

PERMIT TO ALTER A BODY OF WATER

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

Date: **MARCH 29, 2018**

File No: **534-10**
Permit No: **ALT9533-2018**

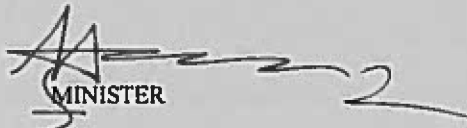
Permit Holder: **Tata Steel Minerals Canada Ltd.**
1000 Sherbrooke Street West
Suite 1120
Montreal, Quebec H3A 3G4

Attention: **Loic Didillon**

Re: **Tata Steel- Joan Lake DSO4- Sedimentation Pond Dam K3-4**

Permission is hereby given for : **the construction of a new earthfill dam and spillway for the creation of a sedimentation pond, drainage ditches and associated appurtenances and activities as detailed in the application received from Tata Steel Minerals Canada on July 12, 2017 and additional documentation received on November 13, 2017 and February 16, 2018.**

- 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 Municipal Affairs and Environment under Section 49 of the *Water Resources Act*.
- Failure to comply with the terms and conditions will render this Permit null and void, place the Permit Holder and their agent (s) in violation of the *Water Resources Act* and make the Permit Holder responsible for taking any remedial measures as may be prescribed by this Department.



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 downstream channel.
2. The dam and appurtenant structures shall be constructed at the following coordinates:

Name	Datum	Northing (m)	Easting (m)	Zone
Sedimentation Pond K3-4	NAD83	6103060	609687	19

3. The dam must have the following dimensions:

Name	Height/Elev of Dam (m)	Elev of Spillway (m)	Maximum Water Elevation (m)	Minimum Water Elevation (m)	Minimum Freeboard (m)
Sedimentation Pond K3-4	5/753	751.6	752.2	748	0.8

4. To safely convey peak flows the dam must be designed according to the following hydraulic criteria:

Name	Design Return Period (years)	Inflow Design Flood (m ³ /s)
Sedimentation Pond K3-4	1000	8.9

General Alterations

5. Any work that must be performed below the high water mark must be carried out during a period of low water levels.
6. Any flowing or standing water must be diverted around work sites so that work is carried out in the dry.
7. 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*.
8. 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.
9. 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.
10. 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.

11. 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.
12. 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.
13. All waste materials resulting from this project must be disposed of at a site approved by the Department of Service NL.
14. Care must be taken to prevent spillage of pollutants into the water.
15. The owners of structures are responsible for any environmental damage resulting from dislodgement caused by wind, wave, ice action, or structural failure.
16. 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.
17. Fill material must be of good quality, free of fines or other substances including metals, organics, or chemicals that may be harmful to the receiving waters.
18. The attached Completion Report (Appendix C) for Permit No. 9533 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.
19. 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 terms are valid for the life cycle of the dam structure: 22, 26, 27 and 53.
20. The location of the work is highlighted on the Location Map for this Permit attached as Appendix D.
21. All work must be carried out within the Permit Holder's legal property boundaries.

Dam Safety

22. The dam has been conditionally classified in the SIGNIFICANT 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 a Dam Safety Review and submit a Dam Safety Report to this Department within three years of the start of initial reservoir filling for the dam and a maximum of every ten years after that,
 - Upon initial reservoir filling, have developed, in consultation with this Department, an Operation, Maintenance and Surveillance (OMS) Manual for the operation of the dam,
 - Upon initial reservoir filling, have developed, in consultation with the Department, an Emergency Preparedness and Response Plan, and
 - Carry out an annual Dam Safety Inspection and provide the results to this Department.

Special Conditions

23. The dam must meet the requirements of the Environmental Protection Plan (latest version) and mine Rehabilitation and Closure Plan for the project.
24. The dam and associated works shall be designed according to the Canadian Dam Association Dam Safety Guidelines and associated Bulletins (most recent edition).
25. 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.
26. The Permit Holder is required to adhere to the Memorandum of Agreement as set forth by this Department. This agreement relates to the operation of real time water monitoring stations. The following monitoring station must remain active for the life cycle of the mining development through the renewal of the Memorandum of Agreement with the Department: Goodream Creek above Triangle Lake (03OB010). The Department may require the setup of additional monitoring stations in the Memorandum of Agreement as per provisions of Section 31 of the Water Resources Act, SNL2002 Chapter W-4.01.

27. The dam shall be inspected after construction and one year after construction for any indications of foundation or embankment settlement. The inspections shall be completed by a qualified geotechnical engineer. Placement of additional fill material may be required if settlement occurs to ensure design freeboard is maintained.
28. 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.
29. 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. Cofferdams must be removed upon completion of their intended function. All material must be removed carefully to prevent disturbance of the water body and to prevent water quality degradation.
30. Geotextile shall be placed directly on the prepared subgrade in accordance with manufacturers recommendations. All seams shall have a minimum overlap of 300 mm. Where placed on slopes, the geotextile shall be placed such that the upper panel overlaps the lower and in the direction of flow.
31. A seepage rate monitoring system shall be installed at the downstream toe of the embankment dam.

Dam Construction

32. Embankment dam and emergency spillway foundations shall be prepared to ensure a clean, stable, competent foundation. Exposed foundations will be inspected and approved by a qualified geotechnical engineer prior to fill placement.
33. 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. All fill material shall be free of ice, snow and frozen material and shall be placed during non-freezing conditions.
34. 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.
35. The reservoir side of the dam structure must be constructed with a 0.45 m layer of riprap with a D50 of 300 mm to provide adequate protection from wave or ice induced erosion.
36. The finished downstream and upstream sides of the embankment dam shall have a slope of 3.5 horizontal to 1 vertical. The emergency spillway inlet and channel shall have side slopes of 3 horizontal to 1 vertical.
37. The upstream slope of the embankment dam shall be constructed using a geotextile. The geotextile shall be placed within a 0.65 m layer of bedding material which is overlain by riprap. Beneath the bedding layer shall be a 0.3 m filter layer. The geotextile shall be anchored in a trench at the new dam crest and tied into a key-in trench excavated into the natural ground at the upstream dam toe to form a hydraulic barrier.
38. The area to be flooded by the reservoir must be prepared by removing timber, brush, and slash up to the maximum water elevation.
39. The transportation of labour and materials to the site must be along existing access roads.
40. The spillway shall be constructed using a geotextile overlain by a 0.4 m thick layer of riprap with a D50 of 200 mm.

Sedimentation Ponds

41. The sedimentation pond design criteria should consider soil type and the required time it will take for particle settlement.
42. The sedimentation pond must be designed in that the sediment-laden runoff is captured and detained allowing the suspended sediment to settle from the water.
43. The sedimentation pond must provide enough storage for the captured sediment. The storage volume of the sedimentation pond shall be a minimum of 80,000 cubic meters at the maximum design water level.

Stream Diversion Design

44. The new channel must provide adequate capacity to safely discharge flood flows at a velocity no greater than that which would occur in the natural channel.

45. A minimum freeboard of 0.25 metres must be provided between the design high water level and the top of the channel bank to prevent overtopping.

46. The stream diversion(s) must have the following dimensions:

Diversion(m)	Bottom Width (m)	Depth of Channel (m)	Bank Slope (H:V)	Bed Slope (%)
Clear Water Ditch	1.0	1.0	2:1	0.3-4.6
Contact Water Ditch	1.5	1.5	2:1	0.3-12

Stream Diversion Construction

47. The old channel must be closed to all flow of water. The fill or structure diverting flows into the new channel must be adequately protected from erosion.

48. The toe of the stream bank must be stabilized with fitted rock. The bank must be covered with an adequate layer of topsoil and seeded or sodded. The channel bed must be stabilized with a layer of clean gravel to resemble natural stream conditions.

49. The Permit Holder must prevent erosion of drainage ditches, streams or other natural bodies of water by installing rip-rap. Ditches with slopes between 0-4% shall be lined with a 0.3 m layer of 100-200 mm riprap. Ditches with slopes greater than 4% shall be lined with a 0.5 m layer of 200-300 mm riprap. All ditches shall have a geotextile placed below the riprap layer.

50. The new channel must be excavated in the dry beginning from the downstream end.

51. Flow must not be diverted into the new channel until all excavation, lining and bank stabilization work has been completed. Water from the old channel must be diverted into the new channel gradually. The channel must be monitored visually for any indications of excessive erosion or other problems.

52. The channel, including any areas up to the high water mark, must be kept free of all excavated or unused construction materials at all times.

53. The channel must be inspected regularly and maintained to ensure that there is no erosion of the channel. Any debris causing a blockage must be removed when necessary.

54. A water quality monitoring program is not required at this time. However, the Department reserves the right to require that the Permit Holder sample, analyse, and submit results of water quality tests, for the purpose of ensuring that the water quality is maintained within acceptable guidelines. All analyses must be undertaken by a CALA accredited laboratory.

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 and/or Ministerial orders and guidelines, as determined by this Department, the Minister may, after providing ten (10) day notice to the Permit Holder, 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: File Copy for Binder
- cc: Mr. Dexter Pittman, P. Eng.
Manager (Acting), Industrial Compliance Section
Pollution Prevention Division
Department of Environment and Conservation
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- cc: Ms. Melissa McComiskey
Environmental Engineer, Water Agreements Section
Water Resources Management Division
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Water Resources Management Division
Department of Municipal Affairs and Environment
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Ecosystem Management Branch
Fisheries and Oceans Canada
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- cc: Mark Bugden
Senior Analyst
Executive Council - Labrador and Aboriginal Affairs
Aboriginal Affairs
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- cc: Mr. Alex Smith, P. Eng.
Director, Mineral Development Division
Department of Natural Resources
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asmith@gov.nl.ca



Appendix C - Completion Report

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

Date: **MARCH 29, 2018**

File No: **534-10**
Permit No: **ALT9533-2018**

Permit Holder: **Tata Steel Minerals Canada Ltd.
1000 Sherbrooke Street West
Suite 1120
Montreal, Quebec H3A 3G4**

Attention: **Loic Didillon**

Re: **Tata Steel- Joan Lake DSO4- Sedimentation Pond Dam K3-4**

Permission was given for : **the construction of a new earthfill dam and spillway for the creation of a sedimentation pond, drainage ditches and associated appurtenances and activities as detailed in the application received from Tata Steel Minerals Canada on July 12, 2017 and additional documentation received on November 13, 2017 and February 16, 2018.**

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 Municipal Affairs and Environment 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 Municipal Affairs and Environment
Water Resources Management Division
PO Box 8700
St. John's NL A1B 4J6

APPENDIX D
Location Map for Permit

