

Appendix 13.6-H

Orica Blast Site Policy Environmental Considerations

ORICA INC.

Blast Site Policy

Environmental

Considerations

February 1998

1.0 APPLICATION

This part of the Blast Site Policy applies to all wholly-owned ORICA INC. operations and all joint ventures in which ORICA INC. is a party.

THE INFORMATION, PREVENTION MEASURES AND PRECAUTIONS SET FORTH HEREIN ARE TO BE USED AS GENERAL GUIDELINES ONLY AND DO NOT CONSTITUTE MINIMUM COMPLIANCE STANDARDS. FURTHER, THESE GUIDELINES ARE NOT INTENDED TO PROVIDE ANY BASIS BY WHICH ANY LEGAL OBLIGATION, DUTY OR LIABILITY MAY ARISE OR BE IMPOSED.

2.0 INTRODUCTION

It has been recognized that at or near some locations where commercial explosives are being used, the potential to contaminate surface or ground water with ammonium nitrate exists. It is also understood that the actual levels of contamination at these locations would be variable and a direct consequence of ammonium nitrate becoming associated with water either before, during or after the blasting process. Considering these facts, the potential to contaminate surface or ground water with ammonium nitrate, which is used as an ingredient in commercial explosives, can be controlled through the implementation of a responsible blast loading plan. Adoption of such a plan as a standard operating procedure will eliminate or minimize the potential for ammonium nitrate to dissolve in or become associated with water.

In addition, mining and quarrying practices that handle and dispose of waste water in a manner that ensures it receives the proper treatment prior to its discharge prevents ammonium nitrate contamination from becoming an undue risk to human health or the environment.

3.0 PURPOSE

The purpose of this document is to provide specific guidelines which are to be included into the current standard operating procedures for blast planning, blasthole drilling and blasthole loading. Their addition should provide a comprehensive plan that will minimize or negate the potential to contaminate surface or ground water with ammonium nitrate. The specific guidelines to be included can be grouped into the following five (5) basic categories:

Education/Training of Explosive Users Explosives Loading and Handling

Selection of Appropriate Explosives Attention to Technical Matters

Adhering to the Standard Operating Procedures on Blasting

4.0 EDUCATION/TRAINING OF EXPLOSIVE USERS

Both the owners/operators of the location where explosives are being used and the personnel working with commercial explosives will be well informed of all applicable regulations as well as the consequences of having ammonium nitrate becoming associated with water. The Clean Water Act, or the equivalent of such at the State level, regulates both the ammonia portion and the nitrate portion of ammonium nitrate to prevent an undue risk to human health or the environment. In addition, the Resource Conservation and Recovery Act, becomes applicable if the explosives fail to detonate.

5.0 EXPLOSIVES LOADING AND HANDLING

- 5.1** All excess product in augers or hoses is to be recovered and used either in the next blasthole or recycled in the mixer/holding tank.
- 5.2** Explosive spillage around the blasthole collar is to be controlled and any such spillage should be placed into the blasthole before stemming
- 5.3** Water contacting explosives during cleanup is to be contained and managed in accordance with applicable regulations
- 5.4** Minimize the amount of time that explosives are exposed to wet conditions within the blasthole. The blast shall be initiated as near the time the loading is completed as safety and operational procedures allow.
- 5.5** Avoid having explosives exposed to precipitation.
- 5.6** To assure complete detonation of explosives placed into the ground, sufficient boosters must be used. At least two (2) primers will be used in each blasthole. One near the top and one near the bottom of the explosive column.

6.0 SELECTION OF APPROPRIATE EXPLOSIVES

Selecting the proper explosive is critical to the prevention of ammonium nitrate contamination.

- 6.1** ANFO (ammonium nitrate - fuel oil) is not water-resistant and should be avoided if contact with water is likely.
- 6.2** Various types of commercial explosives are available to withstand exposure to water. Water-resistant explosives include the cartridge forms of gelatinous nitroglycerin, watergels and emulsions and the

bulk forms of emulsions which are:

- Site Mixed Emulsion (ammonium nitrate - fuel oil - emulsifier) is a water- resistant explosive, semi-solid. This is manufactured on site and detonated while still warm assuring complete detonation.
- Repump Emulsion (ammonium nitrate - fuel oil - emulsifier) is a water- resistant explosive, semi solid, manufactured off site, transported and pumped into the borehole as needed.

7.0 ATTENTION TO TECHNICAL MATTERS

- 7.1** The actual physical conditions into which explosives are being placed must be accounted for.
- 7.2** Personnel responsible for loading explosives into the boreholes should be in continuous communication with the drillers of those boreholes or supplied with adequate drill logs, so that any knowledge regarding fractures, crevices or cavities is obtained.
- 7.3** Where Bulk ANFO or Emulsion is used in fractured, creviced or cavitied boreholes, plastic borehole sleeves and/or positioned inert stemming decks will be used to ensure total detonation of the explosives and avoidance of excessive charges.
- 7.4** Choosing and placing the correct drilling patterns which results in the optimal use of explosives with all the explosives undergoing complete detonation.
- 7.5** Quality assurance/quality control measures to maintain drilling accuracy which prevents the detonation in one blasthole from impacting the proper detonation in a nearby blasthole.
- 7.6** Selecting the appropriate drilling equipment so that adequate borehole quality is maintained.
- 7.7** Correct selection of delay timing for each blasthole to ensure detonation of the entire pattern, and the prevention of cut-off blastholes.

8.0 ENVIRONMENTALLY GOOD PRACTICES IN A MINING OPERATION BY A MINING COMPANY

- 8.1** Obtain or complete a regional geology and hydrogeologic study to obtain data and evaluate if groundwater quality has been impacted by previous users or owners and or nearby landowners.

- 8.2** Determine soil classification, topography, and drainage conditions.
- 8.3** Obtain potable well survey, include casing depth. (250-meter radius minimum of proposed operation)
- 8.4** Determine aquifer depth
- 8.5** Determine depth of mining operation to access possible changes that may affect present neighboring groundwater condition.
- 8.6** To monitor the effectiveness of groundwater contamination prevention measures, it is proposed that monitoring wells be installed by a reputable environmental firm that can assure the installed wells comply with local, regional and/or state environmental agency guidance. The general purpose of the proposed monitoring wells would be as follows:
 - Downgradient of actual mining operations to assess the impact those operations may have on groundwater.
 - Upgradient of the mining operations to access the condition of groundwater entering the mining property.

Adjacent farmland to measure the extent that nitrates have impacted groundwater due to farming and/or fertilizing practices, and to access future impact from mining operations