

PERMIT TO ALTER A BODY OF WATER

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: **MARCH 09, 2023**

File No: **534-08**
Permit No: **ALT12986-2023**

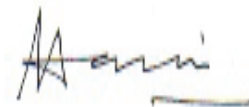
Permit Holder: **Vale Newfoundland and Labrador Limited**
Level 2, KMK Place
18 Hebron Way
St. John's, NL A1A 0L9
Jared.Saunders@vale.com

Attention: **Jared Saunders**

Re: **Long Harbour - Residue Storage Area Dam #1 Upstream Liner Replacement - Vale NL Ltd.**

Permission is hereby given for : **the replacement of the liner of Residue Storage Area Dam #1 and associated activities as per the design brief prepared by Klohn Crippen Berger in January 2022, application received February 2, 2023 and additional information provided on March 7 and 8, 2023.**

- This Permit does not release the Permit Holder from the obligation to obtain appropriate approvals from other concerned municipal, provincial and federal agencies.
- The Permit Holder must obtain the approval of the Crown Lands Administration Division if the project is being carried out on Crown Land.
- This Permit is subject to the terms and conditions indicated in Appendices A and B (attached).
- It should be noted that prior to any significant changes in the design or installation of the proposed works, or in event of changes in ownership or management of the project, an amendment to this Permit must be obtained from the Department of Environment and Climate Change under Section 49 of the *Water Resources Act*.



(for) MINISTER

APPENDIX A
Terms and Conditions for Permit

Dam/Reservoir Design

1. Reservoirs must be provided with a spillway of adequate capacity to safely discharge design flows at non-erosive velocities without causing flooding of the reservoir or damage to the spillway or section downstream channel.
2. The dam and appurtenant structures shall be constructed at the following coordinates:

| Name | Latitude (decimal degrees) | Longitude (decimal degrees) |
|------------|----------------------------|-----------------------------|
| RSA Dam #1 | 47.42931 | 53.78477 |

3. The dam(s) must have the following dimensions:

| Name | Height of Dam (m) | Height of Spillway (m) | Maximum Water Elevation (m) | Minimum Water Elevation (m) | Minimum Freeboard (m) |
|------------|-------------------|------------------------|-----------------------------|-----------------------------|-----------------------|
| RSA Dam #1 | 10 | 1.5 | 138.2 | 134.0 | 0.8 |

4. The dam and associated works must be designed and constructed under the direct supervision of an engineer eligible for membership with the Professional Engineers and Geoscientists of Newfoundland and Labrador (or equivalent Canadian organization) who is able to demonstrate competence in the design, construction, and surveillance of dams.
5. The dam and associated works shall be designed according to the Canadian Dam Association Dam Safety Guidelines and associated Bulletins (most recent edition).

Dam Construction

6. The downstream side of the dam structure must be constructed with a 1.0 metre facing of armour stone or rip-rap.
7. Reservoir shorelines with moderately steep slopes or vulnerability to wave induced erosion, must be adequately protected with armour stone, rip-rap, or by other suitable measures.
8. Where pumping is used to bypass flow, cofferdams must be installed both above and below areas of construction. The Permit Holder must provide pumps with sufficient capacity to prevent washout of cofferdams.
9. Cofferdams must be properly designed and constructed of suitable materials to prevent leakage and to resist loss of any material as a result of erosion. The upstream cofferdam may remain in place upon completion of the work.
10. Fill material must be obtained from an approved quarry site. It must not be taken from beaches or streams, and must not be dredged from a body of water.
11. The work must meet the requirements of the Environmental Protection Plan (latest approved version) for the project.

12. Work must be conducted in dry conditions.
13. The transportation of labour and materials to the site must be along existing access roads.
14. The dam and spillway must be inspected regularly to identify any indications of structural failure, leaking, erosion or other problem so that immediate action can be taken to rectify the problem.

Dam Safety

15. The dam has been conditionally classified in the EXTREME Consequence category based on the 2007 Canadian Dam Association (CDA) guidelines. To meet the CDA's Dam Safety guidelines (Current Edition) for dams of this classification, the owner must:
 - Carry out an annual Dam Safety Inspection and provide the results to this Department,
 - Carry out a Dam Safety Review and submit a Dam Safety Report to this Department a maximum of every **five years**,
 - Update and maintain an Operation, Maintenance and Surveillance (OMS) Manual for the operation and closure phases,
 - Update and maintain an Emergency Preparedness Plan (EPP).

Geoliners

16. The geomembrane installer should be a member of the International Association of Geosynthetic Installers Approved Installation Contractor Program. Installation will be carried out in accordance with the International Association of Geosynthetics Installers industry standards.
17. Selection of geomembrane should consider stresses during construction, field survivability, and workability.
18. The geomembrane shall be protected from mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions. Rolls shall be stored away from high traffic areas. Rolls should be stored on pallets off the ground. If extremely hot or cold temperatures are present, keep the panels inside at a moderate temperature. Continuously and uniformly support rolls on a smooth, level prepared surface.
19. Materials should be transported by the most direct method to site to minimize handling. Materials delivered to site should be off-loaded in a location where minimum handling steps will be required.
20. Leave the geomembranes packaged in UV protected wrap until the day that the panels are to be installed.
21. Geomembrane should not be installed in the presence of standing water, mud, vegetation, snow, frozen subgrade, excessive moisture, while precipitation is occurring, during excessive winds, or when material temperatures are outside 0-75 C.
22. Subgrade surfaces should be free of loose rock fragments (>10 mm), sticks, sharp objects, or debris of any kind. The surface should provide a smooth, flat, firm, unyielding foundation for the geomembrane with no sudden, sharp or abrupt changes or break in grade that can tear or damage the geomembrane.
23. If coarse grained material is encountered in the subgrade, appropriate bedding should be used to protect the geomembrane. This bedding should consist of compacted finer material with a depth of 150 mm minimum. Where bedding sand is not available, a non-woven cushion geotextile may be used if it is designed for puncture protection.
24. The subgrade surface needs to be sufficiently compacted before installation of geomembrane.
25. The geomembrane shall not be allowed to bridge over voids or low areas in the subgrade. The geomembrane shall rest in intimate contact with the subgrade.
26. In general, seams shall be oriented parallel to the line of the maximum slope. In corners and odd shaped geometric locations, the total length of field seams shall be minimized. Seams shall not be located at low points in the subgrade unless geometry requires seaming at such locations.

27. Care should be taken when covering the geomembrane to prevent any damage. At no time will construction equipment be allowed to operate or drive directly on the geomembranes. No vehicular traffic shall travel on the geomembrane other than an approved low ground pressure vehicle or equivalent.
28. Sandbags or equivalent ballast shall be used as necessary to temporarily hold the geomembrane material in position under the foreseeable and reasonably expected wind conditions. Sand bag material shall be sufficiently close-knit to prevent soil fines from working through the bags and discharging on the geomembrane.
29. All seaming, patching, other welding operations, and testing shall be performed by qualified technicians employed by the geomembrane installer that are a member of the International Association of Geosynthetic Installers? Certified Welding Technician Program.
30. The panels shall be overlapped prior to seaming to whatever extent is necessary to affect a good weld and allow for proper testing, generally 300mm or more in the case of high flow. In no case shall this overlap be less than 75 mm.
31. Once the geomembrane is properly placed, the material should be seamed as soon as practical. Only material that is to be welded during that work-day should be deployed.
32. The cover material shall be placed as soon as practical, in conjunction with or upon completion of the geomembrane installation or as the installation progresses to minimize traffic on the geomembrane and damage. Only geomembrane that can be covered during that work-day should be placed.
33. Cover material shall consist of 12 mm minus particles, clean rounded soils or gravels free of sharp edges, sticks, metal, rubbish, and debris or foreign materials. If suitable cover material is not available, a protection geotextile layer may be installed between the geomembrane and the cover materials.
34. Cover material should be dumped and leveled over the geomembrane and not pushed from one end to the other to minimize rolling and wrinkling of the geomembrane beneath the material. Cover material should always be placed from the bottom to the top of slopes to avoid stressing the geomembrane and slope stability problems.
35. Cover material should be placed in lifts of a maximum of 150mm and be sufficiently compacted.
36. For critical structures, if the geosynthetic is damaged, the damaged section should be removed entirely and replaced. For lower risk structures, new geosynthetic can be placed over the damaged area with an overlap equal to the minimum overlap required for adjacent rolls.
37. The geomembrane shall be secured/anchored to the bedrock foundation, concrete plinth, toe of embankment with riprap, or by other sufficient means to form a hydraulic barrier.
38. The geomembrane shall be anchored in a trench, or by other sufficient means, at the dam crest to form a hydraulic barrier.

General Alterations

39. Any work that must be performed below the high water mark must be carried out during a period of low water levels.
40. Any flowing or standing water must be diverted around work sites so that work is carried out in the dry.
41. Water pumped from excavations or work areas, or any runoff or effluent directed out of work sites, must have silt and turbidity removed by settling ponds, filtration, or other suitable treatment before discharging to a body of water. Effluent discharged into receiving waters must comply with the *Environmental Control Water and Sewage Regulations, 2003*.
42. All operations must be carried out in a manner that prevents damage to land, vegetation, and watercourses, and which prevents pollution of bodies of water.

43. The use of heavy equipment in streams or bodies of water is not permitted. The operation of heavy equipment must be confined to dry stable areas.
44. All vehicles and equipment must be clean and in good repair, free of mud and oil, or other harmful substances that could impair water quality.
45. During the construction of concrete components, formwork must 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.
46. Wood preservatives such as penta, CCA or other such chemicals must not be applied to timber near a body of water. All treated wood or timber must be thoroughly dry before being brought to any work site and installed.
47. Any areas adversely affected by this project must 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 considered necessary in the opinion of this Department.
48. The bed, banks and floodplains of watercourses, or other vulnerable areas affected by this project, must be adequately protected from erosion by seeding, sodding or placing of rip-rap.
49. All waste materials resulting from this project must be disposed of at a site approved by the Department of Digital Government and Service NL.
50. Periodic maintenance such as painting, resurfacing, clearing of debris, or minor repairs, must be carried out without causing any physical disruption of any watercourse. Care must be taken to prevent spillage of pollutants into the water.
51. The owners of structures are responsible for any environmental damage resulting from dislodgement caused by wind, wave, ice action, or structural failure.
52. Sediment and erosion control measures must be installed before starting work. All control measures must be inspected regularly and any necessary repairs made if damage is discovered.
53. The attached Completion Report (Appendix C) for Permit No. 12986 must be completed and returned to this Department upon completion of the approved works. Pictures must be submitted along with the completion report, showing the project site prior to and after development.
54. This Permit is valid for two years from the date of issue. Work must be completed by that date or the application and approval procedure must be repeated. The following term(s) are valid for the life cycle of the structure: 14, 15.
55. The location of the work is highlighted on the Location Map for this Permit attached as Appendix D.
56. All work must be carried out within the Permit Holder's legal property boundaries.

APPENDIX B
Special Terms and Conditions for Permit

1. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall keep all systems and works in good condition and repair and in accordance with all laws, by-laws, directions, rules and regulations of any governmental authority. The Permit Holder or its agent(s), subcontractor(s), or consultant(s) shall immediately notify the Minister if any problem arises which may threaten the structural stability of the systems and works, endanger public safety and/or the environment or adversely affect others and/or any body of water either in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for all damages suffered by the Minister and Government resulting from any defect in the systems and works, operational deficiencies/inadequacies, or structural failure.
2. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall operate the said Project and its systems and works in a manner which does not cause any water related and/or environmental problems, including but not limited to problems of erosion, deposition, flooding, and deterioration of water quality and groundwater depletion, in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for any and all damages associated with these problems caused as a result of changes, deficiencies, and inadequacies in the operational procedures by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
3. If the Permit Holder or its agent(s), subcontractor(s), or consultant(s) fails to perform, fulfil, or observe any of the terms and conditions, or provisions of this Permit, as determined by this Department, the Minister may, without notice, amend, modify, suspend or cancel this Permit in accordance with the *Water Resources Act*.
4. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) indemnify and hold the Minister and Government harmless against any and all liabilities, losses, claims, demands, damages or expenses including legal expenses of any nature whatsoever whether arising in tort, contract, statute, trust or otherwise resulting directly or indirectly from granting this Permit, systems and works in or outside the said Project areas, or any act or omission of the Permit Holder or its agent(s), subcontractor(s), or consultant(s) in or outside the said Project areas, or arising out of a breach or non-performance of any of the terms and conditions, or provisions of this Permit by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
5. This Permit is subject to all provisions of the *Water Resources Act* and any regulations in effect either at the date of this Permit or hereafter made pursuant thereto or any other relevant legislation enacted by the Province of Newfoundland and Labrador in the future.
6. This Permit shall be construed and interpreted in accordance with the laws of the Province of Newfoundland and Labrador.

- cc: Ms. Deneen Spracklin, P.Eng.
Manager, Drinking Water and Wastewater Section
Water Resources Management Division
Department of Environment and Climate Change
P.O. Box 8700
4th Floor, West Block, Confederation Building
St. John's, NL A1B 4J6
dspracklin@gov.nl.ca
- cc: Ms. Paula Dawe, P.Eng.
Manager, Water Rights, Investigations and Modelling Section
Water Resources Management Division
Department of Environment and Climate Change
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pauladawe@gov.nl.ca
- cc: Mr. Paul Philpott
Mineral Development Engineer
Engineering Analysis Section, Mineral Development Division
Department of Natural Resources
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paulphilpott@gov.nl.ca



Appendix C - Completion Report

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: **MARCH 09, 2023**

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Permission was given for : **the replacement of the liner of Residue Storage Area Dam #1 and associated activities as per the design brief prepared by Klohn Crippen Berger in January 2022, application received February 2, 2023 and additional information provided on March 7 and 8, 2023.**

I (the Permit Holder named above or agent authorized to represent the Permit Holder) do hereby certify that the project described above was completed in accordance with the plans and specifications submitted to the Department of Environment and Climate Change and that the work was carried out in strict compliance with the terms and conditions of the Permit issued for this project.

Date: _____ Signature: _____

This completion report must be completed and forwarded to the following address upon completion of the approved work.

Department of Environment and Climate Change
Water Resources Management Division
PO Box 8700
St. John's NL A1B 4J6

APPENDIX D
Location Map for Permit

