

**Part III Form 2  
Section 11. ANNUAL REPORT.**

<b>Drinking-Water System Number:</b>	WW No. 240000075
<b>Drinking-Water System Name:</b>	Vermilion Water Treatment Plant
<b>Drinking-Water System Owner:</b>	VALE
<b>Drinking-Water System Category:</b>	Municipal and Private Water Works
<b>Period being reported:</b>	January 1st 2016 to December 31st 2016

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></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><b>Hardcopy Address:</b> VALE 18 Rink Street c/o Water Plants Copper Cliff, Ontario, P0M 1N0</p> <p><b>Web Address:</b> <a href="http://www.greatersudbury.ca">www.greatersudbury.ca</a></p>	<p><b><u>Complete for all other Categories.</u></b></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**

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](http://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) 682-6548

**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 m<sup>3</sup>/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.

## 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 CP1160P 35%
- Polyphosphate (Flogard POT6102)
- Pre Coagulation aid, Sodium Hydroxide

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

## Were any significant expenses incurred to?

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

Raw water force main 24 inch diameter replace 300 feet

**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: One for 2016**

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Sept 7/16	HFS	1.69	Mg/l	Flush clearwell to waste and turn off feed of HFS	September 7 <sup>th</sup> , 2016 AWQI#131124

**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	(N.D.)	(N.D.)	52	(N.D.) – (10)
Plumbing Works	104	(N.D.)	(N.D.)	104	(N.D.) – (10)
N/A=Not Applicable			N.D. = Non Detectable TNTC= To Numerous To Count INT= Interference 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	730	(0.04 NTU)-(0.16 NTU)	8760	(0.00 NTU) - (1.02 NTU)
Chlorine	2136	(1.65)-(2.39) mg/L Free	8760	(0.00) - (5.00) mg/L Free
Fluoride (If the DWS provides fluoridation)	742	(0.06)-(1.70) mg/L	8760	(0.00) – (2.22) mg/L
<b>NOTE:</b> For continuous monitors use 8760 as the number of samples. <b>**Ranges min &amp; max due to calibrations and equipment servicing captured on trending**</b>				

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

**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
<b>Municipal Drinking Water License # 191-101 section 4.4 issued June 2, 2011</b>	TSS U-Drain flow to Environment measured in mg/L TSS	Jan 4	<2.00	R-Grab Sample mg/L
		Feb 03	<2.00	R-Grab Sample mg/L
		Feb 03	<2.00	Comp U-Drain mg/L
		Mar 02	<2.00	R-Grab Sample mg/L
		Apr 04	5.00	R-Grab Sample mg/L
		Apr 06	3.50	R-Grab Sample mg/L
		May 03	<2.00	Comp U-drain mg/L
		May 03	4.40	R-Grab Sample mg/L
		June 20	2.90	R-Grab Sample mg/L
		July 04	15.0	R-Grab Sample mg/L
		Aug 02	2.00	Comp U-drain mg/L
		Aug 02	<2.00	R-Grab Sample mg/L
		Sep 05	<2.00	R-Grab Sample mg/L
		Oct 03	<2.00	R-Grab Sample mg/L
		Nov 04	<2.00	R-Grab Sample mg/L
		Nov 04	<2.00	Comp U-drain mg/L
Dec 06	<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		Exceedance
			Year 2016		
Antimony	ug/L	0.5	<0.50MDL	January 19	<i>Nil</i>
Arsenic	ug/L	1.0	<1.0 MDL	January 19	<i>Nil</i>
Barium	ug/L	1.0	12.1	January 19	<i>Nil</i>

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

Parameter	Unit of Measure	MDL Method Detection Limit	Result Value Year 2016		Exceedance
Boron	ug/L	2.0	6.2	January 19	<i>Nil</i>
Cadmium	ug/L	0.10	<0.1 <MDL	January 19	<i>Nil</i>
Chromium	ug/L	1.0	< 1.0 <MDL	January 19	<i>Nil</i>
Lead	ug/L	0.1	< 0.1 <MDL	January 19	<i>Nil</i>
Mercury	ug/L	0.1	<0.1 <MDL	January 19	<i>Nil</i>
Selenium	ug/L	1.0	<1.0 MDL	January 19	<i>Nil</i>
Sodium	mg/L	0.1	15.5	January 19, 2016	<i>Nil</i>
Uranium	ug/L	1.0	< 1.0 <MDL	January 19	<i>Nil</i>
Fluoride	mg/L	0.10	0.44	January 19, 2016	<i>Nil</i>

Parameter	Unit of Measure	Result Value Year 2016				Exceedance
		Jan 19	Apr 05	Jul 12	Oct 04	
Nitrate	mg/L	0.43	<0.10	<0.10	<0.10	<i>Nil</i>
Nitrite	mg/L	<0.05	<0.05	<0.05	0.06	<i>Nil</i>
Nitrate + Nitrite	mg/L	0.43	<0.10	<0.10	<0.10	<i>Nil</i>

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

Parameter	Result Value Year 2016				Unit of Measure	Exceedance
	Jan 19	Apr 05	July 12	Oct 04		
Alachlor	<0.50 <MDL				ug/L	Nil
Atrazine	<0.50 <MDL				ug/L	Nil
Atrazine + N-dealkylated metabolites	<0.9 <MDL				ug/L	Nil
Azinphos-methyl	<0.30 <MDL				ug/L	Nil
Benzene	<0.20 <MDL				ug/L	Nil
Benzo(a)pyrene	<0.005 <MDL				ug/L	Nil
Bromoxynil	<0.09 <MDL				ug/L	Nil
Carbaryl	<1.0 <MDL				ug/L	Nil
Carbofuran	<1.0 <MDL				ug/L	Nil
Carbon Tetrachloride	<0.20 <MDL				ug/L	Nil
Monochlorobenzene	<0.20 <MDL				ug/L	Nil
Chlorpyrifos	<0.30 <MDL				ug/L	Nil
Desethyl Atrazine	<0.60 <MDL				ug/L	Nil
Diazinon	<0.30 <MDL				ug/L	Nil
Dicamba	<0.08 <MDL				ug/L	Nil
1,2-Dichlorobenzene	<0.20 <MDL				ug/L	Nil
1,4-Dichlorobenzene	<0.20 <MDL				ug/L	Nil
1,2-Dichloroethane	<0.20 <MDL				ug/L	Nil
1,1-Dichloroethylene (vinylidene chloride)	<0.20 <MDL				ug/L	Nil
Dichloromethane	<1.0 <MDL				ug/L	Nil
2-4 Dichlorophenol	<0.2 <MDL				ug/L	Nil
2,4-Dichlorophenoxy acetic acid (2,4-D)	<0.08 <MDL				ug/L	Nil
Diclofop-methyl	<0.08 <MDL				ug/L	Nil
Dimethoate	<0.3 <MDL				ug/L	Nil
Diquat	<7.0 <MDL				ug/L	Nil
Diuron	<6.0 <MDL				ug/L	Nil
Glyphosate	<20.0 <MDL				ug/L	Nil
Malathion	<0.30 <MDL				ug/L	Nil
MCPA	<0.12 <MDL				ug/L	Nil
Metolachlor	<0.20 <MDL				ug/L	Nil
Metribuzin	<0.20 <MDL				ug/L	Nil
Paraquat	<1.00 <MDL				ug/L	Nil
Pentachlorophenol	<0.5 <MDL				ug/L	Nil
Phorate	<0.20 <MDL				ug/L	Nil
Picloram	<0.08 <MDL				ug/L	Nil
Total PCB's	<0.07 <MDL				mg/L	Nil
Prometryne	<0.10 <MDL				ug/L	Nil
Simazine	<0.30 <MDL				ug/L	Nil
<b>THM ug/L</b>	48.6	48.5	63.7	88.1	<b>Latest annual average 62.23</b>	<i>1/2 mac</i>
Terbufos	<0.10 <MDL				ug/L	Nil
Tetrachloroethylene	<0.20 <MDL				ug/L	Nil

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

Parameter	Result Value Year 2016				Unit of Measure	Exceedance
	Jan 19	Apr 05	July 12	Oct 04		
<b>2,3,4,6-Tetrachlorophenol</b>	<0.5 <MDL				ug/L	<i>Nil</i>
<b>Triallate</b>	<0.20 <MDL				ug/L	<i>Nil</i>
<b>Trichloroethylene</b>	<0.20 <MDL				ug/L	<i>Nil</i>
<b>2,4,6-Trichlorophenol</b>	<0.5 <MDL				ug/L	<i>Nil</i>
<b>2,4- Diclorophenol</b>	<0.2 <MDL				ug/L	<i>Nil</i>
<b>Trifluralin</b>	<0.20 <MDL				ug/L	<i>Nil</i>
<b>Vinyl Chloride</b>	<0.20 <MDL				ug/L	<i>Nil</i>
<b>MDL = Method Detection Limit</b>						

**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
<i>THM's running annual average at 62.23 mg/L slightly exceeded half the standard as prescribed in Schedule 2 Of Ontario Drinking Water Quality Standards of 100 mg/L or 0.100 ug/L</i>			

(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)