



EAGLE GOLD PROJECT
EXPLOSIVES MANAGEMENT PLAN

Version 2017-01

July 2017

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DOCUMENT CONTROL

Submission History

Version Number	Version Date	Document Description and Revisions Made
2014-01	Aug 2014	Original submission to the Department of Energy, Mines and Resources and the Yukon Water Board in support of an application for a Quartz Mining Licence and Water Use Licence for the full Construction, Operation and Closure of the Project.
2017-01	Jul 2017	Revisions made to reflect the current site general arrangement and to address the conditions of the Quartz Mining Licence QML-0011.

Version 2017-01 of the Explosives Management Plan (the Plan) for the Project has been revised in July 2017 to update Version 2014-01 submitted in August 2014. The table below is intended to identify modifications to the Plan and provide the rationale for such modifications.

Version 2017-02 Revisions

Section	Revision/Rationale
Section 1 Introduction	<ul style="list-style-type: none"> Updated to the Project description, schedule and layout for consistency with optimized general arrangement and mine plan.
Section 2 Applicable Legislation and Explosives Permits Required	<ul style="list-style-type: none"> Added information on applicable legislation for the management of explosives (Table 2.1-1) and information on explosives contractor responsibilities.
Section 4 Types of Explosives to be used On Site	<ul style="list-style-type: none"> Revisions and re-ordering for consistency with current plan for blasting; added nitroglycerin dynamite; improved description of non-electric detonators; and removed section on inline delays to reduce redundancy.
Section 5 Explosives Quantities	<ul style="list-style-type: none"> Updated production schedule for consistency with current mine plan.
Section 7 Explosives Storage	<ul style="list-style-type: none"> Updated description of explosives storage for consistency with current plan for blasting; deleted section on ammonium nitrate storage (agricultural grade) to be consistent with current explosives use and storage plan; revised volume of explosives to be stored at site and removed reference to ANFO plant and emulsion plant.
Section 8 Onsite handling	<ul style="list-style-type: none"> Removed reference to ANFO and emulsion plants, and added emulsion silo for consistency with current plan for blasting; reduced redundancy in authorized personnel.
Section 9 Blasting Operations	<ul style="list-style-type: none"> Corrected minor errors and revised to include emulsion explosives and update for consistency with types of blasting accessories; Added subsections on training (Section 9.3), manufacturing of ANFO (Section 9.5), inventory management (Section 9.10), inspections (Section 9.11) and additional details on fly rock prevention (Section 9.7) and spill containment (Section 9.13) to address the conditions of the Quartz Mining Licence QML-0011 to incorporate measures to minimize the release of nitrogen compounds as a result of blasting activities.
Section 11 Nitrate Management	<ul style="list-style-type: none"> Added details on spill prevention (Section 11.1) to address the conditions of the Quartz Mining Licence QML-0011 to incorporate measures to minimize the release of nitrogen compounds as a result of blasting activities.

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1 INTRODUCTION

StrataGold Corporation (SGC), a directly held, wholly owned subsidiary of Victoria Gold Corp., has proposed to construct, operate, close and reclaim a gold mine in central Yukon. The Eagle Gold Project (Project) is located 85 km from Mayo, Yukon using existing highway and access roads. The Project will involve open pit mining and gold extraction using a three stage crushing process, heap leaching, and a carbon adsorption, desorption, and recovery system over the mine life.

During operations, the open pit will be developed using standard drill and blast technology. Ore will be transported from the open pit by haul truck and delivered to the first stage crushing plant (the primary crusher), situated on the north side of the open pit rim. Waste rock will be removed from the open pit by haul truck and delivered to one of two waste rock storage areas (Platinum Gulch or Eagle Pup WRSAs).

Ore will be crushed to a passing 80 percent (P80) particle size of 6.5 mm in a three-stage crushing process. All three crushing stages will be located north of the open pit. Ore will be conveyed between each crushing stage by covered conveyor. After the tertiary crushing stage, ore will be transported by covered conveyor to the Heap Leach Facility (HLF) area and will be stacked on the heap leach pad by mobile stacking conveyors.

Gold extraction will utilize cyanide heap leaching technology with process solution containing cyanide applied to the ore to extract gold that is then collected by the HLF leachate collection and recovery system.

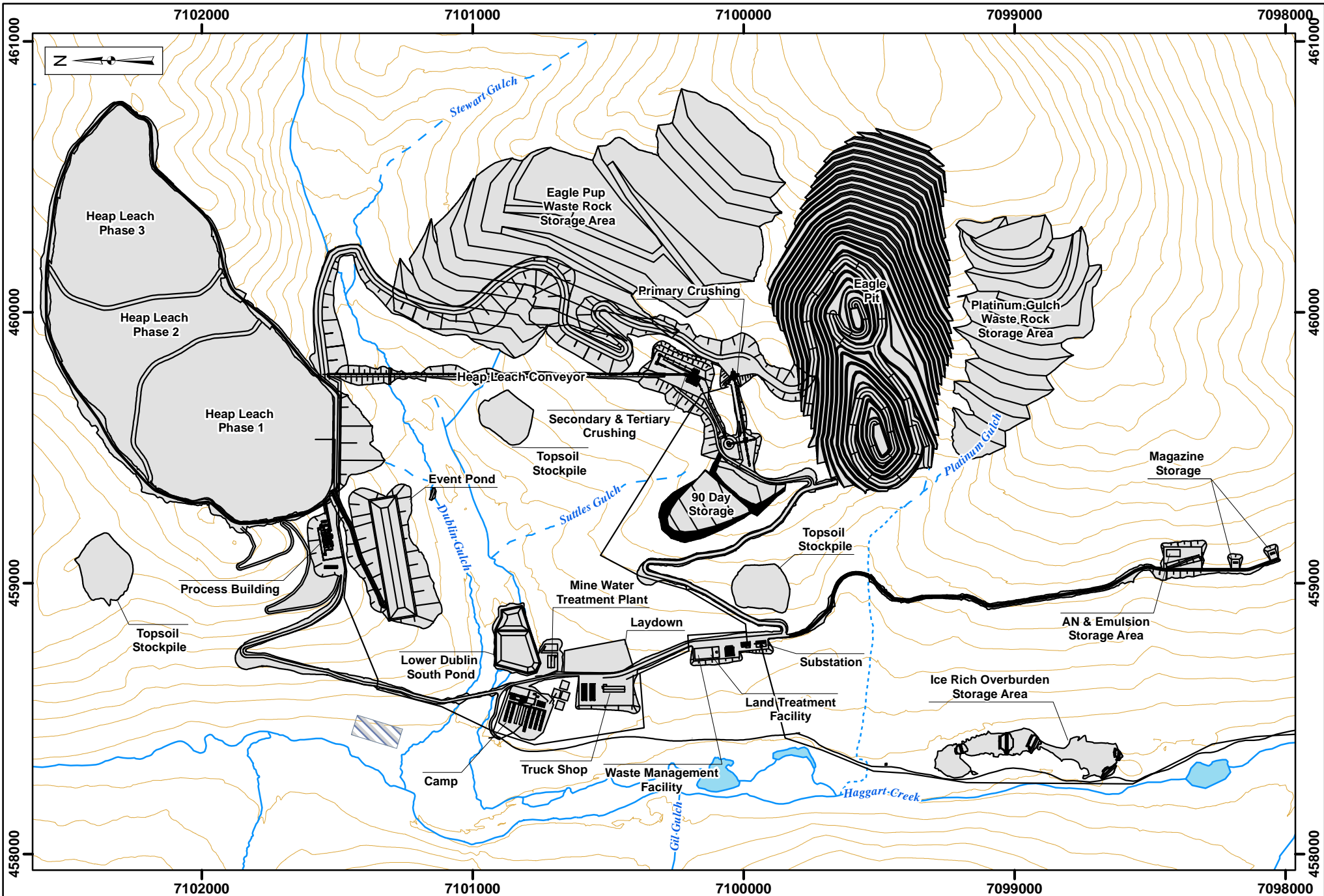
Gold-bearing pregnant leach solution (PLS) will be pumped from the heap to the gold recovery plant. Gold will be recovered from the PLS by activated carbon adsorption and pressurized caustic desorption, followed by electro-winning onto steel anodes, and on-site smelting to gold doré. The gold-barren leach solution that remains after passing through the carbon columns will be re-circulated back to the HLF.

The mining operations at the SGC Project will include the use of explosives for rock breaking. The predominant explosive used for ore and overburden removal will be ammonium nitrate, used to manufacture Ammonium Nitrate Fuel Oil (ANFO) and emulsion explosives (water gel).

The purpose of this Explosives Management Plan is to describe how SGC intends to integrate the safe use of explosives into mine operations while minimizing environmental impacts. Control and use of explosives are covered by both Federal and Territorial regulations. Numerous permits are required for the use and storage of explosives, which will be obtained prior to mining. Operating procedures to ensure that explosives are handled safely, in a manner that minimises the chance of environmental contamination by explosives will be produced by SGC, and only trained competent staff will be allowed to work with explosives.

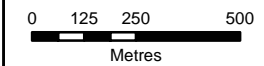
For the mining operations, bulk explosives will be stored and handled onsite by a licensed contractor who will provide a detailed operations manual for transportation, storage and handling of explosives. The recommended formulations are of commercial quality, industry-proven and accepted worldwide.. The contractor will also be providing down-the-hole delivery of the product to the blast hole by means of equipment to be licensed and approved by National Resources Canada, Explosives Division.

In addition to the bulk explosives, the explosives contractor will provide commercial packaged explosives and accessories that will be transported to the mine site. This will include detonators, boosters, detonating cord and packaged explosives for specialty applications. These materials will be stored on site in approved explosive magazines until issued for use. The location of the AN/Emulsion Storage Area and the explosive magazines is shown in Figure 1.1-1.



Legend:

- Facility
- Perennial
- Waterbody
- Reserved Area
- - - Ephemeral
- Contour (25m)
- Intermittent



Projection:
NAD 83 UTM
Zone 8N

Date:
2017/06/06

Drawn By:
HC

Figure:
1.1-1

**EAGLE GOLD PROJECT
YUKON TERRITORY**

Site General Arrangement

2 APPLICABLE LEGISLATION AND EXPLOSIVES PERMITS REQUIRED

2.1 APPLICABLE LEGISLATION FOR THE MANAGEMENT OF EXPLOSIVES

The control and use of explosives within Canada and Yukon is covered by federal and territorial laws and regulations. The Project will implement operational policies and procedures that meet or exceed the required laws and regulations. Table 2.1-1 lists the principle federal and Yukon Acts, regulations, and guidelines applicable to the management of explosives at the Project.

Table 2.1-1: Applicable Federal and Yukon Legislation for Explosives

Acts	Regulations	Guidelines
Federal		
Fisheries Act (RSC 1985, c. F-14)	Metal Mining Effluent Regulations (SOR/2002-2222)	Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters
Explosives Act (RSC 1985 c.E-17)	Explosives Regulations (CRC, c. 599) Ammonium Nitrate and Fuel Oil Order (CRC, c. 598)	
Transportation of Dangerous Goods Act, 1992 (SC 1992, c.34)	Transportation of Dangerous Goods Regulations (SOR/2016-95)	
Territorial – Yukon		
Occupational Health and Safety Act (RSY 2002, c.159)	Occupational Health and Safety Regulations (OIC 2006/178)	
Dangerous Goods Transportation Act (RSY 2002, c.50)	Dangerous Goods Transportation Regulations (OIC 1986/118)	

2.2 EXPLOSIVES PERMITS REQUIRED

The explosives section of the Permit and Authorization Guide for Yukon Activities has been reviewed and taken into consideration when designing this Explosives Management Plan. Various permits are required for explosives use, the emphasis is that the all documents submitted for various permits have comparable details. A brief summary of the permits and licenses required are listed below.

- ANFO Permit – Required under the *Federal Explosives Act*.
- Factory License – Required under the *Federal Explosives Act*.
- Permit for Use of Explosives – Required under the *Federal Explosives Act*.
- Explosives Magazine Permit – Required under the *Federal Explosives Act*.
- Explosive Transportation Permits – Required under the *Federal Explosives Act*.
- Blasting Permit – Required under the Yukon Occupational Health and Safety Regulations.

Section 2 Applicable Legislation and Explosives Permits Required

Table 2.2-1 contains a summary of requirements with respect to different types of explosive facilities and the requirements for compliance.

SGC and the appointed explosives contractor will work with the Explosives Safety and Security Branch (ESSB) of the Explosives Regulatory Division to obtain the necessary permits and licenses for explosives manufacture, storage, and use.

Table 2.2-1: Summary of Requirements from Guidelines for Bulk Explosives Facilities: Minimum Requirements by Natural Resources Canada (July 2010)

Requirements	Base Factory	Temporary Factory	Satellite Site	ANFO Mechanical Certificate	Demonstration	Trial
Prerequisite	Competence in explosives	Base factory proof of temporary nature	Base factory up to 800 km	For use within the owner quarry/mine	Base factory proof of demonstration	Base factory
Document Issued	Licence	Licence	Satellite certificate	ANFO certificate	Satellite certificate	Letter of permission
Customer Sites	Any number. up to 430 km Description day for over 300 km	One project. located near site	Any number. up to 200 km	Not applicable	One project may have multiple customers up to 200 km	Not applicable
Time Constraints	Annual renewal: 12 months	Single renewal 2 years maximum	Monthly: 1 month to base factory expiry period	Annual renewal	Two months maximum	6 months
Environment	EA and Spill Contingency Plan	Possible EA Spill Contingency Plan	Spill Contingency Plan	Spill Contingency Plan	Spill Contingency Plan	
Allowed Process	As per licence	Bulk delivery as per licence	Storing of a process vehicle storing of bulk explosive and/or raw materials, transferring of explosive of raw	Blend ANFO at borehole	Bulk delivery as per licence	As per agreement
Explosives	As per licence	Processing Class 1.5 storage as per licence	Class 1.5	ANFO Class 1.5	Class 1.5	As per agreement
Process Vehicles/Units	As per licence and location list	As per licence and location list	2 Process units as per location list ANFO mix vehicle	1 Process unit	As per agreement	
Buildings	As per licence	As per licence	As per licence			
Magazines	As per licence	As per licence	As per licence	As per licence	As per licence	None
Raw Materials, including AN	Stored on site	Stored on site	Stored on site	Stored on site	Stored on site	As per agreement

Section 2 Applicable Legislation and Explosives Permits Required

Requirements	Base Factory	Temporary Factory	Satellite Site	ANFO Mechanical Certificate	Demonstration	Trial
and Fuel						
Fuel Storage	As per licence	As per licence	As per provincial regulations	1 tank	As per provincial regulations	As per agreement
AN Storage	As per licence	As per licence	1 unit, silo, tanker or tote	1 unit	1 unit	As per agreement
Wash Facilities	Permanent required heated for winter base sites within 250 km of another base site might have this requirement waived	Temporary covered. heated in winter	None	Within 200 km	Temporary or weekly return to base	As per agreement
Garage	Access required	Access required	Access required	Access required	Access required	As per agreement
Processing Time	30 days	30 days	10 days	30 days	10 days	10 days
Fire Smoking/ Welding Permit	May be granted	No	No	No	No	No

A Blaster's Permit is also required under the Yukon Occupational Health and Safety Regulations.

SGC will contract an explosives company to manage explosives. The contractor's responsibilities will include supplying, transporting and storing blasting agents; manufacturing explosive products on-site; and delivering explosives products to blast sites. SGC will supervise the loading of the blast patterns by the contractor, and undertake pattern tie-ins. The objectives of the contract with an explosives company are identified as follows:

- Clearly specify the responsibilities of the contractor and that of SGC and the scope of explosives operations;
- Establish an effective means of communication between the contractor and SGC, including planned daily activities, inventory reports on explosives on-hand, regular meetings, and exchange of weekly reports;
- Note the facilities/activities that are the responsibility of the contractor and those that are the responsibility of SGC;
- Describe the access and egress control and security of the Project; and
- Agree to jointly develop a detailed Bulk Explosives Emergency Response Plan and a Security Plan. The Bulk Explosives Emergency Response Plan will provide details on emergency responses to instances involving explosives and the materials used to manufacture explosives on-site. The Security Plan will address security measures for the Project's explosives facilities.

The contract is to reflect these objectives and be signed by the contractor and SGC (Natural Resources Canada [NRCan] 2014).

3 EXPLOSIVES MANAGEMENT PLAN OBJECTIVES

The objectives of the Explosives Management Plan can be described as follows:

- Communicate a methodical approach to explosives management for the Project;
- Ensure that infrastructure constructed for explosives is compliant with all applicable regulations;
- Ensure that structures are constructed to prevent any safety or environmental incidents relating to onsite explosives storage;
- Ensure that handling of explosives is done in a manner that will minimize the possibility of safety or environmental incidents;
- Prescribe safe and environmentally sound measures for disposal or destruction of explosives;
- Prescribe procedures for safe blasting;
- Prescribe procedures for dealing with spills of explosives materials; and
- Indicate the chain of responsibility for explosives management.

4 TYPES OF EXPLOSIVES TO BE USED ON SITE

SGC plans to use the following types of explosive equipment and supplies in blasting operations:

- Bulk ammonium nitrate fuel oil (ANFO);
- Emulsion (bulk and packaged);
- Nitroglycerin dynamite;
- Pentolite boosters;
- Non-electric, surface delay and in-hole detonator assembly;
- Non-electric, short delay, trunk-line assembly;
- Electric detonators;
- Lead-in line (Shock tube); and
- Detonating cord..

Descriptions of each type of explosive are provided below.

4.1 AMMONIUM NITRATE FUEL OIL (ANFO)

Ammonium Nitrate Fuel Oil (ANFO) is one of the possible blasting agents to be used for the Project. ANFO consists of a mixture of Ammonium Nitrate and Fuel Oil. The mixture will be 94% by weight porous, prilled Ammonium Nitrate that will act as an oxidizing agent and absorbent for the remaining 6% Fuel Oil.

ANFO will act as the primary blasting agent for an estimated 70% of blast holes.

4.2 EMULSION (BULK AND PACKAGED)

Emulsion explosives will be considered for wet conditions. Emulsion is water resistant and can be blended with ANFO for a product that is better suited to variable weather conditions.

SGV will use site mixed emulsion, which uses the same ammonium nitrate / fuel oil chemistry as ANFO, but differs in the physical form that the reactants become, and the final product is significantly denser than ANFO as well as being water-resistant. The end product is a mixture of emulsion and ammonium nitrate prill (usually 70:30, respectively). This is expected to be required for roughly 30% of blast holes.

4.3 NITROGLYCERIN DYNAMITE

Dynamite combines nitroglycerin with adsorbents and stabilizers, rendering it safe to use but retaining the powerful explosive properties of nitroglycerin. Pre-packaged explosives will be kept on-site for small, selective blast requirements, such as fragmenting boulders and removal of high spots on the pit floor.

4.4 PENTOLITE BOOSTERS

The explosives contractor may have to use pentolite boosters to detonate bulk explosives that are known to be booster sensitive. Pentolite boosters are considered to be stable and have a long shelf life when stored under recommended conditions. Pentolite boosters are water resistant and the ingredients do not dissolve in water. Hydrostatic heads commonly found in a mining environment also have no effect on pentolite boosters.

4.5 NON-ELECTRIC DETONATORS

The explosives contractor will have the option to use a non-electronic detonation method. In this case, the initiation system is composed of a series of shock tubes connected to detonation devices. The shock tubes transmit shock waves to the non-electric detonators to initiate the blast. Non-electric Detonating System include the surface delay and in-hole detonator assembly, trunk-line assembly and lead-in line. The use of non-electric systems eliminates the danger of premature detonation owing to radio frequency energy or stray static electricity (e.g., wind, low humidity, plastic liners are sources of static electricity). Such systems can be used under all weather conditions, provide accurate surface and in-hole timing, and can be used in conjunction with lead-in line shock tube and detonating cord.

4.6 ELECTRIC DETONATORS

If warranted electronic detonation may also be considered to increase the accuracy of firing times and programmable detonation, if desired. The precision timing provided by electronic detonators may allow for a more uniform muck pile when conducting controlled pit blasting in different rock units. A more uniform muck pile will reduce processing costs and losses associated with the presence of oversized material and fines.

4.7 DETONATING CORD

Detonating cord is a thin, flexible plastic tube filled with penta erythritol tetranitrate (PETN). Detonating cord may be used by the explosives contractor as a high speed fuse capable of detonating multiple charges almost simultaneously. This may be used to initiate pre-splitting blasts or for detonating large boulders simultaneously with the blast.

5 EXPLOSIVES QUANTITIES

Based on a powder factor of 0.57 kg/m³ or 0.21 kg/tonne of ore or waste, the anticipated explosives required are shown in Table 5.1-1. It should be noted that actual explosive quantities will vary depending on breakage effectiveness, rock type, rock hardness, explosives cost versus crushing costs, and overall refinements to mining operations.

Table 5.1-1: Quantities of explosive required for targeted production

		Year	1	2	3	4	5	6	7	8
Production and explosives requirements	Production schedule	Ore Ktonnage	8,760	10,950	10,949	10,950	10,950	10,950	10,951	2,524
		Waste Ktonnage	7,990	15,712	13,639	15,686	11,418	9,458	10,003	4,972
		Stripping ratio	0.91	1.43	1.25	1.43	1.04	0.86	0.91	1.97
		Total Ktonnes	16,751	26,663	24,588	26,636	22,367	20,408	20,954	7,496
		Ore tonnes per day	29,500	29,500	29,500	29,500	29,500	29,500	29,500	29,500
		Days	365	365	365	365	365	365	365	365
		Waste tonnes per day	21,890	43,047	37,367	42,975	31,282	25,912	27,405	13,622
		Volume per day	30,004	35,875	31,367	28,832	26,375	27,514	26,782	27,018
	Drilling	Holes per day	110	132	115	106	97	101	98	99
	Explosives	Daily tonnage	17	20	18	16	15	16	15	15
		Weekly tonnage	120	143	125	115	105	110	107	108
		Monthly tonnage	513	614	536	493	451	471	458	462
		Annual tonnage	5,985	7,157	6,257	5,751	5,261	5,489	5,343	5,390
		Annual ANFO deliveries @ 25t/load	240	287	251	231	211	220	214	216

6 EXPLOSIVES PREPARATION

Due to the remote location, SGC will pursue a base factory licence versus a satellite explosives storage facility. This will allow the explosives contractor to manufacture the explosive on site and avoid the need to carry explosives on public roads. The quantity of explosives manufactured will be limited to immediate use. The explosives preparation will include:

- Delivery of raw ammonium nitrate, ammonium nitrate prill, emulsifying agent and gasifying agent;
- Ammonium nitrate melting and AN prill formation using a melt plant;
- Preparation of heavy ANFO for immediate use, if required, by mixing with diesel;
- Preparation of emulsion explosive for immediate use through mixing with emulsifying agent; and
- Filling of blast hole delivery trucks with appropriate explosive type.

7 EXPLOSIVES STORAGE

Explosives storage at the Project site will consist of three main components: bulk AN storage, bulk emulsion storage, and explosive and blasting accessories storage magazines. The storage facilities will be designed to meet all government regulations, and will be located according to required separation distances as regulated by the Explosives Regulatory Division of NRCan.

All explosives and accessories will be stored at the planned magazine site and explosive storage facility site. The magazine and the explosive storage facility are 300 m apart and roughly 1,800 m from any other infrastructure as per the distance requirements under the Federal Explosives Act and Regulations. A plan of the proposed explosive storage locations is shown in Figure 1.1-1.

7.1 AMMONIUM NITRATE PRILL STORAGE

Due to its hygroscopic nature, it is important that the ANFO be stored in dry silos or storage sheds, and not in humid or wet conditions. The internal crystalline structure of the product transitions at 32° C and -18° C. In conjunction with these changes there are corresponding volume changes of 3.6% and 2.8% respectively. Repeated cycling through these temperatures can break down the structure of the product. This is most important during summer and winter months, where day/night temperature variations may pass through either of these transition temperatures. If such exposure is unavoidable fast consumption will be undertaken.

Ammonium nitrate will be stored in silos at the bulk explosives storage facility shown in Figure 1.1-1.

It is estimated that up to 150 tonnes of explosive will be used per week during peak operations of that approximately 100 tonnes will be ANFO. Due to the remote location of the mining site, 200 tonnes of ammonium nitrate is proposed for storage. The storage will be in AN silos constructed by an experienced explosive supplier.

7.2 EMULSION STORAGE

Bulk emulsion will be stored in silos at the bulk explosives storage facility shown in Figure 1.1-1.

It is estimated that up to 50 tonnes of emulsion will be used per week during peak operations. Due to the remote location of the mining site, 100 tonnes of emulsion is proposed for storage. The storage will be in emulsion silos constructed by an experienced explosive supplier.

7.3 MAGAZINES

Two containers, constructed according to regulations, will be placed at the explosive magazine site as shown in Figure 1.1-1, which will be used as explosive storage magazines. The magazines will be used to store the detonators, shock tubes, detonating cord, boosters, cartridges and any old explosives prior to destruction. The layout of the magazine will be undertaken in line with explosive regulations and as such the following infrastructure will be provided:

- Pre-constructed detonator magazine for detonators (IEDs) and shock tubes, and
- Powder magazine for boosters and cartridges

The explosive magazines will be barricaded with rock berms and constructed 80 m apart allowing for 35,000 kg of storage in total in accordance with distance requirements for explosives storage facilities as specified in the Federal Explosives Act and Regulations.

8 ONSITE HANDLING

The explosives contractor will do all onsite handling, including operation of ammonium nitrate and emulsion silos and explosives magazine. Explosives handling will be done by qualified personnel using equipment designed for the handling and transport of such materials. Safe handling practices will apply to the handling and transport of explosives waste to the disposal site.

8.1 AUTHORIZED PERSONNEL

Only authorised personnel will be permitted to enter the magazine and explosives storage areas. The personnel will be listed in a register. A daily account of the persons entering the magazine will be maintained. The following are the type of personnel who will be permitted to enter the magazine and explosive storage areas:

- Appointed blasters;
- Explosive contractor employees;
 - Personnel required for explosive delivery; and
 - Personnel involved in site maintenance.
- Blasting assistants;
- Security guards (external area only, no magazine access);
- Mine Manager;
- Mines or explosives inspectors; and
- RCMP

8.2 HAZARDOUS MATERIALS MANAGEMENT

All personnel who will work with explosives will be trained and competent on the procedures for handling explosive materials. Explosives are hazardous materials due to their corrosive nature, although limited contact with explosives is not a health hazard. The personnel will be required to wear personal protective equipment, to prevent accidental exposure to the explosives. This will include:

- Goggles for eye protection;
- Appropriate coveralls;
- Impervious gloves;
- Boots; and
- Dust masks if required.

Personnel will also be trained on spill containment and emergency procedures relevant to explosives and to general mine site operations.

8.3 HOUSEKEEPING

In order to effectively manage explosives on site it is imperative that areas used for explosive storage and magazines are kept clean, and not used for any other storage. Good housekeeping is required on a daily basis for the magazines and explosive storage areas. At the blast site, empty boxes used for explosive storage will be removed and burnt or otherwise disposed of in a safe manner. As far as practical, the explosive blend truck delivering explosive to the blast drill holes will only be filled with the amount required for each blast. At the end of every shift, the outside of the truck will be cleaned. There may be a certain amount of explosive, referred to as the heel that the delivery system cannot extract from the truck. This will not be cleaned out of the truck unless the truck is no longer going to be used for explosive delivery, in which case the heel will be removed and disposed of appropriately.

Access to explosives magazines will be kept in good condition regardless of the time of year. Road maintenance in this area will be a priority, particularly during winter, as adverse weather conditions will increase the risk associated with transporting explosives.

8.4 EXPLOSIVES DISPOSAL

SGC is committed to the safe disposal of explosives when disposal is necessary. Safe disposal of explosives might be required if blasting material has been damaged during transport, or if it has deteriorated and become unfit for use. SGC or the explosives contractor will consult the manufacturer of the damaged explosives, or the Explosives Regulatory Division prior to disposal in an effort to minimize the associated risks. Damaged explosives will be packaged according to the Transportation of Dangerous Goods Regulations for transportation to a destruction site. Disposal of explosives will be done in accordance with SGC's commitments to environmental protection, and the associated regulations.

Intact emulsion explosives should feel smooth and pliable to the touch. If emulsion feels stiff or crusty, it has probably become insensitive and will likely fail to shoot. Wetness on the outside of the film cartridge or segregation of the ingredients indicates that syneresis has occurred and the product will likely fail to detonate.

Prolonged storage of bagged ANFO may result in leakage of fuel oil through the plastic. This creates a fire hazard within the contaminated magazine and, depending on the severity of the leak, it may be necessary to replace the contaminated floor sections. This will be prevented by turning over bags of ANFO to prevent oil migration and accumulation of oil on the bottom of the packaging.

Two methods of explosives disposal that will be employed are destruction by detonation and by combustion. The primary method of disposal will be to detonate small amounts of damaged explosives in a blast hole as part of a production blast. They can be placed in the bore hole under the collar or stemming. This will be done providing the explosives are still in good condition and can be transported to a production blast. Combustion is another method of disposal and will be done in a remote location, as there remains the chance of explosion during the burning process. During combustion, only one type of explosive is to be disposed of at a time. Special attention will be given to make sure no detonation devices are burned along with the explosives. Initiation devices are best disposed of by detonation at a location separate from the disposal site of the other explosives.

Under no circumstances will SGC abandon or bury explosives. Abandoning explosives is a serious offence under the Explosives Act, and any such action could be considered criminal negligence punishable under the Criminal Code. Explosives retain their properties for a very long time and will not be buried, as there would be serious risks associated with any subsequent activity at the disposal site.

9 BLASTING OPERATIONS

9.1 PLANNING

Each blast will be planned by the holder of a blasting certificate. The planning will involve determining as accurately as possible the quantities of explosives and accessories for each blast. The execution of each blast will be undertaken as follows:

- The mine plan will be assessed to determine which blast is being executed and the applicable dimensions;
- The holder of the blasting ticket will then examine the area for blasting, for misfires, unsafe face conditions above and below the bench to be blasted, and the blaster will ensure that the area into which the rock will be blasted is clear of any infrastructure or personnel;
- The blaster will then mark out the holes to be drilled according to the dimensions and the mine planning department instructions;
- After drilling of the holes, the blaster will then measure the holes to ensure they are drilled correctly and for determining quantities of explosives and accessories;
- The blaster will then plan the blast by calculating the appropriate amount of explosive, boosters, initiation systems components and other accessories;
- The explosives and accessories will be drawn from the magazines, and the explosive blend truck will be loaded;
- The blasting site will then be manned by a blasting assistant to ensure that no unauthorized person enters the site, or no other activity takes place at the site that could interfere with blasting procedures;
- Blasting accessories will be delivered to the blast in an approved explosive transportation vehicle, with appropriate warning decals;
- The blaster will check the accessories are the correct quantities;
- Boosters and down the hole initiation systems will then be distributed to the holes;
- The blaster will then commence with charging of the blast with help from blast assistants;
- If using pumped emulsion, the blaster will ensure that the emulsion is allowed to rise prior to closing the holes with stemming;
- Once the holes are charged and the emulsion has risen, the stemming will be placed into the holes;
- At this point the blaster will contact the mining personnel for the evacuation of the mining area to begin;
- Once stemming is complete the blaster will connect the down hole initiation system with trunk lines;
- The blaster will then leave an assistant to guard the blast and then undertake a check on the progress of the evacuation, place guards at access points and lay the firing cable for initiation;
- A guard will also be placed at the far end of the firing cable;

- Once satisfied that the mining area is evacuated the blaster will return to the blast and place the initiating detonator, connect the firing cable to the detonator and leave to the far end (safe firing point);
- At the firing point the blaster will make contact with all the guards at the mine access points to check that the area remains evacuated
- The blaster will then sound an alarm and initiate the blast;
- Once the blast has been completed, the blaster will re-enter after the dust and smoke has dispersed;
- The blaster will then check the blast for misfires and cut-offs and dangerous bench face conditions;
- If safe, the blaster will inform the mining crews that they can re-enter; and
- If not safe, the blaster will take action by either:
 - Re-firing misfired holes or cut-offs;
 - Marking any misfired holes and barricading the area as per regulations; and
 - Supervising any process for making the area safe (bench face hazards).

9.2 SAFETY PROCEDURES

There are several precautions that will be in place for the safety of the workers in the mine. While the mine supervisor holds senior authority over the workers, blasters have complete authority to control all activities at the mine site during blasting. The blaster therefore will personally oversee the evacuation to a safe distance of all personnel working within 500 m of the open pit, prior to blasting. Key factors which will be implemented for ensuring that evacuation processes are well managed include:

- Effective communication with mine personnel prior to blast;
- Clearly defined safe distances from blast site;
- Effective barricading of entrances to blast sites;
- Blaster will only leave the blast site last after checking that the site is clear and connecting the initiating detonator;
- Blaster will confirm that all blasting guards are in place and that all is clear prior to initiating the blast, and
- Alarm used will be designed to be heard by all personnel within 500 m of the blast to be executed.

Other factors that will ensure safe blasting include:

- The area to be blasted will be prepared to the satisfaction of the blaster;
- A smooth floor will provide a safe work area for the drilling and blasting crew;
- The blast pattern will be staked by the mine surveyors and blaster in accordance to the engineers' design;
- Access to the blast pattern will be attained from the blaster in charge;
- The pattern will be drilled in the sequence prescribed by the blast supervisor;

- Loading will be under the direction of the blaster in charge of the pattern;
- The blaster will follow the loading quantities of the engineered design;
- Modifications due to field conditions will be noted and reported;
- The explosives contractor will deliver the bulk product to the hole and track the quantity; and
- The blaster will sign for the delivery and file all paperwork for each blast undertaken.

9.3 TRAINING

Only trained and certified persons will be permitted to work with explosives. Employees working with explosives will undertake formal training and on-the-job training to ensure compliance with legislation. Safety training will include the identification of hazards, safety systems required for the handling, transport and manufacture of explosives, and any other specific rules needed to protect workers and facilities (NRCan 2014). Training requirements are to include theoretical and practical aspects of explosives including, but not necessarily limited to:

- General safety induction;
- Safety-critical procedures and controls related to explosives;
- First aid;
- Use of personal protective equipment (PPE);
- Workplace Hazardous Materials Information System so that the employees have the necessary information regarding the hazards of explosives, Material Safety Data Sheets, and proper labelling;
- The safety basis on why tasks are to be performed as specified;
- Emergency response; and
- Transportation of dangerous goods.

The explosives contractor and SGC will certify that their workers have received the necessary training to perform the duties required of their job, and understand the hazards of the materials to which they may be exposed in the course of their duties. Detailed standard operating procedures (SOPs) for the Project's Operation Phase will be developed specific to critical functions involving explosives. Should SOPs change, training will be provided to those employees who will be implementing the revised procedures.

Training records, including the subjects covered in each course, will be retained by the Human Resources Department, which will notify the employee and their supervisor when refresher training is required. Training records will be made available for inspection to NRCan if requested. The explosives contractor will keep a training record of its on-site staff.

9.4 EXPLOSIVES TRANSPORT EQUIPMENT

The explosives contractor will transport the explosives from the AN/Emulsion Storage Area to the blast site using a truck designed for the safe delivery of ANFO and Emulsion. The truck used for product transport will be capable of delivering explosives blends suited for both wet and dry conditions. The explosive blend truck will meet all conditions specified under the Occupational Health and Safety Act (OHSA) of Yukon. Placards will be

displayed on the side of all explosives transporting equipment as per the Transportation of Dangerous Goods Shipping Regulations.

The explosives blend truck will be equipped with a metering system that will enable SGC to reconcile the amount of explosives used with the amount of explosives delivered to site. This reconciliation will be an integral part of maintaining responsible explosives use on the Project.

Explosives delivery equipment will be managed under a strict maintenance program. The program will be designed to prevent mechanical failures that would endanger personnel or have a negative effect on mine production.

Blasting accessories such as detonators, delays, boosters and detonating cord, will be transported to the blast site in a separate vehicle than the ANFO. The detonators and packaged explosives will be stored separately in closed metal containers lined with wood, or other suitable material. The container will be secured to the vehicle to prevent unintentional unloading during transport.

The following inspection, as required under the OHSA, will be performed on each vehicle prior to the transport of any explosives.

- Fire extinguishers are filled and in working order;
- The electrical wiring is completely insulated and firmly secured;
- The fuel tank and feed lines have no leaks;
- The chassis, engine, pan and bottom of the conveyance are reasonably clean and free from surplus of oil and grease;
- The brakes and steering apparatus are in good condition; and
- The conveyance is in sound mechanical condition.

9.5 MANUFACTURING OF ANFO

Ammonium nitrate-fuel oil will be manufactured in the explosives blend truck, which will subsequently deliver explosives to the blast pattern. The explosives blend truck will be placarded accordingly and meet conditions specified under the Yukon Occupation Health and Safety Act, RSY 2002, c.159. The blast planner, in communication with the explosives contractor, will determine on a daily basis the quantity of ANFO or emulsion required such that no significant excess volume of explosives remain after the blast holes are loaded. Under no circumstances will the quantity transported exceed 20,000 kilograms (kg), which is the maximum allowable net explosive quantity under Transport Canada regulations.

The facility design for the housing the blend trucks are based on aiming to achieve a zero effluent process, and will be equipped with a water collection and evaporation system. The explosives blend truck(s) will be washed on a regular basis in a self-contained wash bay system to ensure that any explosives residue that may be present on the vehicle does not escape to the environment, and that the chassis and engine body are clean and free of excess oil and grease. All wash water will be collected and run through the evaporation system. Any residual solids from the evaporation system will be packed in approved packaging and subsequently loaded into a blast hole to be consumed during the next blast. Any waste or leftover explosives products generated through the manufacturing process will be disposed of in the same manner.

9.6 ADVERSE WEATHER CONDITIONS

Safety precautions will be employed during adverse weather conditions. The blasting supervisor will be able to advise personnel on the best way to proceed based on the severity of the adverse weather. Under no circumstances will blasting take place during an electrical storm. The blast site will be evacuated, and no electrical detonation equipment will be connected.

Snow removal will be a priority along the explosives transportation route. In the event of a snowstorm, the road between the explosives storage area and the blast site will be cleared of snow in preparation for blasting activities to resume. Road maintenance will be important after freshet and periods of heavy rainfall. Erosion due to water movement will be corrected in an effort to extend the functional life of the explosives transport route.

Adequate lighting will be made available at the blasting site in preparation for foggy conditions. Explosives equipment will be equipped with proper high visibility equipment, and proper communication measures will be employed to alert mine personnel of the presence of explosives. The blasting pattern will be clearly marked and control measures will be strictly enforced during the handling and connecting of detonation devices.

9.7 SMOKE, DUST AND FLY ROCK

While smoke and dust are common to every blast, some by-products of blasting include gases such as CO, CO₂ and NO_x, which in higher concentrations can be harmful to humans and wildlife. The gas concentrations are related to product quality, which can degrade due to factors such as groundwater conditions, length of time between loading and blasting, or the manufacturing process. Fortunately the gases disperse quickly.

The blaster will not give the “all-clear” until completely satisfied that the gases have dispersed and that the area is safe to approach. At that time, the guards will be removed allowing access to the area. Fly rock from blasting is potentially dangerous to personnel close to the blasting site and can be minimized by best practices in blast design, and stemming. The blaster and blasting supervisor assess the potential for fly rock in every blast, and from that they determine the blasting danger zone, and to where guards and personnel will be evacuated.

9.7.1 Fly Rock Prevention

As much as possible, fly rock will be prevented through blast design. In order to minimise fly rock, two major design factors will be considered:

- Burden stiffness ratio - to reduce fly rock, SGC will ensure that the bench height to burden ratio is approximately 2. Any blast with ratios lower than this will result in the explosive energy being directed upward, whereas at higher ratios the explosive energy is directed horizontally (generally into the pit). If the ratio is too high, accuracy of drilling may become an issue, which can result in fly rock through under burdened holes close to the free face.
- Stemming height – to reduce fly rock, SGC will ensure that the stemming height is a minimum of 0.7x the burden. Adequate stemming material is required to contain the blast energy. Insufficient stemming heights will result in explosive energy being directed upwards causing excessive flyrock.

9.8 MISFIRES

Modern day blasting technology when handled by trained and competent personnel is designed to reduce the possibility of misfires, through construction materials, sensitivity of explosives and precise initiation systems.

Nevertheless there is always a residual risk of misfires, for which a procedure will be put in place to prevent further injury due to unexploded explosives.

Misfires will be dealt with as specified in the OHS Regulations. If there is evidence or suspicion that a misfire has occurred when using electronic detonation equipment, a minimum of 10 minutes will be allowed to elapse from the time the blasting cable is disconnected and short circuited.

The personnel tasked with dealing with a misfire will be kept to a minimum and restricted to personnel trained for blasting or on handling of explosives.

The blasting certificate holder will direct the removal of as much material as possible in an effort to assess the situation. Equipment for handling misfires will only be used as directed by qualified blast personnel. The blaster will ensure that the lighting of the blast site is adequate, and the proper safety precautions have been taken to prevent accidental detonation.

When a misfire is suspected, the area will then be roped off using non-metal markers in a manner approved by the supervisor. The minimal distance for a misfired hole to be marked off is 8 m around the collar of the hole. A misfired mixture of ANFO will be washed out of the hole in preparation for another blasting attempt.

If drilling is required following a misfire, the blaster will determine the location, direction, and depth of any hole required for blasting the misfired charge. The blaster making this decision is to remain on site and supervise the drilling of this hole. The new hole will be drilled a minimum distance of 1.5 m away from the misfired hole. The location of any remaining misfired shot will also be recorded at the end of the shift.

9.9 VIBRATION

Vibration induced by blasting can result in damage to building structures and infrastructure. Due to the remote location of the mine, there are no public structures, which could be affected by blasting. The mine will take caution however, to keep vibration low to ensure that engineered structures, such as pond and the HLF embankments, and the process plant are not affected by blasting induced ground vibration. The predominant means of limiting ground vibration is to keep critical infrastructure away from the mine. Secondary to that is to ensure that the blasting is planned such that a limited explosive charge is set-off instantaneously. This is achieved through millisecond delays between each hole in the initiation system. Two different delays are often used to ensure that a blast timing system limits the number of holes, which instantaneously detonate.

The graph in Figure 9.9-1 below highlights the relationship between peak particle velocity, explosive charge (shown as number of holes per delay) and horizontal distance from the blast.

For a typical 50 hole blast, expected to be undertaken daily at Eagle Gold, Nonel tubes with 25 millisecond delays and 17 millisecond trunk lines will be used for the timing of the holes.

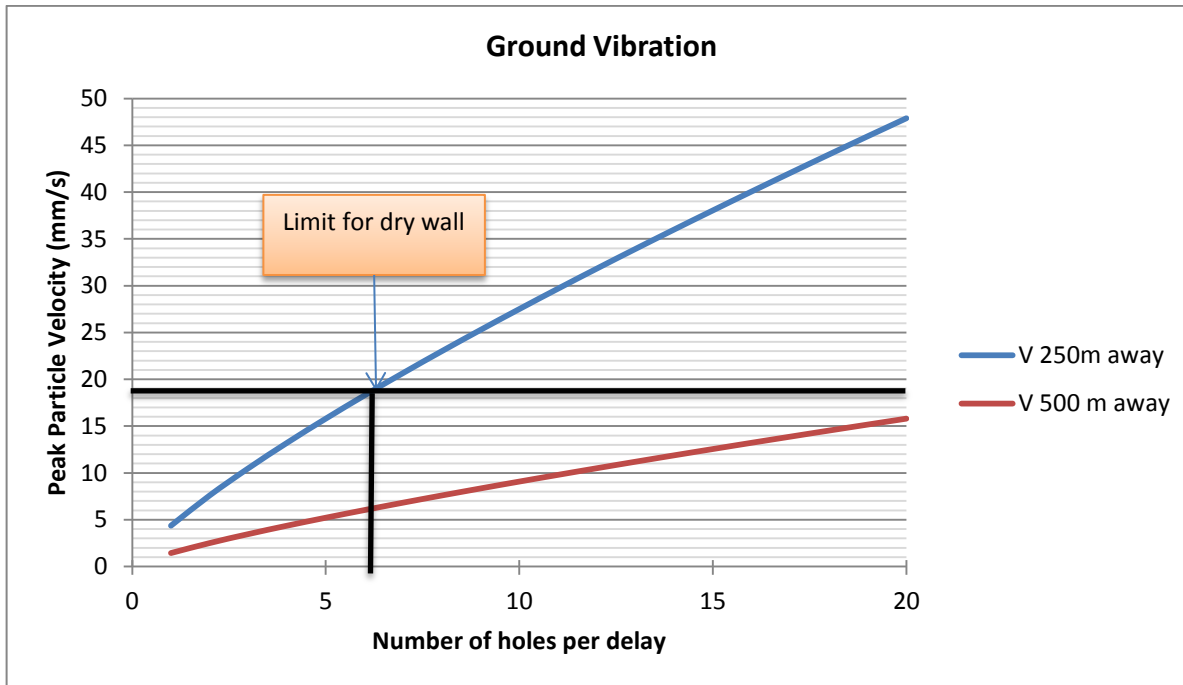


Figure 9.9-1: Peak Particle Velocity Relationship Between Number of Holes per Delay and Distance from Blast

9.10 INVENTORY MANAGEMENT

The federal Explosives Act requires that the following explosives products records be kept:

- Quantity and strength of each explosive manufactured; and
- Quantity of each explosive issued to the Mine Site from the explosive blend truck, including the dates of shipments and quantity of each explosive on-site.

The explosives contractor will perform daily and weekly inventories of AN and emulsion silos and will keep a record of explosives used to ensure an accurate inventory is documented. The inventory of blasting materials remaining available and the amount used will be provided to the mine management on a daily and weekly basis.

Project staff will conduct daily inspections of the magazines that store the dynamite, boosters, delays, lead-in lines, and detonating cords, and will provide an inventory to mine management. Both the explosives contractor and SGC will keep a log book of the inspections and inventories, and provide weekly reports to mine management.

9.11 INSPECTIONS

Weekly inspections by the contractor and SGC staff are conducted to ensure compliance with the regulations, licenses, procedures, and policies. An annual audit will also be undertaken. These audits will be undertaken following written procedures and will record action items and subsequent corrective actions taken. Inspection records will be made available to the NRCan upon request (NRCan 2014).

Access to and use of explosives will be under the exclusive control of SGC. SGC staff who have received proper training will be responsible for inspection of all explosives equipment and facilities, including the AN and

emulsion storage areas, as well as the magazines. The explosives blend truck(s) and the parking garage will be inspected by the explosives contractor who will provide independent inspection reports to mine management.

SGC staff will provide weekly reports to mine management that will include:

- Change in the duties of personnel and new staffing;
- Safety concerns or incidents noted in the use of explosives;
- Total explosives consumption;
- Quantity of AN and emulsion remaining on-site; and
- Inventory of other explosives and accessories.

9.12 REPORTS AND RECORD KEEPING

As part of permit and licensing requirements for explosive use, meticulous record keeping will be undertaken. In particular the following records will be kept:

- All permits and licences for inspections;
- Certificates of blasting crews;
- All records of regular facility inspections;
- Design plans for magazines and explosive storage facilities;
- Explosive delivery records (weigh bills);
- Magazine stock taking records;
- Records of explosive withdrawals from magazines and explosive storage facilities;
- Climate data for explosive storage facilities and magazines to ensure that temperature thresholds have not been exceeded;
- Blast records showing date, blast number, blast layout, explosive quantities used and name of person initiating the blast; and
- Records of any disposal of explosives.

These records will be kept in an orderly state and kept in a safe dry area. The records will be easily accessible for inspections and will be cross referenced to ensure that the records can be used in an accident or incident investigation.

9.13 SPILL CONTAINMENT

SGC will assess the spill containment action required for any incident. Prior to the manufacture of ANFO, AN will be present on the mine site. AN is water soluble and has the potential to dissolve in water and be entrained in runoff or infiltrate into groundwater, which could affect nearby water supplies. In the event of a spill, the AN will be cleaned up immediately and disposed of accordingly. Spilled ANFO will be collected and disposed of in the same manner as other explosives waste produced on site. Loading sites will be kept clean by shovelling spilled ANFO into the nearest blast hole for detonation. ANFO spills outside of these active blasting areas will be cleaned up immediately. Water quality monitoring locations will be monitored to determine the downstream

effect of explosives use. Water quality will be analyzed to ensure all water leaving the mine site is in accordance with the most current water use license.

9.14 CONTINUOUS IMPROVEMENT

SGC is committed to the safe and environmentally appropriate usage of explosives. Blasting practices will be reviewed periodically and compared with industry best practices to identify areas of improvement. As described in the Environmental Monitoring and Adaptive Management Plan, water quality monitoring will be an essential part of determining the environmental effect of using ammonium nitrate based explosives; monitoring data will provide input to improve the safe and environmentally sound usage of explosives. SGC will work with the blasting contractor to select products and produce blast designs that prove to be the most efficient and environmentally stable.

10 ENVIRONMENTAL CONSIDERATIONS

Though the management of explosives for safety reasons will be methodical to the point where spills and harmful emissions from explosives are effectively eliminated, robust procedures will none the less be in place in case of unforeseen events. This includes the provisions in the following sections.

10.1 BERM AROUND STORAGE FACILITIES

For safety and environmental considerations, a berm of at least 1.5 m in height will be placed around the magazines and explosives storage areas. This berm is in addition to berms constructed around explosives magazines, as they have a different function. The berm around the area will be used to deflect an explosion within the magazines and to contain any spills that occur within the magazine and explosive storage areas. The berms will be constructed such that water will accumulate in a sump or diversion ditch, and this water will be collected as mine contact water, by design, and prevented from entering natural water courses.

10.2 SPILL CONTINGENCIES

Releases of ammonium nitrate or its breakdown products into surface or ground water can occur during or following the blasting process. These issues are best managed through a well thought out and responsible blast loading plan, which are coordinated with the Operations Water Management Plan and the Spill Contingency Plan. As such a standard operating procedure for blast loading will be developed to minimize the potential for ammonium nitrate to become associated with water. Additionally SGC will require that a specific spill contingency plan for explosives is developed by the explosive contractor and incorporated into the Spill Contingency Plan. The plan developed by the explosives contractor will indicate the manner of containing and disposing of any spilled explosive and/or affected soil.

10.3 OLD EXPLOSIVES

Though every effort will be made to deliver to site only the quantity of explosives that will be used in a timely manner, there is the possibility of unusable old explosives occurring on site. The explosive contractor will be required to develop a procedure for disposal of old explosives that are expected to have lost some or all of the explosive potential.

11 NITRATE MANAGEMENT

The largest risk to the environment results from the hygroscopic properties of ammonium nitrate. Once mixed with emulsion (diesel and emulsifying agents), it becomes hydrophobic and will not readily dissolve in water or contaminate water bodies. The manner in which nitrates will be managed, to prevent the release of nitrates into any water resource on the mine site is outlined in the following sections.

11.1 PREVENTION OF SPILLS

SGC will require the explosive contractor to ensure relevant personnel are trained and competent in handling of explosives. Standard Operating Procedures will be drawn up to ensure that spills are minimised and, if they occur, are handled appropriately. Any minor spills, which occur at the truck loading areas, will be required to be cleaned up immediately and the contents disposed of by including the spilled material into blast holes prepared for immediate blasting.

Should an AN spill occur, the spill is immediately cleaned up and reported to site Environmental Personnel for subsequent reporting as defined in the Spill Contingency Plan. However, with adherence to Best Management Practices for storage and handling there is minimal risk of AN spillage. Once on site, spill locations would be limited to the interim storage pad and the temporary handling facilities and these areas will be inspected regularly according to operating procedures.

Spill prevention and response actions will include but is not limited to the following:

- Establish and use Safe or Standard Operating Procedures (SOPs) for handling and working around storage areas;
- Regular inspections with frequency driven by activity levels;
- Cleanup is best performed with dry AN (to be completed according to an established Operating Procedure); and,
- Manage and limit contact with snow and water, with particular anticipation of spring thaw/freshet period.

Disposal of spill material and any impacted rock pad material shall be dealt with appropriately, which could include placing within a blast pattern prior to initiation.

11.2 BERMS AROUND STORAGE AREAS

At the explosive storage facility and at the magazines, large berms will be placed for safety reasons and to prevent the release of affected water from the explosives storage site. All affected water will be contained within the berms. Water collected within explosive storage areas will be managed in accordance with the Operations Water Management Plan

11.3 WET HOLES CHARGED WITH EMULSION

Where water is encountered in blast holes, emulsion explosive will be used to prevent dissolving of explosive in water and will detonate under water. Any emulsion spilled during charging of blast holes will be disposed of in the blast holes, prior to blasting, such that it will be destroyed during blasting.

12 REFERENCES

Bajpayee, T.S., Verakis, H.C., Lobb, T.E., An Analysis and Prevention of Fly Rock Accidents in Surface Blasting Operations.

Explosives Regulatory Division. Explosives Safety and Security Branch. Minerals and Metals Sector. Guidelines for Bulk Explosives Facilities: Minimum requirements. July 2010. Revision 5.1.

NRCan (2014) Guidelines for Bulk Explosives Facilities Minimum Requirements. Explosives Regulatory Division. Explosives Safety and Security Branch. Minerals and Metals Sector. February 2014. Revision