Violet Camsell-Blondin, Chair
Wek’eezhii Land and Water Board
#1, 4905 – 48th Street
Yellowknife, NT X1A 3S3
Canada

19 January 2016

Dear Ms. Camsell-Blondin:

Subject: Waste Management Plan Version 1.1


Specific updates to the Waste Management Plan, as required by the Reasons for Decision for the Water License are listed below:

- The following plans have been added as Chapters to the Waste Management Plan:
  - Chapter 1: Solid Waste and Landfill Management Plan
  - Chapter 2: Incinerator Management Plan
  - Chapter 3: Hydrocarbon Impacted Materials Management Plan
  - Chapter 4: Dust Management Plan

Specific updates to each section is detailed in the revision table for each plan. Specific revisions arising from the Reasons for Decision include:

**Incineration Section**

- description of record-keeping procedures for temperatures of the incinerator primary and secondary chambers for each batch run and ensure they are consistent with the manufacturer’s recommended temperature settings;
- outline a monitoring program for scrubber water and incinerator ash (including identification of sampling parameters, with rationale, and sampling frequency);
- description of how DDMI will remove potentially harmful Waste (e.g., plastics) from their incineration stream;

**Hazardous Materials Management Section**

- hazardous Waste reporting;

**Hydrocarbon Management Section**

- active operational practices for landfarming;

**Solid Waste and Landfill Management Section**

- Procedures for determining if buildings, machinery, and
equipment are salvageable for reuse or resale

- Procedures for identifying any current or future off-site needs for salvageable buildings, machinery, and equipment
- Procedures for identifying and segregating materials for off-site recycling (e.g., scrap metal)
- Decontamination procedures to ensure the materials are inert, i.e., identifying and removing all oils, lubricants, batteries, bulk chemicals, hazardous materials, etc.
- Procedure for keeping records of what Wastes were recycled/reused off-site, what Wastes were disposed, and where they were disposed
- Rationale for selection of disposal location within the Waste rock pile
- Disposal procedures to be used, including efforts to be taken to ensure that disposed materials are physically stable and do not result in settling that might later compromise a Waste rock cover
- Information about how potential physical and chemical impacts of Waste disposal will be monitored

**Dust Management Section**

- detail the mitigative actions DDMI has been taking, and will continue to take, in order to decrease the amount of dust generated on site and decrease the potential impact of project-generated dust on the surrounding environment
- identify and discuss additional options of how to mitigate road-generated dust more effectively, particularly in the shoulder seasons, for instance, by using dust suppressants, changing tire sizes, truck speeds, etc. For each option, provide a rationale as to why DDMI plans to reject or implement the option.
- outline the current dust monitoring programs in place

If you have any questions regarding the above, please contact the undersigned.

Yours sincerely

David Wells
Superintendent – Environment
Diavik Diamond Mine Waste Management Plan

Version 1.1

Document #: OPCO-039-1114 R1

January 2016
OVERVIEW

Diavik Diamond Mines (2012) Inc. is committed to ensuring that collection, storage; transportation, treatment and disposal of all wastes generated by the project are conducted in a safe, efficient and environmentally compliant manner. The fundamental basis of the plan is the practical and positive management of wastes, incorporating the implementation of a sound waste minimization/reduction program.

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*On DDMI Intranet under HSEQ MS Element 10
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Introduction

1. **Diavik Diamond Mine**

The Diavik Diamond Mine is an unincorporated joint venture established by Diavik Diamond Mine (2012) Incorporated (DDMI) and Dominion Diamond Corporation (DDC). DDMI is a wholly owned subsidiary of Rio Tinto plc of London, England. Under the Joint Venture Agreement, DDMI has a 60% participating interest in the project, and DDC a 40% participating interest. DDMI has been appointed Manager and is the corporate entity responsible for conducting project activities.

The Mine is located approximately 300 kilometres (km) northeast of Yellowknife, NT. The Mine (64° 31’ N, 110° 20’ W) is situated on East Island, a 17 square kilometre (km²) island in Lac de Gras, NT. (Figure 1). All major freight is trucked to the Mine over a seasonal winter road from Yellowknife. Worker access is by aircraft to the Mine's private airstrip.

1.1 **Effective Date**

This plan is an overview of the various waste related management plans in place at the Mine. This plan will be reviewed, and updated if required annually on March 31. The next review will be conducted for March 31, 2017.

1.2 **Policy**

Diavik maintains two overarching policies related to waste management:

- Diavik Health, Safety, Environment and Quality Policy; and,
- Diavik Wildlife Management Policy.

Both policies apply to all DDMI sites, employees, contractors and visitors. The policies are reviewed and updated every two years.

In addition to the above two policies, Diavik's approach to waste management follows the 4R’s (reduce, reuse, recycle, and recover). Examples of each of the 4R’s in use at Diavik are presented below.

1.2.1 **Reduction**

Reduction is the elimination or decrease of the volume or toxicity of waste generated. Examples of waste reduction at Diavik include:

- Installation of 9.2 MW windfarm reducing diesel usage and emissions from the Powerhouse.
- Building footprint reduction leading to decreased heating and power requirements.
- Purchasing materials in bulk to reduce material handling and containers.
• Inventory control methods.

• New product approval process, which determines if a less hazardous material substitution is present.

1.2.2 Reuse
Reusing a product more than once for the same or different purpose is effective method of waste reduction. Examples of waste reuse at Diavik include:

• Reuse of Mine Water, Treated Sewage Effluent and Process Water in the Processing Plant to reduce the use of Raw Water from Lac de Gras, to approximately 50% of the water license limit.

• Reuse of waste oil from mobile and stationary equipment to provide heat via a waste oil boiler in the backfill plant, offsetting approximately an equal volume of diesel fuel.

• Remining of waste rock for underground backfill and surface construction.

• Reuse of coarse processed kimberlite as a building material within the processed kimberlite containment facility.

• Reusing empty drums as waste containers.

• Reusing heavy equipment tires as barricades.

• Reuse of parts from surplus equipment.

1.2.3 Recycle
Recycling is the process of remanufacturing materials designated for disposal into the same or different products. Examples of waste products that are sent offsite for recycling at Diavik include:

• Batteries

• Waste Glycol

• Drink Containers

• Copper Wire

1.2.4 Recover
Recovery is the process of extracting materials or energy from waste for other use. Examples of waste recovery at Diavik include:

• Waste heat from electrical power generation is used to heat numerous buildings.
1.2.5 Treatment
The treatment of waste employs methods/processes which reduces the volume, mass, and/or toxicity prior to disposal. Examples of waste treatments at Diavik include:

- Thermal treatment (incineration) of food and camp waste to reduce volume and wildlife attraction.
- Thermal treatment of wood and cardboard to reduce volume.
- Treatment of mine water at the North Inlet Water Treatment Plant prior to discharge into Lac de Gras.
- Treatment of raw sewage at the Sewage Treatment Plant prior to discharge into the Processed Kimberlite Containment Facility for reuse in the Processing Plant.

1.2.6 Disposal
After implementing the above waste reduction strategies (4R’s and treatment) there are wastes that require disposal at an approved location/facility. Disposal of waste at Diavik occurs both onsite and offsite. Examples of waste disposal on Site at Diavik include:

- Waste rock;
- Processed kimberlite;
- Treated mine water; and,
- Inert material landfill waste.

Examples of waste disposal off-site at Diavik include:

- Hazardous waste; and
- Used chemicals.
Diavik Health, Safety, Environment and Quality Policy

At Diavik, we are committed to the health and safety of our workforce, environmental protection and quality in the processing of our diamonds. We are committed to creating excellence in our systems to ensure we meet our core values of Integrity, Respect, Teamwork and Accountability. Supported by these values, we believe that all incidents and injuries are preventable. Our goal is zero harm.

To support our Health, Safety, Environment and Quality (HSEQ) policy, we commit to:

- Identify, eliminate, or otherwise control health, safety, environment and quality risks to our people, product, local communities and the environment in which we operate.
- Provide our workforce with the resources they need to achieve our goal of zero HSEQ incidents, injuries and illnesses.
- Comply with all applicable commitments, standards, laws, regulations and other requirements.
- Foster a culture of involvement.
- Support a measurable commitment to quality processes which meets or exceeds our joint venture partner and customer requirements.
- Ensure that HSEQ expectations are clearly communicated and that their management systems are audited.
- Continually seek to reduce the environmental footprint of our operations and related activities.
- Generate sustainable HSEQ performance through long-term, mutually beneficial relationships with our communities and all other stakeholders.
- Be transparent with our workforce, communities, monitoring boards and regulators about incidents that occur within our workplace.

Our vision of excellence is reflected through our people and the product we mine, process and deliver every day. We commit to applying the principles of this policy to continuously improve The Way We Work.

Marc Cameron
President
Diavik Wildlife Management Policy

As a visitor to this special land, Diavik Diamond Mines (2012) Inc. (DDMI) is dedicated to our commitments and responsibilities to conduct business in a safe and environmentally responsible manner through our comprehensive wildlife monitoring programs and management practices. Wildlife management priorities are integrated into all aspects of our business. We strive to continuously improve our environmental performance and reduce our overall environmental footprint.

The following guiding principles set out Diavik’s Wildlife Management commitments:

- All incidents and interactions with wildlife are reported immediately.
- Every effort is to be made to avoid disturbing wildlife, while still operating in a safe and efficient manner.
- Harassing wildlife, feeding of wildlife and littering are prohibited.
- Sport fishing and hunting by employees and contractors is prohibited during their time at the mine site.
- Employees undergo wildlife orientation and training specific to the wildlife risks in their work area.
- Problem or nuisance wildlife is deterred by trained personnel, and regulatory officials will be consulted where additional actions may be required.
- All traffic and work shall yield the “Right of Way” to wildlife.
- Employees are prohibited from cooking outdoors or storing food/food waste in a manner that attracts wildlife.
- Food waste is incinerated to minimize wildlife attraction.
- Waste management requirements are outlined in the Waste Management Plan and seek to minimize wildlife attractants.
- Wildlife monitoring requirements are outlined in the Wildlife Monitoring and Management Plan, with a goal to integrate scientific and Traditional Knowledge.

As individuals, we personally commit to apply the principles of this policy to continuously improve The Way We Work every single day.

Marc Cameron
President
1.3 **Purpose and Scope**

This Waste Management Plan covers all activities at the Mine, Exploration Sites, and Community Based Monitoring Camp. This plan references other established operational plans that meet the requirements of the MVLWB Guidelines for Developing a Waste Management Plan.

This plan applies to all employees, contractors, and visitors at the Mine site.

1.4 **Project Description**

The project involves the mining of four diamond-bearing Kimberlite pipes. The pipes, designated as A154 North, A154 South, A21 and A418 are located directly off shore of East Island. Open pit mining commenced in 2003.

All mining, diamond recovery, support activities and infrastructure are located on East Island. Approximately 600 people work at the Mine.

The current Mine life is estimated to 2023, producing over 100 million carats.

1.4.1 **Regulatory Authorizations**

The Mine operates under several regulatory authorizations that cover waste including:

- Water License W2015L2-0001
- Land Leases 76D8-5-2, 76D8-6-2, 76D8-7-2, 76D9-5-2, 76D9-9-2
- Fisheries Authorization SC98001
- Environmental Agreement

1.5 **Waste Management Facilities and Locations**

There are a number of waste management facilities located at the Mine. Figure 2 shows the locations of existing and former infrastructure. Each of the detailed Management Plans listed in Section 3 provide greater detail on each facility.
1.6 Site Characteristics
The terrain on East Island is characterized by steep-sided bedrock ridges, undulating to strongly rolling slopes consisting of glacial till, ridged eskers and level to depressional glaciolacustrine and organic deposits. The topographic relief is low to moderate, with elevations ranging from 415 meters above sea level (m asl) at the shoreline of Lac de Gras to 445 m asl inland. Most of the terrain features are controlled by shallow bedrock with boulders present on all portions of the island.

The Site is located just north of the diffuse boundary between the widespread discontinuous and continuous permafrost. The Site is situated in a region of low seismicity. There appears to be no regional groundwater flow at the Site due to the combined effects of Lac de Gras acting as a boundary, low topographic relief, and the presence of permafrost. The hydrology of the Site is typical of arctic regions with low precipitation and permafrost. Most precipitation occurs during the winter as snow, which melts and runs off rapidly in early June. On Site, surface water is collected through a number of collection ponds and either transferred to the Processed Kimberlite Containment Storage Facility or the North Inlet for storage or treatment.
2. **Waste Classification**

Waste generated at the Mine is classified into two waste streams:

1. Mineral Waste; and,

2. Non-Mineral Waste

Both waste streams can be further sub-divided dependent on the type of waste. Figure 3 outlines waste divisions used at Diavik.
Figure 3: Waste Classification at Diavik

Waste Management Plan

Non-Mineral Waste
- Incinerator
  - Kitchen Waste
  - Office Waste
  - Dormitory Waste
- Hazardous
  - Controlled Products
- Burnable
  - Used Wood
  - Cardboard
  - Paper Air Filters
- Landfill (Inert)
  - Vent Tubing
  - Metal
  - Plastics
  - Ground Support
- Sewage
- Mine Water

Mineral Waste
- Waste Rock
- Processed Kimberlite
Management of Waste

3. Non-Mineral Waste

3.1 Waste Management Plan

Within the Waste Management Plan, several Management Plans exist as specific chapters. Sections 3.1.1 – 3.1.4 cover the plans that exist as chapters in the Waste Management Plan.

3.1.1 Solid Waste and Landfill Management – Chapter 1

Status: Version 1.1

Last Update: January 2016

Accountability: Mobile Maintenance and Support Services Department

The Solid Waste and Landfill Management Plan is designed to prevent waste from entering the landfill which may attract wildlife or otherwise be harmful to the environment. The Plan outlines what inert materials can be placed in the Landfill while also outlining how additional wastes are managed, included hazardous waste that is shipped offsite and food waste that is incinerated.

3.1.2 Incinerator Management – Chapter 2

Status: Version 1.1

Last Update: January 2016

Accountability: Mobile Maintenance and Support Services Department

The Incinerator Management Plan is designed to outline incineration operation. The Plan outlines what materials can be incinerated, incinerator design, operation and records management.

3.1.3 Hydrocarbon Impacted Materials Management – Chapter 3

Status: Version 1.1

Last Update: January 2016

Accountability: Mobile Maintenance and Support Services Department

The Hydrocarbon Impacted Materials Management Plan is designed to outline the management of hydrocarbon impacted soils, rock, snow and water.

3.1.4 Dust Management – Chapter 4

Status: Version 1.0
The Dust Management Plan outlines dust mitigation and monitoring programs in place at the Mine. It evaluates dust management options and current operation.

### 3.2 Hazardous Materials Management Plan

**Status:** Version 18.0

**Last Update:** March 2015

**Accountability:** Health, Safety, and Environment Department

The Hazardous Materials Management Plan is designed to outline how substances classified and/or deemed to be potentially hazardous (including toxic) will be managed during DDMI’s project life.

### 3.3 Sewage Treatment Plant Operations Plan

**Status:** Version 6.0 (referred to as Version F)

**Last Update:** March 2011 (Reviewed Annually)

**Accountability:** Health Safety and Environment Department

The Sewage Treatment Plant Operations Plan is used as a single source guide by the Water and Wastewater Treatment Plant Operators. The Plan includes plant layout and design, operating guidelines, performance monitoring, contingency planning, and preventative maintenance.

### 3.4 North Inlet Water Treatment Plant Operations Plan

**Status:** Version 2.0

**Last Update:** September 2010 (Reviewed Annually)

**Accountability:** Health, Safety, and Environment Department

The North Inlet Water Treatment Plant Operations Plan is used as a single source guide by the Water and Wastewater Treatment Plant Operators. The Plan includes plant layout and design, operating guidelines, performance monitoring, contingency planning, and preventative maintenance.

### 4. Mineral Waste

#### 4.1 Waste Rock Management Plan

**Status:** Version 6.0
The Waste Rock Management Plan describes and outlines the procedure for identifying and segregating blasted country rock (waste rock) during mining to minimize the potential for poor quality drainage. The country rock geology and geochemical characteristics, including acid-generating potential are described. Waste rock classifications based on total sulphur content is used to segregate potentially acid-generating waste rock from non acid-generating waste rock.

4.2 Processed Kimberlite Containment Facility Operations Plan

Status: Version 2.1

Last Update: October 2012

Accountability: Technical Services Department

The Processed Kimberlite Containment Facility Operations Plan is used to describe water and solids management within the Processed Kimberlite Containment Facility (PKC). The Plan provides information on facility design and dam construction, facility operations, facility monitoring programs and characterization programs for water, ice, and solids stored within the facility.
5. **Infrastructure**

Infrastructure requirements for waste management are outlined in the various Management Plans listed in Sections 3 and 4.

5.1 **Operational Phase Contingency Plan**

Status: Version 19

Last Update: March 2015

Accountability: Health, Safety, and Environment Department

The Operational Phase Contingency Plan provides response measures for any unintentional release of hazardous/toxic substances as well as procedures for water management. The Plan defines the responsibilities of key personnel and outlines their duties and required procedures when responding to unintentional releases of products to the environment. The plan has been designed to facilitate effective communication and the efficient cleanup of spills from potentially hazardous materials. The principle objectives of this plan are to:

1. Provide readily accessible emergency information to the clean-up crews, management, and government agencies in the event of any emergency situation;

2. Comply with federal and territorial regulations and guidelines pertaining to the preparation of contingency plans and notification requirements;

3. Comply with company environmental and safety policies;

4. Promote safe and effective recovery of spilled materials; and

5. Minimize environmental impacts of spills to water or land.
Diavik Diamond Mine Solid Waste and Landfill Management Plan – Chapter One

Document #: OPCO-025-0115 R18

January 2016
OVERVIEW

Diavik Diamond Mines (2012) Inc. is committed to ensuring that collection, storage; transportation, treatment and disposal of all wastes generated by the project are conducted in a safe, efficient and environmentally compliant manner. The fundamental basis of the plan is the practical and positive management of wastes, incorporating the implementation of a sound waste minimization/reduction program.

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Introduction

1. Diavik Diamond Mine

The Diavik Diamond Mine is an unincorporated joint venture established by Diavik Diamond Mine (2012) Incorporated (DDMI) and Dominion Diamond Corporation (DDC). DDMI is a wholly owned subsidiary of Rio Tinto plc of London, England. Under the Joint Venture Agreement, DDMI has a 60% participating interest in the project, and DDC a 40% participating interest. DDMI has been appointed Manager and is the corporate entity responsible for conducting project activities.

The Mine is located approximately 300 kilometres (km) northeast of Yellowknife, NT. The Mine (64° 31' N, 110° 20' W) is situated on East Island, a 17 km² island in Lac de Gras, NT. (Figure 1). All major freight is trucked to the Mine over a seasonal winter road from Yellowknife. Worker access is by aircraft to the Mine's private airstrip.

1.1 Effective Date

This plan is an overview of the various waste related management practices in place at the Mine. This plan will be reviewed, and updated if required annually on March 31.

Mineral waste such as waste rock and processed kimberlite are covered by their own management plans. In this plan, waste shall mean non-mineral waste.

1.2 Policy

Diavik ensures that the collection, storage; transportation and disposal of all wastes generated by the Mine are conducted in a safe, efficient and environmentally compliant fashion. The fundamental basis of the plan is the practical and positive management of wastes, incorporating the implementation of a sound waste minimization program.

The main objectives of this plan are to:

- Create a system for proper disposal of waste;
- Minimize potentially adverse impacts on the physical and biological environment; and,
- Comply with Federal and Northwest Territories (NT) legislation.

Diavik’s approach to waste management follows the 4R’s (reduce, reuse, recycle, and recover). The 4R’s are embodied within all of our management practices related to waste.

1.2.1 Legislation

This plan was developed to comply with the following legislation:

- NWT Public Health Act
• NWT Environmental Protection Act

• Canadian Environmental Protection Act

• Transportation of Dangerous Goods Act and Regulations

• Workplace Hazardous Materials Information Systems (WHMIS) Safety Act

• Waters Act

• Lands Act

• NWT Pesticide Act
Landfill

Processed Kimberlite Containment Area

Chemical Storage
Old Incinerator
Burn Pit
New Incinerator
Landfarm
Decommissioned Sludge Pit

Waste Transfer Area
Landfill

Diavik Diamond Mines
Environment Department
Lac de Gras
Northwest Territories
2016 January
UTM Zone 12, NAD83
Waste Streams

2. Waste Definition
A material is considered waste when it can no longer be used, reused or recycled. This Plan addresses solid and liquid wastes generated on site that are not covered by specific management plans (ie Waste Rock Management Plan). The wastes covered in this plan are either shipped offsite, incinerated or directed to the onsite disposal/treatment facility (e.g. landfill, sewage treatment plant, etc).

2.1 Solid Waste
Solid waste includes garbage, refuse and sludge from water treatment facilities. Examples include: filters, conveyor belts, scrap metals, domestic garbage, and sewage sludge from the sewage treatment plant.

2.1.1 Hazardous Waste
The Government of the Northwest Territories Guideline for General Management of Hazardous Waste (February 1998) and Guideline for Industrial Waste Discharges (April 2004) defines hazardous wastes and non-hazardous wastes as follows:

**Hazardous Waste**: A contaminant which is a dangerous good that is no longer used for its original purpose and is intended for recycling, treatment, disposal or storage. A hazardous waste does not include a contaminant that is:

- Household in origin
- Included in class 1 Explosives, or class 7 Radioactive materials, of Transportation of Dangerous Goods Regulations (TDGR)
- An empty container
- Exempted as a small quantity
- Intended for disposal in a sewage system or landfill that meet the applicable standards set out in schedules I, III or IV of the “Guideline for Industrial Waste Discharges in the NWT.”

The considerations for small quantity hazardous wastes that can be classified under non-hazardous wastes are as follows:

**Small Quantity**: Hazardous waste that is generated in an amount less than 5 kilograms per month of a solid, or 5 litres per month of a liquid; and where the total quantity accumulated at any one time does not exceed 5 kilograms or 5 litres. This does not apply to mercury or in classes 2.3, 5.1 or 6.1 of TDGR. These wastes must be generated in an amount less than 1
kilogram per month of a solid or 1 litre per month of a liquid; and where the total quantity accumulated at any one time does not exceed 1 kilogram or 1 litre.

Examples of hazardous waste include: waste oil, solvents, paints, used/unused chemicals, batteries and fluorescent light tubes. All hazardous wastes generated at Diavik are shipped offsite to a registered recycling/disposal facility.
Waste Sources, Collection and Disposal

3. Waste Sources

An overview of the sources and types of waste generated at the Mine site are presented below in Table 1.

Table 1: Source and Type of Waste Generated at Diavik

<table>
<thead>
<tr>
<th>Source of Waste</th>
<th>Type of Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Handling and Storage Operations</td>
<td>Waste petroleum products, used chemicals</td>
</tr>
<tr>
<td>Sewage Treatment Plant</td>
<td>Biological sludge and grey water</td>
</tr>
<tr>
<td>Equipment Maintenance</td>
<td>Used batteries, engine oil, filters (oil and air), tires, scrap metal, glass, hydraulic hoses, aerosol cans, used oils, oily rags, used grease, conveyor belts</td>
</tr>
<tr>
<td>Building Maintenance/Demolition</td>
<td>Used transformers, fluorescent lighting tubes and ballasts, glycol, chemicals, batteries, smoke detectors, e-waste, material scraps (partitions, carpets, plumbing, electrical, glass, insulation)</td>
</tr>
<tr>
<td>Laboratory</td>
<td>Chemical lab wastes, toxic substances, crucibles</td>
</tr>
<tr>
<td>Domestic waste from:</td>
<td>Biological sludge, domestic garbage, cooking oil &amp; food wastes, paper, cardboard, aerosol cans, used batteries, sharps</td>
</tr>
<tr>
<td>- Accommodation building;</td>
<td></td>
</tr>
<tr>
<td>- Administration offices; and</td>
<td></td>
</tr>
<tr>
<td>- Kitchen</td>
<td></td>
</tr>
<tr>
<td>Surface Operations</td>
<td>Cement, sand, used materials (i.e. metals, pipes, glass, styrofoam, insulation, etc.), dewatering pipe, wire, used chemicals</td>
</tr>
<tr>
<td>First Aid Facility</td>
<td>Sharps (needles, syringes, scalpel blades), biological wastes (blood, human tissue, gauze pads)</td>
</tr>
<tr>
<td>Underground operations</td>
<td>Meyco SA 160 (Shotcrete Accelerator), used oil, oily rags, used floor dry, aerosols, paper, wood, cardboard, used batteries, scrap metal, plastic, rubber, pipes, used glycol, used grease, filters, vent tubing</td>
</tr>
</tbody>
</table>

4. Waste Collection, Storage and Disposal

Waste containers are labelled and available at each facility. All wastes are segregated at point source. Once containers are full they are transported to either the landfill for disposal or the Waste Transfer Area (WTA) for either incineration or packaging and storage until shipped offsite. The WTA is designed to store and dispose of site wastes in a practical, safe manner that reduces potential attractants for wildlife. The WTA is lined, fenced, and designed to contain over a years’ worth of waste prior to being shipped offsite. The WTA contains the
incinerator building, burn pit, hydrocarbon impacted snow and soil facility, along with storage. The facility is staffed during dayshift and all access to the facility is controlled.
Hazardous Waste

5. Hazardous Waste

Hazardous wastes generated at Diavik are classified in the Hazardous Materials Management Plan. This plan outlines the methodology for identification, classification and storage of such materials. The plan also defines the safety protocols to be followed and records to be maintained by personnel handling such wastes, including final disposal practices. Section 5 of this Plan discusses the generation of hazardous wastes, storage and final disposal methodologies.

5.1 Petroleum Waste

Petroleum wastes generated at Diavik consist of used oil, diesel fuel, jet fuel, lubricants and solvents. These wastes are segregated in order to make the individual waste streams easier to reuse or recycle, or to permit recovery of any by-products. Precautions are exercised when handling these materials since their improper release or disposal could adversely affect the environment. Personnel working with these products receive specific safety and procedural training for their handling.

5.1.1 Waste Oil

Waste oil generated from servicing vehicles, equipment, and generators is stored in marked, aboveground tanks adjacent to the Lube Storage Building (467,000 L), Powerhouse 1 (96,000 L) and Powerhouse 2 (72,000 L). These tanks are registered with Environment Canada and are contained within an engineered containment berm. Smaller volumes are collected in drums and stored at the Waste Transfer Area. All connecting pipes are aboveground, making it easy to inspect for leaks. The Diavik Support Service department undertakes regular monitoring of the tanks and piping.

Transfer of used petroleum products is performed in the lined area of the storage facility. Waste oil not suitable for reuse within onsite equipment is transferred and stored in a horizontal (50,000 L) outdoor insulated tank located at the Backfill Plant. The tank is double walled and located in a lined containment berm. The waste oil tank is registered with Environment Canada. The waste oil tank feeds the GNWT approved waste oil boiler which supplements the heating requirements of the Backfill Plant. The waste oil boiler displaces an approximate equal volume of diesel fuel which would be required for heating purposes of the plant.

Used oil pails that are 20 L or larger are collected separately and will be inspected by Support Services to determine requirements for draining and disposal. Plastic containers that are drained, are cleaned and placed within the inert landfill. Pails that cannot be cleaned are stored at the WTA prior to shipment to a registered facility.

5.1.2 Hydraulic Fluid

Hydraulic fluid that is not reusable onsite is placed in labelled drums and are stored at the WTA prior to shipment to a registered facility.
Used hydraulic lines are drained and disposed of in the inert landfill.

5.1.3 Oil Filters
Oil filters are drained for 48 hours following removal. A designated location has been created in the Surface Maintenance Shop for the draining of oil filters. Once drained, the filters are crushed and stored in labelled drums at the WTA prior to shipment to a registered facility.

5.1.4 Contaminated or Out-of-Date Fuels
For safety, some fuels such as aviation fuel may be condemned because of contamination (such as water entry into a drum), or an expired shelf life. These drums are labelled in this manner and may be reused within other fuel burning devices at site that do not have the same specifications as aviation. If fuel cannot be reused on site, it is stored at the WTA prior to shipment to a registered facility.

5.1.5 Soil & Rock Contaminated with Petroleum Product
Soil and rock contaminated with petroleum is covered in the Hydrocarbon Impacted Materials Management Plan. Refer to Chapter 3 - Waste Management Plan.

5.1.6 Snow Contaminated with Petroleum Product
Snow contaminated with petroleum is covered in the Hydrocarbon Impacted Materials Management Plan. Refer to Chapter 3 - Waste Management Plan.

5.1.7 Water Contaminated with Petroleum Product

5.1.8 Oily Rags and Used Absorbent Materials
All materials used to clean up petroleum products are collected in tipper bins around site, transported to the WTA and stored for onsite incineration.

5.1.9 Grease
Scrubber grease is used as part of the recovery process for diamonds and is mixed with a granular material. Once it is no longer possible to reuse the scrubber grease, it is collected in drums and stored at the WTA prior to shipment to a registered facility.

Cardboard grease tubes are collected in drums from various areas around site and are stored at the WTA prior to shipment to a registered facility.

5.1.10 Cooking Grease
Cooking oil and grease from the kitchen is collected in plastic drums/totes and stored indoors to avoid attracting wildlife. Once the drums are full, they are immediately shipped to a registered facility.

5.2 Chemicals
Various chemical wastes are generated at Diavik. Management of these wastes is described below.
5.2.1 Glycol
Ethylene glycol is used in building heating systems, vehicle and equipment coolant systems, and at the airstrip as de-icing fluid. If spilled, the sweet smell of the material may attract and affect wildlife, and have a negative impact on the environment. The glycol waste stream is segregated from other wastes and is stored in marked, aboveground tanks at the Lube Storage Building (50,000 L), Powerhouse 1 (28,000 L) and Powerhouse 2 (30,000 L). Smaller volumes are collected in drums and stored at the WTA. All connecting pipes are aboveground, making it easy to inspect for leaks. The Diavik Support Service department undertakes regular inspections and monitoring.

Transfer of glycol is performed at the Lube Storage Building. Product not suitable for reuse is shipped off-site to a registered facility.

5.2.2 Batteries
Batteries used onsite include lead acid wet-filled, potassium hydroxide (alkaline), nickel-cadmium and lithium. Use of rechargeable batteries is promoted wherever possible. Rechargeable batteries are regularly maintained while in service, and tested prior to disposal to confirm that it is spent. Spent batteries are packaged, labelled and stored at the WTA prior to shipment to a registered facility.

Containers used for battery storage are plastic lined.

5.2.3 Acids
Used acids are stored in approved plastic containers that are contained within enviro-packs at the WTA prior to shipment to a registered facility.

5.2.4 Solvents
Where possible solvents at Diavik have been replaced with non-toxic, citrus-based detergents and are primarily used as degreasing agents in the maintenance shops and other service buildings. Used solvents are packaged in labelled leak-proof containers or drums and/or are transferred to larger storage containers which are stored at the WTA prior to shipment to a registered facility.

5.2.5 Flocculent
Flocculants are used in the Process, Sewage and North Inlet Water Treatment plants as a thickener for tailings or sludge. Spilled flocculent is collected in drums and stored at the WTA prior to shipment to a registered facility.

5.2.6 Freon
Freon is used in refrigeration units and tends to be re-circulated within equipment. Leaked or spilled Freon is collected in drums and stored at the WTA prior to shipment to a registered facility.

5.2.7 Fluorescent Light Tubes and Compact Fluorescent Light (CFL’s) Bulbs
Fluorescent light tubes and CFL’s contain trace amounts of mercury. Both are collected in plastic lined trays and stored at the WTA prior to shipment to a registered facility.
5.2.8 Aerosol Cans
Aerosol cans are collected in drums and stored at the WTA prior to shipment to a registered facility.

5.2.9 Waste Paint Material
Used paint cans are collected and allowed to dry in a sea can within the WTA. Cans containing latex paints are incinerated and taken to the landfill for disposal. Cans/containers that held oil-based paints are stored at the WTA prior to shipment to a registered facility.

5.2.10 Shotcrete Accelerator
Meyco SA 160 (Shotcrete Accelerator) is used as an additive to the Underground shotcrete production process. The product is transported to site in 1,100 L totes. Empty and unusable totes with residual product are stored on surface prior to shipment to a registered facility.

5.2.11 Laboratory Chemical Wastes
Laboratory wastes are stored in appropriate containers at the WTA prior to shipment to a registered facility.

5.3 Biological Waste
Hazardous biological wastes, such as needles, syringes, scalpels and blood and tissue contaminated items are generated at the Medic Station. These wastes are properly contained, labelled and stored in a secure area marked “Biohazard” in the Medic Centre until they are removed and incinerated or stored at the WTA prior to shipment to a registered facility.

5.4 Sewage Sludge
The biodegradable organic components removed by screening in the sewage treatment plant are dewatered and stored in the designated cell within the WTA and/or Till Pile.
Inert Solid Waste

6. Inert Solid Waste

Inert wastes are those that will not chemically or biologically react or decompose when placed in a landfill. Inert wastes typically includes vehicles, building materials, plastics, metal, cement, vent tubing, rubber, clean paper and wood products, and air filters. Landfill operation is detailed in Section 9.

6.1.1 Conveyor Belts and Tires
Re-use of tires is encouraged; some alternate temporary uses for tires are to store materials in the parts lay-down area and to protect roads in turning areas. Used conveyor belts and light vehicle tires are disposed of in the inert landfill.

6.1.2 Vehicles
To date, vehicles and equipment have been shipped offsite for resale. A limited number of vehicles have been salvaged for parts and/or for use by the Emergency Response Team. Prior to placing a vehicle in the Landfill all salvageable parts would be removed for reuse. Additionally, all sources of hydrocarbons, coolants, and fluids would be removed. Batteries and other hazardous materials would be removed. The vehicle would be crushed to reduce volume.

6.1.3 Plastics
Plastic wastes are produced from three sources: food packaging, non-toxic/non-hazardous products, and toxic/hazardous products. Plastics associated with food are incinerated to avoid attracting wildlife. Plastics associated with non-toxic/non-hazardous materials are fully drained and placed in the inert landfill. Plastics associated with toxic/hazardous materials are fully drained into an appropriate container and are stored at the WTA prior to shipment to a registered facility.

6.1.4 Corrugated Cardboard
Clean cardboard is burned in the designated burn pit within the WTA. Cardboard associated with food is placed in the incinerator.

6.1.5 Paper
Paper waste, such as office paper, newsprint, and packaging is placed in the incinerator. Shredded paper is used as packaging material where possible.

6.1.6 Scrap Metal
Scrap metal consists of ferrous and nonferrous metals of various types, which have low recycling price and/or are hard to recycle. Examples include building materials, ground support from the underground, siding, piping, and other similar items. Scrap metal is disposed of in the inert landfill.
6.1.7 Waste Lumber
Waste lumber is disposed of in the designated burn pit at the WTA. Larger pieces are stored in laydown areas for use as dunnage.

6.1.8 Air Filters
Paper air filters from mobile equipment is disposed of in the designated burn pit at the WTA. The burning of filters reduces their volume prior to being disposed of in the inert landfill.

6.1.9 Sandblasting Residue
Sandblasting operations are carried out to prepare some metal surfaces for coatings. During sandblasting activities, the surrounding areas are shrouded for dust control and all residual materials resulting from the sandblasting are collected and stored in drums in the waste transfer area. For larger sandblasting activities, the sandblast residue is stockpiled in a designated area before being transferred and disposed of in the inert landfill.

6.1.10 Incinerator Ash
Ash from the incinerators is collected in bins adjacent to the incinerators themselves. This ash is then transferred to the burn pit to assist in burning operations. When the burn pit is cleaned out, contents are placed in the landfill.

6.1.11 Solid Domestic Waste
Waste that are incinerated (kitchen, offices, lunchrooms, etc.) are discussed in the Incinerator Management Chapter.

6.1.12 Buildings
The decision tree for the valuation and disposal of buildings at Diavik is illustrated below in Figure 1. Disposal of buildings is defined as removing them from the asset inventory and includes

- demolition and placement in the inert landfill; or
- dismantling and resale/recycle; or
- complete removal and sale (such as camp units).
Buildings that are slated for deconstruction or demolition are inspected by the Environment Department to ensure all potential hazardous materials are removed from the building. A copy of the Audit Form is included in Appendix A. The inspection criteria was developed based on the *Burning and Demolition of Buildings and Fire Extinguisher Training (ENR, 2007)* Document produced by the Department of Environment and Natural Resources, Government of the Northwest Territories. Items that must be removed prior to deconstruction/demolition include:

- Thermostats
- Fluorescent light tubes
- Fluorescent light ballasts
- Compact fluorescent light bulbs
- Smoke detectors
- Electronic waste, such as computers and TV's
- Chemicals
- Emergency lighting batteries
- Transformers
- Other products that are restricted from the landfill (food waste, aerosol cans, etc.)

The relatively new age (<25 years) of the buildings at Diavik excludes the possibility of them containing asbestos, lead paint, and vermiculite. Following removal of the above noted items, inspections of the building are conducted by the following:

- Area Owner (manager in charge of the area)
- Building Owner (manager in charge of the building)
- Electrical Supervisor
  - Ensures all power is disconnected
  - Ensures fire alarm system is disabled
  - Removes salvageable equipment
- Mechanical Supervisor
  - Ensures sewage and water tanks are disconnected, if present
- Ensures fire sprinkler system is disabled
- Ensures water, sewage, glycol and fuel lines are disconnected and drained
- Removes salvageable equipment

- **IT Supervisor**
  - Ensures IT infrastructure is unaffected
  - Removes salvageable equipment

- **Support Services Supervisor**
  - Ensures all inspections are completed and documented
  - Ensures conditions are met, if applicable
  - Conducts final walk around of building

The above supervisors all sign-off on a final demolition form prior to the commencement of work. The process cannot proceed until the form is signed. A copy of the form is included in Appendix A.

## 7. Recycling

Materials that can be reused/repurposed on site are stored in laydowns by department owners. Examples of such materials include dewatering pipe, steel, lumber and storage containers. Additionally, specific materials are sent offsite and recycled.

### 7.1 Copper

Materials containing copper, such as cabling, electric engines, etc. are collected in a centralized area near the main underground portal. Copper materials are sent offsite on the winter road and sold to copper recyclers. The proceeds from the sale of copper material are donated to a local charity. The volume of copper recycled each year is reported in the annual Wildlife Monitoring Report.

### 7.2 Drink Containers

Plastic drink containers, tetra packs, and aluminium cans are collected throughout the mine site and stored at the WTA until transported offsite to the recycling centre in Yellowknife. The proceeds from the return of drink containers are donated to a local charity. The volume of containers recycled each year is reported in the annual Wildlife Monitoring Report.

### 7.3 Waste Oil

Waste oil is recycled to produce heat at the backfill plant as described in Section 5.1.1.
Infrastructure

8. Waste Transfer Area
The WTA is located adjacent to the A21 Haul Road. The WTA is staffed during dayshift by incinerator operators and the facility supervisor. The facility is lined with HDPE material and is surrounded by a gated, chain link and barbed-wire fence erected to control wind transportation of litter and wildlife intrusion. Entry into the facility is controlled.

The majority of wastes generated onsite are stored and inventoried at the WTA prior to off site transport on the winter road. Sea cans and sheds are used for the storage of labelled items. Covered storage prevents items from being buried by drifting snow, and ensures year-round accessibility. Drums containing waste are labelled appropriately, inventoried, stored, manifested and transported off site.

The following infrastructure is located within the WTA:

- Contaminated soil containment area;
- Incinerator Building;
- Burn pit;
- Sewage sludge containment area (currently not in use);
- Chemical storage shipping container;
- Storage areas and sheds for drums, crates, bins, totes, etc.; and,
- Office, lunchroom & washroom facilities.

As part of the Diavik Wildlife Monitoring Permit, the WTA is inspected by the Environment Department twice per week during the winter and once per week during the summer. Non-conformances are recorded and actioned to the applicable personnel. Waste inspection monitoring is reported in the annual Wildlife Monitoring Report.

9. Inert Landfill

9.1 Location
The current inert landfill is located within the North Country Rock Pile (NCRP). The landfill is constructed in Type III Waste Rock between the edge of the North Dam of the Processed Kimberlite Containment (PKC) Facility and the NCRP. Several selection rationales were used to determine the location of the landfill:

- Located within Type III Waste Rock;
• Convenient Location;
• Area/Volume requirements to meet site needs; and,
• Closure options

9.2 Construction
The landfill is constructed as a void between the NCRP and the PKC. The east and west boundaries of the landfill are constructed using waste rock. The landfill has an approximate area of 22,500 m², and an approximate volume of 280,000 m³.

9.3 Operation
As previously described, only approved inert solid wastes are placed in the landfill. Waste can be placed in the landfill from three possible locations on the east, south and west ends of the facility. Currently waste is placed primarily on the east end, with the south end available if required.

Number waste bins with appropriate signage are located in the work areas of the mine. Waste bins are picked up, transported and emptied at the landfill using a roll-off truck. Larger waste, such as building demolition, would utilize the mine haulage fleet for transport. When a sufficient volume of waste is present at the dumping site, a bulldozer is used to push the waste into the landfill.

All wastes that are transported and dumped at the landfill are tracked by the roll-off truck operator, or determined prior to a demolition project, if applicable. Records are tracked and filed by the Site Services Department.

Signs and gates are installed at the landfill to restrict access and unauthorized dumping.

9.4 Monitoring
As part of the Diavik Wildlife Monitoring Permit, the WTA is inspected by the Environment Department twice per week during the winter and once per week during the summer. Non-conformances are recorded and actioned to the applicable personnel. Waste inspection monitoring is reported in the annual Wildlife Monitoring Report.

Down gradient of the landfill, seepage inspections of the NCRP and PKC are conducted weekly by the Geotechnical Department, while water quality in Pond 3 is monitored as per the Surveillance Network Program of the Water License.

9.5 Closure
Upon closure the landfill will be covered with waste rock of a sufficient thickness to isolate waste from wildlife. The stability of the waste within the landfill and any potential requirement for compaction or consideration in the final cover placement is currently being investigated.

Any seepage that may originate from the landfill will report to Pond 3 and be monitored as per closure water quality criteria.
10. **Training**

All personnel receive training on Diavik’s Waste Management Standard during their initial Induction to Site and annually through refresher courses. Responsibility for waste management is assigned to the Support Service Department. Operators are trained to use equipment and follow processes.

11. **Reporting and Records Management**

Diavik tracks the volume of wastes delivered to the landfill, incinerator, and burn pit. These records and information recorded and filed by the Site Services Department. Waste records can be provide and viewed by the Inspector upon request.

All wastes that are shipped off-site are manifested using Diavik’s specific GNWT Waste Generator Registration Number – **NTG164**. The storage and movement of hazardous waste in the Northwest Territories is managed according to *Guideline for the General Management of Hazardous Waste in the NWT* (ENR, 1998).

Copy 1 of the completed hazardous waste movement document is forwarded to the Department of Environment and Natural Resources once the waste departs Diavik. All wastes shipped offsite are transported to licensed receiving facility.

Materials that are sent offsite for recycling are recorded via transportation manifests.
References


Appendix A

Building Demolition Audit and Forms
## SUPPORT SERVICES

### DEMOLITION/RELOCATION OF BUILDINGS - STAKEHOLDER SIGNOFF

<table>
<thead>
<tr>
<th>Role</th>
<th>Comments</th>
<th>Print Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Building Location:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Area Owner:</strong></td>
<td>Comments</td>
<td>Print Name</td>
<td>Signature</td>
<td>Date</td>
</tr>
<tr>
<td><strong>Building Owner:</strong></td>
<td>Comments</td>
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<td>RDF Form Filled out</td>
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<td>Signature</td>
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</tr>
<tr>
<td></td>
<td>Power disconnected cut/removed as required</td>
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<tr>
<td></td>
<td>Fire alarm system disabled</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Equipment removed for salvage</td>
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<td></td>
</tr>
<tr>
<td><strong>Mechanical Supervisor:</strong></td>
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</tr>
<tr>
<td></td>
<td>Black water tank disconnected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fire sprinkler system disabled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment removed for salvage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Information Systems and Technology Supervisor:</strong></td>
<td>Comments</td>
<td>Print Name</td>
<td>Signature</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td>Infrastructure/systems unaffected</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment removed for salvage</td>
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<td></td>
</tr>
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<td><strong>Environment Supervisor:</strong></td>
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<td>Audit completed and signed off</td>
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<tr>
<td><strong>Support Services Supervisor:</strong></td>
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</tr>
<tr>
<td></td>
<td>All required signatures in place</td>
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<tr>
<td></td>
<td>All conditions are met (if applicable)</td>
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<tr>
<td></td>
<td>Walk around building completed</td>
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</tbody>
</table>
Disclaimer
The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which were observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Information on the latest workers compensation and OHS / WHS laws can be found at the relevant State WorkCover / WorkSafe Authority.

Confidentiality Statement
In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the assessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.
Table of Contents

PRE-DEMOLITION BUILDING INSPECTION 1
Disclaimer 2
Confidentiality Statement 2
AUDIT 4
Prior to building demolition, and placement in the Diavik Landfill a final inspection and walk thought by the HSE Department is required. If additional work is required/identified during the inspection a final inspection is required.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building name/designation:</td>
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<tr>
<td>Area Owner:</td>
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<tr>
<td>Is the building prefabricated (ie. trailer)?</td>
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</tr>
<tr>
<td>Building description:</td>
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<tr>
<td>Estimated year of construction</td>
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<tr>
<td>Exterior photo of building</td>
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<tr>
<td>Is asbestos potentially present?</td>
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<td>Asbestos was used in insulation, siding, shingles, tile, wall board, pipe elbows, and fire breaks (kitchen, furnace room) prior to 1990.</td>
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<td>Is glycol present in the heating system?</td>
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<tr>
<td>Are any refrigeration devices present?</td>
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<tr>
<td>Have all fire extinguishers been removed?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photograph of removed fire extinguishers.</td>
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</tr>
<tr>
<td>Have all fluorescent light ballasts been removed?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo of removed light ballasts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have all fluorescent light tubes been removed?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo of removed light tubes.</td>
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<tr>
<td>Have all emergency light batteries been removed?</td>
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<tr>
<td>Photo of batteries removed.</td>
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<tr>
<td>Question</td>
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<td>Details</td>
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<tr>
<td>-------------------------------------------------------------------------</td>
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<tr>
<td>Have all chemicals, paints, solvents and other hazardous materials been removed?</td>
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<td>Have fuel lines and tanks been disconnected?</td>
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<td>Have electrical transformers been removed?</td>
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<td>Is additional soil sampling required?</td>
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<td>Please list if other environmental concerns are present?</td>
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<td>Additional photos if required.</td>
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<tr>
<td>Is the building suitable for disposal in the Diavik Landfill?</td>
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</table>
Diavik Diamond Mine Incinerator Management Plan

Chapter Two

Document #: OPCO-040-0115 R1

January 2016
OVERVIEW

Diavik Diamond Mines (2012) Inc. is committed to ensuring that collection, storage; transportation, treatment and disposal of all wastes generated by the project are conducted in a safe, efficient and environmentally compliant manner. The fundamental basis of this plan is the safe and efficient incineration of specific waste streams.

REVISION HISTORY

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<td>Ash sampling procedures</td>
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<td>Scrubber water sampling procedures</td>
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<td>Record keeping for temperatures</td>
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DISTRIBUTION LIST

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<td>Health, Safety, Environmental Manager</td>
<td>Electronic*</td>
</tr>
<tr>
<td>2</td>
<td>DDMI</td>
<td>President</td>
<td>Electronic*</td>
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<tr>
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<td>Manager, Mobile Maintenance and Support Services</td>
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<td>4</td>
<td>WLWB</td>
<td>Chair</td>
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*On DDMI Intranet under HSEQ MS Element 10
Contents page

1. Diavik Diamond Mine 4
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   1.3 Incinerator Facility 4

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Introduction

1. Diavik Diamond Mine

The Diavik Diamond Mine is an unincorporated joint venture established by Diavik Diamond Mine (2012) Incorporated (DDMI) and Dominion Diamond Corporation (DDC). DDMI is a wholly owned subsidiary of Rio Tinto plc of London, England. Under the Joint Venture Agreement, DDMI has a 60% participating interest in the project, and DDC a 40% participating interest. DDMI has been appointed Manager and is the corporate entity responsible for conducting project activities.

The Mine is located approximately 300 kilometres (km) northeast of Yellowknife, NT. The Mine (64° 31’ N, 110° 20’ W) is situated on East Island, a 17 square kilometre (km²) island in Lac de Gras, NT. (Figure 1). All major freight is trucked to the Mine over a seasonal winter road from Yellowknife. Worker access is by aircraft to the Mine's private airstrip.

1.1 Effective Date

This plan has been created to ensure the safe and efficient operation of the waste incinerator units. This plan is effective January 2016. This plan will be reviewed, and updated if required annually on March 31. The first review will be conducted for March 31, 2017.

1.2 Objectives

Incineration is a waste treatment process that involves the combustion of organic substances that significantly (80 - 90%) reduces the volume of burnable waste and reduces the likelihood of wildlife attraction and scavenging.

1.3 Incinerator Facility

Diavik has two incinerators both located within the Incinerator Building. The Incinerator Building is located in the Waste Transfer Area, which is a fully fenced and lined facility where all wastes generated onsite are sorted and stored.
Chemical Storage / Old Incinerator / New Burn Incinerator Pit Landfarm Decommissioned Sludge Pit

Waste Transfer Area Landfill

Processed Kimberlite Containment Area

Diavik Diamond Mines Environment Department Lac de Gras Northwest Territories 2016 January UTM Zone 12, Nad83
Incinerator Management

2. Environment Canada Batch Waste Incineration

Environment Canada issued The Technical Document of Batch Waste Incineration in January 2010 which is intended to provide guidance for owners and operators on system selection, operation, maintenance and record keeping. Each of the below sections (2.1 – 2.6) covers the process outlined in the Technical Document.

2.1 Waste Stream

Waste generated at the Mine that is incinerated comes from one of the following areas:

1. Kitchen Waste;
2. Operational areas (coffee and lunch rooms);
3. Accommodations; and
4. Administration offices.

Wastes from the kitchen are primarily comprised of food waste, while food contaminated packaging and paper waste are primarily from the operational, accommodations and office areas.

During daily incineration operation, any inappropriate waste, such as batteries, aerosol cans, chemicals, e-waste, tires, rubber, oily rags, etc.) is removed from and placed in the correct waste container. All bags that contain waste for incineration are clear to allow the operator to view the contents. All waste that is incinerated is sourced from a waste container labelled “Garbage” following the Diavik Waste Management Standard. An example of the label is shown below as Figure 2.

2.2 Incinerator Selection

Facilities that incinerator more than 26 tonnes of waste per year are recommended to use dual chamber controlled air incinerators. Diavik installed and commissioned two Westland Model CY-100-CA-O-D controlled air dual chamber incinerators. These units manage all waste that is incinerated at Diavik. The CY-100-CA-O-D incinerator was selected for use at Diavik because it is designed to successfully incinerate solid waste while producing emissions below the CCME Canada Wide Standards for Dioxins and Furans and Mercury.

The CY-100-CA-O-D incinerator is designed as Best Available Technology for the incineration of municipal solid waste.
2.3 Incinerator Installation

The two incinerators at Diavik are located within the incinerator building. The building is constructed of materials that are resistant to flames/heat and is equipped with sufficient fresh air to allow operators to operate the incinerators without the need for additional respiratory protection. The incinerator building allows operators and maintenance personnel to work in an environment removed from the extreme arctic environment.
NON-HAZARDOUS WASTE

GARBAGE
Incl. food waste, gloves

NO batteries, aerosol cans or plastic bottles
2.4 Incineration Operation

A detailed training program, which was developed in collaboration with the vendor, is completed for all operators prior to using the incinerator. New operators are mentored by experienced operators prior to being signed off as a competent. Standard operating procedures (SOPs) were developed and are used for Incinerator operation and maintenance.

Waste received at the Incinerator Building is sorted based on the type described in Section 2.1. Kitchen and food waste are considered wet waste and burn less efficiently, whereas paper and cardboard are considered dry and burn more efficiently. Kitchen waste is weighted prior to being transported to the Incinerator Building. The weight of waste from offices and operational areas is known from previous studies, thus number of bags and an average bag weight is used.

The incinerators operate as a batch feed waste system in a non-continuous manner and are equipped with a ram feeder that utilizes a hydraulic arm on a steel plate to push the waste from the charging chamber into the primary chamber. The ram feeder reduces the operator's exposure to heat, smoke and possible explosions from misdirected waste (aerosol cans, batteries, etc.) when charging the incinerator.

Batch incinerators are designed to accept both wet and dry wastes, but operate at maximum efficiency with a mixed load of dry and wet wastes. The incinerators are loaded with a large volume of waste (at a specific wet:dry ratio) prior to the initiation of the burn cycle. Dry waste is loaded first, followed by wet waste. Opening of the primary chamber to rake the material is completed as required.

2.4.1 Plastics

Incinerators in use at Diavik are designed to incinerate plastics safely and in conformance with Environment Canada guidelines.

An incineration waste audit was conducted in the fall of 2015. The audit determined that 49% (by mass) of the waste sent to the incinerator was from the Main and South Camps. This waste included kitchen (70%) and accommodation (30%). The mass of plastic in the kitchen waste was calculated based on known weights and inventory. An average of 54 kg of plastic waste is generated each day from the kitchen. This waste is food contaminated plastic such as food wrap, condiment containers, food containers and milk bags. The mass of plastic waste sent to incinerator represents approximately 5% of the total waste incinerated.

At Diavik it is important that food contaminated waste is incinerated to mitigate potential for the waste to become a wildlife attractant. At the same time Diavik recognizes that reducing the amount of plastics that are incinerated is an additional mitigation measure that can benefit incinerator emissions. Where practical plastics are removed from the incinerator stream. For example large plastic pails (> 5 L) are diverted from the waste stream in the kitchen. These pails are washed by kitchen staff and either reused/repurposed or sent to the inert landfill for disposal.

Diavik will continue to identify plastics that can be practically removed from the incinerator stream. However recognizing that this will not eliminate the incineration of plastics, emphasis
will be placed on the incinerator operations to ensure complete combustion of plastics materials.

2.5 Handling and Disposal of Incinerator Residues
Ash from the primary chamber and water from the scrubber system of the incinerator are regularly removed from the facility. Operators are trained and equipped with the necessary personal protective equipment (PPE) prior to the removal of either waste.

2.5.1 Ash Removal
The volume of waste within the incinerator is reduced by 80-90%. The remaining 10-20% remains as ash or items that will not incinerator that were inadvertently placed in the unit. Ash is removed from the incinerator once it has cooled overnight. The ash is removed from the opposite end that waste is loaded into the unit. Ash is placed in a metal tipper bin and moved outside of the incinerator building. The ash is placed in the adjacent burn pit where untreated wood is burnt. Once an adequate truck load of ash is present, both ash from the incinerators and burn pit is transferred to the onsite inert landfill.

2.5.2 Ash Monitoring
Daily samples of ash (approximately 100 g) will be collected from each of the incinerators by the operator. The sample will be stored in a sealed container with an equal volume of ash added each subsequent day. A composite sample will be collected by the Environment Department each quarter, (March 31, June 30, September 30 and December 31). The samples are sent off site for analysis by an independent laboratory following standard Chain of Custody procedures.

Samples will be analyzed for the following parameters:

<table>
<thead>
<tr>
<th>GNWT Schedule IV Parameters</th>
<th>Leachate Analysis</th>
<th>Total Analysis</th>
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<tbody>
<tr>
<td>Arsenic</td>
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<td>Lead</td>
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<tr>
<td>Barium</td>
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<tr>
<td>Cadmium</td>
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<td>Selenium</td>
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<td>Silver</td>
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<tr>
<td>Zinc</td>
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</table>

1The following GNWT Schedule IV Parameters were not included as it is expected to not be derived from the incineration of municipal solid waste: Carbon Tetrachloride, Cyanide (free), DDT, Endrin, Heptachlor + Heptachlor epoxide, Lindane, Methoxychlor, Methyl ethyl ketone, Metolachlor, PCBs, Tetrachloroethylene, Toxaphene, Trichloromethanes, and 2,4,5-TP (Silvex).

The above parameters were selected from the Guideline for Industrial Waste Discharges in the NWT (GNWT 2004). Parameters from Schedule III of the Guideline were not included as it is expected to not be derived from the incineration of municipal solid waste. The analytical results will be summarized and reported in the appropriate SNP report.
2.5.3 Water Management
Water is used in conjunction with the Venturi scrubber system to remove as much particulate from the hot stack gases entering the Venturi scrubber system as possible. The water is sprayed through pressure nozzles that atomize the water creating a curtain of water that the hot stack gases complete with the particulate pass through; the water scrubs the particulate out of the gases and returns the water to the scrubber tank to be reused in the process. As the water continues to be used in this process it gains the particulate and becomes dirty and unusable. Each week the water is removed and replaced with fresh water. Approximately 1,800 L of wastewater is disposed of in the Processed Kimberlite Containment (PKC) Facility each week.

2.5.4 Scrubber Water Monitoring
Water from the incinerator waste water tank is sampled quarterly (March 31, June 30, September 30 and December 31) by the Environment Department. The samples are sent off site for analysis by an independent laboratory following standard Chain of Custody procedures. Samples will be analyzed for the following parameters:

- Total Metals (including mercury);
- Dioxins and furans; and
- BTEX F1-F4 (as it may be found due to excess fuel use or incomplete combustion during incineration).

The above parameters were selected as probable sources from waste incineration. The analytical results will be summarized and reported in the appropriate SNP report.

2.6 Record Keeping
Waste and incinerator data is collected as hard copies on specified forms during operation. This data is entered into spreadsheets and stored on the company servers which are backed up daily.

Pre-operational and operational checks are completed prior to and during incinerator use as per the vendor guidelines. Primary and secondary burner temperatures are recorded at the commencement of incineration and at the end. The temperatures for each burner are compared to the set point temperature to ensure correct temperatures exist prior to loading the unit with waste. Temperatures are monitored throughout the shift. Abnormal operation is reported to the Waste Management Supervisor.

Bag counts and weights are recorded as waste is loaded into the incinerator.

Maintenance forms are also completed and stored on the company’s server.

Training records are maintained and updated for each operator onsite that is competent to operate the incinerators.

All records are made available to the GNWT Inspector for viewing upon request.
Employee Print Name:___________________________________
Employee’s Signature:__________________________ Date:

Supervisor Print Name:___________________________________
Supervisor’s Signature:____________________________ Date:

PURPOSE: The proper procedure for starting up the incinerator after completing the walk-around check.

HAZARDS: The incinerator may be run continuously to maintain operating temperature, to avoid trouble and delay. Serious injury from moving components or hot accessories can happen. Hot surfaces may cause burns to skin or clothing. Ensure all personnel are clear of surrounding area. Painted deck slippery when wet, clean up and dry off work area.

<table>
<thead>
<tr>
<th>STEP</th>
<th>COMPONENTS – PRIMARY CHAMBER SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Check UF Blower and ensure no blockage to inlet</td>
</tr>
<tr>
<td>2.</td>
<td>Check Auxiliary burners (2) bleeding only need to be done if fuel system has been disrupted.</td>
</tr>
<tr>
<td>3.</td>
<td>Check that fuel supply system, line and valve, ensure valve are open</td>
</tr>
<tr>
<td>4.</td>
<td>Check Contact switches (2) and if ensure no obstruction</td>
</tr>
<tr>
<td>5.</td>
<td>Open the Ash door, the gasket must be intact; and the ash from previous operation has been removed. Ensure door is closed and latched.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP</th>
<th>SECONDARY CHAMBER SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Check Auxiliary burner, bleeding only need to be done if fuel system has been disrupted.</td>
</tr>
<tr>
<td>7.</td>
<td>Check FP Blower, ensure no blockage to inlet</td>
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<tr>
<td>8.</td>
<td>Check stack lid, check integrity of seal, visually check down the stack for buildup around water nozzles near venturi.</td>
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</tbody>
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<thead>
<tr>
<th>STEP</th>
<th>SCRUBBER SECTION</th>
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<tbody>
<tr>
<td>9.</td>
<td>Check Scrubber tank and the water level. If the water is very dirty it must be drained and refilled with clean water.</td>
</tr>
<tr>
<td>10.</td>
<td>Check Make-up water line and valve, ensure valve is open</td>
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</tbody>
</table>
11. Check float valve, ensure free movement and flow
12. Check pH probe and container, ensure probe is immersed in liquid
13. Check Container and sump pump, ensure its clean if needed
14. Bleed line and valves (2) and check upstream valve is closed, downstream open
15. Check Recirculation line and valves (2), ensure both valves are open
16. Check KOH pail, check level and fill or replace if needed
17. Check KOH pump, check tube, replace if needed

<table>
<thead>
<tr>
<th>STEP</th>
<th>ID FAN SECTION</th>
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<tbody>
<tr>
<td>18.</td>
<td>Check drain line, Ensure valve is open.</td>
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<th>STEP</th>
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<td>Check drain line to sump, Ensure valve is open.</td>
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<td>21.</td>
<td>Check drain line, Ensure valve is open.</td>
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<tr>
<th>STEP</th>
<th>RAM FEEDER</th>
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<tr>
<td>22.</td>
<td>Check Electronic eyes (4) on Ram Feeder, ensure cleanliness and no obstruction</td>
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<tr>
<td>23.</td>
<td>Check HAND / OFF / AUTO switch, ensure it is in AUTO position. Check sight glass on hydraulic tank, Pull emergency stop button out to turn power on.</td>
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<table>
<thead>
<tr>
<th>STEP</th>
<th>CONTROL PANEL</th>
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<tbody>
<tr>
<td>24.</td>
<td>AS YOU START UP THE INCINERATOR NOTE IF ALL INDICATOR LIGHTS ARE FUNCTIONING PROPERLY, AND THE PLC SCREEN COMES ON LINE.</td>
</tr>
</tbody>
</table>

Fuel Start: __________   Fuel Finish: __________
Water Start: _________   Water Finish: _________
KOH Start: __________   KOH Finish: __________
Start Time: __________   Finish Time: __________
# Incinerator Temperature Monitoring

**First load of the day**

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<th>2nd Temp</th>
<th>PLC</th>
<th>Ash Bin</th>
<th>1st Temp</th>
<th>2nd Temp</th>
<th>PLC</th>
<th>Ash Bin</th>
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- **1st Temp = Primary Temp**
- **2nd Temp = Secondary Temp**

*All Temperatures must be recorded in celcius*
Diavik Diamond Mine Hydrocarbon Impacted Materials Management Plan

Document #: OPCO-041-0115 R1 – Chapter Three

January 2016
OVERVIEW

Diavik Diamond Mines (2012) Inc. is committed to ensuring that hydrocarbon impacted materials are collected, stored; transported, treated and disposed of in a safe, efficient and environmentally compliant manner.

REVISION HISTORY

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*On DDMI Intranet under HSEQ MS Element 10
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1. **Objective**  
The Hydrocarbon Impacted Materials Management Plan (HIMMP) provides the framework and guidelines for the management of hydrocarbon impacted materials that may be encountered at the Diavik Diamond Mine.

1.1 **Effective Date**  
This plan is effective December 2014. This plan will be reviewed, and updated if required annually on March 31. The next review will be conducted for March 31, 2017.

2. **Scope**  
The HIMMP covers all activities at the Diavik Mine Site and offsite areas such as exploration sites, the community based monitoring camp and monitoring/research areas.

3. **Introduction**  
Hydrocarbon impacted materials are generated at the Diavik Mine from operational activities, such as oil filters from mobile equipment, and from spillage, such as impacted soil and rock. Each hydrocarbon impacted material that is generated at the Mine is identified and dealt with following a standardized procedure.

Efforts to reduce the volume of hydrocarbon impacted materials at the Mine is continually ongoing, especially related to spillage. Preventative maintenance of mobile and stationary equipment is adapted and updated based on root cause analysis of previous incidents that resulted in a spill. Additionally, standard operating procedures (SOPs) and training packages are updated and improved based on incident findings or other information.

3.1 **Spill Reporting**  
The Operational Phase Contingency Plan (OPCP) Version 18 outlines the reporting structure and management procedures for surface and underground spills. All spills at Diavik are reported too, and recorded by the HSE Department. Spills that trigger notification of the Northwest Territories Spill Line are completed within 24 hours of the spill occurrence. All other spills are reported in the monthly SNP Report. An annual spill log is included in the Annual Water License Report, which is submitted on March 31 of each year.

4. **Management Facilities**  
Storage, treatment and disposal facilities for Hydrocarbon Impacted Materials are located at the Mine. An overview of these facilities is presented in Figure 1.
Figure 1

Waste Transfer Area
Waste Oil Burner
Type III Dumps

Diavik Diamond Mines
Environment Department
Lac de Gras
Northwest Territories
2016 January

UTM Zone 12, Nad83
4.1 Landfarm

Landfarming is an ex-situ remediation method in which hydrocarbon contaminated soils are spread out into treatment layers approximately 0.3 – 1.0 m thick to facilitate bioremediation. The addition of nutrients and soil mixing stimulates aerobic microbial activity (Paudyn et al., 2008; Canada, 2013). Factors that control the rate and success of bioremediation include aeration, moisture content, pH, soil nutrients, temperature, and grain size.

The Landfarm is located within the Waste Transfer Area (WTA) (Figure 1). The WTA is an engineered designed containment facility. The Landfarm is constructed as a cell within the WTA, and accepts hydrocarbon impacted soils and gravel which contain fine grained materials. The Landfarm dimensions are approximately 62 m x 43 m x 2.5 m, with a maximum containment volume of 3,780 m³. The Northwest Territories Guideline for Contaminated Site Remediation (2003) classifies fine grained as soil having a median grain size less than 75 µm as defined by the American Society for Testing and Materials.

Currently, hydrocarbon impacted soils are stored/stockpiled in the Landfarm. No active landfarm operations are planned until a sufficient volume of material is present. The following sections describe landfarm operations.

4.2 Landfarm Operations

4.2.1 Aeration

Tilling or soil turnover is completed to aerate the soil, providing oxygen facilitating aerobic respiration in microbes—thus assisting bioremediation. It also acts to mix and evenly distribute nutrients and moisture.
Aeration, through tilling will be completed using available small equipment (e.g. bobcat, mini-excavator) as shown below. Soils would be turned over several times during the summer season to facilitate bioremediation.

![Mini-excavator](image)

4.2.2 Nutrient Addition
Microorganisms require certain amounts of inorganic nutrients that may occur naturally in the soil. If soils are nutrient poor, the addition of commercial fertilizers or sewage sludge may be used to increase phosphorous and nitrogen levels. Nutrient additions, if required, would coincide with tilling schedules to ensure even mixing.

4.2.3 Monitoring
Soil samples will be collected by the Environment Department to determine treatment progress. Samples will be analysed for petroleum hydrocarbons. Samples will be collected pre and post treatment to determine the requirement for further treatment.

4.2.4 Hydrocarbon Impacted Water and Snow
The landfarm also accepts hydrocarbon contaminated snow, ice and water. Absorbent pads are placed on the water, and if required, an oil-water separator is used to collect/remove free product. Remaining water is removed using a vacuum truck and transported to the Processed Kimberlite Containment (PKC) Facility. The PKC is an engineered containment facility designed for the storage of fine and coarse processed kimberlite.

4.3 Type III Waste Rock Dump
The North Country Rock Pile (NCRP) was designed under the direction of a Professional Engineer as described in the Waste Rock Management Plan Version 6.0. The NCRP design includes the placement of rock dependant on sulphur content. Type III waste rock has the
highest sulphur content. Type III waste rock is placed within the centre portions of the NCRP, which reduces the potential for acid generation.

Large diameter rock materials that are impacted by hydrocarbons are disposed of in the Type III Waste Rock Dump.

As described in the Interim Closure and Reclamation Plan Version 3, the Type III dump will be covered to reduce water infiltration and allowed to freeze in place.

4.4 Processed Kimberlite Containment (PKC) Facility

If a spill occurs on Kimberlite Ore during mining or processing operations, the ore is sent to the process plant for processing as per normal operations. Fine and Coarse Processed Kimberlite is transported the PKC for final disposal. The PKC is an engineered containment facility designed for the permanent storage of processed Kimberlite. The facility is designed to meet life of mine requirements.

Hydrocarbon contaminated water is also disposed of in the PKC. Prior to disposal in the PKC, hydrocarbons are removed using absorbent pads, booms and/or skimmers.

4.5 Waste Transfer Area

The Waste Transfer Area (WTA) is a fully lined facility which is designed to allow for the storage and processing of multiple waste streams. The landfarm, sewage sludge holding cell, incinerator building, burn pit, and waste storage is contained within the WTA. The WTA accepts hydrocarbon contaminated materials such as:

- Used absorbents
- Oily rags
- Empty containers
- Used oil/fuel filters
- Hydrocarbon Impacted Water

Waste collected at the WTA is sorted, packaged and stored prior to disposal at an approved facility.

4.6 Waste Oil Boiler

Waste oil from mobile and stationary equipment is stored onsite prior to being processed at the waste oil boiler. The waste oil boiler is used to provide supplemental heat to the backfill plant. The boiler was installed in 2014 and is regulated by the Government of the Northwest Territories. Waste oil tankage is compliant with Environment Canada’s Federal Hydrocarbon Storage Tank Regulations.

5. Recording

The volume of all spilled materials, the area impacted, and the volume of material removed during the clean-up is recorded and stored within the company’s online HSEQ Management Support Tool. The production, transfer and feed rate of waste oil into the waste oil boiler system is recorded and electronically stored on the company’s server. These records can be reviewed by the Inspector upon request.
References


Appendix A

Waste Transfer Area Landfarm As-Built Drawings
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Dust Management

1. Background
WL2015L2-0001 Reasons for Decision require the inclusion of a Dust Management Section in the updated Waste Management Plan, specifically:

- Detail the mitigative actions DDMI has been taking, and will continue to take, in order to decrease the amount of dust generated on site and decrease the potential impact of project-generated dust on the surrounding environment
- Identify and discuss additional options of how to mitigate road-generated dust more effectively, particularly in the shoulder seasons, for instance, by using dust suppressants, changing tire sizes, truck speeds, etc. For each option, provide a rationale as to why DDMI plans to reject or implement the option.
- Outline the current dust monitoring programs in place

Each of the above points is discussed below in Sections 2 – 4.

2. Dust Reduction Mitigation
Dust reduction programs that have been implemented at Diavik include:

- Construction of a rock crushing plant which is 100% enclosed;
- Vehicle reduction program;
- Strict adherence to haul road speed limits (30 km/hr and 60 km/hr);
- Watering of roadways and airstrip during the summer months.
- Application of EK-35 Dust Suppressant to airport apron and helipad.

Additionally, to reduce air emissions the following are in place:

- Use of ultra-low sulphur (~4.3 ppm) diesel fuel;
- Commissioning of incinerators which include secondary combustion chambers and water scrubbers;
- Installation of 9.3 MW windfarm;
- Reduction of Underground heating set point;
- Idling of electrical loads during plant shutdowns; and
- Heat recovery system on the electrical generators.

3. Additional Mitigation Options
To reduce road-generated dust two options exist; the use of 1) dust suppressants and 2) operational modifications.
### Dust Suppressants

The Northwest Territories Dust Suppression Guideline allows for the application of only Calcium Chloride and DL-10 to suppress dust on roadways. While other dust suppressant products exist in the marketplace, DDMI is unaware of other products which are approved for use in the Northwest Territories. DDMI completed an analysis of dust suppressant products and contacted other recorded users to determine effectiveness. The analysis was completed both in attempt to reduce road-generated dust and reduce road maintenance costs. The completed analysis is outlined below:

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<td>• Vendor claim to be “100% Environmentally Friendly”</td>
<td>• Operational Experience at a Nunavut Mine Site showed that the product did not perform well and its use was discontinued.</td>
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<td>EK-35</td>
<td>• Diavik experienced use at Airport • Only product approved by Boeing for use on Gravel Runways</td>
<td>• Not approved by the NWT Dust Suppressant Guideline • Cost prohibitive</td>
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<td>Calcium Chloride</td>
<td>• Approved by the NWT Dust Suppressant Guideline • Used by NWT DOT</td>
<td>• Addition of chlorides to the environment • Requires reapplication throughout the summer to remain effective</td>
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<td>DL-10</td>
<td>• Approved by the NWT Dust Suppressant Guideline • Operational Experience at Other NWT Mine Sites</td>
<td>• Hydrocarbon based product • Requires reapplication throughout the summer to remain effective</td>
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<td>Water</td>
<td>• Readily available • Cost affordable • No addition of potential soil contaminants</td>
<td>• Labour/equipment intensive • Requires continuous application during dry summer months</td>
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Based on the above assessment Diavik is of the opinion that the current practice of applying water to haul roads and airstrip, and EK-35 to the airport apron and helipad remains the best approach which is protective of the environment, sustainable, and practical.

3.2 Operational Modifications

Operational modifications such as road grading, equipment type and size, traffic volumes, tire size and speed limits may all impact road generated dust. Currently roads at Diavik are graded and maintained during the summer months on an as and when required basis. Road grading is typically required following periods of sustained precipitation when rutting occurs. During grading operations, the road surface is thoroughly wetted to decrease dust generation and aid with the grading process.

Commencing in 2012, Diavik reduced the surface haulage fleet and light vehicles numbers by approximately 20%. Currently the minimum number of required equipment is present on site. The tire size of heavy and light equipment is installed as per the manufacturers recommended specifications. Speed limits at Diavik are set at 30 and 60 km/h. These speed limits allow for safe operation of vehicles while minimizing required road and vehicle maintenance.

Typically during the month of May Diavik is unable to water the haul roads because:
1. Ice is still present on Lac de Gras preventing the placement of a pump to feed the seasonal truck fill station; and,
2. Watering roads during the period of overnight freezing conditions would potentially create unsafe driving conditions. Also during this time, increased moisture and freeze-thaw cycles damage haul roads increasing maintenance requirements.

During September local precipitation typically reduces road generated dust. If required, based on local dust level, roads are watered. With the onset of winter each year road dust decreases as the roadways become snow covered and frozen.

4. Dust Monitoring Programs
The following programs are in place at Diavik to monitor and report Dust and Airborne Emissions.

- Dustfall collection and monitoring, reported annually in the AEMP Report;
- Snow core collection and chemical analysis, reported annually in the AEMP Report;
- Continuous Total Suspended Particulate (TSP) monitoring at two locations, as part of the Environmental Air Quality Monitoring Plan as implemented under the Environmental Agreement.
- Annual Greenhouse Gas calculations, reported annually to Environment Canada as part of the National Greenhouse Gas monitoring program.
- Annual emission and road dust calculations, reported annually to Environment Canada’s National Pollutant Release Inventory (NPRI)
- Lichen dustfall monitoring program, completed every three years and reported to ENR as part of the Diavik Wildlife Monitoring Program and the Environmental Agreement Report.
- Vegetation Monitoring plot assessments, completed every three years and reported to ENR as part of the Diavik Wildlife Monitoring Program and the Environmental Agreement Report.
- Occupational air quality monitoring of work spaces and dormitories as required by the NWT Mine Safety Act.