Keystone Environmental
Knowledge-Driven Results

July 25, 2017

Ms. Susan Hildebrand
Klaus Fuerniss Enterprises Inc.
PO Box 570
Gibsons, BC V0N 2W5

Dear Ms. Hildebrand:

Re: George Hotel Marine Residences Foreshore Remediation
Construction Environmental Management Plan
377 and 385 Gower Point Road, Gibsons, BC
Project No. 12845

Please find enclosed the *George Hotel Marine Residences Foreshore Remediation Construction Environmental Management Plan, 377 and 385 Gower Point Road, Gibsons, BC.* The QEP confirms he has reviewed the relevant guidelines of DPA#2 and that the CEMP addresses the environmental management aspects. If you have any questions, please do not hesitate to contact us.

Sincerely,

Keystone Environmental Ltd.

Original signed by

Warren Appleton, R.P.Bio.,
Marine Biologist / QEP

Original signed by

Michael Geraghty, M.Sc., P.Geo., PMP
Senior Technical Manager

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Encl.

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Keystone Environmental
Knowledge-Driven Results

GEORGE HOTEL MARINE RESIDENCES FORESHORE REMEDIATION CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

377 and 385 Gower Point Road
Gibsons, BC

Prepared for:

KLAUS FUERNISS ENTERPRISES INC.
PO Box 570
Gibsons, BC V0N 1V0

Prepared by:

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Project No. 12845

July 2017

PREFACE

This Construction Environmental Management Plan (CEMP) for construction activities related to the George Hotel Marina Residences Foreshore Remediation Project has been prepared for Klaus Fuerniss Enterprises Inc. as a guide to:

- The Contractor(s) and operator(s) working on the Project when working on-site and around the marine environment
- Environmental regulatory agencies involved in review and approval of the Project

The prime objectives of this document are the protection of environmental resources that could be potentially impacted during the project works. The primary means of achieving these objectives include the following general statements.

- All permits and approvals must be in place prior to the start of work on the Project and the Contractor must comply with all conditions of approval at all times.
- The limits of disturbance and environmental protection measures must be clearly defined prior to the start of construction activities, and sediment and erosion control devices must be installed around the perimeter of the construction zone(s) prior to start up, where applicable.
- All equipment used on-site must be clean and free of leaks.
- There is a zero discharge objective with regard to this Project: there is to be no discharge of sediment, sediment-laden water, sanitary wastes, garbage or other contaminants into any water body, or to land.

Additional and more specific requirements and restrictions are identified within the body of this CEMP and its appendices, based on the requirements listed in the environmental assessment document(s) and agency approvals, authorizations(s) and/or letters of advice received for the site-specific Project components and tasks. This document is a living document and may be modified based on site conditions.

This Executive Summary is subject to the same general limitations as contained in the report and must be read in conjunction with the entire report.

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LIST OF ABBREVIATIONS AND ACRONYMS

BCWQG	BRITISH COLUMBIA WATER QUALITY GUIDELINES (APPROVED AND WORKING)
BERC	BURRARD ENVIRONMENTAL REVIEW COMMITTEE
BMPs	BEST MANAGEMENT PRACTICES
CCG	CANADIAN COAST GUARD
CEAA	CANADIAN ENVIRONMENTAL ASSESSMENT ACT
CEMP	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
DFO	FISHERIES AND OCEANS CANADA
DNV	DISTRICT OF NORTH VANCOUVER
EA	ENVIRONMENTAL ASSESSMENT
ECC	EMERGENCY COORDINATION CENTRE
EC	ENVIRONMENT CANADA
EIR	ENVIRONMENTAL INCIDENT REPORT
EM	ENVIRONMENTAL MONITOR
EMS	ENVIRONMENTAL MANAGEMENT SYSTEM
EPP	ENVIRONMENTAL PROTECTION PLAN
ESC	EROSION AND SEDIMENT CONTROL PLAN
HWM	HIGH WATER MARK
MCTS	MARINE COMMUNICATIONS AND TRAFFIC SERVICES
MoE	BC MINISTRY OF ENVIRONMENT
NTU	NEPHELOMETRIC TURBIDITY UNITS
PM	PROJECT MANAGER
PMV	PORT METRO VANCOUVER
SRS	SPILL REPORTING SYSTEM
TC	TRANSPORT CANADA
TDG	TRANSPORTATION OF DANGEROUS GOODS

1. INTRODUCTION

This Construction Environmental Management Plan (CEMP) describes mitigative measures that are to be implemented for remedial excavation of contaminant sediments along the foreshore area and general construction activities associated with a hotel, pier and marina (the Project), located at 377 and 385 Gower Point Road (the Site), Gibsons, British Columbia (BC), see Figure 1.

The intent of this manual is to provide the Contractor with sound environmental protection planning and Best Management Practices (BMPs); this plan is a living document, subject to change where practices may be upgraded and BMPs improved as technology is improved. The plan is also meant to be flexible, so as to accommodate changes to design or methodology that may be required once actual field conditions are known and possible obstacles discovered.

The Proponent (Klaus Fuerniss Enterprises Inc.) will be responsible for compliance with environmental protection measures. Regardless of company affiliation or source, all subcontractors are subject to the same rules and regulations as the Contractor and must abide by the conditions of authorizations obtained by Klaus Fuerniss Enterprises Inc. for the individual components of the Project, including any commitments generated as part of the application and approval process. This CEMP applies to all Contractors involved in the Project and any personnel, whether working for the Contractor or observing/monitoring on-site during construction activities. Thus, where the words “Contractor” or “Operator” are used, those words apply to any company or personnel as described above.

1.1 Project Location and Key Construction Activities

The Klaus Fuerniss Enterprises Inc. George Hotel Marina Residences are located at 377 and 385 Gower Point Road, Gibsons BC, on the west foreshore of the Shoal Channel in the Strait of Georgia. The Project is located along the marina foreshore and includes upland, intertidal and subtidal components. The Site is located in a wave-protected harbour, which contains several high-traffic marinas. There are storm water discharges located in the upper intertidal zone or above the high water mark, and a storm water outfall which discharges into the harbour (Figure 1). The majority of the existing subtidal and upland areas are highly developed and have historically primarily been used for residential purposes.

Key construction activities related to this CEMP include the remedial excavation of contaminant sediments located on the foreshore at the Site. The top 0.1 m to 0.5 m of contaminated sediments in the intertidal foreshore area will be excavated and removed from the Site (refer to the Detailed Site Investigation for exact locations and depths of sediment to be removed). Best management practices included within this CEMP may also apply to additional activities associated with the shoreline development, including pile driving and wharf construction, and upland construction of the Hotel, residences and associated amenities.

The Project is tentatively scheduled to take place during the Least Risk Window for the protection of fish and fish habitat for Howe Sound (August 16 – January 31). The sediment remediation work will likely start in January 2017.

1.2 Review, Permitting and Applicable Legislation

The remedial activities of the Project will occur within the boundaries of the current Klaus Fuerniss Enterprises Inc. or Hyak Marina property; however, some demolition is required just outside of the existing property boundaries. Project marine components require the excavation of contaminant sediments below the high water mark (HWM). Construction activities must comply with environmental requirements described in various assessments, permits and approvals that relate to the project. A list of known environmental permits and approvals that should be reviewed by the Contractor is listed in Table 1. The Contractor is responsible for complying with all laws and project requirements including any not listed in Table 1. The Contractor will be responsible for obtaining from the Owner all permits or approvals completed, and, securing any additional permits and approvals needed for the Contractor to carry out their specific portion of the work.

Table 1 Environmental Permits and Approvals

Agency	Permits and Approvals	Description
BC Ministry of Environment	Approval in Principle	Grants approval to undertake environmental remediation in pursuit of a Certificate of Compliance under the *Environmental Management Act*.
Town of Gibsons	OCP Schedule C Geotechnical Hazards Development Permit No. 1	A development permit for geotechnical hazards.
	OCP Schedule D Environmentally Sensitive Development Permit No. 2	A development permit to conduct works on the foreshore in Gibsons Harbour.
	OCP Schedule E Form and Character Development Permit No. 5 Gibsons Landing	A development permit for form and character for Gibsons Landing
	OCP Schedule F Gibsons Aquifer	A development permit for protection of the Gibsons Aquifer
	Demolition Permit	To permit removal of existing Site features
Fisheries and Oceans Canada	Confirmation from the Fisheries Protection Program that either (a) no serious harm will occur, or (b) serious harm to fish is Authorized.	Confirms that no serious harm to fish will occur, or, grants approval to cause *serious harm to fish* as defined by the *Fisheries Act*.
Transport Canada	Notice to the Minister of Transportation (if required)	Regulates works and obstructions that risk interfering with navigation in the navigable waters listed on the schedule to the *Navigation Protection Act*.

Upon obtaining any permits, licenses, or approvals, the Contractor will provide a copy to the Environmental Monitor (EM) prior to performing works, and they will be attached as Appendix B.

1.3 Remediation Methodology

The proposed works will be completed during low tide levels. Prior to commencement of environmental remediation works on the foreshore, the proposed remediation area (approximately 1,000 m^2 Figure 1) will be isolated by the Contractor such that Water Quality Criteria are met (Water Quality Criteria are described in Section 3.10). In order to meet these criteria, the Contractor will be required to install site isolation measures around the remediation area to contain sediment laden waters to the Site. The methodology and type of site isolation measures will be determined by the Contractor in their Environmental Protection Plan (EPP). It is anticipated that the measures will include a full height silt curtain secured to fully enclose the Site. The Contractor will be required to install additional contaminated measures if required to comply with the Water Quality Criteria.

The Contractor may use land based equipment provided that suitable mitigation measures are identified in the EPP (for example, swamp pads) to minimize additional soil/sediment disturbance. The works may require removal of piles and floats. Any materials that require disposal, such as treated timber piles, will be the responsibility of the Contractor to find a suitable method of disposal in accordance with Canadian laws. Disposal facilities must be approved by the Environmental Manager/QEP prior to commencement of work.

The Contractors EPP will include an Erosion Sediment Control (ESC) plan indicate where the spoil is to be placed on land.

2. ROLES AND RESPONSIBILITIES

This CEMP involves numerous stakeholders and staff that will contribute to its successful implementation. Communication between the Project Team members (Table 2) is essential for the success of the Project. The following section outlines the roles and responsibilities of the Contractor, the Environmental Manager/QEP and the Environmental Monitor (EM) for achieving environmental compliance with applicable legislation, permits, licenses, or approvals during construction of the Project, including basic conformance to Klaus Fuerniss Enterprises Inc. Environmental Management System (EMS).

Table 2 Project Team Roles and Responsibilities

Government Department, Consultants, etc.	Role	Contact	Contact Information
Owner			
Klaus Fuerniss Enterprises Inc.	Project Manager / Proponent / Owner	Ms. Susan Hildebrand	604-970-2318
Government			
Town of Gibsons	Director of Engineering Town of Gibsons	Mr. Dave Newman	604-886-2274 ext 212
Consultants			
Keystone Environmental Ltd.	Environmental Manager/QEP	Mr. Warren Appleton	604-430-0671

2.1 Contractor and Sub-Contractors

The Contractor retained for the Project is responsible for being familiar with this CEMP, implementing the mitigation measures listed, and for ensuring their activities are in compliance with the requirements of the CEMP and applicable legislation and permits issued for the Project. The Contractor is also responsible for the adherence of their sub-contractors to the environmental requirements set out in this CEMP. Additionally; the Contractor is responsible for the following:

- The Contractor will prepare an EPP that explains how the environmental constraints identified in the CEMP will be implemented during construction. As part of the EPP, the contractor will be responsible designing and/or appointing qualified personnel to design a site specific ESC plan. The ESC plan will be specific to the project schedules and activities proposed by the Contractor. It will address the Contractor's schedule and cover the entire Site. The ESC plan will include, but not be limited to, measures such as protected site access / wheel wash, boundary control, grading/ditches to direct surface water to temporary sumps, storage tank locations for sedimentation and water treatment, where discharged water will be directed off-site, it will address off-site catch basin protection and the specifics of ESC monitoring. Before the project can commence the EPP and ESC plan must be reviewed and accepted by the Environmental Manager/QEP.

- Complying with all legislative and regulatory requirements, and applicable permits and approvals;
- Complying with the contract documents and requirements of the EPP and ESC;
- Reporting and documenting all environmental incidents, as outlined in this CEMP;
- Incorporating environmental protection strategies into the design and planned work practices;
- Understanding the roles and responsibilities of the Environmental Manager/QEP/Monitor;
- Correcting deficiencies and non-compliance upon direction from Environmental Manager/QEP/Monitor;
- Conducting routine visual checks on vehicles, fuels storage areas, and equipment at the start of each day to identify potential equipment leaks;
- Remaining on call to respond to environmental issues; and
- Responding to environmental incidents, such as spills, using personnel that are appropriately trained and equipped.

2.2 Environmental Manager/QEP

Keystone Environmental will provide an Environmental Manager/QEP that will report directly to the Owner. The Environmental Manager/QEP will be responsible for providing overall environmental management and coordination; roles will include environmental compliance tracking and reporting, managing the Environmental Monitor, management of required qualified environmental specialists, and coordinating and communicating on progress with the Construction Manager. The Environmental Manager/QEP will liaise with regulatory agencies and other authorities in accordance with the CEMP. Additional responsibilities of the Environmental Manager/QEP include:

- The Environmental Manager/QEP has reviewed the relevant guidelines of the DPA#2 and certifies that the CEMP address environmental management aspects of this project.
- Providing input into the preparation of the EPP and ESC and other environmental submittals (e.g., notifications or permits) prepared by the Contractor;
- Reviewing environmental monitoring reports, identification of appropriate environmental performance indicators;
- Overseeing and directing qualified environmental professionals, and reviewing the deliverables (including erosion and sediment control plans); and
- The Environmental Manager/QEP will liaise with the Contractor and applicable regulatory agencies, as required.

2.3 Environmental Monitor

The Environmental Monitor will liaise with the Construction Manager, Contractor and applicable regulatory agencies, as required. The Environmental Monitor will be appropriately trained and demonstrate relevant environmental monitoring experience. The Environmental Monitor will measure key environmental indicators during routine monitoring to determine if work being conducted is in accordance with the CEMP. The Environmental Monitor will have the authority to halt works if an activity is considered to be causing, or likely to cause, unacceptable environmental damage or risk, until an appropriate solution has been developed. The Environmental Monitor will be on-site during relevant periods of increased potential environmental impacts to ensure appropriate mitigation efforts are in place. The Environmental Monitor will have the following responsibilities and authorities:

- Providing site monitoring to assess whether or not construction is complying with the mitigative measures outlined in the CEMP. The frequency of the monitoring activities would be influenced by the type of construction activities and weather conditions and by regulators e.g., DFO;
- Completing inspections of erosion and sediment control measures (including water quality tests) to determine that they are working properly and effectively;
- Monitoring hazardous material containment, storage, transportation, and disposal to comply with applicable legislation and regulation;
- Monitoring whether the Contractor and Project works comply with federal and provincial permits, approvals, guidelines and regulations relating to environmental protection;
- Liaising with the Contractor, Construction Manager, Project Manager to assist in planning (i.e., identify potential environmental issues and the appropriate mitigation measures);
- Attending site meetings, as required, to maintain environmental communications between the Project Team;
- Conducting ad-hoc site visits to address concerns raised by the Project Team;
- Informing the Contractor immediately of construction activities that fail to meet the environmental requirements as described in the CEMP or that present an unacceptable risk to the local environment;
- Promote timely correction of environmental deficiencies by working directly with the Contractor; and
- Additional responsibilities are also defined within specific environmental management plans.

3. ENVIRONMENTAL MANAGEMENT PLANS

3.1 Sediment Remediation Contamination Management Plan

The contractor is responsible to determine the appropriate equipment type to complete the work in accordance with the requirements of this EMP. Sediment will be excavated using land based equipment in the dry at low tide. The material will be removed from the Site. The collected material will be placed on land behind a berm that will prevent runoff and resuspension of material in the water. Then the collected sediment material will later be removed from the Site in accordance with applicable standards.

While sediment remediation is proposed for the low tide period for environmental protection, site isolation measures are required. The effectiveness of the site isolation measures will be determined by compliance with Water Quality Criteria identified in Section 3.10. The Contractor will be responsible for developing in their EPP suitable site isolation measures to comply with these requirements. It is anticipated this may involve a full height silt curtain connected above the high water mark on both sides of the dredge area to completely encapsulate the site. If a single curtain is not sufficient to meet the Water Quality Criteria, the Contractor may need to consider installation of a second curtain. The Contractor will be permitted to use floats that are in place to hang curtains if requested. Piles or anchors will be permitted to hold curtains in place provided they do not puncture the aquafer and are removed upon project completion. The contractor should consider having extra curtains on hand in case of breakage. The contractor should consider inspected the site isolation measures daily as they will be responsible for maintaining the measures such that they comply with the Water Quality Criteria.

The effectiveness of the site isolation measures will be inspected by the Environmental Monitor. Inspections by the Environmental Monitor may occur daily. In the event that Water Quality Criteria are in exceedance of those identified in Section 3.10, the Environmental Monitor will issue a stop work order to the Contractor. Works will not be allowed to resume until site isolation measures are sufficiently containing sediment laden waters such that Water Quality Criteria are being met. The Contractor will be responsible for the design, implementation, maintenance and decommissioning of all site isolation measures throughout the Project.

3.2 Aquifer Protection Plan

Horizon Engineering Inc. provided information on the physical characteristics of the Gibsons Aquifer in their assessment report stating that the proposed works are unlikely to have a negative effect on the aquifer if excavation does not exceed a depth of 5.0 m geodetic elevation at the northwest portion of the Site. Zero geodetic is equal to 3.02 m above Chart Datum (average lower low tide) in Gibsons. In the southwest, and southeast portions of the Site they recommend that any proposed excavation does not exceed deeper than 0.5 m below existing grades.

3.3 Fisheries and Marine Mammals Management Plan

A biophysical survey of the marine habitat on-site was completed to assess the marine biophysical conditions. Fish, marine mammals, and aquatic habitat have the potential to be negatively impacted during the in water construction remediation works.

The following potential impacts to fish, marine mammals and aquatic habitat have been identified:

Temporary

- Changes to water quality as a result of sedimentation or spills;
- Sensory disturbance to marine mammals, which may frequent the area;
- Fish gill abrasion due to sediment-laden water;
- Accidental spills; and
- Disruption to migrating fish populations.

Permanent

- Marine habitat loss or disruption.

In order to protect aquatic species, the Contractor shall:

- Perform the works only in a low tide window and outside of the water;
- Perform the work in strict compliance with timing restrictions outlined in the permits, regulatory obligations, and approvals;
- Complete the works during the Least Risk Window for the protection of fish and fish habitat - Howe Sound (August 16 - January 31);
- Employ site isolation measures around the area as depicted in Figure 1 to comply with Water Quality Criteria. There will be no dispersal of sediments outside the construction zone;
- Perform intertidal/shallow subtidal work when favorable weather conditions prevail and in absence of water;
- Contractor is to ensure that an aquatic life salvage permit is obtained and that an aquatic salvage is completed in the works area after each high tide event in accordance with the requirements of the federal *Fisheries Act*
- Use low sulphur diesel, where available;
- If the Environmental Monitor or the Contractor observe herring spawning during construction works, all works will be stopped. No equipment that was affected by the spawn will be allowed to move. The Environmental Monitor must provide an inspection to document that all eggs have hatched prior to works resuming.

- The project will adhere to DFO's measures to avoid causing harm to fish and fish habitat including aquatic species at risk (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html);
- Water-based equipment (i.e., boats and barges) shall be prevented at all times from grounding onto the intertidal foreshore; and
- Adhere to this CEMP's Water Quality Management Plan (Section 3.10).

Specific BMPs, legislation and regulations, and guides that the Contractor is responsible to have implemented for the proposed works can be found at:

- BC Fish Protection Act. (1997).

  http://www.qp.gov.bc.ca/statreg/reg/F/FishProtect/89_2000.htm.
- DFO. Measures to Avoid Causing Harm to Fish and Fish Habitat.

  http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html.
- Ministry of Environment (MoE) & DFO. (1992). Land Development Guidelines for the Protection of Aquatic Habitat.

  http://www.dfo-mpo.gc.ca/Library/165353.pdf.
- Fisheries Act (2012)

  http://laws-lois.justice.gc.ca/eng/acts/F-14/.

  Ministry of Water, Land and Air Protection. (2004). *Standards and Best Practices for Instream Works*.
  http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf.
- DFO. (2003). *Guidelines and Best Management Practices for* Pile *Driving and Related Operations* (BC Marine and Pile Driving Contractors Association, November 2003).

  http://a100.gov.bc.ca/appsdata/epic/documents/p351/d32211/1273516310337_a8f9af96262d9ff325e4452109b72a5c6e2c4828796e47dd8ed0c732bc322dfb.pdf.
- BC Approved and Working Water Quality Guidelines for Freshwater, Marine and Estuarine Life.

3.4 Wildlife Management Plan

The Site is located in an area that largely consists of residential land and public use areas such as parks and trails. As such, most of the vegetation is primarily limited to adjacent properties with the exception of dunegrass (*Elymus* sp. or *Leymus* sp.) located in the riprap below the public trail that is not anticipated to be affected. This area has the potential to be frequented by Harbour Seals and River Otters; in addition, heron and heron nests have been observed in the areas surrounding the site, but not within the project area.

The following potential impacts to wildlife and their habitat have been identified during the construction works:

- Mortality and injury (e.g., as a result of vehicle/wildlife collision, ingestion of hazardous materials, feeding or harassment of wildlife by construction personnel);
- Adverse physiological or behavioural effects (e.g., increased noise levels to wildlife frequenting the area or attraction to works – river otters and seals often exhibit curiosity); and
- Interruptions during the breeding season (i.e., March 15–August 15).

In order to protect wildlife and wildlife habitat, the Contractor shall:

- Minimize construction related disturbance (e.g., fugitive dust, etc.) to wildlife;
- Ban all firearms from the work site;
- Report any apparent aggregation areas or migration routes that are occupied to the EM immediately upon encountering them within the work zone or its environs;
- Use low toxicity antifreeze/coolants in equipment on land sites in order to minimize the potential for poisoning wildlife and domestic animals that stray onto the site in the event of a malfunction or leak. In the event low-toxicity antifreeze is not in use, the following management should be in place to reduce potential of contact with wildlife outside working hours;
  - Household waste or any other waste that may be considered an animal attractant must be stored in a lidded, lockable container; household waste should not be left on-site overnight;
  - Spills and leaks should be cleaned up at the end of the day to prevent pooling overnight. Immediate repairs are to be conducted for equipment experiencing leaks to avoid pooling of antifreeze and unattended spill pads outside working hours. Appropriate spill pads and secure disposal containers are to be present to immediately clean potential spills/drips as they occur;
  - Antifreeze containers or other potentially harmful substances should be stored securely on site; the site trailer is acceptable;
- Dispose of garbage in secure bins and ensure that staging areas/vessels are clean and free of food items to deter the attraction of nuisance pests (such as raccoons, seagulls, and ravens). Organic/household waste should be disposed of in lidded and lockable containers;
- Contact the Environmental Monitor in the event a wild animal is found trapped on-site or has taken up residence therein, and will not leave “willingly” (depending on the type of animal trapped, a professional animal control officer or company may be brought in to capture the animal and release it at an appropriate location outside of the work area);
- Implement a noise reduction strategy as outlined in Section 3.7 to decrease sensory disturbance; and
- Conduct nest surveys if vegetation clearing is scheduled to occur during the passerine nesting season between March 1 and August 31.

Specific BMPs, legislation and regulations, and guides can be found at:

- Migratory Birds Convention Act. (1994).
  http://laws.justice.gc.ca/en/M-7.01.
- Ministry of Environment. *Develop with Care guidelines*. (2014).
  http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/.
- Ministry of Water, Land and Air Protection. (2004). *Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia.*
  http://www.env.gov.bc.ca/wld/BMP/herptile/HerptileBMP_final.pdf.
- Species at Risk Act. (2002).
  http://laws-lois.justice.gc.ca/eng/acts/s-15.3/

3.5 Spill Prevention and Emergency Spill Response Plan

3.5.1 External Spill Reporting

Under Section 1 of the BC Spill Reporting Regulation, a "spill" means a release or discharge of a substance in an amount equal or greater than that specified in the Schedule of this Regulation (listed in Section 3.7, Generic Emergency Spill Response Plan and Contact List). The reportable quantities vary according to class of substance, ranging from any amount to 200 kg, depending on the nature of the material that has been spilled. The Contractor will be required to develop an environmental spill procedure applicable to the types of materials being utilized on the Project and be familiar with the reportable spill quantities applicable to these materials. The Environmental Manager/QEP will document and follow up on internal and external spill response actions to ensure that they comply with internal and external reporting requirements.

In the event of a spill occurring that triggers the BC Spill Reporting Regulation, this incident must be immediately reported to the Emergency Coordination Centre (ECC) at 1-800-663-3456 and/or Environment Canada (EC) at the 24-hour emergency telephone number 604-666-6100 and an Environmental Incident Report (EIR) completed by the spill observer or in conjunction with Keystone Environmental. ECC will notify concerned provincial and federal agencies. Spill response advice can be obtained from both EC and the Emergency Coordination Centre (ECC), as well as from Transport Canada's (TC) Chemical Accident Emergency Advisory Service at 1-800-613-9966.

The following process will be followed to record and report all spills externally:

- Spill observer contacts the Environmental Manager/QEP immediately, completes an EIR and sends to the Environmental Manager/QEP;
- The Environmental Manager/QEP will complete the EIR in conjunction with the spill observer if on-site at the time of the spill;
- The Environmental Manager/QEP provides immediate notification to the Project Team and follow up with the completed EIR; and

- The Environmental Manager/QEP will contact EEC and other agencies as applicable (e.g., Canadian Coast Guard (CCG), Marine Communications and Traffic Services (MCTS), may need to be contacted to report any release, or potential release, of any volume of product to marine waters).

The following require consideration when addressing measures to mitigate impacts associated with accidents and malfunctions:

- Accidents and malfunctions generally involve deleterious substances, such as petroleum products and others regulated under the *Canadian Environmental Protection Act* that are released into the environment;
- Release of these substances may impact soil and water quality, and affect the general health of flora and fauna that comes in contact with the substances;
- Vegetation and soil may need to be removed as part of the clean-up effort. If the spill occurs into water, fauna that comes in contact with the substance may be killed or injured (physiological effects are “acute” in that the occurrence is temporary and not continuous, in which case the animal will recover); and
- The greater the spill into the environment, the more difficult it is to contain; therefore, the risk is greater that some longer term impact may occur.

Where a physical impact occurs, property damage or habitat destruction may occur (i.e., intertidal zones may be negatively impacted). Potential impacts would be short-term in that the damage would be repaired where possible or the impact removed and the habitat allowed to recover on its own.

The Contractor shall implement the following mitigation measures:

- During construction, only limited quantities of oils, greases, fuels, and other deleterious substances (i.e., paints, epoxies, wood preservatives, etc.) are brought to site;
- Emergency response and contingency plans are reviewed annually or as per legal requirements;
- Ensure employees are appropriately trained to respond to identified emergencies;
- The Contractor will have an appropriate spill kit equipped with the required clean-up products (e.g., absorbent pillows/pads, booms, disposal bags) on-site at all times;
- All project staff will have to be thoroughly informed of the restrictions of this particular Project location and will be required to act accordingly; and to be vigilant in ensuring petroleum products and any potentially harmful substances are handled with extreme caution;
- Fire extinguishers and other emergency response equipment and supplies must be kept in known and visible locations and access to them shall not be blocked by other materials or equipment; and
- A list of emergency contacts must be posted at predetermined, accessible and visible locations, as well as kept with the emergency response equipment. By law, fire extinguishers are routinely inspected and certified, as is other fire-suppressant equipment and materials. Emergency preparedness must also be covered in the Contractor’s Health and Safety Program. Locations vary by type of activity and whether land- or marine-based

and the locations of fire-fighting equipment are made known to personnel during site orientations; moreover, gas- or diesel-powered equipment must have a fire extinguisher attached or inside the cab).

3.6 Vehicles and Equipment – Fuelling and Servicing Plan

The Contractor shall service or refuel vehicles and equipment in such a way that contaminants do not enter any waterbody, and are not released to land. The following requirements are to be implemented during the Project activities:

- All machinery shall be free of excess oil and grease, and shall be in good mechanical order so that no leaks occur;
- Equipment is to be inspected daily to ensure that it is leak-free or repaired prior to deployment;
- Servicing of equipment is to be done within bermed containment areas and greater than 15 m from the high water mark. No servicing of equipment will be allowed on floating equipment;
- All vehicles utilized for refueling will be equipped with automatic back-pressure shut-off valves, and nozzles should be kept locked at all times, except during refueling. Spigots should be metal to prevent them being accidentally or intentionally damaged. A crew member is to remain in attendance at all times while refueling is being carried out. (Designated suppliers for any land-based fuelling operations use tanker trucks that conform to all specifications listed and the driver stays with the pump during fuelling activities);
- Drip trays should be placed under vehicles and equipment being refuelled;
- All grease and oil required for maintenance will be properly applied. Any excess shall be cleaned up and disposed of in an environmentally appropriate manner, as shall all containers, lids, and contaminated cloths and applicators;
- Any required portable generators and pumps shall be located within bermed and lined containment frames to prevent inadvertent releases of fuels and oils to the environment;
- Refueling of machinery, including portable generators, pumps and outboard motor tanks, must occur away from roadside and Site drainages, or be contained within a suitable pan;
- Each machine working on-Site should have a spill kit containing, as a minimum: 24 oil absorbent sheets; two 1.2 m absorbent socks, and a disposal bag;
- If a spill barrel is also used on-Site, it should contain, as a minimum: 100 oil absorbent sheets; five 2.4 m absorbent socks; two 1.2 m absorbent socks, and two disposable bags;
- Effluent generated during the works on the Project will be contained and disposed of in such a manner as to ensure that the effluent is not released into the marine environment or surficial drainages, unless properly treated and approved by the Environmental Manager/QEP;
- All stationary equipment must have a drip tray placed underneath;
- Oil spill response materials and equipment, such as absorbent pads, booms and leak proof containers, will be kept on-Site in sufficient quantities and in an easily accessible location to contain and clean up the amount of fuel, oil or other petroleum hydrocarbons stored on-Site (land- or marine-based). A detailed inventory list shall be located with the supplies;

- Each machine will be equipped with an appropriate spill kit (with inventory);
- Used spill response materials will be bagged in heavy-duty polyethylene bags, labelled, and disposed of appropriately;
- Vessels will be fuelled at approved marine facilities in accordance with standard safe fuelling regulations and practices (i.e., the port authority has specific requirements and schedules that must be followed during marine-based fuel transfers); land-based equipment will be refueled from mini-tankers or tidy tanks;
- Waste containers will be appropriately labeled and stored in a secure location, protected from weather until removal and disposal can be arranged;
- Waste oil or materials will be removed from Site for appropriate disposal in accordance with Transportation of Dangerous Good requirements and the BC Hazardous Waste Regulation;
- Equipment operators and personnel responsible for spill response will review the Contractor's spill response plan regularly to ensure that it is up to date and all required materials are on Site and easily accessible. The EM will regularly remind the Contractor of this requirement during progress meetings; and
- Machinery employed will be inspected for leaks, worn hoses or fittings, and appropriate repairs will be completed prior to mobilization.

- As part of the Contractor's EPP they will provide procedures to be implemented if equipment is on the beach and breaks down (i.e., a plan to pull out machinery from the works area).

3.6.1 Spill Contingency Plan

The Contractor must be familiar with regulatory requirements and be adequately prepared to respond to a spill condition within the shortest possible time. Spill Response Team(s) will be assembled from suitably qualified members of the workforce at the Site. Spill contingency procedures will be posted in visible locations within the Contractor's Site offices and trailers, and at strategic locations on the Site work platform. All spills (of any volume) will be reported to the EM, regardless of its location within the work areas. The Contractor will also implement the following measures and procedures to ensure adequate protection of the natural resources.

- Sorbent material will be on hand at the work areas as a means of containing and soaking up any spill substance before it reaches the groundwater table or open water;
- Empty drums will be provided on-Site by the Contractor for pre-disposal storage of spillable substances and for disposal of used absorbents, contaminated soil, etc.; and
- Each vehicle, machine or piece of equipment will be inspected on a daily basis for leaks, and worn hoses will be repaired, if needed, prior to use.

3.7 Generic Emergency Spill Response Plan and Contact List

The following Generic Emergency Spill Response Plan is provided as a basic guide for developing plans for marine and land locations and activities (as per Section 3.4.1 of this Plan).

GENERIC EMERGENCY SPILL RESPONSE PLAN

INCIDENT

If a spill of fuel, oils, lubricants or other harmful substances occurs at the site, the following procedures will be implemented. ALL spills must be reported internally immediately regardless of the amount, and especially if released to a water body.

SPILL RESPONSE STEPS

1. ENSURE SAFETY
2. STOP THE FLOW (when possible)
3. SECURE THE AREA
4. CONTAIN THE SPILL
5. NOTIFY/REPORT (EMBC 1-800-663-3456)
6. CLEAN-UP
   (Circumstances may dictate another sequence of events)

ENSURE SAFETY

- Ensure Personal, Public and Environmental Safety
- Wear appropriate Personal Protective Equipment (PPE)
- Never rush in, always determine the product spilled before taking action
- Warn people in immediate vicinity
- Ensure no ignition sources if spill is of a flammable material

STOP THE FLOW (when possible)

- Act quickly to reduce the risk of environmental impacts
- Close valves, shut off pumps or plug holes/leaks, set containers upright
- Stop the flow of the spill at its source

SECURE THE AREA

- Limit access to spill area
- Prevent unauthorized entry onto site

CONTAIN THE SPILL

- Block off and protect drains and culverts
- Prevent spilled material from entering drainage structures (ditches, culverts, drains)
- Use spill sorbent material to contain spill
- If necessary, use a dike, berm or any other method to prevent any discharge off site
- Make every effort to minimize contamination
- Contain as close to the source as possible

NOTIFY/REPORT

- Notify the Environmental Manager/QEP or Owner of incident for any volume (provide spill details) When necessary the first external call should be made to (see spill reporting requirements): EMBC 1-800-663-3456 (24 hours)
- Provide necessary spill details to other external agencies (see spill reporting requirements)

SPILL REPORTING REQUIREMENTS
EMBC 1-800-663-3456

SUBSTANCE:	AMOUNT	REPORTABLE TO:
Oils	> 100 litres	EMBC
	Any spill amount into water	EMBC, DFO & MoE
Special Wastes:		
PCB Oil	any amount > 2 ppm PCB	EMBC
Corrosive	> 5 kilograms	EMBC
Hazardous, e.g., pesticides/Herbicides	> 5 litres	EMBC

Note: If in doubt regarding spill size, affected environment, materials involved and whether reportable, err on the side of caution and report the spill to the external body (i.e., EMBC).

The list of emergency contacts will be posted in strategic locations, on land and on each marine rig along with the Spill Response Plan (contacts will be updated as required for each site-specific location).

CLEAN-UP

- Technical assistance is available from the Environmental Monitor on clean-up procedures and residue sampling
- All equipment and material used in clean-up (*e.g.*, used sorbents, oil containment materials, etc.) must be disposed of in accordance with MoE requirements in approved locations. The Environmental Monitor will assist in compliance with MoE regulations
- Accidental spills may produce special wastes (*e.g.*, material with > 3% oil) and contaminated soil. All waste disposals must comply with the BC Hazardous Waste Regulations and the *Waste Management Act.* The Environmental Monitor will assist in compliance with MoE regulations.
- Waste sorbent material may not be disposed of in a landfill without prior approval from MoE
- If contaminated soil is encountered it must be treated and dealt with as required on a site-specific basis, and must comply with the requirements of the BC Contaminated Sites Regulations.

SPILL REPORT

The spill report should include the following information:

- Name and phone number of person reporting the spill
- Name and phone number of person involved with the spill
- Location and time of the spill
- Type and quantity of material spilled
- Cause and effect of spill
- Details of action taken or proposed to contain the spill and minimize its effect
- Names of other persons or agencies advised

3.8 Noise Abatement Strategy

Project activities can pose a concern to health or hearing (e.g., emissions, noise, etc.). The following strategies are provided in order to limit unnecessary disturbance:

- The use of back-up beepers should be minimized, particularly during twilight and dark hours, as long as compliance with regulatory requirements is maintained;
- Any idling equipment should be turned off when not in use and in compliance with emission-reduction strategies;
- Equipment should be operated at the minimum engine speeds that still provide for effective operation;
- Equipment or processes should be employed that have additional noise control features, such as better mufflers and enclosures on diesel- or gas-powered equipment or exhaust silencers on air tools;
- Machinery should be in good condition prior to construction and that contractors should not utilize excessively noisy equipment. Regular maintenance must be undertaken on all equipment, including lubrication and replacement of worn parts, especially exhaust systems;
- The quietest piece of equipment that is available should be used to conduct a task where feasible (i.e., utilize hydraulic-powered rather than pneumatic-powered equipment); and
- All on-site workers should be trained to be aware of noise issues and how to minimize noise emissions where possible.

The applicable Village of Gibsons Anti-Noise Bylaw 364, 1980, restricts work to daytime during the hours of 0700 hours to 2200 hours on any day. Remediating the area outside of these hours may be required to coincide with lower tides to reduce effects on the aquatic environment. Should there be the need for continuous noise outside of these hours the Contractor will be required to obtain written approval through the Municipal Inspector to carry on the work that is found to be necessary at designated hours.

3.9 Air Quality Management Plan

3.9.1 Idle Reduction Strategies

The Contractor will reduce idling of vehicles and equipment whenever possible. The following idle reduction strategies to improve air quality and to reduce greenhouse gas exhaust emissions include:

- Operational equipment that is not yet required to meet emission standards in Canada must be fitted with catalyzed particulate traps, to filter out particulate matter emissions and to reduce diesel odour emissions;
- Diesel vehicles shall use ultra-low sulphur diesel fuel, when and where available; and

- Restrict idling times of cranes and vessels during periods of inactivity. The Contractor shall reinforce the idle reduction initiative through signage and during toolbox, health and safety, and other meetings.

3.10 Water Quality Management Plan

Silts and fine materials re-suspended from the seabed and sediment-laden water that may be generated during the sediment remediation and construction activities can have adverse effects on the aquatic environment and its resources. Therefore, during any construction works associated with water discharge from a works area controlling particle resuspension and generation during work will be given high priority. In this regard, the works should address the applicable water quality criteria as described in the *British Columbia Water Quality Guidelines (Criteria)* (BCWQG): 1998 updated 2001. Edition produced by BC Ministry of Water Land and Air Protection (formerly the Ministry of Environment, Lands and Parks). In particular, the BCWQG include the following specific criteria for aquatic life (freshwater, marine and estuarine):

- Change from background of 8 Nephelometric Turbidity Units (NTU) at any one time for a duration of 24 h in all waters during clear flows or in clear waters;
- Change from background of 2 NTU at any one time for a duration of 30 days in all waters during clear flows or in clear waters;
- Change from background of 5 NTU at any time when background is 8 NTU–50 NTU during high flows or in turbid waters; and
- Change from background of 10% when background is >50 NTU at any time during high flows or in turbid waters.

For the protection of marine aquatic life under the BCWQG water quality guidelines the following will also be used:

- Dissolved oxygen must be greater than 8 mg/L.
- Degradation of water quality and sedimentation of aquatic habitats are potential impacts identified during the environmental remediation works. Measures that will be taken to control re-suspension of marine sediments are:
  - Minimization of vessel movements in shallow waters to reduce potential propeller wash effects; and
  - Should generated sediment-laden water not meet legislated criteria, where applicable, activity will cease until the water clears, whether by dispersal of sediments by currents or by resettling (no flocculants will be used in salt water).

The Environmental Monitor will determine the frequency that they collect water quality samples. The Contractor should assume the Environmental Monitor will conduct daily sampling. Water quality samples will only be collected 30m outside of the “Silt Curtain” area identified in Figure 1 for the purposes of testing for compliance with the above criteria. The monitor will also collect measurements at 50 m and 100 m, but the **Contractor will be required to comply with the Water Quality Criteria at a distance of 30 m outside of the “Silt Curtain” area shown in Figure 1**. The monitor will chose the exact sampling locations as they deem appropriate to comply with the above requirements.

While the remediation is taking place the Environmental Monitor will collect water quality data every few hours during active dredging. The Environmental Monitor may also collect samples within the site isolation measures for reporting purposes.

To protect water quality for the area, the following will be implemented:

- Site isolation measures (e.g., silt curtain) will be erected around the active dredging area to aid in the containment re-suspended sediments (Figure 1).
- The site isolation measures will be sized to conform to the Site dimensions and function effectively.
- The site isolation measures placement will be determined by the Contractor and identified in the EPP.
- The Contractor shall inspect the site isolation measures between every tide cycle until the work is complete. The site isolation measures will be inspected for tears, openings, connectivity to shore and the floats, or any visual deficiency that is resulting in the remediation area not being fully enclosed.
- The contractor will be required to stop the works and fix any deficiencies with the site isolation measures immediately upon notification from the Environmental Monitor.

3.11 Vegetation Management Plan

Riparian vegetation (vegetation within 15 m of the HWM) is primarily contained to adjacent properties with the exception of Dunegrass located in the riprap just below the public trail. The remaining areas on Site are composed of cultivated hedges, lawn, buildings, roads, or paths. The following potential impacts to vegetation have been identified during the construction works:

- Increased opportunity for establishment and spread of invasive plant species on newly disturbed lands; and
- Destruction or disturbance of vegetative communities outside of the necessary construction work area.

In order to protect vegetation, the Contractor shall:

- Not destroy, remove or clear vegetation to any extent greater than is absolutely necessary for the performance of the work, or to any greater extent than has been authorized;
- If necessary conduct planting of native vegetation as required under provincial regulatory requirements; and
- In order to prevent the introduction of invasive or non-native species, equipment working on this Project should be kept clean and will be regularly monitored/checked by the Environmental Monitor. Any invasive or non-native plant species or materials encountered will be bagged to prevent spread or disbursement and removed from site for disposal at an approved facility.

3.11.1 Invasive species Management

Invasive plant species are typically fast growing and tenaciously colonize disturbed areas. As such, the Capital Regional District Invasive Species Partnership (CRISP) has developed Best Management Practices (BMPs) in order to prevent the further re-establishment of invasive species. The following BMPs should be employed when removing all invasive species on-Site:

- Contact an appropriate disposal facility prior to removal of the invasive species and the contaminated soil to coordinate disposal;
- Contain removed plant debris/seeds on tarps and in bags, before transporting to a pre-approved and designated disposal site;
- Use separate trucks for hauling versus backfilling to prevent cross-contamination;
- Hauling trucks should have haul loads tarped when removing materials off-Site; and
- Infested areas will be restricted to vehicles and equipment used in removal/excavation will be thoroughly washed before leaving infested area.

3.12 Soil and Sediment Management Plan

Works may require temporary soil stockpiling but will ultimately be required to be removed of contaminated soil and sediment on-site. When required, the Contractor will also be responsible for providing documentation that any imported soils meet applicable provincial and environmental regulations and standards (BC Contaminated Sites Regulations 2014).

The following mitigation measures are included to minimize potential impacts to soil and sediment during construction activities:

- For the remediation all material removed during the remedial works may be required to temporarily be deposited into a bermed area. The location will be determined by the contractor such that the requirements of this EMP are met;
- During the works, all equipment operators must minimize movements, swing paths, distances travelled, etc., in order to avoid spreading contamination;
- Equipment used during contaminated soil excavation or loading must be swept off prior to moving it out of the immediate work zone, or be left parked in the same area;
- Sides, bumpers, wheels, etc., must be swept off and any soils spilled around the truck by the loader swept back into a stockpile;
- Any temporarily stockpiled material must be covered with poly-sheeting or other suitable impermeable covering that extends over the berm walls to prevent precipitation from contacting the stockpiled soil. Surface run-off must be directed away from any stockpile to avoid contact with the contaminated soil. Polyethylene sheeting must be weighted down in order to not be blown away by wind;
- Any excavated soil or sediment suspected or identified to contain contaminants must be managed on-site so as to prevent discharge impacts to human health and the environment (i.e., stockpiled on poly tarping and covered);

- Soil and sediment quality must be sampled appropriately if required to be removed or transported off-site to characterize soil for potential contaminants (soil quality is to be compared to BC Contaminated Sites Regulation Schedule 7 column II or column III standards, as appropriate);
- During excavation and/or loading of haul trucks with contaminated soils and sediment, all equipment operators must minimize movements, swing paths, distances travelled, etc., in order to avoid spreading contamination;
- All haul trucks must be equipped with load covers prior to leaving the site;
- When immediate removal and disposal is not feasible, contaminated soil may be temporarily stockpiled in an area of impermeable ground prior to off-site disposal. This containment cell must be isolated by berms (e.g., poly-wrapped sandbags or other suitable substitute, such as straw bales, no-posts) to prevent the spread of materials. There will be one access point which can be closed off at end of shift;
- Any temporary stockpiles of contaminated soil and potentially contaminated material must be covered with poly-sheeting or other suitable impermeable covering that extends over the containment cell walls or berms to prevent precipitation from contacting the stockpiled soil. Surface run-off must be directed away from the stockpile to avoid contact with the contaminated soil and sediment. Polyethylene sheeting must be weighted down in order to not be blown away by wind; and
- Where on-site treatment may not be appropriate or feasible, vacuum trucks may be used to transport contaminated water to an appropriate off-site facility for treatment and disposal.

3.13 Waste Management Plan

The Contractor shall also comply with applicable laws, regulations, permit conditions and requirements when disposing of wastes generated by this Project, including but not limited to general garbage and trash, hazardous wastes (such as used paint or waste batteries), waste oil, or other materials not authorized for on-site disposal. At no time shall any waste material be allowed to enter the marine environment or be discarded or abandoned on land. The Contractor shall be responsible for assuring that all reasonable efforts are implemented to eliminate or minimize waste production. In addition, only facilities approved by the authorities having jurisdiction may be used for disposal or recycling of any waste (garbage, trash, hazardous material, etc.). Potential impacts related to waste management have been identified during the construction phase:

- Waste generated on the Project site could potentially attract wildlife, creating nuisance wildlife;
- Release of Hazardous Waste could potentially contaminate soil, groundwater or a watercourse; and
- Spread of contamination within soil and groundwater via contaminated soil and groundwater movement.

The Contractor shall follow the mitigation measures in the following subsections.

3.13.1 Garbage and General Waste

All non-hazardous and non-toxic garbage, such as paper, paper products, wood, plastic, glass, and discarded food items, shall be stored in closed, leak-proof storage bins that are secure against nuisance wildlife. The Contractor is responsible for the proper collection and transportation of garbage to disposal facilities (i.e., sanitary landfill).

3.13.2 Recyclable Materials

Materials which can be recycled, such as paper and cardboard products, glass bottles and plastic and metal containers, will be sorted and recycled at all times. Recoverable recyclable construction materials (i.e., metals and associated construction wastes) will be taken to an appropriate recycling facility, where available, for handling where it will be recycled and re-used in other products, if feasible. The Contractor is responsible for the proper collection and transportation of material to appropriate recycling facilities. Debris and other garbage will not be deposited in the ocean.

3.13.3 Sanitary Wastes

Sanitary facilities will be required during Project works. These facilities must be serviced on a regular basis and the waste disposed of at permitted treatment facilities. The Contractor will supply and service chemical toilets in its work areas. Portable sanitary facilities will be located at least 15 m from the HWM if possible and must be tied down or anchored, such that they cannot be blown or tipped over, under reasonable conditions.

3.13.4 Equipment-related Wastes

For equipment related waste, the following measures should be adhered to:

- Used oil filters must be drained into a waste oil container and drained filters placed in an appropriate labelled container (i.e., drum) before disposal at a recycling facility or other approved facility;
- Waste-oil and antifreeze must be collected and recycled/disposed of at an approved facility; and
- Used acid-lead batteries must be stored on an impervious surface, under cover, and disposed of at an approved recycling facility.

3.13.5 Hazardous Wastes

It is the Contractor's responsibility to determine whether any waste generated pursuant to the execution of the work has any hazardous or toxic characteristics, or is identified as a "Hazardous Waste" by the Ministry of Environment (MoE), Environment Canada (EC), or any other authority having jurisdiction, and to treat this material appropriately. The Contractor must implement the following measures:

- The Contractor shall review the lists of Hazardous Wastes, as defined by MoE and EC to determine if any waste generated during construction is hazardous;
- If the waste item cannot be found in published Hazardous Waste lists, the Contractor shall determine if the waste displays a characteristic which would make it hazardous;
- The Contractor will review and comply with the *Standards Applicable to Transporters of Hazardous Waste* as defined by MoE and EC; and
- Hazardous Waste shall be treated/ disposed of in authorized facilities, permitted under regulations as defined by MoE and EC. The Contractor shall identify potential facilities for waste disposal and evaluate each facility's legitimacy, compliance with regulatory requirements and capacity. After selecting a facility, the Contractor shall periodically check and verify that the facility is properly handling and disposing of the Hazardous Waste.

3.14 Erosion and Sediment Control Plan

An Erosion Sediment Control Plan (ESCP) outlines the methodology required to provide both short and long term sediment and drainage management measures essential to the protection of aquatic resources and to intercept storm water on this project. The key factors in erosion and sediment control planning are to intercept and manage stormwater that occurs on-site in order to limit the potential for soils to become eroded and for sediment-laden surface runoff to enter any drainage.

By planning construction timing and following BMPs, it is expected that the potential for erosion, sedimentation and harmful substance spills will be minimized. All necessary supplies and equipment for implementing BMPs, such as silt fencing, tarps, filter fabric, straw bales, silt curtains, pumps, hoses, etc., will be kept on-site and utilized as required to maintain environmental compliance.

Erosion and sediment control measures required for this Project may vary greatly depending upon local site conditions and weather at the time the work is undertaken (i.e., not all measures will work in every given situation and during all seasons of the year). The following general sediment and erosion control plans are meant to be flexible in order to react to spatial and temporal requirements and conditions in the marine and upland environment and to minimize the risk of spread of contamination to adjacent clean soils if the ESC plan not implemented properly. Specific objectives of the plan are to provide the following:

- Construction procedures that should be utilized to minimize the potential for erosion and sediment production;
- Site-specific mitigation measures for erosion prevention and control; and
- Mitigation measures for ensuring acceptable water quality.

The following are potential impacts from erosion and sedimentation during Project works:

- Introduction of sediment-laden water into marine waters from construction activities such as site preparation;
- Introduction of contaminants into marine waters from contaminated soil movement;

- Alteration of natural surface water flow from the Project site; and
- Introduction of concrete leachate into marine waters.

3.14.1 Erosion Control

The Contractor shall:

- Minimize disturbance of vegetation when possible as a first defense in the control of erosion and sediment release;
- Minimize trenching, grading, benching and scarification in accordance with the design drawings;
- Use swamp pads where necessary to minimize soil/sediment disturbance and erosion, especially on soft soils in the remediation area;
- Employ sediment and erosion controls as required to minimize the generation of sediment-laden water within the work site (i.e., by staging work and/or only undertaking that portion that can be reasonably completed within a work shift);
- Use silt curtains or other impervious barriers to contain sediment-laden water within a marine work area; and
- Refer to the requirements identified in Section 3.10: Water Quality Management Plan.

Erosion control can be implemented using both temporary and permanent methods. As the Project is primarily within the foreshore and upland areas, the greatest potential for erosion will be from the marine works. The following general strategies will be used during the construction process to reduce erosion potential:

- Restrict construction during periods of heavy precipitation and runoff to minimize soil erosion and potential off-site sedimentation;
- Cover temporary fills or stockpiles with polyethylene sheeting or tarps;
- Temporary stockpiles will be located away from any drainages or the foreshore area as identified in Figure 1;
- Intercept up gradient water sources and divert water around the site;
- Divert water through the site via subsurface piping, channels or ditches that have been constructed to reduce erosion; and
- Line outflow areas of the drainage ditches on either side of the proposed works area (Figure 1) with erosion resistant material and place check dams at regular intervals to reduce the erosive energy of runoff.

Backfilling of excavations and re-grading of the upland construction sites will be carried to completion as quickly as possible in order to ensure that disturbed slopes and exposed soils are stabilized; where necessary, slopes may be temporarily covered with tarps or plastic sheeting to prevent erosion during periods of inclement weather. Exposed soils and seabed sediments (stockpiled upland) will be tarped at the end of each workday and during inclement weather, to

prevent erosion until such time as the infrastructure are completed and the soils can be stabilized during the site restoration process. If applicable to site conditions, the Contractor will have a designated person on-site who will ensure that vehicle tires are cleaned of debris/mud prior to exiting the construction zone and who will also ensure that off-site access areas are swept and kept clear and clean of construction traffic tracking.

3.15 Marine Works Plan

The following section provides a brief overview of activity specific environmental protection measures to be implemented during these works.

3.15.1 Sediment Control

Sediment control seeks to prevent the off-site migration of sediment suspended in stormwater or the marine environment, and its subsequent deposition in sensitive habitats. The following general strategies will be used to control sediment movement offsite:

- Roadways will be regularly swept to prevent sediment tracking;
- Installation and maintenance of silt fencing, gravel berms, and other barriers will be conducted as required to control sediment laden waters within and around the Project area;
- Use of silt curtains when practical and not subjected to strong currents, or other methods to prevent sediment migration during stone column installation below the HWM; and
- Stormwater and surface runoff associated with works will be managed using best available practices to prevent the release of sediment, sediment laden water (in excess of turbidity levels presented in Section 3.10 Water Quality Management Plan), or any deleterious substance into the aquatic environment, where necessary.

3.16 Environmental Monitoring and Reporting Plan

The EM will report directly to Klaus Fuerniss Enterprises Inc. and regulatory agencies to ensure the effectiveness of mitigation and compensation measurements during construction activities. The following activity specific environmental monitoring plan has been developed for the Project.

3.16.1 Water Quality Monitoring

Water quality monitoring will be conducted, if required by the site-specific conditions and activities. *In situ* parameter measurements, such as dissolved oxygen, pH and turbidity, are commonly used to evaluate potential localized effects on water quality. Marine water quality will be monitored during in water works. Water quality results will be compared to background measurements recorded at an area not influenced by construction. Water quality criteria will adhere to the Water Quality Management Plan (Section 3.10). If water quality outside of the silt curtain exceeds the acceptable water quality criteria, additional mitigation measures will be implemented. These may include deployment of additional silt curtains or reducing the speed of the work to reduce sediment disturbance.

Sampling in and around any marine operations will be limited to a safe distance, such that sudden drops/breaks in machinery will not endanger monitoring personnel. The Environmental Monitor will inspect the site on a minimum weekly basis during active construction, at start-up of an activity that has the potential to affect water quality, and more often during periods of inclement weather (i.e., when rainfall exceeds 25 mm in a 24-hour period) to ensure that erosion and sediment control measures are functioning as intended or remediated as necessary. Monitoring will be conducted during the entire tenure of works below the HWM.

When water quality measurements, such as turbidity, are taken in order to determine the zone of construction influence and whether activities are compliant with environmental regulatory guidelines, the direction of flows/currents must be considered. In the marine environment, tidal changes can be extreme and prevailing winds and submarine topography influence longshore current directions. Background turbidity will also vary with the season and depending on algal blooms (turbidity measurements do not distinguish between re-suspended inorganic particulate matter and naturally-occurring planktonic organisms or other organic particles). Background or reference measurements are taken outside or up current of the work zone and will depend on the tide/current direction during the sampling event. The zone of construction influence ("halo") is determined by the configuration of marine structures and equipment, and shoreline/current barriers. The halo size and acceptability of increased turbidity within the immediate construction zone will vary depending on the site and its designated usage.

When and where applicable and appropriate, the BC Approved and Working Water Quality Guidelines for Freshwater, Marine and Estuarine Life will be used for comparison to in situ measurements.

3.16.1 Hydrophone Monitoring Component

The works are not anticipated to involve pile driving, however, in the event that temporary piles are required to secure marine derricks or scows, hydrophone monitoring may be required. In-water pile-driving activities involving steel-pipe piles greater than 24 inches in diameter installed using an impact hammer will be monitored by the Keystone Environmental EM with a hydrophone to ensure the impact pressure is below the recommended upper maximum of 30 kPa. Sound impact pressure is measured with a hydrophone, attached to a blast- or seismic-monitoring device, with internal memory and storage (i.e., Blast-Mate III Seismograph). Temporary piles used to secure scows are typically installed using vibratory hammers, and as such, it is considered unlikely that hydrophone monitoring will be required.

3.16.2 Marine Mammal Management

Project works are expected to comply with the Marine Mammal Regulation of the federal *Fisheries Act.* The presence of marine mammals observed in or about the works will be documented as to type and number. Identifying features will be noted, where such identifications of individuals may be of interest to other stakeholders or agencies. Behaviour will be noted, and if the behaviour appears to be altered in a negative manner due to the work-related activities, work will cease until the animal moves out of the zone of influence. Any such interactions will be noted. At no time will any intentional interactions, such as petting or feeding wildlife be allowed. The following will apply:

- The Environmental Monitor will act as a Marine Mammal Observer (MMO) and will be experienced in performing such work.
- Any works that have a potential to harm or harass marine mammals will not be allowed and appropriate BMPs in the Contractor's EPP will be implemented to ensure no harm or harassment occurs.
- A 1,000 m safety zone will be established for cetaceans and a 100 m safety zone will be established for all other mammals.
- The MMO will immediately alert the site foreman if any pinniped or cephalopod enters the safety zone during works.
- The MMO will advise the site foreman to stop all in-water works until the animal leaves the area or it is not observed for a duration of 30 minutes.
- All mammal sightings during the works will be documented by the MMO in detail and provided to Owner during weekly monitoring reports.

3.16.3 Environmental Incident Reporting

An environmental incident is one that has caused, or has the potential to cause, one or more of the following:

- Environmental damage;
- An adverse effect on fish, wildlife or other environmental resources;
- Heightened publicity associated with a negative effect on the environment; and
- Legal action with respect to environmental noncompliance and/or damage.

In addition to the above points, all spills (regardless of volume) are considered to be environmental incidents in the context of this Project. In the event of an environmental incident, as defined above, the following procedures shall be undertaken by the Contractor:

- Take immediate action to minimize environmental consequences and manage resolution of the incident
- Gather information for the assessment of causes so that prevention of future incidents can be planned;
- Prepare a written Environmental Incident Report (EIR) as soon as possible (within one working day of the occurrence) summarizing events, actions and recommendations for future avoidance;
- Submit EIR to the Environmental Manager/QEP; and
- Prepare updates to the EIR as necessary and submit them to the Environmental Manager/QEP.

3.16.4 Environmental Training and Orientation

As part of Project requirements, the Environmental Monitor will fulfil the following tasks:

- Attend meetings where environmental issues or concerns may arise or may ask for a meeting to discuss such issues with the various stakeholders involved;
- Give an environmental orientation to the Contractor's employees, including other monitors or observers that may not necessarily be aware of the environmental issues or concerns that are part of the activities being undertaken;
- Discuss discipline or activity-specific environmental issues/concerns and mitigative strategies with crews or individuals as the need arises, such that they are aware of the environmental protection measures that should or could be implemented under the conditions at the time the work is undertaken; and
- Be available for meetings (whether in person or via telephone) should the need arise, and will respond to messages or written communications as required by the circumstances.

The Contractor shall participate in implementing an education and training system as part of the site orientation for on-site Contractor and their sub-Contractor staff.

3.16.5 Environmental Monitoring and Compliance Tracking

The Environmental Monitor will keep field notes and logs of site visits conducted and will document site conditions/compliance with a checklist prepared for site-specific conditions and activities, and will keep a photographic record of activities and site conditions as work progresses. These records will form the basis of the formal monitoring reports (prepared following site visits), as well as provide records for quality management control.

Where required by the conditions of an authorization, letter of advice or other permits issued for the Project, reports will be submitted as specified to the regulatory agencies and stakeholders listed in the conditions, by the EM or through a designated Owner representative. The Project authorities may then disseminate the reports to other stakeholders, as deemed appropriate, or request that the Environmental Monitor include them on the transmittal list.

Formal monitoring reports will include a list of construction activities, water quality monitoring results and environmental protection measures implemented or mitigative strategies employed, as well as photographs where appropriate. A discussion of the effectiveness of the environmental protection measures will be included. Special provisions will be detailed and any post-construction monitoring requirements outlined, especially where a potential impact may not be realized immediately. Reporting will also include any deficiencies, correction measures implemented and subsequent compliance with the environmental protection plan. Non-compliance will be documented and the measures taken to correct such deficiencies will be tracked.

A formal monitoring report will be prepared by Keystone Environmental following the proposed works. The report will be sent to the Owner, the Construction Manager, the Project Managers, and other Project stakeholders as determined by the Owner.

Environmental monitoring will be conducted throughout the remediation works that are proposed to be undertaken during the Least Risk Window for the Protection of Fish and Fish Habitat – Gibsons area of August 16 – January 31.

3.17 Contractor Awareness and Education Plan

The construction Contractor shall develop an awareness and education plan which will include an orientation session for each new worker. Training will include site-specific guidance on environmental regulatory requirements and best management construction and protection practices around sensitive areas (drainages and marine waters, vegetation and wildlife habitats) and the protection approaches to be taken for each type. The Contractor will ensure that individuals requiring specialized training due to their responsibilities within the Project, or employees new to this type of work, receive additional training on their work functions, impacts and roles for achieving environmental compliance. Emergency response and waste management will be discussed and appropriate sites for contingency supplies and disposal areas identified as well.

Daily tailgate meetings are required for the Contractor staff to ensure they are appropriately aware and prepared for the day's activities and associated health, safety and environmental risks. Tailgate meetings will be documented, signed by each employee involved and retained at the start of each project activity. Only if the project activity, environmental conditions, or employees change, will an updated tailgate meeting document be required for employee sign-off and retained as record. On days that are scheduled to be near or associated with environmentally sensitive areas or impact environmental values, the EM will attend to outline mitigative strategies for site-specific environmental requirements.

All training sessions with the names of the Contractor, sub-Contractor(s), and other attendees will be properly documented. Environmental monitoring reports will include compliance reporting, how effective the mitigative strategies were, and opportunities for activity and training improvement.

4. STATEMENT OF LIMITATIONS

Findings presented in this CEMP are based upon (i) reviews of available documentation and discussions with available personnel, (ii) review of available records and the terms and conditions for the planned construction, and (iii) observations of the sites and surrounding lands. Consequently, while conclusions and recommendations documented in this report have been prepared in a manner consistent with that level of care and skill normally exercised by other members of the environmental science and engineering profession, practicing under similar circumstances in the area at the time of the performance of the work, this CEMP is intended to provide information and to suggest mitigative strategies to reduce, but not necessarily eliminate, the potential for environmental impacts to occur as a result of planned construction activities at the Project site. This CEMP is meant to be a living and flexible document that can be used to provide guidance in environmental protection measures that can be implemented during routine construction activities, as well as unanticipated events or requirements that may arise during the course of construction.

This report has been prepared solely for the internal use of Klaus Fuerniss Enterprises Inc. pursuant to the agreement between Keystone Environmental Ltd. and Klaus Fuerniss Enterprises Inc. By using this report, Klaus Fuerniss Enterprises Inc. agrees that they will review and use the report in its entirety. Any use which other parties make of this report, or any reliance on or decisions made based on it, are the responsibility of such parties. Keystone Environmental Ltd. accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this report.

5. PROFESSIONAL STATEMENT

This report titled *George Hotel Marine Residences Foreshore Remediation Construction Environmental Management Plan, 377 and 385 Gower Point Road, Gibsons, BC* has been prepared the professionals below.

July 25, 2017
Date

Original signed by

Libor Michalak R.P.Bio., P.Biol.
Ecologist

Original signed by

Warren Appleton R.P.Bio.
Marine Biologist

Original signed by

Michael Geraghty, M.Sc., P.Geo, PMP
Senior Technical Manager

FIGURE 1

REMEDIATION PROJECT

Keystone Environmental
Knowledge-Driven Results

N

GOWER POINT RD.

385

397

WINN RD.

SPOIL CONTAINMENT AREA

SILT CURTAIN
(ANCHORED TO BED)

REGIONAL
GROUNDWATER
FLOW DIRECTION

TP16-46
SED16-23
TP16-45
SED16-59
SED16-22
SED16-25
SED16-65
SED16-58
SED16-61
TP16-54
BH16-40
SED15-1
SED16-21
SED15-8
SED15-9
TP16-53
TP16-51
BH16-41
BH16-38
25
26
27
SED16-24
SED16-26
SED16-60
SED15-2
BH16-42
15
SS15-2
BH16-39
MW04-2
BH04-1
BH16-64
TP16-50
SED15-15
29
SED16-56
SED16-63
MW16-20
17
MW04-4
30
31
SED15-3
32
SED16-54
TP16-55
TP16-49
SS15-11
SS15-17
SS15-16
SED15-13
SED15-6
SED15-7
TP16-32
MW16-35S
MW04-3
6
MW04-5
SED15-14
SED15-16
TP16-29
SED16-57
MW16-35D
1
24
TP16-30
TP16-31
35
36
SED16-62
TP16-33
TP16-34
MW16-37
SS15-12
MW16-28
SS15-18
BH04-6
TP16-52
TP16-48
2
38
5
8
4
3
13
39
TP16-43
SED15-5
10
9
40
TP16-44
41
TP16-27
TP16-47

LEGEND

- SITE
- PROPERTY LINE
- BUILDING OUTLINE
- FORMER BUILDING/STRUCTURES
- FENCE LINE
- DITCH
- SHORELINE
- KEYSTONE BOREHOLE (2004 & 2016)
- KEYSTONE MONITORING WELL (2004 & 2016)
- SOIL OR SEDIMENT SAMPLE (BY OTHERS)
- KEYSTONE SURFICIAL SOIL SAMPLE (2015)
- KEYSTONE SEDIMENT CORE SAMPLE (2015 & 2016)
- KEYSTONE SEDIMENT PONAR SAMPLE (2015)
- KEYSTONE TESTPIT (2016)
- SOIL/SEDIMENT CONCENTRATION(S) LESS THAN CSR STANDARDS
- SOIL CONCENTRATION(S) GREATER THAN CSR STANDARDS (RL)
- SEDIMENT CONCENTRATION(S) GREATER THAN CSR STANDARDS (SedQC$_{TS}$)
- SEDIMENT CONCENTRATION(S) GREATER THAN PSDDA (SL)
- INFERRED EXTENT OF METALS CONTAMINATION IN SOIL & SEDIMENT EXCEEDING CSR STANDARDS
- INFERRED EXTENT OF TRIBUTYLTIN CONTAMINATION IN SOIL & SEDIMENT EXCEEDING CSR STANDARDS
- INFERRED EXTENT OF LEPH, HEPH & PAH CONTAMINATION IN SOIL & SEDIMENT EXCEEDING CSR STANDARDS
- SILT CURTAIN
- SPOIL CONTAINMENT AREA

Keystone Environmental

NOTES:
1. THIS DRAWING IS FOR GENERAL INFORMATION ONLY. LOT BOUNDARIES AND FEATURES ARE APPROXIMATE.

5m 0 25m

SCALE: 1:500(approx.)

377, 385, 397 & 407 Gower Point Rd.
& 689 Winn Rd., Gibsons, B C
Klaus Fuerniss Enterprises Inc.

REVISION No.	DATE	PROJECT No.
00	July 2017	12845-04

Figure 1
Remediation Project

PLOT SCALE: 1:1 DRAWN BY: DK\HL CADD FILE No. I:\12800-12899\12845\Figs\Sept. 2016\Remediation Letter\July 2017\Fig1-Remediation Project-R0.dwg