

Drinking-Water Systems Regulation O. Reg. 170/03

Part III Form 2

Section 11. ANNUAL REPORT.

Drinking-Water System Number:	WW No. 240000075
Drinking-Water System Name:	Vermilion Water Treatment Plant
Drinking-Water System Owner:	VALE
Drinking-Water System Category:	Municipal and Private Water Works
Period being reported:	January 1st, 2020 to December 31st 2020

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [<input checked="" type="checkbox"/>] No []</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [<input checked="" type="checkbox"/>] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <p>Hardcopy Address: VALE 18 Rink Street c/o Water Plants Copper Cliff, Ontario, P0M 1N0</p> <p>Web Address: www.greatersudbury.ca</p>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input type="text" value="0"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No [<input checked="" type="checkbox"/>]</p> <p>Number of Interested Authorities you report to: <input type="text" value="0"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No [<input checked="" type="checkbox"/>]</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

The Vermilion Water Treatment Plant also supplies water to the plumbing works system that is owned and operated by VALE for use by its employees and its process. The Vermilion Water Treatment Plant as owned and operated by Vale has developed a comprehensive Drinking Water Quality Management System as required by legislation. QMS Policy Statement: *“Vale is committed to providing safe drinking water to the City of Greater Sudbury municipal drinking water distribution system, in accordance with all applicable legislative and regulatory requirements, as well as to the maintenance and continual improvement of a Quality Management System”.*

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List all Drinking-Water Systems (if any), which receive all their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
Vermilion Distribution system	260006789

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all its drinking water?

Yes [] No []

Indicate how you notified system users that your annual report is available and is free of charge.

Public access/notice via the web

www.greatersudbury.ca

Public access/notice via a newspaper

Public access/notice via Public Request

Public access/notice via a Public Library

Public access/notice via other method

VALE – Copper Cliff Supervisor’s office – by appointment call (705) 682-6153

Describe your Drinking-Water System

In 1972, INCO Limited constructed the INCO Vermilion Water Treatment Plant, in order to produce process water for the INCO mining operations as well as potable drinking water for INCO staff and the surrounding communities. In 2007, INCO became CVRD INCO and a name change to Vale Inco was completed late in the year. As of 2010, now named VALE, VALE’s Vermilion Water Treatment Plant is designed for a total production capacity of 81,800 m³/day (21.7M USGPD) and is supplied with surface water from the Vermilion River.

All process equipment is installed inside a heated and ventilated building, except for the caustic and alum storage tanks that are installed outside. The water treatment plant consists of the following main elements:

- One rapid mix tank;
- One hydraulic retention time tank;
- One PULSATUBE sludge blanket type clarifier;
- Five AQUAZUR V gravity sand filters;
- One clear-well located below the filters;
- Treated and backwash water vertical turbine pumping station;
- Air scouring blower and air instrument compressor room;
- Chemical storage and dosing system;
- External heat traced caustic and alum storage tanks;
- Liquefied Chlorine (tonners) stored and used in Chlorination room;
- Plant control room and laboratory room.

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Process Flow Description

1. Raw water is pumped from the Vermilion River to the VALE Vermilion WTP.
2. Raw water flow control is achieved with a by-pass pipe and control valve. The by-pass control valve automatically adjusts based on the water level in the clarifier. When the level in the clarifier rises, the by-pass flow control valve opens to decrease the flow to the plant. The by-pass is connected to the U-drain of the WTP.

List all water treatment chemicals used over this reporting period

- Aluminum Sulfate
- Sodium Hydroxide
- Liquefied Chlorine
- Hydro-fluosilicic Acid
- Polyfloc CP1160 35%
- Polyphosphate (Flogard POT6102)

Were any significant expenses incurred to?

Vale has also complied with the requirement for DWQMS and has received full scope accreditation from SAI- Global on behalf of the MECP. Vale has completed all internal and external audit cycles with action taken on findings accordingly.

- Install required equipment
- Repair required equipment
- Replace required equipment

Please provide a brief description and breakdown of monetary expenses incurred

Several air release and drain valves shacks repaired New HFS line repairs (started in 2020) on-going. Secure surface wash pipe supports Fire line repaired inside VWTP Replaced a sludge extraction valve Repaired polymer line. Commission new E house at Vermilion River Pump House New chlorine sensors for exterior of plant	Replaced two alum pumps HFS, Caustic Day Tank and Polyphosphate NDE inspections Replace #3 compressor Purchased new UPS system for Delta V (SCADA system) Repaired automatic transfer switch for backup genset Order new Clay-val for #4 Booster Pump Engineering for 5MG tank, new booster station, #1 Raw Water Line replacement, new air compressors, replacing the Foxboro system, new Ehouse, new genset for VWTP
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Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre:

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
June 17	Planned Power Outage	NA	NA	Notification	June 17

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Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	52	0– (NDOGT)	0 – (NDOGT)	N/A	N/A
Treated	52	0	0	52	<10 - 10
Plumbing Works	104	0	0	104	0 – 20
N/A=Not Applicable			NDOGT= Overgrowth		

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

FINISHED WATER ANALYSIS				
OPERATOR BENCH ANALYSIS			CONTINUOUS MONITORS	
	Number of Grab Samples	Range of Results (min #)-(max #)	Number of Samples As Per Note Below	Range of Results (min #)-(max #)
Turbidity	732	(0.047)-(0.791) NTU	8760	(0.00 NTU) - (1.02 NTU)
Chlorine	2122	(1.46)-(2.59) mg/L Free	8760	(0.00) - (4.22) mg/L Free
Fluoride (If the DWS provides fluoridation)	726	(0.41)-(0.92) mg/L	8760	(0.00) – (2.00) mg/L
			<i>NOTE: For continuous monitors use 8760 as the number of samples. **Ranges min & max due to calibrations and equipment servicing captured on trending**</i>	

NOTE: Record the unit of measure if it is not milligrams per litre

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Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	2020 Date Sampled	Result	Unit of Measure
Municipal Drinking Water License # 191-101 Schedule C, Section 4.4, issued March 22, 2016	TSS U-Drain flow to Environment measured in mg/L TSS	Jan 7	<0.67	R-Grab Sample mg/L
		Jan 7	<0.67	Comp U-Drain mg/L
		Feb 4	<0.67	R-Grab Sample mg/L
		Mar 3	<0.67	R-Grab Sample mg/L
		Apr 7	56.0	R-Grab Sample mg/L
		May 5	2.00	Comp U-Drain mg/L
		May 5	11.0	R-Grab Sample mg/L
		June 2	1.00	R-Grab Sample mg/L
		July 7	1.30	R-Grab Sample mg/L
		Aug 4	1.00	R-Grab Sample mg/L
		Sept 8	2.70	Comp U-Drain mg/L
		Sept 8	2.70	R-Grab Sample mg/L
		Oct 6	1.00	R-Grab Sample mg/L
		Nov 3	2.30	R-Grab Sample mg/L
		Dec 1	1.70	Comp U-Drain mg/L
Dec 1	1.30	R-Grab Sample mg/L		

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Unit of Measure	MDL <i>Method Detection Limit</i>	Result Value		Exceedance
			Year 2020		
Antimony	ug/L	0.5	<0.50 <MDL	January 24	<i>Nil</i>
Arsenic	ug/L	1.0	<1.0 <MDL	January 24	<i>Nil</i>
Barium	ug/L	1.0	10.0	January 24	<i>Nil</i>
Boron	ug/L	2.0	5.0	January 24	<i>Nil</i>
Cadmium	ug/L	0.10	<0.1 <MDL	January 24	<i>Nil</i>
Chromium	ug/L	1.0	< 1.0 <MDL	January 24	<i>Nil</i>
Mercury	ug/L	0.1	<0.1 <MDL	January 24	<i>Nil</i>
Selenium	ug/L	0.5	<0.5 <MDL	January 24	<i>Nil</i>

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Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Unit of Measure	MDL <i>Method Detection Limit</i>	Result Value Year 2020		Exceedance
Uranium	ug/L	1.0	< 1.0 <MDL	January 24	<i>Nil</i>
Fluoride	mg/L	0.05	0.30	January 24	<i>Nil</i>
Lead	ug/L	0.1	< 0.1 <MDL	January 24	<i>Nil</i>
Sodium	mg/L	0.10	15.5	January 24	<i>Nil</i>

Parameter	Unit of Measure	Result Value Year 2020				Exceedance
		Jan 7	Apr 7	Jul 7	Oct 6	
Nitrate	mg/L	<0.05	0.15	0.08	0.07	<i>Nil</i>
Nitrite	mg/L	<0.05	<0.05	<0.05	<0.05	<i>Nil</i>
Haloacetic Acids	ug/L	<8	24	87	61 <i>Latest annual average 45</i>	<i>1/2 mac</i>

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Result Value Year 2020				Unit of Measure	Exceedance
	Jan 7	Apr 7	Jul 7	Oct 6		
Alachlor	<0.28 <MDL				ug/L	<i>Nil</i>
Atrazine + N-dealkylated metabolites	<0.28 <MDL				ug/L	<i>Nil</i>
Azinphos-methyl	<0.21 <MDL				ug/L	<i>Nil</i>
Benzene	<0.1 <MDL				ug/L	<i>Nil</i>
Benzo(a)pyrene	<0.009 <MDL				ug/L	<i>Nil</i>
Bromoxynil	<0.0895 <MDL				ug/L	<i>Nil</i>
Carbaryl	<1.0 <MDL				ug/L	<i>Nil</i>
Carbofuran	<2.0 <MDL				ug/L	<i>Nil</i>
Carbon Tetrachloride	<0.20 <MDL				ug/L	<i>Nil</i>
Chlorpyrifos	<0.21 <MDL				ug/L	<i>Nil</i>
Diazinon	<0.21 <MDL				ug/L	<i>Nil</i>
Dicamba	<0.336 <MDL				ug/L	<i>Nil</i>
1,2-Dichlorobenzene	<0.30 <MDL				ug/L	<i>Nil</i>
1,4-Dichlorobenzene	<0.30 <MDL				ug/L	<i>Nil</i>
1,2-Dichloroethane	<0.30 <MDL				ug/L	<i>Nil</i>
1,1-Dichloroethylene (vinylidene chloride)	<0.3 <MDL				ug/L	<i>Nil</i>
Dichloromethane	<1.0 <MDL				ug/L	<i>Nil</i>
2-4 Dichlorophenol	<0.2 <MDL				ug/L	<i>Nil</i>
2,4-Dichlorophenoxy acetic acid (2,4-D)	<0.336 <MDL				ug/L	<i>Nil</i>

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Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Result Value Year 2020				Unit of Measure	Exceedance
	Jan 7	Apr 7	Jul 7	Oct 6		
Diclofop-methyl	<0.112 <MDL				ug/L	Nil
Dimethoate	<0.21 <MDL				ug/L	Nil
Diquat	<0.6 <MDL				ug/L	Nil
Diuron	<6.0 <MDL				ug/L	Nil
Glyphosate	<20.0 <MDL				ug/L	Nil
Malathion	<0.21 <MDL				ug/L	Nil
2-Methyl-4-chlorophenoxyacetic acid	<5.59 <MDL				ug/L	Nil
Metolachlor	<0.14 <MDL				ug/L	Nil
Metribuzin	<0.14 <MDL				ug/L	Nil
Monochlorobenzene	<0.5 <MDL				ug/L	Nil
Paraquat	<0.30 <MDL				ug/L	Nil
Pentachlorophenol	<0.3 <MDL				ug/L	Nil
Phorate	<0.14 <MDL				ug/L	Nil
Picloram	<0.0783 <MDL				ug/L	Nil
Polychlorinated Biphenyls(PCB)	<0.06 <MDL				mg/L	Nil
Prometryne	<0.0699 <MDL				ug/L	Nil
Simazine	<0.21 <MDL				ug/L	Nil
THM ug/L	37.0	31.6	92.1	71.5	<i>Latest annual average 58.1</i>	<i>1/2 mac</i>
Terbufos	<0.14 <MDL				ug/L	Nil
Tetrachloroethylene	<0.30 <MDL				ug/L	Nil
2,3,4,6-Tetrachlorophenol	<0.2 <MDL				ug/L	Nil
Triallate	<0.14 <MDL				ug/L	Nil
Trichloroethylene	<0.20 <MDL				ug/L	Nil
2,4,6-Trichlorophenol	<0.20 <MDL				ug/L	Nil
Trifluralin	<0.14 <MDL				ug/L	Nil
Vinyl Chloride	<0.10 <MDL				ug/L	Nil

MDL = Method Detection Limit

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
THM Annual Average	54.4	ug/L	Annual Average
Haloacetic Acids Annual Average	45	ug/L	Annual Average

(Only if DWS category is large municipal residential, small municipal residential, large municipal non-residential, non-municipal year round residential, large non municipal non residential)