

19 July 2010

Ms Caroline Kelly
Administration, Environmental Licensing Programme
Office of Climate, Licensing and Resource Use
Environmental Protection Agency Headquarters
PO Box 3000
Johnstown Castle Estate
Co. Wexford

**Re: Certification of Newmarket Landfill Site
Application No. H0001-01**

Dear Caroline,

Further to your letter of 15th March 2010 and 20th April 2010 please find responses below:

- 1) **Appropriate Assessment:**
Cork County Council carried out a screening for an Appropriate Assessment. This screening is attached as Appendix 1. The screening determined that there are no likely significant impacts from the historic landfill at Newmarket to the integrity of the Blackwater River (Cork/Limerick) cSAC. Therefore, a Habitats Directive Assessment – Stage 2 (Appropriate Assessment) is not required.
- 2) **Leachate sampling and testing:**
No leachate was found in any of the leachate wells during the first round of sampling in June due to the dry weather conditions. Further sampling was conducted on the 16th July after a week of heavy rains. BH1 (Leachate Borehole No.1) and BH2 were dry on inspection. There was sufficient sample volume in leachate BH3 however and this sample has been sent off for analysis. The results will be reported in due course.

3) Underlying clays and bedrock

Groundwater monitoring was carried out on the 3No. Groundwater Monitoring wells. The samples were tested for indicator parameters as per the table below:

Parameter	BH-4	BH-5	BH-6	Guideline Values	Units
pH	6	6.5	6.1	≥6.5 and ≤ 9.5	pH Units
Conductivity	193	223	127	1000	uscM -1@25C
Ammonia	0.07	0.068	0.067	0.15	mg/L as N
Sulphate	14.2	11.9	28.1	200	mg/L as SO4
Chloride	15.6	17.6	15.1	30	mg/L
Cyanide	<5.0	<5.0	<5.0	10	ug/L
Sodium	13.8	14.5	13.8	150	mg/L
Potassium	2.6	2.2	1.9	5	mg/L

Only pH was outside the required groundwater guideline values. The pH was retested on the 16th of July. BH4 was 6.61, BH5 6.50 and BH6 6.21. (BH6 remained outside the guideline values of between 6.5 and 9.5).

4) Surface Water Monitoring:

Surface water samples for Newmarket Landfill - June 2010				
Parameter	Units	SW1	SW2	EQS Values
Conductivity (Surface Water)	uscM -1@25C	223	225	1000
Sodium	mg/L	13.3	12.7	~
Potassium	mg/L	1.60	1.30	~
Cadmium (Surface Water)	ug/L	<1.0	<1.0	5 ug/L
Chromium (Surface Water)	ug/L	<1.0	<1.0	30 ug/L
Copper (Surface Water)	ug/L	<3	<3	30 ug/L
Nickel (Surface Water)	ug/L	0.8	0.7	50 ug/L
Lead (Surface Water)	ug/L	<0.3	<0.3	10 ug/L #
Zinc (Surface Water)	ug/L	2.6	2.8	100 ug/L #
Arsenic (Surface Water)	ug/L	<0.1	<0.1	25 ug/L #
Mercury	ug/L	<0.02	<0.02	1 ug/L #
Sulphate	mg/L as SO4	2.06	2.07	200 mg/L
Chloride (Surface Water)	mg/L	14.9	15.2	250 mg/L
Phosphate (Ortho) Surface Water	mg/L as P	0.041	0.053	~
Cyanide	ug/L	<5.0	<5.0	10 ug/L #
Fluoride (Surface Water)	mg/L	<0.1	0.1	5 mg/L #
Total Petroleum Hydrocarbons	mg/L	0.964	1.443	0.01mg/L
VPH C5 - C9	mg/L	0.964	1.443	0.01mg/L
EPH	mg/L	<0.01	<0.01	0.01mg/L

Surface water sampling was undertaken on 3rd June 2010. Samples were taken up-stream and downstream of the landfill. Both samples were taken downstream of the outlet from the sewage treatment plant (the outfall from the sewage treatment plant was not turned off).

The only surface water results showing levels higher than the EQS Values was for Total Petroleum Hydrocarbons. Both the up-stream and down stream values were multiples above the Environmental Quality Standards. It is unlikely that these high values are as a result of the landfill as degradation of shorter chain molecules occur over a short time frame (C5 – C9 is normally associated with Petrol).

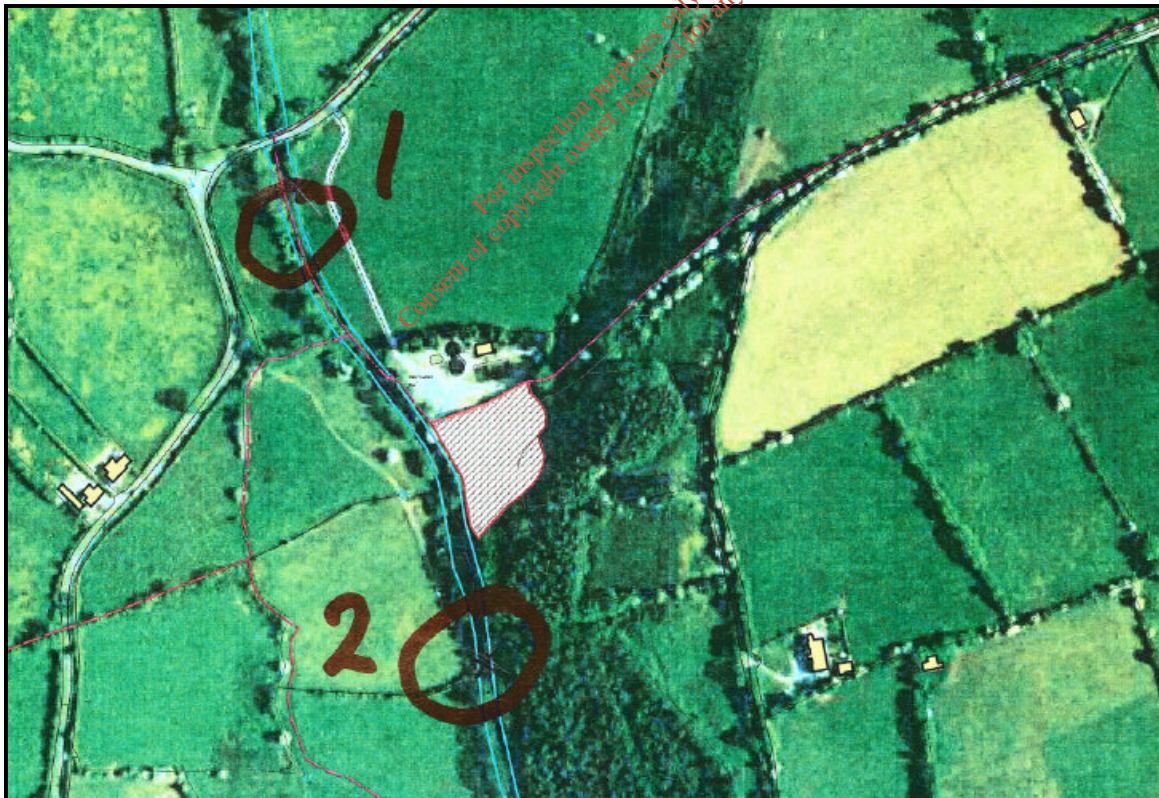
Due to the high readings further testing took place on 16th July. The results from these samples will be reported on in due course.

Analysis reports are included in Appendix 2.

Biological Sampling was carried out on the Dalua River adjacent to the Landfill by Cork County Council Environmental Officer. A summary of the results of this sampling can be seen below (full details are outlined in Appendix 3)

SSRS on Dalua River 11/5/2010

Samples were analysed upstream and downstream on the old landfill site at locations shown on the map below.



The samples were examined for long-lived macro invertebrates of known sensitivity to pollution to provide an indicator of water quality in a single sample. A score card was filled out detailing the presence or absence of certain macro invertebrates and the resulting score is an indicator of water quality calculated within the following categories:

>8 = probably not at risk.
6.5 to 8.5 = probably at risk.
< 6.5 = at risk.

Both samples returned the same score of 9.6 which is in the “probably not at risk” category. The samples had small numbers of mayfly and good abundances of stone fly. The downstream sample had some worms more common in numbers but returned the same score.

In relation to items 5 (review of SPR linkages) and 6 (validation report) of your letter we will address these items when we have the results of the most recent sampling returned to us.

If you have any queries on the above please do not hesitate to contact me on 021 453 2751.

Yours faithfully,

Kieran Coffey
Environment Directorate
Cork County Council

cc. Nicholas Bond, File

Attachments: Appendix 1 - Screening for Appropriate Assessment
Appendix 2 - Sampling and Analysis Reports
Appendix 3 - Biological Sampling Report for Dalua River
CD with all above information in PDF format

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HABITATS DIRECTIVE ASSESSMENT – STAGE 1 (SCREENING MATRIX)

Stage 1: SCREENING MATRIX FOR THE EXISTING UNREGULATED WASTE DISPOSAL SITE AT NEWMARKET, CO. CORK, WITH REGARD TO POTENTIAL IMPACTS ON THE BLACKWATER RIVER (CORK/WATERFORD) cSAC (SITE CODE 002170) - NATURA 2000 SITE (candidate Special Conservation Area) * (cSAC).

(Following Article 6 (3) of the European Union Habitats Directive (92/43/EEC))

**Guidelines used in this assessment	
1. Description of the project or plan	
Location	The Newmarket Landfill is located 1km southwest of Newmarket town, Co. Cork (GIS coordinates E131,030, N106,760). It is accessed off a national tertiary road, which runs between Newmarket and Boherboy. The landfill covers an area of 0.29 hectares.
Distance from designated site	The existing landfill at Newmarket is located directly adjacent and to the east of the cSAC, where the latter designation covers the Dalua River. The Dalua is a tributary of the River Blackwater and is part of the Blackwater River (Cork/Limerick) cSAC (Site Code 002170). This cSAC is part of the Natura 2000 network of sites protected under the EU Habitats Directive (92/43/EEC).
Brief Description of the project or plan	This landfill has been closed since 1984. It is adjacent to the sewage treatment plant which serves Newmarket town. It is estimated that this site was in use from about 1950's but was not a major landfill (due to access difficulties for trucks). The waste that it contains is categorised as non-hazardous municipal solid waste. Remediation of this landfill is proposed in the form of clay capping system, which has been placed over the landfill to prevent any percolation of rainwater.
Is the plan directly connected with or necessary to the Natura 2000 site management for nature conservation?	No

* A candidate Special Area of Conservation is designated under the EU Habitats Directive (92/43/EEC) for the protection of certain habitats and species as listed in the Directive.

** Prepared in accordance with the following documents:

Department of the Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC and

European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.

The information on the Natura 2000 site is taken from the site synopsis¹.

2. Brief Description of the Natura 2000 site	
Name	Blackwater River (Cork/Limerick) cSAC (Site Code 002170)
Site designation status	<ul style="list-style-type: none"> ▪ Designation: Candidate Special Area of Conservation (Site Code 002170) ▪ Basis: EU Habitats Directive (92/43/EEC)
Natura 2000 Site description	The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which includes the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The site is selected for a range of Annex I woodland, river, estuarine and intertidal habitats along with a number of Annex II species (as listed in the EU Habitats Directive 92/43/EEC). The site is also considered to be of high conservation value for the populations of several bird species listed under Annex I of the EU Birds Directive which use the site. Additionally the importance of the site is enhanced by the presence of a number of rare plant species, a number of which are protected under the Flora (Protection) Order, 1999.
Qualifying species	<ul style="list-style-type: none"> ▪ Sea lamprey (<i>Petromyzon marinus</i>) ▪ Brook lamprey (<i>Lampetra planeri</i>) ▪ River lamprey (<i>Lampetra fluviatilis</i>) ▪ Otter (<i>Lutra lutra</i>) ▪ Twaite shad (<i>Alosa fallax</i>) ▪ White-clawed crayfish (<i>Austropotamobius pallipes</i>) ▪ Atlantic salmon (<i>Salmo salar</i>) ▪ Freshwater pearl mussel (<i>Margaritifera margaritifera</i>) ▪ Killarney fern (<i>Trichomanes speciosum</i>)
Qualifying habitats	<ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) (91E0)[†] ▪ <i>Taxus baccata</i> woods of the British Isles (91J0)[†] ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in British Isles (91A0) ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation (3260) ▪ Estuaries (1130) ▪ <i>Salicornia</i> and other annuals colonising mud and sand (1310) ▪ Mudflats and sandflats not covered by seawater at low tide (1140) ▪ Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) (1330) ▪ Mediterranean salt meadows (<i>Juncetalia maritimi</i>) (1410) ▪ Perennial vegetation of stony banks (1220) <p>[†]priority habitat on Annex I of the EU Habitats Directive (92/43/EEC)</p>
Non-qualifying habitats and species of interest	<p>Habitats of interest include those with potential links to Annex I habitats:</p> <ul style="list-style-type: none"> ▪ Wet willow-alder-ash woodland ▪ Wet grassland ▪ Marsh ▪ Semi-natural deciduous woodlands ▪ Old estate woodlands ▪ Reed and large sedge swamps ▪ Lowland depositing rivers with floating aquatic vegetation (<i>Ranunculus spp.</i>) which has links to the Annex I habitat Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation ▪ Blanket bog ▪ Heath <p>Five Red Data Book² plant species, in addition to the Killarney fern, have been recorded within the site and are listed below. Of these the Killarney fern, starved wood sedge and pennyroyal are protected under the Flora (Protection) Order 1999.</p> <ul style="list-style-type: none"> ▪ Starved wood sedge (<i>Carex depauperata</i>)

	<ul style="list-style-type: none"> ▪ Pennyroyal (<i>Mentha pulegium</i>) ▪ Bird's-nest orchid (<i>Neottia nidus-avis</i>) ▪ Golden dock (<i>Rumex maritimus</i>) ▪ Bird cherry (<i>Prunus padus</i>) <p>Fauna species protected under the Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000:</p> <ul style="list-style-type: none"> ▪ All bat species* ▪ Common frog (<i>Rana temporaria</i>) ▪ Badger (<i>Meles meles</i>) ▪ Pine marten (<i>Martes martes</i>)* ▪ Irish hare (<i>Lepus timidus hibernicus</i>) <p>Annex I (EU Birds Directive, 79/409/EEC) bird species of interest:</p> <ul style="list-style-type: none"> ▪ Kingfisher (<i>Alcedo atthis</i>) ▪ Hen harrier (<i>Circus cyaneus</i>) ▪ Peregrine falcon (<i>Falco peregrinus</i>) <p>A wide range of other Annex I (EU Birds Directive, 79/409/EEC) waterfowl species are also found in the site in internationally important numbers such as Whooper swan (<i>Cygnus cygnus</i>), Bewick's swan (<i>Cygnus bewickii</i>) and black-tailed godwit (<i>Limosa limosa</i>). However, these species are predominantly associated with the Blackwater Estuary and Blackwater Callows and do not occur in the area of the site subject of this assessment.</p>
Unit size	Approx. 15049 ha
Condition	<p>Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively; furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.</p> <p>The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage treatment works, dredging of the upper reaches of the Awbeg, overgrazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel. The Munster Blackwater pearl mussel population is in decline due to depressed river quality from nutrient enrichment and siltation from agriculture, forestry, sewage and industry and is deemed to be at unfavourable conservation status in the catchment³.</p>
3. Assessment Criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 sites.	<ul style="list-style-type: none"> • There is no direct overlap between the landfill at Newmarket and the cSAC. There will thus be no habitat loss within the cSAC as a result of this project. • There is the potential for contamination of groundwater and surface water from toxic compounds in the leachate associated with the existing landfill at Newmarket. This has been addressed by a site investigation report.⁴
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of: <ul style="list-style-type: none"> ▪ Size and scale; ▪ Land-take; 	<ul style="list-style-type: none"> ▪ None of the Annex I habitats listed under the EU Habitats Directive, for which the Blackwater River (Cork/Limerick) cSAC is designated, will be impacted by the landfill at Newmarket, as there is no overlap of the landfill with the cSAC. ▪ Groundwater investigations have been undertaken at 3 No. boreholes, one of which is located up-gradient of the landfill and two to the west of the landfill but outside the cSAC boundary. The results for samples taken from these wells indicate that the waste on site has not had a negative impact on the groundwater quality. ▪ The nature of waste observed was typical of household waste that

<ul style="list-style-type: none"> ▪ Distance from Natura 2000 site or key features of the site; ▪ Resource requirements; ▪ Emissions; ▪ Excavation requirements; ▪ Transportation requirements; ▪ Duration of construction, operation etc.; ▪ Others. 	<p>has been buried for more than 26 years and which has undergone considerable biodegradation. With the exception of one parameter in one trial pit analysis has shown that the materials in the landfill are inert.</p> <ul style="list-style-type: none"> ▪ The natural subsoils beneath the waste appear to be of low permeability and will retard the downward movement of infiltrating rainfall. ▪ The Dalua River is directly adjacent to the landfill to the west. Given the inert nature of the waste and no measurable impact on the groundwater, the risk of impact on this stream is considered to be insignificant.
<p>Describe any likely changes to the site arising as a result of:</p> <ul style="list-style-type: none"> ▪ Reduction of habitat area; ▪ Disturbance of key species; ▪ Habitat or species fragmentation; ▪ Reduction in species density; ▪ Changes in key indicators of conservation value; ▪ Climate change. 	<ul style="list-style-type: none"> ▪ No changes to the Natura 2000 site are likely as a result of the continued presence of the existing landfill at Newmarket.
<p>Describe any likely impacts on the Natura 2000 site as a whole in terms of:</p> <ul style="list-style-type: none"> ▪ Interference with the key relationships that define the structure of the site; ▪ Interference with key relationships that define the function of the site. 	<ul style="list-style-type: none"> ▪ No impacts to the Natura 2000 site as a whole are likely as a result of the continued presence of the existing landfill at Newmarket. There are no measurable impacts of the leachate on groundwater or surface water in the vicinity of the landfill, no loss of habitats or species within the Natura 2000 site, and hence, no likely impacts on the structure or function of the Natura 2000 site.
<p>7. Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale of magnitude of impacts is not known.</p>	<p>It has been concluded from this screening that there are no likely significant impacts of the existing landfill at Newmarket on the integrity of the Blackwater River (Cork/Limerick) cSAC or on any of the Annex I habitats or Annex II species which are the qualifying interests of this Natura 2000 site. Therefore, a Habitats Directive Assessment – Stage 2 (Appropriate Assessment) is not required.</p>

References

1. National Parks and Wildlife Service (2006). *Blackwater River (Cork/Waterford) candidate Special Area of Conservation (Site Code 002170)*. Department of the Environment, Heritage and Local Government, Dublin.

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2. Curtis, T.G.F and McGough, H.N. (1988). *The Irish Red Data Book*. 1. Vascular Plants. Wildlife Service, Stationary Office, Dublin.
 3. NS2 (2009). *Freshwater Pearl Mussel, Draft Munster Blackwater Sub-Basin Management Plan*. Department of the Environment, Heritage and Local Government, Dublin.
 4. Cork County Council, Environment Directorate (2010). *Newmarket Tier II Site Investigation Report and Tier III Quantitative Risk Assessment*.

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Analysis Report

Attention: Kieran Coffey Cork County Council (Iniscarra Environmental Directorate) Inniscarra Co Cork	Report No: 17525
Fax No:	Date of receipt: 04/06/2010
Tel No: 021-4532751 / 086 3827197	Date Started: 11/06/2010
PO Number: 462773	Issue Date: 05/07/2010
Sample Type: Surface Water	Page: 1 of 2
Condition on receipt: Satisfactory	Delivery Mode: Hand
	No. of Samples: 2
	Client Ref: Below

SIGNED

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(05/07/2010)

Technical Manager (or Deputy)
Brendan Murray

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Only those tests, matrices, ranges specified are accredited

Method	AQ2						Dissolved Metals ICPMS			ICPMS										IC	GCFID			
Method Number	EW050	EW015	EW035	EW034	EW007	EW015	EM130			EM130										EW137	EO063			
Parameter	CN	Cl	Nitrite	Nitrate	Ortho-Phosphate (MRP)	SO4	Cd (Dissolved)	Cr (Dissolved)	Cu (Dissolved)	As	Ba	Hg	Ni	Pb	Sb	Se	Zn	K	Na	Fluoride	VPH	EPH	TPH	
Units	ug/l	mg/l	mg/l N	mg/l N	mg/l P	mg/l	ug/l	ug/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	
Limit of Detection	5	2.6	0.013	0.12	0.009	1.0	0.1	1.0	0.003	0.2	1.0	0.02	0.5	0.3	0.1	0.2	1.0	0.2	0.5	0.1	10	10	10	
Date Testing Initiated	15/06	16/06	11/06	11/06	11/06	02/01	15/06										16/06	29/06	23/06	23/06				
ELS Ref	Client Ref																							
17525-1	SW1	<5.0	14.9	0.017	1.73	0.041	2.06	<0.1	<1.0	<0.003	<0.1	12.4	<0.02	0.8	<0.3	<0.1	0.2	2.6	1.5	13.3	<0.1	964	<10	964 (See note 4)
17525-2	SW2	<5.0	15.2	0.016	1.74	0.053	2.07	<0.1	<1.0	<0.003	<0.1	11.8	<0.02	0.7	<0.3	<0.1	0.4	2.8	1.4	12.7	0.1	1443	<10	1443 (See note 4)

NOTES

- 1 Sub-contract analysis denoted by *
- 2 ND = Concentration was below the limit of detection
- 3 List of tests required received on 10/06
- 4 Unknown hydrocarbon detected in the VPH range.

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ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET

<p>Miscellaneous (P,G,W,S) Ammonia/Ammonium 0.007-1mg/l N EW003 Chloride 2.6-250 mg/l EW015 Flouride 0.1 - 2 mg/l EW137 COD 8-1500 mg/l EW094 Nitrate 0.12-50 mg/l N EW034 Nitrite 0.013-1 mg/l N EW035 pH 4 – 10 pH Units EW138 Phosphate 0.009-1 mg/l P EW007 Alkalinity 10-1000mg/l EW062 TOC 0.25-100mg/l EW123 BOD 1-1300mg/l EW001 Total Nitrogen 1-100mg/l N EW140 Total Phosphorous 0.01-40 mg/l P EW143</p>	<p>Other VOC's EO025 (P,G,S) Bromomethane 0.5 - 35 µg/l Ethyl Ether/Diethyl Ether 0.5 - 35 µg/l 11 Dichloroethene 0.5 - 35 µg/l Iodomethane/Methyl Iodide 0.5 - 35 µg/l Carbon Disulphide 0.5 - 35 µg/l Allyl Chloride 0.5 - 35 µg/l Methylene Chloride/DCM 5.0 - 35 µg/l 2-Propenenitrile/Acrylonitrile 2.0 - 35 µg/l Chloromethyl Cyanide 0.5 - 35 µg/l Hexachlorobutadiene 0.5 - 35 µg/l Trans-1,2 Dichloroethene 0.5 - 35 µg/l MtBE 0.5 - 35 µg/l 11 Dichloroethane 0.5 - 35 µg/l 22 Dichloropropane 0.5 - 35 µg/l Cis-12 Dichloroethene 0.5 - 35 µg/l Methyl Acrylate 5.0 - 35 µg/l Bromochloromethane 0.5 - 35 µg/l Tetrahydrofuran 5.0 - 35 µg/l 111 Trichloroethane 0.5 - 35 µg/l 1-Chlorobutane 0.5 - 35 µg/l Carbon Tetrachloride 0.5 - 35 µg/l 11 Dichloropropene 0.5 - 35 µg/l 12 Dichloropropane 0.5 - 35 µg/l Dibromomethane 0.5 - 35 µg/l Methyl Methacrylate 0.5 - 35 µg/l 13 Dichloropropene, cis 2.0 - 35 µg/l MIBK/4 Methyl 2 Pentanone 2.0 - 35 µg/l Toluene 0.5 - 35 µg/l 13 Dichloropropene, trans 2.0 - 35 µg/l Ethyl Methacrylate 2.0 - 35 µg/l 112 Trichloroethane 0.5 - 35 µg/l 13 Dichloropropane 0.5 - 35 µg/l 2 Hexanone 1.0 - 35 µg/l 12 Dibromoethane 0.5 - 35 µg/l Chlorobenzene 0.5 - 35 µg/l 1112 Tetrachloroethane 2.0 - 35 µg/l Ethyl Benzene 0.5 - 35 µg/l m & p Xylene 0.5 - 35 µg/l O Xylene 0.5 - 35 µg/l Styrene 2.0 - 35 µg/l Isopropyl Benzene 0.5 - 35 µg/l Bromobenzene 0.5 - 35 µg/l 1122 Tetrachloroethane 0.5 - 35 µg/l 123 Trichloropropane 2.0 - 35 µg/l Propyl Benzene 0.5 - 35 µg/l 2-Chlorotoluene 0.5 - 35 µg/l 4 Chlorotoluene 0.5 - 35 µg/l 135 Trimethylbenzene 0.5 - 35 µg/l Tert Butyl Benzene 0.5 - 35 µg/l 124 Trimethylbenzene 0.5 - 35 µg/l Sec Butyl Benzene 0.5 - 35 µg/l 13 Dichlorobenzene 0.5 - 35 µg/l P Isopropyltoluene 0.5 - 35 µg/l 14 Dichlorobenzene 0.5 - 35 µg/l 12 Dichlorobenzene 0.5 - 35 µg/l N Butyl Benzene 0.5 - 35 µg/l Hexachloroethane 5.0 - 35 µg/l 12 Dibromo 3Chloropropane 2.0 - 35 µg/l 124 Trichlorobenzene 0.5 - 35 µg/l 123 Trichlorobenzene 0.5 - 35 µg/l</p>	<p>PAH EO129 (P,G,S) Range 0.01 - 0.2 µg/l Acenaphthene Benzo (a) Anthracene Benzo (a) Pyrene Benzo (b) Fluoranthene Benzo (ghi) Perylene Benzo (k) Fluoranthene Chrysene Dibenzo (ah) Anthracene Fluoranthene Fluorene Indeno (123-cd) Pyrene Phenanthrene Pyrene</p>
<p>Miscellaneous (P,G,S) Bromate 1 to 50µg/l BRO3 (EW137) Colour 2.5-50mg/l PtCCo (EW021) Conductivity 25-6000 us/cm EW139 Dissolved Oxygen 1 to 10 mg/l (EW043) Sulphate 1-250mg/l SO4(EW016) Suspended Solids 5-1000mg/l (EW013) Total Dissolved Solids 1-1000mg/l (EW046) Total Hardness 3-330mg/l CaCO3 (EM099) Total Oxidised Nitrogen 0.138-51mg/l N (EW051)</p>	<p>Acid Herbicides (P,G,S) Range 0.01 - 0.2 µg/l 2,4,5-T H 2,4-D H 2,4-DB H MCPA H Picloram H</p>	<p>Organophosphorus Pesticides (P,G,S) Range 0.01 - 0.2 µg/l Famphur OP Methyl Parathion OP Parathion OP Thionazin OP</p>
<p>Metals EM130 (P,G,S) Aluminium 5.0 – 500 µg/l Antimony 0.1 – 10µg/l Arsenic 0.2 - 20µg/l Barium 1.0 - 100µg/l Boron 0.02 – 2mg/l Cadmium 0.1 – 10µg/l Calcium 1.0 – 100mg/l Chromium 1.0 - 100µg/l Cobalt 1.0 - 100µg/l Copper 3 - 4000µg/l Iron 5.0 - 500µg/l Lead 0.3 - 30µg/l Magnesium 0.3 – 20mg/l Manganese 1.0 - 100µg/l Mercury 0.02 - 2µg/l Molybdenum 1.0 - 100µg/l Nickel 0.5 - 50µg/l Potassium 0.2 – 20mg/l Selenium 0.2 - 20µg/l Sodium 0.5 – 50mg/l Strontium 1.0 - 100µg/l Tin 1.0 - 100µg/l Vanadium 1.0 - 100µg/l Zinc 1.0 - 100µg/l</p>	<p>Organochlorine Pesticides (P,G,S) Range 0.01 - 0.2 µg/l Aldrin BHC Alpha isomer OC BHC Beta isomer OC BHC Delta isomer OC Dieldrin OC Endosulphan Alpha isomer OC Endosulphan Beta isomer OC Endosulphan Sulphate OC Endrin OC Heptachlor Epoxide OC Heptachlor OC Lindane OC P,P' DDE OC P,P'-DDD OC P,P'-DDT OC</p>	
<p>SI439 Potable Water VOCs & THM EO025 (P,G,S) Benzene 0.1-35 µg/l 1,2-Dichloroethane 0.1-35 µg/l Tetrachloroethene 0.1-35 µg/l Trichloroethene 0.1-35 µg/l Chloroform 1.0-150 µg/l Bromoform 1.0-35 µg/l Dibromochloromethane 1.0-35 µg/l Bromodichloromethane 2.0-35 µg/l</p>		

Notes



**ENVIRONMENTAL
LABORATORY SERVICES**
Acorn Business Campus,
Mahon Industrial Park,
Blackrock,
CorkTel: 021-4536141
Fax: 021-4536149



Analysis Report

Attention: Kieran Coffey Cork County Council (Iniscarra Environmental Directorate) Inniscarra Co Cork	Report No: 17488
Fax No:	Date of receipt: 04/06/2010
Tel No: 021-4532751 / 086 3827197	Date Started: 08/06/2010
PO Number: 462773	Issue Date: 15/06/2010
Sample Type: Groundwater	Page: 1 of 2
Condition on receipt: Satisfactory	Delivery Mode: Hand
	No. of Samples: 3
	Client Ref: Below

SIGNED

(15/06/2010)

Technical Manager (or Deputy)
Brendan Murray

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Only those tests, matrices, ranges specified are accredited.

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MINOR SUITE INDICATOR PARAMETERS

Method		AQ2	AQ2	AQ2	AQ2	ICPMS	ICPMS	Titralab		5-Day	Cust
Method Number		EW050	EW003	EW015	EW015	EM130	EM130	EW139	EW138	EW001	Cust
Parameter		Cyanide	Ammonia	Cl	SO4	K	Na	Cond	pH	BOD	Sample temperature (Onsite)
Units		ug/l	mg/l N	mg/l	mg/l	mg/l	mg/l	us/cm	pH Units	mg/l	Deg C
Limit of Detection		5	0.007	2.6	1.0	0.2	0.5	25-1999	0.3	1	-
Date Testing Initiated		09/06	08/06	10/06		09/06		08/06		04/06	
ELS Ref	Client Ref										
17488-1	Newmarket MW4	<5.0	0.070	15.6	14.2	2.6	13.8	193	6.0	1	Note 3
17488-2	Newmarket MW5	<5.0	0.068	17.6	11.9	2.2	14.5	223	6.5	1	Note 3
17488-3	Newmarket MW6(BH6)	<5.0	0.067	15.1	28.1	1.9	13.8	127	6.1	<1	Note 3

NOTES

- 1 Sub-contract analysis denoted by *
- 2 ND = Concentration was below the limit of detection
- 3 Sample temperature must be taken on site
- 4 pH and conductivity tested outside holding time.

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ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET

<p>Miscellaneous (P,G,W,S) Ammonia/Ammonium 0.007-1mg/l N EW003 Chloride 2.6-250 mg/l EW015 Flouride 0.1 - 2 mg/l EW137 COD 8-1500 mg/l EW094 Nitrate 0.12-50 mg/l N EW034 Nitrite 0.013-1 mg/l N EW035 pH 4 – 10 pH Units EW138 Phosphate 0.009-1 mg/l P EW007 Alkalinity 10-1000mg/l EW062 TOC 0.25-100mg/l EW123 BOD 1-1300mg/l EW001 Total Nitrogen 1-100mg/l N EW140 Total Phosphorous 0.01-40 mg/l P EW143</p>	<p>Other VOC's EO025 (P,G,S) Bromomethane 0.5 - 35 µg/l Ethyl Ether/Diethyl Ether 0.5 - 35 µg/l 11 Dichloroethene 0.5 - 35 µg/l Iodomethane/Methyl Iodide 0.5 - 35 µg/l Carbon Disulphide 0.5 - 35 µg/l Allyl Chloride 0.5 - 35 µg/l Methylene Chloride/DCM 5.0 - 35 µg/l 2-Propenenitrile/Acrylonitrile 2.0 - 35 µg/l Chlormethyl Cyanide 0.5 - 35 µg/l Hexachlorobutadiene 0.5 - 35 µg/l Trans-1,2 Dichloroethene 0.5 - 35 µg/l MtBE 0.5 - 35 µg/l 11 Dichloroethane 0.5 - 35 µg/l 22 Dichloropropane 0.5 - 35 µg/l Cis-12 Dichloroethene 0.5 - 35 µg/l Methyl Acrylate 5.0 - 35 µg/l Bromochloromethane 0.5 - 35 µg/l Tetrahydrofuran 5.0 - 35 µg/l 111 Trichloroethane 0.5 - 35 µg/l 1-Chlorobutane 0.5 - 35 µg/l Carbon Tetrachloride 0.5 - 35 µg/l 11 Dichloropropene 0.5 - 35 µg/l 12 Dichloropropane 0.5 - 35 µg/l Dibromomethane 0.5 - 35 µg/l Methyl Methacrylate 0.5 - 35 µg/l 13 Dichloropropene, cis 2.0 - 35 µg/l MIBK/4 Methyl 2 Pentanone 2.0 - 35 µg/l Toluene 0.5 - 35 µg/l 13 Dichloropropene, trans 2.0 - 35 µg/l Ethyl Methacrylate 2.0 - 35 µg/l 112 Trichloroethane 0.5 - 35 µg/l 13 Dichloropropane 0.5 - 35 µg/l 2 Hexanone 1.0 - 35 µg/l 12 Dibromoethane 0.5 - 35 µg/l Chlorobenzene 0.5 - 35 µg/l 1112 Tetrachloroethane 2.0 - 35 µg/l Ethyl Benzene 0.5 - 35 µg/l m & p Xylene 0.5 - 35 µg/l O Xylene 0.5 - 35 µg/l Styrene 2.0 - 35 µg/l Isopropyl Benzene 0.5 - 35 µg/l Bromobenzene 0.5 - 35 µg/l 1122 Tetrachloroethane 0.5 - 35 µg/l 123 Trichloropropane 2.0 - 35 µg/l Propyl Benzene 0.5 - 35 µg/l 2-Chlorotoluene 0.5 - 35 µg/l 4 Chlorotoluene 0.5 - 35 µg/l 135 Trimethylbenzene 0.5 - 35 µg/l Tert Butyl Benzene 0.5 - 35 µg/l 124 Trimethylbenzene 0.5 - 35 µg/l Sec Butyl Benzene 0.5 - 35 µg/l 13 Dichlorobenzene 0.5 - 35 µg/l P Isopropyltoluene 0.5 - 35 µg/l 14 Dichlorobenzene 0.5 - 35 µg/l 12 Dichlorobenzene 0.5 - 35 µg/l N Butyl Benzene 0.5 - 35 µg/l Hexachloroethane 5.0 - 35 µg/l 12 Dibromo 3Chloropropane 2.0 - 35 µg/l 124 Trichlorobenzene 0.5 - 35 µg/l 123 Trichlorobenzene 0.5 - 35 µg/l</p>	<p>PAH EO129 (P,G,S) Range 0.01 - 0.2 µg/l Acenaphthene Benzo (a) Anthracene Benzo (a) Pyrene Benzo (b) Fluoranthene Benzo (ghi) Perylene Benzo (k) Fluoranthene Chrysene Dibenzo (ah) Anthracene Fluoranthene Fluorene Indeno (123-cd) Pyrene Phenanthrene Pyrene</p>
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Notes

SSRS on Dalua River 11/5/2010

Samples were analysed upstream and downstream on the old landfill site at locations shown on the attached map.

The samples were examined for long-lived macro invertebrates of known sensitivity to pollution to provide an indicator of water quality in a single sample. A score card was filled out detailing the presence or absence of certain macro invertebrates and the resulting score is an indicator of water quality calculated within the following categories:

- >8 = probably not at risk.
- 6.5 to 8.5 = probably at risk.
- < 6.5 = at risk.

Both samples returned the same score of 9.6 which is in the “probably not at risk” category. The samples had small numbers of mayfly and good abundances of stone fly. The downstream sample had some worms more common in numbers but returned the same score.

Billy Sexton,
Environment Officer.

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DALVA NEWMARKET ①

River code: 18-374 DALVA		Date: 11/5/10	Time:	Grid:
Stream accessibility: Accessible		Location: 100M D/S old landfill		Stream Order: 3rd / 4
Inaccessible		Modifications: Y/N Canalised-widened-bank erosion/artificial drainage		Stream flow:
DO%		Dominant Types: Bedrock		Riffle
DQ mg/l		Boulder (>128mm)		Riffle/Glide
Temp		Cobble (32-128mm)		Slow flow
Conductivity		Gravel (8-32mm)		
pH		Fine Gravel (2-8mm)		
Bank width	6M	Sand (0.25-2mm)		
Wet Width	5M	Silt (<0.25mm)		
Avg Depth	15CM	Substratum condition: Calcareous - Compacted - Loose		Shading: H-M-L-N
Velocity: Torrential	Colour: None	Substratum: Stony bottom - Muddy bottom - Mud over stones		Cattle access Y: w/a - d/s or N
Fast	Slight	Degree of siltation: Clean - Slight - Moderate - Heavy		Photo: Yes or No
Moderate	Moderate	Depth of mud: None <1cm 1-5cm 5-10cm 10cm+		
Slow	High	Litter: NO - P - M - A		
Very slow		Filamentous Algae: (A) - M - P - NO		Sewage fungus: (A - M - P - NO)
Stagnant		Main land use w/s: Pasture	Sample retained: Y-NO	Sampled in Minutes:
None		Bog		Pond net x 2M
		Forestry		Stone wash x 30s
		Urban		Wood sweep x
		Tillage		
		Other		
General Comments: A large amount of riffles. Worms more abundant except maybe in trays than v/s sample flies same and some shrimp also not found v/s.				

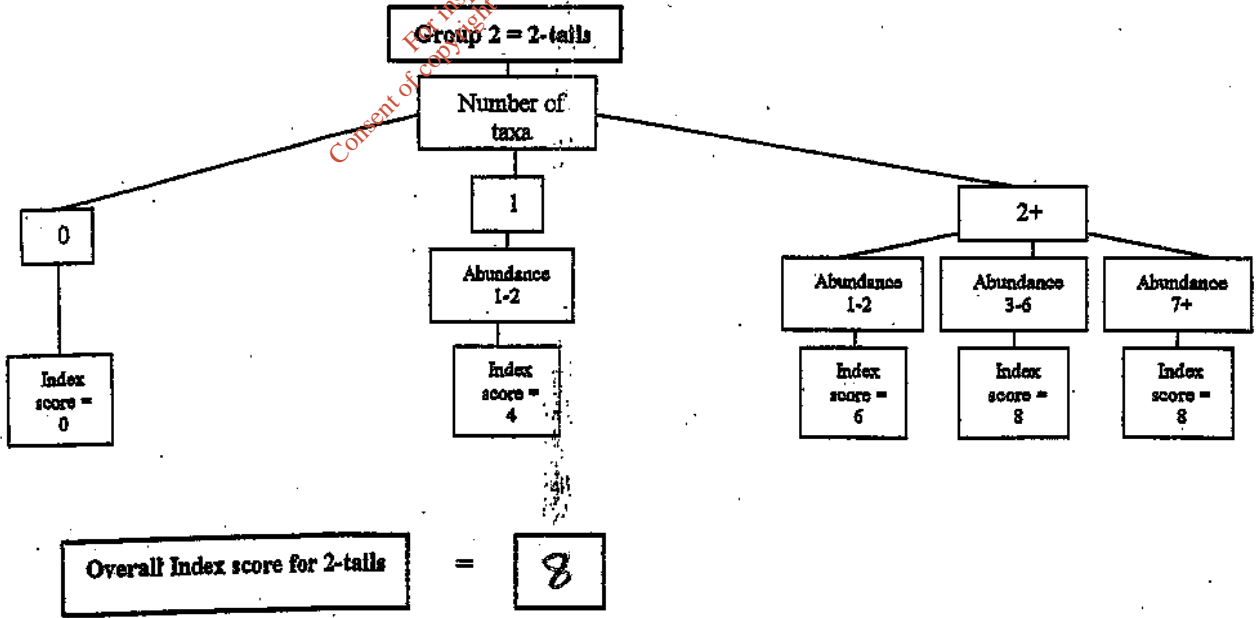
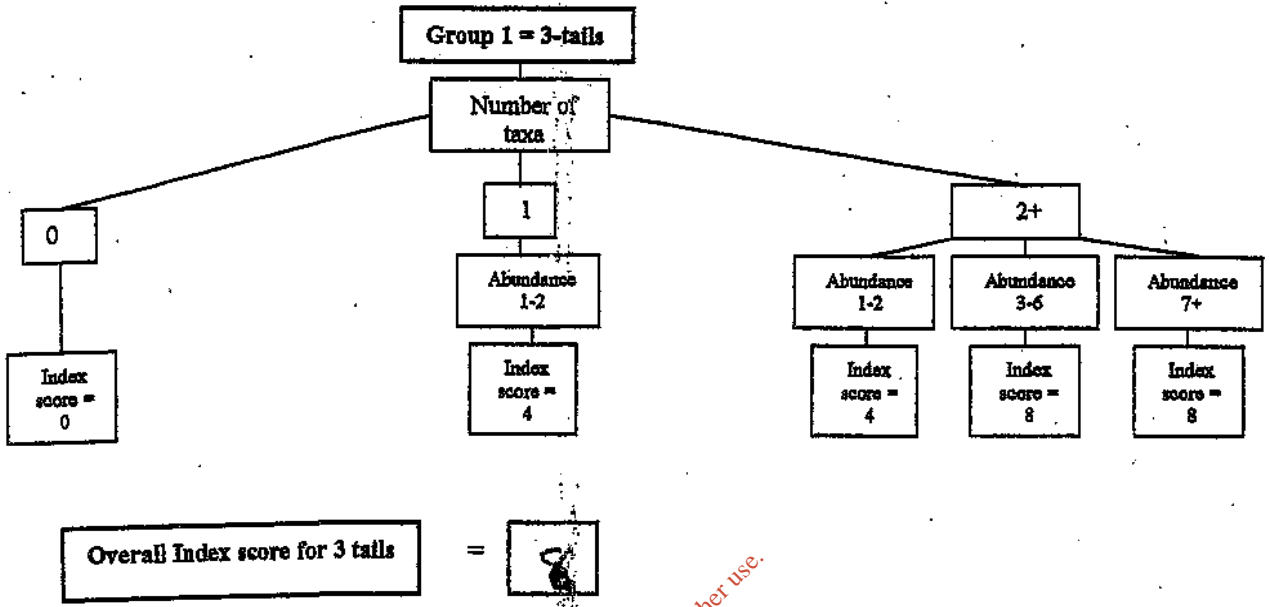
Macroinvertebrate Composition

- The macroinvertebrates are divided into the following 5 specific groups:
- Group 1 = Ephemeropteran (3-tails) - note that tails may be damaged during sampling
 - Group 2 = Plecopteran (2-tails) - note that tails may be damaged during sampling
 - Group 3 = Trichopteran
 - Group 4 = GOLD (Gastropoda, Oligochaeta and Diptera)
 - Group 5 = Asellus

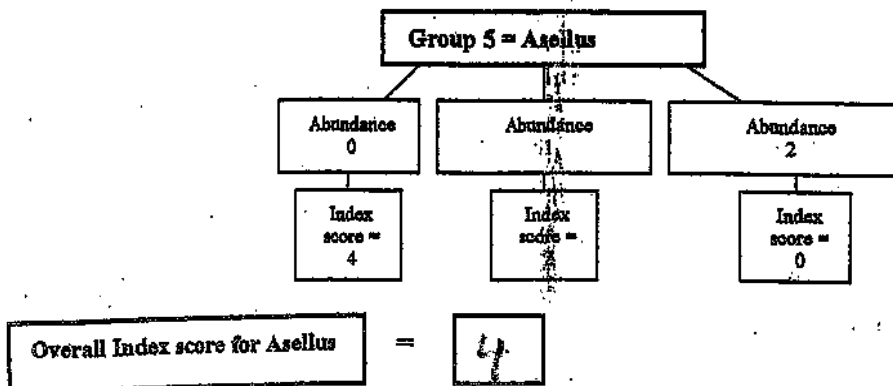
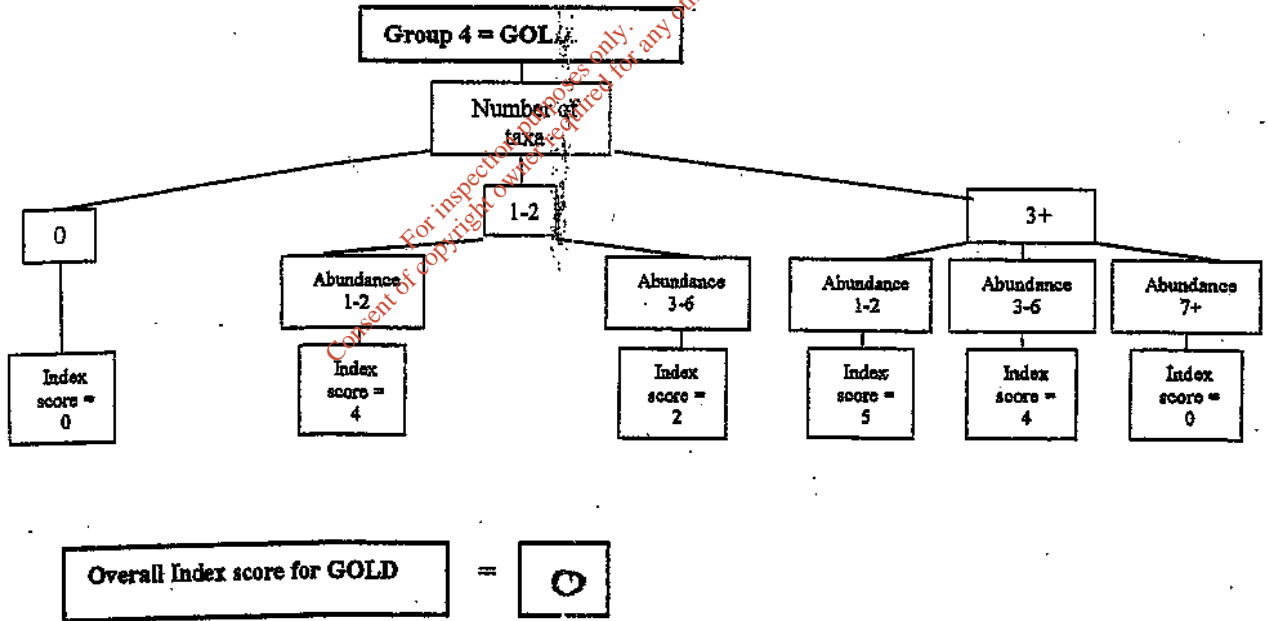
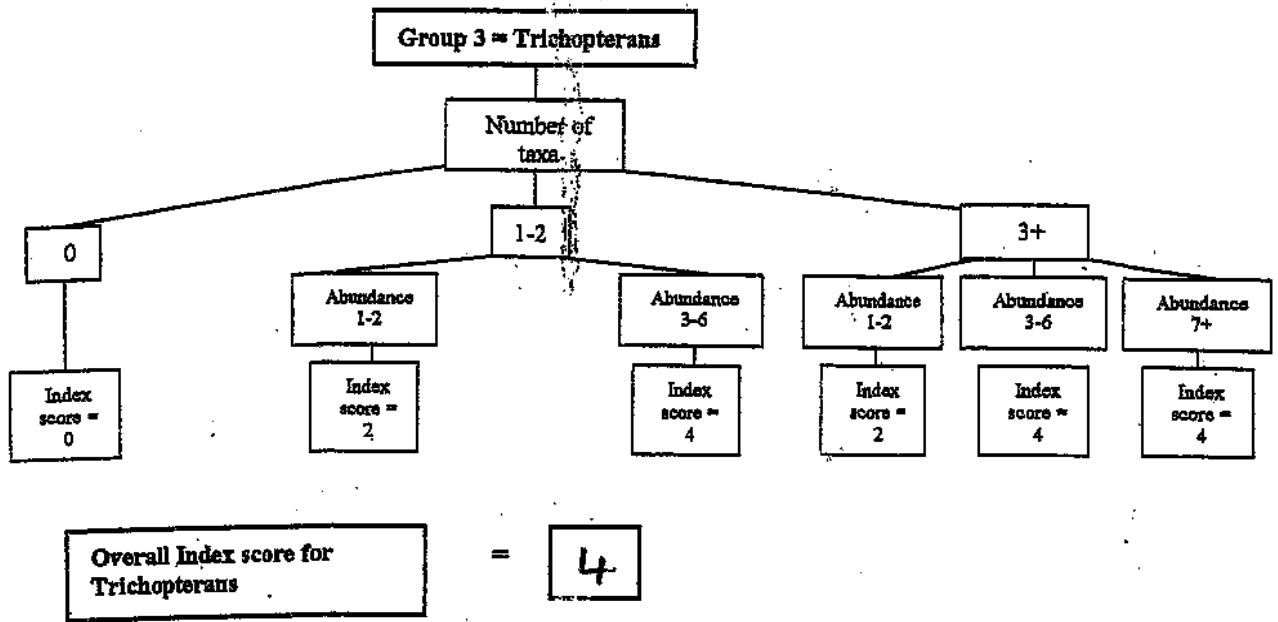
Calculate the total number of taxa and total abundance of each macroinvertebrate group below:

Abundance = Ab: 1-5 macroinvertebrates = Ab 1; >5 macroinvertebrates = Ab 2			
Ephemeropteran:	<i>Eodyonurus</i> Ab 1	Plecopteran:	<i>Leuctra</i> Ab 2
Mayflies	<i>Rhytrogana</i> Ab 2	Stonflies	<i>Isoperla</i> Ab 2
	<i>Heptagenia</i> Ab		<i>Protonemura</i> Ab
	<i>Ephemerella</i> Ab		<i>Amphinemura</i> Ab 1
	<i>Casnia</i> Ab		<i>Perla</i> Ab
	<i>Paraloptophlebia</i> Ab		<i>Dinocras</i> Ab
	<i>Ephemerella danica</i> Ab		<i>Taeniopterygidae</i> Ab
	Ab		Ab
Total no. of taxa 2	Total 3	Total no. of taxa 3	Total 5
Trichopteran:	<i>Hydropsyche</i> Ab 1	GOLD:	<i>Lymnasa</i> spp Ab
Caseless caddis	<i>Polycentropidae</i> Ab	Snails	<i>Potamopyrgus</i> Ab 1
	<i>Rhyacophila</i> Ab 2		<i>Planorbidae</i> Ab
	<i>Philoopotamidae</i> Ab		<i>Ancyliidae</i> Ab
	<i>Limnephilidae</i> Ab		<i>Physidae</i> Ab
	<i>Sericostomatidae</i> Ab		<i>Lumbriculidae</i> Ab 2
	<i>Glossostomatidae</i> Ab		<i>Elsanella</i> Ab
Cased caddis	<i>Lepidostomatidae</i> Ab	Worms	<i>Tubificidae</i> Ab 2
	<i>Coarctidae</i> Ab		Ab
	Ab		Ab
Total no. of taxa 3	Total 4	Total no. of taxa 8	Total 14
Benth: Present/Absent Y	Abundance 2	Asellus: Ab 0	
Protected species:			

Calculate the Index score by circling the appropriate box representing the total number of taxa and the total abundance calculated from each macroinvertebrate group above and enter into the boxes provided below:



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Overall Index score for 3-tails	=	8	
Overall Index score for 2-tails	=	8	
Overall Index score for Trichopteran	=	4	
Overall Index score for GOLD	=	0	
Overall Index score for Asellus	=	4	
Total Index score of 5 groups (sum all 5 groups)	=	24	
Average of Index score in 5 groups	=	4.8	$\times 2 =$ →
			Small Stream Risk (SSR) Score
			9.6

Assess the stream by comparing the final SSR Score calculated with the following categories:

- ~~> 8 = probably not at risk~~
- 6.5-8 = probably at risk
- < 6.5 = at risk

Signed: Billy Sexton

Date: 11/5/10

River code: 18-394 DALVA		Date: 11/5/10	Time:	Grid:
Stream accessibility: Accessible		Location: ANNES BRIDGE		Stream Order: 1
Inaccessible		Modifications: Y/N Canalised-widened-bank erosion-arterial drainage		Stream flow:
DO%		Dominant Types: Bedrock		Riffle
DO mg/l		Boulder (>128mm) 10		Riffle/Glide
Temp		Cobble (32-128mm) 40		Slow flow
Conductivity		Gravel (8-32mm) 20		
pH		Fine Gravel (2-8mm) 10		
Bank width	7 M	Sand (0.25-2mm) 10		
Wet Width	5 M	Silt (<0.25mm) 10		
Avg Depth	15 CM	Substratum condition: Calcareous - Compacted - Loose		Shading: H-M-L-N
Velocity: Torrential	Colour: None	Substratum: Stony bottom - Muddy bottom - Mud over stones		Cattle access Y: w/s - d/s or N
Fast	Slight	Degree of siltation: Clean - Slight - Moderate - Heavy		Photo: Yes or No
Moderate	Moderate	Depth of mud: None <1cm: 1-5cm: 5-10cm: 10cm+		
Slow	High	Litter: NO - P - M - A		
Very slow		Filamentous Algae: (A - M - P - NO)		Sewage fungus: (A - M - P - NO)
Stagnant None				
Clarity:	Discharge:	Main land use w/s	Sample retained:	Sampled in Minutes:
Very clear	Flood	Baggage	Y - N	Pond net x
Clear	Normal	Bog		Stone wash x
Slightly Turbid	Low	Forestry		Weed sweep x
Highly Turbid	Recent flood	Urban		
	Very low	Tillage		
	Dry	Other		
General Comments: River bed slippery with algae abundant. Only one echyonurus found in tray. Rhyacophila and Simulium abundant				

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups;

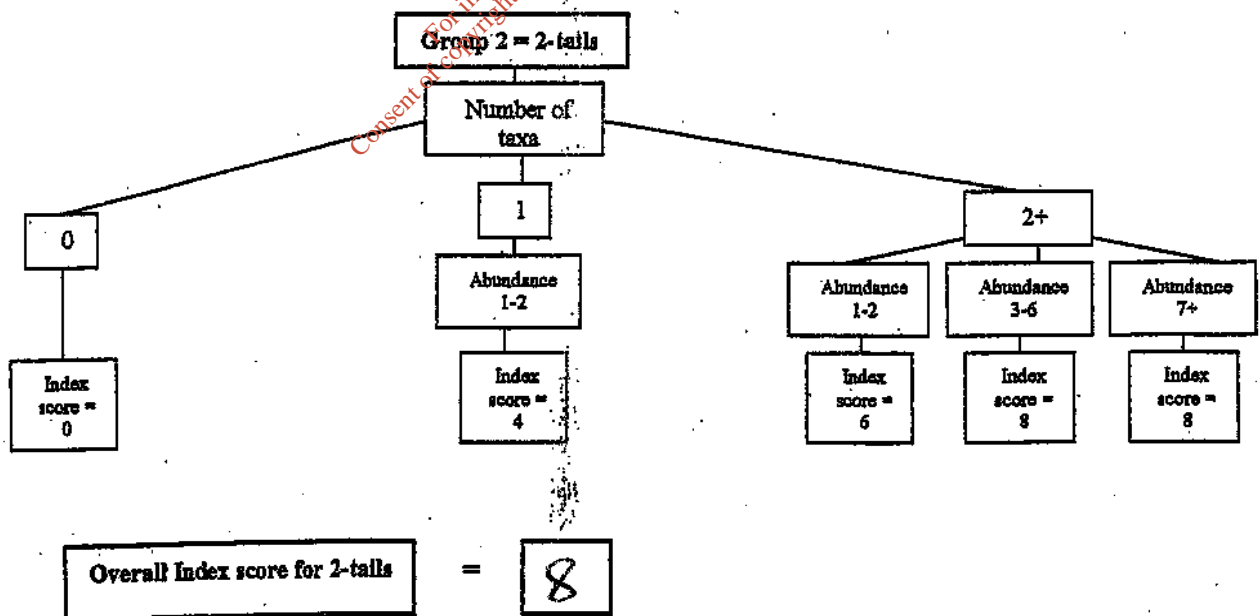
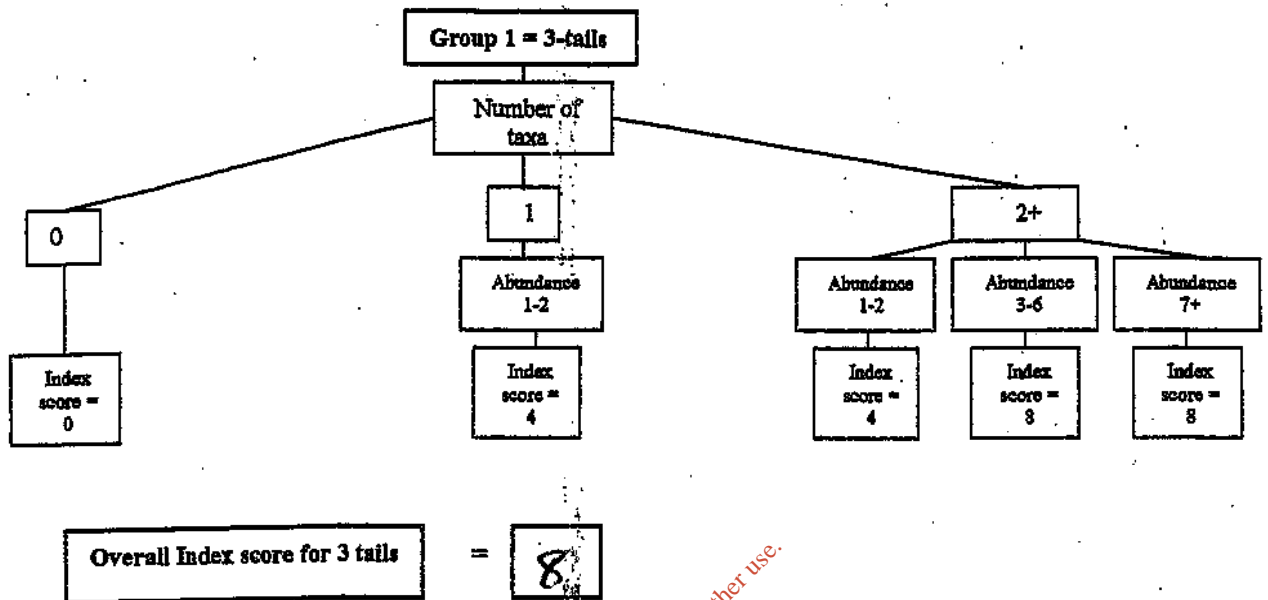
- Group 1 = Ephemeropteran (3-tails) - note that tails may be damaged during sampling
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- Group 3 = Trichopteran
- Group 4 = GOLD (Gastropoda, Oligochaeta and Diptera)
- Group 5 = Asellus

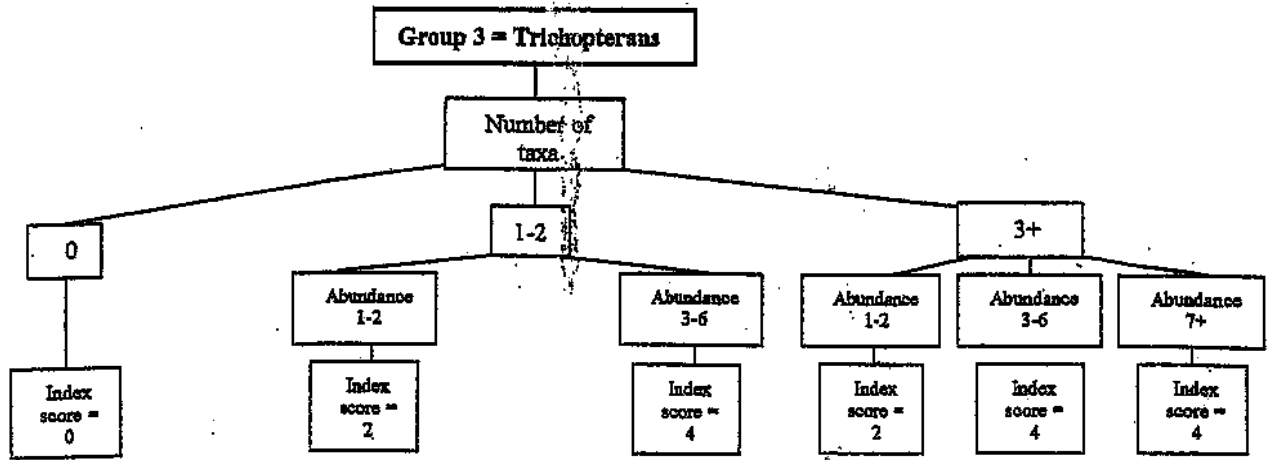
Calculate the total number of taxa and total abundance of each macroinvertebrate group below:

Abundance = Ab: 1-5 macroinvertebrates = Ab 1; >6 macroinvertebrates = Ab 2

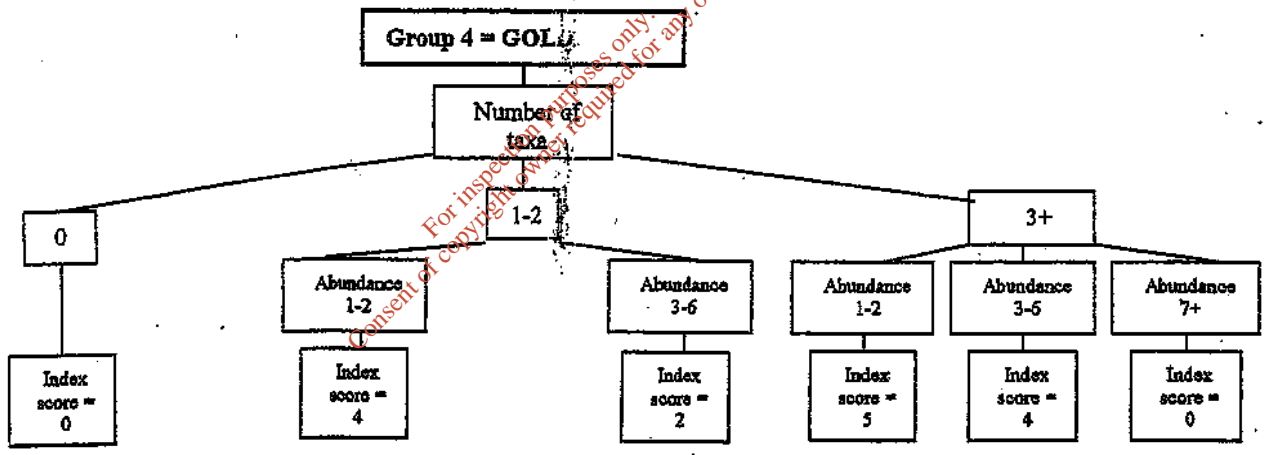
Ephemeropteran:	<i>Ecdyonurus</i> Ab 1	Plecopteran:	<i>Leuctra</i> Ab 2
Mayflies	<i>Rhyacophila</i> Ab 2	Stoneflies	<i>Isoperla</i> Ab 2
	<i>Hepptaganta</i> Ab		<i>Protonemura</i> Ab
	<i>Ephemerella</i> Ab		<i>Amphinemura</i> Ab 1
	<i>Caenis</i> Ab		<i>Perla</i> Ab
	<i>Paraleptophlebia</i> Ab		<i>Dinocras</i> Ab
	<i>Ephemeria danica</i> Ab		<i>Taeniopterygidae</i> Ab
	Ab		Ab
	Ab		Ab
Total no. of taxa	2	Total no. of taxa	3
Total	3	Total	5
Trichopteran:	<i>Hydropsyche</i> Ab 1	GOLD:	<i>Lymnasa</i> spp Ab
Caseless caddis	<i>Polycentropidae</i> Ab	<i>Potamopyrgus</i> Ab	<i>Tubifex</i> (Worm) Ab
	<i>Rhyacophila</i> Ab 2	<i>Planorbidae</i> Ab	<i>Chironomidae</i> Ab
	<i>Phlebotomidae</i> Ab	<i>Anacidae</i> Ab	<i>Chironomus</i> Ab
	<i>Limnephilidae</i> Ab	<i>Physidae</i> Ab	<i>Simuliidae</i> Ab
	<i>Sericostomatidae</i> Ab	<i>Lumbriculidae</i> Ab 2	<i>Dicranota</i> Ab
Cased caddis	<i>Glossosomatidae</i> Ab	<i>Eiseniella</i> Ab	<i>Tipula</i> Ab
	<i>Lepidostomatidae</i> Ab	<i>Tubificidae</i> Ab 1	<i>Ceratopogonidae</i> Ab
	<i>Goeridae</i> Ab	Ab	Ab
	Ab	Ab	Ab
	Ab	Ab	Ab
Total no. of taxa	4	Total no. of taxa	6
Total	5	Total	9
Bacteria: Present/Absent	Y	Abundance	2
Protected species:			

Calculate the Index score by circling the appropriate box representing the total number of taxa and the total abundance calculated from each macroinvertebrate group above and enter into the boxes provided below:

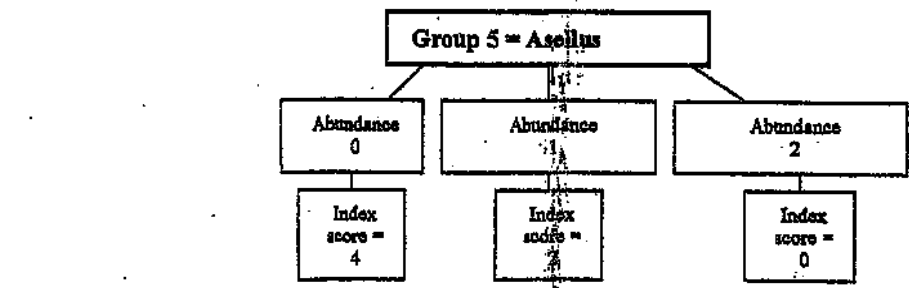




Overall Index score for Trichoptera = 4



Overall Index score for GOLD = 0



Overall Index score for Asellus = 4

Overall Index score for 3-tails	=	8	
Overall Index score for 2-tails	=	8	
Overall Index score for Trichopteran	=	4	
Overall Index score for GOLD	=	0	
Overall Index score for Asellus	=	4	
Total Index score of 5 groups (sum all 5 groups)	=	24	
Average of Index score in 5 groups	=	4.8	

x2 = \longrightarrow 9.6

Small Stream Risk (SSR)
Score

Assess the stream by comparing the final SSR Score calculated with the following categories:

- ~~> 8 = probably not at risk~~
- 6.5-8 = probably at risk
- < 6.5 = at risk

Signed: Billy Sento

Date: 11/5/10



Cork County Council



Environment Directorate
Cork County Council
Iniscarra
Co Cork

Environment Directorate



Project
Environmental Risk Assessment for Unregulated Waste disposal Sites
Tier 1 Investigation

Drawing Description
CSM Plan

Landfill Name & Ref No:
Newmarket - 23/N

Division:
North Cork

Area Office:
Newmarket/Kanturk

Legend

- Roads
- Buildings
- Landfill Area
- River

Issue Details

Drawn: KC	File Ref:	
Checked: -	23-N CSM Plan	
Approved:	Drawing No.	Rev.
Date: 9th Oct 07	23-N_CSM	0

Notes
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