	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

SIGNATURE

DATE

PREPARED BY: Ed Cocchiarella *Cocchiarella* July 22, 2020
REVIEWED BY: Shelley Cox _____
APPROVED BY: Darren Toner _____

ISSUE/REVISION INDEX

Issue Code	Revision					Revision Details
	No.	Prep. By	Rev. By	App. By	Date	

Issue Codes: RC = Released for Construction, RD = Released for Design, RF = Released for Fabrication, RI = Released for Information, RP = Released for Purchase, RQ = Released for Quotation, RR = Released for Review and Comments.



	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				


TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Purpose	4
1.2	Objectives	4
1.3	Scope	4
1.4	Regulatory and Other Requirements	4
2.0	ROLES AND RESPONSIBILITIES	5
3.0	WASTE TYPES AND QUANTITIES	10
3.1	Construction and Demolition Wastes	10
3.2	Excavated Soils	11
3.3	Hazardous Substances and Wastes	11
4.0	WASTE MANAGEMENT	11
4.1	Reduction and Reuse	11
4.2	Source Separation and Recycling	12
4.3	Excavated Soils	13
4.4	Soil Management and Disposal Criteria	15
4.5	Non-Hazardous Waste	16
4.6	Hazardous Waste	16
4.7	Storage of Hazardous Waste	17
4.8	Transportation of Hazardous Waste	19
5.0	EXISTING WASTE MANAGEMENT PRACTICES	19
5.1	On-Site Disposal	19
5.1.1	Sudbury Tailings Area Landfill	19
5.1.2	Thompson Waste Management Facility (WMF)	21
6.0	TRAINING	23
7.0	MONITORING AND REPORTING	24
8.0	REFERENCES	25

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
		Review 2 year		
North Atlantic Projects Group				

LIST OF APPENDICES

Appendix A Summary of Regulatory Requirements for Ontario Operations

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

1.0 INTRODUCTION

1.1 Purpose

The purpose of the Waste Management Plan (WMP, the Plan) is to provide guidance to project personnel on the handling, processing and disposal of waste, including hazardous waste and excess materials, generated during construction activities (which includes demolition of obsolete equipment and buildings) for NAPG projects.

1.2 Objectives

The objectives of the WMP include:


- Where required, making application and/or submitting required documentation for regulatory approvals and notifications, and receiving approvals as per the project schedule;
- Performance of waste audits, preparation of waste reduction work plans (WRWPs), and development of source separation programs in accordance with applicable regulations;
- Implementing WRWPs and source separation programs in order to minimize the waste generated through reuse and recycling, where practical;
- Managing hazardous wastes in accordance with regulatory requirements and in such a way as to protect personnel and the public from unnecessary exposure;
- Defining waste handling and disposal requirements and managing these activities during the project;
- Providing training to personnel on waste management and disposal, including safety issues related to onsite landfills at host operations, and requirements for manifests and record keeping for designated staff; and,
- Coordinating project waste management activities with on-going waste management activities and integrating where possible with host site programs.

1.3 Scope

The WMP provides the requirements for waste management planning, waste processing and waste disposal for demolition and construction activities on project sites. The Plan requirements apply to all site personnel including Vale employees and Contractors to the project where appropriate.

1.4 Regulatory and Other Requirements

The regulatory and other requirements associated with waste management on the NAPG Project sites are summarized in Appendix A and detailed in the Project Permitting Plan.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

2.0 ROLES AND RESPONSIBILITIES

The following table identifies roles and responsibilities specific to waste management that are applicable for NAPG projects. These roles may not necessarily align with project job titles, which may vary depending on the organization of a project. However, the responsibilities listed must be assigned to jobs at each project.


NAPG HSER Manager will approve any modifications or changes made to the WMP

Project Construction Manager is responsible for the following activities:

- Ensure regulatory permits related to waste management are obtained where required.
- May inspect and audit waste management activities and infrastructure.
- Encourage efficient use of resources through the 3R's.
- Management of on-site waste storage facility and associated programs.
- Provide pre-arranged storage areas for waste handling, sorting and collection.
- Report waste generated from the project through existing site contracts, where applicable.
- Classify wastes generated from the project prior to disposal.
- Ensure waste receiving limits at any onsite landfill are not exceeded.
- Implement and ensure compliance with this WMP, and applicable regulations and guidelines through planning, training, managing, monitoring, auditing and reporting.
- Adopt the Vale approach/system of waste management.

Area Construction Manager/ Superintendent will have the following responsibilities:

- Oversee and monitor the Contractors in charge of providing waste management services related to the Project.
- Coordinate collection schedules by waste management Contractors and ensure adequate quantity, size and location of waste containers.
- Oversee Construction / Demolition Contractors to ensure that the WMP is implemented and wastes are segregated as required by the source separation program.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				


- Ensure all hazardous wastes are transferred in accordance with the TDGA, including appropriate waste manifesting.
- Utilize the host site's internal waste management system and the internal manifest, if available to the project.
- If there is an on-site landfill available to the project, oversee transfer of waste to the landfill.

Waste Management Contractors will execute their contract as per the mutually agreed upon scope of work and additionally the following items:

- Collect and haul wastes and/or recyclable materials in compliance with the WMP, applicable regulations and standards, and waste management contract.
- Provide adequate containment for two to three days of waste for each designated waste type for all non-demolition waste.
- Maintain source separated material stockpiles and containers and remove material for recycling frequently to avoid excessive accumulations.
- If materials are to be processed on-site, arrange for frequency of processing that will address stockpile size as well as meet material requirements (e.g. crushed concrete to be used as aggregate).
- Maintain waste collection and recycling receptacles and hazardous waste storage areas in an orderly condition.
- Provide hazardous material storage containers with appropriate labeling to store any hazardous waste generated on site from activities not related to demolition. Arrange for the collection of hazardous wastes in accordance with all Provincial regulations and supervise the loading of hazardous wastes.
- Haul materials to designated approved waste management facilities.
- Follow manifesting and transportation procedures as required by the project and regulations.
- Ensure appropriate staff is trained for handling (WHMIS) and transfer of dangerous goods (TDG), and spill response. Provide training to staff as required.
- Provide records to the Project as required.

Construction and Demolition Contractors are responsible for the following:

- Attend kick-off meeting, orientation and any other required training.


	Waste Management Plan NAPG-ENV-SPI-0002		Revision		
		#	Date		
	Report No. (DM#): 1452742		00	2020-03-10	
				Review 2 year	
North Atlantic Projects Group					

- Minimize waste generation through efficient use of resources.
- Implementing best work practices and green procurement policies where possible.
- Where required, prepare a waste reduction work plan that details all proposals to reduce waste by recycling and reuse, where possible. Within the Demolition Plan minimize waste generation and maximize recycling & re-use opportunities.
- Ensure on-site handling of hazardous wastes is carried out in compliance with this WMP and applicable health, safety and environmental regulations and standards.
- Ensure that all waste generated on the site is segregated as per the source separation program.
- Request in advance and utilize bins provided for the collection of construction/demolition waste.
- Ensure all waste generated is removed off-site for recovery or disposal promptly by licensed facilities, with no hazardous waste storage on-site.
- Ensure that staff (including waste haulers) accessing any on-site landfill have been trained (if required) and have been issued authorization to enter the landfill (completed any required PMRAs and JHAs).


Contracts Manager will prepare the procurement packages for waste management services, equipment, and facilities specific to the project, and oversee the tendering process, or provide scope input to Vale for an extension to an existing contract.

NAPG Environmental Lead has the following responsibilities for waste management on the project site:

- For brownfield projects, coordinate project waste management with the host site's waste management system and ensure project wastes are acceptable by the host site's permits.
- Preparation of all necessary documentation and applications for changes to the permits and approvals if required.
- Set up system to collect, store and dispose of small quantities of hazardous wastes, e.g., spill clean-up materials or chemical residues, including managing inventory and shipping in accordance with regulations.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision		
		#	Date		
	Report No. (DM#): 1452742		00	2020-03-10	
				Review 2 year	
North Atlantic Projects Group					

- Undertake waste audits, and develop waste reduction work plans, and source separation programs in compliance with regulations. Recommend changes to the WMP as appropriate based upon the plan and program(s).
- Address all reported or identified issues of non-conformance with this WMP and/or a regulation and specify corrective actions to be undertaken.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				


The **NAPG HSE Advisor** will support the project with the following tasks:

- Provide training to promote workforce awareness of waste management matters. Ensure all staff involved in the management of hazardous materials and wastes have received appropriate training in waste handling emergency/spill response, TDG and waste manifest completion.
- Audit on-site landfill operations and off-site waste disposal/recycling facilities to verify waste manifests, as required.
- Track inventory of wastes disposed on-site and off-site.
- Assist with classification of wastes generated from the project prior to disposal.

All On-Site Project Personnel will:

- Attend any required waste management training including the kick-off meeting and project orientation.
- Follow all requirements of this WMP, including source separation, proper material handling and good housekeeping.
- Inform supervisor (or designate) immediately when a spill or other issue of non-compliance with this WMP and/or a regulation occurs.

Role	Responsibility
Vale Centre for Materials Disposal (CMD)	<ul style="list-style-type: none"> • Part of Shared Services Organization that sells scrap, surplus equipment and other materials to recover value for Vale; • Maintains an area in an Operation site for storage of Disposable Materials (e.g., Available for use, and scrap materials) until their disposition; ^[1]_[SEP] • Evaluates surplus equipment for potential sale.
On-Site Waste Receiver (On-site landfill, if available)	<ul style="list-style-type: none"> • Manage waste and cover materials in accordance with the existing permits, as well as municipal, provincial and federal requirements. • Sign off on all waste manifests (as the Receiver) for internal site transfer of accepted wastes from the project. • Segregate non-compliant wastes from the project and report issues of non-compliance to the project. • Provide records to the project as required.
Off-Site Waste Receivers	<ul style="list-style-type: none"> • Follow proper manifesting procedures for hazardous waste. • Ensure the facility is licensed to receive, store, treat and/or or dispose of project waste.

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

3.0 WASTE TYPES AND QUANTITIES

Each NAPG project must develop an annual waste audit and waste reduction work plan (WRWP) undertaken by the Environment Lead. In Ontario these must comply with the requirements of Regulation 102 (Waste Audits and Waste Reduction Work Plans). The annual waste audit ensures that waste estimates are accurate and considers major scope changes. The annual waste audits include wastes generated from both construction and demolition contracts to be completed in that year. Wastes generally included in the audit are all waste generated by all normal activities at the site of the construction and demolition of obsolete equipment and buildings.

Based on the results of the Waste Audit, the Project must prepare and implement WRWPs to reduce, reuse and recycle waste generated during construction/demolition/mining activities. The WRWPs focus on those materials that constitute the largest proportion of the waste stream, as well as those products for which there are available waste diversion opportunities. They also take into consideration regulatory requirements, costs and benefits of waste reduction opportunities, and available disposal limitations and reference waste reduction plans developed by retained construction and demolition contractors.


The WRWPs identify the objectives, targets and responsibilities for waste diversion. The Project communicates the WRWP requirements to workers at the site and, the plan or a summary is posted at the site in a place where most of the workers will see it.

The Waste Audit and WRWP reports are retained by Vale. A discussion of key waste types likely to be encountered is provided below.

3.1 Construction and Demolition Wastes

Waste Audits are typically completed prior to the start of the actual construction/demolition activities. During the waste audit a review of the project plans, construction/demolition activities, construction processes, materials proposed to be used and data sheets with actual waste quantities generated from similar activities is completed to provide a high-level estimate of the amount and type of waste expected to be generated in the current year. A written report may be issued with the contract.

As a part of the annual waste audit and development of the WRWP, waste quantity estimates associated with construction/demolition are refined and verified as discussed in Sections 4.1. Before construction begins each project should set their waste disposal policy depending on site-specific conditions, e.g., types and quantities of wastes generated, available on-site landfill capacity and permit restrictions, available local disposal and recycling options. For example, a project may set a policy that, unless otherwise specified, all Construction and Demolition wastes (not recyclables) generated by Contractors remains the property of Vale and must be disposed by Vale at the site landfill or through existing operations disposal contracts. Such a policy may help ensure wastes are properly disposed at a lower cost to the project.

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

For demolition projects; during the FEL study, the local CMD representative must walk through the site to determine what equipment is salvageable and may be sold through this department.

3.2 Excavated Soils

Prior to any excavation, estimated quantities of excavated soil and rock should be provided to the Project. An NAPG excavation permit and approval from the Project Construction Manager and the host Vale operation is required. Soil meeting standards may be re-used, and any excess soil may be directed to a suitable landfill.

At some brownfield sites excavated materials may include historical deposits of slag and metal-bearing raw or intermediate materials associated with processing the ore/rock as well as former building foundations and underground structures. Efforts should be made to re-process metal-bearing materials and process old concrete as aggregate.

Excavated rock should be evaluated for potential to produce acid rock drainage (ARD). Excavated rock found to produce ARD must be stored on designated pads with suitable drainage collection and treatment. Sub-aqueous disposal with tailings may be appropriate if allowed by site permits.

Refer to Section 4.0 for further detail on management of excavated soil.

3.3 Hazardous Substances and Wastes


Hazardous substances and wastes (identified as “designated substances” and “subject wastes” in Ontario) may be generated during the demolition work. The Project must complete hazardous substance and materials surveys (HSM) prior to demolition work, which outlines the anticipated types and quantities of hazardous substances and hazardous materials and disposal requirements. Refer to the *Environmental Management Plan for Demolition* for detail of this process. The HSM survey and disposal of hazardous substances must comply with all regulatory requirements, and align with Vale’s Standard Procedure Instructions for asbestos, PCBs, mercury, lead, hazardous and liquid industrial wastes. Other hazardous wastes that may be generated include residual process chemicals.

4.0 WASTE MANAGEMENT

4.1 Reduction and Reuse

As referenced in Section 3, Waste Audits and WRWPs are produced annually for the Project. Specific waste reduction commitments may include:

- Remove all salvageable material and equipment prior to beginning the demolition activities;

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

- Collect and re-process residual process dust collected from the planned work areas prior to beginning demolition activities;
- Minimize waste by segregation and adopting effective 3Rs initiatives;
- Identified, test, store and manage potentially contaminated materials accordingly;
- Where practical crush all excess concrete for reuse as fill material on the Project or shipped to the landfill to be used as cover material;
- Reuse or recycle all steel scrap generated from the construction activities;
- Collect domestic waste generated by onsite workers in separate bins according to the type;
- Packaging wastes may consist of recyclable materials including wood, plastics, cardboard and papers. Return wood pallets for reuse by the supplier or chipped up and reused as dust suppressant.
- For remote sites, burning some waste types may be allowed by permit.
- Some wastes from the use of explosives may require burning.

WRWP requirements must be communicated to workers at the site and a summary posted in a place where most of the workers will see it.


Construction and demolition contractors shall be provided a copy of the Waste Audit and WRWP and are required to follow the reduction and reuse requirements described therein.

Prior to initiation of demolition works, Vale may inspect buildings and areas to be demolished to identify any salvageable material and equipment. This material may be removed by Vale personnel before demolition activities begin. Alternately, Vale may require the successful Contractor to complete this work.

4.2 Source Separation and Recycling

Each project must assess source separation and recycling opportunities as part of their annual WRWP. Opportunities will be highly dependent on outlets for materials and provincial regulations.

Note for Ontario Projects: O. Reg. 103 requires that a source separation program (SSP) be implemented prior to and during the construction and demolition works as outlined in the Waste Audit and WRWP, and that materials be directed to recyclers or reused as specified in the plan. In accordance with O. Reg. 103, source separation categories for construction and demolition projects include brick and Portland cement concrete, steel and unpainted or otherwise untreated wood. Construction projects also have two additional categories, corrugated cardboard and unpainted drywall.

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

Unless otherwise specified, the waste management contractor shall provide waste and recycling collection bins. Contractors shall request collection bins in advance and separate waste material generated during construction.

Demolition Contractors shall separate demolition waste into waste collection containers that they provide as per contract specifications. Demolition contractors may dispose of material deemed unrecyclable at an on-site landfill providing it meets the waste acceptance criteria and is provided for in the demolition contract. The demolition contractor shall transport of recyclable materials to the recycling facility and provide Vale with records of material quantities in accordance with contract conditions. Recyclable materials should be inspected to ensure it does not contain hazardous or non-recyclable material prior to being transported to the recycling facility. Contamination may result in the entire load being rejected or returned for sorting.

Contractors shall separate recyclable 'office' materials depending on what materials are practical to recycle and there are reasonable outlets for the materials as determined by the WRPR. Where possible employ reusable items instead of single use cups, cutlery, stir sticks, etc. Recyclable materials may include:


- aluminum food or beverage containers,
- cardboard (corrugated),
- fine paper,
- glass bottles and jars for food or beverages,
- newsprint, and
- steel food or beverage containers.
- Plastic food or beverage containers.

Recycling bins are provided in the Project office and waste is removed by the janitorial Contractors. However, Contractors who are bringing their own trailers to site are required to provide their own recycling bins. Contractors shall use clear plastic bags for their recyclable materials.

4.3 Excavated Soils

Each project should adopt Vale's current practices for managing excavated soil with the intent of meeting all regulatory requirements, minimizing on-site disposal and particularly off-site disposal, and recovering metals to the extent possible. In general, the following process should be followed:

Prior to beginning demolition or construction excavations, assess the site's excavation locations for potential contamination by reviewing previous soil or groundwater analyses, historical industrial/mining activities, spill history and other relevant information.

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

Identify if any areas may have potential to recover metal bearing materials. This determination should be conducted in collaboration with Vale’s Materials Management Group.

The investigations may entail collecting samples using boreholes, grab sampling from stockpiled materials, and/or test pits. Several samples enough to characterize the surface and sub-surface soils or rock to the proposed excavation depth in each area shall be submitted to a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory for analyses.

Laboratory bulk analyses are used to provide basic analytical data on investigated soils, with a focus on its metals content to assess its potential for metal recovery. Petroleum Hydrocarbon (PHC) analysis is only completed if evidence of hydrocarbon contamination exists (for example, staining or odours). Soils may also be analyzed for other organic and inorganic parameters, as required, and results compared against the established criteria.

Vale’s Materials Management Group may assess soils with significant concentrations of nickel, copper and zinc and without any visual evidence of hydrocarbon contamination as a potential revert material.

The Project in cooperation with the host site’s environmental group, if applicable, shall assess soil/rock characterization analyses compared to applicable disposal criteria (Section 4.4). Further investigations may be required to determine the extent of contamination in the area or if the rock is acid generating, the volume to be excavated and the recommended disposal or remediation options.


Samples that do not meet the noted criteria are subject to a Toxicity Characteristic Leaching Procedure (TCLP) to determine if they can be disposed of at an on-site landfill, if available, or whether they are to be classified as hazardous waste for off-site disposal. TCLP testing for metals, petroleum hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs) and other potential contaminants of concern are conducted for excess soils unsuitable for reuse with results compared to local standards. Soils that do not meet standards are leachate toxic and must be directed to a licensed disposal or treatment facility.

If analytical results of soils suspected of contamination indicate concentrations of chemicals of concern lower than the applicable criteria, the soils may be reused on-site with the approval from the host site’s Environment group or the project Environment Lead, as appropriate.

Where appropriate topsoil should be stripped and stockpiled separately from underlying soil and reused in site restoration, landscaping and/or resurfacing.

Maximize the use of excavated soil as backfill while avoiding placing clean material in remediation areas unless necessary;

Store surplus re-usable (clean) fill with appropriate dust controls for future application, Vale approval is required for long-term stockpiling;

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

Where unable to use elsewhere on-site, disposing of unusable soil at the on-site landfill, if available, providing it meets the acceptance criteria; and

All contaminated soil must be stored in a designated area and managed in such a manner as to prevent the migration of contamination. Stockpiles of material that fail the TCLP test must be covered with polyethylene tarp during periods of inactivity and inspected and reported on daily. These stockpiles must be disposed of within three months of initial storage. Documentation including bills of lading, and waste manifests also need to be prepared.

Dispose of leachate toxic soil (soil that does not meet the landfill acceptance criteria) off-site at a licensed hazardous waste disposal/ treatment facility.

4.4 Soil Management and Disposal Criteria

NAPG projects must follow soil management and disposal practices applicable to the project's jurisdiction. The regulations for jurisdictions where Vale have operations include the following:

a) Ontario


- Ontario Regulation 153/04 (Records of Site Condition Part XV.1 of the Act);
- Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" (MOE, May 1996);
- Soil, Ground Water and Sediment Standards, for Use under Part XV.1 of the *Environmental Protection Act*.

b) Manitoba

- Contaminated Sites Remediation Act and Regulations
- Requires reporting when the owner/occupier becomes aware of site contamination.
- Uses 3 tiers of standards to determine contamination. Secondary or tertiary tiers standard are used when there are no applicable standards in the upper tiers.

Primary Standards:

- Canadian Council of Ministers of Environment (CCME), Environmental Quality Guidelines, 1999.
- CCME, Canada-Wide Standards for Petroleum Hydrocarbons in Soil, 2008.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

- Health Canada, Guidelines for Canadian Drinking Water Quality—Summary Table, 2012.

Secondary Standards:

- Soil, ground water and sediment standards for use under Part XV.1 of the Environmental Protection Act, 2011.

Tertiary Standards:

- Government of Alberta, Alberta Tier 1 Solid and Groundwater Remediation Guidelines, 2010.

c) Newfoundland and Labrador

- Protocol for the Management of Excavated Soils, Concrete Rubble and Dredged Materials
- Standards used include Atlantic Partnership in RBCA (Risk-Based Corrective Action) Implementation Guidelines or CCME soil quality Guidelines (same as Manitoba).

4.5 Non-Hazardous Waste


As far as possible, each project should utilize the host site’s existing waste management system, regarding non-hazardous wastes.

For convenience, waste containers for source-separated materials may be placed adjacent to work areas where space is available, and location is accessible by the Waste Management Contractors. These containers should be sized to accommodate two to three days of material. All waste and recyclable containers should be colour coded as per the existing site’s waste management system. Waste containers should not be filled to overflowing and containers should be requested in advance to ensure they are available. Containers should also be covered except when adding or removing waste. Regular cleaning of work areas and laydown areas is required to prevent waste accumulation.

Each project must set up an acceptable practice for concrete washout. For example, washout of the chute may be allowed on site if the washout water is retained and allowed to dry to facilitate disposal of the concrete.

4.6 Hazardous Waste

As far as possible, the programs for hazardous waste generated by a project should utilize the existing waste management system. However, there maybe certain regulatory requirements that must be addressed about new wastes that may be generated by the Project, including the registration (including classification and characterization) of all new hazardous wastes (subject

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

wastes in Ontario). Classification and registration of new wastes is the responsibility of Vale operations for the host site, if applicable. The Project's Environmental Lead shall provide information to Vale to allow new wastes to be classified and registered.

For projects at Sudbury sites, small hydrocarbon spills may occur during project work with small quantities (less than 1 tonne/spill) of hydrocarbon-impacted soil directed to the Tailings Area Landfill. The Landfill operator has final oversight on all materials being deposited into the landfill, including contaminated soil. Clean-up material and contaminated soil from minor spills and leaks shall be managed the same as hazardous waste.

4.7 Storage of Hazardous Waste

Large quantities of hazardous waste shall be packaged and removed from site by a qualified contractor as it is being generated. However, small quantities of hazardous waste, and spill clean-up material or contaminated soil, may be temporarily stored in a small quantities hazardous waste storage area within the Contractor's laydown area. No liquid hazardous waste (e.g., oil, paint, thinners, etc.) shall be disposed of into any drain.

Requirements of Contractor's small quantity waste storage area:

Roped-off with a status tag;

Separate containers for incompatible materials, which may include providing enough space between or physical separation between containers. For example, flammable substances must be kept away from ignition sources and oxidizing agents, acids must be kept away from alkalis and other materials with which they could vigorously react, and strong corrosive agents must be kept away from gas cylinders and other types of containers;

Allow storage in closed, leak-proof containers away from direct sunlight, wind and rain;


Include secondary containment systems constructed with materials appropriate for the wastes being contained and adequate to prevent loss to the environment. The containment must be designed to hold the contents of either 110% of the largest container or 25% of the total volume stored, whichever is greater;

Have adequate ventilation where volatile wastes are stored;

Be serviced frequently so that storage duration does not exceed 90 days, unless otherwise approved by local authorities;

Be enclosed and protected from the elements;

Ensure that liquid hazardous waste is collected in drums no larger than 200 L protected by adequate containment for spills and accidental releases;

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

Provide dedicated containers for the storage of spent fluorescent tubes/bulbs, mercury vapour lamps and PCB containing light ballasts;

Ensure that sealed drums or containers containing flammable or volatile waste are stored to avoid the risk of ballooning or pressure build-up.


A hazardous waste storage area must be equipped with an appropriate fire extinguisher, spill kit, eye-wash, first aid kit, and telephone or other communication system to allow for adequate emergency notification. The contractor managing the area shall perform routine visual and product inspections of the facility to ensure that there are no leaks in any of the drums, no spillage of material, no evidence of a reaction between chemicals (for example, presence of bubbles and/or steam or other gases) and to verify that the facility is in good working order. In addition, immediate corrective actions are required.

Waste from minor spills or leaks, including clean-up material and small amounts of contaminated soil that occur during construction or demolition activities shall be managed as hazardous waste. Material shall be deposited into 45 gal drums. The drums may be used for more than one spill or leak event but must be disposed of every 3 months after the initial use. Only like-substances that are compatible with one another shall be disposed of in the same drum, which shall be labelled accordingly. Drums shall be stored in the shade and appropriate ventilation maintained, particularly during the hot summer months. Once the containers are full, or after the 3-month period, or at the completion of the contract, the contractor shall ship out the drums to Vale's designated hazardous waste receiver that is licensed to accept the waste.

Records of hazardous waste and hazardous materials storage and inspections shall be maintained and include, at a minimum:

- a) The date and time of inspection,
- b) The printed name and handwritten signature of the inspector,
- c) A notation of observations made,
- d) The date and nature of any repairs or corrective action taken or pending, and
- e) The start date and ship out date for hazardous waste drums or stockpiles.

Access to the hazardous waste area is restricted and controlled. All workers responsible for hazardous waste must be adequately trained.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

4.8 Transportation of Hazardous Waste

Only carriers that have been licensed by the relevant authorities shall transport hazardous waste off-site.

Contractors removing waste from the site should ensure that:

The vehicle is suitable and registered for the purpose it is being used for;

Transport vehicles must carry all necessary safety equipment;

The vehicle is in a sound condition and capable of containing any leakages;

The vehicle has enough capacity to carry the waste without overloading;

Drivers are suitably trained and are aware of the potential dangers of their cargo and what steps to take in the event of an emergency;

The vehicle displays clear markings indicating the nature of the materials being carried and is marked with a label showing the UN Hazard Classification System. This labeling requirement may be replaced or upgraded with other requirements or regulations from local authorities;

All waste, regardless of its nature, must be clearly labelled. The label must clearly identify the contents of each container and its specific hazards, such as flammability, corrosivity, etc. Labels should be waterproof and indelible;

Documentation with adequate information on the waste hazardous properties must be provided to the transporter and accompany each consignment of hazardous waste, e.g., provincial waste manifest forms in Ontario.

5.0 EXISTING WASTE MANAGEMENT PRACTICES


5.1 On-Site Disposal

Some Vale operations have on-site landfill operations in addition to their tailing's impoundment facilities. For example, Sudbury operations has the Tailings Area Landfill located within the Copper Cliff Tailings Area and Thompson operations has a designate waste management facility.

5.1.1 Sudbury Tailings Area Landfill

For Sudbury, industrial waste (primarily non-hazardous) generated during demolition and construction that cannot be recycled or reused may be disposed of at the Tailings Area Landfill within their acceptance limits. These wastes include:

- Industrial non-hazardous solid waste;

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

- Asbestos;
- Miscellaneous inorganic waste;
- Waste from Vale's smelter operations (acid waste, mine effluent and aqueous solutions);
- Mixed wastes;
- Small amounts of oil contaminated materials; and
- Small quantities of wastes from other waste classes not exempt under O. Reg. 347.

The Tailings Area Landfill facility cannot accept organic wastes (waste oil, paint and grease), hazardous wastes, domestic wastes, recyclable materials (paper, cardboard, plastics, metals, glass, wood) and tires. Any disposal at the Tailings Area Landfill must be coordinated with the Sudbury Operations Environment Department.


Material characterized as slag or tailings do not count against acceptance limits. In addition, excess excavated soil not deemed to be hazardous may be utilized as daily cover material for the landfill and would not count against the acceptance limits. Daily cover material in use at the landfill includes tailings, rock, pit run, crushed aggregates or crushed construction materials, and non-hazardous excavated soil as referenced above. Approved wastes are to be pushed over the active working face and regularly covered.

The Vale Central Environment Department is responsible for submitting annual waste deposition reports to the Ministry of Environment, Conservation and Parks (MECP) detailing the volumes/ tonnages deposited at the Tailings Area Landfill as required by their Approval.

On-site transfer of waste follows the same criteria for off-site transfer of waste. All waste loads are fully contained, or properly secured and tarped to prevent the escape of any liquids, materials or blowing litter. Transfer of material to the on-site waste disposal facility is manifested using Vale's internal manifest forms and weighed at the facility scale. Vale is noted as the generator of the waste.

Staff, including waste haulers, accessing the Tailings Area Landfill must have valid Work Permits and Authorization Forms issued by Vale. As referenced above, this process involves all contractors accessing the Tailings Area Landfill completing the Central Tailings Area indoctrination. PMRAs and JHAs addressing access of the Tailings Area must also be completed.

Waste segregation is practiced on the site and at the Tailings Area Landfill. On site a system of coloured bins is used to capture source separate waste streams: red for domestic

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

waste, blue for recycling, yellow and black for industrial, and grey for steel. Segregated materials are disposed as follows:


- All domestic recyclable materials disposed of in the blue bins are transported to the City of Sudbury’s recycling plant.
- Hazardous recyclables, such as fluorescent tubes and batteries, are placed in the designated nearest small quantity hazardous storage facility. These are then collected and sent off for recycling via a third-party Contractor.
- Domestic waste is sent to the City of Greater Sudbury Landfill for disposal.
- Metal is stockpiled at the waste disposal facility and sold as scrap, though small quantities or equipment dismantling goes to the Investment Recovery Facility.
- Cardboard is removed from the industrial waste stream and sent to the City of Greater Sudbury’s material recovery facility (MRF).
- Clean and untreated wood, pallets and brush are stockpiled and ground for use as cover for control of vegetation growth and dust suppression.

As far as possible, tires are recovered, stored in a designated area and sent for recycling two or three times a year. Contractors are required to remove their own tires from site.

5.1.2 Thompson Waste Management Facility (WMF)

The primary components of the WMF include:

- gated access road to provide controlled access into the WMF;
- waste disposal areas in defined landfill cells;
- main waste handling building;
- cold storage shed;
- outdoor storage pad;
- storage area for clean wood (burn area);
- leachate holding pond;
- expansion areas set up for future cell construction; and
- storage areas for cover soil;
- Groundwater table monitor wells for monitoring of the elevation and quality of groundwater within the WMF boundary.

	Waste Management Plan		Revision	
	NAPG-ENV-SPI-0002		#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

Only waste generated at or during work performed for Vale Manitoba Operations shall be accepted at the WMF. Only industrial waste and solid waste as defined in Section 1 of the Manitoba Waste Disposal Grounds Regulation 150/91, excluding any waste included in section 4.2 Prohibited Waste shall be disposed at the landfill tipping face.

The following wastes are prohibited from final disposal in the landfill cell at the WMF:


- Hazardous wastes;
- Radioactive materials;
- Burning wastes (materials that are still at elevated temperatures);
- Contaminated soil;
- Liquids (as defined in section 1 of the waste disposal grounds regulation 150/91);
- Dead animals; and
- Explosives or ammunition.

The WMF will also be used to temporarily store waste generated from Vale Manitoba Operations, including the following:

- Non-industrial recyclables (non-industrial plastics, recyclables, cardboard and office paper) – baled and, stored in the storage shed, and transported off site for recycling;
- Industrial plastics – stored in the storage shed, and transported off site for disposal;
- Wood – stored within the WMF and burned for disposal with a portion of the wood recovered for re-use;
- Contaminated – the waste oil will be pumped into the AST adjacent to the main building. Other contaminated material will be stored within the WMF. The contaminated waste will be transported off site for disposal; and
- Hazardous - stored within the WMF, and transported off site for disposal

The WMF also has provisions for the following:

- Used tire and rubber waste storage;
- Soil Farm for the bio-treatment of hydrocarbon contaminated soil;
- Asbestos Dump where packaged asbestos waste must be dumped at the active face and immediately covered with fill material;

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

- PCB Storage;
- Hazardous waste storage in the Cold Storage Shed;
- Refinery and clean wood burnable materials;
- Waste rock and concrete;
- Radio-active secure storage;
- Scrap metal area: steel, aluminum, copper, and stainless steel.

The WMF has been designed with five landfill cells. An internal waste segregation program is in place to prolong the life of the landfill. Vale Manitoba Standard Procedure Instruction (SPI) segregates the waste into six streams namely: scrap metal, wood, general recyclables, hazardous, general waste and cardboard. Wastes are further segregated into the following main streams: office paper, industrial plastic, non-industrial plastic, rubber, organic and “other”.

Waste Bins are available in various styles through which waste streams are identified by colour, symbol and name. When bins are found to contain mixed waste, a Correction Notice is issued. The Notices will indicate the bin type, the mixed waste type and how to properly handle the waste. These notices along with requiring action by the department to correct the mixed waste situation are used as a training tool within the operation.


6.0 TRAINING

Project-specific and general training requirements, including record-keeping, are provided in the NAPG Environment Plan Section 7. Waste management and recycling provisions are key elements of general project and site orientation training provided for all project and contract staff. In addition, designated individuals with waste management responsibilities require specific training like waste manifesting and Transportation of Dangerous Goods.

Only personnel trained in the completion of manifests are permitted to undertake this task.

The Construction, Demolition and Waste Management Contractors are responsible to provide hazardous material handling and basic spill response training. Training for all employees involved in the handling of hazardous waste materials includes:

- Proper handling and storage of hazardous wastes;
- Types of potential spills and releases;
- Spill prevention measures;

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

- Spill control and cleanup procedures for small spills (less than 25 L);
- Information on location of fire extinguishers, pull stations, other emergency response equipment and spill response equipment;
- Proper use of spill kits;
- Transportation of Dangerous Goods (TDG); and
- Workplace Hazardous Materials Information System (WHMIS) and Use of Safety Data Sheets (SDS)
-

7.0 MONITORING AND REPORTING


General inspection, monitoring and reporting requirements are provided in the NAPG Environment Plan, Section 8.

Each Project must implement a system to track waste stored or disposed of on-site and transported off-site. The project may adopt the host site's existing system or create a new system that would transfer to operations during the hand-off phase. Examples of monitoring and reporting information that would be required include:

- Landfill records for domestic and industrial waste, asbestos waste, excess non-leachate-toxic soil, waste rock, concrete, brick and asphalt;
- Pass-out forms for recycled metals from demolition;
- Revert manifests for process residues being brought to the materials handling area;
- Provincial manifests for all other hazardous waste removed from site by a licensed carrier; and
- Inspection logs for any hazardous waste being temporarily stored on-site.

The Project compiles all the data into a monthly report, summarizing the previous month's waste, along with a running total of waste disposed of leading up to the reported month. Both the monthly summaries and the running totals are compared to the figures provided in the current Waste Audit most up-to-date version of WRWP.

Where applicable, the results of soil analyses for excess soils being disposed of shall be included in that month's report, as well as identification of areas of improvement.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

The Project may undertake periodic audits (as required) of waste Contractors, demolition Contractors, the worksite accumulation areas and waste manifest information. General environmental auditing requirements are listed in the NAPG Environmental Plan, Section 9. Vale may choose to undertake periodic audits of waste management activities and reporting to satisfy their own environmental auditing requirements. Any non-conformities and corrective actions and their status are maintained in a log by the Project.

A

Il hazardous waste manifests must be kept for 7 years. The Waste Audit and WRWP is to be kept on file for this period (i.e. 7 years from the time of issuance).

8.0 REFERENCES

NAPG Environmental Plan

Environmental Management Plan for Demolition

Spill Prevention and Response Management Plan

O. Reg. 102/94: Waste Audits and Waste Reduction Work Plans

O. Reg. 103/94: Industrial, Commercial and Institutional Source Separation Programs

A Guide to Waste Audits and Waste Reduction Work Plans for Construction and Demolition Projects, Ontario MOE, July 2008

Management of Excess Soil - A Guide for Best Management Practices

Ontario Regulation 153/04 (Records of Site Condition Part XV.1 of the Act)

Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" (MOE, May 1996)

Soil, Ground Water and Sediment Standards, for Use under Part XV.1 of the Environmental Protection Act", April 15, 2011


O. Reg. 347, General Waste Management,

Manitoba Contaminated Sites Remediation Act and Regulations 105/97

PRO-0035 OO Management of Scrap.

PRO-0035-SSO-CMD Management of Scrap Procedure.pdf

Comprehensive Report of Vale Canada Limited Manitoba Operations, August 2015.

	Waste Management Plan NAPG-ENV-SPI-0002		Revision	
			#	Date
	Report No. (DM#): 1452742		00	2020-03-10
				Review 2 year
North Atlantic Projects Group				

Canadian Council of Ministers of Environment (CCME), Environmental Quality Guidelines, 1999.


CCME, Canada-Wide Standards for Petroleum Hydrocarbons in Soil, 2008.

Health Canada, Guidelines for Canadian Drinking Water Quality—Summary Table, 2012

Newfoundland and Labrador, Protocol for the Management of Excavated Soils, Concrete Rubble and Dredged Materials, May 2015.


Atlantic Partnership in RBCA (Risk-Based Corrective Action) Implementation Guidelines

END OF DOCUMENT

 SNC • LAVALIN	Waste Management Plan	Revision		
		#	Date	Page
	Plan No. 507763-000-0000-4EPA-0002	06	2015-04-27	Appendix

APPENDIX A

SUMMARY OF REGULATORY REQUIREMENTS FOR ONTARIO OPERATIONS

 SNC • LAVALIN	Waste Management Plan	Revision		
		#	Date	Page
	Plan No. 507763-000-0000-4EPA-0002	06	2015-04-27	Appendix

General Waste Management Regulation

The plan is consistent with the requirements of *General - Waste Management* (O. Reg. 347) including:

- the designation and exemption of various waste types, sites and systems, including limiting materials to be disposed in landfill;
- classifications and exemptions of waste disposal sites and waste management systems, standards and requirements for municipal, industrial, and hazardous wastes;
- registration of hazardous waste generators, done through the electronic hazardous waste information network (or HWIN);
- a manifest system for tracking hazardous waste movement;
- requirements for the management of asbestos waste; and
- disposal regulations for portable toilet waste and numerous schedules.

Waste Audits and Waste Reduction Work Plans


Waste Audits and Waste Reduction Work Plans (O. Reg. 102/94) requires the performance of a waste audit and the preparation of a waste reduction work plan for large construction projects and demolition projects which includes:

- the amount, nature and composition of the waste;
- the way the waste is produced;
- how the waste is managed; and
- which materials and products used or sold consist of recycled or reused materials or products.

ICI Source Separation Programs

The *Industrial, Commercial and Institutional Source Separation Programs (ICISSP) Regulation* (O. Reg. 103/94, last amended by O.Reg. 230/11) requires waste separation programs at large construction projects and demolition projects which includes:

- provision of facilities for the collection, handling and storage of source separated wastes;
- measures to ensure that the source separated wastes that are collected are removed;
- the provision of information to uses and potential users of the program;

 SNC • LAVALIN	Waste Management Plan	Revision		
		#	Date	Page
	Plan No. 507763-000-0000-4EPA-0002	06	2015-04-27	Appendix

- efforts to ensure that full use is made of the program and that the separated waste is reused or recycled.

Record of Site Condition – Soil Classification

The *Record of Site Condition – Part XV.1 of the Act* (O. Reg. 153/04), as amended by O. Reg. 511/09, establishes the rules for the assessment of the environmental condition and cleanup of a site. For the reuse of excavated soils on site:

- Table 2 of Schedule E of Ontario Regulation 511 designates stockpile sampling requirements; and
- Table 3 and/or Table 5 provide soil classification criteria.

Environmental Compliance Approval – Ontario Water Resources Act

The *Ontario Water Resources Act* (OWRA) regulates sewage disposal and “sewage works” and prohibits the discharge of polluting materials that may affect water quality. Environmental Compliance Approvals (ECAs) are required for discharges under this act. ECAs for the waste disposal area in the tailing’s management area has been issued under this Act.

The OWRA also has provision requiring Permits to Take Water when a project requires pumping or use of surface or groundwater.

Transportation of Dangerous Goods


Ontario has adopted the federal regulations under the *Transportation of Dangerous Goods Act*, 1992, (TDGA). This agreement provides that Ontario will administer all on-highway inspection and enforcement activities and the Federal Government will administer all off-highway inspection and enforcement activities, including:

- Carriers and receivers of hazardous and liquid industrial waste require approvals issued under Part V of the *Environmental Protection Act* (EPA) before they are allowed to manage these types of waste: carriers require a Waste System C of A and receivers require a Waste Facility C of A.
- All materials must be properly labeled, placarded, and manifested. The manifest is required and used to track the movement of liquid industrial and hazardous wastes from the generator to an off-site receiving facility.

Waste Management - PCBs

The *Waste Management – PCB Regulation* (O. Reg. 362/90) was enacted to control the storage, transfer and disposal of polychlorinated biphenyls (PCBs).

- Operators must report the methods and times at which the PCB waste is received and delivered to and from the site, the locations from or to which it is transported and name of the transporter; the nature and quantities of the waste; the location of the site; and the methods of storage. Transfers reported under O. Reg. 347 (manifests for transport within, out of and through Ontario) satisfy this reporting requirement.

 SNC • LAVALIN	Waste Management Plan		Revision	
			#	Date
	Plan No. 507763-000-0000-4EPA-0002		06	2015-04-27

- The presence of PCBs on a site must be disclosed to the prospective purchaser, tenant or person taking possession of the site, and the legal requirements attached to it, and to advise the MOE of any sale or change in possession within ten days.

Sudbury Garbage By-law 2006-280

Sudbury Garbage By-law (2006-280, last amended by 2013-147) deals with the collection, removal and disposal of waste within the City of Greater Sudbury. The by-law requires:

- Property owners who contract for private waste collection must ensure that all wastes are stored in waste containers, and are serviced as required to prevent overflow of containers, odours, attraction of animals and pests, and blowing of litter;
- Wastes are to be transported from private properties to a point of disposal by the owner of the waste, and the owner of the waste may be required to provide proof that the waste has been transported to a waste disposal site in accordance with the by-law.
- Prohibited wastes must be stored separately from regular wastes and other prohibited waste types in appropriate containers and must be delivered only to a facility licensed to accept such a form of waste. Prohibited wastes relevant to the Project include dangerous, hazardous or toxic wastes, any waste in semi-liquid or liquid form, asbestos waste, broken glass and tires.

All waste transported through Greater Sudbury must be appropriately contained in a fully enclosed container or vehicle, or appropriately secured and tarped to prevent the escape of materials. Waste loads should also be managed in a manner that controls the attracting of flies or offensive odors.