

Appendix 8

Environmental Assessment of Receiving Waters

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Comhairle Chontae Luimnigh

Environmental Assessment of receiving waters

For

Churchtown Landfill Site

Newcastle West

Co. Limerick

EPA Ref: S22-02465

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Prepared by:

Robert Imbusch

Environment Section

Limerick County Council

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Introduction

Limerick County Council intends to apply for a Certification of Authorisation for the historic landfill site located at Churchtown, Newcastlewest, County Limerick in accordance with *Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No. 524 of 2008)*. As part of this process, Limerick Co Council is required to carry out an environmental assessment of the site in accordance with the EPA **Code of Practice: *Environmental Risk Assessment for Unregulated Waste Disposal Sites***.

There are no direct surface water discharges from the landfill site to any surrounding watercourses. However, in December 2012, Tobin Consulting Engineers carried out a hydrogeological assessment at the site which indicated that the direction of groundwater flow at the site is from the north-east to the south-west in the direction of the River Dooally. The report identified a possible hydraulic groundwater linkage between the site and the River Dooally and that contaminated groundwater from under the landfill site could migrate to the Dooally River.

This report details the results of ecological monitoring carried out on the Dooally River in the vicinity of Churchtown landfill.

The Dooally River is the nearest significant watercourse to the Churchtown landfill site - see Figures 1 and 2. The Dooally River is a tributary of the Deel River and flows 0.5 km to the west of the landfill in a southerly direction. The closest surface water feature to the site is a small drainage channel which flows from a point 450 metres south of the landfill site to the Dooally River, a distance of approximately 500 metres.

Methodology

Since 1971, the EPA has used the Quality Rating System (Q-values) to assess water quality in Irish rivers, primarily on the basis of macroinvertebrate communities in riffle areas of rivers and streams. In the presence of pollution, characteristic and well-documented changes are induced in the flora and fauna of rivers and streams. Particularly well documented are the changes brought about by organic pollution in the macroinvertebrate community, i.e. the immature aquatic stages of aerial insects (mayflies, stoneflies etc.) together with Crustacea (e.g. shrimps), Mollusca (e.g. snails and bivalves), Oligochaeta (worms) and Hirudinea

(leeches). For the purposes of the EPA assessment procedure benthic macroinvertebrates have been divided into five Indicator Groups.

Relationships between water quality and macroinvertebrate community structure are usually described by means of a numerical scale of values. The EPA scheme of Biotic Indices or Quality (Q) Values and its relationship to WFD status is set out in the table.

Q-Value	WFD Status
5,4-5	High
4	Good
3-4	Moderate
3, 2-3	Poor
2, 1-2, 1	Bad

Freshwater benthic macroinvertebrates were sampled at four sampling sites. The location of the sampling sites in relation to the landfill is shown in Figure 2 (see also photos 1-4). Standard two-minute kick samples were taken at each sampling site. The macroinvertebrates were identified on site and the taxa or groups present and relative abundance are shown in Table 1. The invertebrates are grouped according to their sensitivity to organic pollution. A Q-rating and SSRS Score was assigned to each sample (see Table 1). These are biotic indices used to assess the level of pollution and water quality status.

Q-sampling provides a reliable and consistent indication of water quality in rivers and small streams but may be less suitable for small drainage channels which have low, intermittent flows.

Survey Results

Dooally River Main Channel: The main Dooally River was sampled at three locations-see location map. Site 1 is located upstream of the landfill site, sites 2 and 3 are located upstream and downstream of the confluence of the drainage channel with the main channel. All three samples were indicative of a Q4 or unpolluted status. There was no deterioration in water quality up and downstream of the landfill site.

Drainage Channel The landfill drain was sampled close to its conference with the Dooally River at Site 4 (Photo 4). Only pollution tolerant invertebrates were present in the sample giving a Q1-2 rating (see Table 1). There were no other indications of the presence of organic

pollution, such as algae or sewage fungus which would normally be associated with a sample of invertebrates such as this. Dissolved oxygen here was 75% saturation at the time of sampling but the results of the kick sample suggest that more anoxic conditions are typically prevalent. The drain was sampled in 2012 as part of the Tier 2 Investigation and found not to have elevated parameters of contamination associated with landfill leachate – see Appendix 1 for results.

The drainage channel is not considered a suitable habitat for kick sampling due to its low and intermittent flows.

Recommendations

Further biological and chemical sampling on the drainage channel should be incorporated into the ongoing monitoring programme for Churchtown landfill site.

Conclusion

There is no reduction in biological water quality in the main channel of the Dooally River downstream of Churchtown historic landfill site.

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Robert Imbusch
Assistant Scientist
Environment Section
Limerick Co Council.

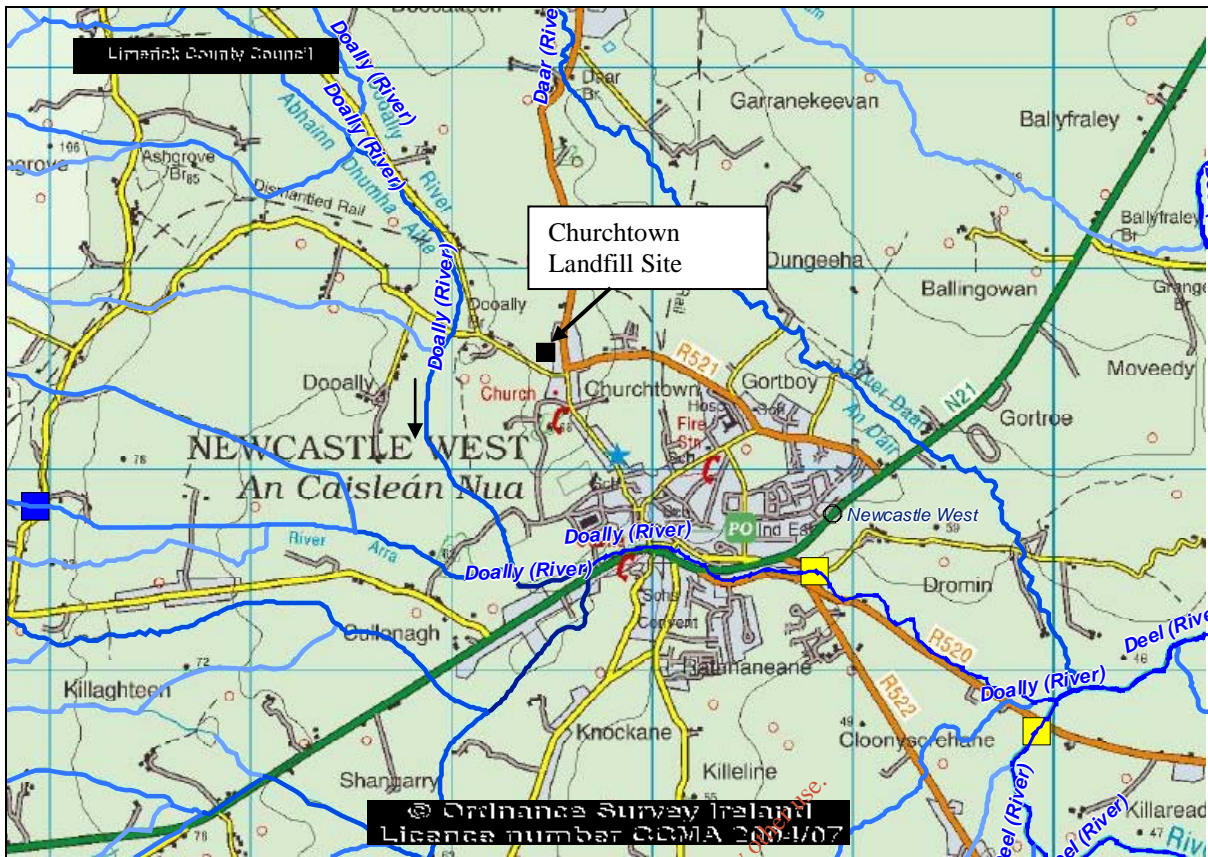


Figure 1. Map of the Churchtown Landfill Site at Newcastlewest, County Limerick.

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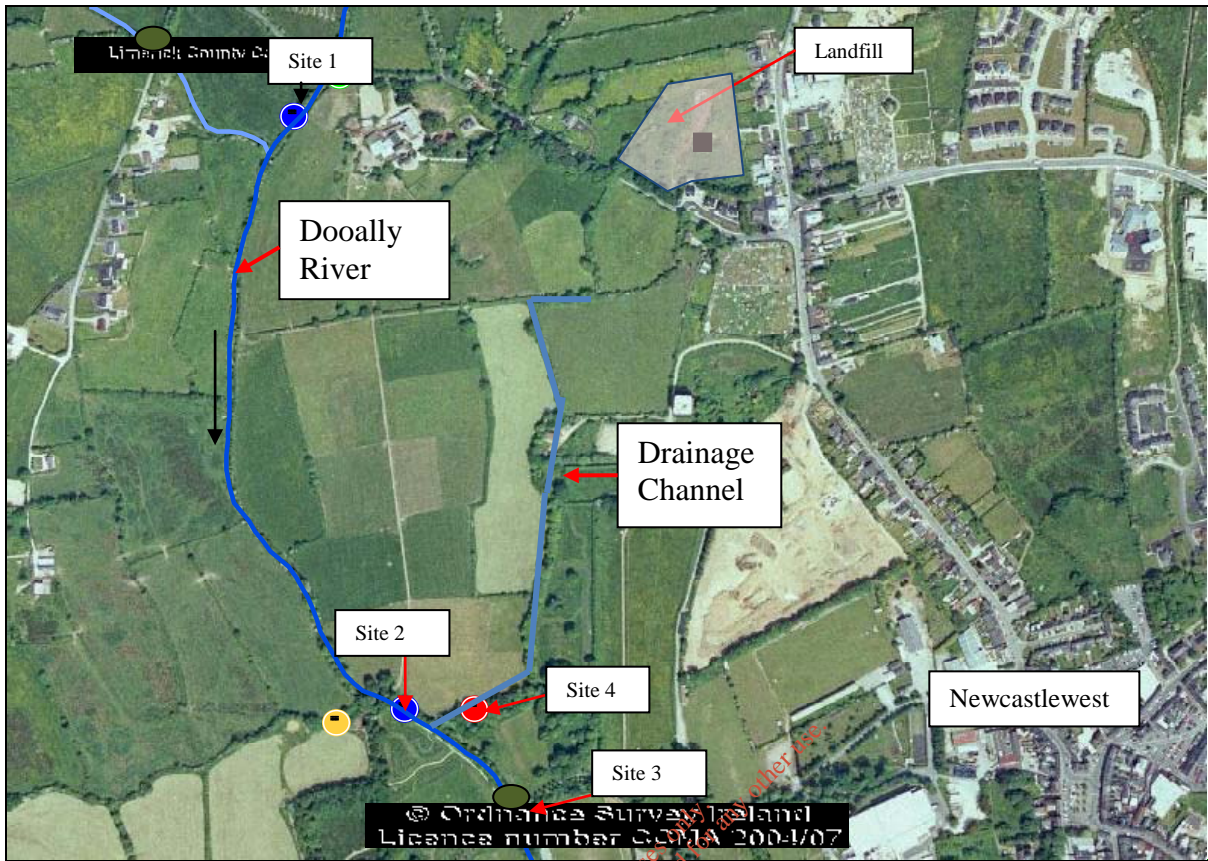


Figure 2. Map of the Churchtown landfill and River Sampling Sites (1-5).

Table 1: Relative Abundance of Macroinvertebrates

	Site 1 Dooally Bridge	Site 2 Dooally River, upstream of drainage channel	Site 3 Dooally River, downstream of drainage channel	Site 4 Landfill Drain
Grid Coordinates	X 126959 Y 134620	X 127095 Y 133884	X 127234 Y 133739	X 127182 Y 133884
Group A (Sensitive)				
<i>Ecdyonurus</i>	Few	Common	Common	
<i>Rhitrogena</i>	Numerous	Numerous	Numerous	
Taenioptergiidae			Few	
<i>Leuctra</i>	Few	Few	Few	
<i>Isoperla</i>		Few		
Group B (Less Sensitive)				
Limnephilidae	Common	Few	Few	
Glossosomatidae	Common			
Goeridae	Common	Few	Few	
<i>Sericostoma</i>	Few	Few	Few	
Ephemereillidae	Common	Common	Common	
Group C (Tolerant)				
<i>Polycentropus</i>	Few	Few		
Hydracarina	Common	Few	Common	
<i>Ancylus</i>	Few	Few	Few	
<i>Potamopyrgus</i>				Few
<i>Gammarus</i>	Dominant	Numerous	Numerous	
<i>Baetis</i>	Dominant	Numerous	Numerous	
<i>Rhyacophila</i>		Few		
<i>Hydropsyche</i>	Few		Few	
Simuliidae		Common	Common	
Chironomidae			Common	
Coleoptera	Common	Common	Common	
<i>Limnea</i>	Few			
Group D (Very Tolerant)				
Hirudinea	Few	Few		Few
Asellus	Few			
Spheariidae				Few
Group E (Most Tolerant)				
Tubificidae	Few	Few	Few	Few
<i>Chironomus</i>				Common
Others:				
Dicranota		Few		
Q-Rating	4 Unpolluted	4 Unpolluted	4 Unpolluted	1-2 Seriously Polluted
SSRS	8.8 (Probably not at risk)	10.4 (Probably not at Risk)	10.4 (Probably not at Risk)	3.2 (At Risk)

Note: Relative abundance of Benthic Macro-invertebrates sampled in the vicinity of Churchtown Landfill site at Newcastlewest, Co. Limerick. (Few 1-5; Common 6-20; Numerous 21-50; Dominant 51-75).



Photo 1. Sampling Site 1 - Doaally Bridge, Dooally River, Newcastlewest, Co. Limerick.



Photo 2. Site 2 – Dooally River, 30 meters upstream of landfill drain.



Photo 3. Site 3 – Dooally River, 150 meters downstream of landfill drain, Newcastlewest, County Limerick.



Photo 4. Site 4 – Landfill Drain at Churchtown, Newcastlewest County Limerick.

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