PROVINCIAL MINE

UNDERGROUND

EMERGENCY PROCEEDURES

Updated April 10, 2024

SECTION 1

NORMAL MINE OPERATIONS

PROVINCIAL MINE

Information for Normal Mine Operations

The Provincial mine is a multi level gold mine with levels at 100-foot intervals. The #1 shaft services all levels to 2600 level and shaft sinking is in progress to the 6000 Level. The #2 shaft begins on 1500 level and services levels 100 feet apart and terminates at 3500-foot level. There is also a ramp beginning on 1900 level servicing all levels to 2400 level. The ramp is at a 10 - 12% grade and is being developed down to service new levels below the 2400 level.

The mine is a combination track and trackless operation with several established and developing stopes. Track is used on all levels 1500 level and above. Below 1500 level all levels are trackless.

Active levels currently being worked are mainly confined to below 1500 level.
The A, B, and C ore zones have been mined out using cut and fill methods. All these stopes in #1 shaft area have been completed.

The D zone at #1 shaft area has been developed and mining is being carried out using vertical retreat methods.

The new E zone at #2 shaft is being stoped from 2200 to 1800 levels and is still being developed from 2800 level down.

Each shaft has its own ore pass system complete with crusher and loading pockets. The main cross-over levels connecting #1 with #2 shafts are 1500 and 2300 level.

This is a two-shift operation, producing 1000 tons per day.

1. **LOCATION**

   The provincial mine is located five kilometers away from the Ontario Mine. The closest Mine Rescue Station is located 80 kilometers away.

   PLANS

   Underground emergency and ventilation plans have been updated as of June 1 by the ventilation staff.

AIR AND WATER

Air and water are supplied underground via the No. 1 Shaft to all levels off this shaft. Water supply is from a water tank on surface. Air and water cross over on the 1500 level and down to No. 2 Shaft servicing all levels off this shaft. Air and water are only supplied in the development portion of the ramp. There are 4" air and 2" water lines located on each level and they have been extended only into the active workings. Headers are located as required throughout and are located at all fire points located on the plans. A standby diesel operated pump is used in case of a power failure to provide water for firefighting.

ELECTRICITY

Electricity is supplied via the #1 shaft to the transformer rooms on 1500 L, 1600 L and 2300 L; all fed by separate power cables. The transformer room on 1503 crosscut services all electric panels in both shaft areas from the 1400 to the 2200 level including the conveyor way on 1500 L.

The transformer room on the 1600 level services only the booster fans located on this level.

Electrical panels above 1400 level are fed from surface.

The transformer room on 2300 level provides power for this level and all levels below. Electrical panels marked on the plans are fed from the nearest transformer.

Power for the hoist on 2800 level is supplied by the transformer in the hoistroom.

Dedicated transformers are provided for the #2 Shaft hoist located at the 1500 level hoistroom and for the underground crusher on 2400 level.

VENTILATION

Air is forced down the No. 1 Fresh air raise and is drawn down the No. 1 Shaft. All return air raises are equipped with fans on surface. A booster fan is located on the 1600 level to force air to the active workings between 1600 and 2300 levels. An exhaust booster fan is also located on the 1600 level. Some fans are located in various stopes but are not detailed on the plans as they are very frequently moved around. All electric fans are provided with on/off switches at fan and at the electrical panel.

In general, the ramp and stopes are upcast. Fixed CO monitors have been installed at various locations underground and at RAR’s. For details refer to the ventilation plans.

REFUGE STATIONS

Fully supplied refuge stations are located on all active working levels 1500 level and down, except for 2200 and #2 Shaft levels. All contain clay, air, water, telephone, first aid kit, stretcher, and emergency cabinet. The emergency cabinet contains various tools that may be required. Some refuge stations are equipped with an airlock; these are indicated on the plans. There are airlines within these airlocks or bottled air to allow purging. Refuge stations on inactive levels contain clay and a telephone but do not contain air or water.

FIRE PROCEDURE

As described in the attached fire procedure.

TOOLS AND SUPPLIES

They are on surface, underground shops and garages.

COMMUNICATIONS

Pager telephones are located throughout the mine and are found on decks, stations, refuge stations, hoistrooms, shops, garages, and transformer rooms. As well, a portable handheld radio communication system is used at the mine.

GROUND SUPPORT

All active workings below 1400 level are bolted throughout with timber and screen as required. Ground falls that have not been cleared away are shown on the plans and have all been guarded with ropes and signs or barricaded off.

FUEL STORAGE

Fuel bays with 2000 litre capacity storage are located on 1900 and 2300 levels. Fuel lines go down the #1 Shaft and down the main level to fuel bay. Shut off valves are located on surface and underground. Each have a manually activated foam suppression system, fire doors, 20 lb fire extinguisher, phones, and a fire point. Fuel for equipment on other levels in #1 Shaft area is brought down the shaft as required in 45-gallon drums. All equipment in the No. 2 Shaft area fuel up on 2300 level. The satellite fueling station is supplied with a 200-gallon fuel cube.

GARAGES, SERVICE BAYS, SHOPS

Garage is located on the 2300 level and is equipped with tools, welding equipment, complements of oil and grease, fire doors, phones, lifting bags, etc., service bays are located on 1900 level #1 and #2 Shaft areas.

Shops are located on various levels. All garages, service bays, and shops are located on the plans.

HOIST

Conventional hoist is on surface for No. 1 Shaft. Underground hoistroom is on the 1500 level for #2 Shaft. The stench gas is automatically activated by hoist operator. The internal hoist for shaft deepening is on the 2800 level.

BLASTING PROCEDURES

There are quantities of powder and fuse in the 4" diameter holes being loaded in various stopes in preparation for blasting. Most powder An/Fo is brought down daily and delivered directly to the stope. Approximately 30 to 40 holes are loaded or 3-4 rings before a stope is blasted. There are 8-20 holes per ring depending on the width of the stope.

Central blasting is used throughout the mine between shifts. However, mechanics in the 2300 level garage work between shifts.

After a large stope blast personnel are sent underground with SCBA's to check to see if gases have cleared.

CONVEYOR

There is a conveyor between No. 2 and No. 1 Shaft. The #2 shaft ore bin feeds to the conveyor below the level. An escapeway is provided at the tail end of the conveyor both as a second access to the workplace and as a ventilation raise. The drive end near 1510 W drift is protected by a heat sensor and fire suppression system.

HAZARDS AND OBSTRUCTIONS

As marked on the level plans.

HISTORY OF GAS

Methane/natural gas outflows associated with diamond drilling. A few occurrences of sulfur dioxide and hydrogen sulfide gas after large blasts have been documented.

ZONES OF POTENTIAL HEAT EXPOSURE

None currently.

STAFFING

Typically, 120 people are employed in the mine on a two eight-hour shift basis.

MINE RESCUE PERSONNEL

The mine has 22 active mine rescue members.

FIRST AID TRAINED

Some employees have first aid training.

FIRE FIGHTING EQUIPMENT

Hoses and nozzles are on surface.

Fire points at all active shaft stations, garages, fuel bays, and near some shops and service bays. Fire points consist of a header or hydrant, 50 feet of hose and a nozzle. All fire points shown on the plans.

Manually activated foam suppression systems are provided for fuel bays. Manually activated water sprinkler/deluge system provided for garage and tire storage area on 2300 level. All valves are outside the fire doors and marked.

FIRST AID EQUIPMENT

First aid kits in all active refuge stations, and surface. Stretchers are on surface and in refuge stations.

MINE RESCUE EQUIPMENT AVAILABLE AT MINE

Substation at Mine
- 11 BG4
- 2 sets of standard equipment
- 4 SSR 90 M
- Carevent
- KED

Headframe
- full set of lifting bags
- 50 ft. fire hose and nozzle
- dry chemical fire extinguishers
- foam generator with concentrate
- lifting jacks
- Mine Rescue Emergency Ropes Kit
- Boltcutter

SCBA, hoist operators hookup and jumbo located at;

- #1 Shaft deck
- #2 Shaft deck
- #2 Shaft hoistroom

Mine Rescue Truck Inventory

- 2 BG4
- 1 Sets of standard equipment including tablet
- 4 SSR 90 M
- 6 Spare oxygen bottles
- 1 ProPak
- 1 AFFF tube, nozzle, hose and eductor
- 1 CAREvent
- 1 Thermal Imaging Camera
- 1 Medic bag with AED and O2

SECTION 2

FIRE PROCEDURES

ONTARIO MINE RESCUE
PROVINCIAL
MINE RESCUE COMPETITION

FIRE PROCEDURE

IF A SMALL FIRE IS DISCOVERED ATTEMPT TO EXTINGUISH IT.
IF YOU ARE UNABLE TO EXTINGUISH THE FIRE REPORT IT TO SURFACE HOISTROOM #1 SHAFT.

HOIST OPERATOR WILL INJECT STENCH AND NOTIFY THE MINE MANAGEMENT EMERGENCY CONTROL GROUP. THE #1 SHAFT CAGETENDER WILL DON APPARATUS AND HOIST EMPLOYEES ON 100 AND 2400 LEVEL. WHEN INSTRUCTED BY THE CONTROL GROUP THEY WILL EVACUATE THE HEADFRAME.

PERSONNEL ARE TO REPORT TO THE DESIGNATED REFUGE STATION.

#2 SHAFT AREA

THE #2 SHAFT CAGETENDER AND HOIST OPERATOR WILL DON APPARATUS AND HOIST PEOPLE TO THEIR DESIGNATED LEVEL. PEOPLE ON 2200 LEVEL ARE TO WALK OUT IMMEDIATELY TO THE SHAFT STATION, THEY WILL BE HOISTED TO 2300 LEVEL AND REPORT TO THE REFUGE STATION. THEN THEY WILL PICK UP ALL EMPLOYEES WORKING BELOW 2400 LEVEL, HOIST THEM TO THEIR DESIGNATED LEVEL AND THEY WILL REPORT TO THE REFUGE STATION.

WHEN ALL PERSONNEL ARE ACCOUNTED FOR IN #2 SHAFT, BOTH CAGETENDER AND HOISTMAN ARE TO REPORT TO 1500 REFUGE STATION.

MINE RESCUE ONTARIO
PROVINCIAL
MINE RESCUE COMPETITION

MEMO: TO ALL UNDERGROUND EMPLOYEES (POSTED)

FROM: I. M. PLUMBER, MINE MANAGER

FIRE PROCEDURE - DESIGNATED REFUGE STATIONS

IN THE EVENT OF AN EMERGENCY

Where possible all employees working on these levels should report to the following Refuge Stations

No. 1 SHAFT LEVELS		DESIGNATED REFUGE STATION
100		Surface
200 - 1500		Level Refuge Station
1600	go to	1600 refuge station
1700	go to	1700 refuge station
1800	go to	1800 refuge station
1900	go to	1900 refuge station
2000	go to	2000 refuge station
2100	go to	2100 refuge station
2200	go to	2200 refuge station
2300	go to	2300 refuge station
2400 and below	go to	2400 shaft station and hoisted to surface

No. 2 SHAFT LEVELS		DESIGNATED REFUGE STATION
1600	go to	1500 refuge station
1700	go to	1800 refuge station
1800	go to	1800 refuge station
1900	go to	1900 refuge station
2000	go to	2000 refuge station
2100	go to	2100 refuge station
2200	go to	2300 refuge station
2300	go to	2300 refuge station
2400	go to	2400 refuge station
2500 and below	go to	Shaft station and hoisted to 2400 refuge station

ALL EMPLOYEES WORKING ON LEVELS WITHOUT REFUGE STATIONS MUST CARRY SELF CONTAINED SELF RESCUERS (SCSR).

NOTE: DESIGNATED ESCAPEWAY

#1 Shaft area - #2 WRAR - West Return Air Raise

#2 Shaft area use ramp to 2300 level to #2 WRAR

SELF CONTAINED SELF RESCUER

PROCEDURE

DO NOT TAMPER WITH IT.

Always keep your rescuer on your person.

If it is accidentally opened or damaged report it personally at the end of your shift to your foreman.

Your self rescuer is for one purpose:

TO ENABLE YOU TO ESCAPE FROM A SMOKE OR CONTAMINATED ATMOSPHERE.

IF YOU HAVE TO USE YOUR SELF RESCUER:

1. Get to a fresh air source or refuge station as soon as possible.

2. Do not talk while wearing the rescuer.

3. Walk at a steady pace, do not rush or run you will find it harder to breathe.

4. Do not take off your self rescuer until instructed to do so.

5. Know your evacuation route to a fresh air source or Refuge Station.

RULES FOR USE

WHEN DO I PUT ON THE SELF RESCUER?

1. When told to do so by an Official
2. Sight ..... Smoke or Air Becoming Hazy
3. Smell ..... Burning
4. Sound ..... Explosion
5. Feel ..... A Sudden Rush of Air

DO NOT WAIT TO BE TOLD

Better to wear your self rescuer in doubt.

Than to be carried out.

WHEN DO I TAKE OFF THE SELF RESCUER?

1. When it is safe
   - Fresh air source
   - Refuge Station
2. When told to do so by an Official or Rescue Team

SECTION 3

UNDERGROUND EMERGENCY AND VENTILATION PLANS

SUPERVISORS' DUTIES

All supervisors and other managers who are underground at the time, will go to the nearest refuge station and follow these instructions:

1) The senior mine supervisor will take charge.

2) Clear the refuge station of foul air by opening air valve.

3) Open airline to maintain a positive pressure and await instructions from headquarters. Open the regulator on the door as required.

4) Have all doors and cracks sealed with fire clay, at your discretion.

5) Account for all persons who are in your refuge station. Fill out the forms available in the refuge station. Make special note of all mine rescue personnel.

6) Keep the people in the refuge stations and the doors closed and sealed with the clay provided.

7) Count the persons present and inquire of missing persons; report all those present to the shifters' office by badge number when such information is required.

8) Wait on headquarters to establish phone communication.

9) Contact surface only in an emergency or to relay information pertaining to the fire.

SECURITY'S DUTIES

On being informed of an underground fire the security officer on shift will do the following:

A) Inject stench in the main fresh air fan and air compressor
B) Notify Senior Management
C) Notify Ministry of Labour
D) Notify Mine Rescue Station
E) Call out Mine Rescue Teams
F) Notify Neighbouring Mines
G) Notify Medical Facilities

CONTROL GROUP

Location: #1 Shaft supervisors' conference room.

Base Director: Mine Superintendent.

- The following are to report to the control group base:
- Mine Superintendent
- Mine Ventilation Engineer
- Safety Superintendent
- Chief Surveyor

The Base Director will assign a person to control access in and out of the base. Mine rescue and advisory personnel will be contacted at the Base Director's request.

Control Group will assign a Briefing Officer for the teams.

Duties of Control Group Personnel:

1) Ensure that all persons underground have been accounted for.

2) Ascertain the location of the fire.

3) Obtain current ventilation plans and have CO readings checked.

4) Identify the need for mutual assistance for additional teams if required

4) Prepare mine rescue plans.

5) Co-ordinate and direct mine rescue operations including the locating of missing personnel, the control/extinguishing of fires, the restoration of ventilation and evacuation of personnel.

6) Maintain a written log of all actions taken.

7) Compiles a final report

ADVISORY GROUP

Location: Office of Mine Manager at #1 Shaft

Base Director: Manager of Mining (Senior Official on Site)

The following are to report to the advisory group base:

- General Manager
- Manager of Engineering
- Manager of Maintenance Services
- Electrical Superintendent

The following personnel are to notify the Advisory Group of their location and are to place themselves on "Standby".

- Director of Materials Control
- Surface Services Superintendent
- Fire Chief

Duties of Advisory Group Personnel

Advise (if required):

1) Head Office
2) Critical Incident Stress Personnel
3) Family
4) Media
5) Union Officials
6) Other Government Agencies
7) Scheduling and Logistic Support for all Emergency Group Personnel

Maintain and forward a written log of all actions taken to Control Group

DUTIES OF LOG RECORDER

The operations log is intended to be a record of events from the start of the incident through to its termination.

The following should be recorded:

The date and time the incident was reported, by whom and the message.

All subsequent developments as they occur.

The arrival and departure of officials

Record all conferences and decisions made.

Any other items they are instructed to record.

All instructions given during the emergency.

Ensure the base director reads and initials the log.

DUTIES OF THE BRIEFING OFFICER

The briefing officer is essential to any situation that may arise. They are the liaison between the control group and the team. They are ultimately responsible for the team while they are underground. Any decisions made must be made with the team's safety in mind at all times. It is their responsibility to:

1. Maintain communications with the working rescue team and the Control Group.

2. Follow the team's progress on the mine map and mark findings on the map as the team reports them.

3. Co-ordinate and oversee the activities of all personnel who are at the fresh air base.

There are many things that must be done during any emergency. It is the responsibility of the briefing officer to obtain all information about the area affected that a team may encounter. This information, which is listed below, will assist the control group and is given to the each team through a designated briefing officer.

Mine fire procedure and up-to-date maps showing the location of the following:

- refuge stations
- communications
- garages
- fuel storage
- fire hoses
- fire hydrants
- electrical installations

Information about the mine equipment such as:

- ventilation and fans
- mining methods
- ground conditions
- timbered areas
- equipment used
- other hazards
- type of hoist
- first-aid equipment
- mine rescue equipment
- other equipment

Information about the emergency:

- type of emergency
- location of the emergency
- missing personnel
- availability of mine rescue personnel
- special skills required by mine rescue team.

These three basic responsibilities consist of several tasks, some of which may be done by the briefing officer. Some of the tasks may be delegated to other individuals, but it is the briefing officer's responsibility to see that they are carried out.

A suggested sequence of briefing a mine rescue team is as follows:

1. Information available
2. Persons missing, location and any trained persons
3. Action taken so far
4. Whether the incident is a potential heat exposure incident
5. Intention
6. Fresh air base location and standby teams
7. Communications
8. Installations such as air, water, electricity
9. Refuge stations
10. Route of travel
11. Conditions on route of travel
12. Potential rest or cooling areas
13. Ventilation
14. Visibility
15. Mine rescue equipment available
16. Fire-fighting equipment and hydrants
17. First-aid equipment and stretcher
18. Tools and supplies
19. Time limit
20. Written instructions

After the team is underground communication is vital. Information to and from the briefing officer must be specific and to the point so the control group may decide on the best course of action the team should take.

The briefing officer must inform the control group when a team passes a hazard, such as: fire area or fall of ground.

If the incident involves heat exposure, the briefing officer must monitor temperature and time exposures, as well as work/rest regimens as reported by the team captain and report this information to the Control Group.

On exploration the team must record all conditions as found with the exception of items that are normal to mining operations (Methane, doors, fans, air flow and team condition). These should only be reported if they are different than expected. Conditions need not be reported if they are the same as the initial exploration.

The conditions the team encounters must be recorded in the captains log and must coincide with the briefing officer's report that is turned into the control group after the team has completed its assignment.

PROVINCIAL MINE

POST BULK BLASTING CHECKOUT POLICY **Revised May 5, 2020**

The following policy will outline procedures to follow after a bulk blast has taken place.

PURPOSE:

To ensure that gases produced by a long hole blast, have been reduced to a safe level prior to the resumption of work.

To ensure that there has been no significant change in ground conditions in or about the workplace after the blast.

APPLICATION:

Where a blasting plan identifies a post bulk blasting checkout is required.

GENERAL:

No persons shall enter contaminated areas following a bulk blast until the team responsible for checking the ventilation and ground conditions has given approval to the Mine Superintendent or their designate.

The inspection will be carried out by a qualified Team of trained Personnel consisting of a minimum of two persons one of which is a currently qualified mine rescue man the second person may be a qualified gas checker. The team will carry:

One SCBA per person
One Ventis Pro5 equipped to detect CO, NO_2, O_2 and LEL
One Ventis Pro5 must accompany the team.
One Jumbo cylinder and extension hose per team.
One SCSR per person

All equipment will be field tested prior to going underground, by competent Mine Rescue personnel.

Gases to be tested are carbon monoxide (CO) and nitrogen dioxide (NO_2). The maximum acceptable limits (TWEAV), before personnel are allowed to work in the area, are 25 parts per million (ppm) for (CO) and 3 ppm for (NO_2).

Oxygen content will be checked by the Ventis and must be minimum 19.5%.

PROCEDURE:

Following a bulk blast, supervision will promptly assess the possible hazards produced by the blasting gasses or ground conditions and will close access to potentially hazardous areas or level(s). These areas will not be opened until normal conditions are verified.

This critical information must be promptly communicated to the cage tender, and all crews affected before anyone is taken U/G.

The team will check for gas concentrations following a designated route of travel laid out by the team in conjunction with mine supervision. Locations of sample points will be arranged prior to going underground.

Testing will be done along a predetermined route of travel subject to the location of the blast. The team may perform limited physical work ie. (repair vent duct, open air headers,) in areas that exceed the TWAEV levels CO 25 ppm, NO_2 3 ppm provided that they are not exposed for longer than 15 minutes.

If at any time concentrations above the SHORT-TERM EXPOSURE VALUES, CO 100 ppm, NO_2 5 ppm are encountered the team is to retreat immediately and notify supervision. If the area cannot be ventilated easily, mine rescue teams will be called to perform the work necessary to ventilate the area.

The team will check in at designated phones on the route of travel or communicate using leaky feeder.

The blasting box will be shorted by the inspection team at the level shaft station before a stope inspection takes place.

All regulators and vent doors will be returned to their normal positions or as prescribed in the blasting plan.

The team will report directly to the Mine Superintendent or their designate when the inspection is complete.

All hazardous conditions will be noted in the hazardous condition logbook.

All readings taken will be noted in the Gas testing logbook in the shifter's office by the person who took the readings, or by the shifter in charge of the shift. All mine rescue equipment is to be properly cleaned and stored after each use.

After all checks are complete the warning light in the shifter's area is to be turned off.