

Notice of Alteration Form



Client File No. : 557.10		Environment Act Licence No. : 960VC	
Legal name of the Licencee: Vale Canada Ltd.			
Name of the development: Thompson Mine			
Category and Type of development per Classes of Development Regulation: Mining <SELECT>			
Licencee Contact Person: Jeff Fountain			
Mailing address of the Licencee: Box 5000			
City: Thompson		Province: Manitoba	Postal Code: R8N 1P3
Phone Number: 204-778-2649		Fax:	Email: Jeff.Fountain@vale.com
Name of proponent contact person for purposes of the environmental assessment (e.g. consultant): Chris Jeffery			
Phone:		Mailing address:	
Fax:			
Email address: C0604286@vale.com			
Short Description of Alteration (max 90 characters): A gaseous carbon dioxide injection system to control pH and ensure effluent quality.			
Alteration fee attached: Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>			
If No, please explain:			
Date: April 28, 2020		Signature: 	
		Printed name: Jeff Fountain	
<p>A complete Notice of Alteration (NoA) consists of the following components:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Cover letter</li> <li><input checked="" type="checkbox"/> Notice of Alteration Form</li> <li><input checked="" type="checkbox"/> 2 hard copies and 1 electronic copy of the NoA detailed report (see "<a href="#">Information Bulletin - Alteration to Developments with Environment Act Licences</a>")</li> <li><input checked="" type="checkbox"/> \$500 Application fee, if applicable (Cheque, payable to the Minister of Finance)</li> </ul>		<p><b>Submit the complete NoA to:</b></p> <p>Director Environmental Approvals Branch Manitoba Sustainable Development 1007 Century Street Winnipeg, Manitoba R3H 0W4</p> <p><b>For more information:</b></p> <p>Phone: (204) 945-8321 Fax: (204) 945-5229 <a href="http://www.gov.mb.ca/sd/ea/">http://www.gov.mb.ca/sd/ea/</a></p>	
<p><b>Note: Per Section 14(3) of the Environment Act, Major Notices of Alteration must be filed through submission of an <a href="#">Environment Act Proposal Form</a> (see "<a href="#">Information Bulletin – Environment Act Proposal Report Guidelines</a>")</b></p>			



Jeff Fountain  
Superintendent - Environment  
T. 204-778-2649  
Jeff.Fountain@vale.com

April 13, 2020

Shannon Kohler, Director  
Environmental Approvals Branch  
Manitoba Conservation and Climate  
1007 Century St.  
Winnipeg, Manitoba R3H 0W4

Dear Ms. Kohler,

**Re: Notice of Alteration to Environment Act Licence 960VC – File No. 557.10**  
Vale Manitoba Operations – CO2 Injection System

Please accept this Notice of Alteration for the installation of a temporary CO2 injection system to be set up at the Weir final discharge point, downstream of the Tailings Management Area (TMA). A CO2 injection system is needed to allow Vale more control over effluent quality and regulatory compliance as effluent leaves the TMA.

As the area for tailings deposition within the TMA diminishes, and areas of the TMA become “full”, the holding time of effluent within the TMA has significantly shortened. This has resulted in more reliance on liming for effluent treatment and precipitation of metals. A consequence of this is that Vale has experienced higher pH values in area 5 of the TMA than usual and additional measures are needed to manage pH to ensure regulatory compliance and the protection of the downstream environment.

The carbon dioxide injection system will consist of four (4) 240 kg cylinders manifolded with an additional two (2) or three (3) cylinders kept as backups. The system will be temporarily setup adjacent the road access loop near the final discharge point known as the “Weir” (55° 44’31.49”N, 97° 43’40.65”W). Carbon dioxide will be delivered just upstream of the final discharge point via an air sparger elevated off the floor of the channel. The system will not require power and will operate completely manually only when pH levels warrant the use of the system. A test period will be conducted to establish a relationship between pH buffering capacity, flow and CO2 injection rate.

The carbon dioxide system as proposed by Vale has a long history of use and is a standard practice for pH control within Vale and other mining operations across Canada. These systems are proven to have minimal environmental impacts and no impact is expected in this case. The environmental effects of the CO2 injection, if any, are expected to be captured in environmental effects monitoring being conducted on a regular basis at Vale Manitoba Operations.



Please accept the Notice of Alteration form (enclosed), supplemental information and the associated application fee as a formal request for review of this proposed alteration to Manitoba Operations currently operating under the authority of Environment Act Licence No. 960VC. We thank you for your time and consideration.

If you have any questions, please contact Jeff Fountain – Environmental Superintendent at 204-778-2649.

Respectfully,



Jeff Fountain  
Superintendent – Environment  
Vale Manitoba Operations

- c. J. Windsor (EAB)  
L. Lanteigne (Vale)

**Notice of Alteration Detailed Report**  
Environment Act Licence 960VC  
Carbon Dioxide Injection System

**Project Description:**

Vale Canada Limited (Vale) proposes a system to inject gaseous carbon dioxide just upstream of our weir final discharge point which drains the Vale Tailings Management Area (TMA).

The injection of gaseous carbon dioxide into mine wastewater is an industry standard used in many other locations in Canada as a means of controlling effluent pH where effluents are too alkaline. Vale is proposing the injection of gaseous carbon dioxide into our effluent, as we require a greater degree of control over our effluent pH. Currently, Vale Manitoba relies solely on batch lime addition at several key points in the TMA. There are currently no controls for alkalinity in place within the TMA.

As our tailings management plans progress, the holding time for effluent treated within the TMA will shorten, giving Vale much less control over pH as time passes. This proposal seeks to address this concern and will ultimately enhance Vale's ability to protect downstream habitat and the environment.

**Project scope:**

The scope of work proposed includes:

- The purchase and installation of a mobile CO<sub>2</sub> tank system proximate to the weir final discharge point. This system will consist of four 240L tanks manifolded, as well as three back up tanks of the same size.
- The installation of a manual CO<sub>2</sub> delivery system with a regulator, hose and sparger, in such a manner as to minimize disruption to the channel bed sediment when in operation.
- A month-long test of CO<sub>2</sub> injection to correlate effluent and gas flow with a reduction in pH.
- The use of carbon dioxide on an as-needed basis in order to reduce pH to meet the legal requirements for discharge.

Technical specifications, drawings and photographs of the system proposed are enclosed (fig. 1-XXXX)

**Summary of Potential Project Environmental Effects:**

Environmental impacts will be mitigated through design, best practices and existing Vale standards and procedures. Given the size and simplicity of the system, as well as the lack of reagents other than CO<sub>2</sub> or mechanical elements to the system, Vale does not anticipate any impacts on the environment.

### **Health Effect:**

All applicable Vale health and safety policies and procedures will apply to Vale employees and contract workers (and anyone else working on site).

All work on the system will be assigned to and completed by trained and qualified personnel only.

### **Terrestrial:**

This project does not involve a major excavation nor will there be new footprint required as the system will be mounted on a mobile base. Trucks delivering CO<sub>2</sub> will use existing roads and delivery will be infrequent.

The system is not expected to contribute to fire or wildfire risk, however, it will be located within a clearing away from any natural fuels or wooded areas to further mitigate that possibility.

### **Aquatic:**

The system proposed will provide Vale with the ability to control pH within our effluent by enabling us to bring down pH on the rare occasion where levels are approaching legal limits within the discharged effluent. This control serves, ultimately, to protect downstream aquatic environments. The injection of carbon dioxide is not expected to have a significant impact on the aquatic environment.

### **Atmospheric:**

The system proposed is not expected to generate particulate or any air emissions that pose a threat to the environment.

### **Noise:**

The system proposed is not expected to create a sound nuisance.

### **Community Impact:**

The proposed system is not expected to create noise or odour hazards. It is not expected to cause harm to fisheries or traplines in the area. No community impacts are expected.

Figure 1. Proposed system location



Figure 2. Praxair CO2 delivery system tank size



240Kg cylinders

- Manifold with 2-3 cylinders “On-Line”
  - 2-3 cylinders as backup
- Ambient vaporizer and pressure regulating regulator 0-100 psi
- No power required
- Weekly CO<sub>2</sub> delivery
  - Capacity to expand if needed
- Local Thompson, MB support currently supplying gas to Vale

**Attached Appendices:**

1. Concoa 485 Series Regulator technical information.
2. Thermax CO2 Ambient Air Vaporizer technical information
3. Proposed schematic for the injection system.