

PROJECT PROFILE

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| Title | Environmental impact of road drainage on ground water quality |  An tÚdarás um Bóithre Náisiúnta National Roads Authority |
| Contractor | Trinity College Dublin | |
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| NRA Mentor | Vincent O'Malley | |
| Start date | Oct-09 | |
| End date | Sep-11 | |
| Status | On-going | |
| Type of project | Research Fellowship: Post-doc (William O'Keeffe) | |
| Project reference | RFP011/09 | |

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| Description | Recent research project by TCD investigated the different types of drainage systems in use on NRA road schemes and the resulting impacts on surface water quality. The major findings of the survey were that there was no significant impact on vegetation, macro invertebrates or fish downstream of outfalls from road developments and that a significant portion of road runoff (up to 80%) in areas of filter drains was bypassing the drainage system and entering the receiving environment. There is now a need to determine the effects of road run-off on groundwater. The research will include: 1) An assessment of the pathways for road runoff when it bypasses the road drainage system quantifying the amount reaching the groundwater table and rock aquifer in different geological settings; 2) A detailed hydrochemistry study on the groundwaters in the vicinity of different types of drainage systems in different terrains in order to quantify the risk of contamination. |
| Objectives | The research focuses on the assessment of the the impacts of road runoff on groundwater aquifers. The study will examine the different pathways and quantify the risk to the rock aquifers by looking at the hydrochemistry of road runoff and groundwater in high risk and low risk areas. A clear objective will be to establish just how much runoff is actually entering the rock aquifer and establish its pollution potential. |
| Benefits | At present there is little understanding of the pathways of road runoff in areas of French or Filter drains and in most case the response is to protect areas with vulnerable aquifers with more expensive drainage options such as sealed drainage. There has been significant improvements in car emissions recently (e.g. significant reduction in lead) and these improvements should be reflected in the associated environmental impacts. There is still a perception that road runoff represents a risk to groundwater quality. These impacts have not been assessed for groundwaters. By identifying the risk to groundwater in different settings the contractor will have further scope to develop more efficient and cost effective drainage design systems. The EU Groundwater Directive is now about to be transposed into Irish Law. This legislation will introduce environmental quality standards for groundwater aquifers and identify the pressures. It is essential that the NRA is in a position to quantify the environmental effects of road runoff from national road developments in the same manner that the impacts on surface water quality were assessed. The project will result in more target specific and cost effective mitigation measures for road |
| Outputs | The research will lead to a document entitled "Impact assessment of National Road Development on groundwaters" detailing all the findings with recommendations on the most cost effective drainage design systems. |