



September 28, 2018

Action Plan Status Update: Copper Cliff Smelter Site-Specific Standard Approvals for Nickel, # 502-11-rv0

Context

On December 28, 2011 the Ministry of Environment issued Vale Canada Limited two Site-Specific Standard Approvals for nickel at its Copper Cliff Smelter. #501-11-rv0 is a 24-hr Site-Specific Standard Approval, which expired on June 30, 2016 when the nickel standard changes from a 24-hr to an annual basis. The annual Approval, #502-11-rv0 remains in place until December 28, 2021. Vale submitted an action plan with its application and this became Schedule 1 in the Approvals. The update of each action item is detailed below:

Action Items

Table A: Fugitive Property Sources

- 1. Implement Smelter Property Dust Management Plan.** A Best Management Practices Plan for the control of fugitive dust emissions was prepared for the Smelter a number of years ago. Vale refers to this as a Dust Emissions Management Plan (DEMP). It is reviewed regularly and opportunities for continuous improvement projects, such as stockpile relocation, outside work and traffic pattern adjustment, are identified and acted on annually. A report is prepared annually, submitted to the Ministry and reviewed with the community Environmental Monitoring Team. *This item is complete and ongoing.*
- 2. Continue evaluation of opportunities to relocate stockpiles, outside work, adjust traffic patterns away from sensitive areas.** The engineering firm, Stantec, was awarded a contract to work on the Smelter Complex Material Handling Modifications study to evaluate 4 options on a conceptual level (FEL2). The options include enclosing some of the material handling operations, moving some activities to Copper Cliff North Mine (further away from receptors), and consolidating some of the activities. The options will be evaluated on capital cost, operating cost, dust control effectiveness, track-out effectiveness and the environmental footprint. A final option will be recommended to move forward to a more detailed study (FEL3 level) later this year/ early in 2019. *This item is ongoing.*
- 3. Continue reclamation and re-vegetation of select community boundary areas to reduce dusting by wind erosion.** Vale continues to progressively reclaim the non-operating footprint of the Smelter Complex. An annual evaluation is completed to determine if additional areas are available to be reclaimed and plans are developed accordingly. *This item is complete and ongoing.*
- 4. Submit to the District Manager with a copy to the Director a written evaluation of alternatives, as part of the Company's AER Project, to further reduce nickel emissions from fugitive property sources.** New facilities and facility modifications addressing property fugitives (metals) outlined in the original June 28, 2012 AER Scope of Facilities Report were

removed from scope for a number of reasons. Item 2 above describes the study that is now being undertaken to replace and improve on the original suggested actions. Monthly progress updates are provided to the local MECP provincial officer, until completion (scheduled to be December 2019). *This item is ongoing.*

Table B: Process Sources

5. **Implement baghouses #1, 2, 4, 5, 7, 8 and 9.** The new high efficiency baghouses in the Matte Processing Fluid Bed Roaster department were installed and commissioned in September, 2010. *This item is complete.*
6. **Implement new baghouse for M floor to improve capture of feed transport system fugitive particulate emissions.** The new high efficiency baghouse on M floor in the Flash Furnace building was installed and commissioned in December, 2010. *This item is complete.*
7. **Implement scrubber for Matte Processing Nickel Storage tank fugitive emissions.** The covers installed on the Matte Processing nickel slurry storage tanks have significantly reduced work place nickel concentrations in the area, without buildup in the tank or roof. Consequently, the new wet scrubber system that was installed in 2010 to vent the tanks has not been required and is not operating (and thus has zero emissions). It is being maintained and is available for use, should it be required in the future due to buildup formation. *This item is complete.*
8. **Install the matte crushing system dust capture system upgrade.** The matte crushing dust capture system upgrade included upgrading and enlarging one baghouse and the replacement of a second unit with a new high efficiency baghouse. Construction and commissioning were completed in 2012. *This item is complete.*
9. **Install the material handling baghouse in converter aisle.** The installation of the new high efficiency converter aisle material handling baghouse was completed in October, 2012 and subsequently commissioned. *This item is complete.*
10. **Submit to the District Manager with a copy to the Director a written evaluation of alternatives, as part of the Company's AER Project, to further reduce nickel emissions from process sources.** To fulfill this action item on June 28, 2012 Vale submitted its Atmospheric Emissions Reduction (Clean AER) project Scope of Facilities Report; this report details all of the new facilities and facility modifications to be constructed to reduce the fugitive emissions of nickel from both process and property sources at the Copper Cliff Smelter. *This item is complete; it is estimated that process source emissions have been reduced by 40%, to be verified once the Surface Facilities Upgrade project is complete in 2020.*

Table C: Additional Work

11. **Continue to characterize emissions and measure the result and effectiveness of control projects.** Regular source testing is executed to measure the performance of both existing and newly installed pollution control equipment, such as the baghouses in action items 5 to 9. *This item is complete and ongoing.*
12. **Operate a community particulate monitoring network.** On behalf of Vale, a third party operates, maintains and reports the results from Vale's particulate monitoring network of 9 stations in accordance with the requirements listed in the most recent version of the Operations Manual for Air Quality Monitoring in Ontario. As required by this Approval, the

additional (8th) monitoring station was installed, in consultation with the Ministry, on Union Street adjacent to the Smelter. Construction and commissioning were completed in November, 2012. Quarterly reports are sent to the Ministry. Graphical summaries of the monitoring results and the quarterly reports are posted on Vale's internet website:

<http://www.vale.com/canada/EN/aboutvale/communities/sudbury/sudbury-environment/environmental-reporting-sudbury/air-quality-monitoring-results/Pages/default.aspx>

A 9th station was installed late in 2017 on Fielding Road, and is now part of the Vale network.

This item is complete and ongoing.

13. Review in writing the Smelter Complex Environmental Emergency and Spill Prevention and Contingency plans annually and update as required or give written reasons for not updating.

As required by the Regulation for Spill Prevention and Contingency Planning, O.Reg. 224/07, a Spill Prevention and Contingency Plan for the Smelter Complex was prepared in 2008. This plan is reviewed and updated annually as required by the Regulation.

This item is complete and ongoing.

14. Review the Smelter Complex environmental training program and update as required.

The environmental training needs analysis was updated. Environmental training requirements were identified for employees and contractors. The training topics included regulatory requirements, policy and environment management systems and technical and functional requirements. In 2012, environmental training packages and reference information were focussed on contractors, an identified gap. The development of new program content and delivery was prioritized. *This item is complete and training program updates ongoing.*

15. Review the Company's community involvement, partnerships and committees. In consultation with stakeholders, develop a forum/methodology to inform and consult with the community on air quality issues.

An Environmental Monitoring team with representatives from the Community, Ministry of Environment, Conservation and Parks and Vale were established. The team meets semi-annually to discuss air quality issues and review progress of Action Plan items. An annual community engagement report is prepared and posted on the internet website,

<http://www.vale.com/canada/EN/aboutvale/communities/sudbury/sudbury-environment/environmental-reporting-sudbury/air-quality-monitoring-results/Pages/default.aspx>

This item is complete and ongoing.

Atmospheric Emissions Reduction (Clean AER) and Surface Facility Upgrade (SFU) Projects Update

Clean AER Project

- The AER Project is 100% complete on all scope items; deficiencies are being addressed.
- The Converter Wet Gas Cleaning Plant continues to treat converter #8 and #10 primary SO₂ gases with no issues.
- The M floor conveyor belt #33 was installed and commissioned in July and handed over to operations for ramp up.
- The Secondary Baghouse and Fan Building construction and commissioning was completed in July with the final duct replacement and tie-ins completed during the August PMP. The Secondary Baghouse was handed over to operations and ramped up on August 25th. The Project and Plant operations are managing the ramp up of the Secondary Baghouse and continue to make adjustments to the process. The Secondary Baghouse was the final scope item to be completed by the AER project.
- The Clean AER project is executing a ramp down/demob/closeout plan to be complete by December 18, 2018.

Surface Facility Upgrade (SFU)

In **2019**, major work scheduled to be done at the Smelter as part of the SFU Project is as follows:

- Internal construction of the flue liners in the two new 450 ft stacks.
- Installation of all flues, burners and fans supporting the 450 ft stacks.

In **2020**, the SFU Project will continue with the following tasks:

- 450 ft stacks tie in to existing process.
- Decommissioning of Superstack.
- SFU Project completion and closed out.