Assessment of Environmental Impact (Water Resources) Mineral Workings - Advice Note

Northern Ireland Environment Agency
www.ni-environment.gov.uk

1. Background

This advice is intended to offer guidance for those carrying out Environmental Impact Assessments and preparing Environmental Statements in support of planning applications. The document lists the main areas and issues to be considered when assessing the potential impacts of mineral working on the water environment and mineral resources. It should not be used to replace existing detailed guidance that may exist.

Mineral extraction is one of a variety of activities and developments that have the potential to impact on water quality, water quantity and/or the established flow regime. Changes to the local water environment resulting from mineral working can affect nearby receptors such as wells/boreholes, springs, wetlands and waterways. In certain situations changes to water levels, flow or quality can have implications for dependent ecology and/or land.

Impacts can be caused both during and post-development and any prior assessment should consider both phases. The degree of risk from a particular development or activity is, in part, dependent on the sensitivity of local water bodies. At a particular site, the local geological setting will influence the vulnerability of groundwater and associated surface waters. For this reason it is generally important to establish local conditions. In some cases this can be done using existing data. Where this is lacking or insufficient, additional data gathering will be required. Compilation and interpretation of new and existing data improves the assessment of potential impact from the site and can beneficially influence design and construction elements of the development or activity.

2. Impact Assessment

Planning development applications for mineral workings have the potential to impact upon water and mineral resources. NIEA (Water Management Unit) and the Geological Survey of Northern Ireland (GSNI) will normally be consulted by Planning Service regarding such applications and will be asked to review the applicant's assessment of potential environmental impacts on water and mineral resources.

Although the scope and detail of an investigation may vary according to individual developments, the following information will generally be required:

i. Site location including NGR (National Grid Reference) of centre of site
ii. Site boundary map (at least 1:2500 O.S. Based)
iii. Description of development
iv. Details of previous land use
v. Geological setting (regional and site specific): Where appropriate, this will include details of any site investigation carried out as part of the development assessment and reference to any relevant previous investigations. Cross-sections showing the relationship of the development with the local geological setting are a useful way of conveying information. Details of the nature and thickness of drift (overburden) deposits should be included for quarry developments.
vi. Hydrogeological Assessment

A hydrogeological assessment will normally include:

1. A description of the local geological setting (solid / bedrock and drift / superficials).

2. A description of the known or anticipated local groundwater and surface water setting at and around the site.

3. A 'water features' survey of all potential receptors whose surface water or groundwater catchment the development may affect such as:
   - wells/boreholes
   - springs/adit discharges
   - waterways (whether designated or not)
   - wetlands (whether designated or not)

4. A description of on-going water management practices (if proposal is an extension to an existing site) and proposed water management practices.

5. An assessment of whether the development could influence water levels, flows or quality at the site and/or at any of the potential receptors.

6. Assessment of the degree of impact (if an impact is predicted).

7. Details of mitigation measures to prevent or reduce any impact.

For developments where dewatering is not anticipated, evidence for this should be presented.

The above information should allow the developer to provide a conceptual model of existing conditions and changes that are likely to occur as a result of the development. Diagrams/cross-sections should be used where possible to support the description of the site and proposed development.

An appropriate risk assessment should be carried out if a development could potentially impact local groundwater movement or surface water flow or local groundwater / surface water quality. Where it is determined that no such risk exists, a statement of reasoning for this opinion should be included.

3. Site Investigation

Where site investigation work has been carried out, all relevant information should be reported within the main report or as an appendix to the report.

Where intrusive techniques such as trial pitting and borehole installation has been undertaken, the findings from such work should be presented in a clear, consistent and comprehensive way. This should include:

- Recording of water level strikes during borehole/ trial pit construction
- Strata logs
- Borehole construction logs
- Water level measurements
- Water/soil chemistry details
- Water/soil sample collection and analysis methodologies
- Hydraulic and geotechnical test results
- Hydraulic and geotechnical test methodologies

Reference should also be made to any assumptions

made, techniques/methodologies employed in the investigation and the standard to which these have been carried out.

NB: The process of installation of investigation boreholes and pits can, in some circumstances, have an environmental impact when investigation points are poorly sited, designed or constructed. Careful consideration is required prior to implementing an investigation programme so that such impacts or adverse effects are avoided. Where there is any doubt advice should be sought from qualified professionals (e.g. hydrogeologist) and/or from NIEA.

4. Risk Assessment Modelling

Where "off-the-shelf" or bespoke models have been used in the assessment, a description of the model should be provided along with a clear explanation of all assumptions made/sensitivity analysis undertaken etc. Diagrams should be used wherever possible to support explanation.

Reference should be made to the sources/ organisations from which information has been sought.

5. Prior Consultation

In certain situations it may be appropriate to consult with the NIEA prior to designing an investigation programme.

Information Sources

Northern Ireland Environment Agency
www.ni-environment.gov.uk
water quality data; ecological data, consented discharges data
E: waterinfo@doeni.gov.uk

Geological Survey of Northern Ireland
www.bgs.ac.uk/gsni
geological/hydrogeological data; borehole logs database, mines database

Ordnance Survey of Northern Ireland
www.osni.gov.uk
topographical information, historical maps

Rivers Agency
www.riversagencyni.gov.uk
flow data, flood areas

Quarry Products Association
www.qpa.org

Irish Mining and Quarrying Association
www.imqs.ie

Mineral Industry Research Organisation administered website
www.goodquarry.com

Guidance Documents

A Guide for the Mineral Extraction Industry:
Guidance Notes on
a) Consent to Discharge,
b) Drainage and Treatment
Northern Ireland Environment Agency
(Water Management Unit)

An assessment of the relative environmental sustainability of sub-water table quarries. R&D Technical report P2-173/TR/2 - Environment Agency 2002

Geology in Environmental Impact Statements – A Guide – The Institute of Geologists of Ireland
www.igi.ie

Hydrogeological Impact Appraisal for dewatering abstractions. Science Report SC040020/SR1
- Environment Agency 2007

Policy and Practice for the Protection of Groundwater in Northern Ireland - Northern Ireland Environment Agency (Water Management Unit)

Reducing the Effects of Surface Mineral Workings on the Water Environment :
A Good Practice Guide – DETR 1998

Recommended Collection, Presentation and Interpretation of Geological and Hydrogeological Information for Quarry Developments
- The Institute of Geologists of Ireland 2007
www.igi.ie

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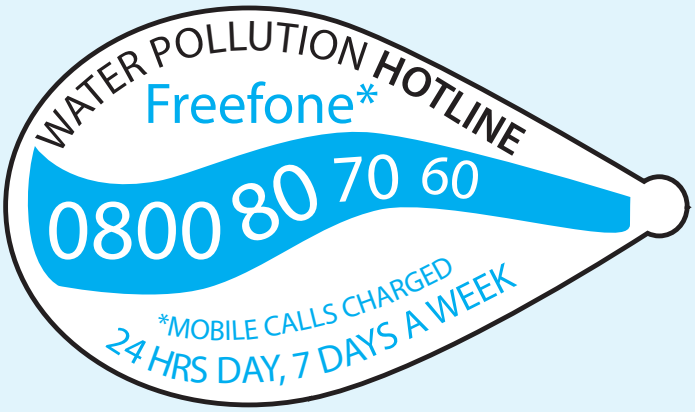

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