



Groundwater Management Information Fact Sheet 5: Development and Construction

This fact sheet is one of five fact sheets developed from the information contained in the Sydney Coastal Councils Group *Groundwater Management – A Guide for Local Government*. For further information about the other facts sheets of the Sydney Coastal Councils Group please visit www.sydneycoastalcouncils.com.au

Development Assessment

Any Development Application, considered under the *Environmental Planning and Assessment Act 1979*, should include an assessment of the impacts of the proposed activity on groundwater, where the potential for interaction has been identified. However, any development proposal that involves construction of permanent structures below the water table, other than pile or footing installation, should be supported by a detailed Geotechnical and Hydrogeological Report. In general, the objectives of such a report should be to demonstrate that the proposed works can be feasibly constructed without adverse impacts to neighbouring properties or the environment, and provide recommendations to address areas of uncertainty or concern.

Note:

It is the responsibility of the approval authority to ensure that an appropriate level of site investigation is undertaken by an appropriately qualified professional prior to development approval and that an ecologically sustainable groundwater management system is adopted, both during construction and in the long-term.

Key Issues

When assessing the merits of a development, the following key issues should be addressed by the proponent prior to an approval being issued:

Site investigation to determine existing groundwater conditions

Where it is intended to construct a development that extends into the existing groundwater regime, it is critical that adequate site investigation is undertaken at an early stage. This is to ensure that:

- The most appropriate groundwater management system is installed.
- The construction is undertaken in a way that minimises its impact on surrounding or adjacent properties, nearby infrastructure and the environment.

Groundwater management during construction

During construction, groundwater inflows into the basement excavation must be managed such that a safe and stable work site is provided. This will usually involve some form of dewatering around the perimeter of the site, so that the work area is kept dry while construction is being undertaken.

The installation of a dewatering system is subject to the same requirement as for the establishment of a water supply bore, that is, only contractors licensed through the Driller's Licensing Board are to be used.

Long-term Groundwater management

To protect the integrity of a completed development and minimise its long-term impact, a suitable ground water management system must be installed. New structures have the potential to cause diversion or damming of groundwater flowpaths in the vicinity of the development that may cause water levels to be altered both up-gradient and down-gradient of the site. Such changes can have the following implications:

- Adverse effects on bearing conditions around the foundations of surrounding dwellings.
- Creation of waterlogging problems on neighbouring properties.
- Impact on flora on adjoining properties.
- Redistribution or spreading of contamination into other areas.

Impacts of tailwater disposal

Tailwater is the water produced through the action of extracting groundwater during an activity other than for water supply or monitoring. The disposal of tailwater is one of the main concerns associated with dewatering activities as poorly managed or inappropriate disposal can result in regular discharge to streets (and, in turn, receiving water) during construction. In such cases, the ongoing discharge into gutters can create issues such as:

- Detrimental 'downstream' environmental impacts by potential chemical, physical and/or biological contamination.
- Concern from local residents about the source of the water and the apparent wastage.
- Potential slipping hazards caused by regular wetting.
- Overloading of the drainage network when dewatering occurs during significant rainfall events.
- Impacts on local businesses due to the volumes or appearance of the discharge or the odours generated by degassing of the tailwater.
- Sand or silt deposits when the tailwater is inadequately treated and filtered.

Groundwater level monitoring

It is important that during construction and operational phases of a project, the existing groundwater regime is maintained as close as possible to the pre-development condition. In this regard, consideration should be given to the level and flow attributes of the groundwater regime, through appropriate monitoring.

Water quality monitoring

Water quality monitoring is necessary at the design stage and through the project. Assessment during the design phase will assist in the determination of the most appropriate construction methodology (tanked or sump and pump) and the corresponding groundwater/tailwater disposal method. This will assist in compliance with legislative requirements (particularly the *Protection of the Environment Operations Act 1997* provisions relating to prevention of pollution) and addressing potential impacts on the completed structure after construction.

Reporting requirements for development and construction

Councils have a responsibility to ensure that proposed works for a new development do not have an adverse effect on neighbouring property and the environment. Any development proposal involving construction of permanent structures below the water table, other than pile or footing installation, should be supported by a series of detailed Geotechnical and Hydrogeological Reports, prepared at the following stages of the development:

- Prior to development approval.
- Prior to construction.
- During construction.
- Prior to occupation of the development.

In general, the objectives of the report submitted with a Development Application should be to demonstrate that the proposed works can be feasibly constructed without adverse impacts to neighbouring properties or the environment and provide recommendations to address areas of uncertainty or concern.

Conclusion

The construction of most structures in areas where groundwater systems exist can interfere with these systems by retarding, preventing or diverting flow into situations that become at best a nuisance and at worst a hazard. Therefore it is important that the appropriate level investigation is undertaken by appropriately qualified professionals before approval is granted.

Recommendations

Based on the information contained in this fact sheet and the *Groundwater Management – A Guide for Local Government*, the SCCG recommends that:

- The existing groundwater regime (flow, levels and quality) is determined prior to construction
- The groundwater regime is maintained as close as possible to the pre-development condition during construction and operational phases of a project.
- Construction techniques that eliminate the need for dewatering, if possible, should be required by Council.
- Water level monitoring is to be undertaken on a regular basis from the monitoring bores installed at the site and any additional on-site or off-site locations, if necessary.
- Developers familiarise themselves with the requirements of DWE and Councils relating to construction dewatering.

For more information on groundwater management please see the other fact sheets in the series. All fact sheets are available at www.sydneycoastalcouncils.com.au

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