

FACTSHEET

Blasting - Fish and Fish Habitat Protection

Department of Fisheries and Oceans

CONDITIONS WHERE APPLICABLE

Fish and fish habitat protection should be provided for blasting activities that are planned in or near a freshwater or marine waterbody. Blasting in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.

CONSIDERATIONS

- Blasting plans should be developed such that the weight of charge (in kilograms (kg)) to be detonated at any precise moment is small.
- For multiple charges, time-delay detonators (eg., blasting caps) should be used to reduce the overall detonation to a series of single explosions separated by a minimum 25 milliseconds (1/1000 seconds) delay (see Figure 1).
- Large charges should be subdivided into a series of smaller charges (ie. decking) in blast holes with a minimum 25 millisecond delay between charge detonations (see Figure 1).
- The on-land set-back distance from the blast site to the waterbody or the set-back distance (zone) around the

blast site in the waterbody are based on the maximum weight of charge to be detonated at one instant in time (see Table 1) and the type of fish and fish habitat in the area of the blast.

- Blast holes should be back-filled (stemmed) with sand or gravel to grade or to streambed/water interface to confine the blast.
- Blasting mats should be placed atop the holes to minimize scattering of blast debris around the area.
- Ammonium nitrate based explosives must not be used in or near water due to the production of toxic by-products.
- Blasting activities are not to be carried out in the marine environment within 500m of marine mammals (additional mitigative measures may also be necessary).

IMPLEMENTATION PROCEDURES

- Blasting activities are to take place at a set-back distance from the waterbody as indicated on Table 1. If on-land blasts are required nearer to the waterbody than indicated on Table 1, then additional mitigative measures should be put in place.

Mitigative measures for blasting in or near a waterbody may include, but are not limited to; installation of bubble/air curtains (ie. a column of bubbled water extending from the substrate to the water surface as generated by forcing large volumes of air through a perforated pipe/hose) to disrupt the shock wave, blasting during less sensitive fishery periods, isolation of the work area from fish movement, detonation of small scaring charges (ie., detonator caps or short lengths of detonating cord) set off one minute prior to the main charge to scare fish away from the site or the use of noise generators to move fish out of the area. When a bubble curtain is used, it should surround the blast site and be started-up only after fish have been moved outside of the surrounded area.

DFO should be contacted regarding the proposed blasting program prior to start-up.

MAINTENANCE / ABANDONMENT

- All blasting debris and other associated equipment/products are to be removed from the blast area, including any debris that may have

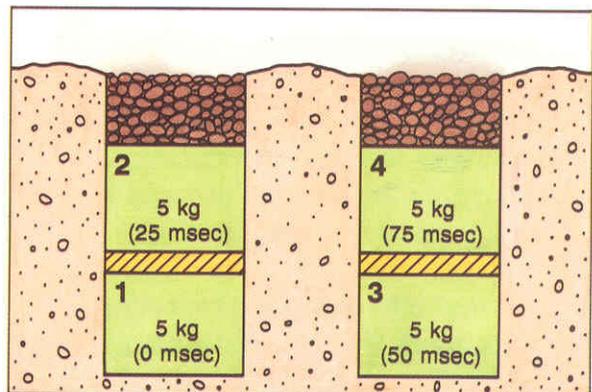
entered the freshwater or marine waterbodies.

Table 1. Set-back Distance in Metres (m) from Blast Site to Fish Habitat for Rock Removal*

Habitat	Weight of Explosive Charge(kg)					
	0.5	1	5	10	25	50
H1	7	10	15	20	35	50
H2	15	20	45	65	100	143

* Set-back distances may vary slightly depending upon specific circumstances. Habitat H1 includes rearing/general fish habitat. H2 includes spawning habitat where eggs or early fish development are occurring.

Figure 1. Sample Blasting Arrangement



Per Fig. 1: 20 kg total weight of charge; 25 msecs delay between charges and blast holes; and decking of charges within holes. As per Table 1, for Fig. 1 example, for a 5 kg weight of charge a 15 m set-back from rearing habitat and a 45 m set-back from spawning habitat should be provided.

This Fact Sheet does not constitute DFO approval; other mitigative strategies may be required. The proponent is advised to contact all other appropriate regulatory agencies.

For more information contact the nearest Department of Fisheries and Oceans office.