

WASTE MANAGEMENT PLAN

**SMELTER AND REFINERY DECOMMISSIONING/DEMOLITION
THOMPSON, MANITOBA**

**Prepared For:
Vale Canada Ltd.**

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1.0 INTRODUCTION

This Waste Management Plan (WMP) describes policies, procedures and protocols for the handling of waste materials generated by Vale and contractors during the decommissioning and demolition of the Smelter and Refinery at the Vale Mine Site (Site) in Thompson, Manitoba. The location of the Site is shown on Figure 1.1 and Figure 1.2 presents a Site plan. Types of wastes that may be generated from the decommissioning and demolition activities include the following:

- Hazardous and regulated waste as defined by the Dangerous Goods Handling and Transportation Act (Act) (C.C.S.M. c. D12) and the Transportation of Dangerous Good Act, 1992 as amended
- Naturally Occurring Radioactive Materials (NORM) as defined in the Canadian Guidelines for the Management of NORM, October 2000
- Asbestos waste (includes insulation, transite, and floor tile)
- Bulk solid wastes (includes potential product/residue in pipelines/tanks, hydrocarbon product, refractory brick, bricks from inside tanks/thickeners, and hazardous dust, and concrete/cinder blocks)
- Recyclable materials (includes cinder blocks/concrete, lighting ballasts (non-polychlorinated biphenyl [PCB]), ozone depleting substances [ODS], mercury-containing devices, liquid mercury, batteries, glycol, and ferrous and non-ferrous metals)
- Demolition debris/non-hazardous materials (includes untreated wood, non-asbestos-containing material [ACM] insulation, roofing materials, plastic, creosote wood [rail ties and cribbing], used filter cloth [washed], and non-PCB light ballasts)
- Rinse water - generated from cleaning the surfaces and equipment in the Smelter and Refinery during decommissioning
- Petroleum and polycyclic aromatic hydrocarbon- (PAH-) impacted soil - identified during a soil investigation within the Smelter and Refinery area¹

The procedures and protocols outlined in the following subsections of this WMP include administrative roles and responsibilities, management, characterization, testing/sampling, containerization, storage, transportation, and/or disposal of wastes generated during project activities. The site-specific WMP may be revised/expanded, as appropriate, while the project work progresses to include information, methodologies,

¹ *Soil and Groundwater Remediation Study*, prepared by AMEC, February 2012.

and procedures associated with any changes in work scope, site conditions and/or regulations.

The WMP has been written in accordance with the Federal Transportation of Dangerous Goods Act (TDG Act) and the Manitoba Dangerous Goods Handling and Transportation Act (Manitoba Act); however, Manitoba Conservation is developing new regulations for the management of hazardous materials. Manitoba Conservation does not have an expected date of promulgation.

The Contractor will be required to prepare a final Waste Management Plan that will, at a minimum, meet all requirements of this WMP and submit the Final Waste Management Plan to Vale for review and approval.

2.0 ADMINISTRATIVE ROLES AND RESPONSIBILITIES

During the decommissioning waste disposal activities, the Project Team Members will have the following planning and administrative roles and responsibilities:

Vale Project Manager - The Vale Project Manager will provide information to the Contractor concerning specific project conditions relevant to the waste media being handled. The Vale Project Manager will provide Facility services where required (i.e. staging areas, holding pads) in accordance with the WMP and the Facility Operating Permits. The Vale Project Manager will communicate information concerning project activities and safety conditions to the Vale Facility personnel as the project activities evolve.

Vale Project Coordinator - The Vale Project Coordinator is responsible for providing the Contractor with all project specific information available concerning project conditions relevant to the waste media being handled. The Vale Project Coordinator will review and approve the Contractor's WMP, verify that the WMP is being followed, and act as a liaison between the Contractor and the Vale Facility Managers/Facility personnel as the WMP is implemented.

Contractor Project Manager - The Contractor Project Manager will be responsible for preparation of the WMP, selecting the Project Waste Administrator, and ensure that the Vale Project Coordinator reviews and approves the WMP. The Contractor Project Manager is ultimately responsible for the implementation of the WMP in a timely and cost effective manner, and is responsible for ensuring that the proper resources are available to complete the waste management activities, including quality control checks to ensure the WMP is being followed.

Contractor's Waste Administrator - The Contractor's Waste Administrator will be responsible for implementation of the WMP. The Waste Administrator will oversee the day-to-day activities concerning waste management, ensure characterization and sampling activities are performed (if required), complete the waste documentation required, complete the waste manifests (if required), track the waste materials to final disposition, and perform project notifications/communications. These tasks will be completed whether or not the Waste Administrator performs the manifesting and/or the manifest signing.

Contractor Waste Internal Auditor - The Contractor Waste Internal Auditor will be responsible for completing the internal audits of the waste handling activities, as needed, to document that the site-specific WMP is being followed.

3.0 WASTE STREAM SUMMARY

The wastes generated during the Smelter and Refinery decommissioning and demolition will be subject to the regulations developed pursuant to one or more of the following:

- Manitoba Dangerous Goods Handling and Transportation Act (C.C.S.M. c. D12) (Manitoba Act) including regulations:
 - Classification Criteria for Products, Substances & Organisms Regulation (M.R. 282/87)
 - Dangerous Goods Handling & Transportation Regulation (M.R. 55/2003)
 - Generator Registration & Carrier Licensing Regulation (M.R. 175/87)
 - Manifest Regulation (M.R. 139/88)
 - PCB Storage Site Regulation (M.R. 474/88)
- Federal Transportation of Dangerous Goods Act (TDG Act), 1992
- Work Place Safety and Health (WSH) Regulation (M.R. 217/2006 Part 37 - Asbestos)
- Guideline 2002-02E: Criteria for Acceptance of Contaminated Soil at Licensed Waste Disposal Grounds. May 2002
- Guideline 96-05: Treatment and Disposal of Petroleum Contaminated Soil. June 1996, revised December 2010
- Canadian Guidelines for the Management of NORM, October 2000
- Canadian Nuclear Safety and Control Act, 2000 (CNSC Act)
 - Nuclear Substance and Radiation Devices Regulations
 - Packaging and Transport of Nuclear Substances Regulations (PTNS Regulations)
- PCB Regulation SOR 2008/273 as amended
- Environmental Act (C.C.S.M. c. 210)
- Operation of Mines Regulation (M.R. 212/2011)

Potential waste types generated during the Smelter and Refinery decommissioning and demolition includes solids, liquids, and mixtures, including:

- Regulated Wastes
 - Radionuclides (nuclear instruments)
 - Lighting ballasts (polychlorinated biphenyl [PCB])
 - Lab packs (unused raw and waste chemical materials)
 - Transformer oil (PCB and non-PCB)

- Other oils (PCB and non-PCB)
- Lighting bulbs (fluorescent and high-intensity discharge [HID] lighting)
- Ozone depleting substances (ODS)
- Mercury-containing devices and liquid mercury (rectifiers)
- Batteries
- Glycol
- Asbestos waste
 - ACM insulation (on pipes and equipment)
 - Other ACM (transite and floor tile)
- Potential Hazardous Bulk Solid/Liquid Wastes
 - Product/residue in pipelines/tanks
 - Refractory bricks (furnaces, converters, roasters, and stack)
 - Potential impacted bricks from tanks and thickener in Refinery
 - Smelter dust
 - Concrete/cinder blocks
- Demolition Debris/Non-Hazardous Materials
 - Wood (untreated)
 - Non-ACM insulation
 - Roofing materials
 - Fibre-reinforced plastic (piping, hoppers, tank liners and tanks) (Refinery-specific)
 - Creosote wood (rail ties and cribbing)
 - Used filter cloth (washed)
 - Lighting ballasts (non-PCB)
- Recyclable materials
 - Ferrous and non-ferrous metals
 - Concrete/cinder blocks
- Rinse water
- Petroleum and PAH-impacted soil

A detailed account by waste types/categories of all wastes produced during performance of the project is to be maintained by the Contractor. Appendix A presents an example of a waste tracking form.

4.0 HANDLING OF GENERATED WASTES

The types of materials and wastes generated during demolition will be categorized into four principal types, specifically: hazardous and regulated wastes, asbestos waste, general demolition debris, and recyclable materials. Hazardous and regulated wastes will be disposed off Site in accordance with applicable federal and provincial regulations. CRA assumes that general demolition debris will be disposed off-Site at an approved non-hazardous waste disposal facility. Recyclable materials have inherent asset value and may be reused on Site as backfill (e.g., clean concrete and bricks) or shipped off Site for material recycling (e.g. steel and copper). A description of the different types and classifications of waste for each of the buildings/structures listed is presented below.

Figures 4.1 and 4.2 present flow charts for the management of waste generated during the decommissioning/demolition of the Smelter and Refinery.

4.1 HAZARDOUS AND REGULATED WASTES

4.1.1 RADIONUCLIDES

The nuclear instruments within the Smelter and Refinery are listed in Table 4.1. Whether Vale chooses to dispose or reuse the nuclear instruments, the instruments must be handled in accordance with the TDG Act and CNSC Act and regulations.

Licensed technicians will dismount/dismantle the gauges in accordance with approved CNSC procedures. Nuclear gauges that will be transported for off-Site disposal or for use at another Vale facility will be packaged and transported based on the nature, form, and quantity or activity of the substance in accordance to the TDG Act and as stipulated in the PTNS Regulations.

If necessary, nuclear gauges may be temporarily stored in Vale's on-Site nuclear storage vault; however, the expectations are that the gauges will be transported to the final destination within a short period of time.

Nuclear gauges designated for disposal, will be transported to a valid CNSC license location prior to final disposal at Atomic Energy of Canada Limited (AECL), Chalk River, Ontario.

4.1.2 LIGHTING BALLASTS (PCB)

The Contractor must verify whether lighting ballasts contain PCBs based on the codes on the ballast. The Contractor will place PCB lighting ballasts in drums that are labeled as containing PCBs in accordance with the PCB Regulation SOR 2008/273 as amended and Vale's Standard Procedure Instruction for Management of PCBs (SPI #34-4). Full drums will be sealed and transported to the licensed PCB storage facility located in the South Yard (see Figure 1.2) for disposal off Site at a licensed facility. If the identification number on the ballast is illegible, the Contractor will handle the ballast as if it contains PCBs.

The Contractor will handle non-PCB lighting ballasts in accordance with Section 4.4.3.

4.1.3 LABORATORY PACKS

The Contractor will place small quantities of unused chemicals and materials into laboratory packs for disposal in accordance with the TDG Act.

4.1.4 TRANSFORMER OIL

Vale completed an extensive PCB removal program to reduce the concentrations of PCBs in transformer oil to less than 50 parts per million (ppm)². Vale provided CRA with an inventory of oil-filled transformers that also included PCB analytical data. CRA understands that this program included the draining of known or suspected equipment containing PCB oils greater than 50 ppm, such as transformers, and the PCB-containing oil was transported off Site for disposal. The removed oil was subsequently replaced with mineral oil or other suitable non-PCB oil. An inventory of the oil-containing transformers within the Smelter and Refinery is presented in Appendix B including the analytical results of the samples collected from the transformers.

CRA also understands that the PCB-containing capacitors were replaced within the Smelter complex, with the exception of two capacitors. CRA observed two PCB-containing capacitors during CRA's Site inspections; one capacitor was located on the switch gear in the Smelter Substation (back of Cell #1: Bus Tie Disconnect Switch) and the second was located in the Smelter Substation tunnel (Surge Cap unit).

² Solid materials with a PCB concentration greater than 50 ppm are considered a PCB waste (SOR 2008/273 as amended).

Prior to shutdown, Vale will collect oil samples from each of the transformers that previously contained PCBs. Transformers that contain oil with PCB concentrations greater than the Leachate Quality Criterion (Table 1 of M.R. 282/87) of 0.3 ppm but less than 50 ppm will be drained and the oil will be classified as hazardous waste in accordance with the Manitoba Act and transported to a licensed disposal facility for destruction. Transformers that contain oil with concentrations less than 0.3 ppm will be drained and the oil may be transported to an off Site facility for recycling.

If the transformer oil contains PCBs at a concentration greater than 50 ppm, the oil must be transported and disposed off Site at a licensed facility for destruction in accordance with the PCB Regulations SOR 2008/273 as amended.

4.1.5 OTHER OILS

Hydraulic oil that has been drained from pumps and other equipment may contain contaminants, such as lead or PCBs, at concentrations greater than the Leachate Quality Criteria (Table 1 of M.R. 282/87); and therefore, would be considered a hazardous waste under the Manitoba Act.

The Contractor will drain hydraulic oil from pumps and equipment into drums or other appropriate storage containers. If the hydraulic oil in any pump or piece of equipment is suspected of containing PCBs, the hydraulic oil from that pump or piece of equipment should be kept in a separate container.

The Contractor will collect a sample from each container of hydraulic oil for analysis for lead and PCBs. If the concentrations of lead and/or PCBs are greater than the Leachate Quality Criteria of 5 ppm and 0.3 ppm, respectively, but the PCB concentration is less than 50 ppm, the oil will be classified as a hazardous waste in accordance with the Manitoba Act, and transported to a licensed disposal facility for destruction. Hydraulic oil that contains concentrations less than the applicable Leachate Quality Criteria will be transported to an off Site facility for recycling.

If the hydraulic oil contains PCBs at a concentration greater than 50 ppm, the oil must be transported and disposed at a licensed facility for destruction in accordance with the PCB Regulations SOR 2008/273 as amended. The drums containing oils with PCBs greater than 50 ppm will be sealed, labeled appropriately, and transported to the licensed PCB storage facility for storage prior to off-Site disposal at a licensed facility.

4.1.6 LIGHTING

Lighting is typically segregated based on type (e.g. mercury or sodium) and by size (e.g. 4 feet or 8 feet). The Contractor will package lighting that Vale has not designated for reuse in accordance with the TDG Act. Lighting wastes will be transported to an off-Site facility for recycling or disposal.

4.1.7 ODS, GLYCOL, MERCURY-CONTAINING DEVICES, LIQUID MERCURY, AND BATTERIES

The Contractor will package ODS, glycol, mercury devices, liquid mercury from the rectifiers, and batteries in accordance with the TDG Act. These wastes will be transported to an off-Site facility for recycling or disposal.

4.2 ASBESTOS WASTE

Asbestos is a substance regulated under Workplace Safety and Health (WSH) Regulation M.R. 217/2006 Part 37 – Asbestos. A licensed asbestos abatement contractor will remove ACM from the Refinery and Smelter prior to demolition in accordance with M.R. 217/2006 Part 37 and other applicable demolition plans. The ACM consists of friable ACM such as insulation, and non-friable ACM such as transite siding, cable trays, vinyl floor tiles, and piping and pipe fittings.

In accordance with Vale's SPI #36-5 (provided in Appendix C), The Use and Handling of Manufactured Asbestos, all asbestos waste including disposable coveralls, gloves, respirator cartridges, filters and material collected by the vacuum must be sealed in 10-mil polyethylene bags or wrapped with polyethylene. All bagged or wrapped material must be tagged as asbestos waste and stored in a designated location within the Smelter or Refinery where it will not be disturbed until it can be transported to the on-Site asbestos waste landfill. The asbestos waste must be unloaded into an active area in the on-Site asbestos waste landfill for immediate burial and cannot be stockpiled adjacent to the landfill for burial at a later date.

In accordance with Vale's Waste Disposal Ground Operating Permit No. 35818, when the asbestos waste has been placed in the on-Site landfill, an initial layer of cover material or fill (20 to 25 centimeters) should be placed over the asbestos waste before heavy equipment passes over the packages. The asbestos waste must be covered with approximately 2 meters of fill by the end of the working day.

The Contractor must document and maintain records of the volume of asbestos disposed and the disposal location.

4.3 POTENTIAL HAZARDOUS BULK SOLID/LIQUID WASTES

Potential bulk solid wastes include the fines from final equipment, process lines, and tank cleaning in the Refinery, bricks from inside the thickeners and tanks in the Cobalt Purification Area, refractory bricks in the Smelter and the Smelter stack, and dust from within the Smelter. Potential bulk liquid waste includes hydrocarbon product remaining in the aboveground storage tanks.

The furnaces, the converters, and the roasters in the Smelter and the Smelter stack are lined with refractory brick. Refractory brick or "fire brick" is used in applications that involve very high temperatures. The bricks are composed of clay and minerals, with silica, alumina, or kaolin in the mix. The ore that is used in the brick (i.e. bauxite) is commonly found in the presence of naturally occurring radioactive elements such as uranium and thorium. These elements can end up in the finished brick. The concentrations of the naturally occurring radioactive material (NORM) are typically too low to pose a health hazard; however, the levels may cause the radioactivity monitors at a commercial landfill to activate. After shutdown and prior to demolition, Vale should retain a qualified professional to assess the level of radioactivity in the refractory brick in the furnaces, the converters, and the stack in accordance with Section 5 of the Canadian Guidelines for the Management of NORM. There is also potential for the brick in the stack to be hazardous for metals due to the number of years that the stack has been in operation. The Contractor will be required to jet wash the inside of the stack prior to demolition. The brick will be sampled after demolition as discussed in Section 8.

The thickeners and the leach train in the Purification area within the Refinery are lined with bricks. The thickener and leach train hold anolyte, which contains high concentrations of nickel, arsenic, copper, and cobalt. The brick will be sampled as discussed in Section 8.

The Contractor will develop an inventory of the bulk solid/liquid wastes and if required, the Contractor will collect sample(s) to properly characterize the waste in accordance with Section 8 prior to shipping.

4.4 DEMOLITION DEBRIS/ NON-HAZARDOUS MATERIALS

4.4.1 WOOD (UNTREATED)

Wood is used in the tank house as a structural base for the plastic grating (tank house), structural supports, hoarding/temporary walls, tank covers and other miscellaneous uses. Wood debris generated during the Refinery demolition will be sorted by the Contractor. The wood debris will be transported to the on-Site waste disposal facility and staged for burning/volume reduction by Vale personnel in accordance with the existing burn permit (Waste Disposal Ground Operating Permit No. 35818). Once burned, the ash will be staged and transported to a Vale-approved location for processing or disposal.

Any untreated wood generated from Smelter demolition will also be burned in accordance with the Waste Disposal Ground Operating Permit and the ash will be disposed at the on-Site waste disposal facility.

4.4.2 NON-ACM INSULATION

Non-ACM insulation will be disposed at a non-hazardous waste disposal facility.

4.4.3 ROOFING MATERIALS

The roofing materials on the Smelter and Refinery may contain asbestos. Prior to demolition of the Smelter and Refinery, the Contractor should collect a sample of each material on the roof that is suspected to contain asbestos (e.g., tar and felt layers of built-up membrane, fibreboard, vapour barrier, flashing, caulking) and that is visually distinct. Each visually distinct area of the roof and each visually different material should be sampled and analyzed for asbestos, unless it is known to contain or to not contain asbestos based on product information or previous sampling results. Products known to contain asbestos, such as transite panels and fascia, should be treated as asbestos-containing materials.

Each distinct area or level of the roof should be treated separately. A change in elevation, date of construction, colour, or construction material represents a new area for ACM surveying purposes. Patched areas should also be sampled. Samples should be collected from the full depth of the roofing membrane (i.e., down to the concrete, metal

or wood deck), and should also include areas where repairs or modifications were performed. To the extent possible, the different layers of roofing materials should be sampled separately. For example, the tar and felt layers of a built-up roof membrane should be analyzed separately.

At a minimum, three samples of each material should be collected and analyzed to demonstrate that a material is not asbestos-containing. One positive analytical result is sufficient to confirm that a material contains asbestos.

Roofing materials will be characterized based on the analytical results of the collected samples and handled and disposed of accordingly. Roofing materials that contain asbestos will be disposed as detailed in Section 4.2. Roofing materials that do not contain asbestos will be disposed off Site at a non-hazardous waste disposal facility.

4.4.4 FIBRE-REINFORCED PLASTIC

Fibre-reinforced plastic includes piping, hoppers, tank liners, and tanks from the Refinery. The plastic will be disposed off Site at a non-hazardous waste disposal facility.

4.4.5 CREOSOTE WOOD (RAIL TIES AND CRIBBING)

CRA collected a total six samples from the rail ties and cribbing of the Copper Ponds for metals and polycyclic aromatic hydrocarbon (PAH) analyses. The analytical data for the collected wood samples are presented in Table 4.4. The total metal concentrations including arsenic, barium, cadmium, chromium, lead, selenium, silver, and uranium, were less than 20 times the Leachable Quality Criteria, which is considered to be a conservative indicator that a solid waste will pass the Toxicity Characteristic Leaching Procedure (TCLP) test required to determine that a solid waste is characteristically hazardous. As a result, CRA concludes that the wood ties and cribbing are non-hazardous for metals.

The PAH concentrations were elevated, which indicates that the rail ties were treated with creosote; therefore, the ties cannot be burned or chipped. Vale may elect to reuse the rail ties on Site. The Contractor will dispose of the rail ties not designated for reuse at a licensed non-hazardous disposal facility.

4.4.6 USED FILTER CLOTH (WASHED)

Filter cloth from the purification area in the Refinery will require disposal. Vale will wash the used filter cloth in the scrap wash area prior to staging and disposal as a solid waste. Wash water generated from the washing of used filter cloth will be sent to the Mill.

The Contractor will collect a sample of the washed filter cloth for TCLP metals analyses to determine if washing the filter cloth was successful in removing the metals. If the concentrations in the sample are less than the Leachate Quality Criteria for metals, then the filter cloth will be disposed at a licensed non-hazardous disposal facility. If the concentrations are greater than the Leachate Quality Criteria, then the filter cloth will be washed again and another sample will be collected. The results from first washing of the filter cloth will be used to develop subsequent methods, retention time in the scrap wash, and potential number of washes for further batches. Additional sampling of subsequent washed filter cloth may be required. CRA assumes that the filter cloth will be non-hazardous if it is washed and will be disposed at a licensed non-hazardous disposal facility.

4.4.7 LIGHTING BALLASTS (NON-PCB)

The Contractor will handle PCB lighting ballasts as detailed in Section 4.1.2. The Contractor will send non-PCB lighting ballasts not designated for reuse to an off-Site facility for recycling or disposal.

4.5 RECYCLABLE MATERIALS

4.5.1 FERROUS AND NON-FERROUS METALS

Scrap steel, copper, and other metals will be collected, segregated, and shipped off Site to be recycled.

CRA collected wipe samples of metal floor surfaces in areas where PCB-containing equipment was known to be present. The analytical results of the wipe samples are presented in Table 4.3.

The primary screening criterion for PCBs on non-porous surfaces was 10 µg/100 cm² which is based on health-risk studies and is generally accepted in the Canadian and

United States legislation as a reasonable risk level for unrestricted use of non-porous surfaces³. PCBs were detected above the screening criterion in the wipe samples collected from the floors of the following rooms/areas:

<i>Building</i>	<i>Location</i>	<i>Coordinates</i>
Smelter	Capacitor Room for Furnace #1	4H13
Smelter	Former Capacitor Room for Furnace #4	5H31

The floors of these areas must be cleaned using a low volume high pressure water spray until the surface is free of all visible contamination. The rinse waters will be collected and containerized as discussed in Section 4.6. The Contractor must collect a confirmation wipe sample to confirm that the concentrations are less than the screening criterion prior to sending the metal floor material off-Site for recycling. The rinse water must be collected and stored separately as it may contain PCBs. The rinse water will be handled as discussed in Section 4.6.

4.5.2 CINDER BLOCKS/CONCRETE

Clean brick and concrete/cinder block will be pulverized on Site with heavy equipment to an aggregate size that allows the material to be used as machine-compacted backfill in basements, pits, and other excavations or low areas.

As discussed in Section 4.3, concrete/cinder block that is suspected to be contaminated will be characterized as described in Sections 8.0 and 9.0 and handled and disposed in accordance with Section 10.0.

CRA collected concrete samples from the most heavily stained area of concrete near equipment with hydraulic and transformer oil potentially containing PCBs for PCB analyses. CRA compared the PCB concentration to the soil quality guidelines for the protection of environmental and human health in an industrial setting published by the Canadian Council of Ministers of the Environment (CCME). All concentrations in the concrete samples were less than the CCME soil quality guideline of 33 mg/kg; therefore, the concrete in these areas will be crushed and used for fill on Site. The analytical data for the concrete samples are presented in Table 4.2 and the areas where PCBs were detected are presented below.

³ Protocol for Sampling and Testing at PCB Storage Sites in Ontario, Ontario Ministry of Environment, January 2000.

<i>Building</i>	<i>Location</i>	<i>Coordinates</i>
Smelter	Oil Drain Tank	1D32
Smelter	Furnace No. 1 Oil Cooling Fan Room	3D11
Smelter	Furnace No. 2 Oil Cooling Fan Room	3D18
Smelter	Furnace No. 2 Transformer Vault Room	3F17
Smelter	No. 7 Switchroom	3F22
Smelter	Furnace No. 5 Transformer Vault Room	3K32
Smelter	Furnace No. 4 Transformer Vault Room	3H26
Smelter	Hydraulic Room for Furnace No. 2	4J20
Smelter	Hydraulic Room for Furnace No. 5	4J34
Refinery	Copper Building (near Racine pump)	3B38
Refinery	Outside Transformer Pad	NW Corner

These areas will be cleaned and the rinse water will be collected and stored separately as it may contain PCBs. The rinse water will be handled as discussed in Section 4.6.

CRA did not collect samples from the concrete pads of the transformers located outside of the Smelter because the transformers could not be shut down. Concrete samples must be collected from each of the outside pads prior to demolition to determine if they are impacted by PCBs. Sample locations should be biased to heavily stained areas. The concrete samples may be collected following cleaning of the pad. All rinse water must be contained and stored separately as it may contain PCBs.

If the PCB concentrations in the concrete samples from the outside transformer pads are greater than the CCME soil quality guideline of 33 mg/kg and greater than 50 mg/kg, the concrete will be removed and disposed as PCB waste and transported to a licensed disposal facility for destruction.

If the PCB concentrations are greater than the CCME soil quality guideline of 33 mg/kg but less than 50 mg/kg, a concrete sample must be collected for TCLP PCB analysis. If the PCB concentration is greater than the Leachate Quality Criteria of 0.3 ppm, the concrete will be removed and disposed as hazardous waste in accordance with the Manitoba Act, and transported to a licensed disposal facility for destruction. If the PCB concentration is less than the Leachate Quality Criteria of 0.3 ppm, the concrete will be removed and disposed as non-hazardous waste and transported to a licensed disposal facility.

There are two storage ponds located in the yard south of the Refinery and Smelter. The ponds are man-made consisting of heavy timber walls set on a concrete base. The

management of the treated heavy timbers is discussed in Section 4.5.4. The concrete will be left in place and broken to prevent collection of water.

4.6 RINSE WATER

Rinse water generated from cleaning areas impacted with PCBs must be segregated and stored separately. The Contractor must collect a sample of the rinse water for PCB analyses to determine final disposition. If PCBs are detected in the rinse water at a concentration greater than 0.3 ppm, the Contractor must dispose of the rinse water off-Site at a licensed hazardous facility. If PCBs are detected at a concentration less than 0.3 ppm, the wastewater may be discharged to the on-Site sewer system, which ultimately discharges to the tailings pond.

Other rinse water will be discharged to the on-Site sewer system after first passing through an oil/water separator.

4.7 PETROLEUM AND PAH-IMPACTED SOIL

Based on the soil investigation completed within the Smelter and Refinery area by AMEC, the following soil impacts within the Smelter and Refinery complexes have been identified⁴:

- Smelter South Yard: Approximately 9,840 m³ of PHC-impacted soil (areal extent 4,100 m² to a depth of 2.4 m bgs)
- Bunker Oil and Furnace Oil ASTs: Approximately 10,540 m³ of PHC- and PAH-impacted soil (areal extent 3,400 m² to a depth of 3.1 m bgs)
- Former Diesel AST located between the Smelter and Refinery: Approximately 2,480 m³ of PHC-impacted soil (areal extent 370 m² to a depth of 6.7 m bgs)

Vale will determine the final disposition for petroleum-impacted soil, which may include on-Site treatment in accordance with the Treatment of Petroleum Contaminated Soil, Manitoba Conservation Authority, June 1996. off-Site disposal at a Class 1 licensed facility provided the facility has a leachate collection system and the BTEX leachate analyses is included as a provision of the license in accordance with the Guideline 2002-02E Guideline: Criteria for Acceptance of Contaminated Soil at Licensed Waste Disposal Grounds, May 2002. The Contractor will excavate and directly load petroleum-impacted

⁴ *Soil and Groundwater Remediation Study*, prepared by AMEC, February 2012.

soil into trucks for transportation to an on-Site treatment area or the Contractor may stockpile the soil prior to off-Site disposal at an approved facility.

A small volume of soil within Bunker Oil and Furnace Oil Area is impacted with PAHs and therefore, cannot be treated on-Site. The PAH-impacted soil will be disposed off Site at a Class 1 licensed facility or another approved facility.

5.0 ON-SITE WASTE MANAGEMENT

All wastes will be separated into waste streams by the Contractor, based on disposal requirements. A primary waste accumulation location will be designated by Vale for temporary accumulation of wastes. Waste intended for off-Site disposal will be sent for disposal as soon as possible following proper waste characterization. Preliminary designated storage areas are described in more detail in the Storage Plan.

The logistics of completing the waste characterization and finalizing the disposal arrangements are the responsibility of the Contractor.

5.1 DISPOSAL CONTAINERS

The Contractor will supply appropriate containers for waste streams and recyclable items for which they are providing off-Site transportation and disposal. The selection of the containers will be based on regulatory requirements, waste compatibility, transportation requirements, and disposal facility requirements.

5.2 STAGING PRIOR TO DISPOSAL

Containerized waste generated during the decommissioning/demolition will be accumulated at a temporary nearby location while the containers are still being filled. Once full, all containerized wastes will be stored on Site at the designated primary accumulation location(s) pending off Site treatment/disposal.

5.3 LABELLING

The Contractor is responsible for labelling all waste disposal containers as required. A summary of labelling requirements is presented in the following sections.

5.3.1 ASBESTOS WASTE

In accordance with the Guidelines for Working with Asbestos (Manitoba Work Place Safety & Health Division, March 2008), asbestos waste must be labeled with the following information:

1. Product identifier
2. Information on the safe handling of the controlled product
3. A statement that a material safety data sheet or waste profile sheet for the controlled product is available

5.3.2 PCB WASTE

In accordance with SOR 2008/273, the Contractor must label PCB waste as follows:

1. State "ATTENTION – contains 50 mg/kg or more of PCBs in black lettering on a white background, in a font size of no less than 36 points
2. Measure at least 150 mm by 150 mm or at least 76 mm by 76 mm in the case of capacitors
3. In the case of equipment for which an extension is applied for under Section 17, state a unique identification number

5.3.3 HAZARDOUS WASTE

The Contractor must label hazardous waste in accordance with Part 4 of the TDG Regulation.

5.3.4 RECYCLABLE MATERIALS

Recyclable material, such as fluorescent lamps and other lights and non-PCB ballasts, shall be placed in appropriate containers and staged in a designated accumulation area prior to off-Site transportation and recycling. Lamps shall be segregated by type (e.g. mercury or sodium) and by size (e.g. 4 feet or 8 feet). Lamps shall be marked clearly with type and size. The Contractor shall also mark on the container the date which the lamps were removed from service. Lamps shall not be accumulated for a period of more than one year.

All other recyclable material shall be placed in containers specified by the recycling facility.

All labelling, container supply, and management of recyclable items shall be provided by the Contractor. The Contractor shall supply Vale with generator copies of shipping documentation and certificates of recycling from the recycling facility.

5.4 PCB WASTE STORAGE REQUIREMENTS

The storage of PCB waste is regulated by M.R. 474/88 and by Environment Canada PCB Regulation SOR 2008/273 under the Canadian Environmental Protection Act, 1999, as amended. Vale has a permanent licensed PCB storage facility located in the South Yard. The Contractor shall transport all PCB waste (greater than 50 ppm) to the permanent storage facility for off-Site disposal at a licensed facility.

PCBs with a concentration of less than 50 ppm are not subject to these storage requirements.

M.R. 474/88 states that no person shall dispose of PCB waste without a prior written authorization from Manitoba Conservation. Prior to shipping out PCBs waste for disposal the Contractor must submit a completed application to the address below and obtain the required written authorization:

Manitoba Conservation Authority
Environmental Services
Hazardous Waste Program
1007 Century Street
Winnipeg, Manitoba R3H 0W4

5.5 HAZARDOUS WASTE STORAGE REQUIREMENTS

Hazardous wastes must be stored in compliance with the TDG regulations including the Part 4 (Dangerous Goods Safety Marks) and Part 5 (Means of Containment), the Environmental Protection Plan, and the Storage Plan. Hazardous waste storage areas should be inspected on a weekly basis.

Appendix D contains a weekly hazardous waste inspection form for containers with secondary containment.

6.0 Spill Prevention and Response

The handling and transport of containerized waste will be, at all times, conducted in a controlled and safe manner that will minimize damage to the waste containers and prevent release of the contents as per Part 5 of the TDG Regulation. Part 5.4 states that a person must load and secure dangerous goods in a means of containment and must load and secure the means of containment of transport in such a way as to prevent, under normal conditions of transport, damage to the means of containment or to the means of transport that could lead to an accidental release of the dangerous good.

In the event that a drum or container of liquid is spilled, the Contractor will immediately respond to the spill as described below. If the material is a TDG regulated material and the size of the release is greater than the quantity or emission level as set forth in Part 8 of the TDG Regulations the Contractor will follow the protocol as per Part 8 of the TDG Regulation.

The spilled liquids will be confined to the immediate area of the spill by dyking around the spill with native material or with an inert absorbent and the liquids will be pumped with the use of a portable hand pump into a re-pack drum. Any residual liquids that cannot be pumped will be absorbed with a sufficient quantity of inert absorbent to ensure that no free liquids remain. If the spill occurred on soil, outside of a previously identified contaminated area, the Contractor will immediately consult with the Vale Project Manager to determine the appropriate response.

If the spilled liquid consists of decontamination water, the decision to excavate the visibly affected soils will be based on whether the water was generated from a source known to exhibit contamination. The Contractor will immediately consult with the Vale Project Manager to determine the appropriate response.

Part 8 the TDG Act requires persons in charge of facilities (including transport vehicles, vessels and aircraft) to report any release of a hazardous substance in a quantity equal to or greater than its reportable quantity (specified in Part 8 of the TDG Act), as soon as that person has knowledge of the release, to the following:

- a) Manitoba Department of Conservation at (204) 945-4888 and either the local police or the fire department
- b) The person's employer
- c) The consignor of the dangerous goods
- d) For a road vehicle, the owner, lessee or charterer of the road vehicle

- e) For a railway vehicle, CANUTEC at (613) 996-6666
- f) For a ship, CANUTEC at (613) 996-6666, a Vessel Traffic Services Centre or a Canadian Coast Guard radio station
- g) For an aircraft, an aerodome or an air cargo facility, CANUTEC at (613) 996-6666 and the nearest Regional Civil Aviation Office of the Department of Transport and, if the aerodome is an airport, the operator of the airport
- h) For Class 1, Explosives, and Class 6.2 Infectious Substances, CANUTEC at (613) 996-6666
- i) For an accidental release from a cylinder that has suffered a catastrophic failure, CANUTEC at (613) 996-6666

All spills must be immediately identified to the Contractor to evaluate and complete the reporting requirements. The Contractor will be notified of these events and provided with the reporting information. The Contractor will report all required information as detailed in Part 8.2 and then follow-up with a 30 day report as required by Part 8.3.

The contact information for CANUTEC is listed below:

CANUTEC:

Information: (613) 992-4624

Emergency: (613) 996-6666

Facsimile: (613) 954-5101

CANUTEC@tc.gc.ca

The contact information for TDG for the Prairie and Northern Region is listed below:

Prairie and Northern Region

Winnipeg: (204) 983-5969

Facsimile: (204) 983-8992

Saskatoon: (306) 975-5105

Facsimile: (306) 975-4555

E-mail: TDG-TMDPNR@tc.gc.ca

Transport Canada Dangerous Goods Directorate Internet address

<http://www.tc.gc.ca/eng/tdg/safety-menu.htm>

7.0 WASTE SAMPLING

7.1 GENERAL

The collection of waste samples from containerized liquid/solid wastes, bulk soil stock piles, or in-situ materials for the purpose of disposal characterization will be conducted as required. These activities will be conducted to ensure compliance with Part 2 of the TDG Act and Manitoba regulations.

The Contractor will be responsible for developing the waste characterization strategy, and completing this task to determine the final disposition requirements.

The following subsections describe the procedures to be implemented for sampling bulk wastewater, drummed liquid wastes, drummed or containerized solid wastes, and drummed/containerized or bulk mixtures of solids and liquids for disposal characterization purposes. The sampling of in-situ materials is also discussed.

7.2 SAMPLE COLLECTION PROTOCOLS

The following sub-sections describe the sampling methods selected for this WMP.

7.2.1 COLLECTING LIQUID AND SOLID SAMPLES

The Contractor will collect samples of containerized wastes based on consultation with the off-Site treatment/disposal/recycling facility, including the sampling methodology (discrete or composite), sample frequency, and analytical parameters. PPE as required by the HASP must be worn at all times during the sampling of containerized wastes.

The Contractor may collect concrete samples using a drill and collecting the fines once a hole has been drilled into the concrete.

7.2.2 COLLECTING WIPE SAMPLES

This section describes the general procedures that will be followed when collecting a wipe sample from a metal or other non-porous surface. Prior to sample collection, the sampler must prepare disposable templates such that the inner edges represent a minimum of 100 cm² surface area.

1. Use a disposable (cardboard) template and mark with a piece of chalk a 100 cm² area on the inside metal surface to be tested. The template may also be taped to the surface.
2. Open one sample jar. Wearing a clean pair of latex gloves, remove the gauze pad from the jar. Add 4 to 5 ml of hexane to the gauze pad from a pump buret on the solvent bottle. The laboratory may also pre-pack the sample jar with the hexane; therefore, no additional hexane is required.
3. Starting in one corner and using a uniform and steady pressure, wipe the pre-marked area with the gauze pad in rows ensuring the entire area is covered.
4. Open the gauze pad and refold to expose fresh surfaces.
5. Wipe the marked area in rows which are perpendicular to the previous ones. Ensure the entire area is swabbed equally using a uniform, steady pressure.
6. Place the gauze pad back in the jar. Close the lid and label the sample appropriately.
7. Dispose of the template and gloves.
8. Complete chain-of-custody data sheets.
9. Transport the sample to the laboratory for analysis.

7.2.3 DRUMMED/CONTAINERIZED MATERIAL SAMPLING

This section describes the general procedures that will be followed when sampling drums or bulk waste containers.

Safety Equipment

PPE as specified within the HASP will be worn at all times when collecting samples from containerized waste.

Sampling Equipment

Materials and equipment that may be required for sampling are as follows:

1. Chain-of-Custody data sheets.
2. Glass sampling thief or other appropriate sampling device for the collection of liquid samples.

3. Stainless steel trowel, spoon or trier for collection of solid or sludge samples, core sampler if applicable. **SAMPLING EQUIPMENT CONTAINING ALUMINUM AND GALVANIZED STEEL SHALL NOT BE USED.**
4. Bung wrench for drummed wastes.

All drums should be sampled on a storage pad whenever possible to mitigate potential spillage onto unprotected ground surfaces.

Sampling Procedures

The following procedures will be adhered to during sampling of drummed liquid waste.

- 1) If drum is suspected of containing flammable materials, or material is unknown, the drum must be grounded and use only non-sparking tools.
- 2) Remove cover from sample container and remove lid/bung from the drum. It is preferable to remove only the bung from drums containing liquids.
- 3) Insert sampling thief almost to the bottom of the drum or until a solid layer is encountered. If the liquid in the drum is a single phase, a representative sample of the liquid in the entire drum will be collected for compatibility testing, if necessary, and waste characterization. If more than a single phase of liquid is determined to be present in the drum, each phase of liquid will be sampled separately.
- 4) Allow the liquid waste in the drum to reach its natural level in the tube.
- 5) Cap the top of the sampling tube with a double-gloved thumb or stopper, ensuring liquids do not come into contact with the sampler's thumb or stopper.
- 6) Carefully remove the capped tube from the drum and insert the uncapped end in the sample container. Do not spill liquid on outside of bottle.
- 7) Slowly release the thumb or stopper and allow the glass thief to drain completely and fill the sample container. Repeat the above steps until sufficient volume has been collected for analysis.
- 8) Cap the sample container tightly and place pre-labeled sample container in a carrier.
- 9) Complete chain-of-custody data sheets.
- 10) Transport the sample to the laboratory for analysis.

Sampling of drummed and/or containerized solids or sludges will, in general, conform to the preceding procedures with the following exceptions:

1. Sample collection will be accomplished using a stainless steel trowel, spoon or trier, or core sampler. All sampling equipment will be cleaned prior to use. Reusable sampling equipment will be cleaned between subsequent drums.
2. A representative sample of drummed and/or containerized solids or sludges, will be collected, if practical.
3. The sample collected will be a composite of a minimum of four 25-gram samples collected from representative locations throughout the containerized material unless it is known that the containerized material is homogeneous in nature (e.g. soil cuttings, spent carbon). In this case, only one sample will be collected from the drum or container.

Samples collected from containerized waste containing the same material may be composited during sample collection into one sample for disposal characterization purposes except for volatile compounds. Samples collected for volatile analysis will consist of grab samples only. The grab samples will be analyzed individually and the results averaged or the laboratory may be instructed to combine the extracts from the separate grab samples prior to analysis.

General field sampling equipment decontamination procedures are as follows:

1. Wash sampling equipment with clean potable water and laboratory detergent (Alconox or Liquinox or similar solution) using a brush if necessary to remove any particles or surface films
2. Rinse thoroughly with potable water
3. Rinse thoroughly with deionized water and allow to air dry
4. Wrap equipment with aluminum foil (shiny side out), to prevent contamination if equipment is going to be stored or transported

7.3 SAMPLE HANDLING AND SHIPMENT/CHAIN-OF-CUSTODY

Good sample management ensures that samples are properly recorded, properly labeled, not lost, broken, or exposed to conditions that may affect the sample's integrity. All samples must be properly labeled as soon as practical after collection. In most cases,

the project will require shipment of samples by overnight carrier. Appropriate chain-of-custody procedures will be followed.

The sample packaging and shipping procedures summarized below will ensure that the samples arrive at the laboratory with the chain-of-custody intact:

- The sampler is personally responsible for the care and custody of the samples until they are transferred to another person or the laboratory. As few people as possible will handle the samples.
- The sampler will identify all sample containers using sample labels that include the date of collection and analyses to be performed.
- The sampler will complete sample labels for each sample using waterproof ink unless prohibited by weather conditions.
- The sampler will include a properly completed chain-of-custody form with all sample submittals. The sampler will list the sample identification numbers on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving the samples will sign and record the date and time on the form. The chain-of-custody form documents sample custody transfers from the sampler to another person, to the laboratory, or to/from a secure storage area.
- The sampler will properly package samples for shipment and dispatch to the appropriate laboratory for analysis, with a separate signed chain-of-custody form enclosed in and secured to the inside top of each sample cooler. The sampler will secure shipping coolers with custody tape for shipment to the laboratory unless the samples will not leave the sampler's custody prior to delivery to the laboratory.
- If the samples are sent by common carrier, the sampler will use a bill of lading and copies will be retained as permanent documentation. Commercial carriers are not required to sign the chain-of-custody form as long as the form is sealed inside the sample cooler and the custody tape remains intact.
- The sampler will attempt to ship the samples to the laboratory on the same day as the samples are collected in the field.

8.0 HAZARDOUS WASTE DETERMINATION

In accordance with the Manitoba DGHT Act, waste may be characterized as hazardous based on the following:

- a) It is listed as a dangerous good in the TDG Regulations, or
- b) It is characteristically hazardous using the classification criteria set forth in M.R. 282/87, Classification Criteria for Products, Substances and Organisms Regulation

There are various physical and chemical testing protocols required to meet the general testing requirements of various treatment/disposal facilities. The waste characterization requirements will be confirmed following selection and identification of the treatment/disposal facility(ies). The site-specific WMP will identify the appropriate sampling strategy.

In general, samples that are collected from containerized waste for disposal characterization will be analyzed for Toxicity Characteristic Leaching Procedure (TCLP) and total constituent levels (volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], and metals, as applicable) along with reactivity, corrosivity, and ignitability, as necessary, to determine if the material is potentially a characteristically hazardous waste.

Waste that contains PCB concentrations greater than 50 ppm will be characterized as PCB waste in accordance with PCB Regulations SOR 2008/273 and disposed of accordingly.

9.0 NORM DETERMINATION

As discussed in Section 4.3, there is potential for the refractory brick in the furnaces, converters, and stack to contain NORM. A qualified radiological professional should initially screen the brick using a Geiger counter to determine if the brick is NORM. If the Geiger counter does not measure any ionizing radiation, then the brick is not NORM. If the Geiger counter measures ionizing radiation, the qualified professional will collect samples of the different types of brick to characterize the potential NORM material in accordance with the Canadian Guidelines for the Management of NORM.

The Canadian Guidelines for the Management of NORM establish dose limits for NORM in which the radioactive hazard associated with this dose is considered insignificant; and therefore, no control on the material is necessary with respect to radiological protection. The dose limits or the "Derived Release Limits" for types of NORM are presented in Section 5.0 of the Canadian Guidelines for the Management of NORM.

NORM quantities greater than the Derived Release Limits may also be released without further consideration after a specific site review has been completed.

10.0 WASTE TRANSPORTATION AND DISPOSAL

10.1 MANIFESTING AND LABELLING

All TDG regulated hazardous and non-TDG regulated hazardous wastes will be labeled and manifested according to applicable TDG regulations and Manitoba regulation M.R. 139/88 prior to leaving the Site. The manifest forms and records must be consistent with TDG Part 3 "Documentation", and the province to which the waste is being shipped. The hazardous waste generator identification number for the Site must be used on all manifests.

NORM, if present, will be handled in accordance with the Canadian Guidelines for the Management of NORM, including the CNSC's Packaging and Transportation Regulations and the TDG regulations. The guideline and other applicable regulations **MUST** be consulted if NORM is identified.

All generated waste and recyclable material will be tracked from generation through disposal. The waste tracking program will track container start dates, container locations, container contents, regulatory storage/disposal timeframes, container labeling requirements, approved disposal locations, approved waste stream profiles and shipping documentation, including generating manifests/shipping documents and tracking receipt of returned manifests.

All manifests must be signed by the Generator (i.e. Vale) or an authorized agent. The Contractor cannot sign waste manifests, hazardous or otherwise, unless an agreement with Vale has been made. Any person who signs manifests must have current hazardous waste training and TDG training.

Generators of hazardous waste must comply with the following requirements when shipping hazardous wastes:

- Generator must identify and classify all hazardous wastes generated.
- Generator must have completed an initial registration as a hazardous waste generator with the Manitoba Conservation by submitting a completed Hazardous Waste Registration Form.
- Manitoba Conservation will assign a hazardous waste generator number (Provincial ID No.) to the Site.
- Generator must submit a supplementary registration form to Manitoba Conservation as required to report changes.

- Generator must use licensed hazardous waste carriers to transport hazardous waste (with the exception of certain recyclable material).
- Generator must dispose of hazardous waste through licensed disposal facilities
- Generator must ensure that Part A of the manifest is completed and that the information is correct.
- Generator must sign the manifest and ensure that Copy 1 of the manifest is sent to the Manitoba Conservation (and other appropriate authority if it is an interprovincial or transborder shipment).
- For recyclable material that qualifies for exemption from the manifest, ensure that appropriate shipping document (with Generator registration number recorded on it) is completed and copy is retained for two years.
- Obtain signature of initial transporter and date of acceptance.
- Retain copy until 2 years after receiving copy of manifest signed by the disposal facility.
- Give transporter remaining copies of manifest.
- If the hand-signed manifest from disposal facility is not received within 35 days after transporter accepted the waste, telephone or communicate with disposal facility to determine if waste has actually been received. If not received, contact transporter to determine disposition of the waste. Retain written record of all telephone or other confirmations.
- If Generator has not received a copy of the signed manifest within 45 days of shipping the waste, the generator shall submit an Exception Report to Manitoba Conservation no later than 45 days from the date on which the Generator should have received the signed manifest.

10.2 PREPARATION OF OFF-SITE TRANSPORT VEHICLES

All off-Site transport vehicles will be prepared as appropriate prior to receiving drummed or bulk waste. Drummed wastes will be loaded and secured in a manner that will prevent damage to the containerized materials as per Part 5 of the TDG Regulations. All applicable TDG requirements will be followed. A weatherproof tarp will be provided and secured over each shipment leaving the Site except for enclosed transport units.

The Contractor will be responsible for decontamination of transport vehicles prior to leaving the Site. Any material on the tires or axles of trucks and material on the vehicle

resulting from loading operations must be removed. Decontamination activities will include sweeping, brushing and/or steam cleaning, as appropriate.

The Contractor will inspect and document that each vehicle leaving the Site has been decontaminated properly, tarps are secured, proper placards are in place, manifest/documents are correct, appropriate copies of the manifest are retained for filing and/or submission, and that there are no visible signs of leaks from the drums/containers that have been loaded onto the vehicles.

10.3 AUTHORIZED TRANSPORTERS

All hazardous waste transporters must be licensed by the Manitoba Conservation and the appropriate provinces through which the trucks will travel to carry hazardous waste. Transporters will comply with applicable provincial and federal hazardous waste transportation requirements and other applicable rules including TDG requirements.

The Transporter is responsible to ensure that they comply with the terms and conditions of their licence and that the Generator is registered prior to shipping of the waste. The Transporter will complete Part B of the manifest. Transporters will keep Copy 4 of the manifest and any shipping documents for recyclable material on record for a period of two years after shipping.

If wastes are deemed to be non-hazardous, then transporters will be licensed for general transportation of wastes as required by Manitoba Conservation.

10.4 TRANSPORTATION ROUTES

Transportation routes to off-Site facilities will be pre-determined by the authorized transporter prior to commencing off-Site transport of waste materials. A primary and secondary route to each facility will be identified. The secondary route will be used only if the primary route becomes impassible due to weather and road conditions or blockage from traffic accidents. The appropriate provincial officials will be consulted as to whether any proposed routes are scheduled for construction or seasonal closures that will occur during implementation of this project. The transportation routes are presented in more detail in the Transportation and Logistics Plan.

10.5 OFF-SITE TREATMENT/DISPOSAL

All off-site treatment/disposal of waste materials will be conducted in accordance with applicable provincial and federal regulations and Vale.

10.5.1 APPROVED TREATMENT/DISPOSAL FACILITIES

Off-Site facilities for the treatment, storage, or disposal of drummed/containerized or bulked wastes must be approved by Vale prior to commencing transport to these facilities. All facilities identified for hazardous waste treatment/disposal will be Manitoba Conservation-approved as applicable in accordance with the Manitoba Act.

Facilities must comply with the Terms and Conditions associated with their licence and accept hazardous waste only from registered generators and licensed carriers (except for exempted recyclable materials).

Receivers must complete Part C of the manifest and send a copy to the Manitoba Conservation (and other appropriate authorities if inter provincial or international shipment) and retain a copy on record for two years for both hazardous and recyclable material.

Any wastes deemed to be non-hazardous may be transported to an approved permitted waste disposal facility and/or other approved facility, if allowed by regulations.

10.6 MANIFEST TRACKING/NOTIFICATION OF DISPOSAL

Hazardous waste manifest tracking requirements vary by province. The Generator must submit Copy 1 of the manifest to the Manitoba Conservation within 3 shipping days. The Receiver will submit Copy 3 of the manifest to the Manitoba Conservation within 3 days of receiving the waste. The Receiver will also send the Generator Copy 6 within 35 days of receiving the waste. Appendix E contains a manifest tracking log.

The waste tracking program will track receipt of returned manifests and certificates of disposal. The Contractor will send Vale a copy of each return manifest and certificate of disposal.