APPENDIX C

2008 and 2009 – Contractor Environmental Management Plans

ENVIRONMENTAL MANAGEMENT PLAN

For

Terminal Finishing Works
Deltaport Container Terminal
Berth 3 Expansion
Delta, British Columbia

Prepared for:

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LIST OF ABBREVIATIONS

Fisheries and Oceans Canada (Department of Fisheries and Oceans)	DFO
Environmental Management Plan	EMP
Environmental Monitor	EM
Erosion and Sediment Control	ESC
Material Safety Data Sheets	MSDS
Ministry of Environment	MoE
Nephelometric Turbidity Units	NTU
Non-Filterable Residue	NFR
Provincial Emergency Program	PEP
Total Suspended Solids	TSS
Vancouver Fraser Port Authority (Port Metro Vancouver)	VFPA
Workplace Hazardous Materials Information System	WHMIS

1 INTRODUCTION

BA Blacktop Ltd. (BA Blacktop) has been retained by TSI Terminal Systems Inc. (TSI) to conduct construction work for the supply and installation of granular subbase, granular base, HMAC paving, concrete runways, and miscellaneous infrastructure associated with the Berth 3 Expansion Terminal Finishing Works (DP3 TFW) project (the Project) at the Deltaport Container Terminal located at Roberts Bank in Delta, BC. Operation and development of Deltaport are under the responsibility of the Vancouver Fraser Port Authority (VFPA), also known as Port Metro Vancouver. Trow Associates Inc. (Trow) has been retained by BA Blacktop to prepare a project specific Environmental Management Plan (EMP) consistent with requirements of regulatory authorities, TSI, and the VFPA.

2 DESCRIPTION OF SITE WORKS

The Project is at the Deltaport container terminal, located approximately 35 km south of Vancouver in Delta, BC, at Roberts Bank and north of the BC Ferries Tsawwassen ferry terminal. A site location plan of the DP3 TFW project area is presented on Figure 1. The terminals at Roberts Bank include Deltaport and Westshore Terminals, a bulk handling coal port facility.

The DP3 TFW project is part of an initiative to expand existing container terminal operations at Deltaport. The expansion adds approximately 20 hectares of additional container storage facilities to two existing berths. As mentioned, the work includes the supply and installation of granular subbase, granular base, HMAC paving, concrete runways, and miscellaneous infrastructure. Based on current understanding of project works at Berth 3, works are being conducted in three general construction areas identified as Areas A, B, and C. A site layout plan of the DP3 TFW project area is presented on Figure 2.

3 OBJECTIVES OF THE EMP

This EMP describes measures that are to be implemented during the DP3 TFW project. These measures are intended to minimize and/or avoid impacts associated with natural resources and the environment in the Project Area during construction.

As a starting point, common sense and proactive approaches to good housekeeping on site, as well as regularly scheduled equipment maintenance, form the basis of a plan designed to avoid and/or reduce negative impacts to either aquatic or terrestrial environments. This approach is supplemented by environmental Best Management Practices (BMP's) that have been developed for construction activities in environmentally sensitive areas. BA Blacktop and its subcontractors are also encouraged to contact suppliers and/or associations for current BMP's that may relate to their specific project activities.

This EMP shall be available to all individuals working on the Project. Project works shall comply with all relevant federal, provincial, local municipal laws and regulations, permits and/or authorizations, where applicable.

Key project personnel referred to in this document are identified in Appendix A.

4 AMENDMENT OF THE EMP

This EMP has been developed based on the current understanding of project activities specific to the DP3 TFW project only (the Project). As activities, scheduling and staging may be altered through the life of the Project, this EMP is considered a living document and may be amended from time to time to appropriately reflect these changes. All members of the project team, including, but not limited to, BA Blacktop, its contractors and the Environmental Monitor, are encouraged to provide information regarding suggested amendments to the EMP. This input will include information regarding existing environmental conditions, work descriptions, schedules of work, environmental protection measures, contingency plans, and monitoring requirements. Throughout the Project, following an amendment to the EMP, an updated, current version will be made available to BA Blacktop, its contractors and the Environmental Monitor.

5 DEFINITIONS

Deleterious Substance or Material is defined as a substance harmful to fish or fish habitat (Canada Fisheries Act, Section 36.3).

Designated Watercourse is a watercourse that is, or is immediately upstream of fisheries habitat, or which has been given designated status by the regulatory authorities.

Environment refers to the physical, biological, social, spiritual and cultural components that are interrelated and affect the growth and development of living organisms. The term “environment” in these specifications shall include socio-community issues and resources.

Environmental Monitor refers to an agent hired by BA Blacktop to monitor project compliance with the environmental protection aspects of this EMP, permits and approvals, and to report to BA Blacktop and regulatory authorities (including Fisheries and Oceans Canada) on environmental problems.

Environmental Approval is defined as the written authority issued to a person or company by a government agency that allows the person or company to do something that otherwise may not be permitted by law or which is not defined in law. An environmental approval is a broad, generic term referring to informal or formal authorization for actions that may have an adverse effect on the environment, such as (i) undertaking an activity (e.g., authorization from fishery agencies to proceed with work within the wetted perimeter of a fish-bearing stream); or (ii) discharging some form of material (e.g., approval under the BC Environmental Management Act to introduce waste into the environment or the storage of hazardous waste for a period of 12 months or less). The term “approval” can include related forms of authorization such as permits and licenses.

Environmentally Sensitive Area(s) refers to areas requiring special management and attention to protect resources, habitat or species (which includes and is not limited to water quality, identified sensitive areas, fish and fish habitat, vegetation, rare and endangered flora/fauna, landscaping and visual aesthetics, soil conservation (including dust control), air quality and archaeological, heritage and cultural resources. There are no areas defined as environmentally sensitive areas.

Fishery Timing or Operating Window refers to the time period(s) of reduced risk for important commercial, sport, and resident fish species, based on their life histories. The fishery timing window is the time of year during which there are no fish eggs or alevin present in the substrates of local watercourses, and the period when fish migration (juvenile out-migration and adult spawning in-migration) is not occurring. This is generally the preferred period for (i) instream work or (ii) work in areas which may potentially affect fish-bearing streams or over top of fish-bearing streams with the potential to create adverse impacts on fish or fish habitat. For this project, every effort should be made to avoid construction works during the fisheries sensitive period for juvenile salmonids (March 1st to August 15th, inclusive) or else work is to be conducted in the dry, as tides permit, or in isolation of fish-bearing waters.

Habitats are defined as those parts of the environment on which terrestrial and/or aquatic species depend, directly or indirectly, in order to carry out their life processes.

Fisheries Sensitive Zone is defined as the aquatic habitats within rivers, lakes or oceans, as well as out-of-stream supporting habitat features such as side channels, wetlands, and vegetated riparian areas adjacent to these features.

Impact is defined as an alteration, either positive or negative, to the environment brought about as a direct or indirect result of a project, including construction, operation and maintenance work (e.g., the consequence of a highway-related activity interacting with its surroundings).

Mitigation refers to a procedure or an action designed to avoid, reduce or control the severity, magnitude, duration and/or frequency of environmental impacts of a project through design alternatives, scheduling or other means.

Permit refers to a formal authorization, typically granted to proponents by an Environmental Agency, for a particular land use or activity. For example, under Section 8 of the B.C. Environmental Management Act, a permit may be issued to introduce waste into the environment or to store special waste subject to environmental protection requirements, which are deemed advisable. The permit can specify the procedures or requirements respecting the handling, treatment, transportation, discharge or storage of waste that the holder of the permit must fulfill. The term “permit” can be defined by applicable legislation. The term “permit” is synonymous with the term “licence”, and the two terms are often used interchangeably.

Relevant Environmental Agencies refers to the appropriate regulating branches of Federal and Provincial government responsible for the management and protection of the Environment and human resources. The environmental authorities that may be involved in the DP3 Project are summarized in Section 6 (Relevant Environmental Authorities and Permits).

Sedimentation is defined as the deposition of material carried in water, usually as a result of a reduction in water velocity below the point at which material can be transported.

Waterbodies(s) shall apply to all areas of water including oceans, streams, rivers, storm sewers, lakes, ponds, and wetlands.

6 AUTHORITIES, REGULATIONS & PERMITS

6.1 Environmental Assessment and Approvals

The overall Third Birth Expansion project has been subject to an environmental review under both the *Canadian Environmental Assessment Act* (CEAA) and the *British Columbia Environmental Assessment Act* (BCEAA). The following key approvals obtained by VFPA in support of the overall DP3 expansion project are outlined below:

- September 29, 2006 - Received a provincial environmental assessment certificate for the Deltaport Third Berth Project.
- December 8, 2006 - The federal comprehensive study of the Deltaport Third Berth Project was completed.
- December 19, 2006 - Received authorization under the *Fisheries Act* for the project (Authorization No. 02-HPAC-PA1-000-000144).
- December 8, 2008 – Received authorization under the *Fisheries Act* for construction of a temporary barge facility at new tug basin located northwest of the Deltaport Third Berth (Authorization No. 02-HPAC-PA1-000-000144-2).

The terms and conditions of these approvals are to be associated with the construction and operation of various aspects of the overall expansion project and terms and conditions, where applicable, are incorporated into this EMP for the DP3 TFW project.

6.2 Regulatory Enforcement

Port facilities and projects are generally governed by federal regulations. A list of federal Acts regarding environmental protection measures include the following:

- Fisheries Act (Sections 34 – 37);
- Canadian Environmental Protection Act (Parts 4 and 7);
- Species at Risk Act;
- Transportation of Dangerous Goods Act; and
- Navigable Waters Protection Act.

Other applicable acts (provincial) that may potentially affect the Project include the following:

- Environmental Management Act;
- Fish Protection Act;
- Water Act; and
- Wildlife Act.

For the duration of this project, the Environmental Manager, Environmental Monitor and Environmental Specialists will work in cooperation with BA Blacktop and Relevant Authorities to address any potential environmental issues that may arise.

6.3 Permits

Requirements for additional environmental permits or approvals are not anticipated for this DP3 TFW project based on the current understanding of the scope of work. However, any work in environmentally sensitive areas (e.g. in and around water) is to be communicated to, and monitored by, the Environmental Monitor.

7 COMMUNICATIONS WITH ENVIRONMENTAL AGENCIES

Communications with Environmental Agencies, both formal and informal, will be ongoing throughout the project with Fisheries and Oceans Canada (DFO) acting as the lead the environmental agency. Environmentally sensitive issues will be addressed by the Project Manager and the Environmental Manager and/or Environmental Monitor. In field situations, the Environmental Monitor and the Site Supervisor will be the point people for addressing concerns that may be raised by the Environmental Authorities. Concerns that are easily resolved are to be dealt with by these individuals. Concerns raised and any action taken or commitments made must be documented and forwarded to the Environmental Manager. If a concern raised is not easily resolved, or affects future or other components of the Project, the concern is to be referred to the Environmental Manager and/or Project Manager. In the event of non-compliance, warning, order, or other such event, the Environmental Manager and Project Manager are to be contacted immediately. All personnel are expected to foster a positive working relationship with the Environmental Agencies and Environmental Monitor.

The Environmental Monitor will generally produce weekly reports whenever there is the potential for adverse impacts to fisheries resources resulting from work on the project which will be delivered to the Environmental Manager, other project team members, and appropriate regulatory authorities (i.e. DFO).

This information will be recorded and communicated with project Design, Construction Managers, Project Manager, and/or the Environmental Authorities as required. Reports may include:

- A concise summary of the works carried out or undertaken during the monitoring period (in point form);
- Commentary on the works and the work area from an environmental perspective (e.g. whether or not fish are present along the shore at the site, the turbidity of the water, etc.);
- Water quality measurements of marine waters at the site and in the vicinity of works such as fill and rock placement. Measurements shall include reference and sample sites as approved by DFO;
- A summary of any erosion or deposition which may be occurring in and around the barge facility or the crest protection.
- Identification of any environmental issues or impacts that arose or occurred and details of specific mitigation measures put in place to address environmental issues and impacts.

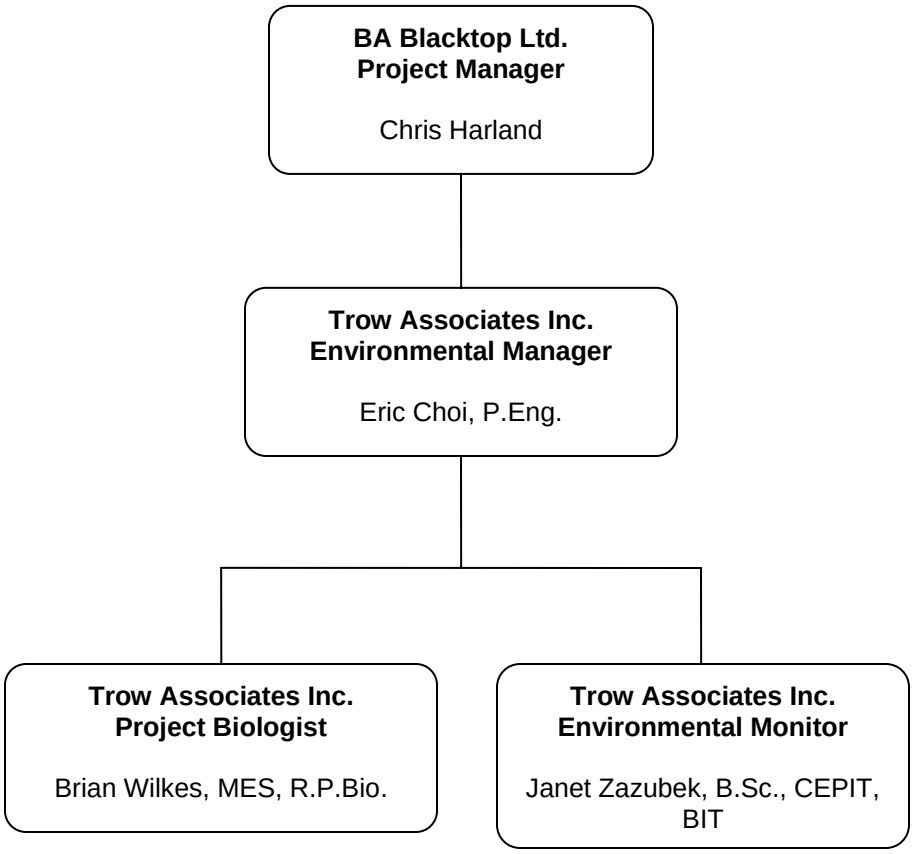
8 INTERNAL COMMUNICATIONS AND RESPONSIBILITIES

Internal communication will be as indicated in the organization chart provided below (Figure 6-1). The Environmental Manager will actively communicate with Design and Construction Managers and be responsible for preparation of the EMP. Environmental Specialists will report directly to the Environmental Manager and be responsible for developing relevant EMP sections and support as needed throughout the duration of the project. The Environmental Specialists include: 1) the Project Biologist and 2) the Environmental Monitor, responsible for implementation of the EMP.

The Environmental Manager will work in cooperation with the Project Biologist, Environmental Monitor, and/or the design and construction teams to ensure that environmental protection measures are employed throughout the project, provide training as required, conduct visual inspections as required, correct work that may not be in conformance.

The Environmental Monitor will assess the implementation and effectiveness of environmental protection measures described in the EMP, measure and monitor environmental quality parameters, monitor site housekeeping, and provide weekly environmental monitoring reports. Information collected in environmental monitoring reports will be summarized and presented to the BA Blacktop Design and Construction Managers and Relevant Authorities (as required) to ensure protection of the environment throughout the project. The information that will be shared will include construction activities, non-compliance/non-conformance issues, unexpected environmental concerns, ESC reports, results of monitoring, amendments to the EMP and incident reports. Details regarding environmental monitoring responsibilities are presented in Section 20 – Environmental Monitoring.

Figure 6-1. Internal Environmental Management Organization Chart



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9 ENVIRONMENTAL REPORTING AND MONITORING

Environment monitoring will be conducted when there is potential for adverse impacts to fisheries resources resulting from work on the project or on a weekly basis depending on construction activities and will generally be prepared on a weekly schedule. Currently, it is understood that works are expected to begin in May 2009, with substantial completion anticipated for November 2009. The Environmental Manager will be responsible for completing the Environmental Reports which will cover action items in the EMP.

Environmental monitoring will provide assurance of environmental protection during construction as well as appropriate mitigation methods. The environmental monitoring team will assess and monitor conditions at, and in, the area which may potentially be affected by the project to ensure acceptable levels of disturbance are not exceeded and to ensure compliance with the environmental specifications contained herein. Furthermore, the team will provide environmental protection advice to the construction personnel as and when required. Should the environmental monitoring determine construction works pose or will pose an environmental concern, the works method will be modified. The team may direct that precautionary or remedial measures be undertaken whenever works are not in accordance with the current EMP, permits or authorizations, or relevant Acts and Regulations.

Table 9-1 below summarizes required environmental monitoring and reporting events and frequencies for the duration of the project. Where applicable, additional specific duties of the Environmental Monitor(s) are summarized throughout other sections of this document.

Table 9-1 – Deltaport Berth 3 Expansion Terminal Finishing Works Project Monitoring Requirements

Individual Responsible - Parameter to be Monitored	Monitoring Frequency	Reporting Frequency
Environmental Monitor - Erosion and Sediment Control & Marine Water Quality Samples [contaminants of concern, Total Suspended Solids (TSS) & pH, as required]	Weekly, or as required, based on construction activity and rainfall events.	Per visit (if exceeds applicable criteria), otherwise bi-weekly.
Environmental Monitor - General Environmental Conditions	Weekly, or as required, based on construction activity.	Weekly whenever potential for adverse effects.
Environmental Monitor Environmental Incidents	As required, during any construction-related environmental event.	After each environmental incident.

Individual Responsible - Parameter to be Monitored	Monitoring Frequency	Reporting Frequency
Health and Safety Manager (1st) Environmental Monitor (2nd) Noise	In conformance with Health and Safety requirements.	Per Health and Safety reporting requirements.
Health and Safety Manager (1st) Environmental Monitor (2nd) Air Quality and Dustfall	Daily visual inspection.	Per Health and Safety reporting requirements.

10 WORK SCHEDULE COMMUNICATIONS

As required, meetings will be arranged with the Project Manager, Site Supervisor, Design and Construction team members, and/or the Environmental Monitor. The purpose of such meetings will be to outline the schedule of upcoming construction and proposed activities, and to review the activities of the previous week.

The project is anticipated to be constructed over an approximately six month period commencing in May 2009 with completion scheduled by October 31, 2009.

11 TEMPORARY WORK STOPPAGE

Work may be stopped to apply mitigative and environmental protection measures required to safeguard the environment and the Project and to ensure compliance with applicable environmental regulations. The Environmental Monitor and construction personnel will inspect Environmentally Sensitive Areas on the Project, as necessary (based on their professional judgment), to assess potential environmental problems. If potential adverse environmental impacts are observed, required environmental measures to avoid or minimize impacts will be initiated. The individuals with authority to stop work are the BA Blacktop Health and Safety Manager, Project Manager, the Construction Manager, Site Superintendent, Resident Engineer, Project Quality Manager, Environmental Manager, Environmental Monitor and/or Relevant Authorities.

12 ECOLOGICAL AND ENVIRONMENTAL PROTECTION PRACTICES

The following table summarizes the environmental aspects which have been anticipated for the DP3 TFW project and the sections of the EMP that address them:

Table 12-1 – Summary of Environmental Aspects

Environmental Aspect	Section of EMP
General Environmental Conditions	13
Air Quality & Dust Management Plan	14
Erosion & Sediment Control Management Plan	15
Surface Water Quality Management Plan	16
Vehicles and Equipment	17
Soil Impacts Management Plan	18
Noise Management Plan	19
Waste Management	20
Emergency & Spill Response	21
Environmental Monitoring & Reporting	22
Environmental Incident Reporting	23

The intent of the environmental management plans are to protect the living, physical and chemical environment associated with the project. During the project, BA Blacktop and its contractors shall strictly comply with the following requirements in order to avoid degrading the habitat quality of the project site and surrounding environment

Each specific environmental management plan contains:

- Purpose and Scope: a statement describing the requirement for, and intent of, each plan in the context of the project;
- Legislation(s), Regulation(s), and/or Guideline(s): an indication of the applicable guidance documents and Relevant Authority(s) involved with that aspect of environmental protection. Where possible, the specific sections of each document that relate to the project works have been identified; and
- Best Management Practices (BMPs): practices designed to avoid, mitigate or reduce potential impacts on the environment.

Implementation of the BMPs is the responsibility of all personnel and companies that are working on the DP3 TFW project. As such, it is BA Blacktop's intent that all personnel and companies will be familiar and compliant with information contained in this document as it relates to their work on the project.

12.1 General Protection Measures

The following general protection measures must be adhered to throughout the project:

I. During the pre-construction meeting, environmental protection measures will be discussed with the BA Blacktop representative. This meeting may include various representatives from the construction team and/or the Environmental Monitor. In addition, the environmental reviewing authorities may be invited to attend.

II. All necessary permits, licenses and approvals will be obtained and copies will be on site prior to the start of construction. Unless otherwise allowed by the environmental reviewing agencies, work should not start on any component of the project, until all environmental authorizations and permits are obtained. Permits and licenses for this project include, but are not limited to:

- Authorization under Section 35(2) of the Federal Fisheries Act
    - Authorization No. 02-HPAC-PA1-000-000144-2 is understood to have already been obtained by VFPA on behalf of the project for the already constructed temporary barge facility at the site.
    - Authorization No. 02-HPAC-PA1-000-000144 is understood to also have been obtained by VFPA for construction of the entire DP3 project.

Furthermore, all work will be undertaken in a manner consistent with the conditions of all permits, licenses and approvals (e.g. the DFO Authorization). Changes to any proposed work must be approved by the Owner's Representative (from VFPA) as well as all appropriate regulatory agencies (e.g. DFO).

III. Do Not Kill Fish or Damage Fish Habitat - BA Blacktop shall take all reasonable and necessary measures to ensure that any activities undertaken in the performance of the work do not result in the loss of fish or fish habitat. All activities will be undertaken only during the approved work windows;

IV. Erosion and Sediment Control - BA Blacktop shall ensure all works are undertaken in a manner that avoids or minimizes on site erosion problems and the discharge of silt laden water or any other deleterious substances into any water body.

V. Dangerous Goods - Dangerous goods, such as welding supplies, paints, primers and preservatives, must be stored in secondary containment / secure sheds and handled in such a manner as to prevent their inadvertent release to the environment.

VI. Material Safety Data Sheets (MSDS) - BA Blacktop shall maintain copies of MSDS onsite and follow the *Workplace Hazardous Materials Information System* (WHMIS) regulations.

13 GENERAL ENVIRONMENTAL CONDITIONS MANAGEMENT PLAN

Purpose and Scope: The General Environmental Conditions Management Plan addresses many common practices that should be conducted throughout the construction phase of the project. Many of the activities of concern can be mitigated through a common sense approach and following the basic housekeeping practices presented here.

Best Management Practices: During construction, BA Blacktop shall comply with the following:

I. Undertake work in compliance with the plans approved by DFO and other Regulatory Authorities;

II. Maintain all key erosion control systems and pollution control equipment throughout the duration of the project;

III. Conduct all operations in such a manner that there are no unauthorized discharges of any sort (liquid or solid) to any waterbody (direct or indirect);

IV. Ensure that all equipment and machinery used is in good working condition, clean, and free of leaks or excess oil and grease;

V. Ensure that appropriate spill kits are available on all equipment working on or in areas which may potentially affect any watercourse or drainage;

VI. Dispose of sewage, refuse and chemical wastes in a manner approved by Relevant Authorities;

VII. Remove all equipment, tools, supplies, temporary structures and waste materials from the work areas upon completion of the project;

VIII. Inspect equipment service, wash-down, maintenance and refueling areas for soil staining; and remediate accordingly;

IX. Upon completion of work in an area, restore the area as soon as practicable to stabilize soil and sediment to provide source erosion protection. Reduce erosion potential by covering exposed soils by various methods such as with plastic sheeting and control overland flow of sediment with various methods including use of silt fencing, compost berms, etc.;

X. Upon completion of the project, decommission all temporary ditches, sedimentation ponds, settling basins, culverts and water diversion berms and fill to grade as required; and

XI. Remove all temporary signage, flagging ribbons, and construction survey markers upon completion of the project.

14 AIR QUALITY AND DUST MANAGEMENT PLAN

Purpose and Scope: The Air Quality and Dust Management Plan recommends measures to reduce construction impact on the local ambient air quality and to protect workers and the environment around the site. The plan identifies project and site-specific strategies to avoid, reduce or eliminate air quality and dust impacts that may result from the project activities.

Legislation(s), Regulation(s), and/or Guideline(s): The following documents summarize applicable protection and mitigation measures for air quality and dust:

- Canada Council of Minister's of the Environment (CCME) for Canada-wide standards for air quality;
- Canadian Environmental Protection Act;
- Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities;
- British Columbia Environmental Management Act;
- British Columbia Worker's Compensation Act; and
- Maintenance Guidelines for Dust Palliatives and Gravel Road Stabilization.

Compliance with the aforementioned legislation and guidelines are anticipated to meet, or exceed, any applicable local bylaw requirements (e.g. Metro Vancouver, Air Quality Management Bylaw No. 937, 1999 for regional ambient air quality objectives).

Best Management Practices: Construction activities and site conditions (e.g. high winds) could generate temporary increase of air pollutants in the local environment. There are three basic sources of short-term air emissions expected to be generated during the construction phase: operation of the construction vehicles (i.e., loaders, dump trucks), creation of dust during storage, handling and placement of subbase and base materials, and use of asphalt or other oil based substances during the final phases of construction. Therefore, mitigation measures are recommended to reduce the impact of the project activities on the local ambient air quality. These measures may include some or all of the following:

General:

- Observe and identify construction areas that may be potential sources of dust emissions;
- Apply water (dust suppressant) to unpaved construction surfaces as required (ensure potential water conservation and drainage considerations are addressed prior to application);
- Reduce speed limits of mobile equipment and vehicles, where practical;
- During windy conditions, where possible, minimize or prohibit construction activities which may generate greater levels of dust and increase application of dust suppressants; and
- Cover trucks transporting fine-grained materials as required.

Dust Palliatives:

- When increasing moisture content of materials to control fugitive dust, consider water conservation, appropriate drainage, and the chemical properties of the liquid being applied.

- No oils shall be used for dust control. Any use of chemical bindings agents, such as calcium chloride, may only be used if authorized by DFO;
- Water is to be applied with trucks equipped with spray bars and/or other suitable control apparatus to increase moisture content of exposed soil areas at regular intervals. Ensure water conservation and drainage considerations are addressed.

Stockpiles:

- Avoid/minimize double-handling of base, subbase, and other potential dust generating materials.
- Water may also be applied to stockpiles if use of the material is anticipated on an ongoing basis.

Gaseous Emissions:

- Conduct regular maintenance of equipment and operate equipment at optimum rated loads.
- As an alternative to idling, turn off equipment if practical;
- Schedule use of efficient equipment with the lowest amount of emissions;
- Equipment emitting unacceptable amounts of black smoke are to be taken of service on the project until the equipment can be adjusted to meet acceptable emission standards;
- Recommend to use ultra-low sulphur diesel (maximum 15 ppm sulphur content) in all stationary, diesel powered equipment (e.g. compressors, generators, etc.);
- For all other diesel construction equipment, recommend to use ultra-low sulphur diesel fuel or use catalyzed particulate traps or a diesel oxidation catalyst; and
- Where practicable, utilize gird power over locally generated power.

Monitoring Requirements: Air quality and dust conditions within the Project area shall be visually inspected over the duration of the project. Sources of fugitive emissions (e.g. unpaved surfaces, stockpiles, etc.) and their proximity to environmentally sensitive areas will be identified. If non-compliance is identified with fugitive dust based on visual observations, monitoring will be conducted to ensure gravimetric dust concentrations do not exceed WCB limits. As part of the Health and Safety requirements of the project, construction personnel should follow applicable Occupational Health and Safety Regulation (i.e., BC Workers' Compensation Board (WCB) Act and/or Canada Labour Code). If non-compliance is identified with air quality based on visual observations, air quality monitoring will be conducted in terms of particulate matter (PM) and will be measured in terms of PM_{10} and $PM_{2.5}$ concentrations (with respect to Metro Vancouver requirements). Overall, air quality and dust concerns will be communicated immediately through verbal means and documented in regular monitoring reports.

15 EROSION & SEDIMENT CONTROL (ESC) MANAGEMENT PLAN

Purpose and Scope: The following section provides general information regarding the sediment and erosion control practices that apply to the DP3 TFW Project.

1. The primary objective is the protection of the aquatic habitat (any waterbodies or watercourses, including storm sewers), through employment of numerous erosion prevention measures and implementation of effective sediment control and treatment methods. Where work is required in the aquatic habitat, protective measures will be undertaken to minimize any impact to fish and aquatic invertebrates and organisms, in accordance with the "no net loss" policy of DFO.
2. The secondary objective would be to develop and implement Best Management Practices (BMPs) and monitor their effectiveness regarding the primary objective, protection of the aquatic environment.
3. The third and last objective of the ESC Plan will be to have remedial contingency plans in place in the event of a significant storm event or where soil loss has inadvertently occurred and impacted the environment.

This ESC Management Plan will address the necessary soil erosion or loss prevention measures and sediment control systems in the designated work areas. Work within aquatic habitats is to be avoided unless required (and approved) for construction. Run-off from the work areas is to be minimized and, where possible, allowed to infiltrate into the ground and or directed into a storm water control/detention/treatment facilities prior to discharge to a receiving waterbody. The work program will be based on local site conditions and the weather at the time the work is performed.

Legislation(s), Regulation(s), and/or Guideline(s): The ESC Plan requires all works to be undertaken in a manner that avoids or absolutely minimizes erosion problems and the discharges of silt or other deleterious substances into any watercourse. The following documents summarize applicable protection and mitigation measures for ESC:

- The *Fisheries Act* regulates that no deleterious substances may be released into fish-bearing waters.
- As per the DFO Authorization, water quality is to be in compliance with British Columbia Water Quality Guidelines (Criteria): 1998 Edition.

Best Management Practices: In order to adequately address erosion and sediment control concerns, the works shall incorporate the following BMPs.

Planning of Construction

BA Blacktop will review the ESC Management Plan with the designated Environmental Monitor and/or Environmental Manager prior to proceeding with the work to ensure that all parties are cognizant with the project's requirements to protect the environment on a 24-hour basis for the duration of construction. Responsibilities should be reviewed and contingencies made. The Work must be conducted under the premise that an intense precipitation event can occur at any time and that the primary environmental mandate will be to take preventive measures against erosion and unwanted sediment transportation. Inspection by the regulatory authorities may occur at any time. BA Blacktop is wholly responsible for compliance with regulations governing a construction site.

- Schedule excavation and grading work in dry weather where and when practical;
- Ensure that all equipment is clean and free of leaks;
- Perform major equipment repairs away from the Site or in an area at least 15 m away from a waterbody;
- Repairs on cranes will require due diligence to preclude materials from entering the watercourse;
- Observe standard *Best Management Practices* for heavy equipment refueling and repair on construction sites. Refuel and/or conduct vehicle/equipment maintenance on the Site within a completely bermed area raised above grade so as not to interfere or impact surface drainage.
- Have a *Spill Kit* available on site;
- Protect down-slope receptors (waterbodies or storm drains) in the immediate environs of the Site with temporary drainage ditches, silt fences, berms or storm drain inlet filters;
- Store excavated soils away from potential offsite transport pathways;
- Discharge to surrounding watercourses must not contain total suspended sediment loading of greater than 75mg/L. Field instrumentation may be used by BA Blacktop or Environmental Monitor; and
- Any discharges to surrounding watercourses should also be monitored for turbidity and should have a pH level of between 6.5 and 8.5.

Erosion Protection

Control of sedimentation will be through sediment traps, silt fences, berms, sand bags and any other means required to satisfy discharge quality standards. The mitigation measures implemented shall be used as suggested by BA Blacktop or its contractors, with actual application of the control measures reviewed by the Environmental Monitor. Control measures should be planned and monitored including, but not limited to:

- Measures shall be installed to prevent the dispersal of sediments outside the construction zone.
- Construction should be staged if possible to minimize the amount of exposed soil present at any one time and/or during predictable periods of wet weather. The Environmental Monitor may halt work during inclement weather.
- Store materials/soils away from storm drains or away from any waterbody.

Control of Storm Water Run-Off

All run-off water shall be presumed to contain sediment and shall be collected for the purposes of the removal of such sediment. Run-off exiting the site must not be discharged to waterbodies without treatment or movement through adequate erosion control features. Based on the work planned and the existing and anticipated subbase and base materials (sands and gravels), it is anticipated much of the stormwater runoff encountered onsite may be controlled by infiltration into the existing ground. Silt fencing or other perimeter control may be installed prior to the start of operation in areas appropriate to the drainage conditions to prevent erosion and to control sediment in run-off if observations indicate potential concern. These controls and facilities, if installed, must be cleaned regularly and maintained for the duration of the project, as well as being removed at the conclusion of the project. It is understood that rock containment dikes are currently utilized to contain fill material and to prevent runoff into the surrounding foreshore areas (i.e. Dyke Road – maintained by others). Additional storm-water control measures may be added per the suggestion of the Environmental Monitor and based upon discussions with, and approval by, BA Blacktop.

Any run-off originating on or entering into the Site must pass through the sediment control features before being discharged from the Site. Where water is observed entering the Site, it may be necessary to construct temporary swales/berms or other control measures to mitigate discharge into excavated areas. When accumulations of sediment are observed on site, they should be transported to a suitable area on a regular basis. Under no circumstances should soils or sediments be actively flushed into adjacent waterbodies. Treatment of discharges in the form of engineered filtration systems would be provided on an as needed basis.

For general guidance, the Land Development Guidelines, co-produced by Fisheries and Oceans Canada and the BC Ministry of Environment, Lands and Parks in 1993 shall be used for reference. Site specific measures will be implemented as required.

- Maintain all key erosion and sediment control systems and pollution control equipment throughout the duration of the project;
- Surface water runoff from a construction area must be controlled within the installed perimeter ditches.
- Separate any potentially contaminated or sediment-laden runoff water from general surface runoff and direct to containment and/or a treatment unit.

- Periodically inspect (especially during rainfall) all drainage from the work area and ensure that the runoff is clean;
- It is the Site Contractor's responsibility to ensure effective and efficient maintenance and operation of the siltation control structures and to ensure that the water being discharged from the site meets the appropriate quality standards (civic, provincial, federal).
- All on-site ditches and ESC mitigation measures are to be maintained free of accumulated sediment. Inspection is to be carried out weekly, with cleaning as required.
- All work must be undertaken and completed in such a manner as to prevent the release of silt, raw concrete leachate or other deleterious substances into a waterbody or watercourse including and storm sewer system.

Flocculants

Flocculants to coagulate fine particulate may not be used unless otherwise stated in this ESC Plan or approved in writing by the Environmental Monitor and/or Environmental Manager

Vehicle Site Entrances and Exits

No sediment/mud shall be tracked onto streets or paved roadways. If sediment/mud accumulation is observed, street sweepers should be employed as required or at the end of each day. Flushing of sediment with water off of roads is not permitted.

Monitoring Requirements:

Prior to commencing the operation, it is recommended that the Environmental Monitor make a site visit to review the ESC Management Plan with the Site Supervisor. As part of the sediment and erosion control management plan, the Environmental Monitor should also make site visits during rainfall events to ensure that erosion control features are functioning adequately. This also allows the sediment and drainage management plan to be amended to ensure compliance with environmental requirements.

It should be noted that the recommendations herein are solely related to controlling loss and movement of soil. The Environmental Management Act of BC outlines soil and water quality standards for various land and end uses and BA Blacktop should make provision for contingency analysis of other constituents (e.g. heavy metals, petroleum hydrocarbons) if evidence suggests that these parameters could be present in any discharge. Treatment may also be required for non-regulated parameters, such as iron, manganese and salt.

The Environmental Monitor for the project will be responsible for all water quality monitoring on site and will issue monitoring reports to BA Blacktop and Relevant Authorities as required. The reports must include concluding statements, as follows:

I. The water quality is within acceptable limits (TSS and any other parameters stipulated in this EMP or applicable regulation) and thus the discharge may be directed to the storm sewer, or other approved receiving body, or

II. The water quality is not within acceptable limits and requires further treatment.

Additionally, the Environmental Monitor should keep a site visit logbook which will specifically note the following information:

- Water turbidity levels and pH;
- TSS concentrations;
- ESC facility conditions; and
- Any remedial measures undertaken or recommended.

16 SURFACE WATER QUALITY MANAGEMENT PLAN

Purpose and Scope: The purpose and scope of these practices are to protect fish and fish habitat quality as well as to protect water quality for other users.

Legislation(s), Regulation(s), and/or Guideline(s): The following documents summarize applicable protection and mitigation measures for water quality:

- The *Fisheries Act* regulates that no deleterious substances may be released into fish-bearing waters.
- As per the DFO Authorization, water quality is to be in compliance with British Columbia Water Quality Guidelines (Criteria): 1998 Edition.

Best Management Practices: In order to prevent discharges of any deleterious substance into any watercourse or water body, during work, BA Blacktop shall:

I. Ensure the Environmental Monitor is present to inspect the potential for contaminants to enter any watercourse or water body for works near foreshore and nearshore areas or over or adjacent the water;
II. Ensure that working hydrocarbon spill containment kits are available on site and that personnel are well trained in their application;
III. Not allow material, i.e., plastics, paper, construction materials, etc., to enter any watercourse (a "zero emissions" objective will apply to all water bodies, watercourses, and tributaries);
IV. Not allow any sediment-laden water discharged onto land to flow into any water bodies; and
V. Where applicable, place pumps and generators within secondary containment.

Applicable water quality criteria includes the following specific criteria:

- When background is less than or equal to 50 nephelometric turbidity units (NTU), induced turbidity should not exceed 5 NTU above the background value.
- When background is greater than 50 NTU, induced turbidity should not exceed the background value by more than 10% of the background value.
- When background is less than or equal to 100 milligrams per litre (mg/L), induced non-filterable residue (NFR), also referred to as total suspended solids (TSS), should not exceed 10 mg/L above the background value.
- When background is greater than 100 mg/L, induced NFR, or TSS, should not exceed the background value by more than 10% of the background value.

Background is defined as the level at an adjacent reference site that is not affected by works at the site nor by sediment-laden turbid water resulting from the site. Background locations are to be general consistent with previous baseline water quality sampling stations established in 2004 by the Deltaport Third Berth Environmental Assessment. Should works results in NTU or NFR/TSS in excess of criteria outlined above, then those works and activities that may be contributing to the turbidity are to be halted until mitigation measures that ensure compliance are implemented.

17 VEHICLES AND EQUIPMENT - FUELLING AND SERVICING

Purpose and Scope: The Vehicles and Equipment Management Plan is intended for the protection of water and soil resources that may potentially be impacted throughout the duration of the project.

Legislation(s), Regulation(s), and/or Guideline(s): The following documents summarize protection and mitigation measures for the protection of water and soil resources from fuelling and services of vehicles, vessels and/or equipment; and all work shall be conducted in accordance with the environmental Legislation and Regulations, and in general accordance with guidelines including:

- Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum (CCME, 2003).
- A Field Guide to Fuel Handling, Transportation and Storage (MWLAP, 2002a).

Best Management Practices: In order to protect soil and water quality from potential impacts associated with fuelling and services of vehicles, vessels and/or equipment, the works shall incorporate the following BMPs:

I. BA Blacktop or its contractors shall service or refuel vehicles and equipment in such a way that contaminants do not enter any watercourse;

II. All machinery operating in the area which may potentially affect any watercourse or waterbodies shall be free of excess oil and grease, and shall be in good mechanical order so that no leaks occur;

III. All equipment is to be inspected daily to ensure they are leak-free (i.e., a walk-around inspection of the equipment prior to daily startup);

IV. Servicing of equipment is to be done at the staging areas within bermed containment areas or at appropriate work yards operated by BA Blacktop or its supplier. 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;

V. 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;

VI. Portable generators and pumps shall be located within containment to prevent inadvertent releases of fuels and oils to the environment.

VII. Refueling of any machinery, including portable generators and pumps, must occur away from roadside drainage ditches;

VIII. Emergency response hydrocarbon spill kits, and personnel trained in their deployment and use, must be on site at all times;

IX. Fire extinguishers and other emergency response equipment and supplies must be kept in known, visible and accessible locations. A list of emergency contacts shall be posted at predetermined, accessible and visible locations, as well as kept with the emergency response equipment;

X. Wash water from concrete trucks, as well as any other effluent generated during work on the project, will be contained and disposed of in such a manner as to ensure that the effluent is not released into any watercourse;

XI. Secondary containment is to be provided for any aboveground storage tanks and should be a minimum of 110% of the volume of the largest tank or 25% of the total stored volume, whichever is larger;

XII. Automatic shut-off nozzles or valves should be installed on all fuel dispensing units. Overfilling of tanks is discouraged;

XIII. All spills shall be remediated and any spill or release exceeding 5L in volume shall be reported to the Environmental Monitor; and

XIV. The procedures for storage and handling of petroleum products in or near riparian areas will be reviewed with the Environmental Monitor prior to initiating the work;

18 SOIL IMPACTS MANAGEMENT PLAN

Purpose and Scope: The Soil Impact Management Plan is intended for the protection and handling of soil resources that may potentially be impacted throughout the duration of the project or be in an existing state where they have already been impacted.

Legislation(s), Regulation(s), and/or Guideline(s): The following documents summarize protection and mitigation measures for the protection of soil resources as well as methodology for dealing with potentially contaminated soils that may be encountered during the project; and all work shall be conducted in accordance with the environmental Legislation and Regulations, and in general accordance with guidelines including:

- Environmental Protection Act;
- Environmental Management Act; and
- Soil Relocation Permits if required.

Best Management Practices: In order to protect soil quality from potential impacts as well as deal with potentially contaminated soils that may be encountered during the project, the works shall incorporate the following BMPs:

I. Contaminated soils are defined in the Contaminated Sites Regulation of BC and the handling, transport and disposal of such soils is regulated at all levels of government. BA Blacktop should become familiar with the procedures governing contaminated soils and review health and safety procedures with the work crews;

II. Obtain and/or review the appropriate "Soil Permit", waste manifests and Soil Relocation Agreement pertaining to the site;

III. "Clean soils" may be moved and stockpiled onsite with few restrictions. These soils may also be transported off the property and disposed of at another site or landfill; however, environmental testing and confirmation may be required by the receiver. Clean soils (fill, pre-loads) may also be imported onsite without restriction although a certification of environmental quality may be required by BA Blacktop;

IV. Soils being disposed of at another property or landfill may require environmental testing before and manifestation during transport;

V. Imported soils and fill material may require environmental testing or certification of environmental quality;

VI. Recycled concrete and asphalt may be used as general or temporary fill only with explicit approval from BA Blacktop;

VII. Stockpiles of soil or fill must be managed to control erosion;

VIII. Surface water runoff must meet the standards outlined in the Water Quality Management and ESC sections of this document;

IX. The movement and transport of soil on site must also comply with the Dust & Noise provisions of this manual;

X. Review the excavation, handling and transportation procedures and the health & safety plan with BA Blacktop and the Environmental Monitor;

XI. Remove, stockpile and transport/dispose of the contaminated soils only on instruction of the Environmental Monitor and/or Environmental Manager;

XII. Ensure that any leachate or runoff from the contaminated soils is stored and/or treated prior to discharge into the environment. Pumped discharges should be handled similarly to contaminated soils;

XIII. Obtain "trip tickets" and/or waste manifests from the Environmental Monitor for contaminated soils that are removed offsite. Confirm the destination as a matter of record; and

XIV. Decontaminate equipment and dispose of contaminated protective clothing per the direction of BA Blacktop or the Environmental Monitor.

19 NOISE MANAGEMENT PLAN

Purpose and Scope: The Noise Management Plan is intended to ensure that noise concerns are addressed throughout the duration of the project.

Legislation(s), Regulation(s), and/or Guideline(s): The following documents summarize protection and mitigation measures for the protection of the shorebirds and their habitat; and all work shall be conducted in accordance with the environmental Legislation and Regulations, and in general accordance with guidelines including:

- Corporation of Delta Noise By-law 1906

Best Management Practices: In order to prevent noise issues, the works shall incorporate the following BMPs:

I. Construction noise shall be limited, where practical, to hours from 7:00am to 10:00pm, Monday to Saturday.
II. Orient stationary equipment emitting elevated noise levels towards existing noise or other large objects.
III. Turn off idling equipment when not in use.
IV. Select equipment or processes that have had additional noise control features such as better mufflers and enclosures on diesel or gas powered equipment.
V. Discuss with all on-site workers to be aware of noise issues and train on how to minimize noise emissions as much as possible.

20 WASTE MANAGEMENT

BA Blacktop shall comply with all applicable laws, regulations, permit conditions and requirements of the Contract when disposing of any waste 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.

BA Blacktop 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.)

20.1 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. Furthermore, all material, which can be recycled, such as paper and cardboard products, glass bottles and plastic and metal containers must be recycled. BA Blacktop is responsible for the proper collection and transportation of garbage and recyclable waste to disposal facilities (e.g., sanitary landfill and appropriate recycling facilities). Open burning and the use of open dumps is prohibited.

20.2 Construction-Related Wastes

Construction wastes, such as spent metal, lumber, spent welding rods, etc., shall be minimized to the fullest extent possible. All construction waste shall be recycled where possible or disposed of in an environmentally acceptable manner, subject to the approval of COD and all authorities having jurisdiction. Construction debris and other garbage will not be deposited in any watercourse.

20.3 Sanitary Wastes

Sanitary facilities must be provided within the construction zone and at any staging sites. These facilities must be serviced on a regular basis and the waste disposed of at permitted treatment facilities.

20.4 Equipment-Related Wastes

BA Blacktop shall comply with the following minimum requirements:

I. Used oil filters must be drained into a waste oil container and drained filters placed in an appropriate trash container before disposal at a recycling facility or other approved facility;

II. Waste-oil and antifreeze must be collected and recycled/disposed of at an approved facility; and

III. Used acid-lead batteries must be stored on an impervious surface, under cover, and disposed of at an approved recycling facility.

20.5 Hazardous Wastes

I. It is BA Blacktop'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 MoE, Environment Canada, or any other authority having jurisdiction, and to treat this material appropriately;

II. BA Blacktop shall review the lists of Hazardous Wastes, as defined by MoE and Environment Canada to determine if any waste generated by BA Blacktop during construction operations is hazardous;

III. If the waste item does not appear in published Hazardous Waste lists, BA Blacktop shall determine whether the waste displays a characteristic, which would make it hazardous;

IV. BA Blacktop and its subcontractors will review and comply with the "*Standards Applicable to Transporters of Hazardous Waste*" as defined by MoE and Environment Canada;

V. All Hazardous Waste shall be treated/disposed of in authorized facilities, permitted under regulations as defined by MOE and Environment Canada;

VI. Separate the waste stream according to solids and liquids and label the waste containers clearly. Special Wastes may require separate storage/containment, as per the regulations;

VII. Segregate the wastes further into Landfillable Materials and Special Disposal containers; and

VIII. Maximize usage of the materials and minimize the waste stream.

20.6 Materials Storage

All construction materials, supplies and consumables should be stored in an organized manner, designed for ease of inventory and to minimize loss, spills or leaks. A distinction shall be made between hazardous and non-hazardous substances and goods and designated storage areas should be assigned for each class of material.

Legislation(s), Regulation(s), and/or Guideline(s):

- Material Safety Data Sheets (MSDS);
- Workplace Hazardous Material Information System (WHMIS);
- Occupational Health & Safety Regulation;
- BC Fire Code;

Best Management Practices: In order to protect the environment, hazardous and non-hazardous materials shall be stored according to the following BMPs:

HAZARDOUS SUBSTANCES: Includes: petroleum products, asphalts/bitumens, paints, solvents, wood preservatives, cement, commercial cleaners, chemical dust suppressants, antifreeze, batteries, liquid adhesives and resins, fertilizers, herbicides, fungicides, acids/bases, explosives etc.

I. Store, maintain an inventory and handle all hazardous substances with caution, according to the regulations and an expected duty of care. Post MSDS information as required;
II. Use secondary containment for all hazardous liquids and store as many small-volume substances as possible in a sheltered, vented area (tarpaulins, shed, sea-container, building);
III. Have a *Spill Response Plan* available and ensure that personnel handling hazardous substances understand the nature of the chemicals utilized; and
IV. Use extra care in riparian areas and near any watercourse. Review storage and handling procedures.

NON – HAZARDOUS SUBSTANCES: These substances should be stored in a dry area or container. These substances may include: treated lumber, plastics, electrical supplies, packaged grouts, sealants, and packaged chemicals.

20.7 Waste Segregation

Non-hazardous wastes are routinely generated in all construction projects and with care, the majority of these materials can be salvaged and recycled. The Contractor should establish a recycling and waste management plan and designate clearly the disposal areas and containers for non-hazardous substances. Periodic pick-up of the containers should be scheduled through a reputable waste management and disposal company.

Recyclable: Cardboard and paper products, scrap metal, concrete, asphalt, electrical cable, copper piping, window frames, rebar, stucco, brick, dimensional lumber.

Salvageable: Wood products (treated or non-treated), dimensional lumber, insulation, electrical equipment, plumbing fixtures, heating ducts, framing, carpet, brick and tiles, mechanical equipment, piping, windows and doors, most roofing materials.

Landfill: Hardened grouts, sealants and resins, paint scrapings (incl. lead-based) office waste, food wastes, small amounts of non-leachable construction debris (e.g., wood cuttings, scrap wire and piping).

21 EMERGENCY RESPONSE AND ENVIRONMENTAL SPILL PROCEDURES AND EQUIPMENT

Purpose and Scope: The Emergency Response & Environmental Spill Procedures and Equipment Plan is intended to identify potential risks at or in proximity to the DP3 Project construction site. These plans shall contain the procedures to facilitate rapid deployment of resources in the event of a spill and to minimize the impact and risk to the environment, the public and personnel on the job site. These plans address either routine activities or unplanned events associated with the proposed work.

Spill Response

In the event of a spill occurring*, this incident must be immediately reported to the Provincial Emergency Program (PEP) at 1-800-663-3456 and/or Environment Canada at the 24 hour emergency telephone number 604-666-6100. PEP will notify all concerned municipal, provincial and federal agencies. Spill response advice can be obtained from both Environment Canada and PEP, as well as from Transport Canada's Chemical Accident Emergency Advisory Service at 1-800-613-9966.

*Under Section 1 of the 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. 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. BA Blacktop must 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.

Fire Response

To prevent potential fire hazards:

I. Store all flammable and explosive substances according to regulations
II. Handle all flammable, ignitable and explosive materials with due care
III. Provide adequate fire protection equipment in the work areas and ensure that personnel are familiar with fire prevention
IV. Manage the construction waste stream to minimize the potential for ignition or combustion of waste products.

In the event of a fire:

I. Initiate Fire Response plan and call the area fire department / 911
II. Secure the area and evacuate personnel
III. Contain the fire and take direction from professional fire-fighting staff
IV. Notify BA Blacktop of the incident
V. Fire extinguishers and other emergency response equipment and supplies must be kept in known, visible and easily accessible locations. A list of emergency contacts will be posted at accessible and visible locations, including with the emergency equipment.

22 ENVIRONMENTAL MONITORING & REPORTING

Purpose and Scope: This section details the environmental monitoring and reporting requirements for the DP3 TFW project. Environmental monitoring is conducted to ensure that project activities are completed in compliance with applicable legislation, regulations, authorizations and guidelines.

Monitoring Requirements: The Environmental Monitor will be a qualified, independent entity that monitors and tracks project compliance. Their duties include:

- Liaising with the BA Blacktop contractors, design teams and construction teams;
- Represent BA Blacktop on environmental matters as requested by the Environmental Manager;
- Attend pre-construction meetings and ongoing construction meetings at least once per month or as required by the Environmental Manager;
- Educate personnel on the environmental requirements/obligations of the project;
- Conduct routine and random inspections/monitoring;
- Assess housekeeping on the construction site(s);
- Collect samples to demonstrate compliance;
- Identify and record all environmental non-conformances;
- Work with BA Blacktop contractors to resolve non-compliance issues; and
- Prepare reports, detailing general environmental conditions, non-compliance/non-conformance issues, unexpected environmental concerns, results of monitoring, amendments to the EMP and incident reports.

Reporting Requirements: The Environmental Monitor will provide weekly Monitoring Reports during works with potential for adverse effects and specific Environmental Incident Reports that will be delivered to the Environmental Manager. These reports will be forwarded to BA Blacktop and the Relevant Environmental Authorities upon their request. The reports may include, but are not limited to the following:

- Works completed, on-going, and scheduled to commence in Environmentally Sensitive Areas;
- Changes to work schedules in Environmentally Sensitive Areas;
- Erosion Control Monitoring Reports;
- Spill cleanup or emergency work reports; and
- Other environmental construction activity progress or developments.

23 ENVIRONMENTAL INCIDENT REPORTING

Purpose and Scope: The following provides descriptions of environmental incidents (one that has caused, or has the potential to cause, one or more of the following):

I. Environmental damage;

II. An adverse effect on fish, wildlife or other environmental resources;

III. Heightened publicity associated with a negative effect on the environment; and,

IV. Legal action with respect to environmental noncompliance and/or damage.

Procedures which shall be undertaken by the BA Blacktop when an environmental incident is recognized:

I. Take immediate action to minimize environmental consequences and manage resolution of the incident;

II. Gather information for the assessment of causes so that prevention of future incidents can be planned;

III. The Environmental Monitor shall prepare a written Incident Report as soon as possible (within one working day of the occurrence) summarizing events, actions and recommendations for future avoidance;

IV. The Environmental Monitor shall submit the Incident Report to the BA Blacktop Project Manager, Construction Manager, Design Manager, Resident Engineer, Project Quality Manager and Environmental Manager; and

V. As required, the Incident Report shall be submitted to applicable regulatory authorities.

24 REFERENCES

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APPENDIX A: KEY ENVIRONMENTAL CONTACTS

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Brian Wilkes Project Biologist	Trow	250 479 8837	250 881 5228	brianwilkes@shaw.ca
Janet Lynn Zazubek Environmental Monitor	Trow	778 990 4919	604 874 1245 604 709 4638 (direct)	janet.zazubek@trow.com
Murray Pike Construction Site Supervisor	BA Blacktop	604 841 6154	604 985 0611	mpike@bablacktop.com
Chris Harland Project Manager	BA Blacktop	604 834 7796	604 985 0611	harland@bablacktop.com
TBD Construction and Protection Field Supervisor in Steveston	Fisheries and Oceans Canada	TBD	604 664 9250	TBD
Jennifer Simpson Environmental Assessment Analyst	Fisheries and Oceans Canada	NA	604 666 4609	Jennifer.Simpson@dfo-mpo.gc.ca

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REFERENCE: GOOGLE MAPS, 2009

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Trow

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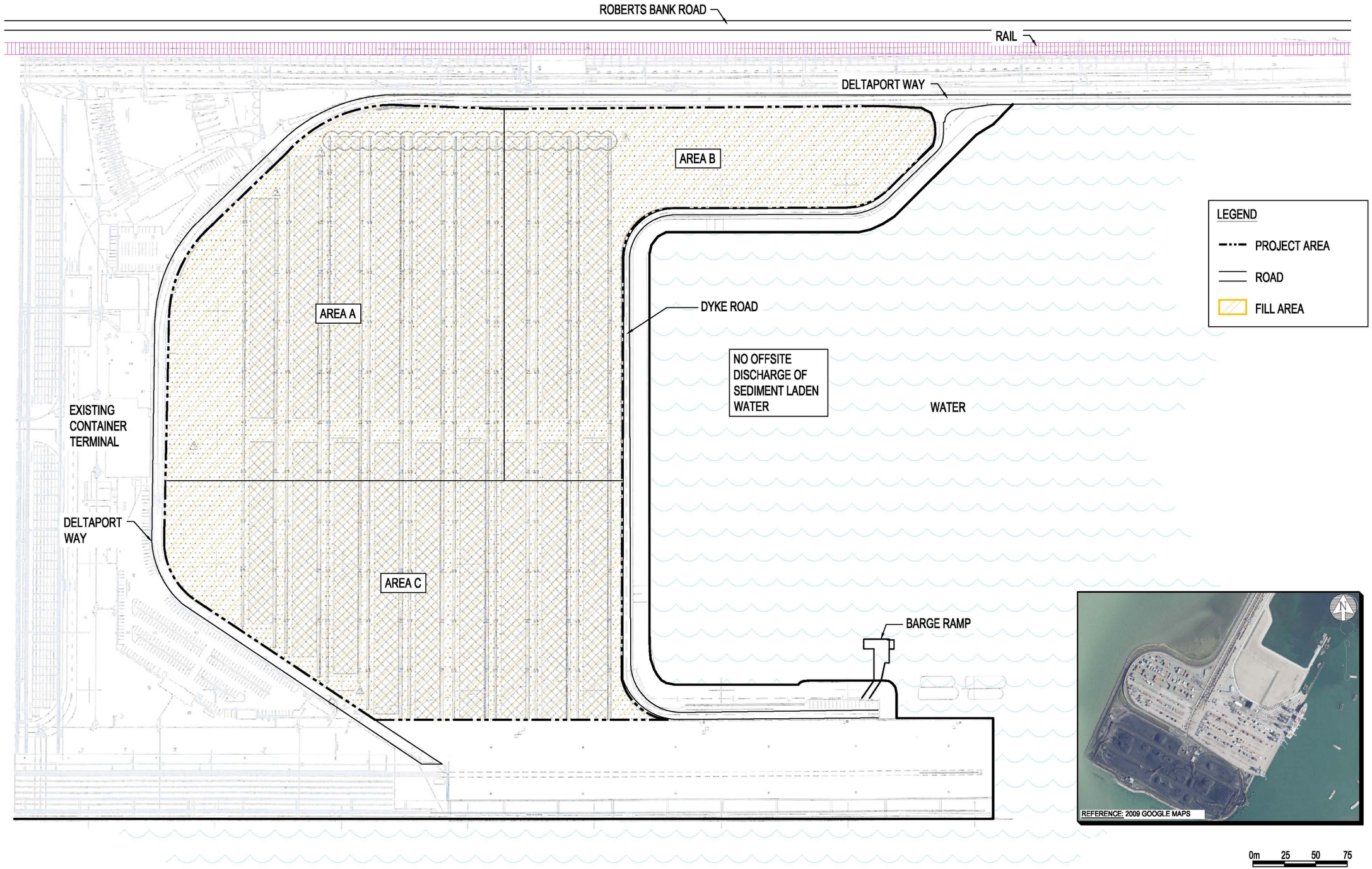
Telephone: 604-874-1245
Fax: 604-874-2358

CLIENT: BA BLACKTOP LTD.				TITLE: SITE LOCATION PLAN		
PROJECT: TERMINAL FINISHING WORKS, DELTAPORT BERTH 3 EXPANSION						
PROJECT NO. 091-02078	DFTR. TH	DSGN. JZ	CHK. EC	DATE MAY 2009	SCALE: APPROX. 1:30000	DWG NO. FIG 1



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TH	JZ	EC

REVISIONS

No.	DESCRIPTION	DATE
1	DRAFT	09/05/04
2	FINAL	09/05/12

CLIENT: BA BLACKTOP LTD.

PROJECT: TERMINAL FINISHING WORKS, DELTAPORT BERTH 3 EXPANSION

PROJECT NO. 091-02076

TITLE: SITE LAYOUT PLAN

DATE	SCALE:	DWG NO.
MAY 2009	APPROX. 1:3000	FIG 2

May 12, 2009 - 2:17pm L:\2009\091-02076 EC Deltaport Berth3\B-Drafting\091-02076 09-05-12 FIGURE 1&2 Rev1.dwg

Environmental Work Plan

For
Third Berth Trackwork Extension at Gulf
On BCRC Property
Delta, British Columbia

Version 3

Prepared for:

Mainland
CIVIL WORKS INC.

Unit 262 – 8128 128th Street
Surrey, BC
V3W 1R1

Attention:
Mr. Peter Baskovic

TROW Reference No: 091-02153
July 22, 2009

Prepared by:

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LIST OF APPENDICES (attached)

1.0 INTRODUCTION

Mainland Civil Works Inc. (Mainland; *the Contractor*) has been required to prepare site specific environmental work plans to be submitted to Hatch Mott MacDonald (HMM), working on behalf of British Columbia Railway Company (BCRC), for preparatory work associated with the Deltaport Third Berth Trackwork Extension at Gulf. The project work is on BCRC property south of Deltaport Way and between 57B Street and 64th Street in Delta, BC. Note that this development is a lateral extension of an active railway; entry to the site is not permitted without a Site Safety Orientation and Clearance from *Rod MacMillan, Supervisor, Track and Facilities Maintenance, BCR Port Subdivision* (see Appendix A for contact information).

Trow Associates Inc. (Trow) has prepared the following Environmental Work Plan (EWP) on behalf of Mainland in support of meeting the requirements of BCRC and in general conformance with requirements of the South Fraser Perimeter Road (SFPR) project.

The scope of preparatory work has been outlined in a letter from HMM on behalf of BCRC to the SFPR project dated May 6, 2009. The highlighted work (in general terms only) includes:

- Supplying and installing extensions to three existing culverts.
- Scraping surface vegetation in the area from 57B Street to 64th Street.
- Supplying and installing geotextile on the scraped surface.
- Placing and installing of site grading fill to project specifications.

Please note it is understood that BCRC and the SFPR project will work together to ensure compliance with all applicable regulations in advance of work. It is also understood that Mainland will be responsible for obtaining the Highway Use Permit from the Corporation of Delta.

2.0 ENVIRONMENTAL PROCEDURES

2.1 Surface Water Quality Management and Sediment Control Work Procedures

The Surface Water Quality Management and Sediment Control Work Procedures (SWQMSCWP) describes measures (including Best Management Practices [BMPs]) for preventing or mitigating construction-related soil erosion and sediment discharge into watercourses (e.g., streams, rivers, sloughs, ditches, ponds, storm sewer systems, etc.). The Site Contractor is responsible for ensuring that the quality of water discharging into watercourses from the construction zone meets municipal, provincial, and federal water quality requirements. Environmental monitoring will be conducted at minimum once per week, and more frequently as may be required.

The SWQMSCWP measures address the following areas of concern:

- Site preparation and timing of activities
- Construction site drainage
- Fill and topsoil storage
- Site access
- Site restoration

2.1.1 Site preparation and timing of activities

- Erosion and sediment control (ESC) must be in place prior to clearing and grubbing activities.
- Clearing and grubbing activities should be timed as closely as possible to construction activities, to minimize soil loss through unnecessary duration of exposure. Clearing and grubbing must not be conducted more than 30 days in advance of construction.
- Planning for clearing/grubbing and construction activities should take into account predicted weather patterns to avoid work in saturated soil conditions and increased sediment in surface runoff. The Environmental Monitor may halt work during inclement weather.
- Clearing and grubbing limits, riparian buffers, and bird nest buffers are to be clearly marked with survey flagging tape.

2.1.2 Construction site drainage

- Maintain all ESC installations (e.g., silt fencing) throughout the duration of the project.

- All work must be completed in such a manner as to prevent the release of silt, raw concrete leachate or other deleterious substances into any watercourse (e.g., streams, rivers, sloughs, ditches, ponds, storm sewer systems, etc.).

Site-specific considerations

- Drainage at this site appears to consist of two main ditches parallel and adjacent to, and on either side of, the existing tracks, between 57B Street and 64 Street. The two main ditches are laterally connected by at least three culverted ditches, at approximately (from west to east): 57B Street, 0.7km east of 57B Street (mile 17.01 BCRC), and 1km east of 57B Street (mile 16.9 BCRC). During site visits in June, water was observed only in the south-side main ditch (in the portion of its reach between 57B Street and Highway 17), and in the lateral connecting culverted ditch at 57B Street. The other two lateral culverted ditches are understood to be cross drains that are shallow and dry throughout most of the year.
- Although the south-side main ditch lies outside of the proposed construction zone, separation between the ditch embankment and the construction zone is very narrow, ranging from 0.5m to 4m approximately. It will therefore be necessary to protect as much of the present vegetation as possible between the BCRC construction zone and the ditch, and to install silt fencing along the north side of the ditch between 57B Street and 64 Street.
- It will be necessary to conduct a fish salvage prior to culvert installation at 57B Street if fish presence is confirmed for this culverted ditch.

2.1.3 Fill and topsoil storage

- Stockpiles of soil are not anticipated as part of this project. The only anticipated stockpiles on BCRC property are the supply of materials (e.g., culvert, geotextile) and the provision of silt fencing, etc.

2.1.4 Site access

- Site access points are to be identified prior to clearing and grubbing. Surface conditions are to be stabilized where site access is in soft soil, and/or in high traffic areas, and/or near paved roadways.
- No mud is to be tracked onto civic lands or streets. Refer to the project Traffic Management Plan for street sweeping requirements. No flushing of loose soils tracked onto roads into surrounding watercourses is permitted. Appropriate dust suppression measures must be

implemented in dry periods. *BCRC permission is required if anything other than water is used to control fugitive dust.*

2.1.5 Erosion and sediment control plan

- An erosion and sediment control plan (3 pages) has been included in this EWP in Appendix B.

2.1.6 Site restoration

- Upon completion of construction any areas of exposed soil are to be re-vegetated (or otherwise protected) as soon as possible. Planting is to be done with species that are native to the Pacific Northwest and are known to occur at this site, to prevent or mitigate the introduction of noxious weeds.

2.2 Construction and Hazardous Waste Management Work Procedures

The Construction and Hazardous Waste Management Work Procedures (CHWMWP) describes measures (including BMPs) for ensuring the proper management of non-hazardous construction-related waste, and for ensuring that management of hazardous waste is in compliance with the provincial *Environmental Management Act* (Queen's Printer, 2003).

Additional information and guidance is provided in the Construction and Hazardous Waste Management Plan (CHWMP) in the SFPR Environmental Management Plan for Phase 1 Works (EMP). CHWMP Best Management Practices include:

2.2.1 General mitigation measures

- Train personnel in waste reduction and to recognize and properly dispose of different types of construction waste.
- Post signs that clearly identify the different types of waste and what to do with them.
- Ensure that containers for materials collection are adequately accessible, are used, and that the site is kept free of litter.

2.2.2 Specific mitigation measures

<u>Stripped organic material</u>

- Excess stripped material byproduct is not anticipated as part of this project. Vegetation clearing, where necessary, will be minimized, especially in and around ESAs (e.g., adjacent to ditching).

Non-Hazardous Solid Waste

- Site will be equipped with garbage bins and recycle bins, if such non-hazardous solid waste is expected.
- No waste materials shall be left on BCRC property and the location of any temporary refuse containers shall be agreed in discussion with Rod MacMillan (BCRC Operations).

Sanitary Waste

- If temporary toilets are required, they are to be equipped with closed holding tanks that are emptied into approved tanker trucks and treatment plants, and they are to be serviced regularly.

Hazardous Waste

- Dispose of all hazardous waste in accordance with the provincial Environmental Management Act Hazardous Waste Regulation.
- Minimize on-site storage of hazardous materials by coordinating deliveries to match imminent needs.
- Establish environmentally sound procedures for refueling and/or transfer and storage of hazardous materials including petroleum products. Should it be considered necessary to refuel equipment on site during the course of this mandate, refueling procedures and refueling location shall be agreed with Rod MacMillan (BCRC Operations) in advance.
- Avoid or minimize the use of hazardous materials whenever possible.
- Ensure that all construction and transportation equipment is properly maintained.

2.3 Spill Management and Emergency Response Work Procedures

The Spill Management and Emergency Response Environmental Work Procedures (SMERWP) describes measures for addressing Project-related spills and emergencies in order to minimize potential effects and risks to the general public, onsite workers and the environment. The SMERWP lists the spill abatement materials/equipment to be stored on the Project site, educational requirements, and incident procedures regarding communications, spill containment and clean-up, debriefing, follow-up reporting relevant external contacts and Environmental Management Team positions that will be responsible for its implementation.

Potential pollutants associated with construction at this site may include hydrocarbons (e.g., gasoline, diesel fuel, waste oil, and lube), which pose fire hazards and/or a soil/water contamination risk; flammable compressed gases (e.g., propane and acetylene), which are explosive; and other materials

and/or chemicals which can have toxic effects on aquatic ecosystems. On-site fuelling, servicing, and equipment failure (e.g., hydraulic hose breaks) can result in spills of hydrocarbon products and other chemical pollutants. Excavation works (e.g., locating services) may risk rupture of underground pipelines and the release of hydrocarbons and/or other pollutants.

2.3.1 Regulatory Framework

The MoE defines a spill as an unauthorized release or discharge of a dangerous good into the environment. A spill greater than or equal to 100 litres of flammable/combustible liquids or waste oil (Transportation of Dangerous Goods Act, Class 3), or spills of any amount of reportable deleterious substances, must be immediately reported to the Provincial Emergency Program (PEP) **(1-800-663-3456)**, as per Schedule 1 of the provincial *Spill Reporting Regulation* (Queen's Printer, 1990). The spill must also immediately be reported to Rod MacMillan, Supervisor, Track and Facilities Maintenance, BCR Port Subdivision, or (if Mr. MacMillan is not available) Tom Winters, British Columbia Railway Company Manager, Port Sub Operations (see Appendix A for contact information). It is further recommended that a copy of Schedule 1 be kept on-site.

2.3.2 Best Management Practices

BMPs to avoid or minimize the probability of a spill occurring can be found in the SFPR Construction and Hazardous Waste Management Plan (CHWMP), including instructions on the proper storage, use and disposal of hazardous materials and other appropriate mitigation measures. The following sections identify best practices, and procedures for responding to spills and managing construction related emergency events.

Contingency measures to be included in the SMERWP include pre-emergency planning (identification of risks), emergency organization and responsibilities (including a list of contacts, and emergency telephone numbers), spill reporting, incident site security, emergency response, evacuation, site restoration and remediation, post-incident evaluation and training, and practice drills.

MoE provides guidelines pertaining to spill prevention and reporting pursuant to the *Environmental Management Act* (MoE, 2003). These guidelines describe a typical plan layout with appropriate headings to promote development of comprehensive and consistent emergency response plans.

Pre-emergency planning will need to include, but not necessarily be limited to, the following:

- A description of pre-emergency planning, including the identification of potential accidents and malfunctions, an estimate of the quantity of material that could be released during such an event, and an evaluation of the consequences;
- A description of incident management, including the delegation of authority during different types of emergency response (i.e., the individual with overall authority, the chain of command, the on-scene authority, liaison with local police and fire departments and spokespersons);
- Requirements for reporting any spill of toxic or hazardous material verbally to the PEP, as set out in the *Environmental Management Act, Spill Reporting Regulation*;
- A description of the steps necessary to stop the impacts (i.e., abate discharges), and provide labour, equipment, materials and absorbents to contain and remove the impact, clean up the affected area, dispose of waste materials at an approved disposal site, and restore the area to the satisfaction of the environmental regulatory agencies;
- A description of procedures to be followed during different types of emergencies, including methods to minimize danger and environmental impacts, and a post-incident evaluation on the effectiveness of the plan;
- A description of emergency reporting protocols and procedures, including reporting for non Project-related incidents and post-incident evaluation reports;
- A description of measures to ensure incident site security;
- A description of site evacuation protocols;
- Spill and emergency response training and practice drills for onsite personnel; and
- Maintenance of spill kits in machines onsite.

2.3.3 Reporting

Any spillage on BCRC property shall be reported to Rod MacMillan and John Brodie of BCRC as soon as any such event has occurred or as soon as possible after any required immediate mitigation measures have been implemented (e.g., eliminate source and isolate area). All spills will be reported immediately to BCRC's Environmental Manager by the Environmental Monitor(s) and/or the Contractor. Any spills greater than or equal to 100 litres of flammable/combustible liquids or waste oil (Transportation of Dangerous Goods Act, Class 3) or spills of any volume of fuels/chemicals that reach or have the potential to reach fish-bearing waters, must be immediately reported to the

Provincial Emergency Program (PEP), BCRC's Environmental Manager, and relevant environmental agencies (including Transport Canada as the federally responsible authority for the Project). In addition to immediate notification, a final incident report will be submitted to BCRC and relevant regulatory agencies with seven (7) days of the incident. Any spills observed in the vicinity of the Project that are not the result of Project-related activities will also be documented, and the incident reported to BCRC, MoT, and relevant environmental agencies.

A written report on each incident should include:

- A general description of the incident, including the location and when it was discovered
- Details on the receiving environment
- Source and cause of the incident
- Record on who it was reported to and when
- A description of the response effort, including the timing of these works
- Type of material spilled, its quantity, and the percent recovered
- Itemized cleanup costs
- Recommendations for preventative and mitigative measures
- Plans for upgrading emergency preparedness and response plans

2.4 Noise and Vibration Work Procedures

The Noise and Vibration Work Procedures are intended to ensure the project construction-related activities avoid and/or reduce potential noise or vibration impacts in areas near sensitive human receptors, wildlife habitat, as well as existing infrastructure. Other than the operation of heavy machinery, significant noise or vibratory impacts are not anticipated for the current phase of work at the project site.

Additional information and guidance is provided in the Noise and Vibration Management Plan (NVMP) in the SFPR Environmental Management Plan for Phase 1 Works. Select BMPs are presented below:

- Turn-off idling equipment when not in use.
- Operate equipment at minimum engine speeds that still provide for effective operation.

- Ensure machinery is in good condition prior to construction and that excessively noisy equipment is not utilized. Carry out regular maintenance on all equipment, including lubrication and replacement of worn parts, especially exhaust systems.
- Train on-site workers to be aware of noise issues (including near raptor nests) and to minimize noise emissions where possible.

Please note the Corporation of Delta (CoD) *Noise Bylaw No. 1906* limits construction to 7:00 AM to 7:00 PM Monday through Friday, between 9:00 AM to 5:00 PM on Saturdays, and no construction noise on Sundays.

A pre-condition vibration monitoring program may be conducted during railway use and non-railway use prior to construction to assess baseline conditions for vibration at the site. These results may be used for comparisons to conditions during construction if required.

2.5 Wildlife and Habitat Work Procedures

The purpose of the Wildlife and Habitat Work Procedures (WHWP) is to provide mitigative measures, BMPs, and monitoring/reporting program requirements for the management of Environmentally Sensitive Areas (ESAs) within the planned construction zone. ESAs identify areas requiring protection because of an ecological vulnerability (e.g., active raptor nest site, rare plant or habitat site, etc.) or because of historical or landscape significance.

2.5.1 ESAs in the BCRC Track Extension site

ESAs in the BCRC site include several active songbird bird nest sites and two potentially fish-bearing watercourses and their associated vegetation (specifically: the water-filled portion of the ditch parallel and adjacent to the south side of the tracks, and the water-filled culverted ditch along 57B Street). (Management of fish-bearing watercourses is explained in Section 2.7 Fisheries Habitat Mitigation and Compensation Work Procedures [FHMCWP]).

No raptor nest sites have been identified within the BCRC site; however, as does the neighbouring SFPR corridor site on the north side of the tracks, the BCRC site also intersects the *quiet-zone* buffer of an active bald eagle nest which is on the transmission tower adjacent to, and east of, Highway 17 on the north side of the tracks (see Appendix B). (The radial distance of the outer boundary of the quiet-zone buffer is 200 m from the nest.) Management of songbird (*Other Birds*) and raptor nest ESAs is explained in the following two subsections.

2.5.2 Work Schedule and Active Bird Nest Sites

Land clearing activities are planned to commence following the critical bird breeding period which runs from March 15 to July 31.

2.5.3 Environmental Procedures – Mitigation of Impacts to Birds

Raptors

The contractor is required to adhere to the standard mitigation measures for raptors in rural settings, as described in the Best Management Practices for Raptor Conservation during Rural and Urban Land Development in BC (BMP for Raptor Conservation). This document recommends the retention of a 100 metre vegetated buffer around bald eagle nests and a 200 metre vegetated buffer around the active red-tailed hawk nests. In addition to the above-noted buffer an additional 100 metre quite-zone buffer is prescribed around active bald eagle nests and 200 metre quite-zone buffer for active hawk nests. The project area intersects the quiet zone buffer of a known existing bald eagle's nest (in the transmission tower north of the project and just east of Highway 17) referred to as raptor nest BAEA-7 by MoT. Although the eagles have not been identified as occupying the nest in recent months, the quiet zone buffer (see Drawing 1 of 3 and 2 of 3) has been identified in this EWP for reference purposes only. Existing disturbances in the area of the nest also include highway vehicle traffic and rail traffic. Although loud noises and other human disturbance are not anticipated to exceed existing noise levels during construction, activities to occur within the quiet-zone buffer that produce noise are to be minimized as a pre-caution only. If any unanticipated loud disturbances from construction activities are later identified to be required in the quiet zone buffer, the contractor is to get approval from the contractor's Environmental Manager and/or Monitor prior to proceeding.

Other Birds

If active (eggs or bird in nest) passerine nests are documented during the pre-clearing nest surveys then a vegetated buffer of 30 metres must be marked with survey flagging.

2.5.4 General Mitigation Techniques

Minimize vegetation removal

Vegetation clearing will be minimized to the greatest extent possible. Any temporary impacts on vegetation, including construction staging areas, will be avoided whenever feasible through careful site selection. Areas where vegetation is to be retained will be clearly indicated on plans/drawings

and delineated in the field with flagging tape or fencing. Working with BCRC environmental staff, the designated environmental monitor for the site will verify these boundaries in the field.

Reduce interactions with wildlife

Construction activities will be carried out as quickly as possible to minimize sensory disturbance/ impacts on wildlife. Project personnel will try to avoid passing through areas where wildlife may be present. Temporary fencing (i.e., silt and/or exclusion fencing) will be installed to help limit access to sensitive habitats and to prevent wildlife from entering advanced site preparation areas. To avoid attracting wildlife, garbage should be placed in wildlife-proof refuse containers and regularly disposed of at a designated facility.

Wildlife and habitat mitigation is not limited to the measures described in this EWP. As work progresses, new information and unforeseen circumstances may call for the implementation of additional mitigative measures by the Ministry representative or by the Environmental Monitor.

2.6 Environmental Monitoring

The Trow Environmental Monitor will be responsible for ensuring that the mitigative measures identified above are carried out by the contractor. Site visits will be scheduled to coincide with work activities (land clearing and fill placement) with the greatest potential for negative impacts to ESAs identified at the site (watercourses and bird nests). The monitor will depend on the contractor to provide a projection of expected work activities. Based on these projections the environmental monitor will schedule monitoring events for the next week.

2.7 Fisheries Habitat Mitigation and Compensation Work Procedures

The Fisheries Habitat Mitigation and Compensation Work Procedures (FHMCWP) is intended for the protection of fisheries resources and water quality in the yellow and green coded watercourses at the site. For these areas, based on previous assessments, the yellow and green watercourse classifications correspond as follows:

- YELLOW Coded Watercourse (Schedule B) – Low food/nutrient values for downstream salmonid-bearing waters. Non-salmonids have been identified as present or likely present.
- GREEN Coded Watercourse (Schedule C) – Insignificant source of food/nutrient values for downstream waters. Salmonids not present. Green watercourses are not considered fish bearing.

As per Corporation of Delta habitat mapping, the ditch at 57B Street is a Schedule C watercourse (green-coded ditch). Based on our experience with other ditches in the general area, fish species may still be present in green-coded ditches in some cases. As added due diligence, a short trapping exercise is to be conducted prior to any in-stream works to confirm or deny fish presence.

The cross drain ditches at 0.7km east of 57B Street (mile 17.01 BCRC) and 1km east of 57B Street (mile 16.9 BCRC) were dry in June and understood to be dry throughout most of the year. In order to protect fish and fish habitat and the quality of water used for domestic and irrigation purposes, all works in and around water shall incorporate the following BMPs:

- All in water work (construction and restoration) will be in accordance with the regulations and Corporation of Delta requests.
- Timing of in-stream works will take place in accordance with details provided by the Corporation of Delta at a meeting conducted on March 23, 2009 (i.e. to proceed following applicable BMPs).
- Yellow-coded watercourses, if identified, are to be isolated and salvaged for fish/amphibians by a qualified environmental professional prior to instream works (e.g. culvert installation, infilling, etc.) by the Contractor. Fish salvage permits are the responsibility of the Contractor Environmental Coordinator.
- Prevent the dispersal of sediments outside the construction zone.
- Periodically inspect (especially during and after rainfall events) all drainage from the work area and ensure that the runoff is clean and separate any potentially contaminated water from general surface runoff and direct to containment and/or a treatment unit.
- Surface water runoff from a construction area must be controlled. Since the runoff invariably reaches a nearby watercourse/area drainage, water quality is an important environmental parameter to monitor during construction activity.

2.7.1 Best Management Practices

- The FHMCWP identifies BMPs that focus on avoidance of direct impacts to fish, application of appropriate timing windows and fish salvage techniques, protection of water quality, and contractor education. Monitoring will involve regular site visits and water quality sampling by the Environmental Monitor.

- All EMP BMPs should be followed by the contractor. Selected BMPs are presented below:

In-stream works

- Provide sufficient notification and time to the Trow Environmental Coordinator to conduct any appropriate fish/amphibian salvages and isolate work areas prior to conducting any in-stream works.

Water Quality

- Prevent the dispersal of sediments outside the construction zone,
- Control surface water runoff from a construction area. Inspect all drainage from the work area and ensure that the runoff is clean and separate from any potentially contaminated water direct to containment and/or a treatment unit,
- The Environmental monitor will assess the effectiveness of BMPs, associated mitigation measures, and habitat compensation habitats through appropriate monitoring and reporting.

Riparian Areas

- Maintain appropriate riparian setbacks. Install silt and/or exclusion fencing in key areas to prevent additional riparian impacts beyond the permitted area.

Fish Salvage

Fish salvages will be conducted by qualified biological personnel from Trow or a designated sub-contractor. The following BMPs will be used to mitigate or avoid potential impacts to fish and fish habitat when conducting fish and amphibian salvage preparatory to instream works.

- Use fish stop nets (stream-spanning nets) to isolate the instream work site (i.e., create a fish exclusion zone that encloses the instream work site). If possible, provide an alternate channel for fish passage around the instream work site.
- Transfer salvaged fish into a nearby undisturbed site within the same watercourse and outside of the fish exclusion zone, preferably upstream of the isolated site.
- The Environmental Monitor will inspect the riparian setbacks regularly to ensure that fencing is in place and that there are no additional impacts.

2.8 Invasive Species Management Work Procedures

Mitigative measures are required to prevent introduction of invasive non-native plant and wildlife species into ESAs (e.g., yellow-coded watercourses and surrounding riparian areas). Invasive species adversely impact ESAs by out-competing native species, and by causing habitat degradation and loss. For this contract, invasive non-native plants are of primary concern because the exposure of soil in right-of-way clearing facilitates their spread throughout the cleared corridor.

It is understood that, based on assessments to date, coordination of non-native species mitigation has not been identified as a significant issue at this stage of the Project, or at this site location, and that BMPs outlined in other sections (e.g., installation of silt fencing for Erosion and Sediment Control) will help mitigate the potential movement of non-native species. To minimize chance introduction of invasive plant species the Contractor must ensure that equipment is kept clean, particularly in proximity to yellow-coded watercourses, if encountered.

The chance introduction of non-native aquatic wildlife can occur during salvage of aquatic species, and during modifications to existing watercourses, including drainage works. Non-native wildlife species that could potentially be captured (e.g., green and bullfrog tadpoles) during instream salvage works are to be managed according to the ISMP by the qualified environmental professional conducting the salvage. Non-native amphibian species will be euthanized using methods consistent with the recommendations contained in the Canadian Council on Animal Care's *Guide to the Care and Use of Experimental Animals* (Volume 1, 1993).

2.9 Air Quality and Dust Mitigation Work Procedures

2.9.1 Introduction

The following air quality guidelines are selected from the Air Quality and Dust Mitigation Management Plan (AQDMMP) in the EMP. Activities associated with the Project works that have the potential for fugitive dust generation include:

- Land grubbing (vegetation and debris clearing);
- Handling and removal of debris and soils;
- Preload storage site preparation activities such as excavation and grading;
- General construction activities, such as vehicular traffic on temporary unpaved roads, also present the potential for fugitive dust emissions.

Potential gaseous emissions associated with work conducted by contractors include combustion emissions from diesel and gasoline powered construction equipment and vehicles. It is understood that the burning of any refuse or other materials is prohibited.

2.9.2 Best Management Practices

2.9.2.1 Fugitive Dust Mitigation BMPs

No significant fugitive dust from fill is expected since site grading fill will conform to MMCD Section 02234, Granular Subbase with a minimum thickness of 300 mm. During the wet fall, winter and spring months, the potential for dust generation is not considered to be significant and, as such, air quality monitoring will be undertaken only on an "as needed" basis:

- During dry periods of the year (i.e. between June and August);
- When Project works are occurring that could potentially generate dust and particulate emissions (e.g., hauling on exposed soil in the construction site); and
- In areas where potential emissions could impact sensitive receptors (i.e., residences or agricultural workers, nesting raptors, etc.).

The following BMPs are intended to help mitigate potential impacts of fugitive dust emission on local air quality during construction, BMPs are to be followed.

2.9.2.2 General Road Dust Mitigation Measures

The following BMPs should be applied on an as-needed basis to minimize road dust:

- As part of the Contractor Environmental Monitor's monitoring role, conduct regular observations on preload haul routes, stockpile and preload sites to identify if: there is sand build-up on roads; whether or not there is a resultant dust issue; and if there are any other potential sources of dust emissions;
- Speed limits on unpaved roads should be set at the BCRC posted speed limit (within BCRC right of way);
- Apply water to unpaved hauling and unpacked surfaces as frequently as needed except within 100 metres of access points to public roadways, where some other dust control method such as clean gravel over geotextile would be preferable to limit tracking of soils onto roadways;
- Conduct regular street sweeping (refer to Traffic Management Plan – under separate cover);
- Cover haul/dump truckloads that are transporting fine-grained materials, particularly when moving to and from off-site locations, applying efforts to minimize the handling and transfer of materials;

- When hauling fine materials long distances over public roads or near sensitive areas, cover fines or apply dust suppressants; and
- As required, the Environmental Monitor will request that road sweeping, water application and or other mitigation measures are undertaken to reduce and/or remove the dust source (general observations of air quality, implementation of mitigation measures and/or requests for additional mitigation will be documented in Environmental Monitoring Reports).

2.9.2.3 Dust Palliatives

During Project works, optimum air quality conditions exist when the ground has high moisture content. To control fugitive dust by increasing ground moisture, consideration should be given towards water conservation, appropriate drainage, and chemical properties. The following should be considered during application of water for dust control:

- No oils shall be used for dust control. Chemical binding agents, such as calcium chloride, should not be used unless authorized by BCRC;
- Water trucks equipped with spray bars and suitable control apparatus must be used to dampen temporary and permanent unpaved access routes and staging areas at regular intervals. Consideration should be given to water conservation and drainage. With the exception of water, application and handling of other dust palliatives must be in compliance with the Ministry standards as outlined in "Best Maintenance Practices for Highway Maintenance Activities" (BC MoT, July 2004);
- The Environmental Monitor will observe for dust build-up on haul routes to determine if there is a risk of fugitive dust emissions requiring immediate attention.

2.9.2.4 Gaseous Emissions BMPs

Gaseous emissions should be minimized from construction activities and equipment along the entire Project corridor. To mitigate potential impacts of gaseous emissions on local air quality during construction activities, the following BMPs should be considered:

- Operate equipment at optimum rated loads and follow routine equipment maintenance procedures;
- Establish staging zones for trucks waiting to load or unload material where diesel emissions from trucks at the greatest distance possible from residences or areas frequented by the public;

- Apply idle reduction initiatives during site orientations and health and safety, tailboard and Project progress meetings;
- Utilize equipment that operates most efficiently and with the lowest emissions;
- Equipment emitting unacceptable amounts of black smoke (visual observations of excessive black smoke) will be taken out of working order until it can be adjusted to an acceptable emission standard;
- All heavy-duty on-road vehicles will be late model and will be required to meet all federal, provincial, and regional emission standards.
- Ensure that all heavy-duty diesel on-road vehicles (i.e., licensed vehicles, such as dump trucks) are in good working order while operating on the Project site; and
- Where available all heavy-duty diesel on-road vehicles and other diesel construction equipment will use ultra-low sulphur diesel fuel (ULSD; maximum 15 ppm sulphur content), and/or a combination of catalyzed particulate traps or a diesel oxidation catalyst, to meet required emission standards.

2.9.3 Air Quality Monitoring

The Environmental Monitor will be responsible for ensuring that mitigative measures are carried out by the contractor. Periodic site audits may also be conducted by a MoT Air Quality Specialist to identify areas of potential non-compliance with air quality goals. *(Please see the requirement for Site Safety Orientation and Clearance in the first paragraph of the Introduction.)* These site inspections will be conducted concurrent with any air quality monitoring that may be occurring. Based on observations of construction practices; compliance with agreed upon mitigation measures; proximity to sensitive receptors (e.g., development, agricultural workers or livestock, etc.); seasonally available dust fall monitoring data; and on-site conditions (i.e., pre-load moisture, date since last precipitation); the MoT Air Quality specialist may require the application of additional mitigation measures to address construction related air emissions.

3.0 CLOSURE

This document was prepared exclusively for Mainland Civil Works Inc. (Mainland), the Ministry of Transportation and Infrastructure (MoT), Hatch Mott MacDonald (HMM), and BC Railway Company (BCRC). The findings, conclusions and recommendations in this document are based on the expertise and experience of the Trow personnel and based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions and qualifications set forth in this document. The possibility remains that unexpected environmental conditions may be encountered at the project site. Should such an event occur, Mainland may determine if any modifications to this document and/or conclusions herein are necessary. This document is intended to be used by Mainland and the Ministry of Transportation and Infrastructure (MoT), Hatch Mott MacDonald (HMM), and BC Railway Company (BCRC) only, subject to the terms and conditions of Mainland's contract with MoT. Any other use of, or reliance on, this document by any third party is at that party's sole risk.

4.0 RESOURCE DOCUMENTS

Canadian Council of Ministers of the Environment (CCME). October 2003. Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products. URL: http://www.ccme.ca/publications/newpublications.html

Fisheries and Oceans Canada (DFO). 1986. Policy for the Management of Fish Habitat.

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Queen's Printer, British Columbia Ministry of Management Services, 2003. Environmental Management Act [EMA], Chapter 53 [SBC 2003] [includes 2006 Bill 15 amendments].

Robertson (RESL) 2006. South Fraser Perimeter Road Vegetation and Wildlife Impact Assessment: Technical Volume 12 of the Environmental Assessment Application. Prepared for Ministry of Transportation.

APPENDIX A

KEY ENVIRONMENTAL CONTACTS

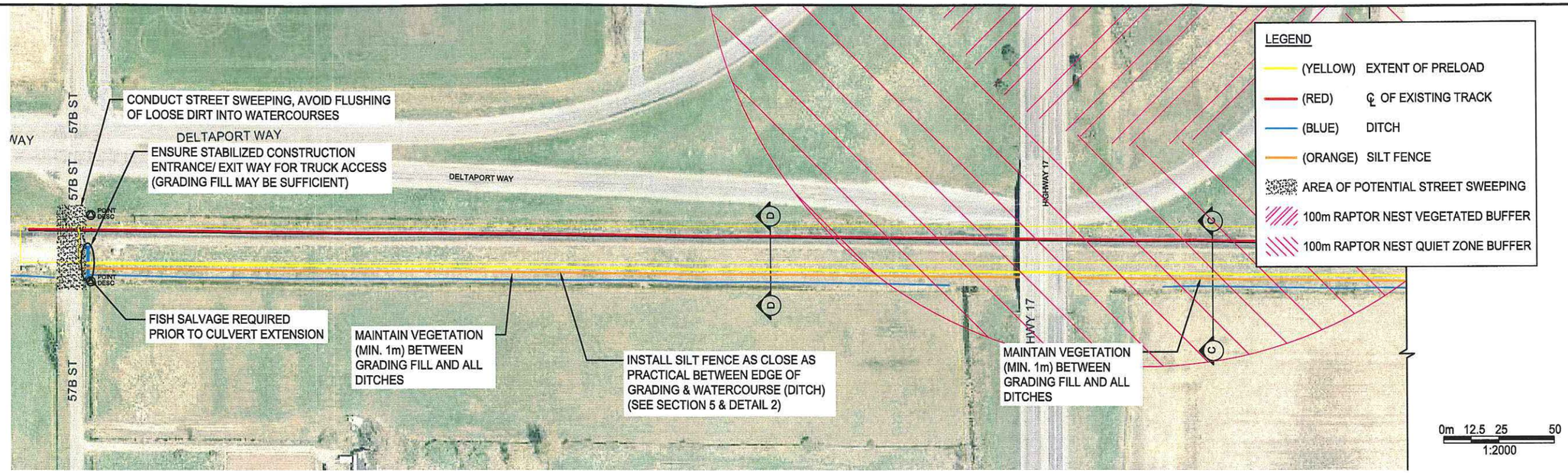
APPENDIX A: KEY ENVIRONMENTAL CONTACTS

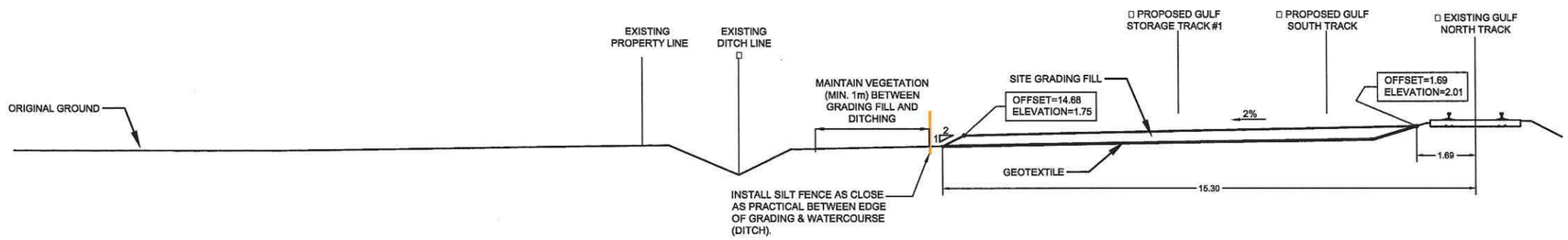
Name, Title	Affiliation	Cellular	Office	Email
Rod MacMillan Supervisor, Track and Facilities Maintenance	British Columbia Railway Company	604-789-7395	604-940-6921	macmillanr@bcrco.com
Tom Winters Manager, Port Sub Operations	British Columbia Railway Company	--	604-940-5543	--
John Brodie Director, Environmental Affairs	British Columbia Railway Company	604-802-1825	604-678-4709	brodie@bcrp.ca
Stuart Riddick, BCRC Project Manager	Hatch Mott MacDonald	--	604 639 1008	stuart.riddick@hatchmott.com
Mike Nutter, BCRC Project Environmental Manager	Hatch Mott MacDonald	778 384-3730	(604) 689-5767	mnutter@hatch.ca
Vern Lange, Ministry Project Manager	MoT	250 868 7320	604 775 0494	Vern.Lange @GatewayProgram.bc.ca
Darcy Penner, Ministry Project Assistant	MoT	604 838 0724	604 775 0494	Darcy.Penner @GatewayProgram.bc.ca
Paul Christie, Ministry Professional Agrologist	MoT	250 542 1567	604 377 0379	paulc@talismanenviro.com
Peter Baskovic	Mainland Civil	604 968 2017	604 591 5599	peterb@mainlandcivil.com
Brent Dilley	Mainland Civil	604 968 2004	604 591 5599	brentd@mainlandgroup.ca
TBD, Site Superintendent	Mainland Civil	TBD	TBD	TBD
Eric Choi, Contractor Environmental Manager	Trow	604 505 3461	604 422 2173	eric.choi@trow.com
Bret Jagger, Contractor Environmental Coordinator	Trow	604 318 5688	604 422 2171	bret.jagger@trow.com

Name, Title	Affiliation	Cellular	Office	Email
Janet Lynn Zazubek, Contractor Environmental Monitor	Trow	778 990 4919	604 874 1245	janet.zazubek@trow.com
Karla Graf, Contractor Wildlife and Fish Coordinator	Triton	604 790 6915	604 279 2093	kgraf@triton-env.com
Hazardous Spills (includes chemical or oil spills and dumping in creeks and stream)	MoE, DOE, and DFO	**Tel: 1-800-663-3456 (MoE Provincial Emergency Program)** Tel: 604-666-6100 (Environment Canada 24-hour Hotline) Tel: 604-666-3500 (DFO 24-hour Hotline)		
Extreme Erosion Sedimentation or Flooding	Ministry of Environment	Tel: 1-800-663-3456 (MoE Provincial Emergency Program)		
BC One Call Dial Before You Dig (non-emergency)	Utility	1-800-474-6886 Cellular *6886 (Toll Free)		
Telus (repair & maintenance)	Utility	611		
BC Hydro	Utility	1-888-POWERON (1-888-769-3766) Cellular *HYDRO (*49376)		
Terasen Gas	Utility	1-800-663-9911		

APPENDIX B

ENVIRONMENTAL MANAGEMENT SITE PLAN

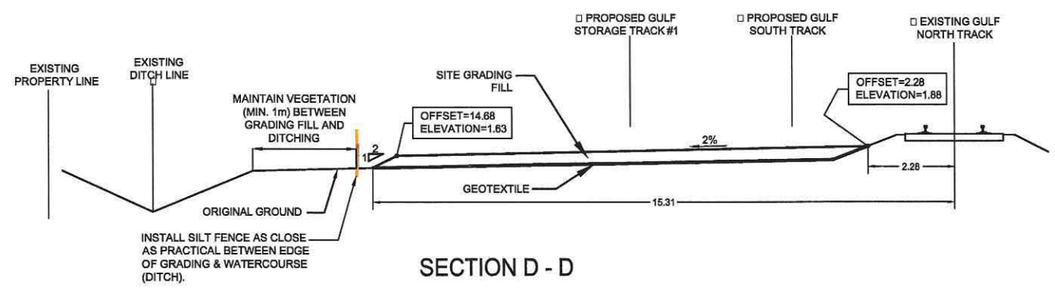




SECTION C - C

NOTES:

- RAPTOR NEST BUFFERS ESTABLISHED FOR KNOWN RAPTOR NEST, BAEA-7, FOR TWO ADULT BALD EAGLE RESIDENTS IN THE TRANSMISSION TOWER AS A PRECAUTION ONLY.
- NO RAPTOR ACTIVITY OBSERVED IN JUNE 2009.
- OTHER EXISTING DISTURBANCES INCLUDE ROAD AND HIGHWAY TRAFFIC AND RAIL TRAFFIC. DISTURBANCES GREATER THAN EXISTING NOISES ARE NOT ANTICIPATED DURING CONSTRUCTION



SECTION D - D

REFERENCE: DELTAMAP, 2009 (COLOUR 2008 AIR PHOTO)

Trow

TROW ASSOCIATES INC.
7025 Greenwood Street, Burnaby, British Columbia, V5A 1X7
Telephone: 604-874-1245
Fax: 604-874-2358

DFTR.	DSGN.	CHK.
TH	BJ	EC

REVISIONS

No.	DESCRIPTION	DATE
1	DRAFT ISSUED FOR REVIEW	JULY 9/09
2	ISSUED FOR CONSTRUCTION	JULY 23/09

CLIENT

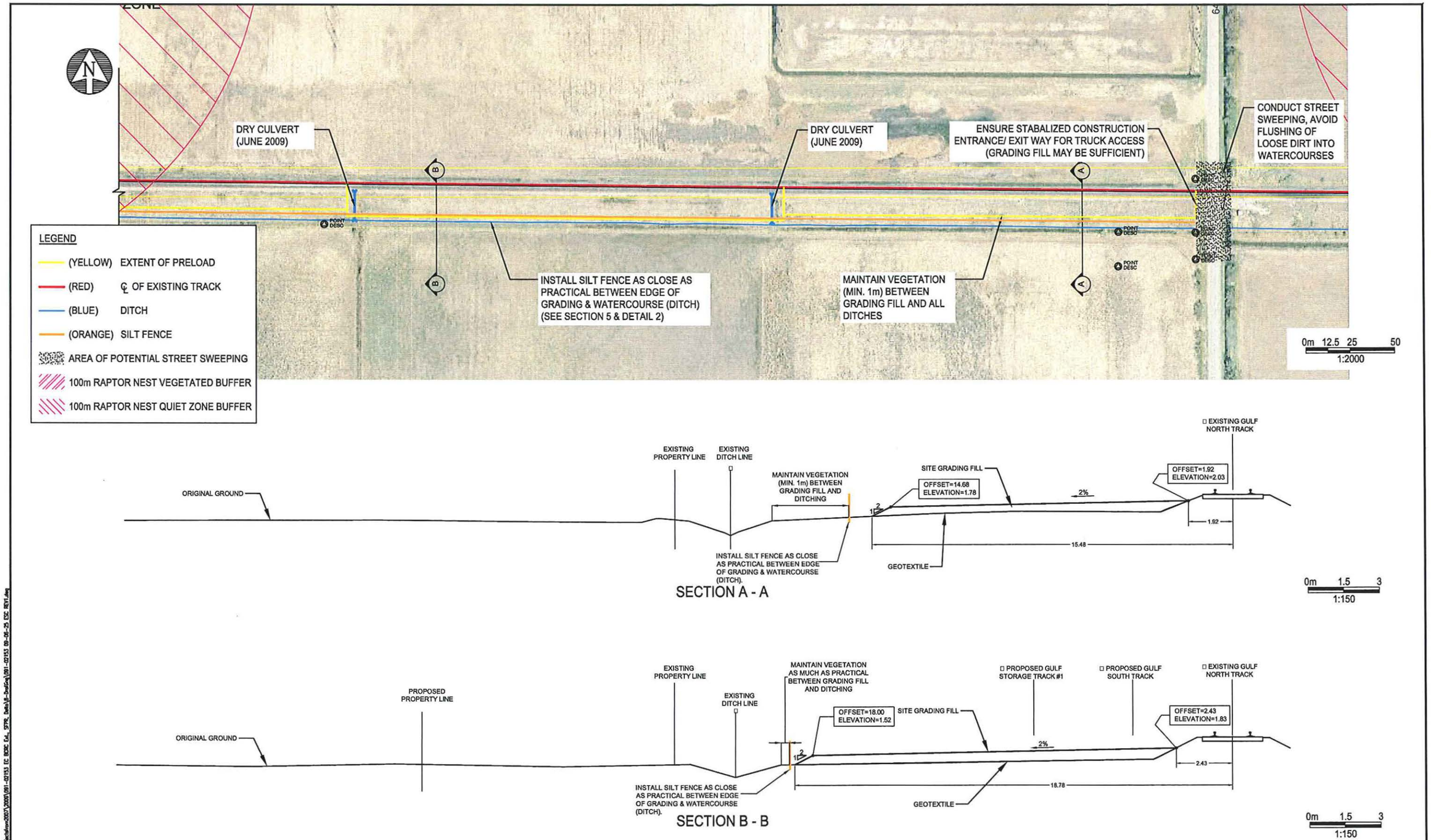
PROJECT: BCRC TRACK EXTENSION ENVIRONMENTAL WORK PLAN

PROJECT NO. 091-02153

TITLE: SITE PLAN

DATE: JULY 2009 | SCALE: AS SHOWN | DWG NO. 1 OF 3

Jul 23, 2009 - 10:56am \\VANAS\Projects\from2007\2009\091-02153 EC BCRC Ext. SPR. Delta\B-Drafting\091-02153 09-06-25 ESC REV1.dwg



REFERENCE: DELTAMAP, 2009 (COLOUR 2008 AIR PHOTO)

TROW ASSOCIATES INC.
7025 Greenwood Street, Burnaby,
British Columbia, V5A 1X7
Telephone: 604-874-1245
Fax: 604-874-2358

DFTR.	DSGN.	CHK.
TH	BJ	EC

REVISIONS

No.	DESCRIPTION	DATE
1	DRAFT ISSUED FOR REVIEW	JULY 9/09
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CLIENT

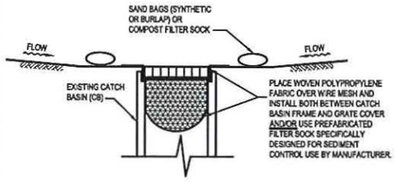
PROJECT: BCRC TRACK EXTENSION ENVIRONMENTAL WORK PLAN

PROJECT NO.: 091-02153

TITLE: SITE PLAN

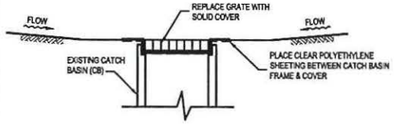
DATE	SCALE:	DWG NO.
JULY 2009	AS SHOWN	2 OF 3

REFERENCE:
NILEX DANDY BAG
BURNABY, BC



DETAIL 1A: CATCH BASIN DETAIL (TYP.)
SCALE NTS

REFERENCE:
LAYFIELD CATCH BASIN
SEDIMENT TRAP
RICHMOND, BC



DETAIL 1B: BLOCKED OFF CATCH BASIN
SCALE NTS

PROPERTY	Nominal Roll Value*
GRAB TENSILE	1.62-0.89 kN
GRAB ELONGATION	24-10 %
MULLEN BURST	3100 kPa
PUNCTURE	0.47 kN
TRAPEZOIDAL TEAR	0.51-0.33 kN
UV RESISTANCE	90 % at 500 hr
AOS	0.425 mm
PERMITTIVITY	1.3 sec
FLOW RATE	7750 L/min/m

* FILTER FABRIC TO MATCH THE FOLLOWING NOMINAL SPECIFICATIONS OR BE AN APPROVED EQUIVALENT SUPPLIED SPECIFICALLY BY THE MANUFACTURER AS "CATCH BASIN FILTER SOCK"

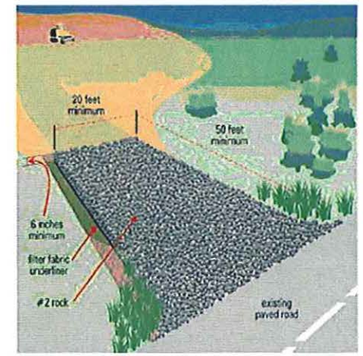
DETAIL 1: INLET CONTROL
SCALE: NTS

DETAIL 3A: MULCH APPLICATION
SCALE NTS

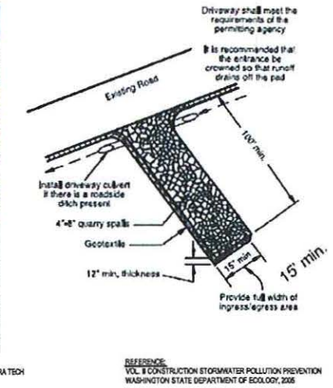
DETAIL 3B: POLYETHYLENE SHEETING
SCALE NTS - ANCHOR TO SLOPE WITH SAND BAGS, ROCK OR WOOD STAKES

DETAIL 3C: LOOSE STRAW
SCALE NTS

DETAIL 3:
SOIL COVER



REFERENCE:
KENTUCKY EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE, TETRA TECH



REFERENCE:
VOL. II CONSTRUCTION STORMWATER POLLUTION PREVENTION
WASHINGTON STATE DEPARTMENT OF ECOLOGY, 2005

DETAIL 4A: ENTRANCE
SCALE NTS

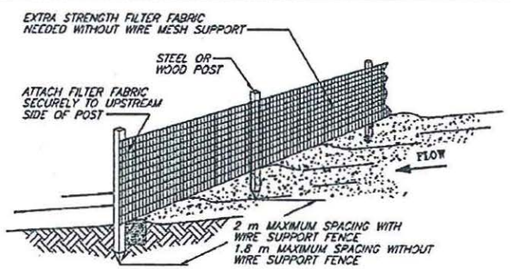
DETAIL 4B: PARKING AREAS
SCALE NTS

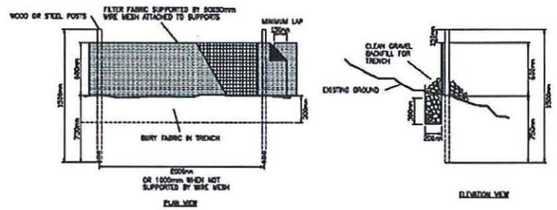
TABLE - RECOMMENDED GEOTEXTILE FABRIC STANDARDS

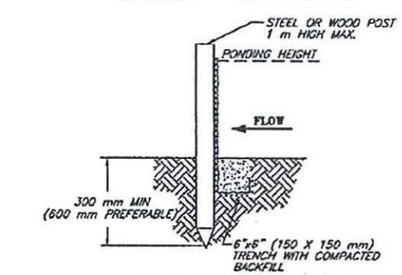
Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

REFERENCE:
VOL. II CONSTRUCTION STORMWATER POLLUTION PREVENTION
WASHINGTON STATE DEPARTMENT OF ECOLOGY, 2005

DETAIL 4: STABILIZED CONSTRUCTION ENTRANCE

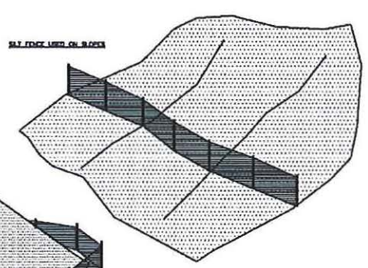






TRENCH METHOD OPTION DETAIL

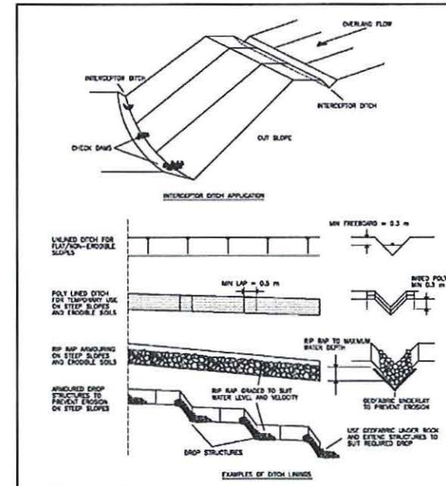
NOTES:
1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT (1:2 YEAR STROM AND/OR +40 mm RAINFALL OVER 24 HOUR DURATION) AND REMOVE SEDIMENT WHEN ACCUMULATED SILT REACHES 1/2 FENCE HEIGHT OR 225 mm MAXIMUM SUGGESTED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA WILL NOT CONTRIBUTE SEDIMENT OFF-SITE.
4. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.



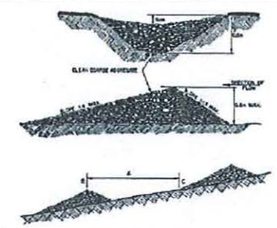
SILT FENCE USED ON SLOPES

SILT FENCE AROUND SOIL STOCKPILES

DETAIL 2: SILT FENCE



DETAIL 5A - PERIMETER DITCH



DETAIL 5B - CHECK DAM

DETAIL 5C - STRAW AND GRAVEL FILTER

DETAIL 5: PERIMETER DITCH

GENERAL EROSION AND SEDIMENT CONTROL SPECIFICATIONS

1. The Site Contractor is responsible for all erosion and sediment control methods on site, in accordance with *Land Development Guidelines for the Protection of Aquatic Habitat* manual published by the BC Ministry of Environment, Lands and Parks (now BC Ministry of Environment) and Fisheries and Oceans Canada (available on line through the following website: http://www.heb.pac.dfo-mpo.gc.ca/publications/pdf/165353.pdf).

2. All on site surface run-off is to be directed to the perimeter ditches. Discharge from the perimeter ditches to any water course must meet the discharge criteria of a pH between 6.0-9.0, a Total Suspended Solids (TSS) content of less than or equal to 25mg/L (May 16-Oct. 14) or less than or equal to 75mg/L (Oct. 15-May 15) - an environmental consultant should be retained to evaluate the sediment controls in place, sample the discharge on a weekly basis and during or after each significant rainfall as well as interpret the data. No discharge of petroleum hydrocarbons, solvents, heavy metal particulate, cement, etc. or any material that could be deemed "deleterious" under the Fisheries Act.

3. A granular base underlain by geotextile filter fabric is to be placed in traffic areas to stabilize driving surfaces and to reduce the amount of sediment transported offsite.

4. Existing vegetation should be removed only when absolutely necessary.

5. Construction should be staged if possible to minimize the amount of exposed soil present at any one time.

6. All soil piles should be covered with polyethylene sheeting, particularly during rainfall or snow (October 16th to May 15th: within two days, May 16 to October 14: within seven days). Sheeting must be inspected on a regular basis and any separation or tears repaired immediately. Sheeting should be anchored to slopes using sand bags, rock or wood stakes. Store excavated soils away from storm drains or other potential offsite transport pathways.

7. All Interceptor Ditches and Sump(s) to be maintained free of accumulated sediment. Inspection of interceptor ditches to be carried out weekly; cleaning as required.

8. No mud or dust shall be tracked onto civic lands or streets. Employ street sweepers as required. No flushing on roads is permitted. In dry periods or as directed by the Engineer, appropriate dust suppression measures must be undertaken.

9. Onsite works shall be in accordance with the current BC Building Code and other applicable codes, regulations, criteria and guidelines.

10. It is the Site Contractor's responsibility to ensure effective and efficient maintenance and operation of the siltation control structures and to ensure that any water being discharged from the site meets the appropriate quality standards (civic, provincial, municipal).

11. All work must be undertaken and completed in such a manner as to prevent the release of silt, raw concrete leachate or other deleterious substances into any ditch, watercourse, ravine and storm sewer system.

12. The Site Contractor is responsible for maintenance of:
a) Perimeter ditch installation, monitoring, and clean-out; and
b) All erosion and sediment control measures until majority of landscaping is complete.

13. All concrete supply trucks shall be equipped with wash bucket system for flushing of flume. Under no circumstances shall excess concrete from flume and/or truck be flushed onto roads or into storm sewer systems.

14. The Contractor is to confirm elevation and location of all existing services prior to commencement of works. Report all discrepancies in existing connections to designer prior to construction.

15. It is the responsibility of the Contractor to maintain traffic on all municipal rights of way by the use of signs, barricades, flag persons, and other means acceptable to the MOTI & BCRC.

16. The Contractor may propose alternative erosion and sediment control methodologies for review by the Project Engineer or Environmental Consultant. The Project Engineer or Environmental Consultant may authorize small changes to procedure or process, with interim and final approval for any material changes to the drawings and guidelines specified herein to be obtained from the MOTI & BCRC. The MOTI & BCRC have final authority over of all aspects of erosion and sediment control at the Site.

17. Decommission all sediment control systems only after areas have been vegetated or otherwise permanently stabilized and surface water is suitably directed to the storm water system. All sediment to be removed off site and disposed per regulation. Any required permits to be acquired by the Contractor prior to decommissioning.

References:

i. National Guide to Erosion and Sediment Control on Roadway Projects, Transportation Association of Canada, May 2005
ii. Land Development Guidelines for the Protection of Aquatic Habitat, BC Ministry of Environment, September 1993
iii. Guidelines for Erosion & Sediment Control, City of Calgary, February 2001
iv. BC Building Code (design rainfall of 134mm/24-hr), 2006
v. Erosion and Sediment Control, Malaspina University-College, April 2005
vi. Fifield, Jerald, Designing for Effective Sediment and Erosion Control on Construction Sites, 2004

EROSION AND SEDIMENT CONTROL SUPPLIERS
(THIS LISTING IS PROVIDED AS A MATTER OF CONVENIENCE TO CONTRACTORS)

ESC ITEM OR FUNCTION	SUPPLIER OR CONTRACTOR
ENVIRONMENTAL CONTRACTORS	HAZCO ENVIRONMENTAL SERVICES
	QUANTUM ENVIRONMENTAL GROUP
	SUMAS ENVIRONMENTAL SERVICES INC.
COMPOST	DENBOW
WHEEL WASH	CANADIAN EQUIPMENT RENTALS
	STORMTEC FILTRATION INC.
GEOTEXTILES	NILEX
	LAYFIELD
WATER FILTRATION	CANADIAN EQUIPMENT RENTALS LTD.
	STORMTEC FILTRATION INC.
	SUMAS ENVIRONMENTAL SERVICES INC.

NOTE: THE MATERIALS, EQUIPMENT AND METHODS SHOWN HEREIN ARE APPROPRIATE EROSION AND SEDIMENT CONTROLS PROVIDED THEY ARE OPERATED AND MAINTAINED PER THE SUPPLIER'S OR MANUFACTURER'S SPECIFICATIONS. TROW DOES NOT ADVOCATE ANY PARTICULAR SUPPLIER OR CONTRACTOR.

Trow
TROW ASSOCIATES INC.
7025 Greenwood Street, Burnaby,
British Columbia, V5A 1X7
Telephone: 604-874-1245
Fax: 604-874-2358

THIS DRAWING AND DESIGN IS THE EXCLUSIVE PROPERTY OF TROW ASSOCIATES INC. AND MAY NOT BE USED OR REPRODUCED WITHOUT PRIOR WRITTEN CONSENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS. THE CONTRACTOR MUST NOTIFY THE ENGINEER OF ANY ANY DISCREPANCIES PRIOR TO COMMENCING RELATED WORK.

	REVISIONS			REVISIONS			REVISIONS	
No.	DESCRIPTION	DATE	No.	DESCRIPTION	DATE	No.	DESCRIPTION	DATE

DFTR: TH
DSGN: BJ
CHK: EC

CLIENT:
PROJECT: BCRC TRACK EXTENSION ENVIRONMENTAL WORK PLAN
PROJECT NO.: 091-02153

TITLE: DETAILS

DATE: JULY 2009
SCALE: AS SHOWN
DWG NO.: 3 OF 3

\\ARGAS\Projects\from2003\2009\091-02153 TC BCRC Ext. SFPR\ Data\B-Drafting\091-02153 09-06-25 ESC DETAILS.dwg
Jul 23, 2009 - 10:56am

Project Environmental Management Plan

Deltaport Berth 3 Finishing Works For Terminal Systems Inc.

MATCON Civil Constructors Inc.

(MATCON)

20 October 2008

0.01 Table of Contents

0.02 Environmental Policy

MATCON and its employees are committed to the protection and preservation of the environment. The environment will be integral with the safety program as a daily planning, discussion and implementation requirement in which all personnel on site are mandated to fully participate. Stewardship will be the focus of all site activities.

0.03 Record of Distribution

Copy	Electronically issued	Revision No.			
		00	01		
1	Terminal Systems Inc.	02/10/08	20/10/08		

0.04 Table of Revisions

Section	Page No.	Revision No.					
		01					
4.1	5	20/10/08					

1.0 Introduction

The Environmental Management Plan is intended to state in specific terms to the satisfaction of the Owner, the Contractor's commitment to environmental protection during the course of the this project work and to be the primary guidance document for MATCON personnel engaged in the work.

2.0 Responsibilities:

2.1 Project Manager – David Leitch **Mobile 250-380-8029**

a. Responsible for the implementation of the Project Environmental Management Plan
b. Responsible for the delegation of responsibilities to key personnel for ensure the effective implementation of the Plan

2.2 Spill Response Coordinator – Malcolm Buchannen **Mobile 604-000-0000**

a. Identify all Federal, Provincial, Municipal and Owner requirements relating to spill prevention, response and remediation.
b. Produce and update an inventory of potentially hazardous material sand site specific

procedures.
c. Document and coordinate notifications and reports pertaining to spills.
d. Initiate, oversee and direct prevention and recovery activities relating to the accidental release of hazardous materials into the environment.
e. Coordinate training of spill response teams.
f. Liaise and coordinate communications and activities with other contractors, regulating agencies and the Owner during a spill response.

2.3 Field Supervisors

a. Ensure that work is conducted in a responsible manner that will reduce the risk of a spill.
b. Assist the Spill Response Coordinator in the control and remediation of a spill.
c. In the conduct of Tool Box and special work briefing supervisors will plan and discuss environmental prevention, spill prevention and response

2.4 Employees

a. Employees will implement their work in a environmentally responsible manner that is accordance with the objectives of the Environmental Management Plan.
b. Under the direction of Spill Response Coordinator employees will participate in the control and remediation of a spill.

3.0 Air Quality Mitigation Plan: MATCON will carry out the construction activities to reduce emissions and the potential for dust.

3.1 Low Sulphur Diesel: The Contractor will use low sulphur diesel in all trucks and equipment whenever possible.

3.2 Particulate Filters: The Contractor will utilize particulate filters on all equipment whenever possible.

3.3 Dust: The Contractor will employ water spraying to suppress dust on site. Considering the quantity of water needed for spraying and the sand fill in all areas there will not be a runoff problem from dust control activities. Covered trucks will be used for any particulate materials hauled either to or from the site, although these quantities will be minor. The speed limit on site will be monitored to ensure minimal dust creation.

3.4 Speed Limit: Site speeds will be limited to control creation of dust.

3.5 Worker Orientation: The workers on site will be educated as part of the daily safety briefings program in reduction and prevention measures as follows:

- General awareness of factors affecting air quality
- Reduced engine idling
- Daily inspections of trucks and equipment
- Preventative equipment and truck maintenance
- Trip and load efficiency

4.0 Marine Water Quality Plan:

4.1 Discharge - The objective in every work plan will be to avoid discharging water into the marine environment. All works and activities will be carried out in compliance with the

following water quality criteria. This includes induced sedimentation of foreshore and near-shore areas and the induced turbidity of local marine waters, and release of sediment, sediment-laden waters, and turbid water to the marine environment as a result of works associated with the project.

- When background is less than or equal to 50 nephelometric turbidity units (NTU) or 100 milligrams per litre (mg/L) non-filterable residue (NFR), induced turbidity should not exceed 5 NTU or 10 mg/L NFR above the background values.
- When background is greater than 50 NTU or 100 mg/L NFR, induced turbidity should not exceed the background values by more than 10% of the background value.

4.2 Sedimentation - MATCON will take all available measures to control sediment on site and to prevent any deleterious substances such as concrete leachate from being released into the marine habitat via piping systems or trenches. Concrete waste will be removed to a safe location and covered to protect materials rainwater runoff. Waste will be removed at the first available opportunity. Silt fencing will be deployed and maintained wherever necessary.

4.3 Storm Water Runoff – Although accumulations of contaminated storm water are not anticipated in association with this work, should storm water accumulate on the work site that contains suspended sediments or concrete residue such will be prevented from entering the marine environment. Deleterious sediments or residue will be removed from the site as waste.

4.4 Concrete – Pre-cast concrete elements will be utilize in every possible application as approved by the Owner. Concrete and mortar placed on site that may come into contact with water that entering the marine environment will be protected as follows:

- Exposed concrete and mortar will be covered will plastic tarps to isolate the concrete until it has sufficiently cured.
- Water that may come into contact with concrete and mortar will be prevented from entering the marine environment.
- Concrete trucks other concrete and mortar contaminated equipment will only be washed down in a containment area well away from the marine environment.

5.0 Waste Management Plan:

5.1 Refuse & Debris Removal - MATCON will monitor all work areas and ensure a final cleanup upon completion of each segment of work. Non-contaminated solid wastes including debris and refuse will be accumulated in bins and transported off-site for disposal. Measures will be taken to secure food waste from wildlife.

5.2 Contaminated Waste Removal - Materials contaminated by petroleum products, chemicals, or other undesirable materials will be managed according to manufacturer's instructions and to regulatory standards. Absorbent materials or soils saturated with oil or gasoline may be classified as special waste and will be contained and disposed of appropriately. All material disposed of off-site will go to an appropriate permitted facility that can accept such material in compliance with all applicable legislation. In the case of contaminated material MATCON will receive prior approval or disposal facilities from the site

Environmental Monitor. In the event that creosoted wooden pilings are encountered in the excavation, MATCON will take care to excavate around the pilings in order that the piles can be pulled or broken off at the base of the excavation as directed by the Environmental Monitor. Where piles are broken off, the remainder of the pile will remain in place. Piles removed from the excavation will be stockpiled in a designated area for cleaning pending disposal arrangements.

6.0 Hazardous Waste Management Plan: The handling of fuel and lubricants is seen to be the extent of the hazardous materials management requirement for the proposed works on this site. The construction work will require use of heavy machinery and haul trucks that use fuels, lubricating oils and hydraulic fluids. It is understood that these fluids can negatively impact terrestrial and aquatic environments and will be managed properly. To reduce the risk of these fluids reaching terrestrial and aquatic environments, the following procedures will be implemented.

6.1 Fuel Storage - No fuel will be stored on site. All fuel will be transported in accordance with the Transportation of Dangerous Good Act.

6.2 Fuel Handling - The following procedures will be followed regarding any fuel handling at the Site.

- No smoking will be permitted on site at any time.
- Machinery fuelling and servicing will take place only within areas designated in the field and must be at least 20 m horizontally from any watercourse and ensure that fuels, oils or other deleterious substances do not enter the soil or any watercourse. Any spills of fuels, oils or other fluids will be contained. A spill kit will be available and stored in a conspicuous location in all such areas.
- Place oil absorbent sheets and/or containers under vehicles and equipment parked within 20 m horizontally of any watercourse for longer than 2 hours or immediately under any vehicle or equipment that is leaking.
- Block the drains in working areas using neoprene mats or another suitable devices to contain potential oil spills at the source.
- Ensure that all fuel vehicles are parked only in designated areas on site with brakes applied and wheels chocked.
- Fuel contaminated water shall not be discharged to ground or any water body.
- Containers used to carry petroleum products must be designed for that purpose and cannot be more than 5 years old.
- Containers must not leak and must be sealed with a proper fitting cap or lid.

6.3 Equipment Maintenance

- Any maintenance of equipment other than routine greasing or oiling of moving parts on-site is prohibited.
- Large equipment, including their hydraulic fittings, will be inspected daily and be free of leaks.

6.4 Emergency Response, Spill Kits, Sorbent Pads and Booms

- Emergency spill kits will be maintained on site within 100 m of any construction equipment at all times. These kits are to be used for emergency spills only.
- Sorbent pads and booms shall be melt down polypropylene pads (i.e., oil only) such as SPC, 3M, Metasorb.
- Sorbent pads (minimum 25) shall be kept with each piece of equipment that is on the Site.
- Oil containment booms shall be deployed and removed as required to contain spills.
- The on-site supply of spill kits and absorbent pads will be maintained at all times. Additional sorbent material will be available for routine use.

- All spills greater than 500 ml (0.5 L) will be reported to the Environmental Monitor and immediately cleaned up.
- MATCON will report all spills to authorities as set out in the appropriate legislation and regulations.

6.5 Marine Environment Protection **–** Some activities have the potential to impact the marine environment and mitigation strategies are summarized as follows

Activity	Potential Fish Impacts	Mitigation Strategies
Truck and Heavy equipment operation	(a) Fuel spills (b) Fuel and lubricant leaks	(a) Refuel and maintain equipment in secure areas, provide spill kits. (b) Maintain equipment in good condition, provide spill kits.
Ground Disturbance	(a) Siltation	(a) Install silt fences and sediment detention ponds, if required.
Foreshore Excavation	(a) Migration of sediments to marine habitat	(a) Installation of silt fencing/barriers where possible.

7.0 Oil and Spill Emergency Response Plan: If a spill of fuels, oils, lubricants or other harmful substances occurs during the TSI Berth 3 Terminal Finishing Works project, the following procedures will be implemented.

7.1 Response Procedures

1. **ENSURE SAFETY**
2. **STOP THE FLOW** (when possible)
3. **SECURE THE AREA**
4. **CONTAIN THE SPILL**
5. **NOTIFY/REPORT** (PEP 1-800-663-3456)
6 **CLEAN-UP**

(Circumstances may dictate another sequence of events)

1 ENSURE SAFETY

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

2. STOP THE FLOW (when possible)

- Act quickly to reduce the risk of environmental impacts.

- Close valves, shut off pumps or plug holes/leaks.
- Stop the flow or the spill at its source.

3. SECURE THE AREA

- Limit access to the spill area.
- Prevent unauthorized entry onto the Site.

4. CONTAIN THE SPILL

- Block off and protect drains and culverts and water bodies.
- Prevent spilled material from entering drainage structures (ditches, culverts, drains) or local water bodies.
- Use spill sorbent material to contain the spill.
- If necessary, use a dyke or any other method to prevent any discharge on site.
- Make every effort to minimize contamination.

5. NOTIFY/REPORT

- Notify the Owners' Representative or alternate (provide spill details) and Environmental Monitor (EM).
- When necessary the first external call should be made to:

Provincial Emergency Program (PEP) 1-800-663-3456 (24 Hour)

Environment Canada Environmental Emergency Section 604-666-6100.
Provide necessary spill details to other external agencies.

Complete an Environmental Incident Report (EIR).

SPILL REPORTING PEP 1-800-663-3456

SUBSTANCE	AMOUNT	REPORTABLE EXTERNALLY PEP 1-800-663-3456	REPORTABLE INTERNALLY
Oils	>100 litres	PEP	EIR, EM
	Any amount aquatic habitats	DFO & BC Ministry of Water, Land and Air Protection (MOE)	EIR, EM
	Any amount off BC Hydro property	BCMOE Local Authority	EIR, EM
Special Wastes - oil with > 50ppm PCB - Corrosives - Hazardous	> 1 litres > 5 kilograms > 5 litres	PEP PEP PEP	EIR, EM EIR, EM EIR, EM
Media Involved	Any Incident	-	EIR, EM

Note: If there is doubt regarding the size of the spill, material involved and whether it is reportable, err on the side of caution and report the spill.

EMERGENCY CONTACTS

CONTACT	NAME	OFFICE #	CELLULAR/ PAGER #	24 HOUR #
TSI Representative	TBA			
MATCON Project Manager	David Leitch	604-943-2112	250-380-8029	250-380-8029
TSI Environmental Monitor	TBA			
Provincial Emergency Program (PEP)				1-800-663-3456
Environment Canada	Environmental Emergency Section			604-666-6100
MATCON	Randy Herber	604-530-1402	604-328-0534	604-328-0514

7.2 Spill Cleanup

- All equipment and/or material used in clean up (e.g., used sorbent, oil containment materials, etc.) must be disposed of in accordance with MOE requirements.
- Accidental spills may produce special wastes (e.g., material with >3% oil) and contaminated soil. All waste disposal must comply with the Environmental Management Act and Regulations.
- Subject to prior approval from MOE, waste sorbent material may be disposed of in a landfill.
- Contaminated soil must be treated and dealt with as required on a site-specific basis.

7.3 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.

7.4 Emergency Spill Response Kit Contents

Quantity	Description
	Spill Response Kit
200	Polypropylene Sorbent Pads 18”X18”X3/8” (Oil only)
25 m	Polypropylene Sorbent Booms 5” diam.
2	Polypropylene Sorbent Socks 3” diam. X 4ft. (Oil only)
1	Treated Oil Only Cellulose Particulate
1	Neoprene Drain Cover 48‘ X 48” X1/8”
6	Poly. Disposal Bags (45 Gal. Drum size, minimum 6 mil)
1000’	Barrier Tape, Yellow “Caution Do Not Enter”

2 pair	Nitrile Gloves Large
2 pair	Nitrile Gloves Extra Large
100’	Polypropylene Rope, Yellow1/4
30	Empty Sand Bags 14” X 22”
1	Roll Poly. Plastic Sheet 100’ X 6’ X 6 mil Thickness
1	Roll Duct Tape 180’ X 2”
1 roll	“Kimwipes” Hand Towelettes
1	Kit Container Marked “Spill Response Kit”

- Spill kits will only be used in emergency situations. Kits will be available for inspection at any time by the Environmental Monitor during the Contractor’s mobilization and after each use.
- The Contractor will replace the items used in each spill kit after they are used. The Contractor will have a supply of sorbant material on hand for routine use during construction.

8.0 Noise Management Plan: MATCON will be responsible for noise generated in the conduct of the work. To reduce noise proper maintenance of trucks and heavy equipment will ensure mufflers and other noise reduction devices are in good condition.

The Contractor will avoid excessive idling of heavy equipment and of trucks standing by for dumping and/or loading. In the unlikely event of a noise complaint the Contractor will take reasonable measures to modify the work procedures to the satisfaction of the Environmental Monitor.

9.0 Traffic Management Plan: In General there is no requirement to haul sand and gravels in and out of the site commercial traffic will be limited to mobilization of equipment and single deliveries of pipe and pre-cast materials. Machines will require fuel to be delivery once daily at most. Job pickups and personal crew vehicle are not likely to exceed 12 at any given time.

MATCON will employ Valley Traffic Systems to prepare localized management traffic plans for inclusion in specific work plans for utilities connections under the main roadways. Work plans will require prior coordination with the Owner, the decisions from which will be incorporate into formalized plans. Such plans will be submitted to Owner for prior approval.

10.0 Visual and Light Management: Works will be generally conducted in daylight hours and therefore may require only infrequent use of temporary lighting equipment. However, in the event of work in darkness the Contractor will utilize only the lighting necessary for the adequate illumination of the works area. Such lighting will be directed downward and away from residences on the foreshore. Where necessary glare shields will be utilized.

11.0 Orientation and Training:

11.1 Orientation

- The Project Manager will ensure that every employee of the TSI Berth 3 Finishing Project is indoctrinated and trained in the policies, individual responsibilities and procedures of this Environmental Management Plan.

- Employees will undergo environmental orientation as part of the project joining routine and will be aware of their individual responsibilities before going to work on site.

11.2 Training

- Employees will attend Tool Box Briefings daily, General Safety Meetings monthly and special briefings as required. These meetings will address safety and environmental issues.
- Employees will undergo training in specific procedures and environmental protection measures specific to their work.
- The Superintendent will train employees in the correct use, handing and storage of materials on site that may pose a risk to the environment. The Superintendent will further ensure that employees are instructed in the location, content and use of spill kits and on site equipment that can be utilized for containment and recovey.