

# Explosives Management Plan

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## Mon Property

For:

New Discovery Mines Ltd.  
1909 108 W. Cordova St.,  
Vancouver, B.C.  
V6B 0G5

Effective:

April, 2021

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## Revisions

Date	Comment	Response
21-03-11	What are the predicted rate of ammonium nitrate in sump waters.	Residual ammonium nitrate in blasts will be less than 2 ppm, Pg. 12
	What is the predicted dissolution rate of ammonium nitrate	of ammonium nitrate detailed on Pg. 8
	Where will the air testing be done, and when?	The underground air testing will be done daily or as required by WSCC, MIS, or the Mine Manager. Pg. 15
	It would be helpful to repeat the SNP and ECQ requirements	Repeated on Pg. 17
	No mention of storage location/transfer/transport monitoring	Add C-size Map as Appendix.
	NDM expects that most holes will be dry. how will this be confirmed? What if this assumption is incorrect?	All blast holes were dry in the past, alternatively sleeves will be used. See Pg. 17
	It is expected to have ammonium levels increase in this water (mine sump). How will this be confirmed? What if this assumption is incorrect? What maximum concentrations are acceptable to NDM, what is the rationale to support this?	Sampling will determine ammonium levels. Discharge will meet EQC requirements, detailed on Pg. 8. The internal sump will never be discharged directly to the environment, but is discharged to a mine water sump (SNP-08).
	There should be clear links to the Water and Groundwater Management and Monitoring Plan that describes how Ammonia and Nitrates will be monitored. In one or both plans, Action levels for these parameters should be identified	More detailed links are referenced where considered. See introduction to this in 1.5 Other Management Plans

## 1.0 INTRODUCTION

New Discovery Mines Ltd (NDM) places a high priority on its performance with respect to the environment for the Mon Gold Project (Mon Mine). It has implemented comprehensive environmental protection practices alongside its Corporate Social Responsibility principles since acquiring the project and has since followed the Prospectors and Developers Association of Canada's "e3 Plus" principles and guidelines to further augment its environmental stewardship (<https://www.pdac.ca/priorities/responsible-exploration/e3-plus>). NDM applies these principles throughout its operations, particularly with respect to the environmental protection and community engagement practices for the Mon Mine.

The e3 Plus Framework for Responsible Exploration is a collection of materials developed by the Prospectors and Developers Association of Canada to promote corporate social responsibility. There are eight principals developed for responsible exploration:

1. Adopt Responsible Governance and Management
2. Apply Ethical Business Practices
3. Respect Human Rights
4. Commit to Project Due Diligence and Risk Assessment
5. Engage Host Communities and Other Affected and Interested Parties
6. Contribute to Community Development and Social Wellbeing
7. Protect the Environment
8. Safeguard the Health and Safety of Workers and the Local Population

The Mon Mine Explosives Management Plan was developed in accordance with the legislation, regulations and guidelines related to explosives management.

This version of the Explosives Management Plan focuses on the underground mining and bulk sample program. The Plan will be regularly reviewed and updated in the future as needed.

## 1.1 Company Name, Project Location, & Effective Date

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Effective Date of Waste Management Plan: On approval

## 1.2 Corporate Environmental & Safety Policy

NDM recognizes that maintenance of environmental quality is vital to the company's existence, progress, and continued development. A corporate Sustainability Policy is under development.

## 1.3 Purpose and Scope of Explosives Management Plan

The purpose of the Explosives Management Plan is to identify safe, secure, and environmentally sound practices for the transportation, handling, storage, and use of explosives at the Mon Mine site. NDM will require ammonium nitrate/fuel oil (ANFO), and emulsions at the Mon Mine to conduct blasting during the

underground mining and bulk sample program. The supply and delivery of explosives and associated products will be contracted to Dyno Nobel Canada Inc., Calgary Alberta, a licensed contractor who will apply their own, more detailed manual for the transportation, storage, and handling of explosives that will not be in any way less stringent than NDM's policies.

## 1.4 Regulatory Requirements

NDM and its contractors will adhere to the legislation, regulations and guidelines related to explosives management including:

- *Explosives Act* (Government of Canada 2015) and Regulations (Government of Canada 2018)
- *Explosives Use Act* (Government of Northwest Territories 2016) and Regulations (Government of Northwest Territories 1990)
- *Mine Health and Safety Act* and Regulations (Government of Northwest Territories 2010), specifically Part XIV
- *Transportation of Dangerous Goods Act* and Regulations (Government of Canada 2019)
- Workplace Hazardous Materials Information System 2015 (Health Canada)
- DFO Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (DFO 1998).

## 1.5 Other Management Plans

This Explosives Management Plan considers sumps which are also dealt with in the Waste Management Plan, ammonium in water which is expanded in the Groundwater and Water Management Plan, any spilled material is also covered in the Spill Contingency Plan.

## 2.0 PROJECT OVERVIEW

NDM acquired the Mon Mine from Cominco Ltd. via transactions with related parties in 1988. A high-grade quartz vein, discovered by Cominco in 1936 and developed by them and others lead to the extraction of 15,000 tonnes of vein material from surface and three underground accesses. The grade of this mineralization was not well documented and is believed to have been under-reported. Recent sampling shows that it likely grades >30 grams per tonne by reconciliation of tailings, drill hole assays, and sampling of the crown pillar.

NDM has optioned the property to Sixty North Gold Mines Ltd., but remains owner and operator until vesting. NDM plans to reopen the north portal and to drive a 200 m of ramp +/- in the hanging wall of the vein to the 200 m AMSL elevation, roughly 20m below the historic East and West Stopes. Scram drifts will be driven into the vein and mineralized quartz material will be extracted and stockpiled on surface.

A second phase will see a 100 tpd (nominal) mill installed and milling of the stockpile rock will commence the following year. Development will continue as supported by these results.

## 2.1 Preparation

A combination of contractors and direct-hired personnel under the direction of NDM will be engaged to:

- Site preparation (clearing);
- Construction, maintenance, use and upgrading of site roads, letdown areas and pads;
- Installation of a 20 person camp and associated infrastructure. The camp occupancy will be limited to the number of personnel approved at any given time;
- Installation of a diesel fuel storage tank (up to 125,000 ltr);
- Explosives storage;
- Re-establishing the North Portal.

## 2.2 Underground Mining

Contractors and direct-hired personnel under the direction of NDM will be responsible for all phases of the operations of the project.

Mining is planned to begin in 2021 and will include:

- Operation and maintenance of the existing exploration camp;
- Maintenance of fuel storage tank;
- Maintenance of power supply;
- Maintenance of explosives;
- Construction of settling ponds and sumps.

## 2.3 Location of Explosive Infrastructure

Explosives to be used will be stored on the surface in an approved explosives and detonator storage area as illustrated in Figure 1. This will include only licensed explosive magazine which include locking double-walled steel containers with non-sparking and non-conducting interiors. One large container for explosives and a smaller one for detonators will be included. Underground, approved explosive storage areas are blasted from solid rock and caged with locked steel fencing.

This conforms to the siting requirements of both the federal explosives storage guidelines and the NWT Mine Health and Safety Act and Regulations. The ANFO magazine will be locked and secured. Detonators will be stored in a separate magazine, sealed from weather, and will be locked and secured.

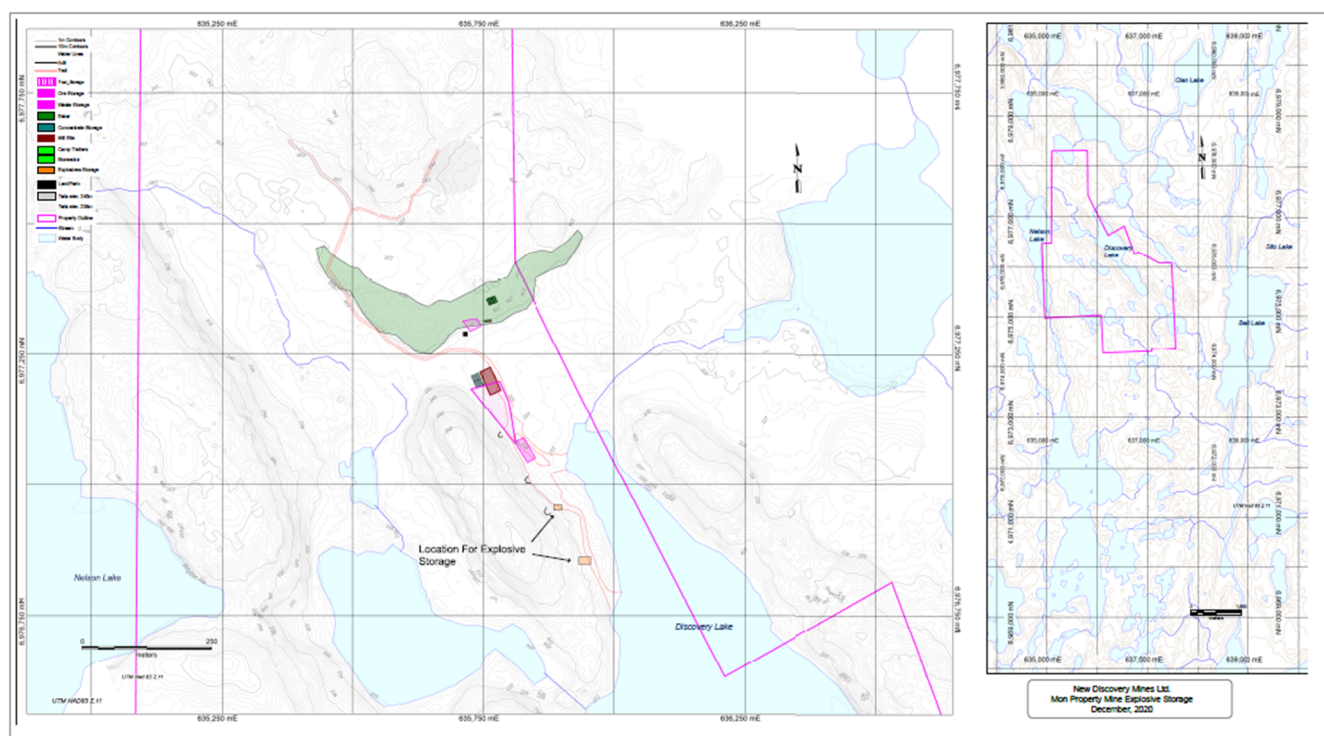


Figure 1. Explosives magazine storage locations. A copy of this map is included at full scale in the Appendix.

### 3.0 DESCRIPTION AND QUANTITIES OF EXPLOSIVES

The primary explosives to be used will be ammonium nitrate mixed with 6% diesel fuel (ANFO). ANFO will be pre-mixed and trucked to site or flown as needed from Yellowknife. Explosives will typically be delivered in 25 kg bags. Any additional explosives will be in stick form including emulsion sticks. These are provided by Dyno Nobel Canada Inc. in containers which will be stored and inventoried in the magazines.

Upon arrival on site, authorized mine personnel will be responsible to transport them to the designated magazines immediately (Figure 1).

Ammonium nitrate is a hygroscopic tertiary explosive. It is a white crystalline solid consisting of ions of ammonium and nitrate. It is highly soluble in water (150 g/100 ml (20 °C)) and hygroscopic as a solid, although it does not form hydrates. It is predominantly used in agriculture as a high-nitrogen fertilizer. Global production was estimated at 21.6 million tonnes in 2017.

### 3.1 Underground Mining

Blasting will be completed once or twice per shift or as needed in drifting, slashing, or mining. NDM anticipates using approximately 24 tonnes of explosives in 2021. Table 1 summarizes the anticipated types and quantities of explosives products to be stored and used at the mine site during underground mining.

Table 1: Underground Mining Explosives Storage and Class Type



Explosive	Type	Weight	Transportation Code	Total Weight
Amex	Bags	25 kg	Class 1.1	16,000
Magnafrac	Cases	25 kg	Class 1.1	8,000
Nonels	Units	piece	Class 1.1	#4,320
Primaline	Rolls	500 ft	Class 1.1	#20
Electric MS	Units	metres	Class 1.1	#900
Total				24,000

# = pieces

All blasts will be washed down with water as per WCSS regulations for dust suppression with the water pumped to the underground sump for settling and reuse. It is expected to have ammonium levels increase in this water, however less than 1 kg of ammonium nitrate is anticipated in the one to three m<sup>3</sup> of water. Much of the water will be entrained in the muds within the sump which will be left in the mine for final abandonment upon closure. Ammonium levels will be monitored and meet EQC standards prior to discharge. There is no concern if ammonium levels are lower than EQC standards, and are being discharged and if they are higher than EQC standards treatment with oxygen, zeolites or ammonium stripping are effective methods to reduce concentrations.

The magnitude of ammonium volumes will be very low given the small size of the operation, and given the permafrost terrain, water is not expected to move within the mine. Should it move, the gross volume of ammonium would likely be taken up by plants prior to getting close to any fish-bearing habitat. This is accepted practice in BC where ammonium nitrate-based prills are scattered into forests to improve growth rates (<https://www.for.gov.bc.ca>).

## 4.0 EXPLOSIVES MANAGEMENT & SAFETY PROGRAM

### 4.1 Security

Explosives are at risk of theft, unexplained loss, possible sabotage, and unauthorized access. To reduce these risks, NDM will have procedures to control access and document the movement of explosives. Monitoring will keep careful inventory to constantly assess theft or losses, and locks, cameras, and lighting will limit opportunities for theft. The isolation of the site with ground access limited to winter roads which we construct, or air access which makes access makes the storage of explosives more secure. Storage will only be in approved and licensed containers.

#### 4.1.1 Security Procedures

NDM will post warning signs such as 'Authorized Access Only' and will use security precautions like alarms, patrols, and extra lighting. The magazines will also be monitored by cameras. Primary locks will secure each of the magazines. Access keys will only be given to designated responsible employees, and NDM will maintain a list of employees who have a key. Access to the mine site will be by truck for several weeks in winter, and by air at all other times.

Documentation will reconcile incoming and outgoing quantities of explosives. The documentation will also track the authority of employees to remove and receive explosives. Further details on these procedures will be included in subsequent updates of the Explosives Management Plan as the construction phase is implemented.

#### 4.1.2 Security Incidents

All security incidents will be reported to site security. If the incident cannot be resolved internally, NDM will report any unexplained loss, theft, attempted theft, or any other security incident to authorities.

## 4.2 Contractors

The explosives contractor will have a more detailed operations manual for the transportation, storage and handling of explosives. The contractor will also be responsible for explosives management including for employee training, hazardous operational analysis, and quality control. NDM management will evaluate contractor performance against the management plan, applicable regulations, and industry best practice. There will be consequences within the contract for non-performance.

The contractor will be responsible for the delivery of the explosives products to the site by plane or truck. Upon arrival of the explosives products onsite, the authorized mine blasting personnel will sign off to confirm the delivery. It is then the responsibility of the authorized mine blasting personnel to transport the explosives to the designated magazines immediately. The mine manager will be responsible for completing the following forms for the work to be performed at the mine site:

- Workers' Safety & Compensation Commission (WSCC) Application for an explosive magazine
- WSCC Application for Explosives Handling Permit
- Natural Resources Canada (NRC) Form 10 Magazine License Application (if necessary)

## 4.3 Employee Training & Certification

The contents and purpose of this Explosives Management Plan will be communicated to employees, contractors, and suppliers through on-site training and regular safety meetings. Employees will be trained in the following areas:

- Regulatory and permitting compliance
- Safety
- Standard Operating Procedures, including record-keeping
- Emergency preparedness and incident reporting

NDM will maintain training records for all employees. Blasters require a certificate from the Chief Inspector of Mines, in accordance with the NWT Mine Health and Safety Regulations. Hot work procedures will be instituted which will prevent hot work from being performed without a permit. This prevents hot work happening within 20 m of the place where any explosive is stored or is being transported. On-site staff will have a significant role to play in reducing/controlling ANFO losses, through proper supervision of loading, emphasis on correct loading procedures and proper training/training updates of blasting personnel.

The blasting certificate will adhere to the following from the NWT Mine Health and Safety Regulations:

**14.16.** (1) *No person shall prepare or conduct or be allowed to prepare or conduct a blasting operation in or about a mine unless that person holds a blasting certificate issued by the chief inspector or a provisional blasting certificate issued by the manager.*  
(2) *Notwithstanding subsection (1), a person who is not the holder of a blasting certificate may assist in the preparation and firing of charges if he or she does so under the immediate direction and supervision of a person who holds a blasting certificate.*

*(3) The blaster shall deliver his or her blasting certificate to the manager when he or she commences employment as a blaster at the mine, and the manager shall, unless the certificate has been suspended, return it to the blaster when his or her employment is terminated.*

## 4.4 Transportation

The explosives contractor will be responsible for transporting the explosives products to site and will be required to provide procedures for the safe transportation of explosives. Once the explosives are in NDM's control, surface transportation of the explosive products will occur in accordance with the Mine Health and Safety Regulations as follows:

- 14.29.** *Mobile equipment used for transporting explosives on the surface shall (a) be kept in sound mechanical condition;*
- (b) when carrying explosives, be provided with orange diamond-shaped placards and with clearly visible signs marked "EXPLOSIVES" in letters not less than 150 mm in height;*
  - (c) have all metal parts that could come in contact with containers of explosives covered with wood, tarpaulin or similar non-sparking material;*
  - (d) not be used to transport other goods or materials at the same time as explosives are transported;*
  - (e) be equipped with a type 20-ABC fire extinguisher;*
  - (f) not be loaded with explosives in excess of 80% of its rated carrying capacity;*
  - (g) have explosives secured or fastened so as to prevent any part of the load from becoming dislodged;*
  - (h) transport detonators with other explosives only if the detonators are*
    - (i) packed in their original containers and placed in a wooden box with a snugly fitting lid that is separated from other explosives by a solid partition of wood at least 150 mm thick and that extends at least 150mm above the highest level to which the explosives are packed in the vehicle, and*
    - (ii) 5,000 or fewer in number;*
  - (i) only be operated by an authorized person who is in attendance at all times;*
  - (j) carry only those persons necessary for handling explosives;*
  - (k) not be refuelled if explosives or detonators are on board except where the mobile equipment is designated and used solely for the transportation of bulk blasting agents; and*
  - (l) have its engine shut off and its park brake on while loading or unloading explosives, except where the vehicle uses an engine-powered device for loading and unloading the explosives.*

## 4.5 Shipping & Receiving

On arrival at the Mon Mine, all explosives products will be immediately transported to the secure storage area.

If arriving by truck, the authorized blasting personnel must sign off and make sure the quantity of explosives are correct. The explosives will be transported by a vehicle designated to transport explosives only. The vehicle will travel to the explosives storage magazines. The explosives will then be manually transferred to a secure magazine.

If arriving by plane, the authorized mine blasting personnel must sign off and make sure the quantity of explosives are correct. The explosives will be transported by a vehicle designated to transport explosives only. The vehicle will travel about 0.5 kilometres from the dock to the explosives storage magazines. The explosives will then be manually transferred to a secure magazine.

Explosives or security-sensitive dangerous substances stock added to or removed from the storage area will be accounted for with a stock control system. The control must provide a basic record in handwritten

form and in electronic format. The records must contain the name and identifier of the transport company that delivered the explosives and method of transportation either by barge or by plane.

## 4.6 Magazines

Explosives will be stored in magazines permitted by the Inspector in accordance with the Mine Health and Safety Regulations:

**14.03.** (1) *Subject to subsection (2), the site for a surface magazine shall be selected in accordance with the Quantity-Distance Table for Blasting Explosives.*

(2) *The manager may apply to the chief inspector for a variance where it is not possible to comply with the Quantity-Distance Table for Blasting Explosives.*

(3) *The manager shall ensure that a surface magazine ceases to be used if the conditions under which the explosives magazine permit was issued no longer exist.*

(4) *The manager shall ensure that "NO SMOKING OR OPEN FLAME" signs are posted at all approaches to a magazine.*

(5) *No person shall smoke, take an open flame or produce sparks within 20 m of any place where explosives are stored or handled.*

(6) *Explosives stored on the surface shall be kept in a magazine with "DANGER EXPLOSIVES" signs conspicuously posted at all approaches to the magazine and on each side of the magazine.*

In addition to conforming to these requirements NDM will:

- Maintain appropriate temperature (as designated by the manufacturer's specifications).
- Keep the magazine clean.
- Use oldest stock first.
- Not allow flame producing devices in the area of the magazine.
- Clear brush and other flammable material from around the magazine
- Install warning signs that identify the explosives storage area as a fire hazard area.
- Ensure that bags are kept in satisfactory condition shielded from the elements, handled with care to prevent toppling, puncture and spilling of the contained prill.

The magazines are licensed with Mines Inspection Services of the WSCC in the NWT and are located on the appended map, Location of Magazines.

## 4.7 Design

When designing the blasts NDM will:

- Design to minimize losses of ammonium nitrate. This means any spilled ammonium nitrate will pick collected and added to the blast hole for use. Any residual ammonium nitrate will be less than 200 gms per blast (90 tonnes) or <2 ppm.
- Plan drill blast patterns to minimize time between placement of the explosives and detonation.

- Minimize the risk of injuries and damage to property.
- Plan to avoid any geologic features that may conduct water. Contingencies in case water is encountered using borehole liners, water-resistant slurry.
- Have a contingency plan for wet holes, although conditions are expected to be dry. Contingencies will include altering blasting cycles, lining blast holes, or the use of gel-type explosives.

## 4.8 Use

- All explosives shall be handled according to the manufacturer's specifications.
- Only properly trained and certified employees or contractors will be permitted to handle explosives.
- Defective explosives shall not be used. Defective explosives shall be immediately reported to a supervisor. Defective explosives will be reported to the manufacturer.
- Explosives shall not be abandoned (use it or store it).
- Unused explosives will be shipped off site, burned or destroyed according to the manufacturer's specifications.
- Detonators, if not used, shall be returned to the detonator magazine or shift box or shift container but the number of detonators in a shift box or shift container must not exceed 50.

## 4.9 Inspections and Reporting

Inspections will be required for and reported for:

- A written weekly inspection of all magazines
- Transportation infrastructure
- Equipment
- Broken or contaminated bags

The manager will ensure that a fire risk assessment is carried out not later than March 31 in each calendar year for all components of the Preliminary Site Preparation Phase or Demonstration Project, and the assessment will identify the potential for a fire or explosion consistent with the listed requirements. An explosive incident report shall be filled in as required. The Form F07-01 Incident Report for Explosives and Restricted Components is included in Appendix A and can also be found at:

[https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/mineralsmetals/pdf/mms-smm/expl-expl/pdf/F07-01\\_E\(1\).pdf](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/mineralsmetals/pdf/mms-smm/expl-expl/pdf/F07-01_E(1).pdf)

Monitoring of all explosives and damaged explosives will be conducted according to MIS regulations with the approval of the Mine Manager. Records of the explosives inventory is kept on site, copies of which are kept at head office. Discrepancies will be investigated and records of these investigations will be maintained at the mine site and head office.

## 4.10 Incident Response

All spills and unplanned discharges are considered within the Spill Contingency Plan. An accident investigation will be conducted following any accidents, incidents, and near-misses. Standard investigation and reporting forms will outline the relevant procedures. In accordance with the Mine Health and Safety Regulations, NWT, a manager shall suspend a blaster from his or her duties and notify the chief inspector when a blaster is unfit, has acted in a careless manner, or has contravened drilling or blasting regulations.

### Thefts

All thefts will be identified, and all personnel present on site will be recorded. If the source and location of the thefts cannot be identified, a report to the appropriate authorities will be made, including the RCMP, Mine Inspection Services, and Land Use Inspector.

### Accidents and Near Misses

Accidents will be recorded and reported according to the on-site health and safety and acting Mine Manager requirements. All accidents will be reported to WSCC.

### Spills

All spills will be reported according to the approved Spill Contingency Plan, and cleaned up according to standard operating procedures which include reducing any release into the natural environment, recycling or disposal of the spilled material, recording and reporting of all actions taken. All spills will be monitored as stipulated within the Spill Contingency Plan. Trigger events will include any event of theft, damage or spill of more than 20 kg of ANFO. This represents the amount a domestic user of ammonium nitrate fertilizer typically spreads on a 400 m<sup>2</sup> lawn. A spill of this amount at the magazine, or roadway is approximately 100 m from any fish-bearing habitat and would cause the forested area to become lush and green. Any spill in the mine is constrained to the mine and is managed by multiple collection systems, ending in the internal sumps prior to discharge to the external sumps. Documentation will be maintained in the Mine Manager log book.

### Misfires

A misfire is the failed detonation of an explosive. It will be reported to the Mine Manager who will determine the best action to take according to WSCC and MIS requirements.

### Damaged Explosives

Miscoloured, wet or otherwise damaged explosives will be evaluated by a licensed blaster to determine the recommended actions. This may include use or disposal which will be recorded and completed in consultation with the Mine Manager.

## 4.11 Waste Management, and Damaged Explosives, and Spills

Empty bags and cartons will be consolidated, stored, and incinerated on-site. Partially or fully contaminated or ripped bags of prill, spilled prill and used empty bags will be collected, stored and incinerated in an approved manner. All spilled prill will be recorded on a spill report and all bags will be inspected by the mining contractor's superintendent or designee and verify the condition accounted for receiving and shipping offsite. This information will be provided to the on-site NDM manager and will be kept as part of inventory reconciliation and in the environmental database.

Clean-up of any spills of explosives products will be done by licensed explosive handlers. The spilled material will be segregated and handled appropriately. Damaged explosives must be destroyed either by detonation or combustion. According to the Explosives Act:

### Destruction by Detonation

An acceptable method of destruction is to detonate explosives in a blast hole as part of a production blast by introducing them in the drill hole past the collar as stemming. Special care must be taken to not mix different types of explosives to avoid contamination or incompatibility between the explosives to be blasted and the explosives to be destroyed. It is important to discuss the intention of doing the destruction with the superintendent, or blaster.

### Destruction by Combustion

Burning is an acceptable method of destruction. However, it must be assumed that there is always the chance of an explosion during burning; consequently, a remote location must be chosen so that no damage to property or injury to people will result. Only small amounts of explosives can be destroyed by this method.

Every precaution must be taken to make certain that only one type of explosive is destroyed at a time. Dynamite, detonating cord, cast boosters, and safety fuses must be examined carefully to ensure that no detonators of any kind are among the explosives to be burned. The presence of only one detonator or of a metallic object will probably lead to detonation. Therefore, initiation devices must never be burned; they should be destroyed separately by being detonated at a carefully selected place.

## 5.0 ENVIRONMENT

### 5.1 Blasting

#### Potential Environmental Impacts

By applying appropriate blasting guidelines and best management practices, and in particular, avoiding the use of explosives in or near fisheries waters, no residual effects from blasting activities are anticipated. This includes laying down tarps in working areas to contain and collect spills, use of covered loading tools, and conducting all blasting underground, >100 m away from any potentially fish-bearing habitat.

Surface blasting can have several potential environmental impacts. Direct effects on fish or other aquatic organisms occur only when blasting takes place in or near watercourses. The potential aquatic effects are:

- Blasting in or near streams and lakes can reduce bank or shoreline stability and result in soil exposure, resulting in erosion and mobilization of sediments, which in sufficient quantity, are harmful to aquatic life.
- Blast residues from detonation near water can generate nutrients and contaminants
- Pressure changes and particle velocity has potentially lethal/sublethal effects on fish, fish eggs, and larvae. Blasting also has the potential to generate dust that can affect air quality and that can be deposited in the surrounding environment.

#### Mitigation

Blasting contractors will be required to adhere to DFO Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (DFO 1998). In particular:



- For confined explosives, setback distances from the land-water interface (e.g. the shoreline), or burial depths from fish habitat (e.g., from under the riverbed or lake bed) will ensure that explosive charges meet the 100 kPa overpressure guideline;
- Confined or unconfined explosives use near fisheries waters will not occur; and,
- Precautions will be taken to prevent the escape of potentially toxic by-products, such as ammonia, to any aquatic systems.

The primary dust-related effects resulting from the Mon Mine are anticipated to minimal as all blasting will be underground or may occur within 10 m of the main development footprint, as this is where the majority of dust is expected to settle. Dust effects may occur up to 100 m away, depending, in part, on site conditions and particle size characteristics.

NDM is committed to conformance with the *Guidelines for Ambient Air Quality Standards in the NWT* established under the Government of the Northwest Territories *Environmental Protection Act*. NWT. NDM or its contractor will employ dust suppression strategies (e.g. water or approved dust suppressant products) on its roads in accordance with GNWT dust suppression guidelines. All blasting will be done underground only, in a constrained and enclosed environment. Ventilation to permit access will be conducted prior to entering the work site as per MIS regulations, and all blasted sites will be stabilized and washed with water to suppress dust. Air quality tests will be completed using standard Draeger test gear, checking for PM<sub>2.5</sub>, CO, NO<sub>2</sub>, O<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>S and TSP.

Table 1. Guidelines for limits on selected parameters for ambient air quality in the NWT.

Parameter	Standard (ug/m <sup>3</sup> )*	Standard (ppb <sub>v</sub> )**
Carbon Monoxide (CO) 1 hr average 8 hr average	15,000 6,000	13,000 5,000
Fine Particulate Matter (PM <sub>2.5</sub> ) 24 hr average Annual arithmetic mean	28 10	
Ground Level Ozone (O <sub>3</sub> ) 8 hr average	126	63
Nitrogen Dioxide (NO <sub>2</sub> ) 1 hr average 24 hr average Annual arithmetic mean	400 200 60	213 106 32
Sulphur Dioxide (SO <sub>2</sub> ) 1 hr average 24 hr average Annual arithmetic mean	450 150 30	172 57 11
Total Suspended Particulate (TSP)		



24 hr average	120	
Annual arithmetic mean	60	

All ambient air quality measurements will be referenced to standard conditions of 25°C and 101.3 kPa.

The air is sampled underground on a daily basis or as required by WSCC, MIS, and the Mine Manager.

## 5.2 ANFO

### Potential Environmental Impacts

Ammonium nitrate/fuel oil mixture (ANFO) is a commonly used explosive in the mining and construction industries. By-products from the use of this explosive include ammonia or similar compounds. These compounds may be directly toxic to fish or increase nutrient levels. Blasting of ANFO also releases carbon monoxide, nitrogen oxides, methane, and other pollutants which have the potential to affect air quality.

### Mitigation

Runoff water from blasting commonly contains elevated ammonia and nitrate concentrations. Ammonium nitrate ( $\text{NH}_4\text{NO}_3$ ) is water soluble (190 g/100ml). This elevated concentration comes from loss in handling and loading, and the incomplete detonation/combustion of ANFO in wet holes. NDM expects that most holes will be dry, which is consistent with past experience at this site. The lack of water will be confirmed by careful examination of the blast holes upon blowing them clear. All residual water is pumped into sumps before loading of explosives occurs. If excess water is noted, blasting in liners or sleeves is an option. NDM assumes there will be no loss in handling and loading of ANFO.

All blasting will be conducted underground where no water will be permitted to be released into the natural environment except as planned and permitted via an internal sump and then an external sump. Discharges from the external sump require notification to an inspector prior to discharge. SNP and EQC details for the mine sump discharge parameters are shown prescribed in the licence for SNP 08.

### Surveillance Network Program (SNP-08):

<b>Description</b>	Minewater holding tank or pond	
<b>Location</b>	To be determined	
<b>Sampling Frequency</b>	Daily (during Discharge)	Once prior to each Discharge period, and then
<b>Sampling Parameters</b>	Flow*, volume*, Total <sub>(d)</sub> and dissolved metals <sub>(e)</sub> , physical parameters <sub>(a)</sub> , major ions <sub>(b)</sub> , nutrients <sub>(c)</sub>	
<b>Rationale</b>	To monitor the quantity and quality of Minewater prior to discharge to the Receiving Environment.	
<b>Status</b>	Active during periods of flow.	

And the EQC standards for this sump are shown below.

Parameter	mg/L	
	Maximum Average Concentration (mg/L)	Maximum Grab Concentration (mg/L)
Ammonia	-	5.9
Arsenic	0.5	1.0

Copper	0.3	0.6
Cyanide	1.0	2.0
Lead	0.2	0.4
Nickel	0.5	1.0
Radium-226	0.37 Bq/L	1.11 Bq/L
TSS	15	30
Zinc	0.5	1.0

NDM is committed to meeting the terms of MVLWB Water Licence MV2020L2-0002 and conform to the Guidelines for Ambient Air Quality Standards in the NWT established under the Government of the Northwest Territories Environmental Protection Act and the NWT Mine Health and Safety Regulations.

### Climate Change

The climate on earth has never been static, and has been documented for the last 500 million years with tremendous changes. The past 450,000 years have had five cycles of temperature swings of around 10° C and atmospheric CO<sub>2</sub> concentration swings from extinction event levels of around 180 ppm to >220 ppm. Homo Sapiens were around for the last two cycles and for some reason is being considered materially responsible for the last cycle, but not the previous several hundred cycles. Some find this corruption of science to be narcissistic.

Longer term we have had temperatures up to 16° C warmer with CO<sub>2</sub> levels >2,200 ppm. It is believed that this will continue and if the short-term cycle continues, the temperatures and CO<sub>2</sub> will start dropping over the next 1,000 years +/- NDM has had one mining permit and one license renewal in the past eight years, and does not feel any documented natural change will affect our operations over the next decade. Legislated and regulated changes such as declarations to hold temperature change to <1.5°C are a far greater risk to the operation, and these cannot be predicted.

## 6.0 REFERENCES

DFO Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (DFO 1998).

Explosive Regulations and the Industry: Tables of Quantity Distances (QD)

<http://www.nrcan.gc.ca/mineralsmetals/explosives/3045>

Mine Health and Safety Act and Regulations <https://www.wscn.nt.ca/occupational-health-safety/ohs-information/safety-legislation#Mine%20Health%20and%20Safety%20Act%20and%20Regulations>

Safety Act and Regulations <https://www.wscn.nt.ca/occupational-health-safety/ohs-information/safety-legislation#Safety%20Act%20and%20Regulations>

Explosive Use Acts and Regulations <https://www.wscn.nt.ca/occupational-health-safety/ohs-information/safety-legislation#Explosive%20Use%20Acts%20and%20Regulations>

*Explosives Act* (Government of Canada 2015) and Regulations (Government of Canada 2018)  
<https://laws-lois.justice.gc.ca/eng/acts/E-17/> <https://laws.justice.gc.ca/eng/regulations/SOR-2013-211/>

*Transportation of Dangerous Goods Act* and Regulations (Government of Canada 2019) <https://laws-lois.justice.gc.ca/eng/acts/t-19.01/>

Workplace Hazardous Materials Information System 2015 (Health Canada)

<https://www.canada.ca/en/health-canada/services/environmental-workplace-health/occupational-health-safety/workplace-hazardous-materials-information-system.html>



APPENDIX A

Form F07-01 Incident Report for  
Explosives and Restricted  
Components



## Incident Report For Explosives and Restricted Components

<b>HOLDER OF A LICENCE, PERMIT OR CERTIFICATE</b>			
Name of Holder		ERD Licence / Permit / Certificate No.	
Address		Person Affected	
Telephone	Fax	Email Address	
<b>POLICE FORCE INVOLVED IN INVESTIGATION</b>			
Name of Police Force		Person Involved	
Telephone	Fax	Email Address	
<b>INCIDENT INFORMATION</b>			
Date of Incident (yyyy/mm/dd)		Time of Incident (hh:mm)	
Location of Incident (Street, Town/City, Province/Territory)			
No. of People Evacuated	No. of People Injured	No. of Fatalities	
Description and Details of the Incident – Include Photos			
Nature of the Injury (e.g. burns to face and hands)			
Property Damage (e.g. to critical or surrounding structures)			
Description of the Explosives or Restricted Components Involved (type, trade name, etc.)		Quantity Present and/or Involved	
Results of Investigation, and Actions Planned or Taken (or specify date when final results will be sent to ERD)			
<b>INCIDENT REPORTED BY</b>			
Name (print)		Organization	
Date (yyyy/mm/dd)		Address	
Telephone	Fax	Email Address	
For Office Use Only	Date Report Reviewed	Reviewed by Inspector	File / Incident No.

**Pacific Region:**  
BC + YT  
1500 - 605 Robson St.  
Vancouver, BC  
V6B 5J3  
Tel.: 604-666-0366  
Fax: 604-666-0399  
ERDpacific@nrcan.gc.ca

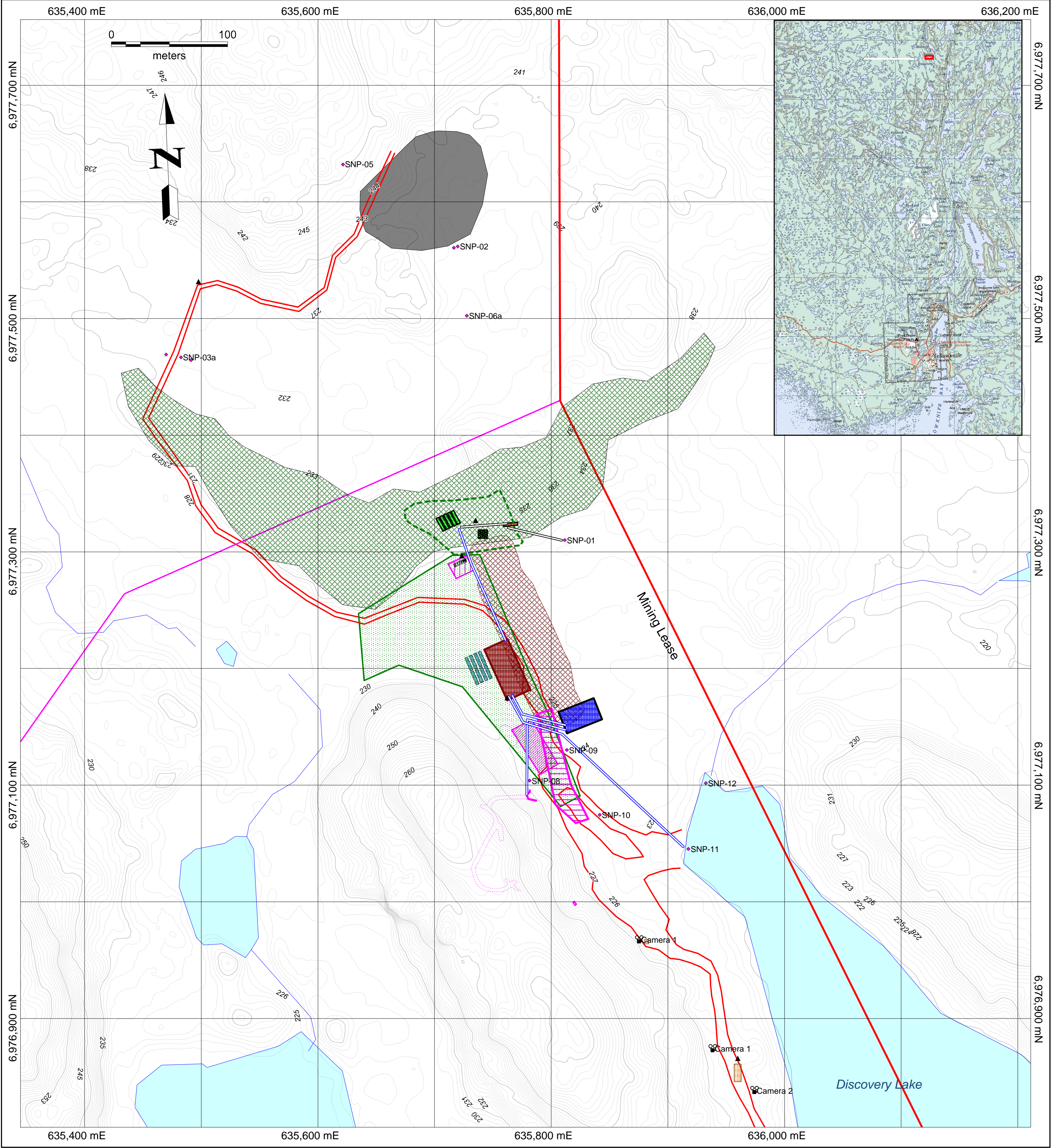
**Western Region:**  
AB + SK + NT  
3303 33 Street Northwest  
Calgary, AB  
T2L 2A7  
Tel.: 403-292-4766  
Fax: 403-292-4689  
ERDwestern@nrcan.gc.ca

**Central Region:**  
ON + MB  
580 Booth St. 10<sup>th</sup> Floor  
Ottawa, ON  
K1A 0E4  
Tel.: 613-948-5187  
Fax: 613-948-5195  
ERDcentral@nrcan.gc.ca

**Eastern Region:**  
QC + NU + Atlantic  
1615 Lionel Boulet Blvd  
PO Box 4800  
Varenes (QC)  
J3X 1S6  
Tel.: 450-652-0703  
Fax: 450-652-4225  
ERDeastern@nrcan.gc.ca

**Headquarters:**  
580 Booth St. 10<sup>th</sup> Floor  
Ottawa, ON  
K1A 0E4  
Tel.: 613-948-5200  
Fax: 613-948-5195  
ERDmms@nrcan.gc.ca





# Legend

1 m Contours	Fuel_Storage	Ore_Storage	SpillKit
10 m Contours	Shops	Gravel Quarry	Concentrate Storage
Roads	75k Storage Tank	Esker	Shops
WaterCourse	Bioreactor	Mine Shaft	Mill_Site
WaterBody	Camp Trailers	ANFO	Portal North Adit
Tailings Storage	SNP_Stations	Waste Rock Storage	Underground, Ramp
Hydrocarbon-Contaminated Soils	Historic Tailings		Water_Lines
Mineral Claims			Sewage Lines
			Water_Tank

## Site Plan

### As Placed March 5, 2021

Date: February 2021	
Author: DRW	
Office: Vancouver, B.C.	
Scale: as shown	
Projection: UTM Nad 83, Zone 11	