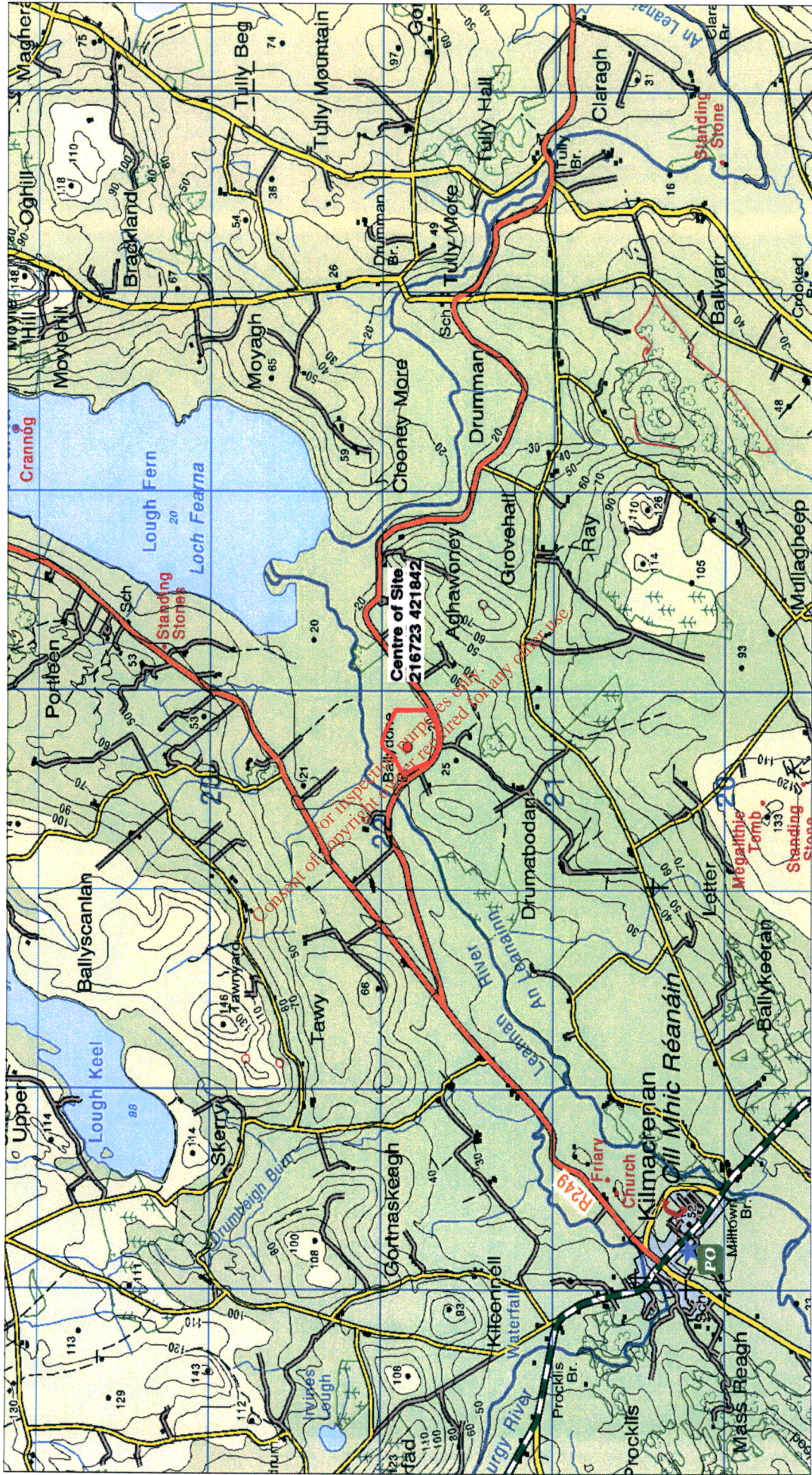


ANNEX 1: TABLES/ATTACHMENTS

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Attachment A1 – Location and Layout Plans
Drumaboden Landfill

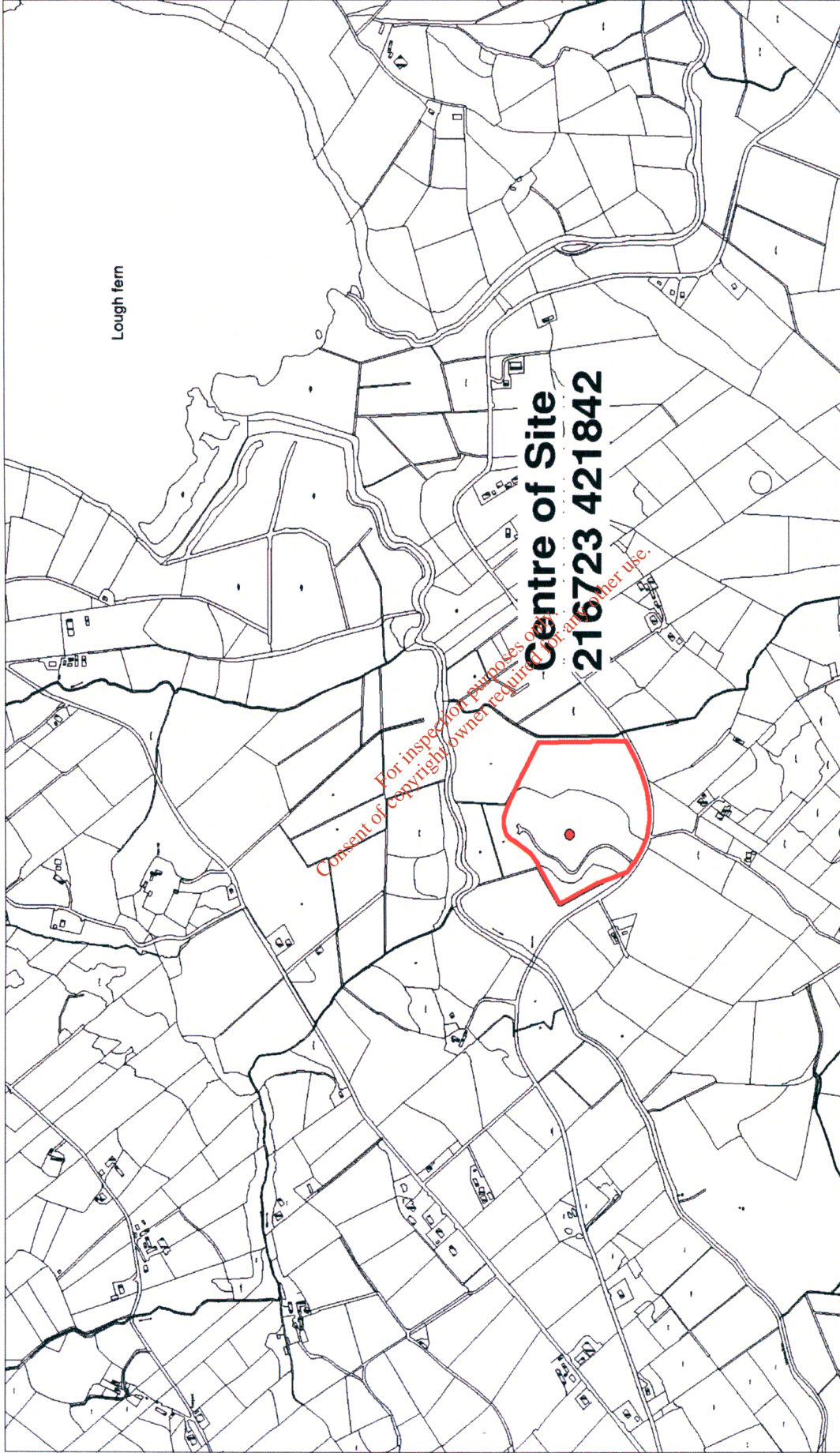


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Scale 1:25,000

Drumaboden Landfill



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Scale 1:10,000



TABLE B.1(i): EMISSIONS TO SURFACE WATERS

(One page for each emission)

Emission Point:

Emission Point Ref. No.:	L1
Source of Emission:	Landfill leachate
Location :	Ballydone Bridge
Grid Ref. (12 digit, 6E,6N):	216783 421990
Name of receiving waters:	River Leannan
Flow rate in receiving waters:	0.436 m ³ .sec ⁻¹ Dry Weather Flow 0.654 m ³ .sec ⁻¹ 95%ile flow

Emission Details:

(i)	Volume to be emitted	
	Normal/day	5.75m ³ Maximum/day
	Maximum rate/hour	0.3m ³

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up / shutdown to be included*):

Periods of Emission (avg)	Continuous	min/hr	hr/day	day/yr
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TABLE B.1(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (One table per emission point)

Emission Point Reference Number: L1

Parameter	Prior to treatment			As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	
	NA	NA	NA	NA	NA	NA	NA	NA

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NB All samples taken for this site are grab samples and are analysed for the parameters stated in the waste licence. The range of measurements referred to in the columns are inappropriate for this site and the results given below are concentrations found in the grab samples for the last twelve sets of results, as agreed for this submission with the EPA.

Pre-treatment results (L2)

Sample date	Ammonia (N) mg/l	pH	BOD mg/l	SS mg/l	Ortho P mg/l
Feb 2011	129	6.9	2.1	85	0.50
May '10	75	6.8	0.6	N/A	N/A
Nov '09	18	7.2	0.3	N/A	0.0
Jul '09	44	6.9	4.1	N/A	0.2

Jun '09	47	7.0	0.3	96	0.1
May '09	56	8.1	1.2	N/A	0.1
Apr '09	35	6.9	0.7	N/A	0.1
Mar '09	49	6.9	0.9	74	0.2
Feb '09	39	6.6	1.2	87	0.1
Jan '09	41	6.9	N/A	95	0.2
Dec '08	65	6.7	2.8	75	0.3
Nov '08	63	6.8	2.0	13	0.2

Post treatment results (L1)

Sample date	Ammonia (N) mg/l	pH	BOD mg/l	SS mg/l	Ortho P mg/l
Feb 2011	37	7.23	0.0	15	N/A
May '10	17	7.37	0.47	N/A	N/A
Nov '09	16	7.4	0	N/A	0
Jul '09	35	7.3	0	N/A	0.1
Jun '09	39	7.9	4.5	326	0.3
May '09	21	8.0	1.8	N/A	0.4
Apr '09	23	7.0	1.5	N/A	0.4
Mar '09	30	7.2	1.4	11	0.2
Feb '09	43	7.3	1.4	369	0.1
Jan '09	45	7.4	N/A	251	0.2
Dec '08	32	6.9	1.1	88	0.1
Nov '08	42	7.1	1.8	850	0.1

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TABLE C.2(i): EMISSIONS MONITORING AND SAMPLING POINTS

(One table per monitoring point)

Emission Point Reference Number: L1

Parameter	Monitoring frequency	Accessibility of S/ampling Points	Sampling method	Analysis method/ technique
Ammonia (N)	Quarterly	Accessible	Grab	Lachat / Hach (Nessler)
pH	Quarterly	Accessible	Grab	pH meter
BOD	Quarterly	Accessible	Grab	5-day BOD
SS	Quarterly	Accessible	Grab	Filter method
Ortho P	Annually	Accessible	Grab	Lachat

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TABLE C.2(ii): AMBIENT ENVIRONMENT MONITORING AND SAMPLING POINTS (One table per monitoring point)

Monitoring Point Reference Number: S1

Parameter	Monitoring frequency	Accessibility of Sampling point	Sampling method	Analysis method/ technique
Ammonia (N)	Quarterly	Accessible	Grab	Nessler / Lachat spec
BOD	Quarterly	<p>For inspection purposes only. Consent of copyright owner required for any other use.</p>		5-day BOD
COD	Quarterly			Dichromate digestion
Chloride	Quarterly			Titration
DO	Quarterly			DO meter
Conductivity	Quarterly			Conductivity meter
pH	Quarterly			pH meter
SS	Quarterly			Filter method
Cadmium	Annually			ICP MS
Calcium	Annually			ICP MS
Chromium	Annually			ICP MS
Copper	Annually			ICP MS
Iron	Annually			ICP MS
Lead	Annually			GC MS
List I/II org.	Annually			ICP MS
Magnesium	Annually			ICP MS
Manganese	Annually			ICP MS
Mercury	Annually			Atomic fluorescence
Potassium	Annually			ICP MS
Sulphate	Annually			ICP MS
Sodium	Annually			ICP MS
Tot Alkalinity	Annually	Titration		
Ortho phosphate	Annually	Lachat spec		
TON	Annually	Lachat spec		
Zinc	Annually	ICP MS		

Monitoring Point Reference Number: S2

Parameter	Monitoring frequency	Accessibility of Sampling point	Sampling method	Analysis method/ technique
Ammonia (N)	Quarterly	Accessible	Grab	Nessler / Lachat spec
BOD	Quarterly	For inspection purposes only. Consent of copyright owner required for any other use.		5-day BOD
COD	Quarterly			Dichromate digestion
Chloride	Quarterly			Titration
DO	Quarterly			DO meter
Conductivity	Quarterly			Conductivity meter
pH	Quarterly			pH meter
SS	Quarterly			Filter method
Cadmium	Annually			ICP MS
Calcium	Annually			ICP MS
Chromium	Annually			ICP MS
Copper	Annually			ICP MS
Iron	Annually			ICP MS
Lead	Annually			ICP MS
List I/II org.	Annually			GC MS
Magnesium	Annually			ICP MS
Manganese	Annually			ICP MS
Mercury	Annually			Atomic fluorescence
Potassium	Annually			ICP MS
Sulphate	Annually			ICP MS
Sodium	Annually			ICP MS
Tot Alkalinity	Annually	Titration		
Ortho phosphate	Annually	Lachat spec		
TON	Annually	Lachat spec		
Zinc	Annually	ICP MS		

Monitoring Point Reference Number: S4

Parameter	Monitoring frequency	Accessibility of Sampling point	Sampling method	Analysis method/ technique
Ammonia (N)	Quarterly	Accessible	Grab	Nessler / Lachat spec
BOD	Quarterly	<p style="text-align: center;">For inspection purposes only. Consent of copyright owner required for any other use.</p>	Grab	5-day BOD
COD	Quarterly			Dichromate digestion
Chloride	Quarterly			Titration
DO	Quarterly			DO meter
Conductivity	Quarterly			Conductivity meter
pH	Quarterly			pH meter
SS	Quarterly			Filter method
Cadmium	Annually			ICP MS
Calcium	Annually			ICP MS
Chromium	Annually			ICP MS
Copper	Annually			ICP MS
Iron	Annually			ICP MS
Lead	Annually			ICP MS
List I/II org.	Annually			GC MS
Magnesium	Annually			ICP MS
Manganese	Annually			ICP MS
Mercury	Annually			Atomic fluorescence
Potassium	Annually			ICP MS
Sulphate	Annually			ICP MS
Sodium	Annually			ICP MS
Tot Alkalinity	Annually	Titration		
Ortho phosphate	Annually	Lachat spec		
TON	Annually	Lachat spec		
Zinc	Annually	ICP MS		

Monitoring Point Reference Number: S5

Parameter	Monitoring frequency	Accessibility of Sampling point	Sampling method	Analysis method/ technique
Ammonia (N)	Quarterly	Accessible	Grab	Nessler / Lachat spec
BOD	Quarterly	Consent of copyright owner required for any other use. For inspection purposes only.		5-day BOD
COD	Quarterly			Dichromate digestion
Chloride	Quarterly			Titration
DO	Quarterly			DO meter
Conductivity	Quarterly			Conductivity meter
pH	Quarterly			pH meter
SS	Quarterly			Filter method
Cadmium	Annually			ICP MS
Calcium	Annually			ICP MS
Chromium	Annually			ICP MS
Copper	Annually			ICP MS
Iron	Annually			ICP MS
Lead	Annually			ICP MS
List I/II org.	Annually			GC MS
Magnesium	Annually			ICP MS
Manganese	Annually			ICP MS
Mercury	Annually			Atomic fluorescence
Potassium	Annually			ICP MS
Sulphate	Annually			ICP MS
Sodium	Annually			ICP MS
Tot Alkalinity	Annually	Titration		
Ortho phosphate	Annually	Lachat spec		
TON	Annually	Lachat spec		
Zinc	Annually	ICP MS		

Monitoring Point Reference Number: S6

Parameter	Monitoring frequency	Accessibility of Sampling point	Sampling method	Analysis method/ technique
Ammonia (N)	Quarterly	Accessible	Grab	Nessler / Lachat spec
BOD	Quarterly	<p style="text-align: center;">For inspection purposes only. Consent of copyright owner required for any other use.</p>		5-day BOD
COD	Quarterly			Dichromate digestion
Chloride	Quarterly			Titration
DO	Quarterly			DO meter
Conductivity	Quarterly			Conductivity meter
pH	Quarterly			pH meter
SS	Quarterly			Filter method
Cadmium	Annually			ICP MS
Calcium	Annually			ICP MS
Chromium	Annually			ICP MS
Copper	Annually			ICP MS
Iron	Annually			ICP MS
Lead	Annually			ICP MS
List I/II org.	Annually			GC MS
Magnesium	Annually			ICP MS
Manganese	Annually			ICP MS
Mercury	Annually			ICP MS
Potassium	Annually			Atomic fluorescence
Sulphate	Annually			ICP MS
Sodium	Annually			ICP MS
Tot Alkalinity	Annually	Titration		
Ortho phosphate	Annually	Lachat spec		
TON	Annually	Lachat spec		
Zinc	Annually	ICP MS		

Table D.1(i) RECEIVING WATER SURFACE WATER QUALITY

Monitoring Point/Grid Reference: S1

Parameter	Results (mg/l)					Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method/ technique
	Jul 09	Feb 10	May 10	Feb 11	Feb 11			
pH	6.77	7.38	7.06	7.04	7.04	Grab	1-14	pH meter
Temperature	17.1	4.5	18.7	13.0	13.0	Grab	0-4- degrees c	pH meter temp probe
Electrical conductivity EC	109	112	200	129	129	Grab	1-20,000us	Conductivity
Ammonia (as N)	0.0	0.0	0.0	0.1	0.1	Grab	0-2.4mg/l	Lachat / Hach (Nessler)
Chemical oxygen demand	41	22	16	19	19	Grab	1-15,000mg/l	Dichromate digestion spectrophotometer
Biochemical oxygen demand	1.2	0.5	1.1	0.5	0.5	Grab	0.1-15mg/l	5-day BOD
Dissolved oxygen DO	8.9	12.1	8.6	11.5	11.5	Grab	0.1-15mg/l	DO meter
Total Nitrogen (as N)	?					Grab	0.01-25mg/l	Lachat
Nitrite (as N)	0.42	0.01	0.03	0.0	0.0	Grab	0.01-1mg/l	Lachat
Nitrate (as N)	0.83	0.18	0.36	0.0	0.0	Grab	0.01-1mg/l	Lachat / Hach (alt)
Total Phosphorous (as P)	?					Grab	0.01-5mg/l	Lachat
OrthoPhosphate (as P)	0.02	0.02	n/a	0.06	0.06	Grab	1-100mg/l	Filter method

Monitoring Point/Grid Reference: S2

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method/ technique
	Jul 09	Feb 10	May 10	Feb 11			
pH	6.81	7.08	7.07	7.08	Grab	1-14	pH meter
Temperature	16.9	5.6	18.8	12.9	Grab	0-4- degrees c	pH meter temp probe
Electrical conductivity EC	100	117	143	131	Grab	1-20,000us	Conductivity
Ammonia (as N)	0.0	0.0	0.0	0.1	Grab	0-2.4mg/l	Lachat / Hach (Nessler)
Chemical oxygen demand	21	23	12	18	Grab	1-15,000mg/l	Dichromate digestion spectrophotometer
Biochemical oxygen demand	0.2	0.5	0.6	0.6	Grab	0.1-15mg/l	5-day BOD
Dissolved oxygen DO	9.4	13.3	9.3	11.6	Grab	0.1-15mg/l	DO meter
Total Nitrogen (as N)	?				Grab	0.01-25mg/l	Lachat
Nitrite (as N)	0.04	0.00	0.20	0.0	Grab	0.01-1mg/l	Lachat
Nitrate (as N)	0.63	0.23	0.26	0.0	Grab	0.01-1mg/l	Lachat / Hach (alt)
Total Phosphorous (as P)	?				Grab	0.01-5mg/l	Lachat
OrthoPhosphate (as P)	0.02	0.01	n/a	0.06	Grab	1-100mg/l	Filter method

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Monitoring Point/Grid Reference: S4

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method/ technique
	Jul 09	Feb 10	May 10	Feb 11			
pH	6.8	7.0	7.1	7.1	Grab	1-14	pH meter
Temperature	16.9	4.7	19.3	12.9	Grab	0-4- degrees c	pH meter temp probe
Electrical conductivity EC	109	93	143	132	Grab	1-20,000us	Conductivity
Ammonia (as N)	0.0	0.0	0.0	0.0	Grab	0-2.4mg/l	Lachat / Hach (Nessler)
Chemical oxygen demand	27	18	19	22	Grab	1-15,000mg/l	Dichromate digestion spectrophotometer
Biochemical oxygen demand	1.1	0.7	0.6	0.4	Grab	0.1-15mg/l	5-day BOD
Dissolved oxygen DO	9.2	12.9	9.2	11.6	Grab	0.1-15mg/l	DO meter
Total Nitrogen (as N)	?				Grab	0.01-25mg/l	Lachat
Nitrite (as N)	0.05	0.00	0.05	0.0	Grab	0.01-1mg/l	Lachat
Nitrate (as N)	0.71	0.19	0.27	0.0	Grab	0.01-1mg/l	Lachat / Hach (alt)
Total Phosphorous (as P)	?				Grab	0.01-5mg/l	Lachat
OrthoPhosphate (as P)	0.02	0.0	n/a	0.06	Grab	1-100mg/l	Filter method

Monitoring Point/Grid Reference: S5

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method/ technique
	Jul 09	Feb 10	May 10	Feb 11			
pH	6.9	6.9	7.1	7.1	Grab	1-14	pH meter
Temperature	17.2	6.6	18.9	13.1	Grab	0-4- degrees c	pH meter temp probe
Electrical conductivity EC	106	92	145	130	Grab	1-20,000us	Conductivity
Ammonia (as N)	0.0	0.0	0.0	0.1	Grab	0-2.4mg/l	Lachat / Hach (Nessler)
Chemical oxygen demand	27	20	12	21	Grab	1-15,000mg/l	Dichromate digestion spectrophotometer
Biochemical oxygen demand	1.1	0.9	0.5	0.0	Grab	0.1-15mg/l	5-day BOD
Dissolved oxygen DO	9.0	12.2	8.8	11.6	Grab	0.1-15mg/l	DO meter
Total Nitrogen (as N)	?				Grab	0.01-25mg/l	Lachat
Nitrite (as N)	0.09	0.00	0.04	0.0	Grab	0.01-1mg/l	Lachat
Nitrate (as N)	0.75	0.18	0.33	0.0	Grab	0.01-1mg/l	Lachat / Hach (alt)
Total Phosphorous (as P)	?				Grab	0.01-5mg/l	Lachat
OrthoPhosphate (as P)	0.00	0.01	n/a	0.06	Grab	1-100mg/l	Filter method

Monitoring Point/Grid Reference: S6

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method/ technique
	Jul 09	Feb 10	May 10	Feb 11			
pH	6.9	6.9	7.1	7.2	Grab	1-14	pH meter
Temperature	17.0	5.9	18.5	12.6	Grab	0-4- degrees c	pH meter temp probe
Electrical conductivity EC	109	93	145	130	Grab	1-20,000us	Conductivity
Ammonia (as N)	0.0	0.0	0.0	0.0	Grab	0-2.4mg/l	Lachat / Hach (Nessler)
Chemical oxygen demand	25	21	12	18	Grab	1-15,000mg/l	Dichromate digestion spectrophotometer
Biochemical oxygen demand	0.9	0.2	0.6	0.4	Grab	0.1-15mg/l	5-day BOD
Dissolved oxygen DO	9.5	12.6	8.7		Grab	0.1-15mg/l	DO meter
Total Nitrogen (as N)	?				Grab	0.01-25mg/l	Lachat
Nitrite (as N)	0.04	0.00	0.03	0.0	Grab	0.01-1mg/l	Lachat
Nitrate (as N)	0.77	0.17	0.34	0.0	Grab	0.01-1mg/l	Lachat / Hach (alt)
Total Phosphorous (as P)	?				Grab	0.01-5mg/l	Lachat
OrthoPhosphate (as P)	0.07	0.00	n/a	0.06	Grab	1-100mg/l	Filter method

Provide summary of the monitoring results

The monitoring of surface water at locations upstream and downstream of the discharge point indicates that the effluent discharged is not having a significant impact on the quality of the River Leannan.

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