enhance wildlife populations and habitats, giving special attention to species at risk, water fowl, and migratory birds*" (B.C. Gov., 2006). Therefore this section will focus on bird species that frequent the Squamish estuary, what time of year each species frequents the estuary, what their habitat preferences are, and the likelihood that they may be impacted from windsport activities in the Windsport Activity Area.

The Squamish Spit borders the Squamish Estuary which provides habitat for numerous migratory bird and waterfowl species. Bird count data has been collected monthly since 1992, first by birders from the Vancouver Naturalist History Society, and more recently by the Squamish Environmental Conservation Society (SECS). In the five year period from 2003 to 2007, 193 bird species were observed in the Squamish Estuary. Notable species include greater white-fronted goose, snow goose, trumpeter swan, and double-crested cormorant (blue-listed). Several species on the provincial red- and blue-lists have been observed in the estuary and are described in *Section 18.0 Rare or Endangered Species*.

Bird species grouped by habitat use can be used to assess potential impacts from wind sports across seasons. Migratory waterfowl, which include geese, swans and ducks, occur in the greatest numbers over winter, with a peak in November and December (Figure 1). They occur on the estuary in lower numbers from May to September and most do not breed locally. It should be noted that Canada geese and mallards, both managed species in the province, have been omitted from observation totals due to their relatively high, year-round abundance in Squamish. Species observed include geese (greater white-fronted, Brandt's), trumpeter swans, ducks (wood, ring-necked, long-tailed), gadwall, American and Eurasian widgeons, blue- and green-winged teal, northern shoveler,

northern pintail, canvasbacks, greater and lesser scaups, buffleheads, common and Barrow’s goldeneyes, hooded and red-breasted mergansers, common loon, grebes (pied-billed, horned, western), and cinnamon teal.

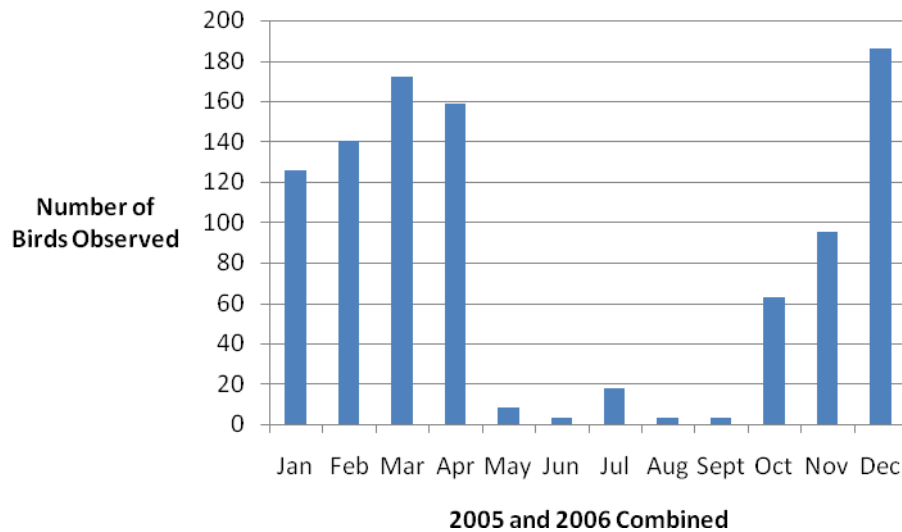
Figure 1: Waterfowl in the Squamish Estuary 2005-2006



Waterfowl feed from the water primarily, though geese, swans and some ‘puddle ducks’ such as widgeons also graze on land. The birds can be expected to be in the water around the estuary from October to April.

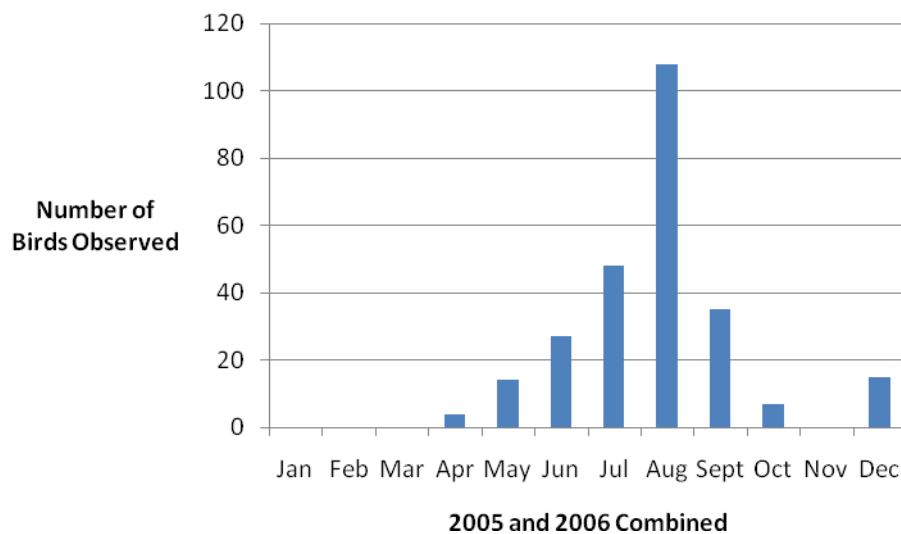
Marine birds such as cormorants also tend to use the Squamish Estuary habitat over winter more than in the summer (Figure 2). They do not breed locally, but rather migrate north to their breeding grounds. Cormorants dive and swim underwater to hunt fish. During winter months they can be expected to be feeding in the estuary during higher water levels. Species observed in the estuary include double-crested, Brandt’s, and pelagic cormorants.

Figure 2: Cormorants in the Squamish Estuary 2005-2006



In contrast to most of the bird groups that utilize the estuarine habitat, shorebirds are most abundant during summer months with a peak in August (Figure 3). By the time shorebirds arrive in the Squamish Estuary, they have already completed breeding and are in the process of migrating southwards. They feed primarily on small fish and invertebrates in the intertidal zone. Species observed in the estuary include sandpipers (spotted, semipalmated, western, least, pectoral), greater and lesser yellowlegs, short- and long-billed dowitchers, sandhill crane, common and Wilson’s snipe, and red-necked phalarope.

Figure 3: Shorebirds in the Squamish Estuary 2005-2006



Wading birds such as great blue herons are year round residents in Squamish and breed locally in colonies near the Mamquam Blind Channel. They feed primarily by stalking small fish in the intertidal zones of the estuary. Heron abundance is lowest in spring and early summer, and highest later in summer (Figure 4). Raptors occur in the estuary year round, but abundance peaks during fall/winter migrations in tandem with the peak of prey species (waterfowl) abundance in November and December (Figure 5).

Figure 4: Wading birds in the Squamish Estuary 2005-2006

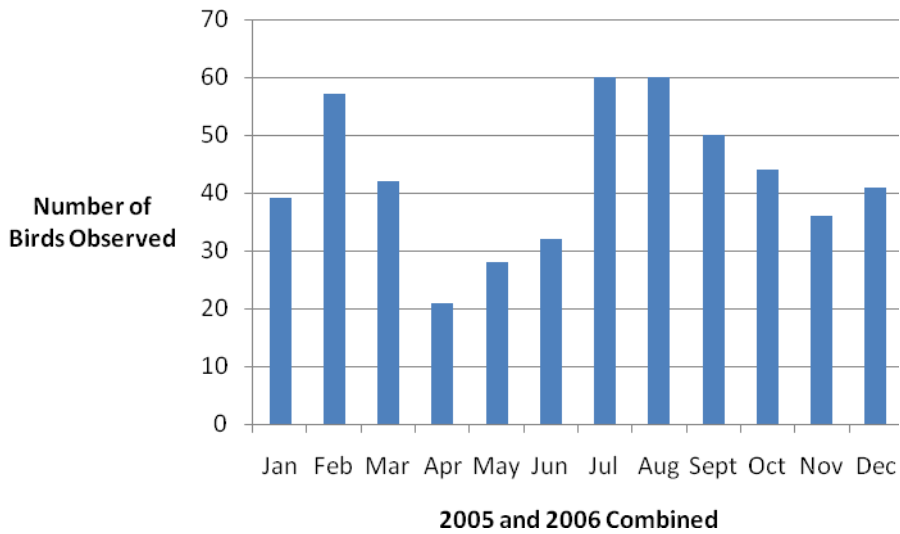
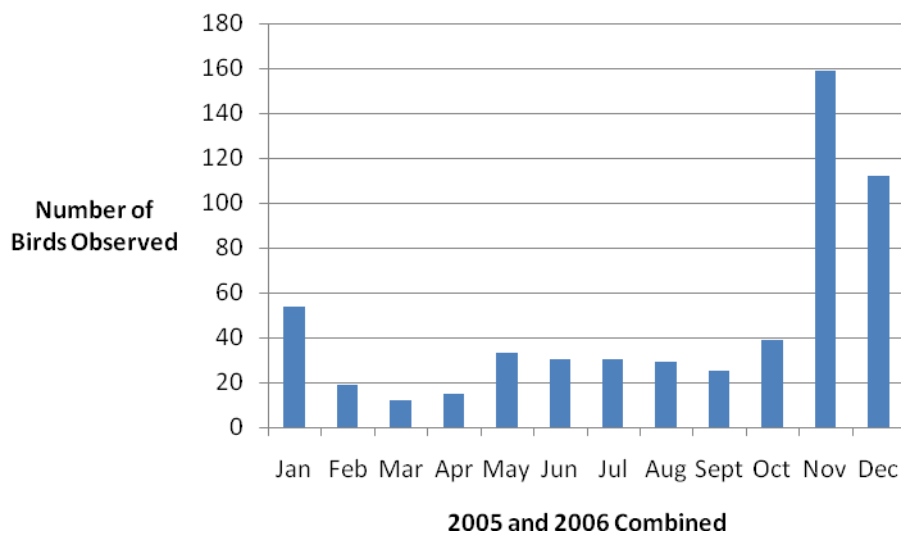


Figure 5: Raptors in the Squamish Estuary 2005-2006



5.2.4 Rare or Endangered Species

The provincial Conservation Data Centre (CDC) was contacted and a list of rare animals for the Squamish Forest District was reviewed. Several wildlife species provincially listed as “yellow” (not in danger, but tracked because the species is managed for hunting), “blue” (sensitive or vulnerable), or “red” (endangered, threatened) have been observed in the application area and are considered relevant to this application.

Green Heron (*Butorides virescens*) – Blue listed

The green heron is a rare migrant on the Squamish Estuary. One individual was observed in September 2005, but none were recorded in 2006 or 2007. The species is known to breed in southwestern BC and it usually winters in California and southeastern US. The heron forages in swamps, marshes, margins of ponds, rivers, lakes, and lagoons by stalking its prey (insects, aquatic invertebrates and small fish). It is unlikely to be affected by windsport activities that are concentrated during the summer months.

Great Blue Heron (*Ardea herodias fannini*) – Blue listed

Great blue heron are abundant year round in the estuary (253 individuals in 2006, 254 individuals in 2005) and are known to breed in the Squamish area (see also *Figure 4: Wading Birds in the Squamish Estuary* for seasonal fluctuations in numbers observed). The *fannini* subspecies is blue listed, but the species itself is quite common and not considered at risk. It is not possible to determine whether individuals observed on the estuary are of the *fannini* subspecies without capturing and taking DNA blood samples. Though unlikely, presence of the listed subspecies cannot be ruled out. Great blue heron forage for small fish and invertebrates in intertidal, estuarine, riparian, and wetland areas by stalking its prey. Individuals could potentially be affected by windsport activity in the summer, especially when boarders are blown into shallow, intertidal areas of the estuary.

Peregrine Falcon (*Falco peregrinus anatum*) – Red listed and (*F. p. pealei*) – Blue listed

Though peregrine falcon are known to nest on the Squamish Chief, a massive granitic cliff towering above the estuary and south end of Howe Sound, observations of individuals in the estuary itself are uncommon. Only nine individuals in total were observed in 2005 and 2006. The *anatum* subspecies is thought to inhabit interior BC, the Fraser River Valley, and the Gulf Islands, and is more likely to be present in Squamish than *pealei*. The *pealei* subspecies generally breeds on the outer coasts of Alaska and BC. As with other species, it is not possible to determine subspecies without capturing animals and taking DNA samples. Peregrines hunt aerially for birds, small mammals, lizards, and fish. They are not expected to be affected directly by windsport activity, but could be affected if their prey species abundances are reduced.

Double-crested Cormorant (*Phalacrocorax auritus*) - Blue listed

Double-crested cormorants are commonly observed in the Squamish Estuary; predominantly in winter months from October to April (refer to *Figure 2: Cormorants in the Squamish Estuary*). The overwinter population most likely migrates north in spring to breeding grounds, but those observed in summer are likely local colonial breeders from nearby islands in Howe Sound. Double-crested cormorants opportunistically fish in water less than 15m deep and could potentially be affected by sail and kite boarders. Encounters should be largely avoided due to seasonal separation between cormorant abundance in winter and windsport activity which is concentrated in summer. There is the potential for locally breeding cormorants, however, to be affected by wind sports.

Brandt's Cormorant (*P. penicillatus*) - Red listed

Brandt's cormorants generally breed along the coastal US extending north to southern Alaska. Some winter in Puget Sound and the Strait of Juan de Fuca, but most are migratory. Observations of the species in the Squamish Estuary are rare, with just three individuals noted in winter 2005 and none in 2006. Brandt's cormorants feed on small fish, squid, crab, and shrimp over sand or mud bottoms. Due to infrequent use of the estuary habitat during winter months it is unlikely that wind sport activities would have a significant effect on the species.

Pelagic Cormorant (*P. pelagicus pelagicus*) - Red listed (main species is yellow listed)

Pelagic cormorants are known to winter as far south as Vancouver Island and to nest on the Queen Charlottes and North Coast of BC. The birds are normally recorded on the estuary in the winter months in low numbers (18 in 2005, 11 in 2006). It is unknown whether the individuals observed are of the red listed *pelagicus* subspecies, or the more common yellow listed *P. pelagicus* species. This species of cormorant is a bottom feeder and forages in bays, harbours, and lagoons. As with other over wintering species on the estuary, wind sport activities are unlikely to have a significant affect because they occur primarily in summer months.

Sandhill Crane (*Grus canadensis*) - Blue listed

Sandhill cranes breed to the north and occasionally (less than annually) pass through the Squamish estuary during southward migrations in late fall. A total of 15 individuals were noted in December 2005 but none were seen in 2006. The cranes are terrestrial feeders and concentrate on roots, tubers, seeds, grain, berries, small vertebrates, worms and insects. They are not likely to be impacted by wind sport activities because of the habitat type's cranes prefer and the season in which they are present in the estuary.

Canada Goose (*Branta canadensis*) – Yellow listed

Canada geese are abundant year-round with a peak from December to February and lows in March, April, and October (Figure 6). The species is tracked and managed in the province as a game species, and for pest control. As number of individuals observed during summer months is substantial, there is the potential for wind sport activities to impact the species. However, Canada geese have proved to be very tolerant to human disturbance and actually thrive in urban areas. If the mitigation measures outlined previously are implemented, it is not likely the resident Squamish population will be adversely affected by wind sport activities. (*occidentalis* subspecies is blue listed- winters in WA and OR, breed in Copper River Delta, AK)

Mallard (*Anas platyrhynchos*) – Yellow listed

Mallards are also managed in the province as a game species and are abundant over-winter in the estuary (Figure 7). Numbers of individuals drop significantly in summer months, indicating that the majority of individuals are migrating to breeding grounds elsewhere. Those that occur in the estuary during the summer are likely breeding locally and could be affected by wind sport activity during that time. However, mallards have also proven to be very tolerant of human disturbance and any potential impacts should be mitigated through recommended measures.

California Gull (*Larus californicus*) – Blue listed

California gulls breed primarily in the interior of North America including Saskatchewan and Manitoba and winter in southern Washington, Idaho, and along the coast south.

During autumn migration, California gulls are the most abundant gull in pelagic waters off the BC and Washington coast. The gulls have been rarely observed in the Squamish estuary during spring and fall migration (one in October 2005, three in April 2006) and due to low numbers and seasons of presence, are not expected to be impacted by summer wind sport activity.

Figure 6: Canada Goose abundance on Squamish Estuary in 2006.

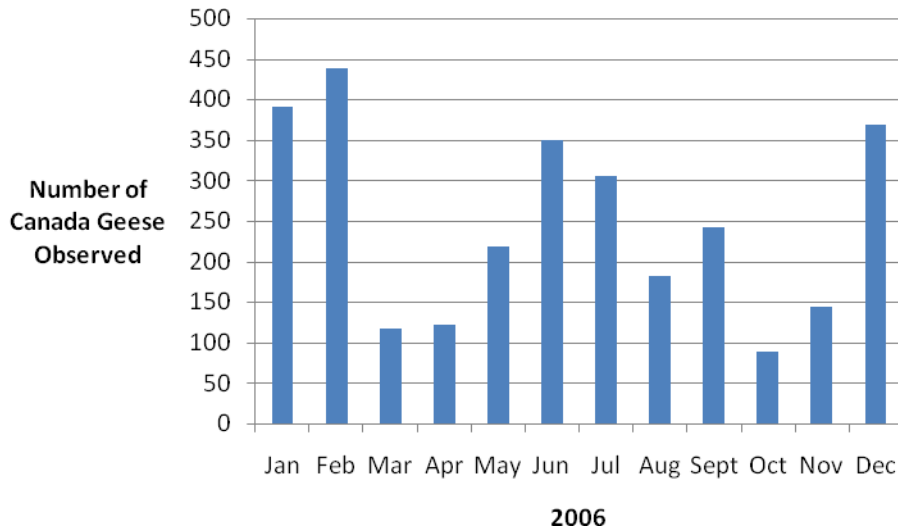
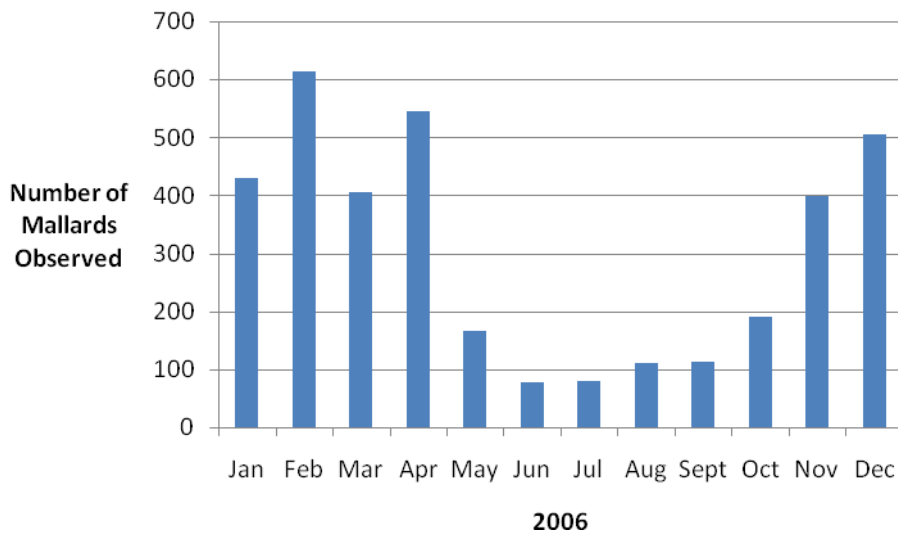


Figure 7: Mallard abundance on Squamish Estuary in 2006.



Caspian Tern (*Hydroprogne caspia*) – Blue listed

Caspian terns breed across Canada from Labrador and SE Quebec to Manitoba and Saskatchewan. On the west coast they are known to breed in Washington and Oregon and generally spend the winter in the southern US to Mexico. Juveniles in western North America disperse northward before migrating south to wintering areas, which might explain the rare occurrences of the species in the Squamish area. Two individuals were observed in June 2006, while nine were noted in June 2005. Although Caspian terns are rare in the Squamish Estuary, they tend to be present during the preferred wind sport season. They eat fish at the surface of water by diving from the air, or sometimes feed from the surface like a gull. Caspian terns, when present, are likely to be affected by wind sport activities due to an overlap in seasonal use of the area in addition to type of feeding behaviours expressed.

Northern Goshawk (*Accipiter gentilis laingi*) – Red listed (main species not listed)

Northern goshawk generally prefer extensive forest habitat with mature trees, dense canopies, and open under story for hunting; it is not surprising they are rarely observed on the Squamish Estuary. Three individuals were noted in spring and winter of 2005, but none were seen in 2006. In BC, the transition from the listed *laingi* subspecies to the unlisted *atricapillus* subspecies not well known, but the northern and central BC coast, and possibly the southern mainland coast, are thought to contain *laingi*. Without DNA confirmation it is not possible to determine subspecies, but *atricapillus* breeds throughout mainland and interior BC and is much more common. Due to the seasons of occurrence and rarity of northern goshawk on the estuary, it is unlikely that wind sport activity will impact the species.

Red-necked Phalarope (*Phalaropus lobatus*) – Blue listed

Red-necked phalaropes are rare migrants through southern BC and just two individuals were noted on the estuary in August 2005. No phalaropes were observed in 2006 or 2007. Phalaropes feed on plankton, insects, crustaceans, and mollusk from the water by whirling around in circles. When they are present in the estuary, there is the potential the phalaropes will be impacted by wind sport activity.

Short-billed Dowitcher (*Limnodromus griseus*) – Blue listed

Another migratory shorebird on the estuary, short-billed dowitchers breed in the southern Mackenzie region of BC and winter in the southern US to Central and South America. They are not observed every year, but 23 individuals were recorded in August and September of 2005. The dowitcher prefers shallow salt water with a soft muddy bottom where it can probe in search of invertebrates. When it is present on the estuary, there is the potential for the short-billed dowitcher to be impacted by wind sport activity. Implementation of the mitigation measures outlined previously will minimize potential impacts.

Western Grebe (*Aechmophorus occidentalis*) – Red listed

The western grebe is a migratory species that utilizes the estuary habitat in the fall with annual variations. Seventy-five individuals were observed in the estuary in 2005 during fall migration, but only two were noted in 2006. Grebes dive underwater from the surface to fish, and are also known to eat insects, mollusks, and crabs. When grebes are present on the estuary it is from September to December, so the potential for the species to be affected by summer wind sport activity is low.

5.2.5 Natural Values Impact Mitigation Strategy

When the high season of windsport activity is overlaid with seasons of relatively high abundances for each bird group we can assess potential impacts to species. The prime windsport season is from April through September when temperatures are warmer and people have more time off work to recreate. High winds do occur through the winter and may attract sail and kite boarders, however the winds during the winter season are not consistent, and the number of participants during this time are significantly reduced from the summer season and impacts to wildlife are expected to be minimal

Bird groups with relatively high abundance during the months of April to September include shorebirds and waders. Waterfowl, cormorants, and raptors are less abundant during these summer months and should be less affected by windsport activities. Shorebirds and waders both forage in the intertidal zone for small fish and invertebrates and generally do not occur in deeper water. Potential impacts to these species are most likely to occur when sail and kite boarders are blown inland and are forced off their boards and into shallow water or on land. Human disturbance to birds during foraging can result in both physical (inability to ingest enough calories) and physiological (stress) responses.

The SWS has an emergency Jet-ski that is on site full time during the operating season. The emergency Jets-ski will be use to rescue windsport participants that drift down wind, to patrol the windsport activity area, and ensure that windsport participants are not sailing deep into the estuary.

Only Squamish Windsport Society staff will be permitted to use the Jet-ski for emergency purposes. All staff will be trained with a wildlife avoidance protocol, to reduce the likelihood of disturbance to wildlife in the intertidal area or on land in the estuary. Jet-Ski use should be minimized to the greatest extent possible, and Jet-Skis are to be clean, free of leaks and hydrocarbon residue, and in good repair.

Most of the potential for adverse impacts on wildlife that are associated with windsport activities can be avoided. Fortunately, windsport activities are temporally separated from seasonal habitat use by most bird species. For species that primarily use the Squamish Estuary during summer months, mitigation of impacts through careful management is possible. The intertidal zone of the estuary and all upland areas will be completely avoided by windsport participants. To ensure no disturbances occur in these areas, Jet-Skis will be used to tow people away and back to the manmade spit. Signs educating the public about the ecological sensitivity of the estuary and the importance of staying away from wildlife and important habitat areas will be posted as per the signage strategy described in Section 3.3.

6.0 References:

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7.0 Appendix of Supporting Documents

Appendix 1: Squamish Spit Head Lease

Appendix 2: Windsport Sublicence and Management Agreement 2

Appendix 3: Emergency Response Plan

To be prepared by the Windsport Society.

Appendix 4: Emergency Spill Response

1. INTRODUCTION

Cascade Environmental Resource Group Ltd. has prepared the following Spill Response Plan for the Squamish Windsport Society. This Spill Response Plan details actions to be taken in the event of a petroleum hydrocarbon (gasoline, diesel fuel, lubricating oil, and waste oil) spill to ground or to water.

The purpose of this plan is to:

- Reduce the risk of exposure to individuals and the environment,
- Clearly define the course of action in the event of a spill, and
- Ensure staff are aware of the correct spill response action.

A spill is an unauthorized release or discharge of a substance into the environment equal to or greater than specified amounts or the uncontrolled release of deleterious substances to the environment.

2. PREVENTION OF SPILLS AND PREPAREDNESS

During operations, management will:

- Ensure all employees are familiar with spill response protocol and ensure a copy of this Spill Response Plan is accessible to all persons on-site.
- Ensure proper spill containment material is in place (i.e. spill pallets for drums, absorbent pads, diapers, etc.).
- Ensure a spill response kit capable of containing and absorbing spills be made available and maintained at the site where hazardous materials are stored and/or used.
- Ensure all staff are familiar with spill kit location, function, and use.

3. SPILL RESPONSE

- The person discovering the spill will conduct an initial assessment to determine if the situation causing the spill can be remedied immediately without assistance. Spill response urgency is related to the nature of the spill. Situations that are a potential threat to life or environmental resources must be dealt with promptly.

3.1 Spills to Ground

3.1.1 GENERAL CHARACTERISTICS OF SPILLS TO GROUND

When light density fuels are spilled on land, they generally have the following characteristics:

- The product will usually migrate to a waterway, either on the surface or underground;
- The rate of soil penetration will depend on the permeability of the soil (i.e., gravel, sand, clay, etc.) and on the moisture content of the ground. If the ground is sufficiently wet, the product will float on the water and soil penetration will be limited but surface migration will be more rapid. If the ground is dry, the product will be able to penetrate the ground more easily resulting in contaminated soil.
- Product which seeps into the ground may settle at the top of the water table and may reappear months later, some distance away, on the surface or in the Estuary; and
- Product released onto pavement or concrete will spread rapidly across the surface and evaporate quickly. Depending on the nature of the product, penetration into concrete or pavement should be minimal if the spill is cleaned up quickly.

3.1.2 EMERGENCY ACTION PLAN FOR SPILLS TO GROUND

In the event of any spill, the following procedures will be performed:

1. Identify the nature of the emergency and ascertain if there are injuries or casualties. Determine safety and protective equipment for working in or around the spill.
2. Locate the source, the area of immediate risk, and the potential for escalation. Note the tank volume and duration of spill from tank or line.
3. For spills of gasoline or other flammable liquids, clear and secure the site and notify the fire department and the Provincial Emergency Program 24 hour spill reporting hotline (1-800-663-3456) immediately. Note any potential fire hazards.
4. If fire suppression is necessary, use foam as appropriate. Do not over apply. Use as little water on the spill as possible. Water contaminated with petroleum will need to be tested and may need to be disposed of as a hazardous waste. If water is used, runoff should be containerized.
5. Initiate procedures for the protection of personnel, property, and the environment. Consider the need to evacuate non-essential personnel and the need for an emergency shut-down of operations. Prioritize the safety action plan.
6. If possible, the spill should be contained at the source or downstream and the release stopped. Construct down slope earthen berms or dig recovery ditches

- around the perimeter (and pits within the spill area) to contain the spill. Ensure that spill cannot enter a watercourse. Plastic tarps can be placed at the base of the berms to allow the material to pool for easier collection. Monitor the ditches and pits to ensure the collection system are effective. Sand, gravel, soil, straw, kitty litter, or other such materials may also be effective in containing and/or absorbing spills.
7. Pump, recover, and containerize as much free product as possible. Recover spilled material using commercial absorbents, sand, straw, or sawdust to absorb residues rather than wash them away with water. Larger quantities of spilled material can be pumped back into resealable barrels, Tidy tanks, or bladders. In many cases, recovered product can be routed back to refineries for recycling.
 8. Mark the extent of the spill area and dig test pits to determine the depth of the spill in the ground. Ensure that spills are recovered and that contaminated soil is removed or treated. All sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation* (Section 8. Treating Hydrocarbon Contaminated Soils). Do not attempt a site cleanup unless you are familiar with the WMA, *Contaminated Sites Regulation*. Contact appropriate regulatory agency for approval prior to soil disposal. Use photos, written notes, and samples to document site clean-up.
 9. Immediately report spills of TDG Class 3 – flammable/combustible liquids or waste oil greater than 100L with the Provincial Emergency Program 24 hour spill reporting hotline (1-800-663-3456). For spills less than 100L, mandatory reporting to the Provincial Emergency Program is not required.

3.2 Spills to Water

3.2.1 GENERAL CHARACTERISTICS OF SPILLS TO WATER

When light density fuels are spilled on water, they generally have the following characteristics:

- The product will spread quickly across the surface of water in a thin film or sheen;
- The product may cover a wide area, if not contained;
- A fairly strong odour may be present;
- The product will tend to evaporate fairly rapidly;
- In a sheltered environment, evaporation of the product may be slow; evaporation and wave action is effective on small spills in environments characterized by higher energy; and
- Distillate releases may form water-in-oil or water-in-water emulsions or mousse.

3.2.2 EMERGENCY ACTION PLAN FOR SPILLS TO WATER

In the event of a spill to water, the following procedures will be performed:

1. Identify the nature of the emergency and ascertain if there are injuries or casualties. Determine safety and protective equipment for working in or around the spill.
2. Locate the source, the area of immediate risk, and the potential for escalation. Note the tank volume and duration of spill from tank or line.
3. Raise the alarm and alert Emergency Response (911), if necessary. For spills of gasoline or other flammable liquids, clear and secure the site and notify the fire department and the Provincial Emergency Program 24 hour spill reporting hotline (1-800-663-3456) immediately. Note any potential fire hazards.
4. Initiate procedures for the protection of personnel, property, and the environment. Consider the need to evacuate guests and staff. Prioritize the safety action plan.
5. In the estuary:
 - Visually inspect the foreshore to identify the extent of contamination,
 - Note where the product is pooling along the shore, and
 - Note any marsh or other environmentally sensitive areas that must be protected.
6. If possible, the spill should be contained and the release stopped. To effectively contain the spill, use several containment methods in series:
 - In open water divert the spilled product to the containment system using sorbent booms, synthetic booms.
 - Use sweeps to corral the spilled product to one location. Add a second containment boom if required.
 - Use sorbent pads and/or pumps to collect the spill products from the containment area.
 - Use sweeps and sorbent pads to recover the product. Use a wringer (if available) to extract the excess product then reuse the sorbent pads.
 - Use a skimmer or suction pump if the volume is significant and the spill is contained.
 - Develop a monitoring program to assess and remove free product over a given time frame.
7. Immediately report all spills to water to the Provincial Emergency Program 24 hour spill reporting hotline (1-800-663-3456).

3.3 REPORTING SPILLS

Spill reporting regulations require that the person who had possession, charge or control of a substance must, within a reasonable time, report all spills of TDG Class 3 – flammable/combustible liquids or waste oil greater than 100L and all spills to water to the Provincial Emergency Program 24 hour spill reporting hotline (1-800-663-3456). On

notification, the caller should be prepared to provide the dispatcher the following information:

- Your name and contact phone number;
- Name and telephone number of the person who caused the spill;
- Location and time of the spill;
- Type and quantity of the substance spilled;
- Cause and effect of the spill;
- Details of action taken or proposed;
- Description of the spill location and surrounding area;
- Details of further action contemplated or required;
- Names of agencies on scene, and;
- Names of other persons or agencies advised concerning the spill.

3.4 DISPOSAL OF CONTAMINATED MATERIALS

Collect spilled material, diapers, containment booms, absorbent pads, etc. and place in appropriate container.

For spills over 100L, prior to removing contaminated or treated soil for disposal or other use, written approval must be obtained from the BC MWLAP Regional Office.

SPILL RESPONSE CONTACTS

Name	Company/Organization	Position	Contact Number
	Squamish Windsport Society		
	District of Squamish		
Agency Personnel			
PEP	24 Hour Spill Reporting		1-800-663-3456
MWLAP	Contaminated Sites Program		604-582-5200
DFO			
Contaminated Soil	Ecowaste		604-276-9511
Other			
Emergency – Fire / Police			911
Emergency – Ambulance			911
Fire – Non-emergency			604-898-9666
Poison Control Centre			1-800-567-8911

EMERGENCY ACTION PLAN FOR SPILLS TO LAND

QUICK REFERENCE GUIDE

1. **Identify** the nature of emergency:
 - a. Any injuries?
 - b. Is it safe?
 - c. Do we need special safety or protective gear?
2. **Locate** source, area of risk, and potential for escalation.
 - a. Tank volume?
3. **Notify** fire department and PEP if spill is gas or flammable liquid.
4. **Supress** fires
 - a. Use foam not water.
5. **Protect** personnel, property, and the environment.
 - a. Evacuate if necessary.
 - b. Shut down operations if necessary.
6. **Contain** spill at source or downstream and **stop** release.
 - a. Construct berms and/or ditches.
 - b. Use absorbent products.
7. **Recover** product.
 - a. Use absorbent products.
8. **Clean-up** site.
 - a. Remove contaminated soil.
 - b. Use photos, notes, and samples to document clean-up.
 - c. Get approval for contaminated soil disposal.
9. **Report**.
 - a. Report spills greater than 100L to PEP (1-800-663-3456).
 - b. No reporting if spill less than 100L.

EMERGENCY ACTION PLAN FOR SPILLS TO WATER

QUICK REFERENCE GUIDE

1. **Identify** the nature of emergency:
 - a. Any injuries?
 - b. Is it safe?
 - c. Do we need special safety or protective gear?
2. **Locate** source, area of risk, and potential for escalation.
 - a. Tank volume?
3. **Notify** fire department and PEP if spill is gas or flammable liquid.
4. **Protect** personnel, property, and the environment.
 - a. Evacuate if necessary.
 - b. Shut down operations if necessary.
5. **Identify** extent of spill
 - a. Where is spill going?
 - b. Can we use tailrace, eddies, pools, or culverts to divert spill?
6. **Contain** spill and **stop** release.
7. **Report** all spills to water to PEP (1-800-663-3456).