



## STANDARD PROCEDURE INSTRUCTION

Title		SPI
<b>Potable Water Quality Management</b>		# 35-1
Department	Supersedes SPI Dated	Effective Date
Safety, Health and Environment <b>APPLIES TO ALL SITES</b>	New	Nov 21, 2013

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**Potable Water Quality Management**

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## 1. GUIDING PRINCIPALS

Vale Manitoba Operations' voluntarily adopts section 4.6(1) of Manitoba Regulation 217/2006, the Workplace Safety and Health Regulation, under the Workplace Safety and Health Act, where it states "an employer must ensure an adequate supply of potable drinking water is available to workers at a workplace".

## 2. CONTEXT

At the Vale Manitoba Operations, Thompson Mine site, potable water (potable water is defined as water which meets regulated quality standards and is suitable for drinking) is received from the Vale Water Treatment Plant that also serves the City of Thompson, and is governed by Manitoba Regulations 40/2007 and 41/2007 under the Drinking Water Safety Act.

At the Birchtree Mine site, potable water is received from a private water treatment plant which services the Birchtree Mine areas only, and is not subject to regulation under the Manitoba Drinking Water Safety Act

Bottled water is purchased and provided in all mines and some surface operations plants. Pre-packaged water is regulated under the Canadian Food and Drug Act. Bottled water dispensers are owned and maintained by Vale.

The Manitoba Drinking Safety Water Act and its regulations preside over the Vale Water Treatment Plant; the plant is responsible to supply water which meets quality standards to the facility (plant and mine) distribution system and the municipal distribution system. The water treatment plant operation is required to supply 'to the door', where each facility is responsible to maintain the plumbing and water quality in its buildings/facility. **Each plant/mine must develop, implement and maintain a preventative maintenance program to ensure that drinking/potable water quality is maintained throughout its internal plumbing works, bottled water dispensing units and emergency eyewash stations.** This SPI is intended to address these requirements and define responsibilities related to the water distribution



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system maintenance program.

### 3. SCOPE

3.1 The preventative maintenance (PM) program for each plant/mine's **potable water distribution system / plumbing works**, as a minimum requirement, must have the following components:

- ✓ Assign and identify a person responsible to coordinate the documentation of the PM program, including inspection routines, inventory, maintenance schedules and procedures.
- ✓ Ensure that all potable water lines are clearly identified and labelled according to **Engineering Standard Specification 3502.1.1.130** for piping systems.
- ✓ Ensure that facility level water distribution system drawings (including isolation valves and sample points) are up-to-date and accessible for use in emergencies.
- ✓ Ensure an inventory is maintained of all water fountains, plumbed eye-wash stations, emergency showers and dry facility showers, as well as in-line particulate and/or activated carbon filters, and that the Environment department receives inventory updates annually.
- ✓ Implement and document PM actions for all water fountains and filters. At minimum, PM actions should follow all manufacturer recommendations. Maintenance schedules should address any specific indoor environmental/hygiene concerns.
- ✓ Implement and document the valve maintenance and exercising program which should include an inventory of critical spare parts, equipment, repair clamps, pipes and valves. See Section 4.0 Procedure 4.1 Valve Exercise Work Instruction
- ✓ Establish a microbiological sampling program that meets the needs of the facility. See section 4.0 Procedure 4.2 Potable Water Sampling Work Instruction. The program must include a minimum of one sample per month and documented procedures to



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deal with adverse results. Adverse results are values greater than “0” or “N.D” (None Detected) See Appendix 1.0 for an example adverse result response procedure.

- ✓ Establish a procedure which identifies indications of upset conditions which may impact water quality or result in biological or chemical contamination of the potable water supply and define a response procedure which includes warnings/notifications to potentially affected areas, confirmation of contamination conditions, corrective actions and all-clear criteria. *The Safety Health and Environment department should be notified, as soon as practical, of any contamination event or other major problem, upset, bypass conditions, water break or malfunction that may adversely affect human health or the environment.*
- ✓ Implement a cross connection and backflow prevention program in accordance with the **Manitoba Plumbing Code** and the **WCS AWWA Cross Connection Control Manual**
- ✓ Establish a unidirectional flushing program (See Section 4 Procedure 4.4 Unidirectional Flushing Work Instruction), to ensure that water quality is maintained within the facility, especially in low-flow areas and dead ends in which chlorine residual may be low, and in response to indications of declining water quality (taste, odour and appearance complaints).
- ✓ Post and maintain warning signs and tags in the areas that the plant or mine cannot ensure water quality is maintained due to workroom conditions. The signs should clearly identify that it is not for drinking purposes; i.e. “Do Not Drink”
- ✓ Ensure that waterless personal hygiene supplies (i.e. hand sanitizer) are provided in all areas that are not supplied with plumbed potable water and areas where warning signs and tags (as described above) are posted.
- ✓ Schedule routine inspections to audit compliance with this SPI and address deficiencies

3.2 The preventative maintenance (PM) program for **the water mains and distribution lines that service the plants/mines**, which are maintained by the utilities department, must, as a minimum requirement, address the following components:



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- ✓ Identify a person responsible to document the PM program
- ✓ Controlled system, pipe and isolation valve drawings that include numbered water sources, distribution lines with sizes, type of pipe, valves and hydrants with appropriate numbering, sewer lines, lift stations and other relevant appurtenances.
- ✓ Maintain positive pressure and adequate disinfection residual in all parts of the system
- ✓ Implement a comprehensive hydrant maintenance - valve exercising - unidirectional water main flushing program adhering to drainage and de-chlorination requirements, notifications to affected areas and documentation of activities and results (i.e. flushing duration, pressures and chlorine residuals).
- ✓ Ensure that all materials, paints, linings, coatings, adhesives, lubricants etc. in direct contact with potable water, are suitable for potable water use in accordance with **ANSI/NSF 61 Standard**
- ✓ Implement a cross connection and backflow prevention program in accordance with the **Manitoba Plumbing Code** and the **WCS AWWA Cross Connection Control Manual**
- ✓ Monitor site and facility level water consumption and if necessary, implement a leak detection program
- ✓ Procedures for routine water tower flushing
- ✓ Post-maintenance and new construction/installation water main disinfection procedures that conform to **AWWA Standard C651**
- ✓ Emergency response procedures to address upset conditions which may impact water quality or result in biological or chemical contamination of the potable water supply which includes warnings/notifications to potentially affected areas, confirmation of contamination conditions, corrective actions and all-clear criteria. *The Safety Health and Environment department should be notified, as soon as practical, of any*



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*contamination event or other major problem, upset, bypass conditions, main break or malfunction that may adversely affect human health or the environment.*

- ✓ Maintain a calibrated portable chlorimeter for use in disinfection activities, investigations and emergency response.
- ✓ Comply with all instructions and specifications issued by Fisheries and Oceans Canada under the fish habitat protection provisions of the Fisheries Act concerning the construction, operation and maintenance of the water works, in accordance with article 15 of **Vale's license to divert water for industrial purposes** (License 2010-072), and **Vale's License to Construct Drainage or Other Water Control Works** (License No. 08 WCW-900) issued under the Manitoba Water Rights Act.
- ✓ Comply with Manitoba Regulation 77/2003 **Water and Wastewater Facility Operators Regulation** under the Environment Act, respecting the classification certificates and certification of water system operators (persons adjust/direct the flow, pressure or quality of water within a water distribution facility)

3.3 The preventative maintenance (PM) program for each plant/mine's **bottled water dispensers and coolers**, as a minimum requirement, must have the following components:

- ✓ Assign and identify a person to co-ordinate the documentation of the preventative maintenance program, and perform scheduled inspections to ensure compliance.
- ✓ Ensure an inventory is maintained of all bottled water coolers and dispensers. The inventory should include a minimum of: location, quantity, type (Make/model), number of bottles.
- ✓ Implement a cleaning and preventative maintenance schedule for all bottled water dispensers. Cleaning and preventative maintenance should use the manufacturer recommendations as a minimum requirement.
- ✓ Wipe Downs: The main purpose of a wipe down is to keep the bottled water cooler/dispenser clean and free of dust and dirt, utilizing a clean wet cloth and a mild disinfectant. The frequency should consider traffic, workroom conditions and environmental or health concerns.



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- ✓ Cleaning should follow the manufacturers recommendations at minimum, when those are not available, refer to instructions listed in Section 4 Procedure 4.3 Work Instruction Bottled Water Dispenser Cleaning
- ✓ Schedule routine inspections to audit compliance with this SPI and address deficiencies

3.4 The preventative maintenance (PM) program for each plant/mine's **plumbed and portable eyewash stations**, as a minimum requirement, must have the following components:

- ✓ Assign and identify a person to co-ordinate the documentation of the preventative maintenance program, and perform scheduled inspections to ensure compliance.
- ✓ Ensure an inventory is maintained of all portable and plumbed eyewash stations. The inventory should include a minimum of: location, quantity, type (Make/model).
- ✓ Implement a wipe-down, cleaning and preventative maintenance schedule for all portable and plumbed eyewash stations. Cleaning and preventative maintenance should use the manufacturer recommendations as a minimum requirement.
- ✓ Eyewash stations should be designed operated and maintained in accordance with the American National Standards Institute (ANSI) standard Z358.1-2009 "Emergency Eyewash and Shower Equipment". Compliance with the standard should be routinely audited to ensure compliance.
- ✓ Schedule routine inspections to audit compliance with this SPI and address deficiencies

3.5 The site level **water quality monitoring program** which is carried out by the SHE department as a minimum requirement must have the following components:

- ✓ Person responsible for the documentation of the monitoring programs



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- ✓ Maintain an inventory of sample points within the systems, design and execute a sampling regime which monitors bacteriological water quality and chemistry. The sampling regime should consider distribution system size, characteristics and ensure adequate sample representation.
- ✓ Maintain approved work instructions for collecting potable water samples
- ✓ Maintain approved response procedures to address adverse results, which include warnings/notifications to potentially affected areas, confirmation of contamination conditions, corrective actions and all-clear criteria.
- ✓ Maintain a calibrated portable chlorimeter for use in investigations and emergency response
- ✓ Audit compliance with this SPI and address deficiencies

#### 4. PROCEDURES

##### 4.1 Valve Maintenance and Exercising Work Instruction / General Guidance



Work Instruction  
Valve Maintenance ar

##### 4.2 Potable Water Sampling (Microbiological) Work Instruction



Work Instruction  
Potable Water Sampli

##### 4.3 Bottled Water Dispenser Cleaning Work Instruction / General Guidance



Work Instruction  
Bottled Water Dispen





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#### 4.4 Unidirectional Flushing Work Instruction / General Guidance



Work Instruction  
UDF Potable Water D

## 5. REFERENCES

- Manitoba Regulation 217/2006, the Workplace Safety and Health Regulation
- Manitoba Regulations 40/2007 and 41/2007 under the Drinking Water Safety Act
- Vale's License to Divert Water for Industrial Purposes  
-License 2010-072
- Vale's License to Construct Drainage or Other Water Control Works  
-License No. 08 WCW-900
- Manitoba Regulation 77/2003 Water and Wastewater Facility Operators Regulation
- ANSI standard Z358.1-2009 "Emergency Eyewash and Shower Equipment"
- AWWA Standard C651
- ANSI/National Sanitation Foundation (NSF) Standard #61
- WCS / AWWA Cross Connection Control Manual
- CSA B64.10-01 Manual for the Selection and Installation of Backflow Prevention Devices
- Manitoba Plumbing Code
- Manitoba Water Stewardship Best Practises Guidance Manual for Small Systems

## 6. CONTROLS

6.1 This SPI should be reviewed when the referenced licenses, water quality standards or regulations change, or every three years.



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## 7. APPENDICES



Example Adverse  
Result Response Proc

Approved By	Title Vice President, Vale Manitoba Operations
Date	

