



Oscar Creek Bridge Relocation Project

Waste Management Plan v.1.1

November 2024



Plan Maintenance and Control

Plan Document History

Version #	Section(s) Revised	Description of Revision	Prepared by	Issue Date
0	n/a	Submitted to support applications to the SLWB	K'alo-Stantec	2024-05-14
1.1	1.2	Updated introductory text on regulatory requirements.	K'alo-Stantec	2024-11-01

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Appendix A – Incinerator Management Plan

Abbreviations

CCME	Canadian Council of Ministers of the Environment
GNWT	Government of the Northwest Territories
GNWT-INF	Government of the Northwest Territories Department of Infrastructure
kg	kilogram
km	kilometre
MVLWB	Mackenzie Valley Land and Water Board
MVWR	Mackenzie Valley Winter Road
NWT	Northwest Territories
the Project	Mackenzie Valley Highway Project
ROW	right-of-way
SLUP	Sahtu Land Use Plan
SLWB	Sahtu Land and Water Board
WMP	Waste Management Plan

1 Introduction

1.1 Purpose

The purpose of this Waste Management Plan (WMP) is to identify measures to reduce, recycle, treat, and dispose of wastes associated with the Oscar Creek Bridge Relocation Project (the Project) in accordance with permits, applicable regulations, guidelines, and best practices for remote operations. The overall goal of the plan is to inform project-specific waste management practices to reduce effects of the Project on the environment.

The Project is in the Sahtu Region of the Northwest Territories. The Project includes the relocation of the Oscar Creek Bridge located at KM1054.4 of the Mackenzie Valley Winter Road (MVWR) to a location 2.9 kilometres (km) to the east (upstream), and re-alignment of the MVWR from approximately KM1051 to KM1056 to connect with the new bridge location. The re-alignment requires construction of additional watercourse crossings of the North and South tributaries of Oscar Creek. (Figure 1-1).

The WMP is intended to guide site personnel on the waste management objectives and procedures to be followed during the construction of the Project. The plan objectives are:

- Reduce and manage the effects of waste on the environment
- Provide the necessary direction for site personnel on how to meet waste management responsibilities that originate from legislation, guidelines, and project authorizations, such as the Land Use Permit and Water Licence
- Describe role responsibilities, controls, procedures, training, communication, inspection, and corrective actions as applicable to managing waste at the project site

1.2 Revisions

The WMP was developed in accordance with applicable guidelines and best practices in Northwest Territories and is one of several plans developed for the Project. This WMP is a requirement of, and is complementary to, terms and conditions contained in Land Use Permit S24E-006 and Water Licence S24L8-003 issued to the GNWT.

1.3 Project Overview

The Project includes the following activities to which this plan applies:

- Mobilizing and demobilizing construction equipment to and from work sites
- Site preparation, including clearing, grubbing and construction of a winter road
- Disassembly and relocation of existing Oscar Creek bridge structure to the new location
- Rehabilitation of the old bridge location, including removing material, cutting piles, removing/cutting bin walls and seeding
- Construction of a bridge crossing at the North Tributary and large diameter culvert crossing at the South Tributary
- Construction of bridge approaches
- Construction of temporary crossings and ice platform
- Borrow source development and operations
- Camp accommodations and associated facilities
 - Camp operations
 - Waste management and water use
- Fuel storage and refuelling

1.4 Project Contacts

In the event of waste management inquiries the following key contacts include:

Primary [Contractor] contact:

[Insert Name]
[Title]
[Company name]
[mailing address]
[Phone]
[Fax]
[Email]

Primary GNWT-INF contact:

Chaudary Murtaza Manager, Structures-
Bridges
Department of Infrastructure
Government of the Northwest Territories
PO BOX 1320, 5015 49th Street
Yellowknife, NT X1A 2L9
867-767-9086 Ext. 31127
Chaudary_Murtaza@gov.nt.ca

1.5 Responsibilities

This WMP applies to the Contract Supervisor and its subcontractors for all aspects of the Project. The Project Owner is the GNWT. The following personnel are key project contacts should an inquiry or notification related to waste management occur.

Table 1-1 Roles and Responsibilities

Who	Responsibility
Contractor	<ul style="list-style-type: none"> • Implement this WMP under the direction of the Contractor Supervisor • Make personnel, equipment, and materials available, as required • Take appropriate response measures • Continue implementing the WMP until responsibility is transferred under the authority of the GNWT • Seek necessary approval from waste facilities, and notify facilities of volumes and types of waste disposed of at said facilities
Contractor Supervisor	<ul style="list-style-type: none"> • Supervise the contractor team • Verify that this WMP is available on site at all times • Verify that personnel are trained and competent in the WMP application • Verify that the measures in the WMP are adequately applied • Coordinate mitigative and remedial measures, where required • Conduct regular worksite inspections • Liaise with Project Inspectors
Contractor Project Manager	<ul style="list-style-type: none"> • Maintain records of construction, mitigation, and worksite inspection for waste management activities • Oversee completion of the Project • Support the Contractor Supervisor as required
GNWT-INF	<ul style="list-style-type: none"> • Comply with all permits and licences • Develop press releases and liaise with media directly (if required) • Liaise with the GNWT Inspector, the GNWT Water Resources Officer, government agencies, and public and Indigenous Governments and Indigenous Organizations (as required) • Obtain agreement with municipal governments to receive project wastes in existing municipal waste and wastewater facilities

1.6 Legislation, Guidelines and Policy

This plan has been developed in consideration of the applicable legislation and guidelines, including:

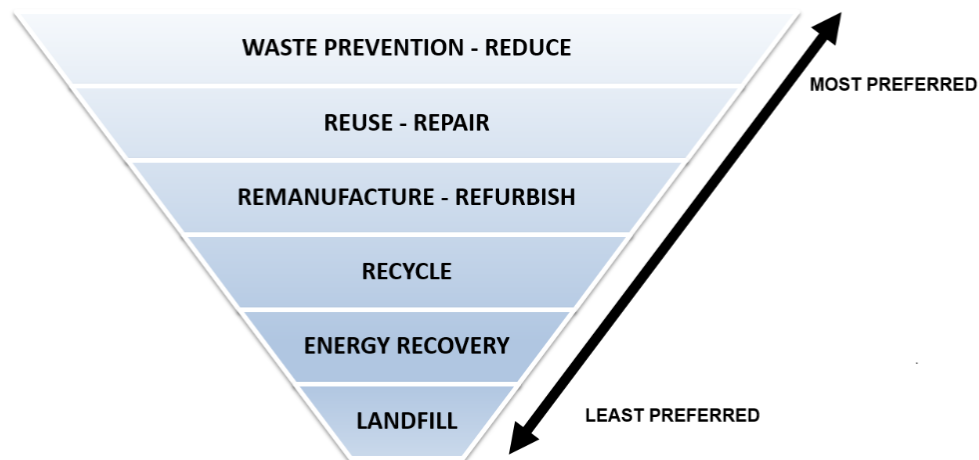
- Northwest Territories *Environmental Protection Act* and regulations (1988)
- Mackenzie Valley *Resource Management Act* (MVRMA) and Land-Use Regulations (CIRNAC, 1998)
- Mackenzie Valley Land and Water Boards Guidelines for Developing a Waste Management Plan (MVLWB, 2011)
- Northwest Territories *Waters Act* and Regulations (2014)
- Guideline for Hazardous Waste Management (GNWT-ENR, 2017)
- Reducing Municipal Solid Waste (Environment and Climate Change Canada [ECCC], 2021)

2 Waste Management

Project waste will be handled based on the approach illustrated in the Waste Management Hierarchy (Figure 2-1). Primarily, the waste generated by the Project will be reduced through selection of supplies and materials and project planning. Waste will be managed at the project site to the extent practicable to limit the need for waste backhaul via application of the waste management hierarchy, which demonstrates the most preferred removal methods. Labelled waste receptacles or storages will be established and available at key project locations. All wastes will be segregated by type to facilitate appropriate waste storage, handling, transfer, and disposal actions.

Certain camp wastes such as sewage, greywater, and domestic wastes are unsuitable for incineration and will be disposed of in the Norman Wells municipal facilities, upon approval from the Senior Administrative Officer, and in accordance with the land use permit. Other wastes, such as recyclables and hazardous wastes, will be transferred to an accredited waste transfer company for disposal. Wastes suitable for incineration will be incinerated on site (see Incinerator Management Plan in Appendix A).

Figure 2-1 Flow Chart of Waste Management Hierarchy



Source: Figure Reproduced from ECCC, 2021

2.1 Waste Locations

There will be several waste management or waste storage locations established at the project site. The camp will include waste transfer and temporary waste management facilities.

2.2 Waste Types and Potential Impacts

The following waste types may be generated by the Project. Waste types and potential volumes are summarized in Table 2-1:

- Domestic Waste
 - Includes food waste, camp waste, office waste, packaging
- Sewage
 - Includes toilet waste but not greywater
- Greywater
 - Wastewater from showers, kitchen, laundry, camp cleaning
- Hazardous Waste
 - Such as batteries, aerosols, solvents, oily rags, glycol, fluorescent lights, empty fuel or oil containers, contaminated soil, contaminated water, used hydraulic hoses, fire extinguishers
- Inert Waste
 - Such as scrap metal, ceramics, glass
- Non-recoverable Waste
 - Such as plastics, rubber (tires, hoses), wood (palettes, lumber)

Food-contaminated wastes and certain hazardous wastes (such as glycol) can become wildlife attractants if not managed properly. Wildlife can become habituated to food waste sources, leading to potential human-wildlife conflicts. Sewage and greywater, if not stored and disposed of properly, can lead to contamination of soils and water. Hazardous waste can adversely affect human and ecological health if it is ingested, absorbed, or inhaled directly, or through contamination of soil, water, or vegetation. Burning and incineration, as methods of managing waste, can release harmful air emissions if not done properly. Table 2-1 summarizes the potential impacts from improper management of each waste type for the Project.

Table 2-1 Waste Generation Source, Volume and Potential Impacts

Waste Type	Source	Volume	Potential Effects
Domestic Waste	Kitchen, camp operations, materials resupply	Estimated at 60 kg per day	Air emissions from burning or incineration, change in wildlife health; increased wildlife mortality risk
Sewage and Greywater	Camp and portable toilets, kitchen, offices, effluent, sewage sludge	2,000 litres per day	Change in water quality; change in wildlife or fish health; change in human health, increased wildlife mortality risk
Hazardous Waste	Camp operations, vehicle maintenance, equipment malfunctions, blasting operations	10 kg/day; 500 litres/month	Soil or groundwater contamination, change in water quality; change in wildlife or fish health; change in human health
Inert Waste	Materials resupply	Estimated at 1,000 kg per year	none
Non-recoverable Waste	Camp operations, vehicle maintenance, materials resupply	Estimated at 1,000 kg per year	Change in air quality; change in water quality; change in wildlife or fish health; change in human health

2.3 Waste Management Procedures

2.3.1 Open Burning

Open burning will not be conducted for this Project.

2.3.2 Incineration

Certain types of waste can be incinerated to reduce the amount of waste to be removed from site and to limit scent attractant to wildlife in the vicinity of the project site. These include:

- Food and food-contaminated waste
- Non-plastic packaging
- Cardboard (food-related)

The decision whether to use an incinerator, and the final type of incinerator is to be determined by the contractor. The incinerator will be suitable for burning mixed solid waste at high temperatures.

In the Northwest Territories (NWT), incinerators are regulated under the NWT *Environmental Protection Act*, the *Canadian Environmental Protection Act*, the *Hazardous Products Act*, and associated regulations. In the absence of an NWT air quality regulatory framework that applies to emissions from incinerators, performance limits for the Project will be in accordance with the emission guidelines set out by the Canadian Council of Ministers of the Environment (CCME):

- Canada-Wide Standard for Dioxins and Furans (CCME, 2001)
- Canada-Wide Standards for Mercury Emissions (CCME, 2000)

If used, the contractor will be responsible for operating the incinerator in accordance with manufacturer's specifications and considering the composition of the waste stream for optimized combustion.

Bottom ash will be stored in odour-proof containers and tested prior to removal from site for disposal at a facility to accept either hazardous or non-hazardous waste.

For incinerator management planning, see Appendix A of this WMP.

2.3.3 Sewage Disposal

Sewage may be managed and disposed of using methods as approved by the Inspector.

Storage and Offsite Disposal: Sewage will be stored in an above-ground temporary holding tank. The tank will be regularly emptied using vacuum truck for disposal to the municipal sewage lagoon in Norman Wells, upon approval from the Senior Administrative Officer. The holding tank's maximum capacity shall include contingency capacity to account for delays in pump out (such as weather conditions). Wastewater treatment is not considered a viable option for short-term construction camps.

The contractor will be responsible for updating procedures related to the management of sewage waste.

2.3.4 Greywater Disposal

Greywater may be managed and disposed of using storage and offsite disposal only.

Storage and Offsite Disposal: Greywater will be stored in an above-ground temporary holding tank. The tank will be regularly emptied using vacuum truck for disposal to a municipal sewage lagoon in Norman Wells, by approval from the Senior Administrative Officer. The holding tank's maximum capacity shall include contingency capacity to account for delays in pump out (such as weather conditions). Offsite disposal was considered for treatment potential and associated environmental benefits in the context of the waste management hierarchy.

Greywater Sump: A greywater sump will not be used for this project.

The contractor will be responsible for updating the procedures related to the operation of the greywater system in accordance with the guidelines and by considering the composition of the waste stream.

2.3.5 Waste Backhaul

Certain types of waste cannot be incinerated, treated, or disposed of at municipal facilities. Wastes to be backhauled to a facility accredited to accept the specific type of wastes include:

- Hazardous waste
- Recyclables
- Inert waste
- Other solid waste if not approved for disposal to municipal facilities

All food-contaminated waste will be stored in wildlife-proof containers and will be removed for disposal regularly. Disposal of plastics will occur at municipal solid waste facilities by approval, as the closest and most logistically feasible option to receive plastic disposal items.

The storage, management, and disposal of hazardous wastes such as batteries, waste fuel and lubricants, oily rags, fluorescent bulbs, glycol, contaminated soil, and empty fuel drums will be in accordance with the Government of the Northwest Territories' Guideline for Hazardous Waste Management (GNWT-ENR, 2017).

Hazardous wastes will be segregated and stored in waterproof, labeled containers prior to removal from site. The transportation of hazardous wastes is regulated under the Transportation of Dangerous Goods Regulations (TC, 2020). All hazardous wastes will be manifested by a certified consignor. Once received, a copy of the manifest signed by the receiver (the facility accepting the waste) will be provided to the GNWT-INF for their records.

The Project may generate recyclable waste such as pop cans and plastic bottles. Recyclable wastes will be segregated and transported to a facility approved to accept recyclable wastes. Disposal of recyclable waste may occur at the Norman Wells Solid Waste Facility, upon approval from the Senior Administrative Officer.

Inert waste types will also be generated by the Project, including items such as scrap metal or glass products. Inert waste will be segregated and transported to a facility approved to accept inert landfill wastes.

In the context of the waste management hierarchy, backhauling certain wastes will allow for safe disposal at an already established waste facility approved to accept such wastes.

2.3.6 Waste Stockpile

Inert materials and certain other non-recoverable wastes generated during construction, such as scrap metal, non-food-contaminated plastics, rubber, and glass, will be crushed if possible and stockpiled onsite for future removal. Materials will be arranged to not pose risk to humans or wildlife.

3 Training, Inspections, Reporting, Records

3.1 Training

All Project personnel will receive training on the purpose and procedures provided in this WMP.

All personnel will receive training in safe work procedures related to storage and handling.

3.2 Inspections

Onsite inspections concerning waste handling, storage, transportation, and disposal areas is required to be conducted by the Contractor Supervisor.

- Inspections of the Hazardous Waste storage area, Waste Stockpile, waste infrastructure and waste receptacles are completed monthly to confirm site compliance with regulatory authorizations (secure area, no standing water, waste labels, waste container integrity, general housekeeping, animal attraction).
- Waste inspections will confirm the amount and types of waste being stored to verify record keeping accuracy.
- Daily general site monitoring will identify and correct for instances of mismanaged waste or related infractions.
- All inspections and monitoring information will be documented.
- In the event of non-conformance, corrective action will be taken and documented.

3.3 Records and Reporting

Prior to disposal, the Project Contractor will track the volume of wastes generated by the Project. Waste tracking will also require information related to the classification of each waste type, storage or holding location of wastes, disposal/treatment option, and destination disposal facility. These records will be used by the project team for continual improvement, analysis, and annual reporting. Additionally, the records can be provided to the Inspector if requested. The tracking information will be used to complete an onsite waste inventory.

All wastes shipped to an offsite receiver will be tracked, recorded, and manifested using the 'Waste Generator Registration Number'. Hazardous waste documentation will occur, as per the Guideline for the General Management of Hazardous Waste (GNWT-ENR, 2017) in the NWT. This information will be forwarded to the GNWT-ECC.

4 References

- CCME (Canadian Council of Ministers of the Environment). 2000. Canada-Wide Standards for Mercury.
- CCME. 2001. Canada-Wide Standards for Dioxins and Furans.
- CIRNAC (Crown-Indigenous Relations and Northern Affairs Canada). 1998. Mackenzie Valley Land Use Regulations. Available at: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-98-429/FullText.html>. Accessed June 2023.
- ECCC (Environment and Climate Change Canada). 2021. Reducing Municipal Solid Waste. Available at: [Reducing municipal solid waste - Canada.ca](https://www.ec.gc.ca/reducing-municipal-solid-waste). Accessed June 2023.
- GNWT (The Government of the Northwest Territories). 2015. Northern Land Use Guidelines, Camp and Support Facilities. Available at: https://www.lands.gov.nt.ca/sites/lands/files/resources/nlug_camps_2015_english_16_sept_2015.pdf. Accessed June 2023.
- GNWT-ENR (The Government of the Northwest Territories-Department of Environment and Natural Resources). 2017. Guideline for Hazardous Waste Management. Available at: https://www.enr.gov.nt.ca/sites/enr/files/resources/128-hazardous_waste-interactive_web_0.pdf. Accessed June 2023.
- MVLWB (Mackenzie Valley Land and Water Board). 2011. Guidelines for Developing a Waste Management Plan. Available at: https://mvlwb.com/sites/default/files/documents/MVLWB-Guidelines-for-Developing-a-Waste-Management-Plan-Mar-31_11-JCWG.pdf. Accessed June 2023.
- SLUPB (Sahtú Land Use Planning Board). 2023. Sahtú Land Use Plan. Government of Northwest Territories. Fort Good Hope. Ratified but not available as of July 19, 2023; see <https://sahtulanduseplan.org/plan>.
- TC (Transport Canada). 2020. Transportation of Dangerous Goods Regulations. Available at: <https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/transportation-dangerous-goods-regulations>. Accessed June 2023.

Appendix A – Incinerator Management Plan



Oscar Creek Bridge Relocation Project

Incinerator Management Plan

November 2024



Plan Maintenance and Control

Plan Document History

Version #	Section(s) Revised	Description of Revision	Prepared by	Issue Date
0	n/a	Submitted to support applications to the SLWB	K'alo-Stantec	2024-05-14

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- Appendix C – Incinerator Records

Abbreviations

CCME	Canadian Council of Ministers of the Environment
EC	Environment Canada
ECCC	Environment and Climate Change Canada
ECC	Environment and Climate Change
GNWT	Government of the Northwest Territories
GNWT-INF	Government of the Northwest Territories - Infrastructure
IMP	Incinerator Management Plan
MVWR	Mackenzie Valley Winter Road
NWT	Northwest Territories
the Project	Mackenzie Valley Highway Project
WMP	Waste Management Plan

1 Introduction

This Incinerator Management Plan (IMP) describes the operational procedures intended to reduce adverse impacts to air and the receiving environment from the incineration of wastes associated with the Oscar Creek Bridge Relocation Project (the Project). This IMP is draft and provides a framework for the Contractor selected by the Government of the Northwest Territories Department of Infrastructure (GNWT-INF) to provide the necessary information to regulatory agencies such as the Sahtu Land and Water Board, should incineration be proposed as a method for waste management.

Incineration is commonly used at remote work sites to assist in the management of specific waste streams via thermal treatment. Incineration is a high temperature, dry oxidation process to reduce organic and combustible waste to an incombustible form (i.e., ash, heat, and flue gas). Incinerating waste reduces scent attractants, which reduces potential to attract wildlife, and reduces waste back-haulage to local landfills. Incinerators can also be advantageous to a remote site for disposal of used oil, which can be burned for heating.

This IMP accompanies and is a complementary document to the Waste Management Plan (WMP). Where appropriate, the IMP may reference the WMP. The IMP was developed to be in line with recommendations with key legislation and guidelines. In this management plan, the following key topics are as follows:

- Operational procedures for waste its incineration
- Location of incineration sites
- Incineration waste stream
- Ash disposal sampling
- Monitoring inspections and maintenance
- Training

The IMP is a living document that will be reviewed and updated as needed to adapt and incorporate any changes in environmental factors, pertinent project-specific changes during construction (e.g., site conditions and design modifications), the Government of the Northwest Territories Department of Infrastructure (GNWT-INF) and Contractor practices, and applicable regulatory changes.

1.1 Project Contacts

In the event of an incinerator accident or malfunction, or for inquiries about project incineration activities, the following key contacts include:

Primary [contractor] contact:

[Insert Name]
[Title]
[Company name]
[mailing address]
[Phone]
[Fax]
[Email]

Primary GNWT-INF Sahtu contact:

[Insert Name]
Regional superintendent, Sahtu Region
Department of Infrastructure
Government of the Northwest Territories
[mailing address]
[Phone]
[Fax]
[Email]

1.2 Roles and Responsibilities

The Contractor is responsible for implementing the IMP and complying with all permits and licences issued to the GNWT. Response roles and responsibilities are outlined below.

Table 1-1 Roles and Responsibilities

Who	Responsibility
Contractor	<ul style="list-style-type: none"> • Develop standard operating procedures associated with management of wastes by incineration • Maintain incinerators in good working order in accordance with manufacturer’s specifications • Implement the IMP under the direction of the Contractor Supervisor • Make personnel, equipment, and materials available, as required • Take appropriate response measures • Continue implementing the IMP until responsibility is transferred under the authority of the GNWT
Contractor Supervisor	<ul style="list-style-type: none"> • Supervise the contractor team • Verify that this IMP is available on-site at all times • Verify that personnel are trained and competent in the IMPs application • Verify that the mitigation measures in the IMP are adequately applied • Conduct regular worksite inspections • Liaise with the GNWT Inspector and the GNWT Water Resources Officer

Who	Responsibility
Contractor Project Manager	<ul style="list-style-type: none"> • Maintain records of incineration activities, mitigation measures, and worksite inspection activities • Support the Contractor Supervisor, as required • Oversee completion and distribution of reporting to the GNWT
GNWT-INF	<ul style="list-style-type: none"> • Comply with all permits and licences • Develop press releases and liaise with media directly (if required) • Liaise with government agencies and public and Indigenous Governments and Indigenous Organizations (as required) • Confirm all reports are completed as required by authorizations

1.3 Legislation and Guidelines

In the Northwest Territories (NWT), incinerators are regulated under the NWT *Environmental Protection Act*, the *Canadian Environmental Protection Act*, the *Hazardous Products Act*, and associated regulations. Additionally, guidelines developed by the Canada Council of Ministers of the Environment (CCME) were also reviewed in preparing this document.

- *Canadian Environmental Protection Act*
 - Toxic substances list: schedule 1
 - Cross-border Movement of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2021-25)
 - Environment Canada (EC) Technical Document for Batch Waste Incineration (EC, 2010)
 - Canada-Wide Standards for Dioxins and Furans (CCME, 2001)
 - Canada-Wide Standards for Mercury (CCME, 2000)
- *Hazardous Products Act*
 - Hazardous Products Regulations (SOR/2015-17)
- *Environmental Protection Act* (Northwest Territories)
 - Used Oil and Waste Fuel Management Regulations (GNWT-ENR, 2003)
 - Environmental Guidelines for Ambient Air Quality Standards (GNWT-ENR, 2014)
 - Guide to Recycling Mercury-Containing Lamps (GNWT-ENR, 2012)
 - Guideline For Industrial Waste Discharges in the NWT (GNWT-ENR, 2004)
 - Guideline for Hazardous Waste Management (GNWT-ENR, 2017)

In the absence of an NWT air quality regulatory framework that applies to emissions from incinerators, performance limits for the Project will be in accordance with the emission guidelines set out by the CCME:

- Canada-Wide Standard for Dioxins and Furans (CCME, 2001)
- Canada-Wide Standards for Mercury Emissions (CCME, 2000)

Ash generation from the incineration process will require disposal. Sampling direction in the NWT Guideline for Hazardous Waste Management (GNWT-ECC, 2017) will inform safe disposal limits. Refer to the WMP for further details.

2 Waste Incineration Operational Procedures

2.1 Incinerator Selection

The Project Contractor will select the type of incinerator with consideration of the types of wastes and amounts to be generated by the Project. Site-specific factors and the requirement to meet the published standards/guidelines will also influence final selection of the incinerator. For example, manufacturers provide different models of controlled air dual-chamber incinerators based on waste volumes and type of waste. *[Incinerator specifications are to be provided by the Contractor as Appendix A to this IMP.]*

2.2 Incinerator Location

The Project will locate the incinerator at the camp. The Project Contractor will choose both the camp location and the location of the incinerator. Incinerators will be placed in a location that is optimized based on predominant wind direction to keep exhaust emissions away from key work areas and accommodations.

2.3 Waste Handling

The contractor will identify specific procedures for waste handling in a Standard Operating Procedure, including but not limited to:

- Hazard identification
- Pre-incineration waste segregation and handling
- Load limits
- Records of confirmatory sampling
- Waste reject records

2.4 Breakdown Contingency

If an incinerator should break down, alternate waste management actions will be taken until such time that a repair can be completed. The alternative methods will be dependent on the length of time that the incinerator is anticipated to be down.

- Temporary storage of waste in sealed containers that are resistant to wildlife damage or entry.
- Backhauling waste on a periodic basis to municipal waste facilities in Norman Wells.

2.5 Incinerator Operation

Operation of project incinerators will be performed according to manufacturer directions and the EC technical guidance document for Batch Waste Incineration (EC, 2010). Specific operational procedures will be updated by the project Contractor following the selection of an incinerator for the Project. General incinerator operational procedures will include:

- Hazard identification
- Operational parameters: such as calorific loading, burn cycling, moisture content, air requirement, fuel burn
- Pre-incineration waste sorting, segregation, and handling
- Incinerator load preparation, limits, calorific specifications
- Records of to be kept for each incineration event
- Waste reject records

2.6 Incinerator Waste Stream

2.6.1 Waste Types for Incineration

Table 2-1 indicates the types of wastes that may be incinerated in approved incinerators, based on the wastes expected to be generated by camp operations. Table 2-1 also details the waste types that are typical of the Project that will not be incinerated.

Table 2-1 Acceptable and Unacceptable Waste Types for Incineration

Waste Type	Suitable for Incineration	Limitations
Unpainted wood and wood with paint removed	✓	
Waste oil	✓	Must meet suitability criteria of Used Oil and Waste Fuel Management Regulations (GNWT, 2003)
Other organic liquids	✓	Must meet suitability criteria of Used Oil and Waste Fuel Management Regulations (GNWT, 2003)
Oily rags	✓	
Kitchen waste (no heavy plastics)	✓	Heavy plastics removed
Paper and cardboard	✓	
Heavy plastics, metal, paint cans	no	Heavy plastics to be washed for landfill disposal
Sewage wastes	no	

Waste Type	Suitable for Incineration	Limitations
Inert materials (concrete, ceramics, ash)	no	
Appliances and electronic devices	no	
Compressed gas (propane tanks, aerosol can, pressurized containers)	no	
Hazardous wastes or toxic substances	no	
Batteries	no	
Light bulbs	no	
Rubber products	no	

2.6.2 Incinerator Ash Sampling & Disposal

Incinerator operations will result in process residual ash that will require removal. The ash will be sampled and analyzed against criteria prior to disposal based on the GNWT Guideline for Hazardous Waste Management Schedules I and II. The sampling is needed to verify that leachable metals, dioxins, and/or furans are not present in the residual ash. If the ash does not exceed the guidelines, it will be classified as a non-hazardous waste and disposed of in a landfill. If the ash is found to exceed one or more parameters of the guidelines, it will be classified as a hazardous waste and stored in containers prior to off-site removal and disposal. The Schedule I and II leachable disposal standards for solid waste and process residual are found in Appendix B.

3 Monitoring, Inspections and Maintenance

All waste that is intended for incineration will be monitored and tracked in a log. Site personnel will track waste volume, weight, fuel usage, and ash volume removal. All ash sampling results will be maintained as monitoring records. Site staff will monitor operational parameters (such as chamber temperature and load weights) during burn cycles and record data concerning the operational efficiency of the incinerator unit. *[A monitoring form is to be provided as Appendix C to this IMP].*

Site personnel will also conduct inspections to verify that safe incineration practices. Prior to incineration start up, site personnel will conduct a circle check and pre-operational inspection of the unit and work area. Daily inspections by staff will be required to audit the workspace for scent attractant, evidence of wildlife presence, litter, spills, and improperly stored waste. Operators will also inspect incineration loads for unapproved waste types prior to starting a burn cycle.

Each incinerator will require routine maintenance, as per the manufacturer's prerequisites. A maintenance log will be created to reflect maintenance activities, dates, personnel involved, observations, issue identification, and repairs. Descriptions of malfunctions and related repairs or corrective actions will be logged as part of the maintenance history for each incinerator. Regular maintenance will be required as a key aspect for safe incineration.

4 Training

All incinerator operators will be required to complete training prior to initiating incineration activities. The training will be created based on the training manual provided by the incinerator manufacturer. Training will include awareness of Environment and Climate Change Canada's (ECCC's) Technical Document for Batch Waste Incineration (EC, 2010).

The training will cover topics such as:

- Job hazards related to incineration operation
- Safety procedures, personal protective equipment, and risk assessment
- Identification of waste types and waste composition for burn efficiency
- Incinerator start up, operation, shut-down, and emergency shut-down procedures
- Incinerator ash sampling, ash removal, and safe disposal
- Maintenance procedures
- Record keeping

All site personnel will receive waste management awareness training to verify that they are aware of incineration requirements, dangers, and risk associated with improper segregation of waste, as it relates to incinerator operation.

5 References

- CCME (Canadian Council of Ministers of the Environment). 2000. Canada-Wide Standards for Mercury.
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- EC (Environment Canada). 2010. Technical Document for Batch Waste Incineration. Available at: https://publications.gc.ca/collections/collection_2010/ec/En14-17-1-2010-eng.pdf. Accessed June 2023.
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- GNWT-ENR. 2012. Guide to Recycling Mercury-containing lamps. Yellowknife, NWT. Available at: http://www.gov.nt.ca/ecc/sites/ecc/files/brochures/mcl_recycling_per_web_2012_guide.pdf. Accessed June 2023.
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- GNWT-ENR. 2017. Guideline for Hazardous Waste Management. Yellowknife, NWT. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/128-hazardous_waste-interactive_web_0.pdf. Accessed June 2023.

Appendix A – Incinerator Manual

[Placeholder]

Appendix B – Leachate Disposal Standards for Solid Waste/Process Residuals

**Oscar Creek Bridge Relocation Project
Incinerator Management Plan**

Appendix B – Leachate Disposal Standards for Solid Waste/Process Residuals

Item	Parameter	Concentration (mg/L)	Item	Parameter	Concentration (mg/L)
1.	Antimony	0.6	25.	Ethyl benzene	0.24
2.	Arsenic	2.5	26.	Fluoride	150
3.	Barium	100	27.	Hexachlorobenzene	0.13
4.	Benzene	0.5	28.	Hexachlorobutadiene	0.5
5.	Beryllium	5.0	29.	Hexachloroethane	3.0
6.	Boron	500	30.	Lead	5.0
7.	Cadmium	0.5	31.	Mercury	0.1
8.	Carbon tetrachloride (Tetrachloromethane)	0.5	32.	Methyl ethyl ketone / Ethyl methyl ketone	200
9.	Chloramines	300	33.	Naphthalene	0.5
10.	Chlorobenzene (Monochlorobenzene)	8.0	34.	Nitrate + Nitrite	1000
11.	Chloroform	6.0	35.	Nitrilotriacetic acid (NTA)	40
12.	Chromium	5.0	36.	Nitrite	320
13.	Cobalt	100	37.	Nitrobenzene	2
14.	Copper	100	38.	Pentachlorophenol	6.0
15.	Cresol (Mixture – total of all isomers, when isomers cannot be differentiated)	200	39.	Pyridine	5.0
16.	Cyanide	20	40.	Selenium	1.0
17.	2,4-DCP / (2,4-Dichlorophenol)	90	41.	Silver	5.0
18.	1,2-Dichlorobenzene (o-Dichlorobenzene)	20	42.	Tetrachloroethylene	3.0
19.	1,4-Dichlorobenzene (p-Dichlorobenzene)	0.5	43.	2,3,4,6-Tetrachlorophenol / (2,3,4,6-TeCP)	10
20.	1,2-Dichloroethane (Ethylene dichloride)	0.5	44.	Toluene	2.4
21.	1,1-Dichloroethylene (Vinylidene chloride)	1.4	45.	Trichloroethylene	0.5
22.	Dichloromethane (also see – methylene chloride)	5.0	46.	Trihalomethanes – Total (also see – Chloroform)	10
23.	2,4-Dinitrotoluene	0.13	47.	Uranium	2.0
24.	Polychlorinated dibenzo dioxins and furans (TEQ)	0.0000015	48.	Xylene	0.5
			49.	Zinc	500

Schedule II: Dioxin Toxicity Equivalency Factors

Column I – Congeners	Column II – TEF*
2,3,7,8-tetrachlorodibenzo-p-dioxin	1.0
1,2,3,7,8-pentachlorodibenzo-p-dioxin	0.5
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	0.1
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	0.1
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	0.1
1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	0.01
octachlorodibenzo-p-dioxin	0.001
2,3,7,8-tetrachlorodibenzofuran	0.1
1,2,3,7,8-pentachlorodibenzofuran	0.05
2,3,4,7,8-pentachlorodibenzofuran	0.5
1,2,3,4,7,8-hexachlorodibenzofuran	0.1
1,2,3,6,7,8-hexachlorodibenzofuran	0.1
1,2,3,7,8,9-hexachlorodibenzofuran	0.1
2,3,4,6,7,8-hexachlorodibenzofuran	0.1
1,2,3,4,6,7,8-heptachlorodibenzofuran	0.01
1,2,3,4,7,8,9-heptachlorodibenzofuran	0.01
octachlorodibenzofuran	0.001

* Toxicity Equivalency Factor

Appendix C – Incinerator Records

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