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Le Mardi 16 décembre 2008

M. Thomas Sevêtre
Les Carrières De Dumbéa

Contamination de l'environnement relatif à l'usage de l'ANFO en tir de carrière

Bonjour M. Sevêtre, voici les impacts environnementaux de l'usage de l'ANFO lors d'un tir de carrière.

L'ANFO est un mélange de Nitrate d'Ammonium et de diesel, le pourcentage de diesel représente 6% du contenu.

Le Nitrate d'Ammonium est un engrais qui ne doit pas se retrouver dans les cours d'eau. A partir d'un certain niveau de concentration, il devient un polluant écologique car il favorise la prolifération d'algue et il a d'autre effet néfaste.

Dans des conditions normales de tir, le Nitrate d'ammonium est complètement transformé en gaz. Il ne se retrouve donc pas dans l'environnement sous la forme de Nitrate. Par contre. Si les circonstances ne sont pas normales, il se peut que du Nitrate se retrouve après les tirs. Voici les principales sources de contamination :

- Utiliser l'ANFO avec la présence d'eau dans les trous de mine. Le Nitrate se dissout immédiatement ou presque au contact de l'eau. Des fumées oranges plus ou moins importante apparaîtront lors du tir.
- Déversement d'ANFO au pourtour du trou de mine et le déversement sur le tir lors de la manipulation des sacs. Le Nitrate ainsi répandu se retrouvera directement dans les eaux de la carrière après le tir.
- Trou raté. Le contenu en ANFO se perdra automatiquement dans l'environnement si le trou n'est pas réamorcé

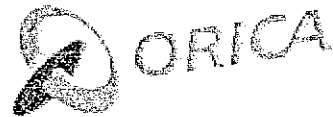
J'espère avoir répondu à vos questions.

Acceptez mon cher monsieur, nos salutations les plus distinguées

Denis Brassard
Directeur des exportations et du développement des services miniers
Orica Mining Services New Zealand Ltd



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Material Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: NITROPRIL
Other name(s): Ammonium nitrate prills, Security Sensitive Ammonium Nitrate, SSAN
Recommended Use: Explosives manufacture.
Various government controls may apply to this material.
Supplier: Orica Australia Pty Ltd
ABN: 004 117 828
Street Address: 1 Nicholson Street,
Melbourne 3000
Australia
Telephone Number: +61 3 9665 7111
Facsimile: +61 3 9665 7937
Emergency Telephone: 1 800 033 111 (ALL HOURS)

2. HAZARDS IDENTIFICATION

Based on available information, not classified as hazardous according to criteria of ASCC; NON-HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

Poisons Schedule: None allocated.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components / CAS Number	Proportion	Risk Phrases
Ammonium nitrate 6484-52-2	>98%	-
Other minor ingredients	<2%	-

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (Phone eg. Australia 131 126; New Zealand 0 800 764766) or a doctor

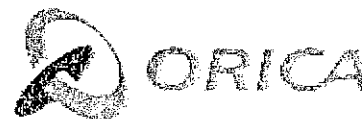
Inhalation: Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give

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oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice. Remove victim from area of exposure - avoid becoming a casualty.

Skin Contact: If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice. Nitrates can be absorbed through cut, burnt or broken skin. Launder clothing before reuse.

Eye Contact: If in eyes, wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek medical advice.

Medical attention and special treatment: Treat as for exposure to nitrates. May cause methemoglobinemia. Clinical findings: The smooth muscle relaxant effect of nitrate salts may lead to headache, dizziness and marked hypotension. Cyanosis is clinically detectable when approximately 15% of the haemoglobin has been converted to methaemoglobin (ie. ferric iron).

Symptoms such as headache, dizziness, weakness and dyspnoea occur when methaemoglobin concentrations are 30% to 40%; at levels of about 60%, stupor, convulsions, coma and respiratory paralysis occur and the blood is a chocolate brown colour. At higher levels death may result. Spectrophotometric analysis can determine the presence and concentration of methaemoglobin in blood.

Treatment:

1. Give 100% oxygen.
 2. In cases of (a) ingestion: use gastric lavage, (b) contamination of skin (unburnt or burnt): continue washing to remove salts.
 3. Observe blood pressure and treat hypotension if necessary.
 4. When methaemoglobin concentrations exceed 40% or when symptoms are present, give methylene blue 1 to 2 mg/kg body weight in a 1% solution by slow intravenous injection. If cyanosis has not resolved within one hour a second dose of 2 mg/kg body weight may be given. The total dose should not exceed 7 mg/kg body weight as unwanted effects such as dyspnoea, chest pain, vomiting, diarrhoea, mental confusion and cyanosis may occur. Without treatment methaemoglobin levels of 20-30% revert to normal within 3 days.
 5. Bed rest is required for methaemoglobin levels in excess of 40%.
 6. Continue to monitor and give oxygen for at least two hours after treatment with methylene blue.
 7. Consider transfer to centre where haemoperfusion can be performed to remove the nitrates from the blood if the condition of the patient is unstable.
 8. Following inhalation of oxides of nitrogen the patient should be observed in hospital for 24 hours for delayed onset of pulmonary oedema.
- Further observation for 2-3 weeks may be required to detect the onset of the inflammatory changes of bronchiolitis fibrosa obliterans.

5. FIRE FIGHTING MEASURES

Hazards from combustion products: Oxidizing substance. Nitrate salts on their own are not combustible, however they support the combustion of other materials. Decomposes on heating emitting irritating white fumes. Brown fumes indicate the presence of toxic oxides of nitrogen.

Precautions for fire fighters and Increases intensity of a fire. Nitrate salts on their own are not combustible, however

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special protective equipment: they will support the combustion of other materials. Decomposes on heating emitting irritating white fumes. Brown fumes indicate the presence of toxic oxides of nitrogen. On detection of fire the compartment(s) should be opened up to provide maximum ventilation. Fire-fighters to wear self-contained breathing apparatus and suitable protective clothing if there is a risk of exposure to products of combustion/decomposition. Fires should be fought from a protected location. Keep containers and adjacent areas cool with water spray. If safe to do so, remove containers from path of fire. A major fire may involve a risk of explosion. An adjacent detonation may also involve the risk of explosion. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding.

Suitable Extinguishing Media: Water jets. Water spray (large quantities).

Unsuitable Extinguishing Media: DO NOT USE the following as extinguishing media: Dry agent (carbon dioxide, dry chemical powder).

Hazchem Code: 1[Y]

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures: Shut off all possible sources of ignition. Clear area of all unprotected personnel. Wear protective equipment to prevent skin and eye contact. Avoid breathing in dust. Work up wind or increase ventilation.

Methods and materials for containment and clean up: Contain - prevent run off into drains and waterways. Sweep up, but avoid generating dust. Collect and seal in properly labelled containers, bags or drums for disposal or re-use. (Loose fitting lids). DO NOT return spilled material to original container. Ensure that contaminated material (clothing, pallets) is thoroughly washed. If contamination of sewers or waterways has occurred advise local emergency services.

This material is classified as Security Sensitive Ammonium Nitrate (SSAN). Spillage recovery needs to be appropriately documented and material accurately accounted for.

In the case of a transport accident notify the Police, Explosives Inspector and Orica Australia Pty Ltd (Telephone: 1800 033 111 – 24 hour service) and/or Orica New Zealand Pty Ltd (Telephone: 0800 734 607 – 24 hour service).

7. HANDLING AND STORAGE

Conditions for safe storage: Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from sources of heat or ignition. Keep containers closed when not in use - check regularly for spills. Store away from combustible materials including organic materials, reducing agents, metal powders, strong acids, nitrites, chlorates, chlorides and permanganates. Store away from incompatible materials described in Section 10. Store away from possible contaminants. Ammonium Nitrate is incompatible with, and must be stored away from, tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, any bromate, chlorate, chlorite, hypochlorite or chloroisocyanurate or any inorganic nitrite. If using wooden pallets, these must be hardwood and periodically washed down with

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large amounts of water to remove all traces of the material. Concrete floors are recommended for storage. If ammonium nitrate is to be stored in bulk, the surface must be treated so that it is resistant to attack by an oxidising agent. Bulk ammonium nitrate should not be stored on a bituminous floor.

This product when stored in a confined, unventilated space/hold can give off ammonia or other odour and lead to the depletion of oxygen within this space and other confined spaces. It is therefore essential that ventilation is carried out prior to entry to all ship holds.

Ensure ammonium nitrate is stored securely and in accordance with regulations/controls issued by relevant authority. The secure storage of ammonium nitrate within Australia includes but is not limited to the use of site security plans, locking the facility/container with physical restraining items, validation and record keeping of all stock, and where deemed necessary through a risk management approach constant surveillance.

Within Australia all persons who have unsupervised access to Security Sensitive Ammonium Nitrate (SSAN), will require security clearances. The issuing of security clearances is controlled and issued through the local Government authorities. The checks include a criminal history check (CHC), and a politically motivated violence check (PMV).

Precautions for safe handling: Avoid skin and eye contact and breathing in dust. Avoid handling which leads to dust formation.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits:

No value assigned for this specific material by the National Occupational Health and Safety Commission.

Engineering controls:

Use in well ventilated areas. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

Personal Protective Equipment:

The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: E - OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, DUST MASK.

Wear overalls, safety glasses and impervious gloves. Avoid generating and inhaling dusts. If excessive dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

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Physical state: Granular Solid / Prills
Colour: White to Off-white
Odour: Negligible
Solubility: Soluble in water.
Specific Gravity: 0.72 - 0.78 g/cm³ (bulk density)
Flash Point (°C): Not applicable
Flammability Limits (%): Not applicable
Autoignition Temperature (°C): Not available
Boiling Point/Range (°C): Decomposes
pH: 4.6 - 5.2 (10% solution @ 20°C)

10. STABILITY AND REACTIVITY

Chemical stability: Powerful oxidising agent. May explode under confinement and high temperature, but not readily detonated.

Conditions to avoid: Avoid exposure to heat, sources of ignition, and open flame. Will react with organic materials and reducing agents. Avoid contact with combustible substances. Avoid contact with other chemicals. Avoid dust generation. Hygroscopic - adsorbs moisture from the air.

Incompatible materials: Ammonium nitrate is a powerful oxidising agent. It is incompatible with tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, any bromate, chlorate, chlorite, hypochlorite or chloroisocyanurate, any inorganic nitrite and metal powders. Incompatible with combustible materials. Incompatible with reducing agents.

Hazardous decomposition products: Oxides of nitrogen. Ammonium nitrate fumes.

Hazardous reactions: Oxidising agent. Supports combustion of other materials and increases intensity of a fire. Will react with organic materials, and reducing agents. Reacts with nitrites, chlorides, chlorates, permanganates and metal powders. When mixed with strong acids, and occasionally during blasting, it produces an irritating toxic brown gas, mostly of nitrogen dioxide. When molten may decompose violently due to shock or pressure. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. Hazardous polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion: Swallowing can result in nausea, vomiting, diarrhoea, and abdominal pain. Swallowing large amounts may result in headaches, dizziness and a reduction in blood pressure (hypotension).

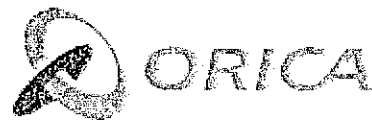
Eye contact: May be an eye irritant. Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.

Skin contact: Repeated or prolonged skin contact may lead to irritation. See effects as noted under 'Inhalation'. Can be absorbed through cut, broken, or burnt skin with resultant adverse effects.

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Inhalation: Breathing in dust may result in respiratory irritation. Blasting may produce a toxic brown gas of nitrogen dioxide. Inhalation of the gas may result in chest discomfort, shortness of breath and possible pulmonary oedema, the onset of which may be delayed.

Absorption of ammonium nitrate by inhalation, ingestion or through burnt or broken skin may cause dilation of blood vessels by direct smooth muscle relaxation and may also cause methaemoglobinaemia.

Long Term Effects:
No information available for the product.

Toxicological Data:

Oral LD50 (rat): 2,217 mg/kg for ammonium nitrate
Following the ingestion of nitrates in humans and animals methaemoglobinaemia has occurred.

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

Aquatic toxicity:

Ammonium nitrate was evaluated at 5, 10, 25 and 50 mg (NH₄⁺)/L.

The fertility of *Daphnia magna* was decreased at 50 mg/L. Post embryonic growth of crustacea was impaired at 10, 25 and 50 mg/L.

13. DISPOSAL CONSIDERATIONS

Disposal methods: Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Empty containers must be decontaminated by rinsing thoroughly with water. Rinsing water needs to be disposed of carefully.

Disposal of material needs to be appropriately documented and material accurately accounted for.

14. TRANSPORT INFORMATION

Road and Rail Transport

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

UN No: 1942
Class-primary: 5.1 Oxidizing Agent
Packing Group: III
Proper Shipping Name: AMMONIUM NITRATE

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Hazchem Code: 1[Y]

Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No: 1942
Class-primary: 5.1 Oxidizing Agent
Packing Group: III
Proper Shipping Name: AMMONIUM NITRATE

Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No: 1942
Class-primary: 5.1 Oxidizing Agent
Packing Group: III
Proper Shipping Name: AMMONIUM NITRATE

15. REGULATORY INFORMATION

Classification: Based on available information, not classified as hazardous according to criteria of ASCC; NON-HAZARDOUS SUBSTANCE.
Poisons Schedule: None allocated.

All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

Various regulations/controls/authorisations/licences may apply governing the manufacture, importation, exportation, use, handling, storage, sale/supply, transport and disposal of ammonium nitrate. Ammonium nitrate in Australia is considered a security sensitive material and loss, theft, attempted theft and unexplained discrepancies shall be reported to authorities. Record keeping and licensing of individuals shall be required and maintained.

16. OTHER INFORMATION

'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2006.

In: 'The Dictionary of Substances and their Effects'. Ed. Gangoli S. Royal Society of Chemistry, 1999.

PACIA Code of Practice for Secure Distribution of High Analysis Ammonium Nitrate. 03/ 2004.

'Principles for the Regulation of Ammonium Nitrate COAG (Council of Australian Government)'.
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This material safety data sheet has been prepared by SH&E Shared Services, Orica.

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Reason(s) for Issue:
Revised Primary MSDS

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

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