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Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Airport Community Road Washout Rehabilitation Project Coral Harbour, NU

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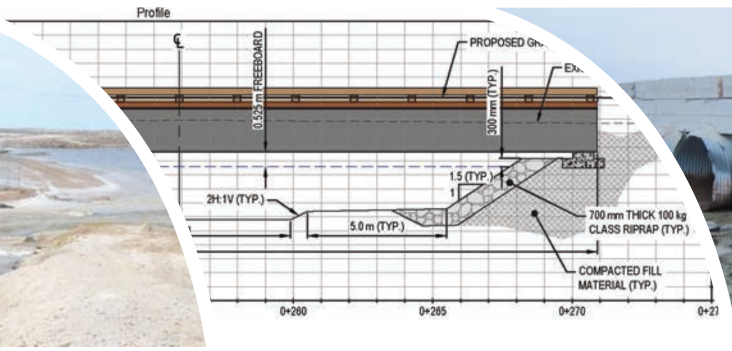
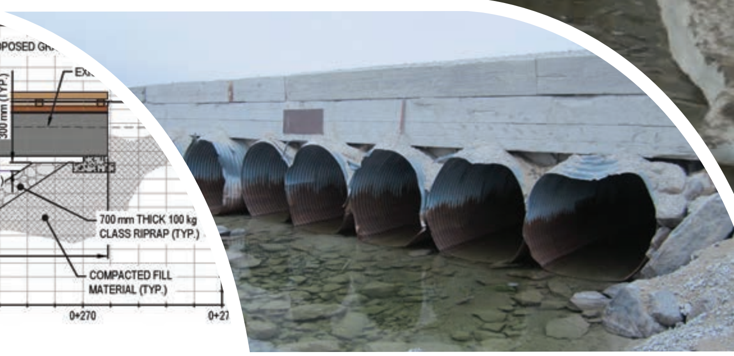
FEBRUARY 2016





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EXECUTIVE SUMMARY

This document is the Construction Environmental Management Plan (CEMP) for the proposed Airport Community Road Washout Rehabilitation Project located near Coral Harbour, on Southampton Island Nunavut. The CEMP was prepared by Tetra Tech EBA Inc. (Tetra Tech EBA) on behalf of the Department of Community and Government Services (CGS) of the Government of Nunavut for use by the contractor to be retained to implement the Project in 2016.

This CEMP is based on the known environmental conditions at the Site and the nature of the proposed Project. It provides recommendations to mitigate potential adverse effects of the Project on the aquatic and terrestrial environment based on available design plans. The CEMP is designed as a guidance document that provides general mitigation measures and best management practices (BMPs) for the Project construction phase to protect existing environmental values.

Also incorporated into the CEMP is the **Emergency Response Plan** and the **Spill Contingency Plan**. This CEMP should be read in conjunction with the Tetra Tech EBA Supplemental Information Report (2015a) for this project (Appendix B), which provides more detailed information regarding the environmental and physical characteristics of the Project area, and the Tetra Tech EBA Detailed Design Drawing Package (2016) provided in Appendix C, which provides engineering and environmental specifications for the Project.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Department of Community and Government Services (CGS) of the Government of Nunavut and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the CGS, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

1.0 INTRODUCTION

Tetra Tech EBA Inc. (Tetra Tech EBA) has been retained by the Department of Community and Government Services (CGS) of the Government of Nunavut to prepare a Construction Environmental Management Plan (CEMP) for the proposed Airport Community Road Washout Rehabilitation Project ("Project") near Coral Harbour, Southampton Island, Nunavut ("Site").

This CEMP is based on the known environmental conditions at the Site and the nature of the proposed Project. It provides recommendations to mitigate potential adverse effects of the Project on the aquatic and terrestrial environment based on available design plans. The CEMP is designed as a guidance document that provides general mitigation measures and best management practices (BMPs) for the Project construction phase to protect existing environmental values.

Also incorporated into the CEMP is the **Emergency Response Plan** and the **Spill Contingency Plan**.

This CEMP should be read in conjunction with the Tetra Tech EBA Supplemental Information Report (2015a) for this project (Appendix B), which provides more detailed information regarding environmental and physical characteristics of the Project area, and the Tetra Tech EBA Detailed Design Drawing Package (2016) provided in Appendix C, which provides engineering and environmental specifications for the Project.

2.0 PROJECT INFORMATION

2.1 Location

The Project is located near Coral Harbour, Southampton Island. Two specific watercourse crossing locations on the Post River comprise the main components of the project. The geographical coordinates at the approximate centre of these locations are 64° 07' 54" North, 83° 11' 09" West, and 64° 07' 52" North, 83° 11' 17" West, respectively. The attached Figures 1-2 identify the locations where construction is to occur.

2.2 Project Description

2.2.1 Background

The Airport Road has washed out four times in the past nine years during spring freshet. The last occurrence was in June 2012, when snowmelt and heavy rain caused the road to wash out in two places east and west of the fuel storage facility tank farm. The community was without access to the airport for approximately one week and the flooding also damaged the fuel tank farm's resupply pipeline. The airport and fuel tank farm are the community's lifelines; medevac services, food deliveries, and other basic provisions rely on the airport, and heating and power rely on fuel. The Project was therefore conceived to minimize or prevent future flooding and washout occurrences by replacing an eight culvert stream crossing with a bridge, the replacement of the existing bridge with a longer one, and the replacement of the existing culverts near the community fuel tank farm. These modifications are intended to increase flow capacity at the road crossings and direct flow away from the community fuel tank farm's resupply pipeline.

2.2.2 Project Alternatives

During the Feasibility Review, a total of four primary approaches were identified for CGS to consider when addressing the drainage issues along Airport Road, these included:

- **Approach 1 – Maintain Existing System:** Leave the Airport Community Road drainage system in its current configuration, performing repairs as failures take place;

- **Approach 2 – Augment Existing Capacity of the System:** Replace Crossing 4 with a new crossing able to increase the system's overall capacity to match the 100-year peak flow of 94.2 m³/s. This assumed the existing bridge at crossing 7 will remain an integral component of the drainage system;
- **Approach 3 – Replace Existing System with One Crossing:** Construct a new crossing that is able to convey the entire 100-year peak flow of 94.2 m³/s and remove all the existing crossings including the eight culverts at Crossing 4 and the bridge at Crossing 7 and
- **Approach 4 – Replace Existing System with Two Crossings:** Construct two new crossings that are able to convey the entire 100-year peak flow of 94.2 m³/s and remove/replace the existing crossings.

Approach 4 has been recommended as being the most favourable design to consider.

2.2.3 Project Components

The proposed plan includes:

- Replacement of the existing eight culverts at Crossing #4 with the bridge currently in place at Crossing #7. This bridge will be founded on new bin-wall abutments;
- Construction of a new, 30 m long bridge at Crossing #7, founded on a pre-cast concrete sill and protected by an earth-filled abutment protected by rip-rap;
- Removal of the twin 1.2 m diameter culverts at Crossing #5 and the 1.2 m diameter culvert at Crossing #6, followed by re-installation of these three culverts at Crossings #9 and #9a to improve the hydraulic capacity of the East Basin;
- Removal of the existing culvert crossing at Crossing #10 to protect the existing fuel line to the Hamlet and forcing the flow in the East Basin through Crossings #9 and #9a; and
- Construction of temporary access roads around all crossings involved in the upgrades during construction to maintain 24-hour access between the Hamlet and airport.

A detailed description of the existing environment for the Project area is included in Section 4.0 of the Tetra Tech EBA Supplemental Information Report (Appendix B). This description identifies characteristics of the Project area related to: climate, terrain, permafrost, hydrology, water quality, aquatic resources, vegetation, and wildlife.

2.3 Project Schedule

The Project is expected to commence during the summer of 2016 and be completed by December 2016.

2.4 Site Description

A detailed description of the existing environment for the Project area is included in Section 4.0 of the Tetra Tech EBA Supplemental Information Report (Appendix B). This description identifies characteristics of the Project area related to: climate, terrain, permafrost, hydrology, water quality, aquatic resources, vegetation, and wildlife.

Based on existing information, there is no evidence that the Post River supports a fishery resource of commercial, recreational or Aboriginal value. However, it is known that coastal waters in the area provide habitat for such important species as Arctic Char (*Salvelinus alpinus*) as well as marine mammals, and that the Post River is therefore an important contributor of food and nutrients, which support coastal ecology. As such, the purpose of this CEMP is to avoid or minimize adverse effects on all terrestrial and aquatic environmental values. Tetra Tech

EBA biologists have concluded that once completed, the Project will result in environmental benefits by reducing or eliminating flooding and road washout risks and by improving fish passage opportunities, in the event that fish migration into the Post River does occur.

3.0 CONTACTS AND RESPONSIBILITIES

3.1 Key Project Personnel

The effective environmental management of this Project requires a coordinated effort from all individuals involved. The following sections outline the responsibilities of key personnel involved with the Project.

The Project contact list (Table 1) for the works proposed in this CEMP should be completed as soon as the information is known and made available to all parties.

Table 1: Contact List

Name	Role	Phone Number
To be Determined	Construction Foreman	
Tetra Tech Representative	Environmental Monitor	778-875-4842
Ashwani Sharma	CGS Contact	867 645 8180
David Moschini	Construction Manager	778-875-4842

3.2 Environmental Monitor Responsibilities

On-site monitoring is a key component to ensure that the recommendations made in the CEMP are implemented properly and to identify ongoing or potential unanticipated adverse effects. A qualified environmental professional (QEP) should be retained as the Environmental Monitor (EM) to provide guidance on implementing the recommended measures and, if necessary, to advise on or direct the application of additional mitigation measures if the need arises.

Full time monitoring may not be necessary for this Project since much of the work will be conducted away from flowing water and because existing information indicates that fish presence or migrations in the Post River are unlikely. An appropriate monitoring schedule should be established among the EM, the proponent and the contractor undertaking the construction work. Notwithstanding the above, the extent and nature of the monitoring program must adhere to regulatory requirements, potentially issued by the Nunavut Water Board and/or Fisheries and Oceans Canada (DFO). The frequency of monitoring should also be adjusted according to ambient environmental conditions. It is equally or more important to take corrective action prior to inclement weather events as it is to react during or after the event. Monitoring should be conducted with greater frequency during periods of inclement weather (i.e., heavy precipitation, strong winds) and during critical stages of the Project. Key monitoring stages may include, but are not necessarily limited to:

- Works conducted directly within the wetted channel of the Post River;
- Installation of erosion and sediment control measures;
- Start-up of new phases of the Project; and
- The first freshet following the Project.

The primary responsibility of the EM is to ensure that the environmental protection objectives of the CGS are met by confirming that the requirements of this CEMP are enacted. The responsibilities of the EM include the following:

- The EM will monitor compliance with the CEMP;
- The EM will communicate the requirements of the CEMP to Project members during pre-construction and during the weekly meetings;
- The EM will be onsite as per the schedule established among parties prior to Project start. The EM will remain on-call during non-critical work periods to respond to emerging environmental issues;
- The EM will review the contractor's work procedures to ensure functionality and compliance with the CEMP and applicable regulations, standards, and BMPs;
- The EM has the authority to modify and/or halt any construction activity at any time if deemed necessary for the protection of the environment;
- The EM will advise Project members if project activities have caused or are likely to cause an environmental incident and make recommendations for corrective action;
- The EM will liaise directly with Project members and provide technical advice for the purpose of resolving situations that may impact the environment as they arise;
- The EM will ensure that construction work is conducted in the absence of flow;
- If necessary or desired, the EM will conduct routine water quality data collection (turbidity, pH, temperature, conductivity) during construction activities in watercourses potentially affected by the project, using portable water quality meters. Such testing would be carried out: if required by regulatory agencies; as previously established as part of the monitoring protocol; or, as determined by the EM based on observed site conditions. Results will be compared to Approved Water Quality Guidelines for suspended solids (See Section 6.6, below). If a Guideline is exceeded, the EM will direct the Contractor to undertake corrective measures;
- The EM will maintain complete records of activities related to the implementation of the CEMP. This should include any readings or measurements taken, photographs and incident reports; and
- The EM will complete and submit a monitoring report to CGS and will report any unanticipated adverse environmental effects to relevant regulatory agencies within 24 hours of occurrence. Such reports should include the nature of the effect, its cause, mitigation and/or remediation implemented, and whether a work stoppage was ordered, as well photographs, analyses, and measurements, if applicable.

3.3 Contractor Responsibilities

The Project contractor(s) undertakes and supervises construction activities and is responsible for adherence to the project design, including environmental mitigation measures. The following are the main responsibilities assumed by the contractor(s) with respect to environmental protection and management:

- The Contractor will review this CEMP with their staff and sub-contractors prior to undertaking any work;
- The Contractor will comply with all laws, orders, rules, regulations, and codes of Territorial or Federal environmental agencies or like authorities, which are applicable to the Project;

- The Contractor must cooperate with the EM appointed for the work by complying with written or verbal instructions regarding the implementation of the mitigation measures outlined in Section 7.0 of this document, and any other measures identified in permits or approvals issued by regulatory agencies;
- The Contractor must ensure that all work areas are effectively isolated from downstream habitat, as indicated in the Project design. The Contractor will co-ordinate isolation procedures with the EM;
- The Contractor is responsible for following and enforcing the BMPs and mitigation measures outlined herein;
- The Contractor will correct deficiencies and any non-compliance upon direction from the EM whether written or verbal. Corrections should be made as soon as reasonably possible, ideally within 24 hours of directions;
- The Contractor will arrange provision of appropriate on-site waste containers and appropriate disposal at approved locations; and
- The Contractor is responsible for the restoration of all disturbed areas resulting from any of the works they undertake. The Contractor is responsible for remediation of the Site after construction, to the satisfaction of the Project Manager and the EM.

4.0 REGULATORY ENVIRONMENT

4.1 Territorial

4.1.1 Nunavut Water Board

The Nunavut Water Board, established under the Nunavut Land Claims Agreement, has responsibilities and powers over the use, management and regulation of inland water in Nunavut. Its objective is to provide for the conservation and utilization of waters in Nunavut in a manner that will provide the optimum benefits for the residents of Nunavut in particular and Canadians in general. The Nunavut Water Board's primary function is to license uses of water and deposits of waste.

4.1.2 Environmental Protection Act

Nunavut's *Environmental Protection Act* (1988) and its regulations apply throughout Nunavut and is administered by the Department of Environment (DOE). The DOE mandate under that Act is the protection of the environment throughout the Territory. In addition, the 33 metre strip of land extending from the high water mark along the shoreline of the seacoast, navigable rivers and navigable lakes, is administered and controlled by the Commissioner of Nunavut. Activities taking place in these areas are subject to the *Environmental Protection Act* as well as the *Commissioner's Land Act* and the Spill Contingency Planning and Reporting Regulations.

4.2 Federal

4.2.1 Fisheries Act

The *Fisheries Act* (1985) is the main federal legislation providing protection for all fish, fish habitat, and water quality. The Act is administered federally by Fisheries and Oceans Canada (DFO) and Environment Canada. It requires that projects avoid causing serious harm to fish unless authorized by DFO. This applies to work being conducted in or near waterbodies that support fish that are part of or that support a commercial, recreational or Aboriginal fishery.

Fish habitat is defined as spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes. This definition indicates that a watercourse (which includes but is not limited to streams, ditches, ponds and wetlands), which provides water, food or nutrients to a fish bearing stream, is considered fish habitat even if it does not contain fish and/or if it only has temporary or seasonal flows. The definition also indicates that not only the watercourse itself but also the vegetated stream side or riparian areas which provide nutrients and shade to the stream are considered fish habitat.

Under current policies and practices, DFO encourages and promotes project assessment by the proponent or their consultant, wherein the proponent is responsible for determining whether their project requires DFO review or not based on the nature of the watercourse and the type of proposed project. DFO provides a list of waterbodies and activities that do not require review and advises that if the proponent is unsure they should seek the advice of a qualified environmental professional. However, a Request for Review to DFO is available to proponents where there is uncertainty regarding the potential for the project to result in serious harm to fish or where it is important to the proponent to demonstrate that they have practiced due diligence pursuant to the *Fisheries Act*.

Following a review of the Project, the characteristics of the Post River, and the potential for fish presence in the Post River, it is the opinion of Tetra Tech EBA qualified professional biologists (R.P.Bio. status in BC) that the Project will not result in serious harm to fish, provided that appropriate mitigation measures are implemented, particularly in regard to erosion and sediment control and spill prevention. Nonetheless, in regard to providing greater certainty to CGS, a Request for Review to DFO was submitted and it is understood that DFO will be providing their comments on this Project directly to the NWB.

4.2.2 Species at Risk Act

The *Species at Risk Act* (SARA) (1994) prohibits the killing, harming, harassing, capturing or taking of species at risk, or destruction of their critical habitats. Species are designated ‘at risk’ by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent body of experts that assesses species according to a broad range of scientific data. The federal Cabinet then decides whether those species should receive legal protection under the Act.

It is not expected that any rare plants or viable rare plant communities, or rare wildlife, or rare aquatic life will be encountered or affected during this project.

Should a SARA-listed species or any other rare species be identified at the Site prior to or during the Project, Environment Canada, which administers SARA, should be notified immediately for direction on appropriate action as measures employed would vary greatly with the species encountered, its sensitivity to the project, and its proximity to the works.

4.2.3 Migratory Birds Convention Act

This act restricts the disturbance or destruction of migratory birds and their nests, eggs, and shelters, except in accordance with a permit. The *Migratory Birds Convention Act* (1994) prohibits the taking or killing of migratory bird nests and eggs, and the deposition of harmful substances in areas frequented by migratory birds.

No migratory birds, nests, eggs or shelters are anticipated to be present or affected by this Project.

4.3 Environmental Incident Reporting

Any incidents which result in non-compliance with any Act or Regulation must be reported immediately to CGS and within 12 hours to the relevant agency responsible for that Act or Regulation. Examples of Environmental Incidents include, but are not limited to:

- Discharge of deleterious substances into a watercourse, such as:
  - Spills of oil, fuel or chemicals
  - Sediment laden water entering a watercourse
  - Concrete materials (e.g., wet grout) spills into water
- Harmful alteration, disruption, or destruction of fish habitat.

The spill contingency and response plan, including reportable spill quantities, is provided in Section 7.3 of this CEMP.

5.0 SENSITIVE HABITAT FEATURES AND POTENTIAL ENVIRONMENTAL IMPACTS

Based on the background review of environmental information and the Project description, potential environmental values that could be affected were identified for this Project and were assessed to determine if they are present at or near the Site and if they are subject to stakeholder or regulatory concern. Table 2 identifies Project components and their potential environmental effects. It should be noted, however, that some effects noted in Table 2 are unlikely to occur. For example, fish presence or fishing activities in the Post River have not been noted by informed individuals in Coral Harbour who were contacted during the Project assessment. Although unlikely, it is possible that some fish may be present in the vicinity of the project and therefore, potential effects should be considered.

Table 2: Summary of Potential Project Effects

Component	Impact
Site Access & Equipment Mobilization/Demobilization	▪ Potential release of deleterious substances (i.e., fuel, lubricants); ▪ Increased noise and vibration; ▪ Downstream fish disturbance.
Bridge Removal/Replacement Road Repairs	▪ Increased turbidity in water; ▪ Potential release of deleterious substances (i.e., fuel, lubricants, uncured concrete, etc.); ▪ Increased noise and vibration; ▪ Changes to aquatic habitat features/availability; ▪ Downstream fish disturbance.
Culverts Removal/Replacements	▪ Increased turbidity in water; ▪ Potential release of deleterious substances (i.e., fuel, lubricants, etc.); ▪ Increased noise and vibration; ▪ Fish migration disturbance.

6.0 BEST MANAGEMENT PRACTICES

Throughout all phases of the Project, the proponent and all contractors are expected to comply with all federal and Territorial regulations, permits, authorizations, conditions, and agreements with respect to environmental protection. Additional guidance for project-related environmental management practices and activities will be determined by the terms and conditions of relevant permits, licenses and approvals as they are acquired. Supplementary environmental standards, guidelines and best management practices are also contained in the following documents:

- Aboriginal Affairs and Northern Development Canada (AANDC). 2007. Guidelines for Spill Contingency Planning. http://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-NWT/STAGING/texte-text/ntr_pubs_SCP_1330712728397_eng.pdf
- BC Ministry of Transportation and Infrastructure. 2013. Culverts and fish passage. http://www.th.gov.bc.ca/publications/eng_publications/environment/references/3824_CulvertFishPassage_InfoSheet.pdf
- DFO. 1992. Land Development Guidelines for the Protection of Aquatic Habitat. http://www.dfo-mpo.gc.ca/Library/165353.pdf
- Nunavut Dept. of Environment. 1999. Environmental guideline for the management of contaminated sites. Revised December 2014. http://gov.nu.ca/sites/default/files/contaminated_sites_remediation_2014.pdf
- Nunavut Dept. of Environment. Contingency planning and spill reporting in Nunavut. Accessed on December 15, 2015 at http://gov.nu.ca/sites/default/files/Spill%20Planning%20and%20Reporting%20Guide.pdf

The following sections outline general best management practices and mitigation measures that should be implemented to minimize potential environmental impacts.

6.1 General Practices

It is the responsibility of the contractor(s) to acquire and familiarize themselves with the requirements of the guideline documents listed above and of the legislation discussed in Section 4.0. These responsibilities include:

- Encouraging all contractors and site managers to review this CEMP and the applicable guidelines prior to each project phase or new activity;
- Monitoring the work carried out by their staff to determine whether protection measures were properly installed according to approved mitigation measures;
- Adherence to all relevant Federal and Territorial acts, regulations, guidelines and codes of good practice at all work sites and to all activities associated with the Project;
- Stockpiling (or have readily available), supplies of erosion and sediment control materials as appropriate on-site such as (but not limited to) rock, gravel, silt fencing, staking, and polyethylene sheeting;
- Planning and scheduling project activities for dry weather whenever possible and minimizing project works and equipment travel during periods of heavy precipitation; and

- Implementation of “adaptive management” strategies for the Project. Adaptive management evaluates and adjusts management decisions (i.e., mitigation measures) to reflect the actual interactions. Site managers and contractors should be prepared to change existing measures and BMPs should they fail or if additional measures are required. The EM should be notified of any changes to ensure they are adequate and installed properly.

6.2 Site Access and Laydown Areas

The following represent site access and construction laydown areas for the Project. These are subject to change depending on site characteristics at the time of construction:

- A temporary road, approximately 120 m in length, will be constructed north (upstream) of Crossing #7 to allow for continual flow of traffic throughout construction. This roadway will be constructed of crushed granular material placed onto filter fabric. No culverts or other openings will permit the passage of water through this temporary roadway during construction; instead, all water in the Post River will cross Airport Road via Crossing #4 Expected equipment to be utilized during this phase includes one excavator at the borrow pit, three dump/rock trucks, and one loader at Crossing #7 distributing the material;

- The temporary road, constructed around Crossing #7 in Phase 1, will be relocated north (upstream) of Crossing #4 to allow for continual flow of traffic throughout construction. This roadway will be constructed of crushed granular material placed onto filter fabric. No culverts or other openings will permit the passage of water through this temporary roadway during construction; instead, all water in the Post River will cross Airport Road via the new bridge at Crossing #7. Expected equipment to be utilized during this phase includes one excavator at Crossing #7, two/three dump/rock trucks, and one loader at Crossing #4 distributing the material

- A laydown area for storage of equipment and materials should be established. It should be located on a flat, stable area as far from the watercourse as possible.

6.3 Air Quality

The following are measures designed to reduce Project effects on air quality:

- Dust-generating activities should be minimized as much as possible especially during windy periods;

- No burning of oils, rubber, tires and any other material should take place at the Site;

- Stationary emission sources (e.g., portable diesel generators, compressors, etc.) should be used only as necessary and turned off when not in use;

- Equipment and vehicles should be turned off when not in active use, except under extremely cold conditions when equipment and vehicle may have to be left in idle;

- All equipment, vehicles and stationary emission sources should be well-maintained and used at optimal loads to encourage minimal emissions; and

- Vehicles or equipment producing excessive exhaust pollution should be repaired or replaced prior to being used on the Project.

6.4 Noise and Vibration

Short-term noise generation and vibrations will result from equipment and associated activities during the Project.

Because the Project will occur in an uninhabited area, typical noise concerns are not likely applicable to the Site. However, construction BMPs recommend that all equipment be properly maintained to limit noise emissions.

6.5 Machinery and Equipment

Equipment operation and maintenance should be carried out as follows to minimize potential environmental effects:

- Equipment and machinery should be in good operating condition (power washed), free of leaks, excess oil and grease. Equipment should be operated at optimum rated loads and be turned off when not in use to minimize exhaust emissions. Equipment producing excessive exhaust should be repaired or replaced;
- Equipment should operate above the high water mark of all watercourses. Where instream work is necessary (and has been approved through appropriate regulatory processes) equipment should work from a dry location such as a gravel bar or from an area that has been isolated and dewatered where possible;
- Machinery should be situated to minimize track movement;
- No equipment servicing should be undertaken within 30 m of any watercourse;
- Refueling of equipment should occur on land at least 30 m from any watercourse, where possible. Where 30 m is not possible, a location as far as possible from the watercourse should be chosen. Topographic features and slope should be considered. The refueling area should have a spill containment kit immediately accessible and personnel should be knowledgeable in its use (see Section 7.4 for Fuel Management Plan);
- A spill containment kit should be readily accessible onsite in the event of a release of a deleterious substance to the environment. All members of the construction team should be trained in its use;
- Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities must immediately be reported to the Nunavut Spill Report Line at 867-920-8130 - 24 hours a day. It is also necessary to complete a spill report form[1] and fax it to 867-873-6924 or e-mail it to **spills@gov.nt.ca**; and
- Response to a spill incident should be conducted in general accordance with the Spill Contingency Plan provided in Section 7.3 of this CEMP.

6.6 Soil Management

The Project involves activities, such as temporary road construction and demobilization, road repairs, culvert removal, and abutment construction, which have potential to contribute sediments to the Post River, which contributes to fish bearing waters. Sediment laden water entering a fish bearing watercourse can be considered an act that causes serious harm to fish and is a contravention of the Federal *Fisheries Act*. Therefore, managing soil and surface runoff is paramount.

According to DFO's Land Development Guidelines, water is considered sediment laden if it has more than 25 mg/L of total suspended solids (TSS) above background levels during dry weather or 75 mg/L above background levels during wet weather. Because TSS is not typically measured in the field (as it requires filtering the water sample and weighing the resulting solids), turbidity is often used as a field measurement to roughly correlate TSS levels. Ambient Water Quality Guidelines (developed by the BC Ministry of Environment) provides guidelines for

[1] The Spill Report Form is available at http://gov.nu.ca/sites/default/files/NT%20NU%20Spill%20Report%20Form.pdf.

both TSS and Turbidity. These guidelines consider sediment levels excessive when they exceed the levels shown in Table 3.

Table 3: Water Quality Guidelines for Turbidity and Total Suspended Solids

Water Use	Turbidity	Total Suspended Solids
Aquatic Life (freshwater, marine and estuarine)	Change from background of 8 NTU at any one time in a 24 hour period during low/clear flows (dry weather)[1]	Change from background of 25 mg/L at any one time in a 24 hour period during low/clear flows (dry weather)[1]
	Change from background of 2 NTU at any one time for a period of 30 days during low/clear flows (dry weather)[2]	Change from background of 5 mg/L at any one time for a period of 30 days during low/clear flows (dry weather)[2]
	Change from background of 5 NTU at any one time when background is 8 to 50 NTU during high/turbid flows (wet weather)[1]	Change from background of 10 mg/L at any one time when background is 25 to 100 mg/L during high/turbid flows (wet weather)[1]
	Change from background of >10% at any one time when background is > 50 NTU during high/turbid flows (wet weather)[2]	Change from background of >10% at any one time when background is >100 mg/L during high/turbid flows (wet weather)[2]
1. Turbidity should not exceed the level expressed in any single measurement.		
2. Average turbidity (minimum 5 measurements over 30 days) should not exceed the level expressed.		
Details available at: http://www.env.gov.bc.ca/wat/wq/BCguidelines/turbidity/turbiditytech.pdf		

Establishing a background level in the Post River will be necessary to ensure that guidelines are not exceeded. These measurements should be established prior to the start of the Project.

The following measures are recommended to manage soil, minimize erosion and reduce sediment mobilization:

- Erosion and sediment control devices (such as, but not limited to, silt fencing, straw, mulch, gravel for check dams, etc.) should be available for use on-site. Project crew members should be trained in the installation and use of the devises;
- The Site should be prepared so that measures to reduce sediment from entering the Post River could be implemented quickly, if necessary. The overall goal is to isolate the work area and any potential sediment laden runoff from entering a watercourse;
- Minimize the area of soil exposed at any one time by phasing construction activities and, once construction works are completed, stabilizing the exposed soils as soon as possible using temporary measures such as mulch, erosion sediment control blankets, and/or plastic sheeting;
- Periods of heavy precipitation are possible during the proposed construction schedule. As much as possible, earthworks should be scheduled to be conducted and completed during dry weather. When significant wet weather is encountered, additional measures may be required to minimize erosion potential;
- Excavation or any earth works activities in or adjacent to the Post River should be halted during heavy rainfall events. Work may be stopped completely or works may require additional erosion and sediment control measures to be implemented in order to permit work to continue;

- Erosion and sediment control measures should be routinely inspected. After a heavy rain event, it is likely that many of the controls will require repair, clean out, or reinforcement. A quick response to assess and correct damages of the controls is required, especially before subsequent precipitation events; and
- Water quality should be frequently monitored during in-stream works to ensure turbidity is at an acceptable level. Table 3, above, provides guidelines for water quality; however, the levels directly applicable to the Project should be determined prior to start-up by appropriate regulatory agencies. When turbidity exceeds the established acceptable levels the EM may direct activities, including additional sediment control measures or halting work.

6.7 Concrete Works & Grouting

Wet concrete products typically have high pH and can negatively impact aquatic organisms. High pH may also increase the toxicity of other substances. Wet concrete products also have the potential to contribute fine sediments to a watercourse. In contrast, dry concrete is generally inert and not typically an environmental concern.

Although it is understood that this Project will not generally involve the pouring of concrete, proper housekeeping measures and appropriate work site isolation techniques should be employed to minimize the potential for chemical spills during concrete pouring and grouting, if such is required. Uncured or wet concrete must be prevented from entering a watercourse.

General BMPs to mitigate the effects of concrete grouting include:

- Concrete should be carefully poured and/or grout will be carefully applied to minimize spillage;
- Proper housekeeping practices and appropriate work site isolation techniques will be employed on-site to minimize the potential for chemical spills; and
- Appropriate spill cleanup materials will be readily available and easily accessible. Contractors will be aware of the materials required to clean up a concrete spill.

6.8 Cultural/Archaeological Resources

The work sites in question are those presently possessing watercourse structures and have therefore been previously modified. As such, no cultural or archaeological resources are known or expected in the Project Area. However, should any be encountered Project members should notify the EM immediately.

7.0 EMERGENCY RESPONSE PLAN

7.1 Emergency Communication

Table 4 lists emergency contact numbers. Recognising that cell phone service is not available at the project site, alternative means of contact, such as radio or satellite phone, should be planned.

Table 4: Emergency Contact Numbers

Agency	Phone Number
Search and Rescue	(867) 925-8045
RCMP - Coral Harbour detachment	(867) 925-0123
Fire Department - Coral Harbour	(867) 925-4422
Health Centre - Coral Harbour	(867) 925-9916
Nunavut Spill Report Line	(867) 920-8130

7.2 Environmental Emergency Action Plan

Potential environmental emergencies may include but are not limited to:

- Reportable fuel spills;
- Sediment laden water leaving the Site; and
- Observation of previously unidentified sensitive environmental features.

The EM should be notified of all environmental emergencies, either by the Construction Foreman or by construction team members. The EM should assess and record all incidents and determine appropriate action.

7.3 Spill Contingency Plan

This Spill Contingency Plan has been prepared in general accordance with the Federal Government's Guidelines for Spill Contingency Planning (AANDC 2007). All project employees and contractors are required to familiarize themselves with this plan.

This Spill Contingency Plan serves to formalize the actions to be taken in the event of a spill of hydrocarbon product or other hazardous material. The responsibilities of key personnel are defined, along with procedures for spill response that will minimize hazards to health and safety, damage to the environment and clean-up costs. This plan has been prepared to provide easy access to the required information needed for effective spill response.

Equipment to be used for the proposed construction program includes one excavator, two/three dump trucks, one loader and several pick-up trucks. Fuel types used by these types of equipment include diesel and gasoline. Other materials used will include lubricants and hydraulic fluids for equipment operation.

To minimize the risk of leaks or spills, the following preventative measures should be implemented:

- A pre-construction meeting should be held to identify all materials of a deleterious nature that could be spilled;
- Store hazardous materials and wastes in covered containers and in secondary containment;
- Appropriate spill cleanup materials should be readily available and easily accessible;
- Construction team members should be aware of the materials required to clean up various spills; and
- If a spill occurs, stop work immediately to respond. Action should be taken to contain the spill and then, if necessary, reported.

In addition, consistent with Section 6.5 of this CEMP, to minimize the risk of leaks or spills:

- Equipment and machinery should be in good operating condition (power washed), free of leaks, excess oil and grease;
- Equipment should operate above the high water mark of all watercourses. Where instream work is necessary (and has been approved through appropriate regulatory processes) equipment should work from a dry location such as a gravel bar or from an area that has been isolated and dewatered where possible;
- No equipment servicing should be undertaken within 30 m of any watercourse;
- Refueling of equipment should occur on land at least 30 m from any watercourse.; and
- A spill containment kit should be readily accessible onsite in the event of a release of a deleterious substance to the environment. All members of the construction team should be trained in its use.

7.3.1 Spill Reporting

Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities must immediately be reported to the Nunavut Spill Report Line at **867-920-8130** – 24 hours a day. It is also necessary to complete a spill report form and fax it to 867-873-6924 or email it to spills@gov.nt.ca.

If the spill is over 100 L of fuel, or if you do not know how much was spilled, you are legally required to report it.

When reporting a spill, the caller should be prepared to provide the dispatcher with the following information, if possible:

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

7.3.2 Spill Response Personnel

Because of the limited human resources associated with this small project, the key personnel identified in Section 3.0 of this CEMP will lead any spill response activities as may be required. The site response personnel will be drawn from the contractor's resources and as necessary other personnel to be brought in from the Hamlet of Coral Harbour.

7.3.3 Initial Spill Response Procedures

Initial spill response procedures include:

- ***Assess safety*** – ensure unnecessary people are kept clear of the area and that people with proper training and equipment deal with the spill. Put on any required personal protective equipment and consult Material Safety Data Sheets;
- ***Stop the source*** – if required, and when it is safe to do so, stop the spill at its source. This may simply be righting an overturned container or sealing a hole;
- ***Contain and control the spill*** – the spill should be prevented from infiltrating into the ground or entering a watercourse. If the spill occurs on water, booms should be deployed to prevent its spread;
- ***Clean up the spill*** – utilize appropriate absorbent pads or other materials based on the type of substance spilled. The method of disposing of the waste is dependent on the amount and type of deleterious substance that was spilled;
- ***Notify appropriate authority*** – spills of a reportable quantity must be reported to the Nunavut Spill Report Line. Minor spills should be reported to the Construction Foreman and EM; and
- ***Record the incident*** – make a note of what, how and where the incident happened as well as what was done to clean it up.

The Construction Foreman should be familiar with the Spill Contingency Plan and should ensure that the entire construction team is aware of the Plan and its contents.

7.3.4 Spills on Land

Spills on land should be contained as close to the source as possible with every effort being made to ensure that a spill does not reach water (taking into account the safety of everyone involved). Spills on land should be contained and cleaned up as follows:

- Construct a temporary berm/barrier down slope of leaking material;
- Place impermeable material (e.g. liner) at the foot of and over top of the berm to allow pooling of leaked material;
- Use appropriate absorbent material to soak up the fuel. It may also be possible to transfer fuel into drums or pails for re-use of the pads. Larger quantities of fuel may be pumped into empty drums;
- Use a light covering of absorbent material (e.g. absorbent pads or kitty litter) to remove films of petroleum products; and
- Collected material must be transported to an approved disposal/recovery site;

7.3.5 Spills on Snow

Containment on snow is readily achieved and is generally very effective due to its natural absorbent qualities. Liquid spills (petroleum) will become immobile within the snow and can be easily removed for transport and recovery or disposal. Spills on snow should be contained and cleaned up as follows:

- Construct a trench or ditch in the snow to channel and control the flow of spilled product;
- Compact any snow lying along the outside perimeter of the control ditch;
- Construct a snow dyke or dam;
- Use impermeable lining material to create an impervious barrier;
- Locate the topographic lowest point of the spill area and create snow channels to direct unabsorbed material away from water courses; and
- Collect the contaminated snow for disposal or product recovery.

7.3.6 Spills on Water

Spills on water should be contained and cleaned up as follows:

- Contain spill as close to release point as possible;
- Use floating booms for containment;
- Use absorbent pads to capture/recover floating product;
- Place contaminated absorbant pads in a container for subsequent disposal; and
- Dispose of fuel-soaked materials in a timely manner.

7.3.7 Training

All project personnel will be oriented as to the location of spill kits, their contents and use, potential and nature of spill hazards, and locally available spill control materials. In addition, all employees and contractors will be familiarized with documented procedures.

7.3.8 Materials Safety Data Sheets (MSDS)

The MSDS sheets for diesel, gasoline, hydraulic fluid and anti-freeze are provided in Appendix D of this CEMP.

7.4 Fuel Management Plan

Potential environmental risks from the transportation, storage, and transfer of fuel can be minimized by adhering to the following measures:

- Equipment should not be fuelled within 30 m of a waterbody. If possible, one area should be designated for fuel transfer. Refuelling should occur on a flat surface to minimize potential off-site runoff;
- All fuels, oils, lubricants and other petrochemical products should not be stored within 30 m of any waterbody;
- Refuelling equipment and tanks should be clean and in good working order. Fuel tanks should be situated within appropriate secondary containment (an impermeable containment facility capable of holding 110% of the storage tank contents). This may be achieved through the use of double-walled storage tanks or sit-in containers constructed out of impermeable material, such as aluminum or plastic;

- Fuel storage containers and equipment should be inspected daily for leaks and wear points, kept clean and any measurable rainwater removed and disposed of appropriately. If practical, the containment area should be covered to prevent infilling with rainwater. Where leaks and/or wear points are found, they should be repaired promptly to restore full containment;
- Small containers (i.e., jerry cans) should be stored in a secure location, protected from weather. These containers must be designed solely for the purpose of storing and pouring fuel and should not be more than five years old. Containers must not leak and must be sealed with a proper fitting cap or lid;
- Tanks, hoses and connections should be inspected before use. All hose connections should be wrapped and secured with absorbent pads during fuel/oil transfers. All hoses, valves and equipment should be kept in a containment area whenever possible. Hose length and the number of connections should be minimized. Dripless connections should be used if possible and hoses should be drained upon completion of work;
- Smoking is not permitted during refuelling or near fuel storage areas; and
- Spill kits should be available on equipment and at the site. Construction team members should be trained in their use.

7.5 Waste Management (Including Hazardous Wastes and Potentially Contaminated Soils)

- Contractors are expected to adhere to all applicable legislation with respect to the handling, transportation, and/or disposal of all materials related to this Project (waste or otherwise). These regulations may include (but not be limited to) the Spill Reporting Regulations, Workers' Safety and Compensation Commission Regulations, and Transportation of Dangerous Goods Regulations;
- Hazardous wastes generated could include waste petroleum products (engine oils, lubricants) from machinery and equipment, spent batteries, solvents and cleaning agents, etc. Contractors should provide labelled separate container(s) for potentially hazardous waste such as oily rags and hydrocarbon absorbent pads;
- All hydrocarbon products and other hazardous wastes potentially present during project activities should be identified and the associated Workplace Hazardous Materials Information System (WHMIS) and Materials Safety Data Sheets (MSDS) made available to all Project members;
- Any waste considered to be hazardous will be labeled and disposed of according to the WHMIS criteria and the Transportation of Dangerous Goods (TDG) Regulations;
- Non-hazardous construction waste should be collected at designated areas on the site and removed to appropriate facilities on a regular basis;
- Maintain a tidy work area to minimize loose waste from leaving the Site;
- Recycle materials whenever possible;
- Waste materials should not be buried or burned; and
- If hazardous or contaminated material (including suspect soils) is encountered stop work immediately and report it to the Construction Foreman and EM who will determine appropriate BMPs. Hazardous materials should only be handled by appropriately trained personnel.

8.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Department of Community and Government Services and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than CGS, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

9.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech EBA Inc.

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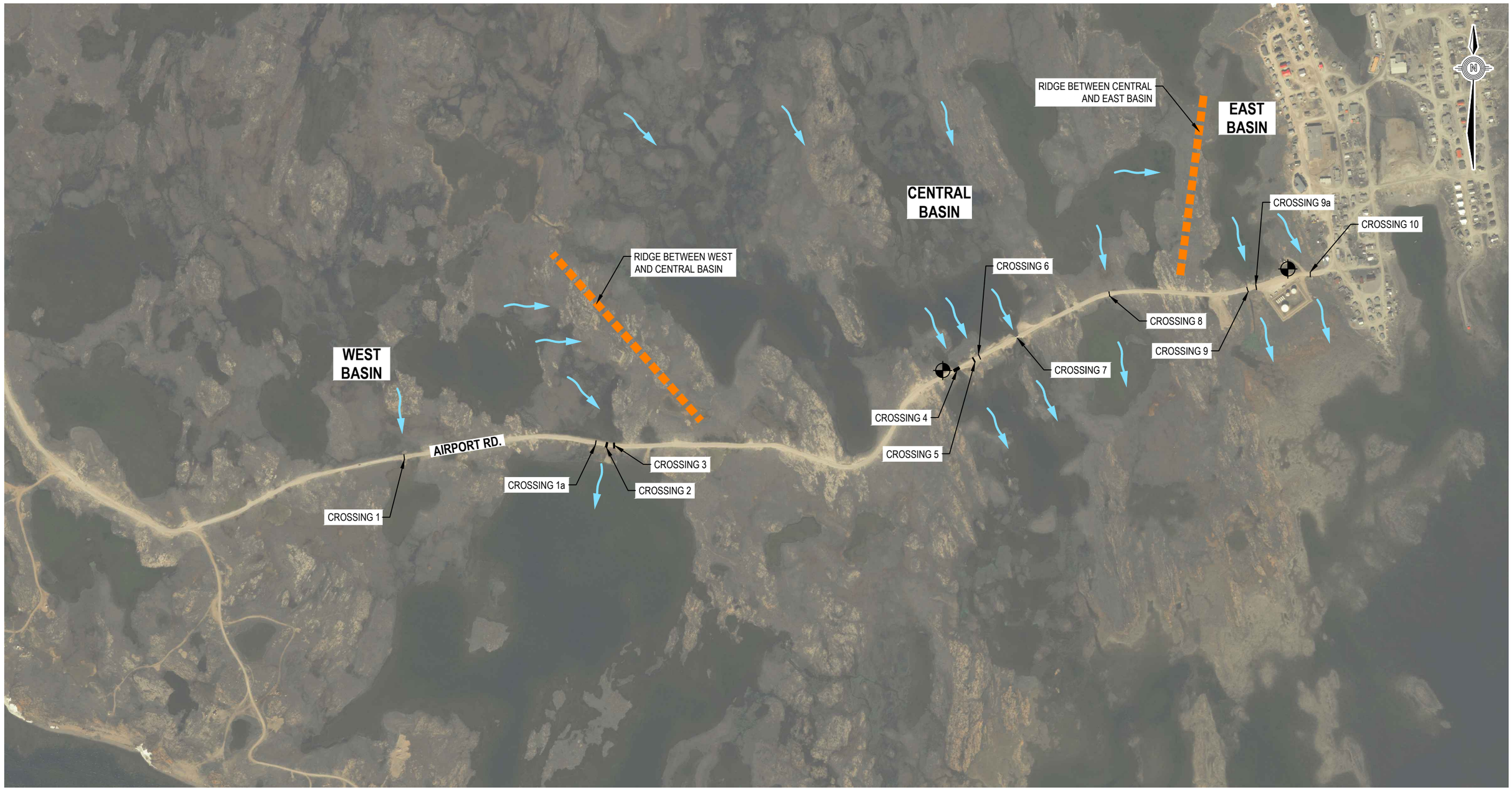
FIGURES



DRAINAGE PLAN
SCALE: 1:10 000

LEGEND

Water Level Monitoring Location

NOTES

SCALE 1:10,000
100 0 100 200 400m

NUM	DATE	DWN	CKD	APR	DESCRIPTION

REVISIONS

PROFESSIONAL SEAL

CLIENT

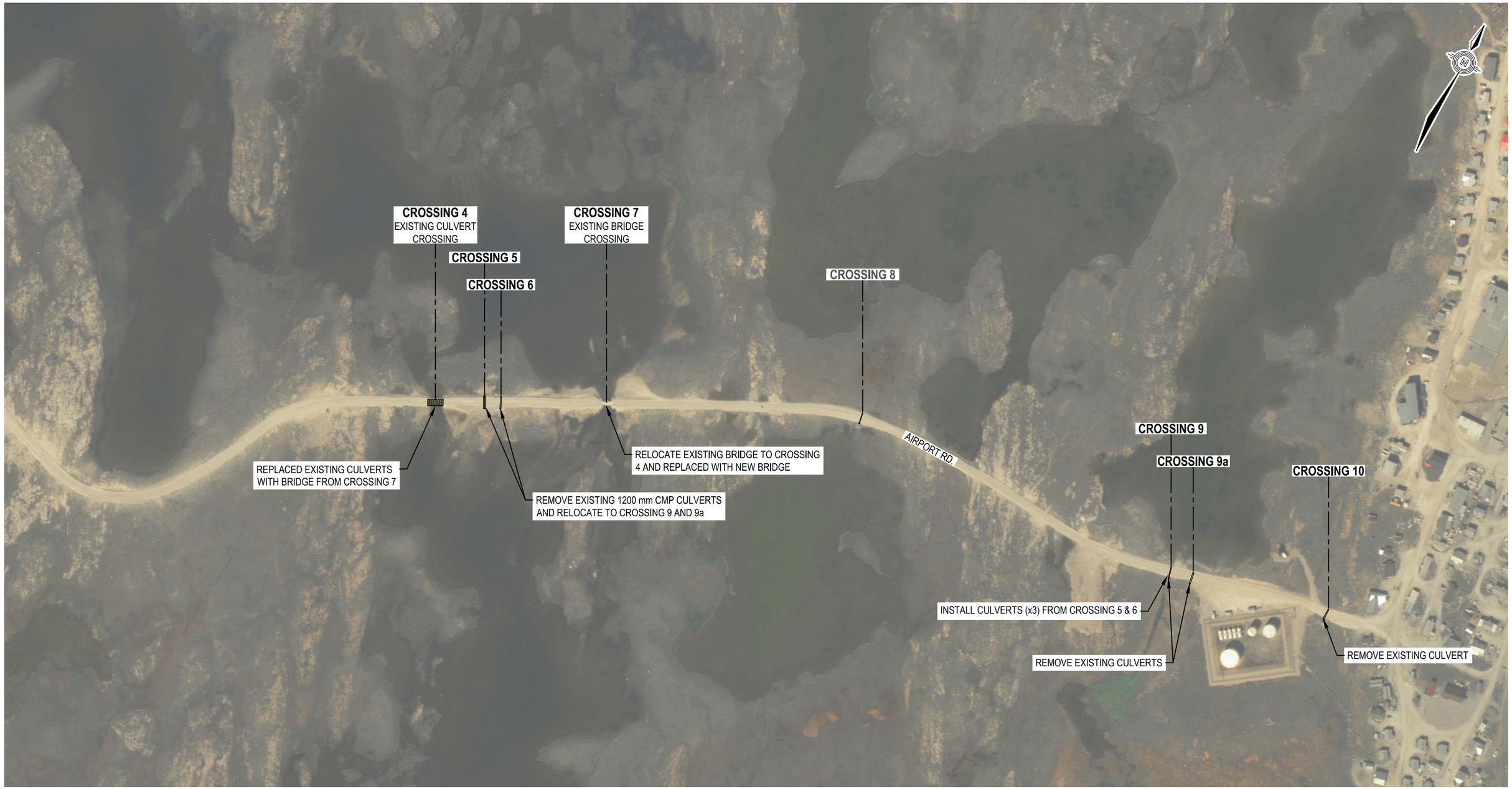
Nunavut

TETRA TECH EBA | BUCKLAND & TAYLOR | COWI

AIRPORT RD. WASHOUT REHABILITATION CORAL HARBOUR, NU

SITE LOCATION AND DRAINAGE PLAN

PROJECT NO.	OFFICE	DES	CKD	REV	DRAWING
V13203282	VANC	MAN	DNM	0	Figure 1
DATE	SHEET No.	DWN	APP	STATUS	
February 3, 2016	of	JDM	DNM	-	



SITE PLAN
SCALE: 1:2000

LEGEND

NOTES

SCALE 1:4000
40 0 40 100 160m

NUM	DATE	DWN	CKD	APR	DESCRIPTION

REVISIONS

PROFESSIONAL SEAL

CLIENT

Nunavut

TETRA TECH EBA | BUCKLAND & TAYLOR | COWI

AIRPORT RD. WASHOUT REHABILITATION
CORAL HARBOUR, NU

PROPOSED SITE PLAN

PROJECT NO.	OFFICE	DES	CKD	REV	DRAWING
V13203282	VANC	MAN	DNM	0	Figure 2
DATE	SHEET No.	DWN	APP	STATUS	
February 3, 2016	of	JDM	DNM	-	

APPENDIX A
TETRA TECH'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOENVIRONMENTAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of Tetra Tech EBA’s client. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Tetra Tech EBA’s Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of Tetra Tech EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA’s instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. The Client warrants that Tetra Tech EBA’s instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by Tetra Tech EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B

SUPPLEMENTAL INFORMATION REPORT – COAL HARBOUR AIRPORT COMMUNITY ROAD WASHOUT REHABILITATION PROJECT, NU

APPENDIX C

TETRA TECH EBA DETAILED DESIGN DRAWING PACKAGE (2016)

APPENDIX D
MATERIALS SAFETY DATA SHEETS (MSDS)

1. Diesel Fuel
2. Gasoline
3. Hydraulic Fluid
4. Anti-freeze

Material Safety Data Sheet

DIESEL FUEL

1 . Product and company identification

Product name : DIESEL FUEL

Synonym : Seasonal Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, D50, D60, P40, P50, Arctic Diesel, Farm Diesel, Marine Diesel, Low Sulphur Diesel, LSD, Ultra Low Sulphur Diesel, ULSD, Mining Diesel, Naval Distillate, Dyed Diesel, Marked Diesel, Coloured Diesel, Furnace special, Biodiesel blend, B1, B2, B5, Diesel Low Cloud (LC).

Code : W104, W293; SAP: 120, 121, 122, 125, 126, 129, 130, 135, 287, 288

Material uses : Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining Diesel has a higher flash point requirement, for safe use in underground mines.

Manufacturer : PETRO-CANADA
P.O. Box 2844
150 – 6th Avenue South-West
Calgary, Alberta
T2P 3E3

In case of emergency : Petro-Canada: 403-296-3000
Canutec Transportation: 613-996-6666
Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

Physical state : Bright oily liquid.

Odour : Mild petroleum oil like.

WHMIS (Canada) :

Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : WARNING!

COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

Combustible liquid. Severely irritating to the skin. Irritating to eyes. Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapour or mist. Avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

Ingestion : Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract.

Skin : Severely irritating to the skin.

Eyes : Irritating to eyes.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

2 . Hazards identification

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure : Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
Kerosine (petroleum), hydrodesulfurized / Fuels, diesel / Fuel Oil No. 2	64742-81-0 / 68334-30-5 / 68476-30-2	95 - 100
Fatty acids methyl esters	61788-61-2 / 67784-80-9 / 73891-99-3	0 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : Combustible liquid

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Products of combustion : Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), smoke and irritating vapours as products of incomplete combustion.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

5 . Fire-fighting measures

Special remarks on fire hazards : Flammable in presence of open flames, sparks and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.

Special remarks on explosion hazards : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Runoff to sewer may create fire or explosion hazard.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Kerosine (petroleum), hydrodesulfurized	**ACGIH TLV (United States). Absorbed through skin.** TWA: 200 mg/m³ 8 hour(s).
Fuels, diesel	**ACGIH TLV (United States). Absorbed through skin.** TWA: 100 mg/m³, (Inhalable fraction and vapour) 8 hour(s).
Fuel oil No. 2	**ACGIH TLV (United States). Absorbed through skin.** TWA: 100 mg/m³, (Inhalable fraction and vapour) 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: nitrile, neoprene, polyvinyl alcohol (PVA), Viton. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Bright oily liquid.

Flash point : Diesel fuel: Closed cup: ≥40°C (≥104°F)
Marine Diesel Fuel: Closed Cup: ≥60°C (≥140°F)
Mining Diesel: Closed Cup: ≥52°C (≥126°F)

Auto-ignition temperature : 225°C (437°F)

Flammable limits : Lower: 0.7%
Upper: 6%

Colour : Clear to yellow (This product may be dyed red for taxation purposes).

Odour : Mild petroleum oil like.

Odour threshold : Not available.

pH : Not available.

Boiling/condensation point : 150 to 371°C (302 to 699.8°F)

Melting/freezing point : Not available.

Relative density : 0.80 to 0.88 kg/L @ 15°C (59°F)

Vapour pressure : 1 kPa (7.5 mm Hg) @ 20°C (68ºF).

Vapour density : 4.5 [Air = 1]

Volatility : Semivolatile to volatile.

Evaporation rate : Not available.

Viscosity : Diesel fuel: 1.3 - 4.1 cSt @ 40°C (104°F)
Marine Diesel Fuel: 1.3 - 4.4 cSt @ 40°C (104°F)

Pour point : Not available.

Solubility : Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

10 . Stability and reactivity

Chemical stability : The product is stable.

Hazardous polymerisation : Under normal conditions of storage and use, hazardous polymerisation will not occur.

Materials to avoid : Reactive with oxidising agents and acids.

Hazardous decomposition products : May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Kerosine (petroleum), hydrodesulfurized	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LC50 Inhalation Vapour	Rat	>5000 mg/m³	4 hours
Fuels, diesel	LD50 Dermal	Mouse	24500 mg/kg	-
	LD50 Oral	Rat	7500 mg/kg	-
Fuel oil No. 2	LD50 Oral	Rat	12000 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

11 . Toxicological information

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Kerosine (petroleum), hydrodesulfurized	A3	-	-	-	-	-
Fuels, diesel	A3	3	-	-	-	-
Fuel oil No. 2	A3	3	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1202	DIESEL FUEL	3	III		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Combustible liquid
Irritating material

Canada

WHMIS (Canada) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

15 . Regulatory information

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : All components are listed or exempted.

16 . Other information

Label requirements : COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	2
Physical hazards	0
Personal protection	H

National Fire Protection Association (U.S.A.) :

References : Available upon request.
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Date of printing : **7/6/2010.**

Date of issue : 6 July 2010

Date of previous issue : 7/3/2009.

Responsible name : **Product Safety - JDW**

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

GASOLINE, UNLEADED

1 . Product and company identification

Product name : GASOLINE, UNLEADED

Synonym : Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending

Code : W102E, SAP: 102 to 117

Material uses : Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.

Manufacturer : PETRO-CANADA
P.O. Box 2844
150 – 6th Avenue South-West
Calgary, Alberta
T2P 3E3

In case of emergency : Petro-Canada: 403-296-3000
Canutec Transportation: 613-996-6666
Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

Physical state : Clear liquid.

Odour : Gasoline

WHMIS (Canada) :

Class B-2: Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : WARNING!

FLAMMABLE LIQUID AND VAPOUR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. CONTAINS MATERIAL WHICH CAN CAUSE HERITABLE GENETIC EFFECTS.

Flammable liquid. Irritating to eyes, respiratory system and skin. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapour or mist. Avoid contact with eyes, skin and clothing. Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure. Contains material which can cause heritable genetic effects. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

Ingestion : Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

2 . Hazards identification

Skin : Irritating to skin.

Eyes : Irritating to eyes.

Potential chronic health effects

Chronic effects : This product contains an ingredient or ingredients, which have been shown to cause chronic toxic effects. Repeated or prolonged exposure to the substance can produce blood disorders.

Carcinogenicity : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : Contains material which can cause heritable genetic effects.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure : Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated skin exposure can produce local skin destruction or dermatitis.

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
Gasoline	86290-81-5	85-100
Ethanol	64-17-5	0.1-1
Benzene	71-43-2	0.5-1.5
Toluene	108-88-3	15-40*

**Montreal: may vary from 3-40%*
**Edmonton: may vary from 1-5%*

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : Flammable liquid (NFPA) .

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Products of combustion : Carbon oxides (CO, CO2), nitrogen oxides (NOx), polynuclear aromatic hydrocarbons, phenols, aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Special remarks on fire hazards : Extremely flammable in presence of open flames, sparks, shocks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.

Special remarks on explosion hazards : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Containers may explode in heat of fire. Vapours may form explosive mixtures with air.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical

7 . Handling and storage

(ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Gasoline	**ACGIH TLV (United States).** TWA: 300 ppm 8 hour(s). STEL: 500 ppm 15 minute(s).
Ethanol	**ACGIH TLV (United States).** STEL: 1000 ppm 15 minute(s).
Benzene	**ACGIH TLV (United States). Absorbed through skin.** TWA: 0.5 ppm 8 hour(s). STEL: 2.5 ppm 15 minute(s).
Toluene	**ACGIH TLV (United States).** TWA: 20 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

8 . Exposure controls/personal protection

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: polyvinyl alcohol (PVA), Viton. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Clear liquid.

Flash point : Closed cup: -50 to -38°C (-58 to -36.4°F) [Tagliabue.]

Auto-ignition temperature : 257°C (494.6°F) (NFPA)

Flammable limits : Lower: 1.3% (NFPA)
Upper: 7.6% (NFPA)

Colour : Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.

Odour : Gasoline

Odour threshold : Not available.

pH : Not available.

Boiling/condensation point : 25 to 220°C (77 to 428°F) (ASTM D86)

Melting/freezing point : Not available.

Relative density : 0.685 to 0.8 kg/L @ 15°C (59°F)

Vapour pressure : <107 kPa (<802.5 mm Hg) @ 37.8°C (100°F)

Vapour density : 3 to 4 [Air = 1] (NFPA)

Volatility : Not available.

Evaporation rate : Not available.

Viscosity : Not available.

Pour point : Not available.

Solubility : Hydrocarbon components virtually insoluble in water. Soluble in alcohol, ether, chloroform and benzene. Dissolves fats, oils and natural resins.

10 . Stability and reactivity

Chemical stability : The product is stable.

Hazardous polymerisation : Under normal conditions of storage and use, hazardous polymerisation will not occur.

Materials to avoid : Reactive with oxidising agents, acids and interhalogens.

Hazardous decomposition products : May release COx, NOx, phenols, polycyclic aromatic hydrocarbons, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Gasoline	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	13600 mg/kg	-
Ethanol	LD50 Dermal	Rabbit	>15800 mg/kg	-
	LD50 Oral	Mouse	3450 mg/kg	-
	LC50 Inhalation Vapour	Rat	8850 mg/m³	4 hours
Benzene	LD50 Dermal	Rabbit	>8240 mg/kg	-
	LD50 Oral	Rat	930 mg/kg	-
	LC50 Inhalation Vapour	Rat	13228 ppm	4 hours
Toluene	LD50 Dermal	Rabbit	12125 mg/kg	-
	LD50 Oral	Rat	636 mg/kg	-
	LC50 Inhalation Vapour	Rat	7585 ppm	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Gasoline	A3	2B	-	-	-	-
Ethanol	A3	-	-	-	-	-
Benzene	A1	1	A	+	Proven.	+
Toluene	A4	3	D	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : There is a wealth of information about the teratogenic hazards of Toluene in the literature; however, based upon professional judgement regarding the body of evidence, WHMIS classification as a teratogen is not warranted.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1203	GASOLINE	3	II		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Flammable liquid
Irritating material
Carcinogen

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : All components are listed or exempted.

16 . Other information

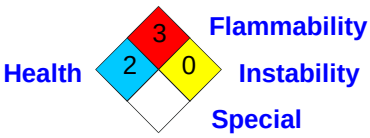
Label requirements : FLAMMABLE LIQUID AND VAPOUR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. CONTAINS MATERIAL WHICH CAN CAUSE HERITABLE GENETIC EFFECTS.

Hazardous Material Information System (U.S.A.) :

Health	*	2
Flammability		3
Physical hazards		0
Personal protection		H

16 . Other information

National Fire Protection Association (U.S.A.) :



References : Available upon request.
™ Trademark of Suncor Energy Inc. Used under licence.

Date of printing : **4/21/2010.**

Date of issue : 9 April 2010

Date of previous issue : No previous validation.

Responsible name : **Product Safety - RS**

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

MATERIAL SAFETY DATA SHEET

602698-00 MOBIL DTE 13M

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL DTE 13M
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037
24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296
Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 613-228-1467
MSDS Internet Website: http://emmsds.ihssolutions.com/

2. COMPOSITION/INFORMATION ON INGREDIENTS
CHEMICAL NAMES AND SYNONYMS: PET. HYDROCARBONS AND ADDITIVES
GLOBALLY REPORTABLE MSDS INGREDIENTS:
None.
OTHER INGREDIENTS:
Substance Name Approx. Wt%

HYDROTREATED LIGHT NAPHTHENIC 25-35
DISTILLATE (PETROLEUM)
(64742-53-6)
See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION
Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).
EMERGENCY OVERVIEW: Amber Liquid. Note: Pressurized mists may form a flammable mixture. DOT ERG No. : NA
POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.
For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES
EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.
INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.
INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.
INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES
EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Note: Pressurized mists may form a flammable mixture.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): 210(410) (ASTM D-92).
Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%
NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES
NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify
CHEMTREC (800) 424-9300.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.
PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE
HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.
SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.
EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
OCCUPATIONAL EXPOSURE LIMITS:
When mists/aerosols can occur, the following are recommended: 5 mg/m3 (as oil mist)- ACGIH Threshold Limit Value (TLV), 10 mg/m3 (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m3 (as oil mist) - OSHA Permissible Exposure Limit (PEL)
VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.
RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.
EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.
SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES
Typical physical properties are given below. Consult Product Data Sheet for specific details.
APPEARANCE: Liquid
COLOR: Amber
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): 210(410) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.874
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 32.0
VISCOSITY AT 100 C, cSt: 6.1
POUR POINT C(F): -45(-49)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY
STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA
—-ACUTE TOXICOLOGY—-
ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). —-Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). —-Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). —-Based on testing of similar products and/or the components.

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score:
greater than 6 but 15 or less). —-Based on testing of similar
products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary
Irritation Index: greater than 0.5 but less than 3). —-Based
on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.
—-SUBCHRONIC TOXICOLOGY (SUMMARY)—-
No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).
—-REPRODUCTIVE TOXICOLOGY (SUMMARY)—-
No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.
—-CHRONIC TOXICOLOGY (SUMMARY)—-
Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified
Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.
—-SENSITIZATION (SUMMARY)—-
Not expected to be sensitizing based on tests of this product, components, or similar products.

12. ECOLOGICAL INFORMATION
ENVIRONMENTAL FATE AND EFFECTS:
In the absence of specific environmental data for this product, this assessment is based on information for representative products.
ECOTOXICITY: Available ectoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.
MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.
PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.
BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

13. DISPOSAL CONSIDERATIONS
WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.
RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION
USA DOT: NOT REGULATED BY USA DOT.
RID/ADR: NOT REGULATED BY RID/ADR.
IMO: NOT REGULATED BY IMO.
IATA: NOT REGULATED BY IATA.
STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION
US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.
EU Labeling: Product is not dangerous as defined by the European Union
Dangerous Substances/Preparations Directives. EU labeling not required.
Governmental Inventory Status: All components comply with TSCA,
EINECS/ELINCS, AICS, DSL, and KECI.
U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no “EXTREMELY HAZARDOUS SUBSTANCES”.
SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.
This product contains no chemicals subject to the supplier notification
requirements of SARA (313) toxic release program.
THIS PRODUCT HAS BEEN AUTHORIZED BY USDA FOR USE UNDER THE FOLLOWING
CATEGORY: This product is acceptable as a lubricant where there
is no possibility of food contact (complies with earlier USDA
guidelines for H-2 lubricant use).
The following product ingredients are cited on the lists below:
CHEMICAL NAME CAS NUMBER LIST CITATIONS *

ZINC (ELEMENTAL ANALYSIS) (0.08%) 7440-66-6 22
ZINC ALKYL DITHIOPHOSPHATE 68649-42-3 22
(0.67%)

—- REGULATORY LISTS SEARCHED —-
1=ACGIH ALL 6=IARC 1 11=TSCA 4 16=CA P65 CARC 21=LA RTK
2=ACGIH A1 7=IARC 2A 12=TSCA 5a2 17=CA P65 REPRO 22=MI 293
3=ACGIH A2 8=IARC 2B 13=TSCA 5e 18=CA RTK 23=MN RTK
4=NTP CARC 9=OSHA CARC 14=TSCA 6 19=FL RTK 24=NJ RTK
5=NTP SUS 10=OSHA Z 15=TSCA 12b 20=IL RTK 25=PA RTK
26=RI RTK
* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: HYDRAULIC OIL
NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES
ARE NOT FORMULATED TO CONTAIN PCBS.
Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:
INDUSTRIAL LABEL
Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 602698-00, CMCS97: 970705, REQ: US - MARKETING, SAFE USE: L EHS Approval Date: 25APR2003

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Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

Material Safety Data Sheet

PETRO-CANADA ANTIFREEZE

1 . Product and company identification

Product name : PETRO-CANADA ANTIFREEZE

Synonym : Universal Antifreeze, Radiator Antifreeze, Diesel Antifreeze, Petro-Canada Antifreeze-Coolant, Petro-Canada Heavy Duty Antifreeze-Coolant, Pre-Mix Antifreeze, Petro-Canada Premium Radiator Antifreeze, Diesel Engine Coolant, Pre-Mixed Radiator Antifreeze/Coolant Petro-Canada.

Code : W269

Material uses : Used as an engine antifreeze coolant.

Manufacturer : PETRO-CANADA
P.O. Box 2844
150 – 6th Avenue South-West
Calgary, Alberta
T2P 3E3

In case of emergency : Petro-Canada: 403-296-3000
Canutec Transportation: 613-996-6666
Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

Physical state : Clear viscous liquid.

Odour : Odourless.

WHMIS (Canada) :

Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class D-2A: Material causing other toxic effects (Very toxic).

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : CAUTION!

MAY BE HARMFUL IF SWALLOWED. MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE BIRTH DEFECTS, BASED ON ANIMAL DATA. POSSIBLE DEVELOPMENTAL HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE ADVERSE DEVELOPMENTAL EFFECTS, BASED ON ANIMAL DATA.

May be harmful if swallowed. Slightly irritating to the eyes and skin. Avoid exposure - obtain special instructions before use. Do not breathe vapour or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Contains material that may cause target organ damage, based on animal data. Contains material which may cause birth defects, based on animal data. Contains material which may cause developmental abnormalities, based on animal data. Avoid exposure during pregnancy. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Inhalation of this product may cause respiratory tract irritation.

Ingestion : Harmful if swallowed. Ingestion of this product may cause gastro-intestinal irritation, nausea, vomiting, abdominal pain, and diarrhea. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

Skin : Slightly irritating to the skin.

Eyes : Slightly irritating to the eyes.

Potential chronic health effects

2 . Hazards identification

Chronic effects : Contains material that may cause target organ damage, based on animal data.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : Contains material which may cause birth defects, based on animal data.

Developmental effects : Contains material which may cause developmental abnormalities, based on animal data.

Fertility effects : No known significant effects or critical hazards.

Target organs : The substance may be toxic to kidneys and liver. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
Ethylene glycol	107-21-1	45 - 50

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : Non-flammable.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

5 . Fire-fighting measures

Products of combustion : Carbon oxides (CO, CO2), smoke and irritating vapours as products of incomplete combustion.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Special remarks on explosion hazards : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid exposure during pregnancy. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Ethylene glycol	**ACGIH TLV (United States).** CEIL: 100 mg/m³, (aerosol)

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

8 . Exposure controls/personal protection

Engineering measures : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour filter

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: neoprene, nitrile, polyvinyl chloride (PVC). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Clear viscous liquid.
Flash point : Not available.
Auto-ignition temperature : Not available.
Flammable limits : Not available.
Colour : Yellow.
Odour : Odourless.
Odour threshold : Not available.
pH : Not available.
Boiling/condensation point : 129°C (264.2°F)
Melting/freezing point : -37°C (-34.6°F)
Relative density : 1.06 to 1.09
Vapour pressure : 0.008 kPa (0.06 mm Hg)
Vapour density : 2.1 [Air = 1]
Volatility : Not available.
Evaporation rate : Not available.
Viscosity : Not available.
Pour point : Not available.

9 . Physical and chemical properties

Solubility : Soluble in water, methanol and diethyl ether.

10 . Stability and reactivity

Chemical stability : The product is stable.

Hazardous polymerisation : Under normal conditions of storage and use, hazardous polymerisation will not occur.

Materials to avoid : Reactive with oxidising agents, acids and alkalis.

Hazardous decomposition products : May release COx, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Ethylene glycol	LD50 Dermal	Rabbit	9530 mg/kg	-
	LD50 Oral	Rat	4700 mg/kg	-
	LC50 Inhalation Dusts and mists	Rat	2725 mg/m³	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Ethylene glycol	A4	-	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	Not regulated.	-	-	-		-
DOT Classification	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Ethylene glycol based coolant)	9	III		**Special provisions** In single containers of 5000 lbs capacity or less this product is exempt from DOT regulations (not regulated).

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Target organ effects

Canada

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class D-2A: Material causing other toxic effects (Very toxic).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : Not determined.

16 . Other information

Label requirements : MAY BE HARMFUL IF SWALLOWED. MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE BIRTH DEFECTS, BASED ON ANIMAL DATA. POSSIBLE DEVELOPMENTAL HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE ADVERSE DEVELOPMENTAL EFFECTS, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :

Health	*	2
Flammability		0
Physical hazards		0
Personal protection		H

16 . Other information

National Fire Protection Association (U.S.A.) :

References : Available upon request.
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Responsible name : **Product Safety - JDW**

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

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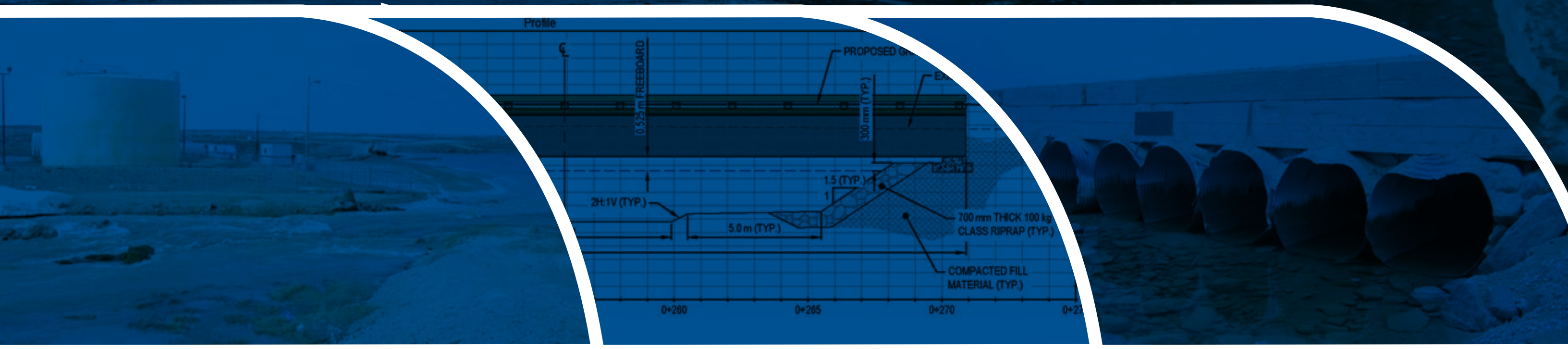

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