ENVIRONMENT AND HERITAGE SERVICE

Water (Northern Ireland) Order 1999

A Guide for the Mineral Extraction Industry

Guidance notes on:

(a) Consent to discharge
(b) Drainage and treatment

An Agency within the Department of the Environment

Environment & Heritage Service

Environment and Heritage Service is an Agency within the Department of Environment for Northern Ireland. Our aim is to protect and conserve the natural and built environment and to promote its appreciation for the benefit of present and future generations. We have diverse responsibilities for regulating activities which have the potential to impact on the environment and for ensuring they are undertaken in a sustainable way.

Why is a Discharge Consent Required?

Under Article 9 of the Water (NI) Order 1999, the consent of the Department is required to make a discharge of trade effluent to a waterway or underground strata.

Discharges of surface water run-off which may be significantly contaminated by site activities are considered to be trade effluent and require consent. " Trade Effluent" means any liquid, either with or without particles or matter in suspension, which is discharged from any premises or site used for carrying on any trade or industry. In general, the storm drainage from quarries or mineral works is described as:

"Trade effluent comprising site drainage"

Silt/suspended solids and oil are the main pollutants of concern from this industrial sector.

Pollution Impacts from Silt & Soil

Silt/suspended solids causes lasting damage to a river habitat by:

(a) clogging gills, so fish suffocate and die;

(b) destroying spawning sites, resulting in a reduction in fish populations;

(c) injuring fish by abrasion;

(d) destroying insect habitats on the riverbed, thereby depriving fish of their food source;

(e) stunting aquatic plant growth thereby reducing dissolved oxygen levels.

Oil causes lasting damage to a river habitat by:

(a) its direct toxicity to fish and aquatic invertebrates;

(b) depleting dissolved oxygen;

(c) inhibiting oxygen transfer between the air and the water surface;

(d) tainting fish;

(e) creating barriers to fish movements;

(f) endangering bird life;

(g) contaminating drinking water supplies;

(h) adversely affecting the aesthetic appearance of the river.

Settlement Ponds

The prevention of pollution is far better and cheaper than the cure. Careful planning and the installation and maintenance of well designed treatment facilities, operated with suitable pollution precaution measures, will eliminate future problems.

The Institute of Quarrying publication, "Sand and Gravel Production" by A Littler is a useful reference.

Best Practice and Good Practice

The following key principles are best applied to new sites, but they can also assist current operators experiencing drainage or treatment problems.

1. Reduce the quantity of run-off from the site.

2. Segregate clean water from contaminated drainage and discharge separately, for example, roof or spring water.

3. Reduce the velocity of run-off to allow filtering, infiltration and/or settlement.

4. Provide passive treatment for collected storm water so that the final discharge back to the environment meets appropriate water quality standards.

5. Where possible re-circulate water.

6. Consider groundwater re-charge where appropriate.

7. Appoint an environmental manager and develop a policy of regular inspection and servicing of treatment facilities.

Differences of scale, geology, location etc, mean that wide variations exist between sites. There is, therefore, 'no single fits all solution'.

Know your Site

1. Drainage catchment area
2. Topography and site gradients
3. Rainfall & evapotranspiration data
4. Infiltration data for soil/bedrock
5. Assess available vegetation areas as possible drainage buffer zones.

Water Abstraction

Drainage and Treatment

The following principles should be considered when designing new drainage/treatment systems or when improvements are being planned for existing systems.

1. Keep clean water and effluent separate.

2. Consider the whole sites drainage network as a purpose built drainage treatment system.

3. Encourage infiltration of storm water by designing filter drains rather than using conventional pipes, or incorporate infiltration sumps as part of the overall design.

4. Shallow slope design is crucial for effective infiltration and/or settlement. Consider contoured or stepped drainage. In general, slopes should not exceed 5 percent.

5. Avoid high flow velocities particularly at the entry point to the final settlement pond. Energy dissipation devices or multiple outflow structures will help avoid the re-suspension of sediment. Calm flow through a settlement pond will also facilitate the deployment of booms in the event of a oil spillage within the site.

6. T-pipes or baffles incorporated as part of pond design will help trap oil or floating debris.

7. Treatment facilities should be designed with a retention capacity of between 24 and 48 hours.

8. The installation of additional pre–settlement traps on internal drains will not only provide extra treatment capacity but accessible service points for desludging accumulated sediment prior to a final pond and discharge point.

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9. Consider vehicular access and take all necessary measures to ensure proper and safe disposal of accumulated solids.

10. Base calculations for predicted storm drainage volumes on a 1 in 5 year storm event.

11. The average depth of water in a permanent pond should be between 1.3 and 2 meters, with a maximum depth of 3 meters. To meet Health & Safety requirements pond side slopes should be limited to 1 in 4, or 25 degrees.

Applying for Consent

- Your application will be acknowledged within three working days of receipt, if deemed incomplete you will be asked to supply relevant information.

- If required, a site meeting can be arranged with the Department to discuss specific pollution prevention and effluent treatment queries.

- Depending on the complexity of your application, it will be processed within 4 months of receipt unless a time extension is agreed with you.

If your application is refused you will be told how to appeal.

Further information and advice on the contents of this leaflet and on any aspect of water pollution prevention can be obtained from:

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