



GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR
Department of Municipal Affairs and Environment
CERTIFICATE OF APPROVAL

Pursuant to the Environmental Protection Act, SNL 2002 c E-14.2 Section 83

Issue Date: *May 5, 2020* Approval No. AA20-055659A
Amendment Date: *July 24, 2020*
Expiration: *December 31, 2023* File No. 731.550

Proponent: **Vale Newfoundland & Labrador Limited**
KMK Place, 2nd Floor
18 Hebron Way
St. John's, NL A1A 0L9

Attention: Mr. Matt Hynes, Superintendent – Safety, Health and Environment

Re: **Voisey's Bay Mine/Mill Project Site**

Approval is hereby given for the operation of: an open pit mine; ore crusher; concentrator; effluent treatment system; potable water treatment plant expansion; tailings management facility; explosives manufacturing plant; and port unloading, storage and reclaim facilities and the construction of the following components of the Voisey's Bay Mine Expansion Project: temporary facilities – accommodation and expansions, dorms, construction warehouse and mine maintenance shops, laydown areas and trailers; mine access portals and surface facilities; underground mine and associated infrastructure; associated clearing and grubbing of the project areas; construction of drainage structures; paste backfill plant, booster station, and binder storage silos at the port site; concentrator facility modifications; access/haul road development, early pit development to access and strip 'waste' and a temporary dewatering system for the Discovery Hill Early Works Pit (Quarry) including the pond; service roads, and surface-run and buried utilities, and power lines to connect to new and existing services as required at the Voisey's Bay Project Site.

This Certificate of Approval does not release the proponent from the obligation to obtain appropriate approvals from other concerned provincial, federal and municipal agencies. Nothing in this Certificate of Approval negates any regulatory requirement placed on the proponent. Where there is a conflict between conditions in this Certificate of Approval and a regulation, the condition in the regulation shall take precedence. Approval from the Department of Municipal Affairs and Environment shall be obtained prior to any significant change in the design, construction, installation, or operation of the Voisey's Bay Project Site, including any future expansion of the Voisey's Bay Mine/Mill. This Certificate of Approval shall not be sold, assigned, transferred, leased, mortgaged, sublet or otherwise alienated by the proponent without obtaining prior approval from the Minister.

This Certificate of Approval is subject to the terms and conditions as contained therein, as may be revised from time to time by the Department. Failure to comply with any of the terms and conditions may render this Certificate of Approval null and void, may require the proponent to cease all activities associated with this Certificate of Approval, may place the proponent and its agent(s) in violation of the *Environmental Protection Act*, and will make the proponent responsible for taking such remedial measures as may be prescribed by the Department. The Department reserves the right to add, delete or modify conditions to correct errors in the Certificate of Approval or to address significant environmental or health concerns.


For **MINISTER**

TERMS AND CONDITIONS FOR APPROVAL No. AA20-055659A

July 24, 2020

General

1. This Certificate of Approval is for the operation of:

- an open pit mine;
- ore crusher;
- concentrator;
- effluent treatment system;
- potable water treatment plant expansion;
- tailings management facility;
- explosives manufacturing plant; and
- port unloading, storage and reclaim facilities;

and the construction, commissioning and operation of the following components related to the Voisey's Bay Mine Expansion:

- temporary accommodation facilities and expansions (South Camp);
- temporary dorms;
- temporary construction warehouse and mine maintenance shops (surface and underground);
- temporary construction and mining laydown areas and trailers;
- mine access portals and surface facilities (including associated conveyors, ventilation systems and power centres);
- underground mine and associated raise bores, escapeways and refuge stations (including pump houses and electrical houses located at the surface);
- associated clearing and grubbing of the project areas including the incinerator area;
- construction of drainage structures (including sumps);
- paste backfill plant, booster station, and binder storage silos at the port site;
- concentrator facility modifications (including pipelines to transfer tailings to the paste plant);
- access/haul road development for Discovery Hill Early Works Pit (Quarry);
- accessing and stripping of material (including quarry material and waste rock) from the top of Discovery Hill;
- Discovery Hill Early Works Pit (Quarry) dewatering system including a temporary system for the development stage;
- service roads; and
- surface-run and buried utilities (including fuel storage tanks and pipelines), and power lines to connect to new and existing services

as required at the **Voisey's Bay Project Site (VBPS)** as per plans and specifications supplied by **Vale Newfoundland & Labrador Limited (VNL)** for this Certificate of

Approval. Extensive future expansion or change of activities will require a separate Certificate of Approval.

2. This Approval does not include other components of the Voisey's Bay Mine Expansion such as the construction of the concrete/shotcrete batch plant.
3. Any inquiries concerning this Approval shall be directed to the St. John's office of the Pollution Prevention Division (telephone: (709) 729-2556; or facsimile: (709) 729-6969).
4. In this Certificate of Approval:
 - **accredited** means the formal recognition of the competence of a laboratory to carry out specific functions;
 - **acutely lethal**, in respect of an effluent, means that the effluent at 100% concentration kills
 - (a) more than 50% of the rainbow trout subjected to it for a period of 96 hours, when tested in accordance with Reference Method EPS 1/RM/13; or
 - (b) more than more than 50% of the Daphnia magna subjected to it for a period of 96 hours, when tested in accordance Reference Method EPS 1/RM/14;
 - **acid mine drainage** means any flow or drainage of water having a pH of less than 5.5 from areas affected by mining activities;
 - **air contaminant** means any discharge, release, or other propagation into the air and includes, but is not limited to, dust, fumes, mist, smoke, particulate matter, vapours, gases, odours, odorous substances, acids, soot, grime or any combination of them;
 - **ALT (acute lethality test)** means a test conducted to determine whether an effluent is acutely lethal;
 - **binder** means a material consisting of a 90:10 mixture of binder slag to Portland cement;
 - **composite sample** means
 - (a) a quantity of effluent consisting of not less than three equal volumes or three volumes proportionate to flow that have been collected at approximately equal time intervals over a sampling period of not less than seven hours and not more than 24 hours; or
 - (b) a quantity of effluent collected continuously at a constant rate or at a rate proportionate to the rate of flow of the effluent over a sampling period of not less than seven hours and not more than 24 hours;

- **Director** means the Director of the Pollution Prevention Division of the Department;
- **discharge criteria** means the maximum allowable levels for the parameters listed in **Table 3**;
- **EDMS** means Environmental Data Management System;
- **GAP** means *Storage and Handling of Gasoline and Associated Products Regulations, 2003*;
- **grab sample** means a quantity of undiluted sample collected at any given time. In this Approval it refers to used oil and effluent;
- **hazardous waste** means a product, substance or organism that is intended for disposal or recycling, including storage prior to disposal or recycling, and that:
 - (a) is listed in Schedule III of the *Export and Import of Hazardous Waste Regulations under the Canadian Environmental Protection Act, 1999*;
 - (b) is included in any of Classes 2 to 6, and 8 and 9 of the *Transportation of Dangerous Goods Regulations* under the *Transportation of Dangerous Goods Act, 1992*; or
 - (c) exhibits a hazard classification of a gas, a flammable liquid, an oxidizer, or a substance that is dangerously reactive, toxic, infectious, corrosive or environmentally hazardous;
- **Headwater Pond** is a multi-purpose storage facility which is used:
 - (a) for the current and future storage of mine inflows to the Open Pit and underground mines from direct precipitation, pit wall runoff, groundwater seepage, and surface runoff from the mine access portals which are collected in sumps and pumped to the mill, from where they are sent to Headwater Pond;
 - (b) as a tailings impoundment area for storage of tailings generated from the milling of Voisey's Bay ore; and
 - (c) to provide surge capacity and retention time for site water management and act as a source of process water for the mill.

At the time that Headwater Pond reaches its permitted storage capacity tailings will subsequently be diverted to the depleted Ovoid pit. At that point references to Headwater Pond, as it pertains to tailings, should be considered to refer to the Ovoid pit.
- **licensed** means has a Certificate of Approval issued by the Minister to conduct an activity;

- **malfunction** means any sudden, infrequent and not reasonably preventable failure of air pollution control equipment, wastewater treatment equipment, process equipment, or a process to operate in a normal or usual manner. Failures, caused in part by poor maintenance or careless operation, are not malfunctions;
- **MDMER** means the federal Metal and Diamond Mining Effluent Regulations;
- **Minister** means the Minister of the Department;
- **NAG** means non-acid generating waste rock;
- **NO_x** means oxides of nitrogen;
- **NO₂** means nitrogen dioxide;
- **PAG** means potentially acid generating rock;
- **paste** means a mixture of dewatered tailings from the concentrator plant with binder to create a material that will be used as backfill in mined-out stopes of the underground mines;
- **Plan** means the specific plan as identified in the section of this Approval within which it is used. For example, in the *Waste Management Plan* section it refers to the Waste Management Plan;
- **PM_{2.5}** means particulate matter with a diameter of 2.5 µm or less;
- **proficiency testing** means the use of inter-laboratory comparisons to determine the performance of individual laboratories for specific tests or measurements;
- **QA/QC** means Quality Assurance/Quality Control;
- **Reference Method EPS 1/RM/13** means Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, Second Edition – December 2000, published by Environment Canada, as amended from time to time;
- **Reference Method EPS 1/RM/14** means Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*, Second Edition – December 2000, published by Environment Canada, as amended from time to time;
- **register(ed)**, in the context of storage tanks, means that information regarding the storage tank system has been submitted to a Service NL office and a registration number has been assigned to the storage tank system. In the context of dispersion modelling, registered means submitted to and approved by the Department in accordance with departmental policy and guidelines.

- **regulated substance** means a substance subject to discharge limit(s) under the *Environmental Control Water and Sewage Regulations, 2003*;
- **site plan** means the drawings supplied in the documentation, dated *September 24, 2018*, for this Approval;
- **SOP** means Standard Operating Procedure;
- **spill or spillage** means a loss of gasoline or associated product in excess of 70 litres from a storage tank system, pipeline, tank vessel or vehicle, or an uncontrolled release of any volume of a regulated substance onto or into soil or a body of water;
- **stack** means a chimney, flue, conduit or duct arranged to conduct an air contaminant into the environment;
- **storage tank system** means a tank and all vent, fill and withdrawal piping associated with it installed in a fixed location and includes a temporary arrangement;
- **TDS** means total dissolved solids;
- **toxic pass** means a mortality rate of no more than 50% during the ALT;
- **TPH** means total petroleum hydrocarbons, as measured by the Atlantic PIRI method;
- **TPM** means total particulate matter with diameters less than 100µm;
- **TSS** means total suspended solids;
- **used glycol** means glycol that, through use, storage or handling, can no longer be used for its original purpose;
- **used oil** means oil that, through use, storage or handling, can no longer be used for its original purpose;
- **VBPS** means Voisey's Bay Project Site; and
- **VNL** means Vale Newfoundland & Labrador Limited.

5. All necessary measures shall be taken to ensure compliance with all applicable acts, regulations, orders, policies, guidance documents and guidelines, including the following, or their successors:

- *Environmental Protection Act*;
- *Water Resources Act*;
- *Air Pollution Control Regulations, 2004*;
- *Environmental Control Water and Sewage Regulations, 2003*;
- *Halocarbon Regulations*;
- *Storage and Handling of Gasoline and Associated Products Regulations, 2003*;

- *Used Oil and Used Glycol Control Regulations;*
- *Heating Oil Storage Tank System Regulations, 2003;*
- *Voisey's Bay Nickel Company Limited Mine and Mill Undertaking Order;*
- *Ambient Air Monitoring Guidance Document;*
- *Sampling of Water and Wastewater - Industrial Effluent Applications Guidance Document;*
- *Accredited Laboratory Policy;*
- *Compliance Determination Guidance Document;*
- *Stack Emission Testing Guidance Document;*
- *Plume Dispersion Modelling Guidance Document;*
- *Precipitation Drainage of Dyke Areas Guidance Document;*
- *Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tank.; and*
- *Guidance Document for the Management of Impacted Sites.*

This Approval provides terms and conditions to satisfy various requirements of the above listed acts, regulations, order, policy, guidance documents and guidelines. If it appears that any of the pertinent requirements of these acts, regulations, order, policy, guidance documents and guidelines are not being met, then a further review of the works shall be conducted, and suitable pollution control measures may be required by the Minister.

6. All reasonable efforts shall be taken to minimize the impact of the operation on the environment. Such efforts include:
 - minimizing the area disturbed by the operation,
 - minimizing air or water pollution,
 - finding alternative uses, acceptable to the Director, for waste or rejected materials,
 - removing equipment or structures when they no longer have further use, and
 - considering the requirement for the eventual rehabilitation of disturbed areas when planning the development of any area on the facility property.
7. **VNL** shall provide to the Department, within a reasonable time, any information, records, reports or access to data requested or specified by the Department.
8. **VNL** shall keep all records or other documents required by this Approval at the **VBPS** location for a period of not less than three (3) years, beginning the day they were made. These records shall be made available for review by officials of the Department or Service NL when requested.
9. Should **VNL** wish to deviate in any way from the terms and conditions of this Certificate of Approval, a written request detailing the proposed deviation shall be made to the Minister. **VNL** shall comply with the most current terms and conditions until the Minister has authorized otherwise. In the case of meeting a deadline requirement, the request shall be made at least 60 days ahead of the applicable date as specified in this Approval or elsewhere by the Department

Activities Affecting Bodies of Water

10. Any work that must be performed in a body of water below the high water mark shall be carried out during a period of low water levels, unless otherwise permitted in writing by the Department.
11. All construction operations shall be carried out in a manner that minimizes damage to land, vegetation, and watercourses, and which prevents the discharge of substances, to bodies of water, in excess of applicable regulatory limits.
12. The use of heavy equipment shall be confined to dry stable areas and shall not be carried out in streams or bodies of water, unless otherwise permitted in writing by the Department.
13. All vehicles and equipment shall be in good repair, and shall be free of leaks of oil or other harmful substances that could impair water quality.
14. During the construction of concrete components, formwork shall be properly constructed to prevent any fresh concrete from entering a body of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.
15. Waste hardened concrete shall not be disposed as unsuitable material at the project site. Waste hardened concrete shall be put to beneficial use on site as fill material, or it shall be sent to an approved waste disposal site.
16. All areas affected by this project shall be restored to a state that resembles local, natural conditions. Further remedial measures to mitigate environmental impacts on water resources can and will be specified, if necessary in the opinion of this Department.
17. Prior written permission is required from the Department for all work that takes place in a body of water, including but not limited to bridges, culverts, fording, stream modifications, infilling and dredging.

Environmental Protection Plan

18. **VNL** shall implement the most recent version of the Voisey's Bay Environmental Protection Plan. This plan shall be reviewed annually by **VNL** and revised as necessary, accounting for expanding or alteration of activities. All proposed revisions shall be submitted to the Director for review. The Department will acknowledge receipt of the Plan and/or revisions, and shall provide any review comments within a reasonable time frame.

Waste Management

19. The management of waste generated at the facility is subject to compliance with the ***Environmental Protection Act***. All non-industrial waste shall be stored in a manner acceptable to the Department and, on at least a weekly basis, be disposed of:

- at an authorized waste disposal site, with the permission of the owner/operator of the site; or
- by some other means acceptable to the Department.

If required, industrial waste shall be disposed of by a licensed operator.

20. **VNL** shall ensure that all volatile chemical and solvent wastes, if they cannot be reused, are placed in suitable covered containers for disposal in a manner acceptable to the Department. Disposal of liquid wastes at waste disposal sites in the province is not permitted.
21. Disposal of hazardous waste in a municipal or regional waste disposal site in this Province is prohibited. Transporters of hazardous waste shall have an Approval issued by the Minister. Those generating hazardous waste shall have a waste generator's number issued by the Director and shall also complete the required information outlined in the Waste Manifest Form.

Waste Management Plan

22. **VNL** shall continue to implement the Voisey's Bay Waste Management Plan (*June 13, 2016*), including all revisions, for the **VBPS**. Every year the Plan shall be reviewed by **VNL** and revised as necessary, accounting for expanding or alteration of activities. All proposed revisions shall be submitted to the Director for review. The Department will acknowledge receipt of the Plan and/or revisions, and shall provide any review comments within a reasonable time frame.

Open Burning

23. Materials listed in **Table 1** shall not be burned in open fires.

Table 1 - Material Not Approved for Open Burning	
tires	manure
plastics	rubber
treated lumber	tar paper
asphalt and asphalt products	railway ties
drywall	paint and paint products
demolition waste	fuel and lubricant containers
hazardous waste	used oil
biomedical waste	animal cadavers
domestic waste	hazardous substances

trash, garbage, or other waste from commercial, industrial or municipal operations	materials disposed of as part of the removal or decontamination of equipment, buildings or other structures
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24. The Department shall be notified prior to the burning of any materials not listed in **Table 1** except where authorized in VNL's Waste Management System Approval No. LB-WMS19-030246, as renewed or amended.

Noise

25. Efforts shall be made to minimize and control noise resulting from the VBPS's operations and maintenance activities. All vehicles operating within the facility shall have exhaust and muffling devices in good working order.

Dust Suppression

26. VNL shall control dusting resulting from construction and operational activities at the site. Use of dust suppressants other than water or calcium chloride shall require approval of the Director. VNL are encouraged to use best management practices when applying calcium chloride or any other approved dust suppressant.

Chemical Operations

27. All chemical loading and blending shall be done inside the facility, with no chemical containers being opened outside. All vessels will be blanketed to eliminate vapour or odour releases.
28. Empty chemical drums, totes or packaging shall be either sent:
- back to the original equipment manufacturer for re-use;
 - to a recognized disposal company, or;
 - to a recognized re-cycling facility.

When deemed necessary, waste material from drums, totes or packaging will be retained on-site for collection and disposal by a recognized waste treatment company according to provincial and federal regulations.

Spill Prevention and Containment

29. Areas in which chemicals are used or stored shall have spill containment systems constructed with impermeable floors, walls, dykes or curbs as applicable and be configured, maintained, inspected and repaired as follows:
- they shall not discharge to the environment;
 - they shall have an effective secondary containment capacity of at least 110% of the chemical storage tank capacity, in the case of a single storage container;
 - if there is more than one storage container, the spill containment system shall be able to retain no less than 110% of the capacity of the largest container or

100% of the capacity of the largest container plus 10% of the aggregate capacity of all additional containers, whichever is greater;

- they shall be kept clear of material that may compromise the containment capacity;
- they may include a floor drain system provided that the floor drains, and the place or device to which they drain, are configured in such a manner that the required effective secondary containment capacity is maintained;
- every year they shall be visually inspected for their liquid containing integrity, and repairs shall be made when required; and
- once every ten years, spill containment systems shall be inspected, by a means other than visual inspection, for their liquid containing integrity, and repairs shall be made when required.

30. All on site storage of petroleum shall comply with the ***Storage and Handling of Gasoline and Associated Products Regulations, 2003***, or its successor. Storage tank systems shall be registered with Service NL. All aboveground storage tanks shall be clearly and visibly labelled with their GAP registration numbers.

31. Where applicable, all tanks and fuel delivery systems shall be inspected to appropriate American Petroleum Institute or Underwriters' Laboratories of Canada standards, or any other standards acceptable to this Department. The required frequency of inspections may be changed at the discretion of the Director.

32. VNL shall maintain an inventory of all petroleum and chemical storage tanks. This inventory shall include the following information:

- site plan showing tank location,
- registration number (where applicable),
- identification number,
- material stored,
- capacity,
- annual throughput,
- tank material,
- tank type,
- tank diameter,
- tank height,
- tank colour,
- roof type,
- year of manufacture,
- date of installation,
- date of last inspection,
- failure history,
- maintenance history,
- effective secondary containment capacity, and
- date of next planned inspection.

An update of the complete storage tank inventory including any changes to it shall be submitted to the Director within three (3) months of the change having occurred.

33. Refuelling and maintenance of vehicles and equipment shall, whenever possible, be undertaken on a prepared impermeable surface with an oil containment or collection system. When this is not possible, due care shall be taken to prevent spillage on the ground and to the surrounding environment, particularly streams and other water bodies. The Emergency Response (Contingency) Plan for fuel storage shall detail the specific response actions in the event of a spill from refuelling or maintenance activities.
34. VNL shall put into place a maintenance program for the prevention of leaks/spills of hydrocarbons from mobile equipment (ie. from the hydraulic hoses and/or motors from the machine houses of the drills, excavators and trucks). This plan shall be submitted by **October 30, 2020** to the Director for review.

Emergency Response (Contingency) Plan

35. VNL shall continue to implement the most recent version (**February 23, 2016**) of the Voisey's Bay Emergency Response (Contingency) Plan, including all revisions, for the **VBPS**. This Plan describes the actions to be taken in the event of a spill of a toxic or hazardous material. Copies of the Plan shall be placed in convenient areas throughout the facility so that employees can easily refer to it when needed. VNL shall ensure that all employees are aware of the Plan and understand the procedures and the reporting protocol to be followed in the event of an emergency. An annual response exercise is recommended for response personnel. Every year, as a minimum, the Plan shall be reviewed by VNL and revised as necessary. Any proposed significant revisions shall be submitted to the Director for review. Changes which are not considered significant include minor variations in equipment or personnel characteristics which do not affect implementation of the Plan.
36. Every time VNL implements the Emergency Response (Contingency) Plan, information shall be recorded for future reference. This will assist in reviewing and updating the Plan. The record is to consist of all incidents with environmental implications, and include such details as:
 - date;
 - time of day;
 - type of incident (i.e. liquid spill, gas leak, granular chemical spill, equipment malfunction, etc.);
 - actions taken;
 - problems encountered; and
 - other relevant information that would aid in later review of the Plan performance.

Each incident report shall be submitted to the Department as per the **Reporting** section.

Rehabilitation and Closure

37. A Rehabilitation and Closure Plan detailing the actions to be taken to restore areas disturbed by the operation has been submitted to the Department (*June 17, 2016*). The Plan shall be implemented progressively as required and completed upon site closure.
38. As part of the site decommissioning and restoration process, VNL shall employ a registered Site Professional to complete a site-wide environmental site assessment, as defined in the *Guidance Document for the Management of Impacted Sites*. Should impacts be identified, VNL shall proceed through the process outlined in the Guidance Document to achieve regulatory site closure.

Ore, Concentrate and Binder Storage, Handling and Transport

39. Spills of ore, concentrate and binder shall be promptly cleaned up. Spilled ore and concentrate shall be returned to an operationally acceptable stage of the process. Spilled binder shall be disposed, be placed into silo storage or be delivered to the paste plant for use.
40. All concentrate haul trucks shall have concentrate loads fully enclosed while transferring concentrate from the concentrator loadout facility at the Mine/Mill to the concentrate receiving station at the Port Unloading, Storage and Reclaim Facility.
41. Concentrate deposits on the exterior surfaces of the concentrate carrier trucks and dedicated concentrate handling equipment shall be removed before the equipment leaves the concentrate load-out area. Concentrate carrier wash water shall report to the truck wash settling pit and recycle to the truck wash module following settling and filtration.
42. Concentrate-contaminated equipment at the Port Unloading, Storage and Reclaim Facility shall be cleaned in the washdown annex before leaving the concentrate storage facility. All wash water used at the washdown annex shall be collected and retained within the washdown annex with no discharge permitted to the environment.
43. Concentrate deposits on exterior surfaces of mobile equipment used in ship loading shall be removed before the equipment is hoisted from the ship.
44. Collected sediment from the truck wash and the washdown annex systems shall be removed from the settling chambers as necessary and returned to the process or discharged to the tailings management area.
45. Run of mine (ROM) ore shall not be permitted to be stored on the former ROM ore storage pad area west of the primary crusher.

46. The primary crusher shall not be operated without the primary crusher dust collector being operational. Limited periods of dust collector downtime associated with routine dust collector maintenance activities are acceptable. Collected dust shall report to the crushed ore stockpile conveyor.
47. Storage of crushed ore shall be limited to the coarse ore storage building. However, in order to allow the mill to sustain ore feed when the gyratory crusher is unavailable the use of a temporary ore transfer pad is acceptable. Implementation of the temporary ore transfer pad shall adhere to the terms and conditions as specified in the Labrador Operations Alternative Ore Supply to the Coarse Ore Storage Facility Procedure (SOP-M31, **July 18, 2018** or as later revised) (i.e. **VNL** shall provide notification of the Department prior to its use, maximum tonnage of ore to be stored and restoration of the ore pad area after its use).
48. The port unloading, storage and reclaim facilities shall be used to store and load copper and nickel concentrates that are to be transported from site. Concentrate shall be conveyed from the concentrate storage building via the conveyors to the ship loader. Binder shall be transported from the dock to the storage silos at the Port Facilities via a pneumatic line. Binder shall be further transported by truck from a truck unloading facility at the Port Facilities to a silo at the Paste Backfill Plant. **VNL** shall employ and maintain measures (i.e. filters, mechanical dust collector, collection stacks, fully enclosed shiploader) to contain fugitive dust emissions and concentrate or binder spillage during loading and unloading operations wherever such activities occur at the site.

Used Oil and Used Glycol

49. Used oil and used glycol shall be retained in separate approved or registered tanks or closed containers, and disposed of by a company licensed for handling and disposal of used oil and/or used glycol products.
50. Information on used oil that is generated by the diesel generating units in the facility's main power plant shall be submitted to the Director for review within 30 days of the beginning of each calendar year. This shall include a description of:
- the type(s) of oil used;
 - the method of disposal for the used oil; and
 - the approximate total volume of used oil generated during the previous year.

The first such report shall be submitted on or before **January 30, 2021**.

Site Water Management

51. Mine inflows to the Open Pit from direct precipitation, pit wall runoff, groundwater seepage, paste backfill line flushing, and surface runoff from the local area watershed, including the temporary surface maintenance shop area, the temporary

PAG stockpile, paste backfill plant area, underground mine portal areas, Eastern Deeps Surface Facilities, water collected in Discovery Hill Early Works Pit (Quarry) and mine haul and pit access roads, shall be collected in the pit sump and pumped to the mill, from where they shall be sent to Headwater Pond.

52. The Plant Site Sedimentation Pond (PSSP) shall collect surface runoff from the plant site area. PSSP Cell A shall provide storage and sediment control for surface runoff from the south side of the plant site including the northern part of the temporary accommodations construction area and from the Discovery Hill Early Works Pit (Quarry) access/haul road. PSSP Cell B shall provide storage and sediment control for surface runoff from the northern portion of the plant site. Runoff collected in PSSP Cell B shall be pumped to PSSP Cell A, then to the mill and sent to Headwater Pond.
53. The North Sedimentation Pond provides storage and sediment control for surface runoff from the Clean Rock Dump drainage area, and the temporary warehouse area. Runoff accumulated in the North Sedimentation Pond shall be pumped to the Plant Site Sedimentation Pond or used as process water supply by the underground mines.
54. The South Sedimentation Pond shall be utilized to temporarily store runoff from the overburden and topsoil stockpile areas, and temporary underground mine maintenance shop area. Runoff collected shall be sent to the North Sedimentation Pond or directly to the mill.
55. Runoff from the new Sewage Treatment Plant area is collected locally and pumped directly to the mill.
56. The Port Site Sedimentation Pond shall be utilized to provide storage and sedimentation control for runoff and snowmelt from the port site prior to discharge into Anaktalak Bay.
57. The Mine Water Surge Pond shall be utilized for surge capacity by providing storage of inflows from other single lined or unlined site sedimentation ponds. The Mine Water Surge Pond shall not be used to collect mine inflows without prior written authorization from the Director.
58. The single geomembrane liner systems associated with the Mine Water Surge Pond, the Plant Site Sedimentation Pond (Cell A and Cell B), the North Sedimentation Pond and the Port Site Sedimentation Pond shall be periodically evaluated for leakage using methodology acceptable to the Director. The results of the leak detection survey shall be recorded and kept on file for review upon request by officials of the Department or Service NL. The occurrence of any adverse event that impacts the integrity of a liner shall require immediate repair and testing of any damaged or leaking areas of the liner. VNL shall immediately notify the Department of any issues.

59. All external berms for the Mine Water Surge Pond, the Plant Site Sedimentation Pond (Cell A and Cell B), the North Sedimentation Pond, the South Sedimentation Pond and the Port Site Sedimentation Pond shall be visually inspected for signs of leakage or erosion that might affect the integrity of the structures. The visual inspections shall be conducted at least **monthly**, and the date and results of each inspection shall be recorded and kept on file for review upon request by officials of the Department or Service NL.
60. Discharge of the Port Site Sedimentation Pond shall only occur, on an as needed basis, if the water meets discharge requirements. Discharge shall only occur using a pump. The flow rate, duration and quantity of water discharged shall be recorded. During periods when no discharge occurs, these daily values shall be recorded as zero. Monthly total flow volume shall be submitted as per the **Reporting** section.
61. Water from the underground mines, including used process water, groundwater inflow and bleed and flush water from the paste backfill system will be filtered underground to remove most solids (solids to be disposed underground) and recycled to the extent practical with any excess water pumped to the Open Pit and, from there, pumped to the mill and onward to Headwater Pond.

Tailings and Effluent Management

62. Headwater Pond is a tailings impoundment area for storage of tailings generated from the milling of Voisey's Bay ore. Headwater Pond shall also be utilized to provide surge capacity and retention time for site water management and act as a source of process water for the mill. Excess water from Headwater Pond shall be treated in the effluent treatment plant prior to discharge. Treated effluent shall be discharged into Edward's Cove via the treated effluent line and submarine diffuser.
63. All tailings shall be placed under water in Headwater Pond. The maximum elevation of placed tailings shall be maintained a minimum of 0.5 metres below the water surface at all times. Sediment removed from sedimentation ponds shall be collected as required and disposed of in Headwater Pond or as otherwise authorized by the Department.
64. Operation of the tailings, effluent and reclaim water pipelines shall be governed by the *Labrador Operations Pipeline Leak Detection and Response Procedure* (SOP ML-10, **March 3, 2019** or as later revised).
65. Only NAG shall be reused on the surface. If waste rock is identified as PAG or metal leaching, it shall be disposed of in Headwater Pond.
66. This identification shall be in accordance with MEND Report 2.20.1, ***Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials***.
67. All PAG, once removed from the confines of the Open Pit and the Discovery Hill Early Works Pit (Quarry), shall be disposed of in Headwater Pond. Once the Open Pit is mined out, PAG will be stored there. PAG and NAG can also be stored in

mined out underground areas or as backfill material for cut-and-fill stopes. With the exception of the top safe working surface of the PAG infill area at Headwater Pond, all PAG there shall be fully immersed in the water.

68. Drainage from the treated effluent line may be discharged to the environment from the low point drains to perform extended periods of routine maintenance and to prevent freezing during periods when the line is not active. Prior to discharge, the effluent remaining in the line shall be tested to ensure it meets the discharge criteria as listed in **Table 3**. ALT is not required when discharging to land. Drainage activities shall be conducted in a manner that does not disturb the ground surface or create suspended sediment flows.
69. Surface water seepage from Tailings Dams H1 and H2 shall be returned to Headwater Pond or otherwise treated. If seepage water quality meets the discharge criteria specified in **Table 3** it may be discharged to the environment.

Effluent Monitoring and Discharge

70. **VNL** shall perform an Effluent Monitoring Program as per **Table 2**. The applicable limits for the effluent discharge are listed in **Table 3**. Analytical results shall be submitted as per the **Reporting** section.

Table 2 - Effluent Monitoring Program			
Location	EDMS Location Code	Parameters	Frequency
Effluent Treatment System Discharge	00196	EDC (except ALT)	Weekly if outflow (at least 24 hours apart)
		ALT & TPH	Monthly (at least 15 days apart)
		Flow Rate	Continuous/ Estimate During Sample Collection
Port Site Sedimentation Pond Discharge	00197	EDC (except ALT)	Weekly if outflow (at least 24 hours apart)
		ALT & TPH	Monthly (at least 15 days apart)
		Flow Rate	Continuous/Estimate During Sample Collection
Tailings Dam H1 Seepage Water	00198	EDC (except ALT)	Weekly if outflow (at least 24 hours apart)
		ALT & TPH	Monthly (at least 15 days apart)
		Flow Rate	Continuous/ Estimate During Sample Collection
Tailings Dam H2 Seepage Water	00199	EDC (except ALT)	Weekly if outflow (at least 24 hours apart)
		ALT & TPH	Monthly (at least 15 days apart)
		Flow Rate	Continuous/Estimate During Sample Collection

Note: ALT includes both rainbow trout and Daphnia magna testing.

71. Refer to **Table 3** for the Effluent Discharge Criteria (EDC).

Table 3 – Effluent Discharge Criteria (EDC)			
Parameter	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
Arsenic	0.50 mg/L	0.75 mg/L	1.00 mg/L
Copper	0.30 mg/L	0.45 mg/L	0.60 mg/L
Lead	0.20 mg/L	0.30 mg/L	0.40 mg/L
Nickel	0.50 mg/L	0.75 mg/L	1.00 mg/L
Zinc	0.50 mg/L	0.75 mg/L	1.00 mg/L
TSS	15.00 mg/L	22.50 mg/L	30.00 mg/L
Radium 226	0.37 Bq/L	0.74 Bq/L	1.11 Bq/L
Un-ionized ammonia [†]	0.5 mg/L expressed as nitrogen (N)	Not applicable	1.00 mg/L expressed as nitrogen (N)
ALT*	Toxic Pass		
pH	Allowable Range 5.5 to 9		
[†] un-ionized ammonia testing currently in effect. Criteria enforcement will be in effect as of June 01, 2021 * Daphnia magna testing currently in effect. Criteria enforcement will be in effect as of June 01, 2021			

72. **VNL** may reduce the frequency of testing for a parameter that is set out in **Table 2** with the exception of pH, TSS, TPH, ALT and Radium 226 to not less than once in each calendar quarter, at least 30 days apart, if that parameter's monthly mean concentration in the effluent is less than 10 percent of the maximum authorized monthly mean concentration for the 12 months immediately preceding the most recent test. **VNL** shall notify the Director in writing, at least 30 days in advance of a reduction in the frequency of testing.
73. **VNL** may reduce the frequency of testing for Radium 226 to not less than once in each calendar quarter, at least 30 days apart, if that substance's concentration in the effluent is less than 0.037Bq/L in 10 consecutive tests. **VNL** shall notify the Director in writing, at least 30 days in advance of a reduction in the frequency of testing.
74. **VNL** shall increase the frequency of testing to the originally prescribed frequency for a parameter that is set out in **Table 2** with the exception of pH, TSS, TPH and ALT, if the parameter's monthly mean concentration is equal to or greater than 10 percent of the maximum authorized monthly mean concentration.
75. **VNL** may reduce the frequency of conducting ALT to once in each calendar quarter, at least 30 days apart, if the effluent is determined not to be acutely lethal over a period of 12 consecutive months. **VNL** shall notify the Director in writing, at least 30 days in advance of a reduction in the frequency of testing.

76. If a sample is determined to be acutely lethal, an aliquot of the failing sample shall be analyzed for the parameters outlined in **Table 4** without delay.
77. If a sample is determined to be acutely lethal, **VNL** shall collect a grab sample from the final discharge point of the failing site and conduct an ALT in accordance with Section 6 of the Reference Method. Samples shall be collected twice per month, not less than 7 days apart, and an ALT shall be conducted on each sample, until it is determined that the effluent is not acutely lethal for three consecutive tests. Following the third consecutive non-acutely lethal test, **VNL** shall conduct ALT as per the original prescribed frequency outlined in **Table 2**.
78. Reports submitted under section 31 of **MDMER** as a result of a deposit out of the normal course of events shall be provided to the Department.

Water Chemistry Analysis

79. **VNL** shall perform a Water Chemistry Analysis as per **Table 4**. All results shall be submitted as per the **Reporting** section.

Table 4 - Water Chemistry Analysis Program			
Location	EDMS Location Code	Parameters	Frequency
Effluent Treatment System Discharge	00196	General Parameters - must include the following: Temperature, dissolved oxygen (DO) nitrate + nitrite, nitrate, nitrite, ammonia, pH, TSS, colour, sodium, potassium, calcium, sulphide, magnesium, alkalinity, sulfate, chloride, turbidity, reactive silica, orthophosphate, phosphorous, DOC, conductance, TDS (calculated), phenolics, carbonate (CaCO ₃), hardness (CaCO ₃), bicarbonate (CaCO ₃). Metals Scan - must include the following:	Four (4) times per year (not less than one month apart)
Port Site Sedimentation Pond Discharge	00197		
Discharge End of Cutoff Ditch M1	00200		
Unnamed Stream – North Sedimentation Pond Area	00201		
ROM Pad Monitoring Well 1 (MW06-11)	00202		
ROM Pad Monitoring Well 2 (MW06-12)	00203		
South Sedimentation Pond Monitoring Well 1 (BH-8)	00204		
South Sedimentation Pond Monitoring Well 2 (BH-10)	00205		
North Sedimentation Pond – Wet Well	00206		
Plant Site Sedimentation Pond A – Wet Well	00207		
Plant Site Sedimentation Pond B – Wet Well	00208		
Headwater Pond Reclaim Barge	00209		
Tailings Dam H1 Seepage	00198		
Tailings Dam H2 Seepage	00199		
Tailings DamH1 Monitoring Well 1 (MW05-4)	00210		
Tailings DamH1 Monitoring Well 2 (MW05-5)	00211		
Tailings DamH2 Monitoring Well 1 (MW05-1A)	00212		
Tailings DamH2 Monitoring Well 2 (MW05-1B)	00213		

Tailings DamH2 Monitoring Well 3 (MW05-2A)	00214	aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, mercury, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, zinc.	
Tailings DamH2 Monitoring Well 4 (MW05-2B)	00215		
Tailings DamH2 Monitoring Well 5 (MW05-3A)	00216		
Tailings DamH2 Monitoring Well 6 (MW05-3B)	00217		
Explosives Plant Monitoring Well 1 (MW06-03)	00218		
Explosives Plant Monitoring Well 2 (MW06-04)	00219		
Camp Pond Brook Monitoring Well (MW06-01)	00220		
Camp Pond Brook Monitoring Well (MW06-02)	00221		
Diffuser Water Quality Site 1 – ‘A’ Bay	00226		
Reference Water Quality Site 2 – ‘A’ Bay	00227		
Camp Pond - Near the temporary underground maintenance shop - (C1)	00228		
Otter Pond	00229		
Reid Brook - Near western construction area for Reid Brook - (C2)	00230		
Eastern Deeps Portal (C3)	00710		
Reid Brook Portal (C4)	00711		
ROM Pad Drainage Pipe	00222	pH, copper, nickel	Monthly grab
Mine Water Surge Pond Wet Well	00223	arsenic, cobalt, copper, lead, nickel, zinc, TSS	
Mine Water Surge Pond – Leak Detection Sump	00224		
Mine Water Surge Pond Underdrain	00225		
North Sedimentation Pond – Wet Well	00206	arsenic, cobalt, copper, lead, nickel, zinc, ammonia	

80. **VNL** may discontinue testing for mercury if the mercury concentration in the effluent is less than 0.10 ug/L in 12 consecutive quarterly samples. **VNL** shall notify the Director in writing, at least 30 days in advance of a reduction in the frequency of testing.

Environmental Effects Monitoring

81. **MDMER** requires that **VNL** conduct Environmental Effects Monitoring (EEM) as part of the mine’s authority to deposit effluent under the Fisheries Act. Copies of all EEM study designs and reports shall be submitted to the Department.

Ambient Air

82. **VNL** shall continue to operate an ambient air monitoring program as per the conditions in this Approval and its amendments. Approval shall be obtained from the Director prior to purchase or installation of any monitoring equipment.

83. Parameters to be monitored are outlined in **Table 5**.

Table 5 - Ambient Air Monitoring Program			
Location	EDMS Location Code	Number of Monitors	Parameter
Primary Crusher	00231	1	NO _x *
Accommodations	00232	1	NO _x *
Accommodations	00232	1	PM _{2.5}
Port Site	00233	1	TPM
* NO _x includes both NO ₂ and Nitric Oxide (NO).			

84. Ambient air monitoring shall be done in accordance with the *Ambient Air Monitoring Guidance Document (GD-PPD-065)*, or its successors.

85. VNL shall operate, calibrate and maintain a meteorological station at Voisey’s Bay in accordance with the guidelines specified in the United States EPA document “Quality Assurance Handbook for Air Pollution Measurement Systems - Volume IV: Meteorological Measurements Version 2.0 (Final),” EPA-454/B-08-002, or its successors. Parameters to be measured and recorded on an hourly basis shall include, as a minimum:

- wind speed,
- wind direction,
- ambient air temperature,
- relative humidity,
- barometric pressure, and
- precipitation.

All records shall be submitted, on a monthly basis, as per the *Reporting* section.

86. Information regarding calibrations, site visits and maintenance for all continuous ambient air monitors shall be recorded into the DR DAS electronic logbook.

87. The ambient air quality standards specified in Schedule A of the *Air Pollution Control Regulations, 2004* shall apply to all points outside of VNL’s administrative boundary. The administrative boundary is defined as the area encompassed by the coordinates contained in Appendix A, a total area of approximately 56.1362 km². All coordinates are referenced to NAD83 UTM Zone 20.

Annual Air Emissions Reporting

88. VNL shall submit an annual Air Emissions Report to the Director by *February 28* of the subsequent year. This report shall include:

- the estimated annual emissions of the following flue gas constituents: Sulphur Dioxide (SO₂), NO₂, NO_x, Carbon Dioxide (CO₂), Carbon Monoxide (CO), TPM, and PM_{2.5}; and
- the actual calculations including factors, formulae and/or assumptions used.

Fuel Consumption

89. VNL shall record and submit, on a monthly basis as per the **Reporting** section, the:
- date and quantity of fuel received at each fuel delivery to the VBPS;
 - total monthly fuel consumption for all equipment (both mobile and stationary including, but not limited to, diesel generator units, boilers, vehicles, mining equipment and incinerators) at the VBPS;
 - daily consumption of fuels combusted by each operating boiler at the existing powerhouse installation; and
 - daily combined consumption of fuels combusted by all of the diesel generating units operating at each of the following:
 - existing powerhouse installation,
 - satellite power station located at Reid Brook Portal, and
 - satellite power station located at Eastern Deeps Portal;

If and when individual meters are installed on the diesel generating units, the daily consumption of fuels by each operating diesel generating unit so equipped shall be recorded and submitted on a monthly basis as per the **Reporting** section.

Pollution Control Equipment

90. All pollution control equipment shall be maintained and operated per the manufacturer's specifications for best performance.
91. All oil/water separators shall be checked routinely to ensure they are working properly. A log of these checks shall be maintained.

Stack Emissions Testing and Dispersion Modelling

92. Stack emissions testing shall be done in accordance with the **Stack Emission Testing Guidance Document (GD-PPD-016.1)**. Dispersion Modelling shall be done in accordance with the **Plume Dispersion Modelling Guidance Document (GD-PPD-019.2)**. Determination of frequency of stack emissions testing and dispersion modelling shall be done in accordance with the **Compliance Determination Guidance Document (GD-PPD-009.4)**.
93. VNL shall be required to complete stack emissions testing once every four years if it has been shown, via a registered dispersion model, that the operation is in compliance with section 3(2) and Schedule A of the **Air Pollution Control Regulations, 2004**. If it has been shown, via a registered dispersion model, that the operation is not in compliance with section 3(2) and Schedule A of the **Air Pollution Control Regulations, 2004**, then the facility shall complete stack emissions testing every two years.
94. Stack emissions testing results shall be submitted to the Department within **75 days** of completion of the sampling.

95. Plume dispersion modelling results shall be submitted to the Department within **120 days** of acceptance of the stack emissions testing results by the Department.
96. If the results from the plume dispersion modelling indicate that VNL is not in compliance with section 3(2) and Schedule A of the ***Air Pollution Control Regulations, 2004***, then VNL shall submit to the Director, ***within 6 months*** from the date of submission of plume dispersion modelling results, an Action Plan to bring emissions of the parameters of concern into compliance. In addition to this, the Plan shall include information detailing the improvements to be implemented to the VBPS's equipment and instruments, and a time frame for the improvements. By ***December 31*** of each year, a report shall be submitted to the Director outlining the progress made to date towards accomplishing the goals of the Plan.

Analysis and QA/QC

97. Unless otherwise stated herein, all solids and liquids analysis performed pursuant to this Approval shall be done by either a contracted commercial laboratory or an in-house laboratory. Contracted commercial laboratories shall have a recognized form of accreditation. In-house laboratories have the option of either obtaining accreditation or submitting to an annual inspection by a representative of the Department, for which VNL shall be billed for each laboratory inspection in accordance with Schedule 1 of the ***Accredited Laboratory Policy (PD:PP2001-01.2)***. Recommendations of the Director stemming from the annual inspections shall be addressed within ***6 months***; otherwise further analytical results shall not be accepted by the Director.
98. If VNL wishes to perform in-house laboratory testing and submit to an annual inspection by the Department then a recognized form of proficiency testing recognition shall be obtained for compliance parameters for which this recognition exists. The compliance parameters are listed in the ***Effluent and Monitoring*** section. If using a commercial laboratory, VNL shall contact that commercial laboratory to determine and to implement the sampling and transportation QA/QC requirements for those activities.
99. The exact location of each sampling point shall remain consistent over the life of the monitoring programs, unless otherwise authorized by the Director. Using a GPS or similar device, the northing and easting of each sampling location shall be recorded and submitted by ***October 31, 2020*** to the Department.
100. VNL shall bear all expenses incurred in carrying out the environmental monitoring and analysis required under conditions of this Approval.

Monitoring Alteration

101. The Director has the authority to alter monitoring programs or require additional testing at any time when:
- pollutants might be released to the surrounding environment without being detected;

- an adverse environmental effect may occur; or
- it is no longer necessary to maintain the current frequency of sampling and/or the monitoring of parameters.

102. VNL may, at any time, request that monitoring programs or requirements of this Approval be altered by:

- requesting the change in writing to the Director; and
- providing sufficient justification, as determined by the Director.

The requirements of this Approval shall remain in effect until altered, in writing, by the Director.

Reporting

103. Monthly reports containing the environmental compliance monitoring and sampling information required in this Approval shall be received by the Director in digital format within 30 calendar days of the reporting month. All related laboratory reports shall be submitted with the monthly report in XML format and Adobe Portable Document Format (PDF). Digital report submissions shall be uploaded through the EDMS web portal. The Pollution Prevention Division shall provide details of the portal web address and submission requirements.

104. Each monthly report shall include a summary of all environmental monitoring components and shall include an explanation for the omission of any requisite data. The monthly summary reports shall be in Microsoft Word or Adobe PDF and shall be uploaded through the EDMS web portal with the data submissions.

105. All incidents of:

- *Emergency Response (Contingency) Plan* implementation; or
- non-conformance of any condition within this Approval; or
- spillage or leakage of a regulated substance; or
- discharge criteria being, or suspected of being, exceeded; or
- verbal or written complaints of an environmental nature received from the public by VNL and related to the VBPS, including complaints submitted anonymously;

shall be immediately reported, within one working day, to the Department.

A written report including a detailed description of the incident, summary of contributing factors, and an Action Plan to prevent future incidents of a similar nature, shall be submitted to the Department. The Action Plan shall include a

description of actions already taken and future actions to be implemented, and shall be submitted within thirty days of the date of the initial incident.

106. Any spillage or leakage of gasoline or associated product shall be reported immediately through the National Environmental Emergencies Centre at 1- (800) - 563-9089 or 1- (709) - 772-2083.

Expiration

107. This Certificate of Approval expires *December 31, 2023*.
108. Should **VNL** wish to continue to operate the **VBPS** beyond this expiry date, a written request shall be submitted to the Director for the renewal of this Approval. Such request shall be made prior to *June 30, 2023*.

Appendix A

Vale Voisey's Bay Site – Administrative Boundary Coordinates

Surface Lease

564000.00	6243500.00
564000.00	6241000.00
554500.00	6241000.00
554495.87	6242888.48
553014.00	6242888.39
553014.00	6243679.16
553750.00	6243679.10
553750.00	6244179.04
554500.00	6244179.04
554500.00	6247500.00
556006.44	6248519.86
556002.61	6251747.38
556308.81	6252237.50
556609.64	6252719.00
557271.01	6252700.51
558452.64	6253706.00
558805.20	6253304.00
557500.01	6252193.60
557500.01	6246500.00
564000.00	6243500.00

APPENDIX B

Abandonment and Restoration Plan Guidelines

This appendix is intended to provide guidance for the development of an Abandonment and Restoration Plan and to identify areas that are of particular concern or interest. The points presented are not set and are open to interpretation and discussion.

The Plan is intended to present the scope of activities that VNL shall undertake at the time of final closure and/or abandonment of the VBPS properties. Where it is useful and practical to do so VNL is encouraged to begin undertaking some of the activities outlined in the Plan prior to final closure and abandonment. The objectives of the restoration work to be undertaken can be summarized as follows:

- to ensure that abandoned mine facilities do not endanger public health or safety;
- to prevent progressive degradation and to enhance the natural recovery of areas affected by mining activities;
- to ensure that mine facilities, wastes and tailings are abandoned so that the requirement for long term maintenance and monitoring is minimized;
- to mitigate, and if possible prevent, the continued loadings of contaminants and wastes to the environment. The primary objective shall be to prevent the release of contaminants into the environment. Where prevention is not practical due to technical or economic limitations then activities intended to mitigate the consequence of such a release of contaminants shall become the objective of restoration work;
- to mitigate, and if possible prevent, the formation of acid mine drainage. The primary objective shall be to prevent the formation of acid mine drainage. Where prevention is not practical due to technical or economic limitations, then activities intended to mitigate the consequences of the formation of acid mine drainage shall become the objective of restoration work; and
- to return affected areas to a state compatible with the original undisturbed condition, giving due consideration to practical factors including economics, aesthetics, future productivity and future users.

In particular the following areas should be addressed in the Plan:

Mill and Service Buildings

- The mill processing equipment shall be washed and cleaned of all ore residues. This activity shall remove all concentrate and chemical bearing residues from the milling circuit with the washed residues being treated through the effluent treatment plant and ultimately discharged into Headwater Pond.
- The equipment and internal fittings contained in both the mill and service buildings shall be dismantled, removed and sold for their salvage value. Items with no salvage value shall be disposed of according to section 30 of the Environmental Protection Act.

- All buildings are to be dismantled and removed from the site. All concrete walls, footings, foundations or floor slabs of the mill and service buildings should be demolished to ground level. All openings or indentations below ground level are to be backfilled to ground level. Fill material shall be non-contaminated soil or concrete from demolition. All other outbuildings and pipe racks in the immediate vicinity of the mill and service buildings, and elsewhere on the property should be removed using the same philosophy.
- All buried pipelines and electrical cables may be left in place in the ground. Where these pipes or cables come to surface they should be cut off below ground level and buried with local fill. If oil filled power cables are to be left in place in the ground they shall be purged. Pipelines are to be purged of all residual materials and capped before backfilling. VNL shall provide the Department with drawings showing the location of all buried pipes and cables which are to remain after the mine's closure.

Fuel Storage Facilities

- All of the fuel storage facilities, including fuel handling equipment and pipelines, at the mine site shall be emptied and removed from the site according to the *Storage and Handling of Gasoline and Associated Products Regulations, 2003*.

Tailings

- The tailings impoundment areas should be left in a condition, acceptable to this Department, to prevent the generation of acid mine drainage and dust. Runoff from impoundment areas is to be directed to an outflow where drainage from the area can be monitored.

Till Borrow Areas/Quarries

- The till borrow areas/quarries used by VNL should be graded to ensure natural runoff patterns and then revegetated to mitigate future erosion. Till borrow areas/quarries shall be closed out in accordance with the permits already issued by this Department and the Department of Natural Resources.

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