PILITAK ENTERPRISES LTD

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QUARRY AND BLASTING MANAGEMENT PLAN

Arctic Bay Harbour Development

CW2405837

Submitted to:

Public Services and Procurement Canada

Rev-01: June 2026

June 19, 2026

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June 19, 2026

Review : **Jean-Marc Ballard**
Environmental Monitor

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1. INTRODUCTION

The purpose of this document is to present the Quarry and Blasting Management Plan in order to describe the design, the development and the operation of the quarry from initial development through to final reclamation.

The construction project was awarded to Pilitak Enterprises Ltd (PEL) in February 2026 by Public Services and Procurement Canada (PSPC) for the Department of Fisheries and Ocean (DFO). At the end of August 2026, heavy equipment, camp facilities and material will be delivered by sealift to Arctic Bay. The project consists mainly of the construction of a new breakwater with fixed wharf, a boat launch ramp, small craft floating docks laydown area and lighting. The new marine infrastructure will be constructed during the summers of 2027, 2028 and 2029 while preparation work will be carried out during the fall of 2026.

Quarry development will commence in August 2026 following the arrival of the annual sealift. Quarry operations will continue throughout the 2027, 2028 and 2029 construction seasons. Upon completion of quarry activities, the site will be reclaimed while remaining accessible and available for future development to meet the needs of the Arctic Bay community. This plan is based on the information currently available and will be revised, as required, based on site observations and field conditions encountered during the quarry development.

1.1 ADDITIONAL DOCUMENTATION

The latest version of the following documents, which have been issued for the current project, must be used in conjunction with the present plan:

Document	**Current Revision**
Contract specifications and drawings	Specifications (IFT) Drawings (IFC)
Construction Environmental Management Plan (CEMP)	Rev. 2
Contractor Construction Environmental Management Plan (CCEMP)	Rev-01
Traffic Management Plan	Rev-01
Erosion and Sediment Control Plan	Rev-01
Health and safety and Emergency Response Plan	Rev-00
Archeological Resource Discovery Plan	Rev-01
Spill Prevention and Contingency Plan	Rev-01
Waste Management Plan	Rev-01

Wildlife Protection and Monitoring Plan	Rev-00

The conditions of the following licences and permits issued for this project shall be complied with:

Permit/licence	
Nunavut Planning Commission (NPC)	No. 149437
Nunavut Impact Review Board (NIRB)	No. 21UN004
Nunavut Water Board (NWB)	8BCABH2125
Fisheries Act Authorization (FAA)	20-HCAA-00155
Environment and Climate Change Canada (ECCC)	PNR-00214-1
Transport Canada (TC)	2021-603772
Quarry permit (Municipality of Arctic Bay)	Q001AB (attached in Appendix 2)
Natural Resources Canada (NR Can)	To be issued

1.2 OBJECTIVE AND DEFINITIONS

The main objectives of this plan are described below:

- Present the development steps of the quarry;
- Detail the drilling and blasting procedures;
- Explain the explosive management;
- Present the reclamation plan at the end of our operations.

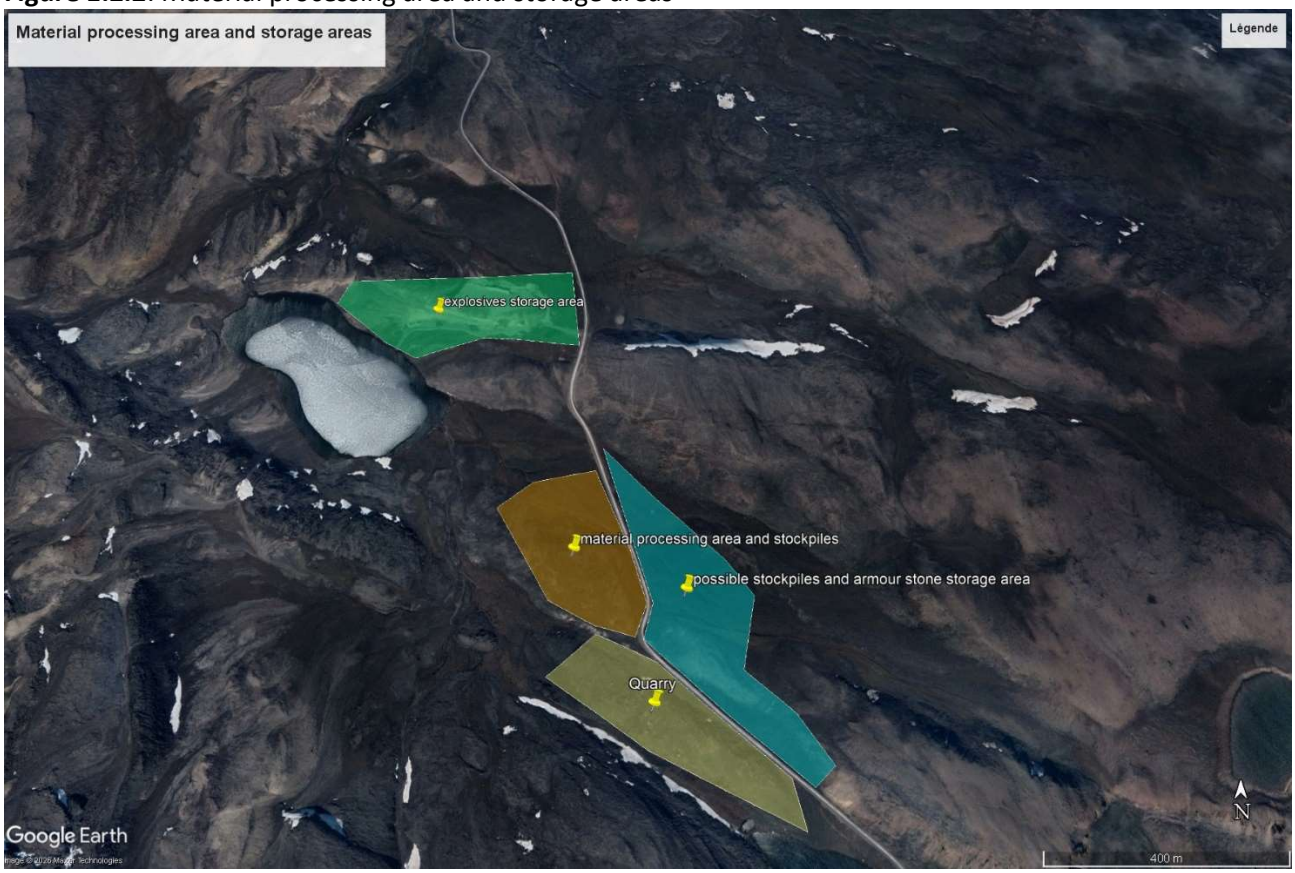
The proposed quarry is located approximately 1.5 km northwest of the SCH site, on the west side of the road leading to Victor Bay, as shown in **Figure 1.1.1**. Within the proposed quarry limits, the rock outcrop has a base elevation of approximately 109 m and reaches a maximum elevation of about 133 m at its highest point.

The rock extracted from the quarry will be processed in a flat area located approximately 200 m north of the extraction site, as shown in **Figure 1.1.2**. The proposed quarry footprint covers an area of approximately 17,000 m². The quarry floor will be established at an elevation of approximately 110 m, with quarry faces ranging from approximately 2 m in height along the western boundary to 14 m along the southern and eastern boundaries.

The total volume of rock required for the project is estimated at approximately 150,000 m³, including allowances for losses associated with rejected material. This volume may increase if the rock mass is found to be highly fractured.

Figure 1.2.1: Quarry location

Figure 1.2.2: Material processing area and storage areas



1.3 EXISTING SURFACE AND BEDROCK CONDITIONS

According to the geotechnical investigation, "the subsurface conditions included 1.6 to 2.2 m of colluvium and/or frost shattered bedrock, overlying diorite bedrock. The bedrock type was assessed as Quartz Diorite. The bedrock and was generally described as medium to coarse grained diorite, dark grey to black and red. The rock mineral composition of the Diorite included predominantly quartz, plagioclase feldspar, amphibole and biotite. The rock fabric was logged as massive. Field estimates of rock strength ranged from R2 to R4 (weak to strong) and typically R4 (strong). UCS test results ranged from 50 to 66 MPa (based on two samples) indicative of strong rock. Recovered rock cores were generally fresh rock, however slightly to moderately weathered rock, primarily frost shattered, was intersected in the upper 1.6 m in borehole BHQ21-02 and 2.8 m in borehole BHQ21-01B. "

1.4 ROCKS FOR LOCAL CARVERS

Local artists currently source marble/dolomite rock for their carvings from the northern portion of the quarry area, as shown in **Figure 1.5.2.** According to the project specifications, a 1-tonne stockpile of carving stone shall be prepared for the local carvers at the start of the project. The location of this stockpile will be determined in consultation with the local users. If required during the project, the stockpile will be replenished as needed. Upon completion of the work, access to the carving stone source area will be reinstated.

1.5 TOPOGRAHY AND HYDROGEOLOGY

The natural drainage paths in the surrounding of the quarry area are indicated in the **Figure 1.5.1**. The surface water in the vicinity of the quarry flow mainly to the north – northwest, to reach out the Alternate Water Supply Lake, located about 600 m downgradient. The water surface elevation of the lake is approximately 76 m, while the quarry floor will be at an elevation of ±110 m, representing an average slope of approximately 6% from the quarry toward the lake. The terrain between the quarry and the lake is mainly covered with tundra and rocks.

The runoff from the quarry and the processing area will discharge into existing drainage paths leading to the Alternate Water Supply Lake. To mitigate the potential migration of fine materials into the drainage system, silt fences and catch basins will be installed. Their exact locations will be determined once on site. A culvert will also be installed across the quarry access road to be constructed, as shown in **Figure 1.5.2**.

It is expected that no runoff originating from the quarry or the processing area will flow toward Dead Dog's Lake.

***Figure 1.5.1**: Drainage path in the quarry area*

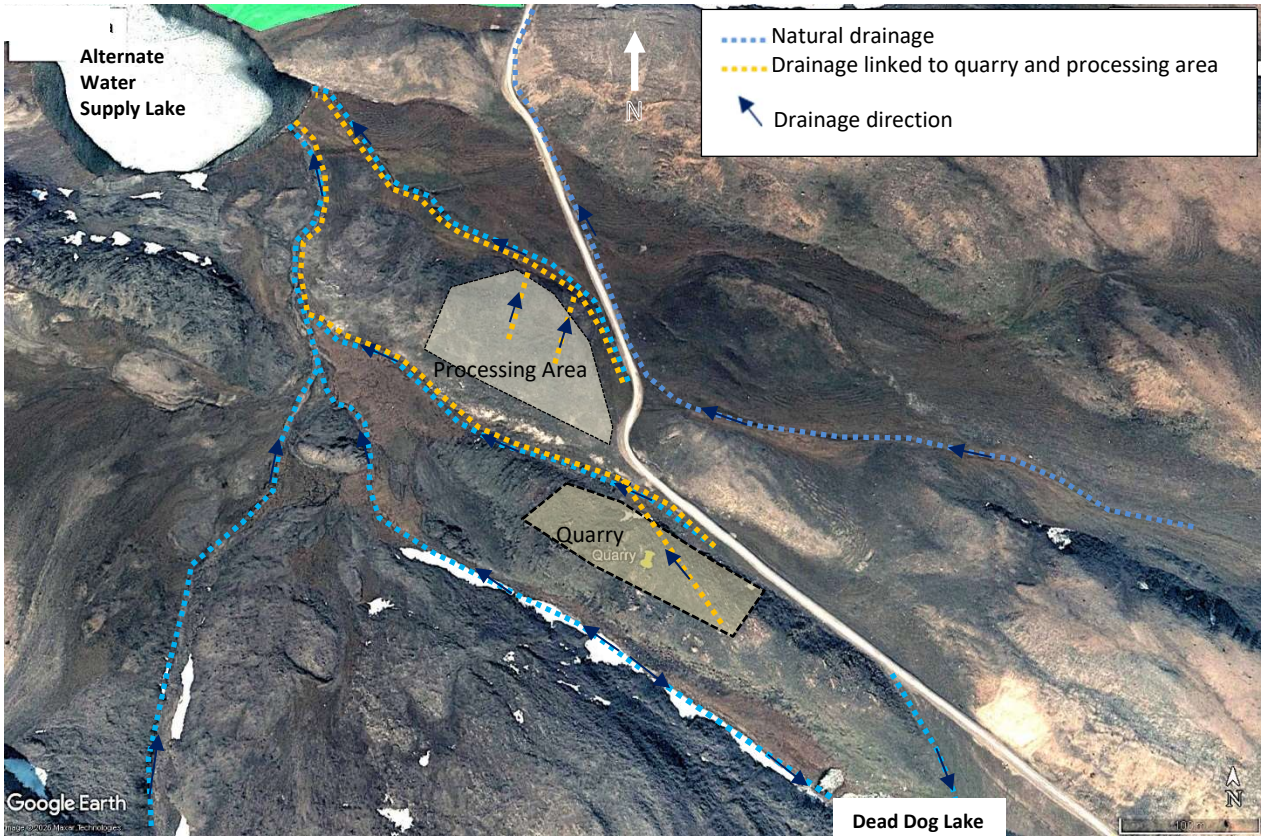
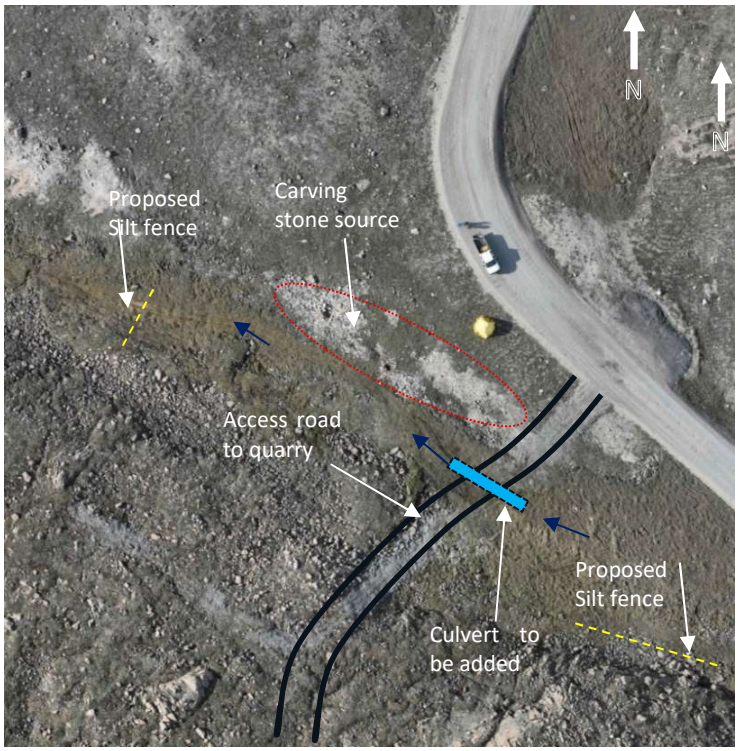


Figure 1.5.2: *Culvert to be added*



2. QUARRY DEVELOPMENT

2.1 CLEARING AND GRUBBING

Prior to the development of each quarry section, the organic vegetation mat and upper soil horizon, where present, will be stripped and stockpiled for use in future site rehabilitation and reclamation activities. Grubbing and stripping operations will be carried out in a manner that minimizes disturbance to adjacent undisturbed areas. Care will be taken to ensure that vegetation, soils, and other grubbed materials are not pushed, deposited, or otherwise displaced into areas designated to remain undisturbed. Stockpiled materials will be managed to preserve their suitability for future reclamation purposes.

2.2 SNOW REMOVAL AND LOCAL WATER MANAGEMENT

Positive drainage will be incorporated in the quarry design as development progresses. The pit floor will also have a positive grade applied for drainage to flow and to minimize ponding effects. Grades will not exceed 2% to avoid adverse flow and erosion problems. The drainage will exit the pit floor to natural ground elevations at the north end of the quarry.

At the end of each season, rocks will be removed from the pit floor in order to facilitate the snow removal at the beginning of the next construction season. The accumulated snow during the winter will be cleared out from the pit floor and stockpiled outside of the work area, away from natural drainage, water course and wetlands. Erosion and sediment control measures will be implemented where needed, according to the site conditions and to the Erosion and Sediment Control Plan (ESCP).

2.3 DEVELOPMENT PHASES AND PROCESSING

2.3.1 Development phases

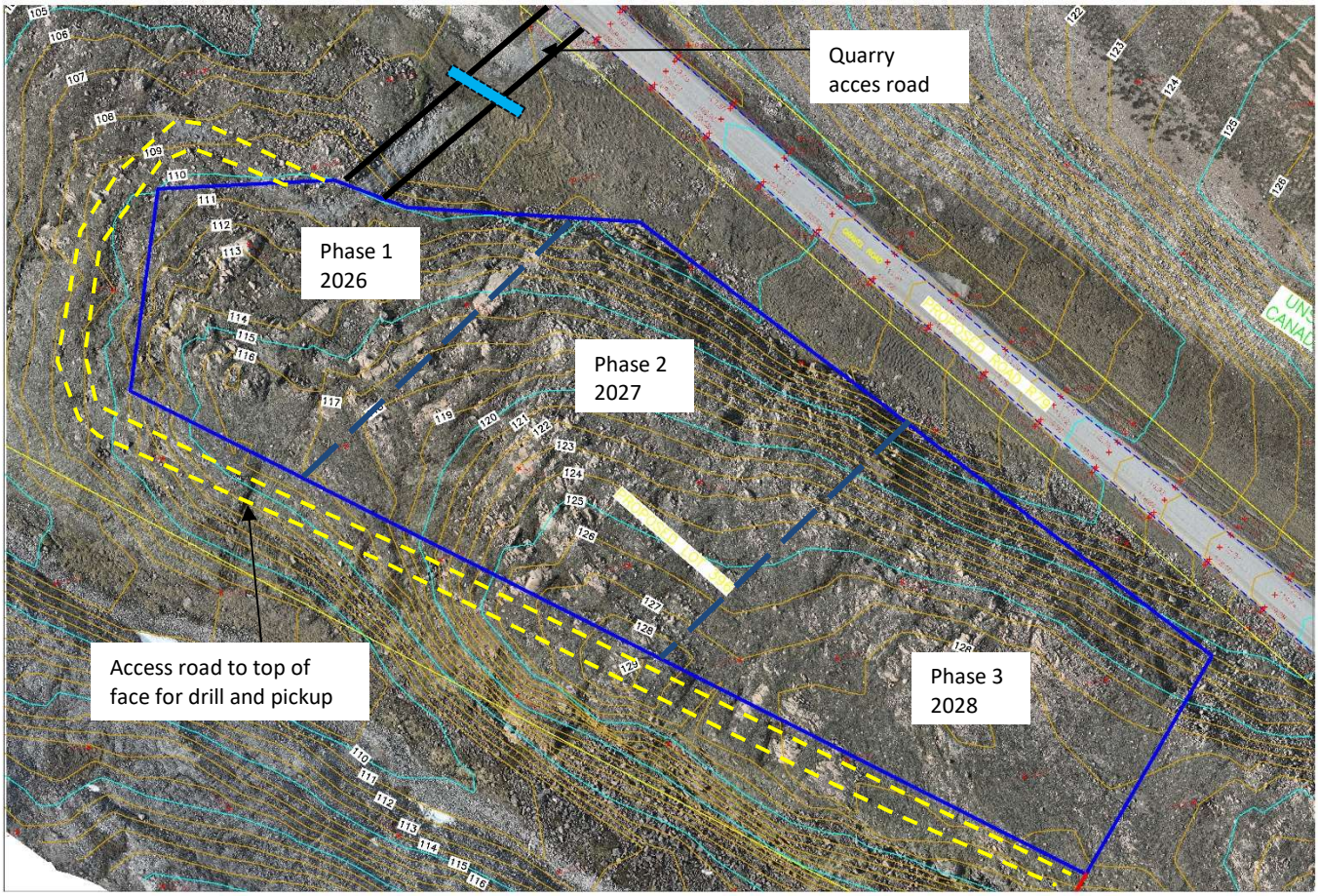
The quarry site will be developed as a drill-and-blast rock quarry, with extraction commencing from the northern end of the pit, as shown in **Figure 2.3.1**. Phase 1 of the development is scheduled for Fall 2026 and will focus on improving access to the quarry and producing aggregate material required for site preparation activities. This initial phase will also expose a clean rock face, allowing the main geological features of the deposit to be observed and assessed. A trial blast will be conducted under the supervision of an independent blasting

expert to determine the optimal drilling and blasting pattern for maximizing quarry yield and armour stone recovery.

An access road will be constructed along the southeastern edge of the quarry to provide access for drilling equipment and to facilitate the transportation of explosives.

Phases 2 and 3 will be carried out during the 2027 and 2028 construction seasons. During these phases, all rock products and aggregate materials required for the project will be produced.

Figure 2.3.1: *Quarry Development*



2.3.2 survey

An initial ground topographic survey will be completed prior to the commencement of quarrying activities in 2026 and at the beginning of each construction season. Additional

topographic surveys will be conducted at the end of each construction season to document site conditions and monitor quarry development.

2.3.3 Processing

Rocks meeting the requirements for Type 1 armour stone, with dimensions ranging from 900 mm to 1,200 mm, will be selectively removed from the blasted rock mass using an excavator. The material will then be transported and placed in windrows along the Victor Bay access road or at the material processing area, depending on space availability. All rock with dimensions smaller than 900 mm will be transported to the processing area and stockpiled prior to processing.

Oversized rock will remain in the quarry and will be reprocessed using an excavator equipped with a hydraulic hammer to reduce the material to sizes that meet the armour stone specifications. In certain cases, oversized material may be reduced by the drilling and blasting crew using a small secondary charge ("pop shot") to break the rock into usable material that meets the required specifications.

Material smaller than 900 mm will be processed through the riprap screening plant, which will be configured to simultaneously produce Type 2 armour stone, Type 1 fill material and Type 2 fill material. All material smaller than 25 mm will be rejected and stockpiled for subsequent processing into other products required for the project.

2.3.4 Equipment

<u>Rock processing Plant</u>

- Rip Rap Plant Lippman VGF6224
- Screener Plant and conveyor JCI-FT6203
- Excavator Komatsu PC-650-11
- Excavator PC-490 LC8
- Loader Komatsu W500-8
- Dump truck HM-300 (2)

<u>Rock crushing plant</u>

- Rock crusher Pioneer FT2650
- Rock crusher JCI FT 300
- Excavator PC-490 LC8
- Loader Komatsu W500-6
- Dump truck HM-300

2.3.5 Dust Control

For dust control on roads and access roads, both water and calcium chloride will be applied to minimize airborne dust. Water will be distributed using a water truck equipped with a rear spreader bar to ensure even coverage. Calcium chloride will be applied using a 2-tonne spreader mounted on the back of a pickup truck.

Dust control during screening and crushing operations is achieved through the application of water. Water is sprayed through a hose fitted with a small opening to create a fine mist, which helps suppress and reduce airborne dust generated by these activities.

2.3.6 Material gradation testing

Fill Material

For Type 2, Type 4, Type 5 and Type 6 fill material, gradation testing will be performed by an independent laboratory located in southern facilities. Samples will be transported to the laboratory by air. Approximately 45 kg of material will be collected for each sample and placed in clearly labelled plastic bags prior to shipment. The gradation of Type 1 fill material will be tested on-site. Material gradation testing will be conducted at the following frequency:

Material Type	*Quantity to produce*	*Minimum Testing Frequency*	*Minimum Sieve/gradation analysis quantity*
Type 1	74,985 m3	2	2
Type 2	11,510 m3	1 per 2,000 m3	6
Type 4	1,950 m3	1 per 500 m3	4
Type 5	3,130 m3	1 per 500 m3	6
Type 6	510 m3	1 per 300 m3	2

Armour stones

For the armour stone production, sample stones will be identified at the production area to allow the operator during sorting to judge sizes necessary for producing armour stone of suitable gradation. Stones representing D15, D50, and D85 will be marked. Sample stones will be weighed and identified in the presence of the Departmental Representative and approved by the Departmental Representative and will remain visible at the sorting area until placement of the last riprap.

Each type of rock will be graded between the limits specified with the longest dimension of any piece not greater than 2.5 times its least dimension. For riprap, mass governs the gradation, not the nominal size. Normal size is defined as:

$$D = 1000 * \left(\frac{W}{2.65} \right)^{1/3}$$

Where W is the mass in tonnes and D is the nominal size in millimetres. The rocks will be weighted with a rock grapple equipped with a crane scale. Armour stone gradation testing will be conducted at the following frequency.

Material Type	*Quantity to produce*	*Testing requirement*	*Gradation testing quantity*
Armour stone Type 1	19,820 m3	--	2
Armour stone Type 2	4,910 m3	--	2

Rip rap plant and screener plant typical setup

2.4 ACID ROCK DRAINAGE

The results of the Potential Acid Generating (PAG) testing conducted on rock samples collected from the exploratory drill holes in the quarry, as part of the geotechnical study completed for this project, indicate that the rock is classified as non-potentially acid generating (Non-PAG). However, recognizing that geological variations may be encountered during quarry development, special attention will be given to identifying signs that may indicate the presence of sulphide-bearing rock, including:

- Evidence of oxidation or mineral staining, such as rock discoloration or a “rusty” appearance. This may include, but is not limited to, yellow-brown, red-orange, white, or green staining.
- The presence of visible sulphide minerals, such as pyrite, pyrrhotite, or chalcopyrite, occurring as disseminations, veinlets, or fracture infillings.
- A noticeable sulphurous (“rotten egg”) odour released during excavation, drilling, or rock breakage.
- Dark grey to black mineralized zones that may be associated with sulphide mineralization.

- Zones of intense fracturing, shearing, alteration, or mineralization that may indicate favourable conditions for sulphide occurrence.
- Groundwater seepage exhibiting unusual staining, precipitates, or discolouration associated with mineralized rock.

Any visual indication or variability in the rock type as described above, or additional rock types are noted will be reported to the Departmental Representative. The affected rock material will be stockpiled separately until further instructions are provided.

As part of the Water Licence requirements, runoff from the quarry will be monitored and tested for three parameters, including pH. Particular attention will be given to any decrease in pH, as this could indicate the presence of Potentially Acid Generating (PAG) rock.

3. DRILLING AND BLASTING

The drill pattern for the initial blasts will be adjusted based on observed site conditions and the requirements of site development. Typically, to produce smaller rock fragments during the early stages of development, a drilling pattern of 2.4 m × 2.4 m is used, with a powder factor of approximately 1.0.

For the production of materials required for the project, the primary objective is to produce Type 1 armour stone. The remaining blasted material will be processed to produce the other aggregate products required for the project. The initial drilling pattern will be established based on recommendations from the blasting specialist to determine the optimal drilling and blasting configuration for maximizing quarry yield and armour stone recovery. The drill pattern will subsequently be adjusted based on the results of the initial blasts and any changes observed in geological conditions. Boreholes will have a diameter of 4½ in. and will be drilled to the planned pit floor elevation, currently established at Elevation 110 m. The pit floor will be sloped to provide positive drainage toward the north.

It should be noted that blasting operations at the quarry will be conducted such that any fly rock is directed northward, away from the community. All blasting operations will be conducted during daytime hours.

3.1 PERMITTING AND QUALIFICATIONS

An explosive license for the acquisition and storage of explosives is in process to be obtained through Natural Resources Canada for the Project.
Considering that the quarry is located in the alignment of the runway, an aeronautical assessment form was sent to transport Canada and a land use proposal to NAV Canada in order to advise them that blasting operations will be carried out at the new quarry. These notifications shall be done at the beginning of each blasting season. A NOTAM (Notice to Airmen) agreement for blasting will be issued by NAV Canada when required.

All explosive handling and blasting operations will be carried out by our licenced explosive specialists.

3.2 EQUIPMENT AND EXPLOSIVES

The following equipment will be assigned to the drilling and blasting operations.

Equipment

- 2 Drills Sandvik DX800
- 2 explosive magazines, capacity 2,500Kg
- 2 explosive magazines, capacity 7,500Kg

- 6 explosive magazines, capacity 10,000Kg
- Pick up truck with explosive magazine, capacity 900 Kg

The following explosives and accessories will be used. The safety data sheets are presented in Appendix 2.

Explosives

- ANFO bags Rioxam HD
- ANFO bags Rioxam WR
- Packaged emulsion 1.5 Normite V 2.5'' x 35''
- Cast boosters AES 12/14 OZ
- Non-electric detonators Daveynel 42 ms x 6m
- Non-electric detonators Daveyquick DDX 15m/21m
- Electric detonator Riodet IZ, 5m
- Electric detonators Daveydet, 4m

3.3 EXPLOSIVE MANAGEMENT

The explosives will be transported in six marine containers prepared and clearly identified for both ground and marine transportation in accordance with the Transportation of Dangerous Goods (TDG) Regulations. In compliance with applicable regulatory requirements, the explosive magazines will be transported empty to their designated installation locations. Upon arrival in Arctic Bay, the explosive containers will be transported to the designated explosive storage area located near the quarry, where their contents will be transferred to certified explosive magazines. The explosive containers will be continuously monitored and secured 24 hours a day until all explosives have been transferred to the magazines.

When boreholes are ready to be loaded, explosives will be transported from the storage magazines to the quarry using a pickup truck equipped with a certified explosives magazine mounted in the truck bed. The transportation, handling, and use of explosives will be carried out in accordance with applicable federal regulations and industry best practices. The following procedures will apply to the transportation and handling of explosives:

- Transportation and handling of explosives to be done only by authorized and qualified personnel;
- No smoking or any source of light or fire shall be allowed near explosives;
- Explosives and detonators are to be transported into separate magazines;
- A daily Inventory of the explosives shall be done;
- Ensure the stock of explosives is rotated so that the oldest stock is used first;
- Explosive magazines are to be weekly inspected;
- Empty packages shall be removed immediately and destroyed;

- Proper signage to be installed on magazines and vehicles
- In the event of spillage, collect explosive materials using non-sparking tools and implements and place in suitable container

During the winter shutdown period, the explosive magazines will be inspected weekly by a designated local worker to verify their security, integrity, and compliance with applicable permit conditions. Inspection records will be maintained and any issues identified will be reported and addressed promptly.

3.4 SAFETY PERIMETER

The quarry and material processing areas will be restricted to authorized workers and project vehicles, with the exception of occasional users requiring access to the carving stone source. These users will be met with in advance to establish a protocol ensuring safe access.

Before each blast, the road to Victor Bay will be temporarily closed for 300 metres on each side of the quarry. The public will be notified at least 12 hours and again 2 hours in advance through the project Facebook page and local radio announcements. A designated vehicle, staffed by a worker equipped with an FM radio, will control access on each side of the closure and await instructions from the site superintendent before reopening the road. The road closure is expected to last no longer than 30 minutes.

3.5 BLASTING PROCEDURES

The following blasting procedures will apply:

- Two trucks will be positioned to block the Victor Bay Road, as described above.
- The guards will communicate with the blaster by radio to confirm that the entire blasting perimeter has been cleared and that it is safe to proceed with the blast.
- Once clearance has been confirmed, the blaster will sound the warning siren to notify all personnel that blasting is imminent. After a 30-second delay, the blast will be initiated.
- No one shall leave their position until the blaster has inspected the blast site and confirmed that all explosives have detonated as intended.
- The blaster will then sound the all-clear siren to indicate that it is safe to resume work.
- The trucks will reopen the road, and the guards will remove the warning signs.

3.6 MISFIRE

Before drilling operations resume, the blaster shall inspect the entire blast pattern to identify any misfires or cut-off holes. The inspection will include checking for signs of unexploded explosives and areas exhibiting little or no ground movement that may indicate a misfire or cut-off hole. Where a misfire

or cut-off hole is identified, no work shall be carried out within the affected area except that required to secure the area and safely address the condition. Once the hole has been safely cleared and deemed secure, it may be reloaded, re-stemmed, and reblasted.

3.7 VIBRATION MONITORING

Considering that the quarry is located approximately 90 m above the Hamlet of Arctic Bay and more than 1 km from the nearest buildings, it is highly unlikely that blasting-induced ground vibrations would have any adverse effects on structures within the community. A seismograph will be installed at the Health Centre, the nearest high-priority community building to the quarry, to monitor and record ground vibrations generated by blasting activities.

3.8 PRESSURE CHANGE IN FISH HABITAT

According to DFO guidance for explosives in or near fish habitat,"no explosive is to be detonated in or near fish habitat that produces, or is likely to produce, an instantaneous pressure change (i.e., overpressure) greater than 100 kPa (14.5 psi) in the swimbladder of a fish". The Alternate Water Supply Lake is located more than 600 m from the quarry, and it is unlikely that blasting activities will generate overpressure effects in the lake. As Dead Dog Lake is located closer to the quarry, pressure changes will be monitored during the initial blasts to verify that blasting activities do not result in exceedances of the DFO criterion. The preliminary monitoring results will determine whether additional monitoring is required or whether adjustments to the blasting procedures are necessary.

3.9 FALLING ROCK PROTECTION

The slopes surrounding the community consist primarily of talus deposits and boulder accumulations that have formed naturally through the erosion and weathering of the adjacent rock cliffs and outcrops. The community has previously reported occurrences of rocks falling from these cliff faces and talus slopes, raising concerns that vibrations and air overpressure generated by quarry blasting could potentially trigger additional rockfalls.

To mitigate this risk, rockfall protection fences will be installed in accordance with the measures outlined in the Construction Environmental Management Plan (CEMP). The condition and effectiveness of these protective structures will be regularly monitored throughout the project. Any observed rockfall events will be documented, including their location, extent, and potential cause. Where necessary, damaged sections of the rockfall protection fences will be repaired, and fallen rocks will be removed to maintain the effectiveness of the mitigation measures and ensure public safety.

3.10 EXPLOSIVE SPILL

When handling, transporting, or storing explosives, all reasonable precautions will be taken to prevent spills or releases of explosive products and associated materials. Any spill or accidental release will be immediately reported, contained, cleaned up, and disposed of in accordance with applicable regulatory requirements.

A spill report documenting the nature, location, extent, and response actions associated with the incident will be prepared and submitted as required.

3.11 INCIDENTS INVOLVING EXPLOSIVES

Any incident involving the transportation, the storage of explosives and restricted of explosives and restricted components shall be reported to the Chief Explosives Inspector as soon as circumstances permit. For an accident serious injury or major property damage, call (855) 912-0012 as soon as possible. All other accidents/incidents should be reported to (450) 773-3431. The completed Explosive Incident Report Form F07-01 and should be emailed to ERDmms@rncan.gc.ca or by fax to (450) 773-6226.

3.12 TRAINING

Training is seen as a key element in the safe usage and proper environmental management of explosives and blasting. All employees working on or around blasting operations will undergo rigorous employee orientation and training procedures for managing, transporting and loading explosives into blast holes. Experienced competent employees are an essential part of blasting best management practices

4. RECLAMATION

The operation of the quarry is anticipated to continue until the end of the 2027 construction season. The quarry will be reclaimed while remaining accessible and developable for the future needs of the Arctic Bay community. The process of the quarry reclamation will be ongoing and not relegated to the end of operations. As a result, progressive reclamation will be employed as areas of the quarry pit is no longer used. The active quarry site will be kept clean, tidy, trimmed and free of any garbage and debris during the operational. Where feasible, all unused materials will be returned to the quarry and spread, graded, and contoured as part of the final reclamation activities. Subject to the agreement of the Hamlet, certain stockpiles may be left in place outside the quarry for future community use. Displaced and stored topsoil and overburden will also be returned and placed into selected areas where revegetation will be promoted.

4.1 WATER DIVERSION

As described previously, the quarry development includes a positive drainage management plan for the pit floor. On completion of the operations and final clean-up of the quarry, positive drainage will be maintained or improved to enhance the drainage requirements. Disruption of drainage courses will not be encountered in the development of the quarry. According to the Erosion and Sediment Control Plan (ESCP), adequate mitigation facilities will be installed to reduce the erosion at the discharge point, where the water is coming out from the quarry pit.

4.2 PERMAFROST PROTECTION

Soil permafrost conditions in the quarry are not anticipated. At the end of the quarry operation, the general appearance of the quarry will be of exposed rock, not prone to movement or erosion.

4.3 FACE STABILIZATION AND EDGE PROTECTION

Each time a face section of the quarry is completed, loose rocks will be removed with the excavator in order to make sure to avoid future potential rock fall-off. Boulders and rocks will be placed along the top edge of the quarry faces in order to indicate the limit of the quarry perimeter.

4.4 WASTE REMOVAL

All waste materials will be removed from the quarry and processing areas and disposed of in accordance with the Waste Management Plan.

4.5 TOP OF QUARRY ACCESS ROADS ABANDONMENT

The temporary access roads that were constructed to access the top of the quarry for blasting will be abandoned and blocked with rocks.

4.6 WARNING SIGNS

Warning signs will be installed according to the final quarry configurations following the cleanup.

APPENDIX 1

Quarry permit
Natural Resources Canada (NR Can) permit

QUARRY PERMIT NO. Q001AB

QUARRYING PERMIT

PURSUANT TO THE HAMLET'S LAND ADMINISTRATION BY-LAW

FULL NAME OF PERMITTEE

Pilitak Enterprises Ltd.

MAILING ADDRESS OF PERMITTEE

1519 Sivumugiaq Street, Iqaluit, Nunavut

is hereby authorized to take **5,000** cubic metres of **Lot 396 Plan 4786** in the Hamlet of Arctic Bay, Nunavut
This permit is subject to the following conditions:

1. This permit expires on **November 8, 2026**, or when the quantity of material specified in this permit has been quarried or removed, whichever is sooner.
2. This permit does not grant to the permittee any exclusive right or leasehold interest in the land described above.
3. This permit is not assignable and any assignment of it is of no effect.
4. All quarrying under this permit shall be carried out in accordance with the MINING SAFETY ACT, where that Act applies.
5. This permit is issued subject to the provisions of the Hamlet's Land Administration By-Law and the conditions set out in this permit. Failure to comply with the provisions of the By-Law and the conditions set out in this permit may result in the cancellations of the permit without prior notice to the permittee.
6. This permit is also subject to the following special conditions (if any): **(SEE ATTACHED)**

ISSUED AT

ARCTIC BAY , NUNAVUT

DATE

Nov 8 2026

MUNICIPAL CORPORATION OF THE HAMLET OF ARCTIC BAY

CHIEF ADMINISTRATIVE OFFICER

APPENDIX 1

EXPLOSIVE PRODUCTS SAFETY DATA SHEETS

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Packaged ANFO: RIOXAM™HD

CAS Number: N/A

Recommended Use: Cap sensitive packaged ANFO for blasting. Use only as directed in "Always and Never" instruction sheet included in product packaging.

Manufacturer Name:
MAXAM North America, Inc.
225 Six Mile Hollow Road
Hernshaw, WV 25107

Emergency Contacts:
(800) 424-9300 (CHEMTREC)
(613) 996-6666 (CANUTEC)
(866) 748-6133 (ERAP 2-1722) Eastern Canada Only
(450) 346-7999 (MAXAM Explosives, Inc.)
(304) 759-8693 (MAXAM North America, Inc. – Hernshaw, WV)
(214) 736-8100 (MAXAM North America, Inc. – Mooresville, NC)

SECTION 2 – HAZARDS IDENTIFICATION

Classification:
Explosives Division 1.5 (H205)
Oxidizing Solids, Category 2 (H272)
Eye Damage/Irritation, Category 2A (H319)
Carcinogenicity, Category 2 (H351)
Hazards to the Aquatic Environment Long-Term (Chronic), Category 2 (H411)

Hazard Pictograms:

Signal Word: Danger

Hazard Statements:
H205 – May mass explode in fire
H272 - May intensify fire; oxidizer

H319 - Causes serious eye irritation
H351 - Suspected of causing cancer
H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements:

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 - Keep away from clothing and other combustible materials.
P234 - Keep only in original packaging.
P250 - Do not subject to grinding/shock/friction.
P264 - Wash exposed skin thoroughly after handling.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P305+P338+P351 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P313+P337 - If eye irritation persists: Get medical advice/attention.
P370+P372+P380+P373 - In case of fire: explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.
P391 - Collect spillage.
P401 - Store in accordance with all applicable regulations.
P405 - Stored locked up.
P501 - Dispose of contents/container in accordance with all applicable regulations.

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS No.	% w/w	Ingredient Classification (GHS)
Ammonium Nitrate	6484-52-2	88-95	H272 - Oxidizing Solid H319 - Eye Damage/Irritation H411 - Hazards to Aquatic Env. - Long-Term (Chronic) Hazard

Fuel Oil	68476-34-6	2-6	H226 - Flammable Liquid H315 - Skin Corrosion/Irritation H336 - Specific Target Organ Toxicity (Single Exposure) H351 - Carcinogenicity H401 - Hazardous to Aquatic Env. - Short Term (Acute) Hazard H411 - Hazards to Aquatic Env. - Long-Term (Chronic) Hazard
Aluminum	7429-90-5	0-7	H228 - Flammable Solid
Guar Gum	9000-30-0	0-5	N/A

There may be ingredients not listed above that are inert, are not hazardous chemicals as defined by OSHA regulations, or are found below the cut-off concentrations for specific hazard classes (e.g., Germ Cell Mutagenicity or Specific Target Organ Toxicity). Contact your MAXAM representative if you have questions or concerns.

SECTION 4 – FIRST AID MEASURES

In Case of Accidental Detonation: Seek medical help immediately as necessary.

Inhalation: Product is a solid prill. Do not breathe dusts, fumes, gases, mists, vapors, or spray. Seek immediate medical attention for breathing difficulties.

Skin Contact: Wash exposed skin thoroughly after handling. If exposed or concerned, get medical advice/attention.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

Ingestion: Rinse mouth. Immediately call a poison center/doctor if you feel unwell.

SECTION 5 – FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: None. DO NOT fight fires involving explosives. Evacuate the area. DO NOT attempt to fight fires involving product. Withdraw to a safe distance and allow the fire to burn out.

Specific Hazards Arising from the Chemical: Product is an oxidizer-fuel solid and may explode when subjected to extreme heat or shock. Burning will release hazardous combustion byproducts including Carbon Monoxide (CO), Carbon Dioxide (CO2), Nitrogen Oxides (NOx), and ammonia.

Special PPE Requirements and Precautions for Firefighters: Explosion risk in case of fire. DO NOT attempt to fight fires involving product. Withdraw to a safe distance and allow the fire to burn out. Act only to avoid fire from spreading. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding/shock/friction.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal Precautions, PPE, and Emergency Procedures: Contact the manufacturer, CHEMTREC (USA), or CANUTEC (Canada). Evacuate unnecessary personnel. Wear protective gloves, clothing, and eye/face protection to prevent skin and eye contact, and ingestion. Avoid breathing combustion byproducts, dusts, fumes, gases, mists, vapors, and spray. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding/shock/friction.

Clean up Methods: Prevent entry into the environment (e.g., air, water, and sewer). Contain spill with inert materials. Collect spillage using non-sparking tools and implements and place in suitable container.

SECTION 7 – HANDLING AND STORAGE

Precautions for Safe Handling: Handle with Care. Keep only in original packaging. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Utilize proper PPE. Avoid exposure to skin and eyes, and ingestion. Avoid breathing combustion byproducts, dusts, fumes, gases, mists, vapors, and spray. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding/shock/friction.

Conditions for Safe Storage: Store material in cool, dry, well ventilated magazines approved for explosives. DO NOT store product with explosives. Stored locked up. Store away from heat, hot surfaces, sparks, open flames and other ignition sources. Store away from incompatible materials identified in Section 10. Keep only in original packaging and keep packaging containers closed when not in use. Check for spills and container integrity regularly.

SECTION 8 – EXPOSURE CONTROL / PERSONAL PROTECTION

Ammonium Nitrate	
Exposure Limit:	5 mg/m3 PEL-TWA Respirable
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.
Fuel Oil	
Exposure Limit:	100 mg/m3 TLV-TWA Skin (ACGIH)
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.
Aluminum	
Exposure Limit:	15 mg/m3 TWA (total dust) (PEL)
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.
Guar Gum	
Exposure Limit:	N/A
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Solid prill (beads) coated with oil packaged in 50 lb (22.7 kg) polyethylene lined multi-layered paper bags or 55 lb (25 kg) polyethylene waterproof bags.

Physical State: Solid prill.

Color: Prill is gray, pink, or white.

Odor/Odor Threshold: Odor of fuel.

pH: N/A

Melting Point: N/A

Freezing Point: N/A

Boiling Point/Boiling Range: N/A
Flash Point: N/A
Evaporation Rate: N/A
Flammability: N/A
Upper/Lower Flammability or Explosive Limit: N/A
Vapor Pressure: N/A
Vapor Density: N/A
Relative Density: 0.84 g/cm3
Solubility: N/A
Partition Coefficient (n-octanol/water): N/A
Auto-Ignition Temperature: N/A
Decomposition Temperature: N/A
Viscosity: N/A

SECTION 10 – STABILITY AND REACTIVITY

Reactivity: Product is a USDOT and Canadian ERD Division 1.5D Explosive.

Chemical Stability: Stable under recommended handling and storage conditions noted in Section 7.

Possibility of Hazardous Reactions: May explode when subjected to extreme heat or shock.

Conditions to Avoid: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Do not subject to grinding/shock/friction. Avoid contact with incompatible materials.

Incompatible Materials: Explosives, poison gasses, flammable liquids, toxic liquids, and corrosives.

Hazardous Decomposition Products: Carbon Monoxide (CO), Carbon Dioxide (CO2), Nitrogen Oxides (NOx), Sulfur Oxides (SOx), ammonia, and other combustion gasses.

SECTION 11 – TOXICOLOGICAL INFORMATION

Likely Routes of Exposure (Inhalation, Skin and Eye Contact, Ingestion): Product is a solid prill. Inhalation and ingestion are unlikely. Skin and eye contact are possible in the absence of using appropriate protective gloves, clothing, eye/face protection.

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Skin and eye contact can cause mild to serious irritation.

Delayed and Immediate Effects from Exposure: Skin and eye contact can cause mild to serious irritation both as a delayed and immediate effect.

Chronic Effects from Short and Long-Term Exposure: The petroleum-based ingredients have been classified under the Carcinogen and Specific Target Organ Toxicity hazard classes and are present above their respective cut-off concentrations. Given the physical characteristics of the emulsion and the small concentration of petroleum-based ingredients, chronic effects are unlikely.

Numerical Measures of Toxicity: N/A

Is chemical listed in National Toxicology Program (NTP) Report on Carcinogens, a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs, or by OSHA? No.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity (Aquatic and Terrestrial): Ammonium nitrate is classified as being toxic to aquatic life with long term effects, and fuel oil is classified as being toxic to aquatic life with both short- and long-term effects.

Persistence and Degradability: N/A

Bioaccumulative Potential: N/A

Mobility in Soil: N/A

Other Adverse Effects: N/A

SECTION 13 – DISPOSAL CONSIDERATIONS

Recommendations: Dispose of contents/packaging in accordance with all applicable regulations. Contact the manufacturer or CHEMTREC for advice on correct disposal methods.

SECTION 14 – TRANSPORT INFORMATION

Agency	UN No.	Proper Shipping Name	Hazard Class	PG	EX No.	Other
USDOT	UN0331	Explosive, Blasting, Type B	1.5D	n/a	EX2005090468	ERG 112

SECTION 15 – REGULATORY INFORMATION

Product is subject to at least in part of the following regulations during its life cycle:

- USDOT Hazardous Materials (49 CFR 171-180);
- Canada Transportation of Dangerous Goods (TDG);
- Canada Explosives Regulatory Division (CN ERD);
- OSHA Hazard Communication Standard (29 CFR 1910.1200);
- USEPA Solid and Hazardous Waste Regulations upon disposal;
- USEPA EPCRA (40 CFR Parts 370, 372 and 355);
- US ATF Commerce in Explosives (27 CFR Part 555).

SECTION 16 – OTHER INFORMATION

This Safety Data Sheet (SDS) was prepared in accordance with the US OSHA Hazard Communication Standard, the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), and Canadian WHMIS.

The information included in this SDS is based on MAXAM's current knowledge and is intended for use by persons having appropriate training and knowledge. The properties and characteristics indicated are based on research and experience and are believed to be accurate.

Revised: November 2, 2022

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Packaged ANFO: RIOXAM™, RIOXAM™ AL, RIOXAM™ WR

CAS Number: N/A

Recommended Use: Cap sensitive packaged ANFO for blasting. Use only as directed in "Always and Never" instruction sheet included in product packaging.

Manufacturer Name:
MAXAM North America, Inc.
225 Six Mile Hollow Road
Hernshaw, WV 25107

MAXAM Explosives, Inc.
396 Rang Versailles, PO Box 119
Mont-St-Gregoire, QC J0J 1K0 Canada

Emergency Contacts:
(800) 424-9300 (CHEMTREC)
(613) 996-6666 (CANUTEC)
(866) 748-6133 (ERAP 2-1722) Eastern Canada Only
(304) 759-8693 (MAXAM North America, Inc. – Hernshaw, WV)
(450) 346-7999 (MAXAM Explosives, Inc.)
(214) 736-8100 (MAXAM North America, Inc. – Mooresville, NC)

SECTION 2 – HAZARDS IDENTIFICATION

Classification:
Explosives Division 1.5 (H205)
Oxidizing Solids, Category 2 (H272)
Eye Damage/Irritation, Category 2A (H319)
Carcinogenicity, Category 2 (H351)
Hazards to the Aquatic Environment Long-Term (Chronic), Category 2 (H411)

Hazard Pictograms:

Signal Word: Danger

Hazard Statements:
H205 – May mass explode in fire
H272 - May intensify fire; oxidizer
H319 - Causes serious eye irritation
H351 - Suspected of causing cancer
H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements:

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 - Keep away from clothing and other combustible materials.
P234 - Keep only in original packaging.
P250 - Do not subject to grinding/shock/friction.
P264 - Wash exposed skin thoroughly after handling.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P305+P338+P351 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P313+P337 - If eye irritation persists: Get medical advice/attention.
P370+P372+P380+P373 - In case of fire: explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.
P391 - Collect spillage.
P401 - Store in accordance with all applicable regulations.
P405 - Stored locked up.
P501 - Dispose of contents/container in accordance with all applicable regulations.

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS No.	% w/w	Ingredient Classification (GHS)
Ammonium Nitrate	6484-52-2	88-95	H272 - Oxidizing Solid H319 - Eye Damage/Irritation H411 - Hazards to Aquatic Env. - Long-Term (Chronic) Hazard

Fuel Oil	68476-34-6	2-6	H226 - Flammable Liquid H315 - Skin Corrosion/Irritation H336 - Specific Target Organ Toxicity (Single Exposure) H351 - Carcinogenicity H401 - Hazardous to Aquatic Env. - Short Term (Acute) Hazard H411 - Hazards to Aquatic Env. - Long-Term (Chronic) Hazard
Aluminum	7429-90-5	0-7	H228 - Flammable Solid
Guar Gum	9000-30-0	0-5	N/A

There may be ingredients not listed above that are inert, are not hazardous chemicals as defined by OSHA regulations, or are found below the cut-off concentrations for specific hazard classes (e.g., Germ Cell Mutagenicity or Specific Target Organ Toxicity). Contact your MAXAM representative if you have questions or concerns.

SECTION 4 – FIRST AID MEASURES

In Case of Accidental Detonation: Seek medical help immediately as necessary.

Inhalation: Product is a solid prill. Do not breathe dusts, fumes, gases, mists, vapors, or spray. Seek immediate medical attention for breathing difficulties.

Skin Contact: Wash exposed skin thoroughly after handling. If exposed or concerned, get medical advice/attention.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

Ingestion: Rinse mouth. Immediately call a poison center/doctor if you feel unwell.

SECTION 5 – FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: None. DO NOT fight fires involving explosives. Evacuate the area. DO NOT attempt to fight fires involving product. Withdraw to a safe distance and allow the fire to burn out.

Specific Hazards Arising from the Chemical: Product is an oxidizer-fuel solid and may explode when subjected to extreme heat or shock. Burning will release hazardous combustion byproducts including Carbon Monoxide (CO), Carbon Dioxide (CO2), Nitrogen Oxides (NOx), and ammonia.

Special PPE Requirements and Precautions for Firefighters: Explosion risk in case of fire. DO NOT attempt to fight fires involving product. Withdraw to a safe distance and allow the fire to burn out. Act only to avoid fire from spreading. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding/shock/friction.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal Precautions, PPE, and Emergency Procedures: Contact the manufacturer, CHEMTREC (USA), or CANUTEC (Canada). Evacuate unnecessary personnel. Wear protective gloves, clothing, and eye/face protection to prevent skin and eye contact, and ingestion. Avoid breathing combustion byproducts, dusts, fumes, gases, mists, vapors, and spray. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding/shock/friction.

Clean up Methods: Prevent entry into the environment (e.g., air, water, and sewer). Contain spill with inert materials. Collect spillage using non-sparking tools and implements and place in suitable container.

SECTION 7 – HANDLING AND STORAGE

Precautions for Safe Handling: Handle with Care. Keep only in original packaging. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Utilize proper PPE. Avoid exposure to skin and eyes, and ingestion. Avoid breathing combustion byproducts, dusts, fumes, gases, mists, vapors, and spray. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding/shock/friction.

Conditions for Safe Storage: Store material in cool, dry, well ventilated magazines approved for explosives. DO NOT store product with explosives. Stored locked up. Store away from heat, hot surfaces, sparks, open flames and other ignition sources. Store away from incompatible materials identified in Section 10. Keep only in original packaging and keep packaging containers closed when not in use. Check for spills and container integrity regularly.

SECTION 8 – EXPOSURE CONTROL / PERSONAL PROTECTION

Ammonium Nitrate	
Exposure Limit:	5 mg/m3 PEL-TWA Respirable
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.
Fuel Oil	
Exposure Limit:	100 mg/m3 TLV-TWA Skin (ACGIH)
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.
Aluminum	
Exposure Limit:	15 mg/m3 TWA (total dust) (PEL)
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.
Guar Gum	
Exposure Limit:	N/A
Engineering Controls:	Handle per good industrial hygiene and safety practices.
Individual Protection Measures:	Respiratory, gloves, clothing, eye/face protection.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Solid prill (beads) coated with oil packaged in 50 lb (22.7 kg) polyethylene lined multi-layered paper bags or 55 lb (25 kg) polyethylene waterproof bags.

Physical State: Solid prill.

Color: Prill is gray, pink, or white.

Odor/Odor Threshold: Odor of fuel.

pH: N/A

Melting Point: N/A

Freezing Point: N/A

Boiling Point/Boiling Range: N/A
Flash Point: N/A
Evaporation Rate: N/A
Flammability: N/A
Upper/Lower Flammability or Explosive Limit: N/A
Vapor Pressure: N/A
Vapor Density: N/A
Relative Density: 0.84 g/cm3
Solubility: N/A
Partition Coefficient (n-octanol/water): N/A
Auto-Ignition Temperature: N/A
Decomposition Temperature: N/A
Viscosity: N/A

SECTION 10 – STABILITY AND REACTIVITY

Reactivity: Product is a USDOT and Canadian ERD Division 1.5D Explosive.

Chemical Stability: Stable under recommended handling and storage conditions noted in Section 7.

Possibility of Hazardous Reactions: May explode when subjected to extreme heat or shock.

Conditions to Avoid: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Do not subject to grinding/shock/friction. Avoid contact with incompatible materials.

Incompatible Materials: Explosives, poison gasses, flammable liquids, toxic liquids, and corrosives.

Hazardous Decomposition Products: Carbon Monoxide (CO), Carbon Dioxide (CO2), Nitrogen Oxides (NOx), Sulfur Oxides (SOx), ammonia, and other combustion gasses.

SECTION 11 – TOXICOLOGICAL INFORMATION

Likely Routes of Exposure (Inhalation, Skin and Eye Contact, Ingestion): Product is a solid prill. Inhalation and ingestion are unlikely. Skin and eye contact are possible in the absence of using appropriate protective gloves, clothing, eye/face protection.

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Skin and eye contact can cause mild to serious irritation.

Delayed and Immediate Effects from Exposure: Skin and eye contact can cause mild to serious irritation both as a delayed and immediate effect.

Chronic Effects from Short and Long-Term Exposure: The petroleum-based ingredients have been classified under the Carcinogen and Specific Target Organ Toxicity hazard classes and are present above their respective cut-off concentrations. Given the physical characteristics of the emulsion and the small concentration of petroleum-based ingredients, chronic effects are unlikely.

Numerical Measures of Toxicity: N/A

Is chemical listed in National Toxicology Program (NTP) Report on Carcinogens, a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs, or by OSHA? No.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity (Aquatic and Terrestrial): Ammonium nitrate is classified as being toxic to aquatic life with long term effects, and fuel oil is classified as being toxic to aquatic life with both short- and long-term effects.

Persistence and Degradability: N/A

Bioaccumulative Potential: N/A

Mobility in Soil: N/A

Other Adverse Effects: N/A

SECTION 13 – DISPOSAL CONSIDERATIONS

Recommendations: Dispose of contents/packaging in accordance with all applicable regulations. Contact the manufacturer or CHEMTREC for advice on correct disposal methods.

SECTION 14 – TRANSPORT INFORMATION

Agency	UN No.	Proper Shipping Name	Hazard Class	PG	EX No.	Other
USDOT	UN0331	Explosive, Blasting, Type B	1.5D	n/a	See Below	ERG 112
CN ERD	UN0331	Explosive, Blasting, Type B	1.5D	II	See Below	ERG 112

RIOXAM™, RIOXAM™ AL EX2004080229
RIOXAM™ WR EX2004080230

SECTION 15 – REGULATORY INFORMATION

Product is subject to at least in part of the following regulations during its life cycle:

- USDOT Hazardous Materials (49 CFR 171-180);
- Canada Transportation of Dangerous Goods (TDG);
- Canada Explosives Regulatory Division (CN ERD);
- OSHA Hazard Communication Standard (29 CFR 1910.1200);
- USEPA Solid and Hazardous Waste Regulations upon disposal;
- USEPA EPCRA (40 CFR Parts 370, 372 and 355);
- US ATF Commerce in Explosives (27 CFR Part 555).

SECTION 16 – OTHER INFORMATION

This Safety Data Sheet (SDS) was prepared in accordance with the US OSHA Hazard Communication Standard, the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), and Canadian WHMIS.

The information included in this SDS is based on MAXAM's current knowledge and is intended for use by persons having appropriate training and knowledge. The properties and characteristics indicated are based on research and experience and are believed to be accurate.

Revised: November 2, 2022

1. Identification

Product identifier	NORMITE V™
Product code	N.Av.
Other means of identification	NorMite V™ Emulsions.
Recommended use of the chemical and restrictions on use	Water-Resistant Commercial Blasting Agent (Non Cap-Sensitive Explosive)
Manufacturer	EPC CANADA 3045 Hwy 650 P.O. Box 790 Kirkland Lake, Ontario Canada P2N 3K4 Tel. 705-642-3265 Fax. 705-642-3266 www.epc-groupe.ca
Emergency phone number	(705) 642-7215

2. Hazard identification

Summary	Wear eye protection, gloves and other protective clothing that are adapted to the task being performed and the risks involved. Follow Canada's Explosive Act and Regulations, and the Department of Labour directives. Note that unlike the GHS or OSHA HCS 2012 (USA), explosives substances or articles are not regulated under WHMIS 2015.

WHMIS 2015/OSHA HCS 2012/GHS

Not Regulated under WHMIS 2015

Other hazards which do not result in classification :
Explosives (Division 1.5)

DANGER
H205: May mass explode in fire
P103: Read label before use.
P210: Keep away from heat, sparks, open flames and hot surfaces. No smoking.
P234: Keep only in original container.
P250: Do not subject to grinding and shock.
P280: Wear protective gloves, protective clothing and eye protection.
P370+P372+P380+P373: In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.
P401: Store only in an approved and licensed high explosives magazine.
P501: Dispose in a blast hole in accordance with local, regional and national regulations. DO NOT BURN.

3. Composition/information on ingredients

Common name	CAS	Weight % content
Ammonium nitrate	6484-52-2	85 - 98 %
Polyisobutylene succinic anhydride	67762-77-0	1 - 5 %
White mineral oil	8042-47-5	1 - 10 %

4. First-aid measures

Inhalation	Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen by trained personnel. If a problem develops or persists, seek medical attention.
Skin contact	Flush with plenty of water. Wash skin with warm water and mild soap. Avoid touching eyes with contaminated body parts. Remove contaminated clothing and wash before reuse. If a problem develops or persists, seek medical attention.
Eye contact	IMMEDIATELY flush with plenty of water. Remove contact lenses. Flush with water for at least 15 minutes. Hold eyelids apart to rinse properly. Consult a physician, preferably an ophthalmologist.
Ingestion	DO NOT induce vomiting, unless recommended by medical personnel. If victim is conscious wash out mouth with water and give 1-2 glasses of water to drink. Never give anything by mouth if victim is unconscious or convulsing. Seek medical attention or contact a Poison Centre immediately.
Other	No information available.
Symptoms	No acute effect on health is likely to occur. May cause temporary eyes irritation. May cause temporary skin irritation.
Notes to the physician	Apply a symptomatic and supportive treatment.

5. Fire-fighting measures

Suitable extinguishing media	DO NOT FIGHT FIRE -EVACUATE -MAY EXPLODE!
Specific hazards arising from the chemical	Heating may cause explosion.
Special protective equipment	Firefighters must wear self contained breathing apparatus with full face mask. Firefighting suit may not be efficient against chemicals.
Special protective actions for fire-fighters	DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS OR WHICH INVOLVE CONTAINERS OF THIS PRODUCT. Withdraw from area and let burn. Remove all persons from the vicinity of the scene.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Make sure to wear personal protective equipment mentioned in this Safety Data Sheet.
Environmental precautions	Notify the Ministry of Environment or the relevant authorities. Refer to Natural Resources Canada - Explosives Regulatory Division.
Methods and materials for	No action shall be taken involving any personal risk or without suitable training. Evacuate unauthorized personnel. Ventilate the area well. Eliminate all ignition sources. Use non-sparkling and

containment and cleaning up	antistatic tools. Remain upwind and notify those downwind of hazard. Sweep or shovel (no-sparking shovel) up and dispose in a blast hole. DO NOT BURN.

7. Handling and storage

Precautions for safe handling	The personnel having to handle this product must be formed to use it in safety. Keep away from heat, sparks and open flame. Not smoking. Prevent impact and friction. Avoid contact with skin, eyes and clothing. Wear eye protection, gloves and other protective clothing that are adapted to the task being performed and the risks involved. After use, wash hands with soap and water. Avoid contact with incompatible materials. Keep containers tightly closed when not used. Follow Canada's Explosive Act and Regulations, and the Department of Labour directives.
Conditions for safe storage, including any incompatibilities	Store only in an Approved and Licensed High Explosives Magazine. DO NOT STORE explosives in a detonator magazine or detonators in an explosive magazine. Store in original container. Keep away from direct sunlight and heat. Store away from incompatible materials (see section 10).
Storage temperature	<25°C (77°F)

8. Exposure controls/personal protection

Immediately Dangerous to Life or Health	No information available.			
White mineral oil	STEL	Mist	10 mg/m^3	RSST
	TWA (8h)	Mist	1 mg/m^3	BC
		Mist	5 mg/m^3	ACGIH , ON, RSST
Appropriate engineering controls	Provide sufficient mechanical ventilation (general and/or local exhaust) to keep the airborn concentrations of vapors, mists, aerosols or dust below their respective occupational exposure limits. Explosion proof mechanical ventilation should be necessary.			
Individual protection measures				
Eye	Safety glasses.			
Hands	Wear nitrile or neoprene gloves. Before using, user should confirm impermeability. Discard gloves that show tears, pinholes, or signs of wear. Gloves must only be worn on clean hands. Wash gloves with water before removing them. After using gloves, hands should be washed and dried thoroughly.			
Skin	Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Wear an apron or long-sleeve protective coverall suit.			
Respiratory	Wear respiratory protection if exposure exceeds the TLV. Seek advise from respiratory specialists.			
Feet	Wear safety shoes.			

Safety glasses Nitrile gloves Safety shoes

9. Physical and chemical properties

Physical state	Oily prilled paste	**Flammability**	Explosive
Colour	Various color	**Flammability limits**	N/Ap.
Odour	N/Av.	**Flash point**	N/Ap.
Odour threshold	N/Av.	**Auto-ignition temperature**	N/Ap.
pH	N/Av.	**Sensibility to electrostatic charges**	No
Melting point	N/Av.	**Sensibility aux sparks and/or friction**	No
Freezing point	N/Av.	**Vapour density**	N/Ap. (Air = 1)
Boiling point	N/Av.	**Relative density**	1.24 kg/L (Water = 1)
Solubility	Insoluble in water.	**Partition coefficient n-octanol/water**	N/Av.
Evaporation rate	N/Ap.	**Decomposition temperature**	N/Av.
Vapour pressure	N/Av.	**Viscosity**	N/Ap.
Percent Volatile	N/Av.	**Molecular mass**	N/Ap.

N/Av.: Not Available N/Ap.: Not Applicable Und.: Undetermined N/E: Not Established

10. Stability and reactivity

Reactivity	No reaction with aluminum or stainless steel. Can produce a powerful explosion in case of severe shock and/or high heat.
Chemical stability	Stable under recommended storage conditions. Blasting Cap Sensitivity Test: no detonation.
Possibility of hazardous reactions (including polymerizations)	Heating may cause explosion. Hazardous reaction will not occur under recommended storage.
Conditions to avoid	Avoid contact with incompatible materials.
Incompatible materials	Some powdered metals, strong reducing agents (potassium, sodium, lithium, metal hydrides), strong acids, flammable materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

Numerical measures of toxicity	Ammonium nitrate	Ingestion	2217 mg/kg	Rat	LD50
		Inhalation	>88 mg/l/4h	Rat	LC50
		Skin	>2000 mg/kg	Rat	LD50
	Polyisobutylene succinic anhydride	Ingestion	>5000 mg/kg	Rat	LD50
		Skin	>2000 mg/kg	Rat	LD50
	White mineral oil	Ingestion	>2460 mg/kg	Rat	LD50
		Inhalation	>2.46 mg/l/4h	Rat	LC50
		Skin	>2000 mg/kg	Rabbit	LD50

Likely routes of exposure	Skin, eyes.	
Delayed, immediate and chronic effects	**Eye contact**	May cause slight irritation to eyes. Dust and powder can mechanically irritate the eye.
	Skin contact	May cause temporary skin irritation. The mechanical friction can cause skin irritation.
	Inhalation	This product is not likely to cause inhalation exposure. When detonated or heated to decomposition, this product will evolve highly toxic gases. Symptoms of exposure may include shortness of breath, chest pain, asphyxia, methaemoglobinaemia, and pulmonary oedema. Symptoms may be delayed several hours.
	Ingestion	Not a likely route of exposure. Swallowing will causes digestive tract disturbances resulting in nausea, vomiting, cramps and diarrhea.
	Respiratory or skin sensitization	Ingredients present at levels greater than or equal to 0.1% of this product are skin or respiratory sensitizers.
	IRAC/NTP Classification	No ingredients listed.
	Carcinogenicity	Ingredients present at levels greater than or equal to 0.1% of this product are not listed as a carcinogen by IARC, ACGIH, NIOSH, NTP or OSHA.
	Mutagenicity	Ingredients in this product present at levels greater than or equal to 0.1% are not known to cause mutagenic effect.
	Reproductive toxicity	Ingredients in this product present at levels greater than or equal to 0.1% are not known to cause effects on reproduction.
	Specific target organ toxicity - single exposure	No target organ is listed.
	Specific target organ toxicity - repeated exposure	No target organ is listed.
Interactive effects	No information available.	
Other information	The oral and skin acute toxicity estimates (ATE) of the mixture were calculated to be greater than 2000 mg/kg. The acute toxicity estimate (ATE) by inhalation (dust/mist) of the mixture was calculated to be greater than 5 mg/L/4h. These values are not classified according to WHMIS 2015 and OSHA HCS 2012.	

12. Ecological information

Ecological toxicity	Fish - Rainbow trout - Salmo gairdneri - fresh water LC50 5657 mg/L; 96 hr (Ammonium nitrate) Aquatic Invertebrate - Crustaceans, Daphnia Magna EC50 111-840 mg/L; 48 hr (Ammonium nitrate)
Persistence	Inorganic compounds persist in the environment indefinitely or incorporate into biological systems. Plastic materials persist in the environment.
Degradability	Simple inorganic salts are not susceptible to photodegradation. Nitrates may be transformed to nitrogen by denitrification by bacterial process.
Bioaccumulative potential	No bioaccumulation.
Mobility in soil	The product is soluble in water, it is not expected to partition to the soil. Nitrate and ammonium salts are chemically stales in soil and water.
Other adverse effects	This chemical does not deplete the ozone layer.

13. Disposal considerations

Container 	Important! Prevent waste generation. Use in full. Dispose in a blast hole. DO NOT BURN. Refer to Natural Resources Canada - Explosives Regulatory Division. Observe all federal, state/provincial and municipal regulations. If necessary consult the Department of Environment or the relevant authorities.

14. Transport information

UN Number	UN 0332
UN Proper Shipping Name	EXPLOSIVE, BLASTING, TYPE E
Environmental hazards	This material is not listed as a marine pollutant.
Special precautions for user	The dangerous goods must not be transported in any quantity on board a passenger carrying road vehicle or a passenger carrying railway vehicle. Permit required for transportation with proper placards displayed on vehicle.
TDG - Transportation of Dangerous Goods (Canada)	
Transport hazard class(es)	 Class 1.5D
Packing group	II
Emergency response guidebook 2012	112
IMO/IMDG - International Maritime Transport	
Classification	UN 0332. Class 1.5D, EXPLOSIVE, BLASTING, TYPE E. Emergency schedules (EmS-No) F-B, S-Y
IATA - International Air Transport Association	
Classification	This material is FORBIDDEN on Passenger and Cargo Aircraft. UN 0332. Class 1.5D, EXPLOSIVE, BLASTING, TYPE E.

These transportation classifications are provided as a customer service. As the shipper YOU remain responsible for complying with all applicable laws and regulations, including proper transportation classification and packaging. In addition, if a domestic exemption exists, it is the responsibility of the shipper to define the application of it.

15. Regulatory information

Other regulations	CANADA : - Canadian National Pollutant Release Inventory Substances (NPRI): Nitrate ion in solution at a pH of 6.0 or more. White mineral oil (CAS no 8042-47-5). - Canada DSL and NDSL: All ingredients are listed in the Domestic Substances List (DSL). UNITED STATE OF AMERICA: - Toxic Substance Control Act (TSCA) : All ingredients are listed in the TSCA Inventory. - EPCRA Section 313 Toxic Chemicals: Ammonium Nitrate (CAS no. 6484-52-2). - CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act): No material is listed. - EPCRA Section 302/304 Extremely Hazardous Substances: No material is listed. - Clean Water Act (CWA) 311 Hazardous Substances: No material is listed.

	- Clean Air Act (CAA 112b) HAP - Hazardous Air Pollutants: No material is listed. - Clean Air Act (CAA 112b) HON - Hazardous Organic National Emission Air Pollutants: No material is listed. - California Proposition 65: No material is listed.
	WHMIS 1988 Non-WHMIS controlled Non-WHMIS controlled **HMIS** Heath Flamability Reactivity Protective Equipment **NFPA** 

16. Other information

Date (YYYY-MM-DD)	LES EXPLOSIFS NORDEX LTEE. 2015-09-23
Version	01
Other information	REFERENCES: - Haz-Map, Information on Hazardous Chemicals and Occupational Diseases, http://hazmap.nlm.nih.gov/index.php - OECD Existing Chemicals Database, Chemicals Screening Information DataSet (SIDS) for High Volume Chemicals, UNEP publications, http://webnet.oecd.org/HPV/UI/Search.aspx - NIOSH Pocket Guide to Chemical Hazards, Centers for Disease Control and Prevention, NIOSH Publications, 2007, http://www.cdc.gov/niosh/npg/npg.html - Service du répertoire toxicologique de la Commission de la santé et de la sécurité du travail (CSST), http://www.reptox.csst.qc.ca - Database, Institut National de Recherche et de Sécurité, http://www.inrs.fr/accueil/produits/bdd.html ACGIH: American Conference of Governmental Industrial Hygienists AIHA: American Industrial Hygiene Association HMIS: Hazardous Materials Identification System NFPA: National Fire Protection Association OSHA: Occupational Safety and Health Administration (USA) NIOSH: National Institute for Occupational Safety and Health NTP: National Toxicology Program RSST: Règlement sur la santé et la sécurité du travail (Québec) GHS: Globally Harmonized System IARC: International Agency for Research on Cancer IDLH: Immediately Dangerous to Life or Health STEL: Short Term Exposure Limit (15 min) TWA: Time Weighted Averages WHMIS: Workplace Hazardous Materials Information System

Safety Data Sheet

Issue Date: 11-Mar-2019 **Revision Date:** 13-Mar-2019 **Version** 1

1. IDENTIFICATION

Product identifier

Product Name Cast Booster / Charge

Other means of identification

SDS # AES-007

Recommended use of the chemical and restrictions on use

Recommended Use For military or industrial use.

Details of the supplier of the safety data sheet

Supplier Address

Accurate Energetic Systems, LLC.
5891 HWY 230 W.
McEwen, TN 37101

Emergency telephone number

Company Phone Number Phone: 931-729-4207
Fax: 931-729-4217

Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Dark grayish-brown **Physical state** Solid **Odor** No distinguishing odor

Classification

The classification and labeling information in this Safety Data Sheet should be viewed as provisional, as physical test data has not been performed.

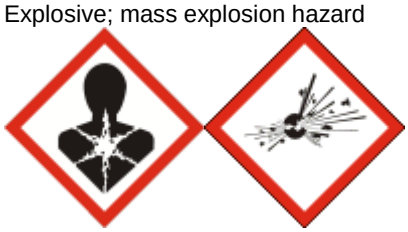
Carcinogenicity	Category 1B
Specific target organ toxicity (repeated exposure)	Category 2
Explosives	Division 1.1

Signal Word

Danger

Hazard statements

May cause cancer
May cause damage to organs through prolonged or repeated exposure
Explosive; mass explosion hazard



Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Do not breathe dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Keep wetted with water
Ground/bond container and receiving equipment
Do not subject to grinding/shock/friction

Precautionary Statements - Response
If exposed or concerned: Get medical advice/attention
Explosion risk in case of fire
In case of fire: Evacuate area
DO NOT fight fire when fire reaches explosives

Precautionary Statements - Storage
Store locked up
Store in accordance with local regulations

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other hazards
Toxic to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No	Weight-%
2,4,6-Trinitrotoluene	118-96-7	20-100
Pentaerythrite tetranitrate	78-11-5	0-65
Octogen	2691-41-0	0-65
Cyclotrimethylenetrinitramine (RDX)	121-82-4	0-65
Aluminum	7429-90-5	0-25
Paraffin Wax	6474-43-4	0-7

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

General Advice If exposed or concerned: Get medical advice/attention.

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes.

Inhalation Remove exposed individual(s) to fresh air for 20 minutes. Consult a physician/poison center if individual's condition declines or if symptoms persist.

Ingestion Call a poison center or doctor/physician if you feel unwell. Rinse mouth.

Most important symptoms and effects, both acute and delayed

Symptoms May cause cancer.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Explosive; mass explosion hazard. Explosion risk in case of fire.

Explosion Data
Sensitivity to Static Discharge Explosion caused by friction, impact, static electricity, or heat.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Wear protective clothing as described in Section 8 of this safety data sheet.

Environmental precautions

Environmental precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Use only non-sparking tools. Ground and bond containers when transferring material. Place in appropriate containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves/protective clothing and eye/face protection. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Keep away from heat/sparks/open flames/hot surfaces. — No smoking. Keep wetted with water. Ground/bond container and receiving equipment. Do not subject to grinding/shock/friction.

Conditions for safe storage, including any incompatibilities

Storage Conditions Store locked up. Store in accordance with local regulations.

Incompatible Materials Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
2,4,6-Trinitrotoluene 118-96-7	TWA: 0.1 mg/m^3 S*	TWA: 1.5 mg/m^3 (vacated) TWA: 0.5 mg/m^3 (vacated) S* S*	IDLH: 500 mg/m^3 TWA: 0.5 mg/m^3
Cyclotrimethylenetrinitramine (RDX) 121-82-4	TWA: 0.5 mg/m^3 S*	(vacated) TWA: 1.5 mg/m^3 (vacated) S*	TWA: 1.5 mg/m^3 STEL: 3 mg/m^3
Aluminum 7429-90-5	TWA: 1 mg/m^3 respirable particulate matter	TWA: 15 mg/m^3 total dust TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 15 mg/m^3 total dust (vacated) TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 5 mg/m^3 Al Aluminum	TWA: 10 mg/m^3 total dust TWA: 5 mg/m^3 respirable dust TWA: 5 mg/m^3 Al

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Wear safety glasses with side shields (or goggles). Refer to 29 CFR 1910.133 for eye and face protection regulations.

Skin and Body Protection Wear impervious protective clothing including boots, gloves, lab coat, apron, or coveralls to prevent skin contact. Refer to 29 CFR 1910.138 for appropriate skin and body protection.

Respiratory Protection If necessary, wear a MSHA/NIOSH-approved respirator. Refer to 29 CFR 1910.134 for respiratory protection requirements.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Solid
Appearance Dark grayish-brown
Color Grayish brown
Odor No distinguishing odor
Odor Threshold No data

Property	Values	Remarks • Method
pH	No data	
Melting point / freezing point	PETN=140°C, TNT=70-80°C, RDX=205°C, HMX=276°C	
Boiling point / boiling range	N/A, Explosive	
Flash point	Explosive	
Evaporation Rate	Not data	
Flammability (Solid, Gas)	Explosive	
Flammability Limit in Air		

Upper flammability or explosive limits	Not determined
Lower flammability or explosive limits	Not determined
Vapor Pressure	TNT / RDX = 0.1 @ 100°C (212°F)
Vapor Density	Not data
Relative Density	1.15 min
Water Solubility	0.1 % @ 67 °C (TNT)
Solubility in other solvents	Not determined
Partition Coefficient	No data
Autoignition temperature	PETN 445°C, RDX=234°C
Decomposition temperature	TNT= 246°C, PETN=150°C, RDX= 205°C, HMX=280°C
Kinematic viscosity	Not determined
Dynamic Viscosity	Not determined
Explosive Properties	Explosion caused by friction, impact, static electricity, or heat
Oxidizing Properties	Not determined

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Conditions to Avoid
Keep out of reach of children.

Incompatible materials
Strong oxidizing agents.

Hazardous decomposition products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact	Avoid contact with eyes.
Skin Contact	Avoid contact with skin.
Inhalation	Do not inhale.
Ingestion	May cause discomfort if swallowed.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
2,4,6-Trinitrotoluene 118-96-7	= 795 mg/kg (Rat) = 607 mg/kg (Rat)	-	-
Cyclotrimethylenetrinitramine (RDX) 121-82-4	= 71 mg/kg (Rat)	-	-
Octogen 2691-41-0	= 6490 mg/kg (Rat)	= 719 mg/kg (Rabbit) = 634 mg/kg (Rabbit) > 5 g/kg (Rat) = 630 mg/kg (Rabbit)	-
Pentaerythrite tetranitrate 78-11-5	= 1660 mg/kg (Rat)	-	-

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity May cause cancer.

Chemical name	ACGIH	IARC	NTP	OSHA
2,4,6-Trinitrotoluene 118-96-7		Group 3		
Pentaerythrite tetranitrate 78-11-5		Group 2A		X

Legend

IARC (International Agency for Research on Cancer)
Group 2A - Probably Carcinogenic to Humans
Group 3 IARC components are "not classifiable as human carcinogens"
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

STOT - repeated exposure May cause damage to organs through prolonged or repeated exposure.

Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document Not applicable due to form of the product.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxic to aquatic life with long lasting effects.

Component Information

Chemical name	Algae/aquatic plants	Fish	Crustacea
Cyclotrimethylenetrinitramine (RDX) 121-82-4		5 - 8.7: 96 h Pimephales promelas mg/L LC50 flow-through 5.4 - 7.4: 96 h Oncorhynchus mykiss mg/L LC50 static 1.9 - 6.6: 96 h Lepomis macrochirus mg/L LC50 static 3.0 - 5.0: 96 h Pimephales promelas mg/L LC50 static 5.6 - 10: 96 h Lepomis macrochirus mg/L LC50 flow-through	
Octogen 2691-41-0		8.8 - 26: 96 h Pimephales promelas mg/L LC50 static 32: 96 h Lepomis macrochirus mg/L LC50 static 32: 96 h Oncorhynchus mykiss mg/L LC50 static	

Persistence/Degradability
Not determined.

Bioaccumulation
There is no data for this product.

Mobility

Chemical name	Partition coefficient
2,4,6-Trinitrotoluene 118-96-7	1.6

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical name	California Hazardous Waste Status
2,4,6-Trinitrotoluene 118-96-7	Toxic Ignitable Reactive
Pentaerythrite tetranitrate 78-11-5	Reactive
Aluminum 7429-90-5	Ignitable powder

14. TRANSPORT INFORMATION

Note This material is classified as Dangerous Goods Class 1 Explosives. Please refer to the competent authority approval for specific information regarding UN hazard information and approval numbers. Class 1 Dangerous Goods are incompatible in a placard load with any of the following: - Division 2.1: Flammable gases - Division 2.2: Non-flammable Non-toxic Gases - Division 2.3: Toxic Gases - Class 3: Flammable Liquids - Division 4.1: Flammable Solids - Division 4.2: Spontaneously Combustible Substances - Division 4.3: Dangerous when wet Substances - Division 5.1: Oxidizing substances - Division 5.2: Organic Peroxides - Class 6: Toxic or Infectious Substances - Class 7: Radioactive materials unless specifically exempted - Class 8: Corrosive Substances - Class 9: Miscellaneous substances - Fire risk substancesTransportation packaging must comply with PG II standards.

DOT Please contact manufacturer for most current information

IATA Please contact manufacturer for most current information

IMDG Please contact manufacturer for most current information

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
2,4,6-Trinitrotoluene	X	X	X	X	X	X	X	X
Cyclotrimethylenetrinitramine (RDX)	X	X	X	X	X	X		X
Octogen	X	X	X		X			X
Pentaerythrite tetranitrate	X	X	X	X		X		X
Aluminum	X	X	X		X	X	X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	CAS No	Weight-%	SARA 313 - Threshold Values %
Aluminum - 7429-90-5	7429-90-5	0-25	1.0

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical name	California Proposition 65
2,4,6-Trinitrotoluene - 118-96-7	Carcinogen

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
2,4,6-Trinitrotoluene 118-96-7	X	X	X
Cyclotrimethylenetrinitramine (RDX) 121-82-4	X	X	X
Octogen 2691-41-0	X		

Pentaerythrite tetranitrate 78-11-5	X		
Aluminum 7429-90-5	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 11-Mar-2019
Revision Date: 13-Mar-2019
Revision Note: New format

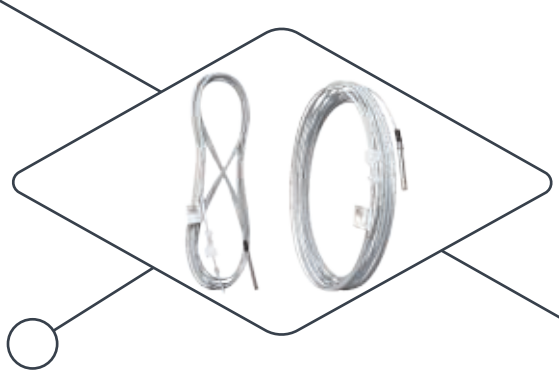
Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

DaveyNel® LP

Davey Bickford



October 2021
Data Sheet V1021

NON-ELECTRIC
long period delay detonator

APPLICATION

- Underground mining (except coal) and tunneling
- Any specific construction blasting requiring long period delay times such as tunnelling or shaft sinking

KEY BENEFITS

1. Ease of use
2. Accuracy
3. Waterproofness
4. Safe and reliability
5. Security
   - Track & Trace compliant with a unique ID datamatrix code*

*Compliance with European directives 2008/43 & 2012/4

DESCRIPTION

The **DaveyNel® LP** is composed with the following key elements:

- An aluminum alloy shell with a triple crimp which includes:
  - A primary explosive charge (200mg lead azide), embedded in the pyrotechnic delay element to ensure better resistance to external shock
  - The delay component itself, one of Davey Bickford's core know-how for optimum accuracy
  - A secondary explosive charge (800mg PETN)
- A robust shock tube technology providing resistance to damage in loading, even with pneumatic loader
- A insensitive non-electric lead-in line, offering high strength, UV protection and resistance to abrasion attributed to its 3 layer construction
- Accuracy with a high VoD (+/- 2000 m/s or 6562 ft/s)
  Available in various colors (white, orange, red)
  Available in both coiling version: "0" or "8/0"
- A water resistant label which includes delay period, shock tube length and lot number to ease use and traceability
- A J-Hook (option) to initiate the shock tube with **DaveyCord** (or any other detonating cord)

ALWAYS	NEVER
• Transport, store and use **DaveyNel® LP** in accordance with Federal, State, and local laws • Store under moderate temperature and dry conditions, in a well ventilated and approved detonator magazine, to maximize shelf life (up to 2 years) • If during the loading the shock tube is potentially damaged or cut, reprime the blasthole using a new unit with equal delay period • Use the plastic J-Hook to initiate the shock tube with **DaveyCord**. A minimum 5g/m is required to initiate shock tube • Ensure shock tube is perpendicularly connected to detonating cord, without the shock tube returning to the hole collar crossing over or laying near any detonating cord. If any contact under 6 inches (15 cm) occurs between the detonating cord and shock tube, the shock tube could be damaged resulting in potential misfires	• Put more than 20 **DaveyNel® LP** delays per bunch. A minimum 5 g/m (25 gr/ft.) detonating cord is required for bunch blasting • Cut or trim seals from the shock tube of a **DaveyNel® LP** delay • Drive any equipment over the shock tube or detonator assemblies

Enaex

DaveyNel® LP

TECHNICAL CHARACTERISTICS

Colors	White. On request, orange and red
Shock Tube	Triple polyethylene coating - external diameter: 3 mm / 0.12”
Velocity of Detonation	Approx. 2000 m/s / 6562 ft/s
Water Resistance	4 bars for 7 days
Abrasion Resistance	Exceeds EN 13763-4
Operating & Storage Temperature	-30°C to +50°C / -22°F to +122°F
Shelf Life	2 years
Certificates	Compliant with European Standards EN 13763-1 to 25, and with Explosive Directive 2014/28/EU Certified by INERIS: CE Product Type Inspection Certificate: 0080.EXP.00.0063 Compliant with European Directive REACH 1907/2006/EC Transport Certification and Packaging UN 0360 - 1.1B / UN 0500 - 1.4S
Packaging Size	Cardboard box: 463 x 243 x 326 mm (0.037 m^3) / 18.2” x 9.6” x 12.8” (2 236 in^3) Except for «8/0» coiling in 1.4S: cardboard box: 590 x 330 x 380 mm (0.074 m^3) / 23.2” x 13.0” x 15.0” (4524 in^3)

* Packaging varies with J-hook option in 1.1B

DaveyNel® LP a wide range of delays combined and lengths to meet most non-electric blast requirements.

Delays	Ref.	Delays	Ref.
100 ms	LP 01	2000 ms	LP 20
400 ms	LP 04	3000 ms	LP 30
500 ms	LP 05	3500 ms	LP 35
600 ms	LP 06	4000 ms	LP 40
700 ms	LP 07	4500 ms	LP 45
800 ms	LP 08	5000 ms	LP 50
900 ms	LP 09	5500 ms	LP 55
1000 ms	LP 10	6000 ms	LP 60
1100 ms	LP 11	6500 ms	LP 65
1200 ms	LP 12	7000 ms	LP 70
1400 ms	LP 14	7500 ms	LP 75
1600 ms	LP 16	8000 ms	LP 80
1800 ms	LP 18		

Length (m / ft)	“0” coiling				“8/0” coiling			
	Unit / Box		Gross weight (kg / lbs)		Unit / Box		Gross weight (kg / lbs)	
	1.1B	1.4S	1.1B	1.4S	1.1B	1.4S	1.1B	1.4S
4.8 / 15.7	160	70	6.8 / 15.0	4.7 / 10.4	110	120	4.9 / 10.8	9.1 / 20.1
6.0 / 19.7	140	70	7.0 / 15.4	5.2 / 11.5	90	100	4.8 / 10.6	9.3 / 20.5
7.8 / 25.6	140	70	8.5 / 18.7	5.7 / 12.6	70	100	4.6 / 10.1	10.3 / 22.7

For other options, please contact your Davey Bickford representative.

Do you want to get in touch with one of our experts?

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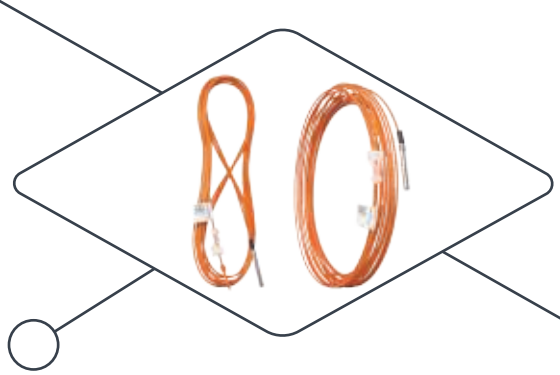
DaveyNel® SP

Davey Bickford



October 2021
Data Sheet V1021

NON-ELECTRIC
short period delay detonator

APPLICATION

- Open pit mining or quarrying
- Underground mining (except coal) and tunneling
- Any specific blasting requiring short period delays

KEY BENEFITS

1. Ease of use
2. Accuracy
3. Waterproofness
4. Safe and reliability
5. Security
   - Track & Trace compliant with a unique ID datamatrix code*

*Compliance with European directives 2008/43 & 2012/4

DESCRIPTION

The **DaveyNel® SP** is composed with the following key elements:

- An aluminum alloy shell with a triple crimp which includes:
  - A primary explosive charge (200mg lead azide), embedded in the pyrotechnic delay element to ensure better resistance to external shock
  - The delay component itself, one of Davey Bickford's core know-how for optimum accuracy
  - A secondary explosive charge (800mg PETN)
- A robust shock tube technology providing resistance to damage in loading, even with pneumatic loader
- A non-electric lead-in line, offering high tensile strength, UV protection and resistance to abrasion attributed to its 3 layer construction
- Accuracy with a high VoD (+/- 2000 m/s or 6562 ft/s)
  Available in various colors (orange, white, red)
  Available in both coiling version: "0" or "8/0"
- A water resistant label which includes delay period, shock tube length and lot number to ease use and traceability
- A J-Hook (option) to initiate the shock tube with **DaveyCord** (or any other detonating cord)

ALWAYS	NEVER
• Transport, store and use **DaveyNel® SP** in accordance with Federal, State, and local laws • Store under moderate temperature and dry conditions, in a well ventilated and approved detonator magazine, to maximize shelf life (up to 2 years) • If during the loading the shock tube is potentially damaged or cut, reprime the blasthole using a new unit with equal delay period • Use the plastic J-Hook to initiate the shock tube with **DaveyCord**. A minimum 5g/m (25 grain) is required to initiate shock tube • Ensure shock tube is perpendicularly connected to detonating cord, without the shock tube returning to the hole collar crossing over or laying near any detonating cord. If any contact under 6 inches (15 cm) occurs between the detonating cord and shock tube, the shock tube could be damaged resulting in potential misfires	• Cut or trim seals from the shock tube of a **DaveyNel® SP** delay • Drive any equipment over the shock tube, detonating cord or detonator assemblies

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DaveyNel® SP

TECHNICAL CHARACTERISTICS

Shock Tube	Triple polyethylene coating - external diameter: 3 mm / 0.12”
Velocity of Detonation	Approx. 2000 m/s / 6562 ft/s
Water Resistance	4 bars for 7 days
Abrasion Resistance	Exceeds EN 13763-4
Operating & Storage Temperature	-30°C to +50°C / -22°F to +122°F
Shelf Life	2 years
Certificates	Compliant with European Standards EN 13763-1 to 25, and with Explosive Directive 2014/28/EU Certified by INERIS: CE Product Type Inspection Certificate: 0080.EXP.00.0065 Compliant with European Directive REACH 1907/2006/EC Transport Certification and Packaging UN 0360 - 1.1B / UN 0500 - 1.4S
Packaging Size	Cardboard box: 463 x 243 x 326 mm (0.037 m^3) / 18.2” x 9.6” x 12.8” (2 236 in^3) Except for «8/0» coiling in 1.4S: cardboard box: 590 x 330 x 380 mm (0.074 m^3) / 23.2” x 13.0” x 15.0” (4524 in^3)

* Packaging varies with J-hook option in 1.1B

DaveyNel® SP a wide range of delays and lengths to meet most non-electric blast requirements.

Delays	Ref.	Length (m / ft)	“0” coiling				“8/0” coiling			
			Unit / Box		Gross weight (kg / lbs)		Unit / Box		Gross weight (kg / lbs)	
75 ms	SP 03		1.1B	1.4S	1.1B	1.4S	1.1B	1.4S	1.1B	1.4S
100 ms	SP 04	4.8 / 15.7	160	70	6.8 / 15.0	4.7 / 10.4	110	120	4.9 / 10.8	9.1 / 20.1
125 ms	SP 05	6.0 / 19.7	140	70	7.0 / 15.4	5.2 / 11.5	90	100	4.8 / 10.6	9.3 / 20.5
150 ms	SP 06	7.8 / 25.6	140	70	8.5 / 18.7	5.7 / 12.6	70	100	4.6 / 10.1	10.3 / 22.7
175 ms	SP 07	10.2 / 33.5	100	50	7.8 / 17.2	5.1 / 11.2	70	75	5.6 / 12.3	9.6 / 21.2
200 ms	SP 08	12.0 / 39.4	100	45	8.8 / 19.4	5.6 / 12.3	60	75	5.5 / 12.1	10.4 / 22.9
225 ms	SP 09	15.0 / 49.2	70	35	7.7 / 17.0	5.1 / 11.2	50	60	5.6 / 12.3	10.4 / 22.9
250 ms	SP 10	18.0 / 59.1	60	30	7.8 / 17.2	5.1 / 11.2	40	60	5.4 / 11.9	13.8 / 30.4
275 ms	SP 11	21.0 / 68.9	40	30	6.0 / 13.2	7.1 / 15.7	32	48	5.0 / 11.0	13.3 / 29.3
300 ms	SP 12	24.0 / 78.7	40	25	7.5 / 16.5	6.5 / 14.3	32	48	5.6 / 12.3	14.1 / 31.1
325 ms	SP 13	30.0 / 98.4	30	25	6.3 / 13.9	7.5 / 16.5	24	48	5.2 / 11.5	15.8 / 34.8
350 ms	SP 14									
375 ms	SP 15									
400 ms	SP 16									
425 ms	SP 17									
450 ms	SP 18									
475 ms	SP 19									
500 ms	SP 20									

For other options, please contact your Davey Bickford representative.

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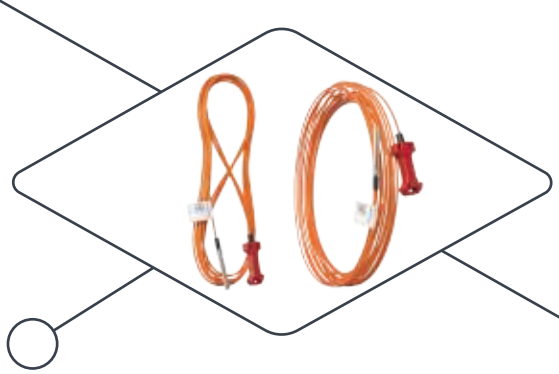
DaveyQuick®

Davey Bickford



November 2021
Data Sheet V1121

NON-ELECTRIC SHORT (SP) or LONG PERIOD (LP) dual delay detonator

APPLICATION

- **Short period (SP)**
  - Open pit mining or quarrying
  - Underground mining (except coal) and tunneling
  - Any specific blasting requiring short period delay
- **Long period (LP)**
  - Underground mining (except coal) and tunneling
  - Any specific blasting requiring long period delay times such as shaft sinking

KEY BENEFITS

1. Ease of use
   - Facilitates easy connections of blasting patterns, in all working conditions
   - Reduces number of stock items for better stock management
2. Accuracy
3. Waterproofness
4. Safe and reliability
   - Reduces surface noise
   - Eliminates risk of shrapnel damaging surrounding tubes
5. Security
   - Track & Trace compliant with a unique ID datamatrix code*

*Compliance with European directives 2008/43 & 2012/4

DESCRIPTION

The **DaveyQuick®** is a combination of a **DaveyNel®** downhole non-electric detonator and a surface connector (without PETN).

It is composed with the following key elements:

- A **DaveyNel® SP** or **LP** made with an aluminum alloy shell with a triple crimp which includes
  - A primary explosive charge, embedded in the pyrotechnic delay element to ensure better resistance to external shock (200mg lead azide)
  - The delay component itself, one of Davey Bickford's core know-how for optimum accuracy
  - A secondary explosive charge (800mg PETN)
- A non-electric lead-in line, offering high tensile strength, UV protection and resistance to abrasion attributed to its 3 layer construction.
- Accuracy with a high VoD (+/- 2000 m/s or 6562 ft/s)
  - Available by default in orange color
  - Available in both coiling version: "0" or "8/0"
- A water resistant label which includes delay period, shock tube length and lot number to ease use and traceability
- A surface connector including a 250mg lead azide aluminum alloy shell detonator that enables the initiation of up to 5 shock tubes

ALWAYS	NEVER
• Transport, store and use **DaveyQuick®** in accordance with Federal, State, and local laws • Store under moderate temperature and dry conditions, in a well ventilated and approved detonator magazine, to maximize shelf life (up to 2 years) • If during the loading the shock tube is potentially damaged or cut, reprime the blasthole using a new unit with equal delay period • Use the plastic J-Hook to initiate the shock tube with **DaveyCord**. A minimum 5g/m is required to initiate shock tube • Ensure shock tube is perpendicularly connected to detonating cord, without the shock tube returning to the hole collar crossing over or laying near any detonating cord. If any contact under 6 inches (15 cm) occurs between the detonating cord and shock tube, the shock tube could be damaged resulting in potential misfires • Connect detonating cord using Davey Bickford approved knots and tight connections. Place detonating cord hook-ups in closed loops using cross-ties • Make sure that no shock tube or detonating cord can be pinched between the equipment and the ground. Rupturing or damaging shock tube or detonating cord may cause misfires	• Cut or trim seals from the shock tube of a **DaveyQuick®** • Drive any equipment over the shock tube, detonating cord or detonator assemblies

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DaveyQuick®

TECHNICAL CHARACTERISTICS

Shock Tube	Triple polyethylene coating - external diameter: 3 mm / 0.12”
Velocity of Detonation	Approx. 2000 m/s / 6562 ft/s
Water Resistance	4 bars for 7 days
Abrasion Resistance	Exceeds EN 13763-4
Operating & Storage Temperature	-30°C to +50°C / -22°F to +122°F
Shelf Life	2 years
Certificates	Compliant with European Standards EN 13763-1 to 25, and with Explosive Directive 2014/28/EU Certified by INERIS: CE Product Type Inspection Certificate: 0080.EXP.02.0039 / 0080.EXP.17.0006 (North America) Compliant with European Directive REACH 1907/2006/EC Transport Certification and Packaging UN 0360 - 1.1B / UN 0500 - 1.4S

DaveyQuick® a wide range of delays and lengths to meet most non-electric blast requirements.

Delays	Connector colors	“0” coiling					“8/0” coiling			
		Length (m / ft)	Units / Box		Gross weight (kg / lbs)		Units / Box		Gross weight (kg / lbs)	
			1.1B	1.4S	1.1B	1.4S	1.1B	1.4S	1.1B	1.4S
0 ms*		6.0 / 19.7	120	70	7.0 / 15.4	6.2 / 13.7	90	100	6.6 / 14.6	12.2 / 24.7
9 ms		7.8 / 25.6	120	60	7.0 / 15.4	6.2 / 13.7	70	100	5.9 / 13.0	12.3 / 27.1
17 ms		9.0 / 29.5	100	50	8.0 / 17.6	6.1 / 13.5	70	75	6.5 / 14.3	10.6 / 23.4
25 ms		12.0 / 39.4	80	45	8.0 / 17.6	6.1 / 13.5	60	60	6.8 / 15.0	10.6 / 23.4
42 ms		15.0 / 49.2	70	35	9.2 / 20.3	5.8 / 12.8	50	60	6.5 / 14.3	14.0 / 30.9
65 ms		18.0 / 59.1	60	30	9.0 / 19.8	5.8 / 12.8	40	60	6.2 / 13.7	15.0 / 33.1
100 ms**		21.0 / 68.9	40	30	7.0 / 15.4	7.6 / 16.8	32	48	5.6 / 12.3	14.2 / 31.3
200 ms		24.0 / 78.7	40	25	7.5 / 16.5	7.0 / 15.4	32	48	6.2 / 13.7	15.1 / 33.3
300 ms*		30.0 / 98.4	30	25	7.0 / 15.4	8.0 / 17.6	24	48	5.6 / 12.3	16.8 / 37.0
		36.0 / 118.1	30	20	7.5 / 16.5	7.5 / 16.5	18	36	4.7 / 8.8	15.6 / 34.4
Packaging Size		Cardboard box: 463 x 243 x 326 mm (0.037 m^3) / 18.2” x 9.6” x 12.8” (2 236 in^3) Except for 1.4S «8/0» coiling: Cardboard box: 590 x 330 x 380 mm (0.073 m^3) / 23.2” x 13.0” x 15.0” (5 524 in^3)								

* 0 ms: not available for North America - 300 ms: available only for North America
**100 ms: black connector for North America

For other options, please contact your Davey Bickford representative.

Do you want to get in touch with one of our experts?

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www.enaex.com

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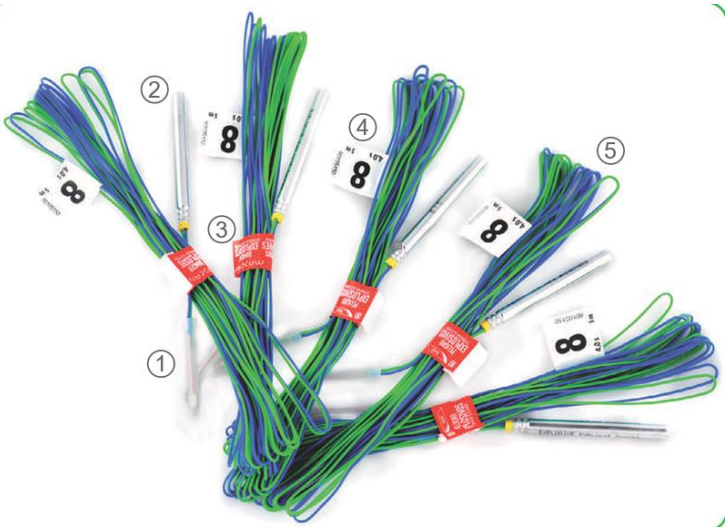
RIODET

Détonateur Electrique Aluminium

TDS : Fiche Technique



1. Capsule de shunt sûre et facile à ôter.

2. Détonateur de force 8 avec double sertissage.

3. Bandeau de maintien facile à casser manuellement pour plus de rapidité.

4. Etiquette résistante à l'eau indiquant le retard fond de trou, la longueur et le numéro de lot.

5. Code couleur des fils pour l'identification de la série : retard et sensibilité.

DESCRIPTION

Les détonateurs électriques **RIODET** ont été conçus pour être utilisés dans les applications souterraines, les carrières et les travaux publics.

Les détonateurs **RIODET** sont fournis en trois séries de période de retard : instantanée (Z), Micro Retard (M) et Retard (D).

Les détonateurs **RIODET** retards comprennent 12 numéros en pas de 500 ms, permettant une grande amplitude de séquence.

Les détonateurs **RIODET** sont distribués en deux types de sensibilité :
I – Insensible : sensibilité standard pour les applications normales;
H – Hautement Insensible : pour les applications qui présentent un risque potentiel d'inflammation accidentelle.

Les fils des **RIODET** se déploient rapidement et la capsule de shunt se retire facilement.

Pour une identification robuste, la période de retard de chaque détonateur est gravée sur l'extrémité du détonateur et indiquée sur l'étiquette d'identification.

Les détonateurs **RIODET** sont rigoureusement testés à une pression de colonne d'eau de 100 mètres pendant 48 heures, ce qui rend la série de détonateurs **RIODET** extrêmement fiable pour un fonctionnement en conditions difficiles.

AVANTAGES

- Sûr, fiable et facile d'utilisation.
- Précision du retard
- Résistant à l'eau et aux fortes pressions
- Les couleurs et étiquettes facilitent la visibilité et l'identification des retards.
- Fabrication MAXAM

RIODET

RIODET MAXAM

Caractéristiques électriques des fils (valeurs nominales)

Diamètre (mm)	Résistance (ohms/m)
0,60	0,065
0,72	0,042

Caractéristiques de la tête d'amorce (valeurs nominales)

	Type I	Type H
Résistance amorce (ohms)	0,3 – 0,5	0,03 – 0,05
Energie de fonctionnement (mJ/Ohm)	8 – 16	1100–2500
Courant de sécurité (A)	0,45	4
Impulsion de courant recommandée en série (A)	2,5	25

Code couleur des fils

	Type I	Type H
Instantané	Rose Blanc	Vert Blanc
Retard (500 ms)	Rose Bleu	Vert Bleu
Micro retard (25 ms)	Rose Turquoise	Vert Turquoise

Temps de retard (valeurs nominales)

Série Micro Retard (25ms)		Série Retard (500ms)	
Numéro	Temps (ms)	Numéro	Temps (ms)
0	-	0	-
1	25	1	500
2	50	2	1.000
3	75	3	1.500
4	100	4	2.000
5	125	5	2.500
6	150	6	3.000
7	175	7	3.500
8	200	8	4.000
9	225	9	4.500
10	250	10	5.000
11	275	11	5.500
12	300	12	6.000
13	325		
14	350		
15	375		
16	400		
17	425		
18	450		
19	475		
20	500		
22	550		
24	600		
26	650		
28	700		
30	750		

Emballages standard, classe 1.1 B (Valeurs nominales)

Longueur (m)	Unités / caisse	Diamètre de fil (mm)	Poids Net (kg)	Poids Brut (kg)
3	500	0,6	15	17
5	250**	0,6	11	13
7	250	0,6	16	18
9	250	0,6	19	21
12	200	0,6	20	22
15	120	0,72	21	23
20*	100	0,72	25	27
25*	60	0,72	20	22

*Les produits sont livrés en bobines dans des boites de 552mm x 444mm x 246mm.
** Disponible en emballage 1.4 B avec 500 unités par caisse.

Classement au transport	Classe	Numéro ONU
Emballage Standard	1.1B	UN 0360
Emballage Spécial	1.4B	UN 0361

AVERTISSEMENT DE SECURITE

Lire avec soin les recommandations d'utilisation et les Fiches de Données de Sécurité fournies avant d'utiliser les produits de la série RIODET. MAXAM recommande fortement de ne pas utiliser les RIODET avec des détonateurs ou systèmes d'initiation fournis par d'autres fabricants dans le même tir et décline toute responsabilité dans ce cas.
Les détonateurs RIODET ne doivent pas être utilisés en environnement inflammable comme le méthane ou la poussière de charbon.
Les détonateurs RIODET doivent être stockés à des temperatures modérées, dans des dépôts secs et bien ventilés conformément à la legislation en vigueur.

AVERTISSEMENT ET LIMITE DE RESPONSABILITE

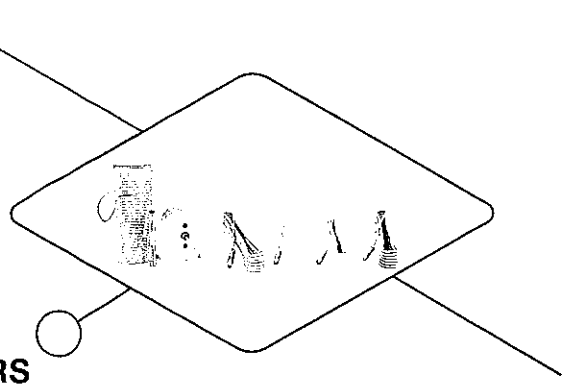
Distributeur

MAXAM INTERNATIONAL
Avda del Partenón, 16
28042 Madrid

MAXAM FRANCE SAS
Forêt d'Autun
79390 THENEZAY
FRANCE

DaveyDet®

Davey Bickford



September 2021
Data Sheet V0921

ELECTRIC DETONATORS

APPLICATION

- Open pit mining or quarrying
- Underground mining (except coal) and tunneling
- Any specific blasting in non-permissible atmosphere (special products available for permissible environments)

SAFETY

- High resistance to electrostatic discharges
- High resistance to shocks

KEY BENEFITS

Due to continuous production and quality control processes, these products involve a high level of performance, accuracy and a wide range to obtain:

- Minimum vibration levels
- Optimum fragmentation
- Crimping ensuring ignition after being immerged 7 days at 5 bars
- Highly visible color codes for lead wires
- Abrasion and traction resistance
- Eased handling, due to duplex wire
- Stripped and isolated wire ends

RECOMMENDATIONS FOR USE

- **DaveyDet®** detonators must not be used in the same circuit with other brands of electrical detonators
- The different intensities (Medium, High, Super High) must not be used simultaneously in the same circuit
- In addition to being well designed and properly loaded, a successful blast requires good, tight and insulated connections, a complete resistance check carried out before and after the tamping and a blasting machine of appropriate rating

DaveyDet® a wide range of delays to answer most of electric blast plan requirements.

The 800 mg PETN base charge confers a full priming compatibility with commercial explosives.

	Instantaneous	Short Delay Series 30 Delay Numbers	Delay Series 12 Delay Numbers
Nominal Firing Time	Instantaneous Depending on the blasting sequence, down to a milisecond	**CR n°1 to 20:** 25 to 500 ms with 25 ms interval **CR n°24 to 40:** 600 to 1000 ms with 100 ms interval **CR n°48 to 80:** 1200 to 2000 ms with 200 ms interval	**n°1 to 12:** 0.5 to 6 s with 500 ms interval

Enaex

DaveyDet®

TECHNICAL CHARACTERISTICS

Fusehead Characteristics	Medium Intensity (N59K)	High Intensity (N130K)	Super High Intensity (N165K)
Fusehead resistance	0.32 Ω ± 0.10 Ω	0.04 Ω ± 0.01 Ω	0.035 Ω ± 0.015 Ω
Guaranteed no fire current, I0	0.65 A	4.2 A	4.5 A
Guaranteed all fire current, I1	1 A	7 A	11 A
Maximum no fire energy, W0	8 mJ/Ω	500 mJ/Ω	1100 mJ/Ω
Maximum all fire energy, W1	15 mJ/Ω	1000 mJ/Ω	2000 mJ/Ω
Recommended fire current for 5 dets in serie, I	> 2 A	> 15 A	> 25 A
ESD Resistance*	**Class II**	**Class I**	**Class 0**
Minimum ESD impulse energy «pin to pin»	6 mJ/Ω	60 mJ/Ω	300 mJ/Ω
Minimum ESD impulse energy «pin to case»	12 mJ/Ω	120 mJ/Ω	600 mJ/Ω

Detonator Standard Formats	
Format and Length**	Wire definition**
Folded - 4, 6 and 8 m	Cu 0.51 mm / AWG 24 / PVC 0.17 Ω /m
Spooled - 10, 15, 20, 30, 40 and 50 m	Cu 0.60 mm / AWG 23 / PE 0.12 Ω /m

* These characteristics are expressed in accordance with the methodology adopted by the French body INERIS.
** Other lengths and wires available on special request. For other options, please contact your Davey Bickford representative.

PERFORMANCES

Operating and storage temperature	-10°C to +50°C / +14°F to +122°F
Shelf Life	2 years
Certificates	Compliant with European Standards EN 13763-1 to 25, and with Explosive Directive 2014/28/EU Certified by INERIS: CE Product Type Certificates: 0080.EXP.97.0072 (Medium Intensity), 0080.EXP.97.0073 (High Intensity), 0080.EXP.97.0074 (Super High Intensity) Compliant with European Directive REACH 1907/2006/EC Transport Certification and Packaging: UN 0030 - 1.1B / UN 0456 - 1.4S

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