ENVIRONMENTAL EMERGENCY PLAN
PORT COLBORNE REFINERY

REVISION DATE: 2020-12-21

VALE CANADA LIMITED
PORT COLBORNE, ON OPERATIONS

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1 PURPOSE

In 2003, the Environmental Emergency (E2) Regulations came into force under the authorities of the *Canadian Environmental Protection Act*, 1999 (CEPA 1999). The regulations were first amended in 2011.

The Environmental Emergency Regulation, 2019 requires a company to have an environmental emergency plan (E2 Plan) to demonstrate that it is prepared to react in the event of an accidental release of a regulated hazardous substance.

An Environmental Emergency Plan, commonly referred to as an E2 Plan, helps facilities to better prevent, prepare for, respond to and recover from an environmental emergency. The plan is used, in unexpected releases of the regulated substances, establish specific training requirements, and conduct exercises to test the plan to make sure the environment and human life and health are protected.

These plans may be prepared in accordance with existing emergency response documents and systems (i.e. Emergency Preparedness or Crisis Management Plans) if they meet the requirements of subsection (2) of the Regulation or have been amended so that they meet all requirements.

A key pillar in E2 planning is the consideration of the risks present in the overall management of hazardous substances from movement, storage and disposal perspectives. Addressing key risks contributes to the overall reduction of risk severity through the implementation of critical controls and is an effective way to minimize potential catastrophic events.

2 FACILITY DESCRIPTION

Vale Canada Limited – Port Colborne Refinery (PCR) focuses on the production of electrocobalt, the processing of precious metals and the packaging and distribution of finished nickel products to market. These three product lines are processed at three distinct production areas at PCR: the Cobalt Refinery, the Precious Metals Refinery and Nickel Processing. There are also support services and utilities throughout PCR in support of the production areas. Products and intermediates of PCR are shipped to other Vale Refineries or to market.

An administration office building, Process Technology office and workspace, and a Changehouse are also located onsite at PCR.

This following information provides a brief overview of the PCR operations.

2.1 Cobalt Refinery

Slurry feed is received from Vale Canada Limited – Copper Cliff Nickel Refinery containing nickel and cobalt carbonates and other impurities. This slurry is first dissolved with sulphuric acid and then pH adjusted with soda ash. The mixture is then filtered to remove calcium and iron along with other metals, such as copper, nickel, and cobalt, co-precipitated. The solid phase is rejected and liquid phase is sent through several other purification steps including zinc ion exchange and copper removal using ion exchange. The remaining liquid containing purified cobalt and nickel is treated with sodium hypochloride (bleach) to

separate the cobalt from the nickel. The remaining nickel solution is treated with soda ash producing a nickel carbonate precipitate which is reverted in slurry form to the Copper Cliff Nickel Refinery. Cobalt hydrate is precipitated, filtered, and sent to the Electro Cobalt Refinery (ECR) building.

In the ECR, the cobalt hydrate feed is subjected to additional purification through ion exchange, settling and filtering. Soluble cobalt contained in acidic liquor is pumped into plating cells containing cathodes and a sacrificial lead anode. Passing an electric current through the cells, metallic cobalt is electrolytically deposited onto mandrels. Several hundred cobalt disks form on each mandrel to a size of about three centimetres in diameter. Once removed from the mandrel, the rounds are polished, degassed in an electrically heated kiln and packaged for market in 250 kg drums.

The process for the maintenance and refinishing of the mandrels that are used in the ECR involves a series of treatments including acid cleaning with both nitric acid and sulphuric acid and grit blasting with aluminum oxide. The mandrels are then coated with epoxy ink in a pattern specific for rounds formation, and dried.

2.2 Precious Metals Refinery

In the PMR, slurry feed shipments of residues or process intermediates are received from Vale's Sudbury Operations, or other toll materials from clients. These feeds undergo batch hydrometallurigical processes to remove impurities and purify targeted metals (i.e. gold) or metallic compounds (i.e. platinum group metals). The feed is either charged to atmospheric leach tanks to be leached in an oxygen atmosphere. The resultant copper-free filter cake is leached to remove lead, fed to a thickener and filtered again, producing a lead carbonate. The leach solution is treated with iron and chlorine to precipitate silver and silver chloride and to dissolve various other precious metals for further upgrading steps. The solids are further processed to separate and concentrate various precious metals. Several metallic compounds are also created as by-products. The PMR produces gold sand, silver sand and platinum group metal cake, which is sent off-site for further refining and processing. By-products such as lead carbonate cake, selenium cake and bismuth sand are sold to other refining operations. An additional process circuit, produces a saleable tellurium-containing product.

An analytical laboratory that services all of PCR is also housed in the PMR building. This laboratory provides analytical testing of PCR intermediates and products only.

2.3 Nickel Processing

Nickel products are received from Vale Canada Limited's other operations. Nickel rounds go through a sulphuric acid dip for cleaning followed by screening, a water rinse and polishing. Nickel cathodes are sheared into squares of varying sizes. Nickel pellets and flats are also received in bulk containers for repackaging. The products are packaged into 10 kg bags, 250 kg drums or tonne bulk bags for shipment to market.

2.4 Surrounding Area

Sensitive receptors are places which would be significantly impacted by the adverse effects caused by an emergency at PCR. The sensitive receptors are listed below and have been incorporated in mapping the receptors associated with PCR.

1. Hospitals and Long-Term care facilities;
2. Schools and Child care facilities;
3. Residential, Commercial and Industrial buildings;
4. Highways;
5. Tranportation Corridors;
6. Parks;
7. Wildlife habitats;
8. Water sources; and:
9. Water Bodies

The following resources have been used to determine sensitive receptors that must be considered during the implementation of this plan:

- The City of Port Colborne's Official Plan (2006)
- Niagara Peninsula Source Water Protection Area Assessment Report to identify groundwater and surface water intakes, sensitive natural receptors (2010);
- Vale Modelling Plans to identify locations of air monitors, buildings and emission sources (2017);
- Niagara Navigator web tool used to identify sensitive receptors, land uses in the area (2012);
- Natural Heritage Map used to identify ecological, cultural and First Nation values (2008);

All maps and figures can be found in **the Spill Prevention and Contingency Plans which are located on the Vale Intranet site (**http://intranet.valepub.net/en/canada/Pages/Port-Colborne-Sustainability/Emergency-Response--Rescue.aspx) for reference.

3 SCHEDULE 1 SUBSTANCES

PCR has three Schedule 1 substances that are in quantities greater than the quantity listed in column 4, minimum quantity, that requires a substance specific emergency response plan. The substances are: chlorine, sulphur dioxide, and hydrochloric acid. Safety Data Sheets (SDS) for each substance are attached in **Appendix B**. A summary of physical and chemical properties for each substance is included in **Table 1.**

Table 1: Information on basic physical and chemical properties

Physical/Chemical Properties	Chlorine	Sulphur Dioxide	Hydrochloric Acid
CAS Number	7782-50-5	7446-09-5	7647-01-0
UN Number	UN 1017	UN1079	UN1789
Physical State	Gas	Gas	Liquid
Colour	Yellow	Colourless	Clear / colourless
Odour	Sharp	Pungent	Pungent
pH	Not Available	If dissolved in water will effect pH	<1
Melting Point	Not Available	-75.5^{o}C	-44^{o}C
Boiling Point	-34. 04^{o}C	-10^{o}C	74^{o}C
Flash Point (close up)	Not Applicable	Not applicable for gases and gas mixtures	Not Applicable
Explosive Limits	Not Applicable	Not Applicable	Not Applicable
Density	1.47 kg/m^3 at 0^{o}C	2.2697kg/m^3 at 20^{o}C	1.16
Auto-Ignition Temperature	Not Applicable	Not Applicable	Not Applicable
Soluble in Water?	Not Applicable	soluble	soluble
E2 Hazard Category	Inhalation (I)	Inhalation (I)	Inhalation (I)

3.1 Chlorine

Chlorine is a greenish-yellow gas that is an intense irritant to eyes and mucous membranes. Combining with bodily moisture to liberate nascent oxygen and form HCl, which can cause inflammation of the tissue with which they are in contact with. It is stored and transported in its compressed liquid form, but used most commonly in its gas state.

3.2 Sulphur Dioxide

Sulphur Dioxide is a highly reactive, colourless gas which can create a suffocating odour. When released, sulphur dioxide can react with other elements in air to form particulate matter, or be chemically transformed into acidic pollutants. Inhaling sulphur dioxide can cause severe irritation of the nose and throuat and can create a pulmonary edema by accumulating fluids in the lungs. The gas can irritate and burn skin and eyes. It is stored and transported in its compressed liquid form, but used most commonly in its gas state.

3.3 Hydrochloric Acid

Hydrochloric acid is the aqueous solution of hydrogen chloride gas. HCl is a clear, colourless liquid with a strong pungent smell. When released to ambient, the liquid can fume and result in gas that can be transported further. Reacting with water, the acid will return to liquid form and can burn and irritate eyes and mucous membranes. It is transported and stored in liquid form.

3.4 Maximum Expected Quantities

3.4.1 Chlorine-Precious Metals Refinery

The Precious Metals Refinery at PCR consumes the reagent chlorine, delivered in 1-tonne cylinders. There is a storage building exterior to the PMR to house cyclinders, while two cylinders are on-line within the the PMR. The location of the chlorine storage room is 0.189km away from the boundary of the facility and the adjacent public recreational area in Port Colborne. In total there can be 10 tonnes of chlorine with two online cylinders and eight others in storage.

3.4.2 Sulphur Dioxide

Sulphur dioxide is a reagent utilized at the Cobalt Refinery. There is a rail ar docking station that serves two 91-tonne cars. The location of the sulphur dioxide rail car dock is 0.13km away from the boundary of the facility and the adjacent residential community of Port Colborne. The maximum expected quantity at the facility is 182 tonnes with the largest container, being any of the rail cars, having a maximum capacity of 91 tonnes.

3.4.3 Hydrochloric Acid

Hydrochloric acid is a reagent utilized at the PMR. The Cobalt Refinery (CoR) reports hydrochloric acid in some exhaust gas, however it is not directly used in the process. The location of the hydrochloric acid storage tanks is at the PMR, and they are 0.22km away from the boundary of the facility and the adjacent public recreational area in Port Colborne. The maximum expected quantity at the facility is 30,000 litres, equivalent to 34.8 tonnes. The twin storage tanks are married with common piping.

3.5 Use at the Facility

Chlorine, Suplhur Dioxide and Hydrochloric acid are each utilized as reagents within Port Colborne Refinery. The tanks and vessels referenced in Sec 3.4, as accounted for under the *Environmental Emergency Regulations 2019* are noted in **Table 2**. **Figure 1** illustrates the respective locations of the materials at Port Colborne Refinery.

Table 2: Location of Chlorine, Sulphur Dioxide and Hydrochloric acid storage at Port Colborne Refinery

Material	Tank Location	Easting*	Northing*	Tank Size (tonnes)
Chlorine	PMR	4748741.2	643914.3	(10) 1
Sulphur Dioxide	Cobalt Refinery	4749061.4	643640.4	(2) 91
Hydrochloric Acid	PMR	4748779.6	643848.8	(2) 17.4

*- UTM coordinates NAD83 Zone 17

Table 3: Sensitive Receptors Identified in area surrounding PCR

Sensitive Receptors	Description / Identifier	Location Relative to PCR (distance, general direction)
Health Care Facility	Port Colborne Urgent Care	1460 m, West
Senior Citizens' residences and Long-term Care facility	Port Colborne Long Term Care, Portal Village Residences, Anglea's Place, Northland Manor	1460 m, West 1950 m, North West 1850 m, North West 3100 m, North Northwest
Child Care Facilities	Catharine/Charlotte Sts., Elm/Charlotte Sts., Port Colborne Highschool, Oakwood Elementary School, DeWitt Carter School	1050 m, West Northwest 1200 m, West Northwest 1700 m, North West 2800 m, North West 1150 m, North
Educational facilities	DeWitt Carter School Ecole St. Joseph St. Therese School Lakeshore Catholic Secondary Steele Street School Port Colborne Highschool McKay School St. Patrick School St. John Bosco School Oakwood Elementary School	1150 meters, North 1500 meters, North 1650 meters, North East 1800 meters, North 1650 meters, West 1700 meters, North West 1800 meters, North West 2500 meters, West 2650 meters, North West 2800 meters, North West
Dwellings	Residential buildings	Within 100 meters, multidirectional
Places of business	Industrial, commercial (stores, shopping centres, etc.)	Within 100 meters, multidirectional
Transportation corridors	Major routes of transportation: Welland Canal	600 meters, West
Vulnerable areas as defined in subsection 2(1) of the Clean Water Act 2006	- Significant ground water recharge area or aquifer - Surface water intake protection zone	Will not be effected in Worst Case scenario, or otherwise
Sensitive ground /surface water feature identified as instrument under the Planning Act	Planning Act, 2006	Evaluated wetlands as represented on Drawing 3.1
Wells and intakes of drinking water systems	Municipal and domestic drinking water wells	Municipal Water Intake and private-owned wells are illustrated on Drawings 3.2, 3.3 and 3.4
Flood plain areas	A level land area subject to periodic flooding from a contiguous body of water	Hazard Land and Flood plains as represented on Drawing 3.1
Fish and wildlife habitat areas	Lakes, rivers, swamps, etc.	Habitat areas as represented on Drawing 3.1

Niagara Region

Port Colborne Refinery location and surrounding Sensitive Receptors

Legend

- Places of Worship
- All Schools
  - Adult Learning Centre
  - Elementary Schools
  - Elementary and Secondary Schools
  - Post-Secondary Institution
  - Secondary
- Fire Station
- Police Station
- EarlyON Child and Family Cen
  - Main site
  - Satellite site
- Provincial
- Regional
- Hospital
- Urgent Care Center
- Facility Boundary
- Cobalt Refinery rail docks
- Precious Metals Refinery

1.0 0 0.51 1.0 Kilometers

N

Notes

Figure 1

4 POTENTIAL ENVIRONMENTAL EMERGENCIES

The materials in use at PCR accounted for under the *Environmental Emergency Regulations 2019,* Chlorine, Sulphur Dioxide and Hydrochloric acid are each Inhaltion Hazards. While the risk of each is similar (Inhalation) the method of the release which would create the risk must be considered. Both Chlorine and sulphur dioxide are liquid when contained in their respective pressure vessel and are converted to a gas within PCRs infrastructure. Hydrochloric acid is also an Inhalation Hazard due to the fact that the liquid can vapourize in ambient atmospheric conditions. The potential scenarios of release of chlorine or sulphur dioxide from a rail car are similar and can be assessed in the same manner. There are multiple potential scenarios of a release for each mode, however each scenario that is a risk to the surrounding community is based on a gaseous plume migrating off-site

Table 4 Potential impact to each sensitive receptor, dependant on whether the plume migrates off-site or stays within the PCR airshed.

Sensitive Receptors	A release of chlorine or sulphur dioxide or hydrochloric acid fume that creates a plume that migrates off-site	A release of chlorine or sulphur dioxide or hydrochloric acid fume that does not create a plume capable of migrating off-site
Health care facilities; Long term care facilities; Child care facilities; Educational facilities; Places of buisines	In worst case scenario the plume would migrate to the receptor in a concentration that could cause fatalities or create cause for emergency treatment, due to inhalation of toxic gas. This scenario is dependent on quantity spilled, rate of release, all the variables of weather and no prevention or mitigation taking place.	No off-site impacts
Dwellings	In worst case scenario the plume would migrate to the receptor in a concentration that could cause fatalities or create cause for emergency treatment, due to inhalation of toxic gas. This scenario is dependent on quantity spilled, rate of release, all the variables of weather and no prevention or mitigation taking place.	No adverse effects to nearby dwellings, although residents may react to in-plant alarms or sirens.
Transportation corridors	In worst case scenario the plume would migrate towards the Welland Canal (a section of the St. Lawrence Seaway), and/or Highways 3, 58 or 140 which connect Port Colborne with neighbouring communities, either in a concentration that could cause fatalities or create cause for emergency treatment, or due to emergency response, block transportation through the corridor. This scenario is dependent	No off-site impacts

	on quantity spilled, rate of release, all the variables of weather and no prevention or mitigation taking place.	
Groundwater and surface water intakes to drinking water systems	Gaseous release will not adversely affect water systems.	Gaseous release will not adversely affect water systems.
Fish and wildlife habitat areas	In worst case scenario the plume would migrate to the receptor in a concentration that could cause mortality of non-aquatic wildlife. This scenario is dependent on quantity spilled, rate of release, and all the variables of weather.	May have minor on-property impact to wetland or woodlot adjacent east of PMR, if release originates at PMR. The topographical relief would prevent migration of a plume to the Fowler's Toad habitat, along the shoreline

4.1 Assessment of Possible Event

The 2016 Emergency Response Guidebook (ERG2016) issued by Transport Canada provides several emergency response guides for numerous hazardous material classes. The guides provide initial isolation distances that are protective of public health and safety in the event of a release. In addition, the guides provide downwind protection distances to consider. Wind speed and ambient air temperature should also be considered when assessing the severity of a release of any toxic substance.

The Port Colborne Refinery has established a system to reference the potential impact of a release of chlorine, sulphur dioxide or hydrochloric acid gas. The system consists of three levels, each associated with a prescribed degree of response. These levels are known plant wide, are included in the contractor orientation program and are advertised in the surrounding community. The Level II gas emergency situation is field-practised as a minimum, on a once-per year basis with certain parameters measured against the expected/trained response. In the event of a false alarm, the response to the alarm is still measured for efficiency and effectiveness, as all emergency response steps must be taken until the response crew confirms that there was a false alarm.

The gas emergency Levels, as quoted in the controlled document SPI 1 (PCR Toxic Gas Emergency Response Plan) are as follows:

- Level I - An emission of toxic gas confined to a single department area, not likely to affect other areas of the plant, or the public, and which can be controlled and/or contained using the department's facilities and personnel.

- Level II - An emission of toxic gas confined to the plant, not likely to affect the public but could pose a hazard to personnel within the plant, and which can be controlled and/or contained using personnel and equipment from the plant.

- Level III - Any significant, uncontrolled emission of toxic gas that would pose a significant hazard to personnel within the plant, the public, and/or the environment.

To assist in the emergency response to a gas leak, PCR utilizes a contaminant dispersion modelling program named SAFR Real-Time. This software combines meteorological data and release parameters to create a plume dispersion model. The meteorological data is retrieved from an on-site weather station which PCR maintains. The release parameters are either input by the plant protection officer according to information parlayed by the emergency response crew, or data is input from online sensors for that particular gas. The modelled results can then be used by the plant manager or his designate, when determining if a Level III emergency notification is warranted.

4.2 Chlorine

4.2.1 Worst Case Scenario and Resulting Harm

The largest means of containment of chlorine at Port Colborne Refinery are 1 tonne cylinders. The Precious Metals Refinery utilizes chlorine gas as a reagent. There can be up to ten (10) 1 tonne cylinders in storage, all within buildings. Once the liquid chlorine is vaporized, within the cylinder holding room, it is transferred through the Precious Metals Refinery, all indoors. The cylinders in storage are located at a room separated from the Precious Metals Refinery building.

Tranport Canada's 2016 Emergency Response Guidebook (ERG2016) identifies isolation distances that are protective of public health and safety in the event of large spills of chlorine (Guide 124) on Table 3. The table below is a summary of ERG2016 chlorine isolations, measured in kilometers, for containers utilized at Port Colborne Refinery.

Transport Container	Initial Isolation	Protection during Day / Night		
		Low Wind (<10 km/h)	Moderate Wind (10-20 km/h)	High wind (>20 km/h)
Multiple tonne cylinders	3.0	2.1 / 4.0	1.3 / 2.4	1.0 / 1.3
Single tonne cylinder	1.5	1.5 / 2.9	0.8 / 1.3	0.5 / 0.6

Figure 3 illustrates the worst case scenario of a single 1-tonne cylinder and multiple tonne cylinders. A release of the contents of multiple cylinders would potentially impact the whole of the City of Port Colborne. As discussed further in Section 7, a measurement of a chlorine concentration of 3ppm or greater will instigate a Level II emergency with the potential to upgrade to Level III emergency if there is risk the community can also be effected.

The potential health hazards in case of a complete release of chlorine from any combination of 1-tonne cylinders, creating a plume that migrates off-site, includes the following:

- Toxic; may be fatal if inhaled
- Fire may produce irritating and/or toxic gases
- Vapors from liquified gas are initially heavier than air and spread along the ground.

- Does not burn but will support combustion
- Strong oxidizer, will react vigorously or explosively with many materials including fuels

Any off-site release of chlorine could have a large impact on the community and environment due to the inhalation hazard and the toxic properties of concentrated gas. At reduced concentrations the odour threshold is such that irritation could cause discourse and panic in the community, prompting complaints to Vale PCR as well as first repsonders in the community.

Figure 3: Potential Impact Zones for Worst Case release in a Chlorine Emergency

Legend

- Fire Station
- Regional Administration
- Municipal Administration
- Provincial Offences Court
- Police Station
- Provincial
- Regional
- Niagara EMS Facilities
  - EMS Administration
  - Ambulance Base
- Urgent Care Center
- 3 km radius – multiple
- 1.5 km radius - single

2.0 0 1.02 2.0 Kilometers

N

Notes

Niagara Region

4.2.2 Alternate Scenario and Resulting Harm

The potential of the worst-case scenario (complete release of multiple cylinders at Port Colborne Refienry) is extremely low from an operational experience, technical advice, and the preventive measures already in-place (discussed in Sec 7) at PCR. A reasonably anticipated scenario is one where only the on-line cylinder could vent, thereby less harm resulting. Such a scenario will still require several prevenetive measures to fail, which has not been evident in the 40 year operational history of chlorine use at PCR. However, an alternate scenario of resulting harm has been prepared. Utilizing Transport Canada's ERG2016 Table 3 information equivalent to a single tonne cylinder relates to an alternate scenario with a more reasonable potential. As referenced above and illustrated on Figure 3, the isolation radius for a release of a single cylinder has a radius of 1.5 km during the day and 2.9 km at night. The area of impact would extend to the residential area of the City of Port Colborne and some of the sensitive receptors listed in **Figure 1**.

The single cylinder release scenario will be included in the planning and communication related to the this E2 Plan.

4.3 Sulphur Dioxide

4.3.1 Worst Case Scenario and Resulting Harm

The largest means of containment of sulphur dioxide at Port Colborne Refinery are Rail tank cars. These tank cars supply sulphur dioxide as a reagent to the Cobalt Refinery. Each full tank car has a capacity of 92 tonnes sulphur dioxide. There is potential to have two full cars and one partially loaded tank car onsite. The sulphur dioxide tank car docking station is an open-frame structure. Once the liquid sulphur dioxide is vaporized, at a structure near the docking station, it is transferred to Cobalt operations via an elevated trestle, also open to the environment.

Tranport Canada's 2016 Emergency Response Guidebook (ERG2016) identifies isolation distances that are protective of public health and safety in the event of large spills of Sulphur dioxide (Guide 125) on Table 3. The table below is a summary of ERG2016 sulphur dioxide isolations, measured in kilometers, for containers utilized at Port Colborne Refinery.

Transport Container	Initial Isolation	Protection during Day / Night		
		Low Wind (<10 km/h)	Moderate Wind (10-20 km/h)	High wind (>20 km/h)
Rail tank car	1.0	11 / 11	11 / 11	7.0 / 9.8

Figure 4 illustrates the worst case scenario of a release of sulphur dioxide from a rail tank as well as a more likely scenario. A release of the full contents of the rail tank car would potentially impact the whole of the City of Port Colborne and the southern portion of the City of Welland. As discussed further in Section 7, a measurement of a sulphur dioxide concentration of 3ppm or greater will instigate a Level II emergency with the potential to upgrade to Level III emergency if there is risk the community can also be effected.

The potential health hazards in case of a complete release of Sulphur dioxide from the rail tank car which creates a plume that migrates off-site, includes the following:

- Toxic; may be fatal if inhaled
- Fire will produce irritating, corrosive and/or toxic gases
- Vapors are extremely irritating and corrosive..
- Does not burn but will support combustion

Any off-site release of sulphur dioxide could have a large impact on the community and environment due to the inhalation hazard and the toxic properties of concentrated gas. At reduced concentrations the odour threshold is such that irritation could cause discourse and panic in the community, prompting complaints to Vale PCR as well as first responders in the community.

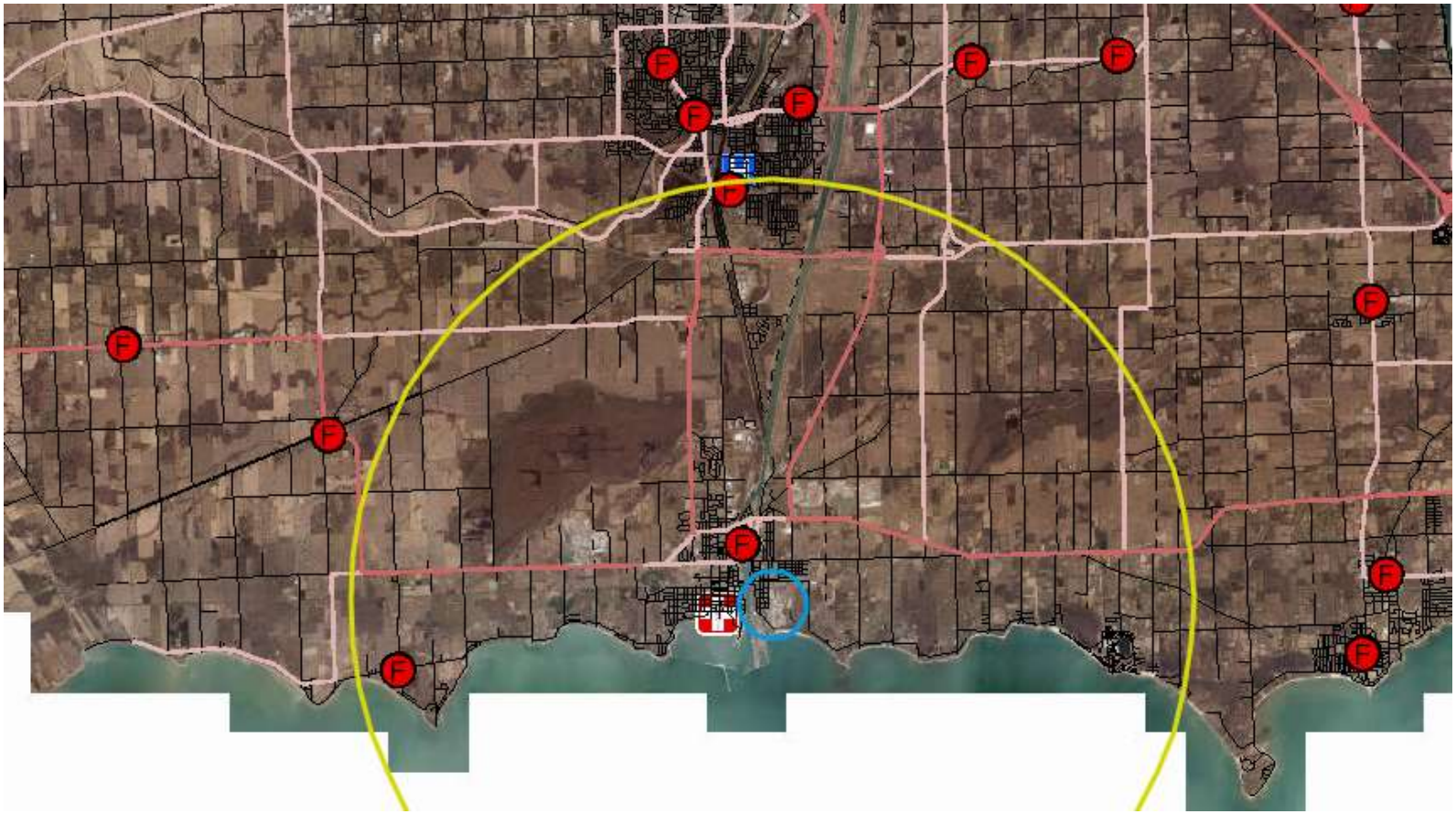
4.3.2 Alternate Scenario and Resulting Harm

The potential of the worst-case scenario (complete release of the rail tank car at Port Colborne Refienry) is extremely low from an operational experience, technical advice, and the preventive measures already in-place (discussed in Sec 7) at PCR. A reasonably anticipated scenario is one where there is not a complete loss of a rail tank car contents, but rather a much less significant release, thereby less harm resulting. Such a scenario will still require several prevenetive measures to fail, which has not been evident in the 40 year operational history of Sulphur dioxide use at PCR. However, an alternate scenario of resulting harm has been prepared. As referenced above in Sec 4.3.1 the zone of the initiatial clearance area is 1.0 km. This area seems appropriately reasonable to illustrate the more likely scenario of a release of Sulphur dioxide at PCR. As illustrated on Figure 5, the isolation radius for a release of Sulphur dioxide has a radius of 1.0 km. The area of impact would extend to the residential area of the City of Port Colborne and some of the sensitive receptors listed in **Figure 1**.

The potential health and physical hazards in the situation of a lesser volume of Sulphur dioxide gas released have the same risks as the larger volume listed above.

The more likely alternate scenario will be included in the planning and communication related to the this E2 Plan.

Figure 4: Potential Impact Zones for Worst Case release of in a Sulphur Dioxide Emergency



Legend

- Fire Station
- Provincial
- Regional
- Municipal Roads
- Hospital
- Urgent Care Center
- 11 km radius – rail tank car
- 1.0 km radius - initial

N

8.1 0 4.06 8.1 Kilometers

4.4 Hydrochloric Acid

4.4.1 Worst Case Scenario and Resulting Harm

The largest single means of containment of hydrochloric acid is a 15,000 litre tank. There are twin tanks of equal size (15,000 l) located outdoors at the Precious Metals Refinery area. The worst-case scenario would result in a complete failure of both tanks, causing a release of 30,000 litres of hydrochloric acid with a concentration of 20 baume. The twin tanks are located within a dyke with a capacity of 35,000 litres and so all of the relased liquid contents would be contained. If the acid were to fume, an inhalation hazard could be generated. A release of liquid would be considered a Level I emergency as it would be contained to the site as shown in Figure 1, however if the released liquid were to generate fume an inhalation hazard could result, over a much larger area, reaching off-site.

Tranport Canada's 2016 Emergency Response Guidebook (ERG2016) identifies isolation distances that are protective of public health and safety in the event of large spills of Hydrogen Chloride from a highway tank truck (Guide 125) on Table 3. The table below is a summary of ERG2016 hydrogen chloride isolations, measured in kilometers, for containers which are most similar to the tankage utilized at the Precious Metals Refinery at Port Colborne Refinery.

Transport Container	Initial Isolation	Protection during Day / Night		
		Low Wind (<10 km/h)	Moderate Wind (10-20 km/h)	High wind (>20 km/h)
Truck tank	0.2	1.5 / 3.9	0.8/ 1.5	0.6 / 0.8

Figure 5 illustrates the worst case scenario of a release of hydrogen chloride from a tank. A release of the full contents of the twin tanks would not have a significantly greater potential impact as the tanks are within a dyke so the available surface area for vaporization is reduced similar to a tank truck. If a complete loss of a tank were to occur, the whole of the City of Port Colborne could be impacted in worst case atmospheric conditions. As discussed further in Section 7, failure of one or both tanks with liquid hydrochloric acid contained within secondary containment and volatizing would have the potential to instigate a Level II emergency with the potential to upgrade to Level III emergency if there is risk the community can also be effected.

The potential health hazards in case of a complete release of hydrogen chloride from the storage tanks which creates a plume that migrates off-site, includes the following:

- Toxic; may be fatal if inhaled
- Fire will produce irritating, corrosive and/or toxic gases
- Vapors are extremely irritating and corrosive..
- Does not burn but will support combustion

Any off-site release of volatilized hydrochloric acid could have an impact on the community and environment due to the inhalation hazard and the toxic properties of the vapour. At reduced concentrations the odour threshold is such that irritation could cause discourse and panic in the community, prompting complaints to Vale PCR as well as first repsonders in the community.

4.4.2 Alternate Scenario and Resulting Harm

A partial release of hydrochloric acid from piping associated with the storage tanks is more likely to occur, than a complete release of the largest single container at Precious Metals Refinery. This is more likely to be considered a Level I, or II emergency potentially only impacting onsite personnel. The meteorological conditions as well as the volume of acid released would need to be factored in. Figure 5 does not demonstrate the impact distances for a level I or II event as such an event would not impact the areas outside of the property boundaries.

There is no modeled SAFER case for a release of hydrochloric acid.

The more likely alternate scenario will be included in the planning and communication.

Figure 5: Potential Impact Zone for Worst Case release in a Hydrochloric Acid Emergency

Legend

- Fire Station
- Provincial
- Regional
- Municipal Roads
- Urgent Care Centre
- 3.9 km radius - tank

N

4.0 Kilometers 0 2.0 4.0

Niagara Region

5 ENVIRONMENTAL EMERGENCY ACTIONS

The following section includes potential causes of environmental emergencies at Port Colborne Refinery involving the release of the three regulated substances at the facility, the preventative measures in place, how the facilities are prepared to deal with such emergency as well as the recovery methods that will take be used in such event.

5.1 Potential Causes of Chlorine Environmental Emergencies

The identified environmental emergency involving the release of multiple tonne cylinders at Vale's Port Colborne Refinery could occur from: valve failure, mobile equipment contacting and rupturing tank, improper maintenance or training, use of improper materials of construction of piping transferring chlorine within the PMR, and failure of a cylinder yolk when in the holding area. Any of these causes are more likely to result in a small release. A large (complete) release of multiple cylinders is only plausible if the storage building holding the full cylinders were destroyed .

5.2 Potential Causes of Sulphur Dioxide Environmental Emergencies

A release from a rail tank car of Sulphur Dioxide at Port Colborne Refinery could occur from: valve failure, large mobile equipment contacting and pushing the tank from the carriage, improper maintenance or training, use of improper materials of construction of piping transferring Sulphur dioxide via the trestle, or within the CHP operational area. Any of these causes would result in a small release, which could in turn result in a large (complete) release of container contents if not addressed.

5.3 Potential Causes of Hydrochloric Acid Environmental Emergencies

Each identified environmental emergency involving Hydrochloric Acid containment systems at Vale's Port Colborne Refinery would stem from various circumstances. A release from one or both of the storage tanks could occur from: over pressurization of the tank during filling, valve failure, failure of the structural integrity of a tank, improper maintenance or training, use of improper materials of construction of piping transferring hydrochloric acid within the PMR operational area. Any of these causes would result in a small release, which could in turn result in a large (complete) release of container contents if not addressed.

6 PREVENTION

To prevent the release of any hazardous substance to the environment, there are several written documents that outline standard operations and the preventative controls in place to reduce the risk of a release and potential harm to people and the environment.

The Port Colborne Refinery has an extensive system of preventive maintenance tasks and responsibilities. The Preventive Maintenance Coordinator tracks, distributes and verifies the completion of the scheduled tasks. A record of each inspection is kept on file and any suggested remedial activity is relayed to the operating authority. The table below references a variety of preventive maintenance tasks performed or organized by each operating area, specifically for tasks regarding spill response and spill prevention. There is also preventive maintenance of personal safety devices for the emergency responders. To determine the full spectrum of tasks related to spill response equipment, the actual job card would need to be reviewed. While some preventive maintenance job cards are associated specifically with spill response equipment (i.e. 7UP191, Cobalt SCBA Testing) the general manner in which some preventive maintenance tasks are written has proper maintenance activities grouped with spill response equipment and materials, or spill prevention (7UP228, PMR Chlorine analyzers). The majority of these tasks are performed by trained PCR employees; however some tasks require contractor participation. The department identified in the list below may be the facilitator and not necessarily the actuator. The listing below was provided by the Preventive Maintenance Coordinator.

	PMR Chlorine Preventive Maintenance List				
Std Job No	**Element No.**	**Standard Job Description**	**Freq of inspection**	**Equip No.**	**Department**
7UP228	705701	PMR CL2 area monitors	4 wk	31496	instrumentation
7UP402	705701	PMR CL2/SO2/HYD/O2 analyzers	12 wk	31436	instrumentation
7UP434		PMR Cl2 area monitors	1 wk	31436	instrumentation
7PP053	702181	PMR area 40 Cl2 leaching pumps	16 w	34237	mechanical
7PP128	702181	Chlorine house fans	26 w	36160	mechanical
7PP132	702181	Chlorine hose change out	52 w	31448	mechanical
7UP587	705701	Chlorine Regulator, Repalce	52 w		

	COBALT SO2 Preventive Maintenance List				
Std Job No	**Element No.**	**Standard Job Description**	**Freq of inspection**	**Equip No.**	**Department**
7CP172	701681	SO2 piping Ultrasonic Inspection	52 w	30926	mechanical
7CP378	701681	SO2 hand valve/PSVh	53 w	30925	mechanical
7CP416	701681	Sulfur Dioxide tank	156 w	30923	mechanical
7UP306	701681	Hyd SO2 heat tracing	52 w	30924	electrical
7UP213		EIT CL2 & SO2 sensor check	4 wk	30925	instrumentation
7UP266	705701	EIT SO2 sensors	12 wk	30925	instrumentation
7UP273	705701	SO2 auto valve/metering	52 wk	30925	instrumentation
7UP401	705701	Cobalt CL2/SO2/HYD analyzers	12 wk	32238	instrumentation
7UP423	705701	Cl2/SO2 Simplex Evac. System	52 wk	30913	instrumentation

	Emergency / Spill Response Preventive Maintenance

Std Job No	Element No.	Standard Job Description	Freq of inspection	Equip No.	Department
7CP420	701681	Tank berm integrity check	52 wk	31094	mechanical
7PP131	701681	PMR Gas Emergency equipment	4 w	31437	mechanical
7UP092	705803	Gas Emergency Sign, Inspect	4 w		
7UP182	705701	PCR CL2 perimeter sensors	4 wk	36382	instrumentation
7UP185	701681	Cascade System	4 w	31876	mechanical
7UP186	701681	Cobalt Ref cascade system	4 w	33216	mechanical
7UP191	701681	Cobalt SCBA Testing	4 w	33216	mechanical
7UP194		MSA 401 SCBA	4 w	31876	mechanical
7UP201		PMR survive air hydro tests	52 wk	31437	mechanical
7UP325	701681	PCR MSA hip apparatus	4 w	33216	mechanical
7UP470		PMR Survive air flow check	52 wk	31437	mechanical

7 PREPAREDNESS

An emergency resulting from the release of any of the substances included in this Plan may cause substantial harm to people and/or the environment. As such, Vale PCR has deployeed a variety of initiatives which would limit the release of chlorine, sulphur dioxide or hydrochloric acid from reaching the degree of release that could pose risk to the community.

Steps already taken to prevent or reduce the risk of a spill from occuring include but are not limited to:

With respect to any release of chlorine gas that could migrate off-site and cause an adverse effect. *Maximum potential volume released from a cylinder (up to 1 tonne):*

- There are three probes monitoring ambient chlorine concentrations in the range 1-5 ppm along the western perimeter of Port Colborne Refinery. There are also gas analyzers and alarm-activating push buttons located within Cobalt Refinery buildings. If a probe within either Cobalt Refinery building measures a concentration of 1 ppm chlorine, a Level I alarm is activated and valves within that particular building will close. The gas emergency response procedures specific to Cobalt operations are described in the controlled document SPI-17 (Cobalt Operations Chlorine Gas Emergency Response Plan) and other documents maintained by the Cobalt unit trainer.

- A number of probes monitor ambient chlorine concentrations within areas of chlorine cylinder storage, on-line cylinders, and in locations that chlorine is utilized within the PMR. The probes will alarm at 1.0 ppm. Activation of an alarm initiates emergency response by trained PMR personnel. The gas emergency response procedures specific to Precious Metals Refinery operations are described in the controlled document SPI-44 (PMR Toxic Gas Emergency Response Plan) and other documents maintained by the PMR unit trainer.

- The on-line chlorine cylinders and the cylinders in storage are all kept in enclosed rooms. In the event of a minor leak, the closed doors will minimise the rate at which chlorine gas would disperse into the ambient environment while the leak is being repaired.

- Port Colborne Refinery Plant protection Officers are all trained regarding gas emergency procedures. Their written procedures are maintained in the PMR security office. The response in accordance to each gas emergency level as described in SPI 1 is documented. As outlined in SPI 1, the Plant Protection Officer will be the liaison between PCR emergency responders, PCR Plant Manager, and Port Colborne Emergency Services. Their duties also include securing the site to prevent non-emergency responders from entering PCR, during an emergency situation and operating the SAFER Real-Time dispersion modeling software, described later in this section.

- All chlorine handling equipment, analyzing devices and spill response equipment is on a strict preventive maintenance schedule. A listing of the preventive maintenance tasks is referenced in Port Colborne Refineries Spill Prevention and Contingency Plan document in Section 4.8.

With respect to any release of sulphur dioxide gas that could migrate off-site and cause an adverse effect. *Maximum potential volume released from tank car (up to 92 tonnes):*

- A probe monitors ambient sulphur dioxide concentrations at the rail docking station. There are also six probes and five alarm activating push buttons located within Cobalt Refinery buildings. Upon measuring a concentration of 3 ppm, a Level I alarm is activated and valves within the Cobalt Refinery

will close. If the inter-building valves do not close within 10 seconds, the main valve on the storage tank will close. Upon measuring a concentration of 5 ppm, the alarm will initiate closure of all valves in the sulphur dioxide system. Activation of any alarm initiates emergency response from the Cobalt department. The gas emergency response procedures specific to Cobalt operations is described in the controlled document SPI-18 (Cobalt Refinery Operations SO2 Gas Emergency Response Plan).

- The rail cars are protected from a vehicular impact by traffic bollards on the southeastern approach. A vehicle cannot approach from the north, west or south sides as the asphalt is not continuous.

- The risk of a tank car or the trestle being damaged as a result of an impact from a vehicle has been minimized. The steel frame trestle elevation is 12 meters above ground. It is supported at ground level by robust concrete piers that are 1.5 meters tall. The tank car is protected from vehicle impact by bollards and the rise of the rail track. The asphalt approach from the north has bollards and the approach from the south or east has open rail track which would stop a rolling vehicle.
-

- Port Colborne Refinery Plant protection Officers are all trained regarding gas emergency procedures. Their written procedures are maintained in the PMR security office. The response in accordance to each gas emergency level as documented in SPI 1. As outlined in SPI 1, the Plant Protection Officer will be the liaison between PCR emergency responders, PCR Plant Manager, and Port Colborne Emergency Services. Their duties also include securing the site to prevent non-emergency responders from entering PCR, during an emergency situation and operating the SAFER Real-Time dispersion modeling software, described later in this section.

- All sulphur dioxide handling equipment, analyzing devices and spill response equipment is on a strict preventive maintenance schedule. A listing of the preventive maintenance tasks is referenced in Port Colborne Refineries Spill Prevention and Contingency Plan document in Section 4.8.

8 RESPONSE

The response that is required in the event of an emergency is outlined in detail in the Port Colborne Refinery Emergency Preparation Manual, the Spill Prevention and Contingency Plans, the EMRG2016 Guide 115 and Guide 170. In addition to the emergency response procedures listed below, the site also maintains several standard job procedures that can be referenced in the event of a site emergency.

Vale's Levels of Emergency
Level I Emergency – confined to a building or operational area, with no effect to other parts of the facility, plant or public. The public is not notified for a Level I Emergency.
Level II Emergency – confined to a plant complex but has no effect to the public. The public is not notified for a Level II Emergency.
Level III Emergency – any situation which could pose a significant hazard to the public. Air horns are activated and the public is notified for a Level III Emergency.

In most cases, PCR will have the necessary resources and equipment to properly address the spill response. In other cases, depending on the pollutant, volume of a release, and/or location of the release, other resources may be required. For each scenario, the plan provides the appropriate level of action necessary, a list of possible spill response equipment which may be needed (where it is located and its purpose) and the suitable contractors, when needed (which must have valid PCR site specific training and WHMIS).

The Standard Operating Procedures at PCR detail the actions for spill response and the additional on-site and off-site resources and equipment which can be used to respond to the various levels of spills at the PCR. If the spill is of a gas, or a liquid that vaporizes such as chlorine and sulphur dioxide, emergency response equipment can only be used to stop the release. Once in a gaseous state in the natural environment, aerial dispersion will occur.

The Precious Metals Refinery has employees trained for spill response to chlorine, while Cobalt Refinery personnel are trained for sulphur dioxide spill response. Responding to a spill of a gas not only requires tools and equipment to stop the leak, but also equipment to support the safety and protection of the responders.

A list of these support supplies for Cobalt personnel responding to a leak of sulphur dioxide was excerpted from SPI-17 and is included below:

- **COMMUNICATIONS**

The department will make full use of portable radios in emergency situations.
The operator working in the cobalt precipitation area will ensure that the area's radio is taken with him so it is available for use in relaying leak information to the shift foreman.
The foreman will communicate information to plant protection officer and the officer will communicate information to the PCR via the plant public address system, or portable radios.
If no supervision available, the operator's will make full use of portable radios in emergency situations, ensuring that a radio is accessible any time for use in relaying leak information to the plant protection officer.

- **LEAK REPAIR CREW TRANSPORTATION**

A fully charged electric golf cart is available in the Gas Emergency Equipment Room at all times to ensure that the leak repair crew has a quick, easy means of getting to the leak location, cascade systems, etc.
A Sulphur Dioxide monitor is also mounted on the Emergency Golf Cart to check the concentration in the atmosphere.

- **GAS EMERGENCY EQUIPMENT LOCATION**

a) M.S.A. Self-Contained Breathing Air Packs

SCBA packs are located at:
- Hydrate area North Entrance (2 packs)
- E.C.R. building entrance (2 packs)
- Gas emergency equipment room (7 packs)
- Foremen's office west wall (outside)(3 packs)
- Cobalt Precipitation Control Room (1 packs)

b) Compressed Breathing Air Cascade Bottle Systems

Breathing air cascade systems are located at:
- SO_2 safety shower building
- ECR gas emergency equipment room
- Inside small door on east side of Main Changehouse

c) Leak Repair Kits

Leak repair kit for repairing leaks on SO_2 tank cars is located in the equipment locker on the SO_2 tank car platform.

d) Responder Suits

The Gas Emergency Response Suits are located in the Gas Emergency Equipment Room.

A list of the support supplies for PMR personnel responding to a leak of chlorine was excerpted from SPI-44 and is included below:

- **GAS EMERGENCY EQUIPMENT LOCATION**

a) M.S.A. Self Contained Breathing Air Packs

The packs are located at:
- 1st Floor Reduced Crew Safe Room (3 packs)
- 1st Floor SW Stairwell (1 pack) – Helper's pack
- 3rd Floor Control Room (5 packs)

b) Compressed Breathing Air Cascade Bottle Systems

The cascade system is located in the 1st Floor Reduced Crew Safe Room.

- **CHLORINE CYLINDER REPAIR KITS**

The repair kits are located in the chlorine house and the chlorine storage building.

- **TRAINING AND RESPONDER SUITS**

The responder suits are located in the 1st Floor Reduced Crew Safe Room.
Training suits are located in Safety Supply room.

The supplies required in response to other scenarios are often written into the Standard Operating Procedures listed in Appendix D. An illustration of this can be found in ETP-13 Sulphuric Acid Unloading. Written into this procedure, but not specifically identified as a contingency response is instruction to cover a sewer grate with a rubber mat, and to have a hose running water so that any spilled acid can be flushed to the wastewater collection system.

As per the EMRG2016 Guide 115 a spill of gaseous chlorine or sulphur dioxide should include the following actions;

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spill material.
- Stop leak if you can do it without risk
- If possible, turn leaking containers so that gas escapes rather than liquid.

- Use water spray to reduce vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapours through sewers, ventilation systems and confined areas.
- Isolate area until gas has dispersed.

CAUTION: When in contact with refrigerated/cryogenic liquids, many material become brittle and are likely to break without warning.

9 RECOVERY FOR ANY LEVEL OF EMERGENCY

The recovery process for any level of emergency at Port Colborne Refinery is detailed in the Port Colborne Refinery Emergency Response Manual in section 5.11.1. To reach the logical conclusion of any emergency operations Port Colborne Refinery will ensure that the following issues are addressed.

• Damage assessment
• Clean up
• Post-Emergency Response review
• Repair of damaged equipment
• VALE internal investigations
• Government investigations & notifications
• Critical Incident Stress Management
• Business Continuity

10 ROLES AND RESPONSIBILITIES

The following sections outline the general responsibilities of those identified in the emergency organization.

Manager- The Port Colborne Refinery Manager is accountable for PCR during an emergency. The PCR On-Call assumes this accountability outside of regular office hours or in the Manager's absence. The responsibility to manage an emergency has been delegated to the On-scene Emergency Coordinator.

On-scene Emergency Coordinator- The On-Scene Emergency Coordinator is the on-site person designated to manage an emergency event. The role is held by the Area Supervisor; they are backed up by alternate Supervisors on site during the event.

<u>On-scene Coordinator Responsibilities</u>

- Confirm the declared emergency and level classification
- Assumes responsibility over the emergency
- Coordinates on-site emergency response activities
- Directs Emergency Response and/or First Response operations as required
- Summons external assistance and conveys notifications as required
- Liaise with on-site outside emergency agency activities

- Determines changes to the level of emergency as the situation evolves (reductions and escalations). Communicates changes via the Communication Centre.
- Declares the ALL CLEAR for Level I and II Emergencies
- Ensure the workplace is secure for the re-entry

Plant Responders

The Plant Responders are comprised of:

- Operations personnel trained on responding to gas emergencies

Plant Responder Responsibilities:

- Respond to spill scenarios to add
- Provide direction for location of emergency and meeting of emergency responders to #1 First Aid.
- Receive emergency responders at the stipulated location.
- Serve as a knowledgeable guide for external emergency services (fire, police, EMS). Safely guide them to the emergency site and provide information on area potential hazards.
- Ensure that all personnel are accounted for in a Surface Safe Assembly or Evacuation Area.
- Coordinate isolations as required.
- Remain in contact with the On-Scene Coordinator.
- Assist the On-Scene Coordinator in declaring the ALL CLEAR.
- Maintain Associated qualifications in SCBA use.

Protection Services Personnel

In an emergency, Plant Protection Officers (PPOs) provide First Aid and security support for the plant during an emergency (Level I, II, III).

Plant Protection Officers Responsibilities:

- Secure site.
- Prepare to provide first aid, as may be required.
- Coordinate efforts with First Responders.

PMR Office (Alert Call Centre & Communication Centre)

The PSP in the 24hr PMR office runs the Alert Call & Communication Centres.

Alert Call Centre Responsibilities:

- Receives calls advising of an emergency.
- Activates Vale Emergency Notification system advising PCR Operations of emergency.
- Notifies outside emergency services as required.
- Notifies Safety, Environment & Executive On-Call
- Runs SAFER when applicable and provides vital information to emergency responders.
- When necessary, provides on-going communications with outside emergency services.
- On directions from Executive On-Call or the On-Scene Coordinator, advises of the “ALL CLEAR”.
- Keeps written records of all events.

Communication Centre Responsibilities:

- Receives calls advising of an emergency.
- Activates Vale Emergency Notification system and EverbridgeTone Alerts.
- Activates PCR Air Horn
- Activates First Responders and On-Scene Coordinator (via Radio “All Call”).
- Upgrades or downgrades the Level as per direction from the On-scene Coordinator.
- Keeps written record of all events.

Assembly Area Coordinator
Assembly Area Coordinators take charge of the Assembly Area. It is expected that the first person arriving at the Assembly Area assume responsibility. Instructions are in Emergency Boxes in each Gas Emergency Safe Room.

Gas Emergency Safe Room Coordinator Responsibilities:

- Assume control of the Assembly Area.
- Accounting of personnel by completeing attendance sheets.
- Ensures that all visitors sign in books have been retrieved and personnel are being accounted for.
- Delegates personnel to take the required action to secure the Assembly Area (i.e seal room, shutdown H&V’s, or use air sampler).
- Receives emergency information during the event (via radio or Emergency Phone). Conveys all information received to personnel assembled.
- Communicates the “ALL CLEAR” when the event is over.
- Completes and returns documentation to the Emergency Management Coordinator for post emergency/drill evaluation: - Personnel accounting lists

PSP Emergency Coordinator
Plant Security Personnel cross-reference the information obtained from Assembly Area Coordinators to determine who may be missing.

- Obtains the names of those who are suspected “missing” and those who are “extra” to the expected occupants (contractors, visitors) of all Assembly Areas:
    - Phones each Assembly Area records the names of missing and extra personnel.
    - Once all areas are contacted, the names are consolidated by reviewing each area to determine if the missing personnel are appearing extra at other locations.
    - If required, each area is contacted again to see if there are any changes to their lists.
    - The status of the accounting process is relayed to the On-Scene Coordinator

11 TRAINING

All PCR personnel receive emergency and fire safety training annually (code SA216) so they can recognize the difference between invac and outvac emergencies and any area specific assembly area procedures that they will be required to follow when they enter a department.

Drills and Exercises

A Gas Emergency Drill and a Fire Emergency Drill will be conducted at least once each year for staff and employees. It will test the response of employees to a gas emergency event and the process used in the assembly areas. A debriefing process will be used to identify any deficiencies in response and of the audible alarm systems. The PCR Training Coordinator will facilitate the process to address all deficiencies.

Responsibility for Coordinating Training
The Safety and Training Coordinator is responsible to:
• Establish and maintain the training criteria for key roles within emergency plans.
• Establish and maintain the training criteria for general worker emergency awareness review.

Training Program
First Responders are trained on an annual basis. Training includes:
• First Response Review SSS500
• MSA SCBA Operation SRP 4500
• MSA full face mask fit test

On-Scene Coordinators are trained on an annual basis. Training includes:
• On Scene Coordinator Response Review SSS503
• MSA SCBA Operation SRP 4500
• MSA full face mask fit test

There are annual communication exercises with the City to test/verify the Standard Operation Procedures and well as Everbridge reporting system.

12 NOTIFICATIONS AND ALERTS

12.1 Potential Environmental Emergencies

Vale utilizes several different means of communicating with the public. Examples include, but are not limited to:

- Vale Open Houses (i.e. during Emergency Preparation Week)
- Information Pamphlets
- Posters
- Post Cards to individual households
-

Information on potential environmental emergencies, as defined in the Regulations and applicable to the Port Colborne Refienry will be provided to the community using one of the above means of communication and will specifically address the hazards associated with each substance included in this Plan. In addition, it will identify all scenarios that are most likely to occur at the site and the corresponding potential effects that could be anticipated. The public will be made aware of the emergency response procedures outlined in this Plan (section 8 Response) and will be advised of how Vale will communicate an emergency should it occur. All information contained in this plan will be communicated by the Corporate and Indigenous Affairs Specialist.

12.2 Actual Environmental Emergencies

The public will be notified in the event of a Level III Emergency involving any of the three substances in this Plan. Once the site has determined that a Level III Emergency has been called, the Communication will notify the Vale Alert Call Centre.

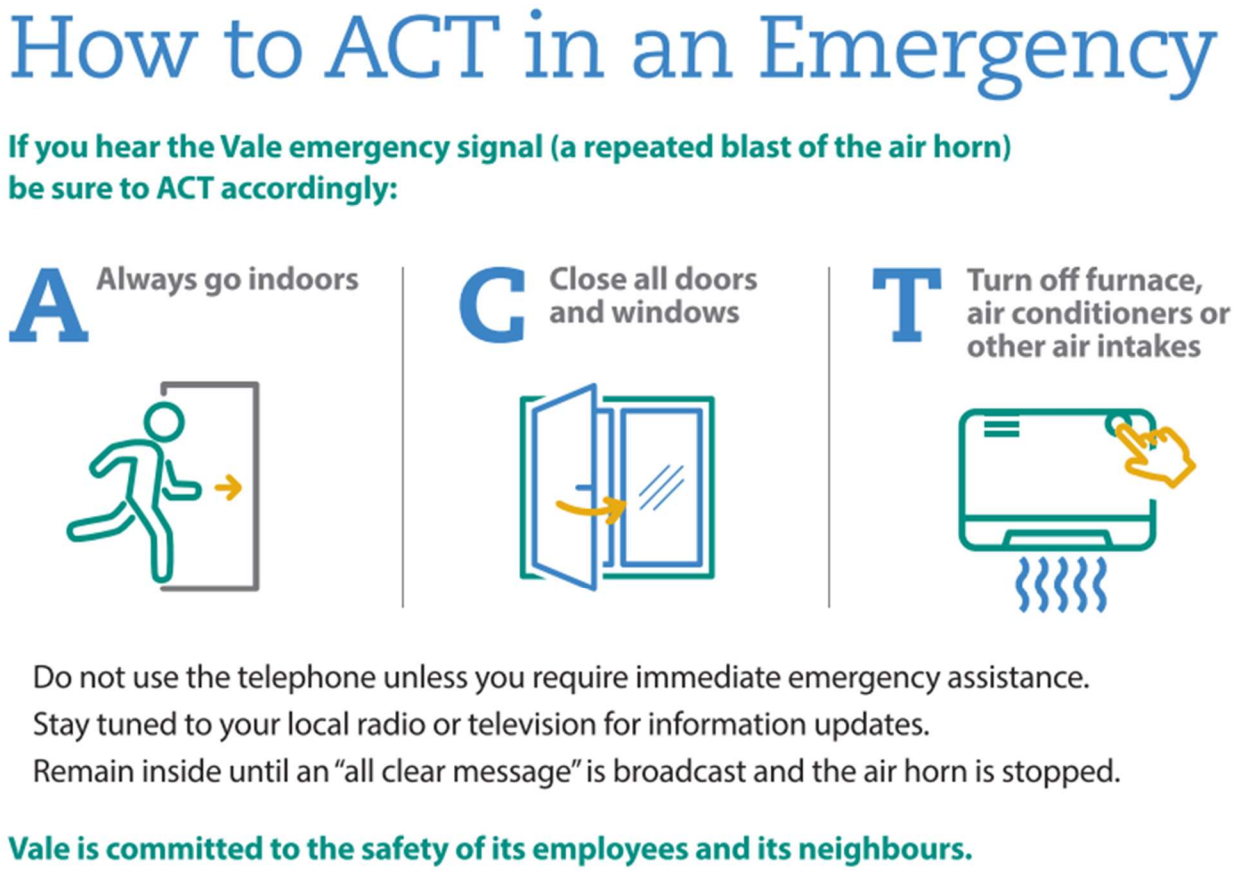
Alerts and notifications will follow from roles and responsibilities listed above and, in the case of emergencies, will follow procedures outlined in the Crisis Management System and in the OMS emergency response plans. Notifications to regulators will be made by the Environment department or a designate including both initial notifications and follow-up written reports or responses to inquiries, as required.

This E2 plan has been included to the Emergency Management intranet site, and any environmental emergency involving the scenarios presented in this Plan that reach a level III emergency will require notifications to be made.

12.3 Consultation with Local Authorities

Vale is prepared for all types of incidents and emergencies through a robust and multi-faceted emergency response program.

Figure 1: How to ACT in an emergency



13 REFERENCES

REVISION RECORD

Revision Date	Section(s) Updated	Description of Changes*
2020-xx-xx	All	Plan preparation; first draft

*If no changes come out of annual plan review, a revision record must still be entered. Include the date of revision and a note that no changes resulted from annual plan review.