

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 2018 to December 31st 2018

<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. <u>Hardcopy Address:</u> VALE 18 Rink Street c/o Water Plants Copper Cliff, Ontario, P0M 1N0 <u>Web Address:</u> www.greatersudbury.ca</p>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 50px; text-align: center;" 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 style="width: 50px; text-align: center;" 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

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

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

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 the maintenance and continual improvement of a Quality Management System”.

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 of 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;

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- External heat traced caustic and alum storage tanks;
- Liquefied Chlorine (tonners) stored and used in Chlorination room;
- Plant control room and laboratory room.

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

<ul style="list-style-type: none"> - Aluminum Sulfate - Sodium Hydroxide - Liquefied Chlorine - Hydro-fluosilicic Acid - Polyfloc CP1160 35% - Polyphosphate (Flogard POT6102)
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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 MOECP. Vale has completed all internal and external audit cycles with action taken on findings accordingly.

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

#1 raw water line replaced 32 feet of pipe
 Repaired 10 treated water line boxes, drains and air releases
 Purchased new pre-caustic skid which comes with two chemical feed pumps
 Purchased new Raw water pump and motor for the river
 Purchased new MCC for River pump house

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
Jan 16	Sodium	20.4	mg/L	Re-sample	Feb 13

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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	53	ND- (NDOGT)	0 - (NDOGT)	N/A	N/A
Treated	53	(N.D.)	(N.D.)	53	(N.D.) - (>1500)
Plumbing Works	106	(N.D.)	(N.D.)	106	(N.D.) - (370)
N/A=Not Applicable			N.D. = Non Detectable 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	728	(0.045)-(0.720) NTU	8760	(0.00 NTU) - (1.02 NTU)
Chlorine	2164	(1.730)-(2.360) mg/L Free	8760	(0.00) - (4.85) mg/L Free
Fluoride (If the DWS provides fluoridation)	733	(0.012)-(0.907) mg/L	8760	(0.20) - (2.19) mg/L
<p><i>NOTE: For continuous monitors use 8760 as the number of samples.</i></p> <p><i>**Ranges min & max due to calibrations and equipment servicing captured on trending**</i></p>				

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	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 11	<2.00	Comp U-Drain mg/L
		Jan 11	<2.00	R-Grab Sample mg/L
		Feb 16	<2.00	R-Grab Sample mg/L
		Mar 13	<2.00	R-Grab Sample mg/L
		Apr 4	3.2	R-Grab Sample mg/L
		May 4	13.00	R-Grab Sample mg/L
		May 20	2.4	R-Grab Sample mg/L
		May 20	<2.00	Comp U-Drain mg/L
		June 5	2.2	R-Grab Sample mg/L
		July 3	<2.00	R-Grab Sample mg/L
		Aug 8	<2.00	R-Grab Sample mg/L
		Sept12	<2.00	Comp U-Drain mg/L
		Oct 1	<2.00	R-Grab Sample mg/L
		Nov 6	<2.00	R-Grab Sample mg/L
		Dec 4	<2.00	Comp U-Drain mg/L
Dec 4	<2.00	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 Year 2018		Exceedance
Antimony	ug/L	0.5	<0.50MDL	January 16	<i>Nil</i>
Arsenic	ug/L	1.0	<1.0 MDL	January 16	<i>Nil</i>
Barium	ug/L	1.0	12.8	January 16	<i>Nil</i>
Boron	ug/L	2.0	3.3	January 16	<i>Nil</i>
Cadmium	ug/L	0.10	<0.1 <MDL	January 16	<i>Nil</i>
Chromium	ug/L	1.0	< 1.0 <MDL	January 16	<i>Nil</i>
Lead	ug/L	0.1	< 0.1 <MDL	January 16	<i>Nil</i>
Mercury	ug/L	0.1	<0.1 <MDL	January 16	<i>Nil</i>
Selenium	ug/L	1.0	<1.0 MDL	January 16	<i>Nil</i>
Sodium	mg/L	0.1	20.4	January 16	<i>Notification Provided</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 2018		Exceedance
Uranium	ug/L	1.0	< 1.0 <MDL	January 16	<i>Nil</i>
Fluoride	mg/L	0.10	0.37	January 16	<i>Nil</i>

Parameter	Unit of Measure	Result Value Year 2018				Exceedance
		Jan 16	Apr 5	Jul 3	Oct 3	
Nitrate	mg/L	0.2	0.33	0.14	<0.02	<i>Nil</i>
Nitrite	mg/L	<0.03	<0.03	<0.03	<0.008	<i>Nil</i>
Haloacetic Acid	ug/L	22.2	48.8	62.2	49	<i>Nil</i>

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

Parameter	Result Value Year 2018				Unit of Measure	Exceedance
	Jan 16	Apr 5	Jul 3	Oct 3		
Alachlor	<0.2 <MDL				ug/L	<i>Nil</i>
Atrazine + N-dealkylated metabolites	<0.5 <MDL				ug/L	<i>Nil</i>
Azinphos-methyl	<0.2 <MDL				ug/L	<i>Nil</i>
Benzene	<0.1 <MDL				ug/L	<i>Nil</i>
Benzo(a)pyrene	<0.005 <MDL				ug/L	<i>Nil</i>
Bromoxynil	<0.09 <MDL				ug/L	<i>Nil</i>
Carbaryl	<1.0 <MDL				ug/L	<i>Nil</i>
Carbofuran	<1.0 <MDL				ug/L	<i>Nil</i>
Carbon Tetrachloride	<0.20 <MDL				ug/L	<i>Nil</i>
Chlorpyrifos	<0.20 <MDL				ug/L	<i>Nil</i>
Diazinon	<0.20 <MDL				ug/L	<i>Nil</i>
Dicamba	<0.08 <MDL				ug/L	<i>Nil</i>
1,2-Dichlorobenzene	<0.20 <MDL				ug/L	<i>Nil</i>
1,4-Dichlorobenzene	<0.30 <MDL				ug/L	<i>Nil</i>
1,2-Dichloroethane	<0.20 <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)	<0.80 <MDL				ug/L	<i>Nil</i>
Diclofop-methyl	<0.08 <MDL				ug/L	<i>Nil</i>
Dimethoate	<0.2 <MDL				ug/L	<i>Nil</i>
Diquat	<0.7 <MDL				ug/L	<i>Nil</i>
Diuron	<6.0 <MDL				ug/L	<i>Nil</i>
Glyphosate	<20.0 <MDL				ug/L	<i>Nil</i>
Malathion	<0.20 <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 2018				Unit of Measure	Exceedance
	Jan 16	Apr 5	Jul 3	Oct 3		
2-Methyl-4-chlorophenoxyacetic acid	<10 <MDL				ug/L	Nil
Metolachlor	<0.10 <MDL				ug/L	Nil
Metribuzin	<0.10 <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	<0.10 <MDL				ug/L	Nil
Picloram	<0.08 <MDL				ug/L	Nil
Polychlorinated Biphenyls(PCB)	<0.06 <MDL				mg/L	Nil
Prometryne	<0.06 <MDL				ug/L	Nil
Simazine	<0.20 <MDL				ug/L	Nil
THM ug/L	42.3	35.2	81.9	81.8	<i>Latest annual average 60.3</i>	<i>½ mac</i>
Terbufos	<0.10 <MDL				ug/L	Nil
Tetrachloroethylene	<0.30 <MDL				ug/L	Nil
2,3,4,6-Tetrachlorophenol	<0.3 <MDL				ug/L	Nil
Triallate	<0.10 <MDL				ug/L	Nil
Trichloroethylene	<0.30 <MDL				ug/L	Nil
2,4,6-Trichlorophenol	<0.20 <MDL				ug/L	Nil
Trifluralin	<0.10 <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	60.3	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)