



**APPENDIX 9.2:**

**INCHAMORE WIND FARM  
SITE PHOTOGRAPHS**

**Inchamore WF, Co. Cork**

**Photographs**

**Appendix 9.2 – Photographs**

**Subject: Baseline Surface Water Monitoring Location - SW1**

(File Ref. 3188-A2-008; 603679)



Surface Water Sampling R1 12/08/2020 (Dry)



Surface Water Sampling R1 12/08/2020 (Dry)



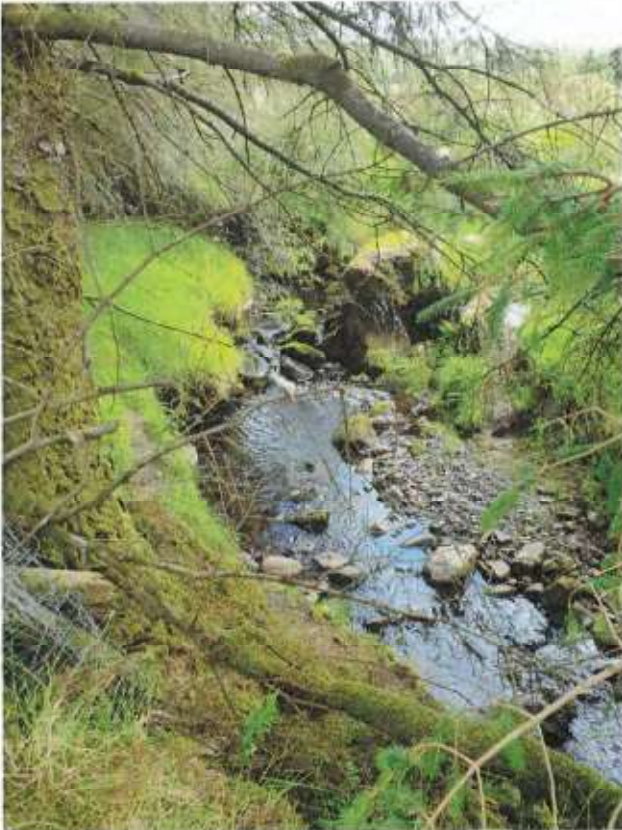
Surface Water Sampling R3 24/02/2021 (Wet)



**Appendix 9.2 – Photographs**

**Subject: Baseline Surface Water Monitoring Location - SW2**

(File Ref. 3188-A2-008; 603679)



Surface Water Sampling R1 12/08/2020 (Dry)



Surface Water Sampling R1 12/08/2020 (Dry)



Surface Water Sampling R3 24/02/2021 (Wet)



**Appendix 9.2 – Photographs**

**Subject: Baseline Surface Water Monitoring Location - SW3**

(File Ref. 3188-A2-008; 603679)



Surface Water Sampling R1 12/08/2020 (Dry)



Surface Water Sampling R1 12/08/2020 (Dry)



Surface Water Sampling R3 24/02/2021 (Wet)



**Appendix 9.2 – Photographs**

**Subject: Baseline Surface Water Monitoring Location - SW4**

(File Ref. 3188-A2-008; 603679)



Surface Water Sampling R1 12/08/2020 (Dry)



Surface Water Sampling R1 12/08/2020 (Dry)



Surface Water Sampling R3 24/02/2021 (Wet)



Preparation for forestry plantation observed during Surface Water Sampling R4 16/03/2021, near SW1.



Evidence of peat cutting observed during site surveys 16/06/2020.





Existing artificial / modified drainage observed during site surveys 16/06/2020.



New access track and drainage associated with ongoing forestry activities observed during site surveys 16/06/2020.





Peat and till exposed at new access track and drainage associated with ongoing forestry activities observed during site surveys 16/06/2020.





Peat and till exposed at new access track and drainage associated with ongoing forestry activities observed during site surveys.





Peat and fill exposed at new access track and drainage associated with ongoing forestry activities observed during site survey.

**APPENDIX 9.3:**

**HYDROCHEMISTRY DATABASE**



Appendix 9.3 - Baseline Surface Water Hydro-Chemistry & Discharge Rate Database.

(Minerex File Ref. 3188-011.xls)

Minerex Environmental		LIMITS re EIA (Ref. NRA) Indicative Limits Re.: Bathing, Drinking Surface Water reg's.	
Sample Details		Sampling Event (Date Sampled)	
Sample ID	ALL		SW1 SW2 SW3 SW4
Site	ALL		A2-Inchamore A2-Inchamore A2-Inchamore A2-Inchamore
Project COC Reference - SW R1	12/08/2020	Dry / Low Flow	3188-028-COC1 3188-028-COC1 3188-028-COC1 3188-028-COC1
Project COC Reference - SW R2	26/08/2020	Wet / High Flow	3188-028-COC2 3188-028-COC2 3188-028-COC2 3188-028-COC2
Project COC Reference - SW R3	24/02/2021	Wet / High Flow	3188-028-COC4 3188-028-COC4 3188-028-COC4 3188-028-COC4
Project COC Reference - SW R4	16/03/2021	Dry / Low Flow	3188-028-COC3 3188-028-COC3 3188-028-COC3 3188-028-COC3
Sample Type	ALL	Medium	Surface Water Surface Water Surface Water Surface Water
Grid Reference for Sampling Location	ALL	Irish Grid	513031.2, 578569.0 513613.1, 577809.8 513338.0, 577571.8 512057.7, 577399.8
Field Data - Discharge			
Surface Water Feature	ALL	Type	Ditch Drain Drain Ditch
Description of sample location	ALL	Type	Alongside feature Road bridge Road bridge Road bridge
Width of Water Body	ALL	m	<1.0 1.5 2 3
Depth (d)	ALL	m	<0.2 <0.25 <0.25 <0.5
Total Rain 3 Days Prior (Table 9.11)	12/08/2020	mm/72hours	0.0
Total Rain 3 Days Prior (Table 9.11)	26/08/2020	mm/72hours	59.7
Total Rain 3 Days Prior (Table 9.11)	24/02/2021	mm/72hours	47.8
Total Rain 3 Days Prior (Table 9.11)	16/03/2021	mm/72hours	8.1
Estimated Discharge Rate (Q)	12/08/2020	l/sec	1 to 2 6 to 8 6 to 8 30
Estimated Discharge Rate (Q)	26/08/2020	l/sec	5 to 6 8 to 10 20 to 25 50 to 60
Estimated Discharge Rate (Q)	24/02/2021	l/sec	5 to 6 10 to 15 20 to 25 50 to 60
Estimated Discharge Rate (Q)	16/03/2021	l/sec	2 to 4 6 to 8 6 to 8 10
Laboratory Data - Hydrochemistry			
Alkalinity, Bicarbonate as CaCO3	12/08/2020	mg/l	9.11 22.5 18 16
Alkalinity, Bicarbonate as CaCO3	26/08/2020	mg/l	4.5 7.5 9 18.6
Alkalinity, Bicarbonate as CaCO3	24/02/2021	mg/l	2.5 4 2 3.5
Alkalinity, Bicarbonate as CaCO3	16/03/2021	mg/l	5.5 7.5 5.5 10.3
Alkalinity, Total as CaCO3	12/08/2020	mg/l	9.11 22.5 18 16
Alkalinity, Total as CaCO3	26/08/2020	mg/l	4.5 7.5 9 18.6
Alkalinity, Total as CaCO3	24/02/2021	mg/l	2.5 4 2 3.5
Alkalinity, Total as CaCO3	16/03/2021	mg/l	5.5 7.5 5.5 10.3
Ammoniacal Nitrogen as N (low level)	12/08/2020	mg/l	0.02 0.0245 0.0121 0.0243 0.028
Ammoniacal Nitrogen as N (low level)	26/08/2020	mg/l	0.02 0.0164 0.0177 0.0321 0.018
Ammoniacal Nitrogen as N (low level)	24/02/2021	mg/l	0.02 0.037 0.036 0.024 0.032
Ammoniacal Nitrogen as N (low level)	16/03/2021	mg/l	0.02 0.04 0.042 0.029 0.042
Apparent Colour	12/08/2020	mg/l Pt/Co	30.8 31.2 97 65.8
Apparent Colour	26/08/2020	mg/l Pt/Co	96 62.7 165 79.3
Apparent Colour	24/02/2021	mg/l Pt/Co	37.4 75.2 52 61.3
Apparent Colour	16/03/2021	mg/l Pt/Co	20.4 35.9 20.9 27.8
Conductivity @ 20 deg.C	12/08/2020	mS/cm	2.5 0.0578 0.057 0.0757 0.0625
Conductivity @ 20 deg.C	26/08/2020	mS/cm	2.5 0.0427 0.0304 0.063 0.0526
Conductivity @ 20 deg.C	24/02/2021	mS/cm	2.5 0.025 0.0377 0.0281 0.0293
Conductivity @ 20 deg.C	16/03/2021	mS/cm	2.5 0.0539 0.0706 0.0568 0.0634
Nitrate as NO3	12/08/2020	mg/l	0.539 <0.3 <0.3 <0.3
Nitrate as NO3	26/08/2020	mg/l	0.374 <0.3 <0.3 <0.3
Nitrate as NO3	24/02/2021	mg/l	<0.3 0.384 <0.3 <0.3
Nitrate as NO3	16/03/2021	mg/l	<0.3 <0.3 <0.3 <0.3
Nitrite as NO2	12/08/2020	mg/l	0.05 <0.05 <0.05 <0.05 <0.05
Nitrite as NO2	26/08/2020	mg/l	0.05 <0.05 <0.05 <0.05 <0.05
Nitrite as NO2	24/02/2021	mg/l	0.05 0.273 <0.05 <0.05 <0.05
Nitrite as NO2	16/03/2021	mg/l	0.05 <0.05 <0.05 <0.05 <0.05
pH	12/08/2020	pH Units	>6 & <9 6.88 7.08 7.13 7.13
pH	26/08/2020	pH Units	>6 & <9 6.72 6.60 6.36 6.96
pH	24/02/2021	pH Units	>6 & <9 6.69 6.74 6.47 7.03
pH	16/03/2021	pH Units	>6 & <9 6.75 6.97 7.38 7.25
Phosphate (Ortho as P)	12/08/2020	mg/l	<0.02 <0.02 <0.02 <0.02
Phosphate (Ortho as P)	26/08/2020	mg/l	<0.02 <0.02 <0.02 <0.02
Phosphate (Ortho as P)	24/02/2021	mg/l	<0.02 <0.02 <0.02 <0.02
Phosphate (Ortho as P)	16/03/2021	mg/l	<0.02 <0.02 <0.02 <0.02
Phosphorus (tot.unfilt)	12/08/2020	µg/l	<20 <20 <20 <20
Phosphorus (tot.unfilt)	26/08/2020	µg/l	<20 <20 <20 <20
Phosphorus (tot.unfilt)	24/02/2021	µg/l	<20 <20 <20 <20
Phosphorus (tot.unfilt)	16/03/2021	µg/l	<20 <20 <20 <20
Suspended solids, Total	12/08/2020	mg/l	25 <2 <2 <2
Suspended solids, Total	26/08/2020	mg/l	25 <2 <2 <2
Suspended solids, Total	24/02/2021	mg/l	25 <2 2.55 <2
Suspended solids, Total	16/03/2021	mg/l	25 <2 <2 <2
True Colour	12/08/2020	mg/l Pt/Co	24.7 21.1 76.6 48.3
True Colour	26/08/2020	mg/l Pt/Co	84.7 51.9 143 66.3
True Colour	24/02/2021	mg/l Pt/Co	31.4 61.2 44.2 51.4
True Colour	16/03/2021	mg/l Pt/Co	13.8 26.8 14.2 20.2
Turbidity	12/08/2020	ntu	0.54 0.674 2.06 1.17
Turbidity	26/08/2020	ntu	1.28 0.562 1.53 0.885
Turbidity	24/02/2021	ntu	0.561 3.65 1.62 2.22
Turbidity	16/03/2021	ntu	0.805 1.26 0.694 0.452

**APPENDIX 9.4:**

**SW LABORATORY CERTS**





Unit 7-8 Hawarden Business Park  
Manor Road (off Manor Lane)  
Hawarden  
Deeside  
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Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

Minerex Environmental  
Taney hall  
Eglinton Terrace  
Dundrum  
Dublin  
Dublin 14

Attention: Sven Klinkenbergh

## CERTIFICATE OF ANALYSIS

<b>Date of report Generation:</b>	20 August 2020
<b>Customer:</b>	Minerex Environmental
<b>Sample Delivery Group (SDG):</b>	200814-71
<b>Your Reference:</b>	3188-A2-COC1
<b>Location:</b>	Inchamore, Co. Cork
<b>Report No:</b>	564014

We received 4 samples on Friday August 14, 2020 and 4 of these samples were scheduled for analysis which was completed on Thursday August 20, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager





# CERTIFICATE OF ANALYSIS

Validated

SDG: 200814-71  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC1  
Order Number:

Report Number: 564014  
Superseded Report:

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22656606	3188-SW1		0.00 - 0.00	12/08/2020
22656623	3188-SW2		0.00 - 0.00	12/08/2020
22656636	3188-SW3		0.00 - 0.00	12/08/2020
22656649	3188-SW4		0.00 - 0.00	12/08/2020

### Maximum Sample/Coolbox Temperature (°C) :

17.4

#### ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.





# CERTIFICATE OF ANALYSIS

Validated

SDG: 200814-71      Client Reference: 3188-A2-COC1      Report Number: 564014  
 Location: Inchamore, Co. Cork      Order Number:      Superseded Report:

Tests Legend			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container								Sample Type	
			500ml Plastic (ALE208)	HNO3 Unfiltered (ALE204)	H2SO4 (ALE244)	HNO3 Unfiltered (ALE204)	H2SO4 (ALE244)	NaOH (ALE245)	500ml Plastic (ALE208)	HNO3 Unfiltered (ALE204)	H2SO4 (ALE244)	NaOH (ALE245)	500ml Plastic (ALE208)	HNO3 Unfiltered (ALE204)	H2SO4 (ALE244)	NaOH (ALE245)
<b>X</b> Test <b>N</b> No Determination Possible  Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid U111 - Other			22656606	3188-SW1		0.00 - 0.00										
			22656623	3188-SW2		0.00 - 0.00										
			22656636	3188-SW3		0.00 - 0.00										
			22656649	3188-SW4		0.00 - 0.00										
Alkalinity as CaCO3	All	NDPs: 0 Tests: 4	X				X			X			X			
Ammonium Low	All	NDPs: 0 Tests: 4		X				X			X			X		
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X				X			X			X			
Colour Test	All	NDPs: 0 Tests: 4	X				X			X			X			
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 4	X				X			X			X			
Nitrite by Kone (w)	All	NDPs: 0 Tests: 4						X			X			X		X
	All	NDPs: 0 Tests: 4	X				X			X			X			
Phosphate by Kone (w)	All	NDPs: 0 Tests: 4	X				X			X			X			
Suspended Solids	All	NDPs: 0 Tests: 4	X				X			X			X			
Total Metals by ICP-MS	All	NDPs: 0 Tests: 4						X			X			X		X
Turbidity in waters	All	NDPs: 0 Tests: 4	X				X			X			X			



CERTIFICATE OF ANALYSIS

Validated

SDG: 200814-71 Client Reference: 3188-A2-COC1 Report Number: 564014  
 Location: Inchamore, Co. Cork Order Number: Superseded Report:

Results Legend		Customer Sample Ref.	3188-SW1	3188-SW2	3188-SW3	3188-SW4				
#	ISO 17025 accredited.									
#	ISO 17025 accredited.									
#	Approved / Method sample.									
#	Approved / Method sample.									
#	Total Unfiltered sample.									
#	Total Unfiltered sample.									
#	Subcontracted - refer to subcontractor report for accreditation status.									
#	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery.									
#	Target Insects monitored									
#	Sample deviation from appendix									
Component	LOD/Units	Method	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)	AOE Reference
Suspended solids, Total	<2 mg/l	TM022	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Alkalinity, Total as CaCO3	<2 mg/l	TM043	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Alkalinity, Bicarbonate as CaCO3	<2 mg/l	TM043	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Phosphorus (tot.unfilt)	<20 µg/l	TM152	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Nitrite as NO2	<0.05 mg/l	TM184	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Phosphate (Ortho as P)	<0.02 mg/l	TM184	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Nitrate as NO3	<0.3 mg/l	TM184	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Turbidity	<0.1 ntu	TM195	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
pH	<1 pH Units	TM256	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
Apparent Colour	<1 mg/l P/Co	TM261	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#
True Colour	<1 mg/l P/Co	TM261	0.00 - 0.00	Surface Water (SW)	12/08/2020	00:00	14/08/2020	200814-71	22059996	
										#





## CERTIFICATE OF ANALYSIS

SDG: 200814-71  
Location: Inchamore, Co. CorkClient Reference: 3188-A2-COC1  
Order Number:Report Number: 564014  
Superseded Report:

## Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981, BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM184	EPA Methods 325.1 & 325.2	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM195	Colour and Turbidity of water, Methods for the Examination of Waters and Associated Materials. HMSO, 1981, ISBN 0 11 751955 3.	Determination of Turbidity in Waters & Associated Matrices
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLPH pH Meter
TM261	Colour and Turbidity of Waters, Methods for the Examination of Waters and Associated Materials, HMSO, 1981, ISBN 0 11 7519553.	Determination of True and Apparent Colour by Spectrophotometry

N/A Not applicable.

C All testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



# CERTIFICATE OF ANALYSIS

Validated

SDG: 200814-71  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC1  
Order Number:

Report Number: 564014  
Superseded Report:

## Test Completion Dates

Lab Sample No(s)	22656606	22656623	22656636	22656649
Customer Sample Ref.	2188-001	2188-002	2188-003	2188-004
AGS Ref.				
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	19-Aug-2020	19-Aug-2020	19-Aug-2020	19-Aug-2020
Ammonium Low	18-Aug-2020	19-Aug-2020	18-Aug-2020	18-Aug-2020
Anions by Kone (w)	17-Aug-2020	19-Aug-2020	19-Aug-2020	19-Aug-2020
Colour Test	18-Aug-2020	18-Aug-2020	18-Aug-2020	18-Aug-2020
Conductivity (at 20 deg.C)	19-Aug-2020	19-Aug-2020	19-Aug-2020	19-Aug-2020
Nitrite by Kone (w)	17-Aug-2020	19-Aug-2020	19-Aug-2020	17-Aug-2020
pH Value	19-Aug-2020	19-Aug-2020	19-Aug-2020	19-Aug-2020
Phosphate by Kone (w)	20-Aug-2020	20-Aug-2020	20-Aug-2020	20-Aug-2020
Suspended Solids	20-Aug-2020	19-Aug-2020	19-Aug-2020	19-Aug-2020
Total Metals by ICP-MS	19-Aug-2020	19-Aug-2020	19-Aug-2020	19-Aug-2020
Turbidity in waters	18-Aug-2020	18-Aug-2020	18-Aug-2020	18-Aug-2020





# CERTIFICATE OF ANALYSIS

SDG:  
Location:

200814-71  
Inchamore, Co. Cork

Client Reference:  
Order Number:

3188-A2-COC1

Report Number:  
Superseded Report:

564014

## Appendix

## General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOL, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix effect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. Leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss are not used.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
⬇	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

### 19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TMO48 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos type	Colour/Fibre
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Minerex Environmental  
Taney hall  
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Dundrum  
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Dublin 14

Attention: Sven Klinkenbergh

## CERTIFICATE OF ANALYSIS

<b>Date of report Generation:</b>	05 September 2020
<b>Customer:</b>	Minerex Environmental
<b>Sample Delivery Group (SDG):</b>	200828-87
<b>Your Reference:</b>	3188-A2-COC2
<b>Location:</b>	Inchamore, Co. Cork
<b>Report No:</b>	566071

We received 4 samples on Friday August 28, 2020 and 4 of these samples were scheduled for analysis which was completed on Saturday September 05, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager







# CERTIFICATE OF ANALYSIS

Validated

SDG: 200828-87  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC2  
Order Number:

Report Number: 566071  
Superseded Report:

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22737270	3188-SW1		0,00 - 0,00	27/08/2020
22737286	3188-SW2		0,00 - 0,00	26/08/2020
22737302	3188-SW3		0,00 - 0,00	26/08/2020
22737315	3188-SW4		0,00 - 0,00	26/08/2020

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 200828-87 Client Reference: 3188-A2-COC2 Report Number: 566071  
 Location: Inchamore, Co. Cork Order Number: Superseded Report:

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type
	X Test	N No Determination Possible									
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other											
Alkalinity as CaCO3	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Ammonium Low	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Anions by Kone (w)	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Colour Test	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Conductivity (at 20 deg.C)	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Nitrite by Kone (w)	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
pH Value	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Phosphate by Kone (w)	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Suspended Solids	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Total Metals by ICP-MS	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X
Turbidity in waters	All	NDP: 0 Tests: 4	X	X	X	X	X	X	X	X	X





### CERTIFICATE OF ANALYSIS

**SDG:** 200828-87      **Client Reference:** 3188-A2-COC2      **Report Number:** 566071  
**Location:** Inchamore, Co. Cork      **Order Number:**      **Superseded Report:**

Results Legend		Customer Sample Ref	3188-SW1	3188-SW2	3188-SW3	3188-SW4		
#	ISO17025 accredited.	Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
M	mCESTI accredited.	Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
A	Aqueous / filtered sample.	Date Sampled	27/08/2020	26/08/2020	26/08/2020	26/08/2020		
dis.B	Dissolved / filtered sample.	Sample Time	00:00	00:00	00:00	00:00		
dis.T	Total / unfiltered sample.	Date Received	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
+	Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	200828-87	200828-87	200828-87	200828-87		
-	% recovery of the sample standard to check the efficiency of the method. The results of individual components within samples aren't corrected for the recovery.	Lab Sample No.(s)	22737270	22737285	22737302	22737315		
1-4	1-4°C Sample location (see appendix)	AOB Reference						
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022	<2	<2	<2	<2	#	#
Alkalinity, Total as CaCO3	<2 mg/l	TM043	4.5	7.5	9	18.6	#	#
Alkalinity, Bicarbonate as CaCO3	<2 mg/l	TM043	4.5	7.5	9	18.6	#	#
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.0164	0.0177	0.0321	0.018	#	#
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.0427	0.0304	0.063	0.0526	#	#
Phosphorus (tot.unfilt)	<20 µg/l	TM152	<20	<20	23.1	<20	#	#
Nitrite as NO2	<0.05 mg/l	TM184	<0.05	<0.05	<0.05	<0.05	#	#
Nitrite (Ortho as P)	<0.02 mg/l	TM184	<0.02	<0.02	<0.02	<0.02	#	#
Nitrate as NO3	<0.3 mg/l	TM184	0.374	<0.3	<0.3	0.456	#	#
Turbidity	<0.1 ntu	TM195	1.28	0.562	1.53	0.885	#	#
pH	<1 pH Units	TM256	5.73	6.59	6.35	6.96	#	#
Apparent Colour	<1 mg/l Pt/Co	TM261	96	62.7	165	79.3	#	#
True Colour	<1 mg/l Pt/Co	TM261	84.7	51.9	143	66.3	#	#



# CERTIFICATE OF ANALYSIS

Validated

SDG: 200828-87  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC2  
Order Number:

Report Number: 566071  
Superseded Report:

## Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981, BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM195	Colour and Turbidity of water. Methods for the Examination of Waters and Associated Materials, HMSO, 1981, ISBN 0 11 751955 3,	Determination of Turbidity in Waters & Associated Matrices
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters, HMSO, 1978, ISBN 011 751428 4,	Determination of pH in Water and Leachate using the GLPH pH Meter
TM261	Colour and Turbidity of Waters, Methods for the Examination of Waters and Associated Materials, HMSO, 1981, ISBN 0 11 7519553,	Determination of True and Apparent Colour by Spectrophotometry

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).





# CERTIFICATE OF ANALYSIS

Validated

SDG: 200828-87  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC2  
Order Number:

Report Number: 566071  
Superseded Report:

## Test Completion Dates

Lab Sample No(s)	22737270	22737286	22737302	22737315
Customer Sample Ref.	3188-001	3188-002	3188-003	3188-004
AGS Ref.				
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	04-Sep-2020	04-Sep-2020	04-Sep-2020	03-Sep-2020
Ammonium Low	03-Sep-2020	03-Sep-2020	05-Sep-2020	05-Sep-2020
Anions by Kone (w)	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020
Colour Test	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020
Conductivity (at 20 deg.C)	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020
Nitrite by Kone (w)	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020
pH Value	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020
Phosphate by Kone (w)	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020
Suspended Solids	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020
Total Metals by ICP-MS	04-Sep-2020	04-Sep-2020	04-Sep-2020	04-Sep-2020
Turbidity in waters	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020



# CERTIFICATE OF ANALYSIS

SDG: 200828-87 Client Reference: 3188-A2-COC2 Report Number: 566071  
 Location: Inchamore, Co. Cork Order Number: Superseded Report:

## Appendix

## General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and GEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix effect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

### 19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM049 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Names
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than - Trace - Where only one or two asbestos fibres were identified.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.





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Dublin 14

Attention: Sven Klinkenbergh

## CERTIFICATE OF ANALYSIS

**Date of report Generation:** 04 March 2021  
**Customer:** Minerex Environmental  
**Sample Delivery Group (SDG):** 210301-15  
**Your Reference:** 3188-A2-COC4  
**Location:** Inchamore, Co. Cork  
**Report No:** 589280

We received 4 samples on Monday March 01, 2021 and 4 of these samples were scheduled for analysis which was completed on Thursday March 04, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager





# CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-15  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC4  
Order Number:

Report Number: 589280  
Superseded Report:

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23815010	3188-A2-SW1 (Inch. 1)		0.00 - 0.00	24/02/2021
23815030	3188-A2-SW2 (Inch. 2)		0.00 - 0.00	24/02/2021
23815049	3188-A2-SW3 (Inch. 3)		0.00 - 0.00	24/02/2021
23815061	3188-A2-SW4 (Inch. 4)		0.00 - 0.00	24/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



### CERTIFICATE OF ANALYSIS



SDG: 210301-15      Client Reference: 3188-A2-COC4      Report Number: 589280  
 Location: Inchamore, Co. Cork      Order Number:      Superseded Report:

Tests Legend	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
	23815010	3188-A2-SW1 (Inch. 1)		0.00 - 0.00	500ml Plastic (ALE208) H2SO4 (ALE244) NaOH (ALE245)	SW
	23815030	3188-A2-SW2 (Inch. 2)		0.00 - 0.00	500ml Plastic (ALE208) HNO3 Unfiltered (ALE204) H2SO4 (ALE244)	SW
	23815049	3188-A2-SW3 (Inch. 3)		0.00 - 0.00	500ml Plastic (ALE208) NaOH (ALE245)	SW
	23815061	3188-A2-SW4 (Inch. 4)		0.00 - 0.00	NaOH (ALE245)	SW
Alkalinity as CaCO3	All	NDP: 0 Tests: 4	X	X	X	X
Ammonium Low	All	NDP: 0 Tests: 4	X	X	X	X
Anions by Kone (w)	All	NDP: 0 Tests: 4	X	X	X	X
Colour Test	All	NDP: 0 Tests: 4	X	X	X	X
Conductivity (at 20 deg.C)	All	NDP: 0 Tests: 4	X	X	X	X
Nitrite by Kone (w)	All	NDP: 0 Tests: 4	X	X	X	X
Phosphate by Kone (w)	All	NDP: 0 Tests: 4	X	X	X	X
Suspended Solids	All	NDP: 0 Tests: 4	X	X	X	X
Total Metals by ICP-MS	All	NDP: 0 Tests: 4	X	X	X	X
Turbidity in waters	All	NDP: 0 Tests: 4	X	X	X	X



Validated

### CERTIFICATE OF ANALYSIS

**SDG:** 210301-15      **Client Reference:** 3188-A2-COC4      **Report Number:** 589280  
**Location:** Inchamore, Co. Cork      **Order Number:**      **Superseded Report:**

Results Legend		Customer Sample Ref	Customer Sample Ref			
#	3011029 accredited		3188-A2-SW1 (Inch. 1)	3188-A2-SW2 (Inch. 2)	3188-A2-SW3 (Inch. 3)	3188-A2-SW4 (Inch. 4)
#	m-CERTS accredited	Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
#	Approved / filtered sample	Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
#	disc:20	Date Sampled	24/02/2021	24/02/2021	24/02/2021	24/02/2021
#	disc:20	Sample Time	00:00	00:00	00:00	00:00
#	disc:20	Date Received	01/03/2021	01/03/2021	01/03/2021	01/03/2021
#	disc:20	SDG Ref	210301-15	210301-15	210301-15	210301-15
#	disc:20	Lab Sample No. (x)	23815010	23815030	23815040	23815060
#	disc:20	AOS Reference				
#	disc:20	Method				
#	disc:20	LOD/Units				
#	disc:20	Method				
Suspended solids, Total	<2 mg/l	TM022	<2	2.55	<2	<2
			#	#	#	#
Alkalinity, Total as CaCO3	<2 mg/l	TM043	2.5	4	2	3.5
			#	#	#	#
Alkalinity, Bicarbonate as CaCO3	<2 mg/l	TM043	2.5	4	2	3.5
			#	#	#	#
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.037	0.036	0.024	0.032
			#	#	#	#
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.025	0.0377	0.0281	0.0293
			#	#	#	#
Phosphorus (tot.unfil)	<20 µg/l	TM152	<20	<20	<20	<20
			2#	#	#	#
Nitrite as NO2	<0.05 mg/l	TM184	0.273	<0.05	<0.05	<0.05
			#	#	#	#
Phosphate (Ortho as P)	<0.02 mg/l	TM184	<0.02	<0.02	<0.02	<0.02
			#	#	#	#
Nitrate as NO3	<0.3 mg/l	TM184	<0.3	0.384	<0.3	<0.3
			#	#	#	#
Turbidity	<0.1 ntu	TM195	0.561	3.65	1.62	2.22
			@#	@#	@#	@#
pH	<1 pH Units	TM256	6.69	6.74	6.47	7.03
			#	#	#	#
Apparent Colour	<1 mg/l Pt/Co	TM261	37.4	75.2	52	61.3
			#	#	#	#
True Colour	<1 mg/l Pt/Co	TM261	31.4	61.2	44.2	51.4
			#	#	#	#





# CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-15  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC4  
Order Number:

Report Number: 589280  
Superseded Report:

## Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981,BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM195	Colour and Turbidity of water. Methods for the Examination of Waters and Associated Materials. HMSO, 1981, ISBN 0 11 751955 3.	Determination of Turbidity in Waters & Associated Matrices
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM261	Colour and Turbidity of Waters, Methods for the Examination of Waters and Associated Materials, HMSO, 1981, ISBN 0 11 7519553.	Determination of True and Apparent Colour by Spectrophotometry

N/A Not applicable.

C All testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-15  
Location: Inchamore, Co. Cork

Client Reference: 3188-A2-COC4  
Order Number:

Report Number: 589280  
Superseded Report:

Test Completion Dates

Lab Sample No(s)	23815010	23815030	23815049	23815061
Customer Sample Ref.	Y98AG-091 (P-01)	Y98AG-092 (P-02)	Y98AG-093 (P-03)	Y98AG-094 (P-04)
AGS Ref.				
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	03-Mar-2021	03-Mar-2021	03-Mar-2021	03-Mar-2021
Ammonium Low	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
Anions by Kone (w)	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
Colour Test	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
Conductivity (at 20 deg.C)	03-Mar-2021	03-Mar-2021	03-Mar-2021	03-Mar-2021
Nitrite by Kone (w)	02-Mar-2021	02-Mar-2021	02-Mar-2021	02-Mar-2021
pH Value	02-Mar-2021	02-Mar-2021	02-Mar-2021	02-Mar-2021
Phosphate by Kone (w)	03-Mar-2021	02-Mar-2021	02-Mar-2021	03-Mar-2021
Suspended Solids	02-Mar-2021	02-Mar-2021	02-Mar-2021	02-Mar-2021
Total Metals by ICP-MS	03-Mar-2021	03-Mar-2021	03-Mar-2021	03-Mar-2021
Turbidity in waters	02-Mar-2021	02-Mar-2021	02-Mar-2021	02-Mar-2021

# CERTIFICATE OF ANALYSIS



<b>SDG:</b>	210301-15	<b>Client Reference:</b>	3188-A2-COC4	<b>Report Number:</b>	589280
<b>Location:</b>	Inchamore, Co. Cork	<b>Order Number:</b>		<b>Superseded Report:</b>	

## Appendix

## General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and GEN Leach tests, flash point LOL, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be marked up as an invalid VOC on the test schedule and the result marked as deviating on certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if 25% or more of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss is not corrected.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
+	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

### 19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TMD48 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Characteristics
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Attapulgite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



**APPENDIX 9.5:**

**SAFETY MATERIAL DATASHEET – CLEARBORE**

### Section 1 - Identification of The Material and Supplier

Clearbore Pty Ltd 62 Mt Tootie Rd Bilpin, NSW 2758 AUSTRALIA	AUS Freecall 1800 013 210 AUS Fax (02) 4567 0122 NZ Freecall 0800 443 537 NZ Freefax 0800 443 538
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<b>Chemical nature:</b>	Organic acid with indicator dye.
<b>Trade Name:</b>	<b>Clearbore</b>
<b>Product Use:</b>	Bore water pump cleaner.
<b>Creation Date:</b>	<b>February, 2009</b>
<b>This version issued:</b>	<b>January 2019</b> and is valid for 5 years from this date.

### Section 2 - Hazards Identification

#### Statement of Hazardous Nature

This product is classified as: Xn, Harmful, Xi, Irritating, Hazardous according to the criteria of SWA.

Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code.

**Risk Phrases:** R36, R21/22. Irritating to eyes. Harmful in contact with skin and if swallowed.

**Safety Phrases:** S2, S20, S22, S45, S24/25, S36/39. Keep out of reach of children. When using, do not eat or drink. Do not breathe dust. In case of accident or if you feel unwell, contact a doctor or Poisons Information Centre immediately (show this MSDS where possible). Avoid contact with skin and eyes. Wear suitable protective clothing and eye/face protection.

**SUSMP Classification:** S6

**ADG Classification:** None allocated. Not a Dangerous Good under the ADG Code.

**UN Number:** None allocated



#### GHS Signal word: WARNING.

##### HAZARD STATEMENT:

- H302: Harmful if swallowed.
- H312: Harmful in contact with skin.
- H320: Causes eye irritation.

##### PREVENTION

- P102: Keep out of reach of children.
- P264: Wash contacted areas thoroughly after handling.
- P280: Wear protective gloves, protective clothing and eye or face protection.
- P281: Use personal protective equipment as required.

##### RESPONSE

- P311: If swallowed, call a POISON CENTER or doctor.
- P337: If eye irritation persists: seek medical attention.
- P353: Rinse skin or shower with water.
- P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337+P313: If eye irritation persists: Get medical advice.
- P370+P378: Not Combustible. Use extinguishing media suited to burning materials.

##### DISPOSAL

- P501: Dispose of contents and containers to landfill.

### Emergency Overview

**Physical Description & Colour:** Blue crystalline solid.

**Odour:** No odour.

**Major Health Hazards:** harmful in contact with skin, and if swallowed, eye irritant.

### SAFETY DATA SHEET

Issued by: Clearbore Pty Ltd

AUS Freecall 1800 013 210

NZ Freecall 0800 443 537

Poisons Information Centre: 13 1126 from anywhere in Australia, 0800 764 766 in New Zealand.

### Potential Health Effects

#### Inhalation:

**Short Term Exposure:** Available data indicates that this product is not harmful. However product may be mildly irritating, although unlikely to cause anything more than mild transient discomfort.

**Long Term Exposure:** No data for health effects associated with long term inhalation.

#### Skin Contact:

**Short Term Exposure:** Available data shows that this product is harmful, but symptoms are not available. In addition product may be irritating, but is unlikely to cause anything more than mild transient discomfort.

**Long Term Exposure:** No data for health effects associated with long term skin exposure.

#### Eye Contact:

**Short Term Exposure:** This product is an eye irritant. Symptoms may include stinging and reddening of eyes and watering which may become copious. Other symptoms may also become evident. If exposure is brief, symptoms should disappear once exposure has ceased. However, lengthy exposure or delayed treatment may cause permanent damage.

**Long Term Exposure:** No data for health effects associated with long term eye exposure.

#### Ingestion:

**Short Term Exposure:** Significant oral exposure is considered to be unlikely. Available data shows that this product is harmful, but symptoms are not available. However, this product is an oral irritant. Symptoms may include burning sensation and reddening of skin in mouth and throat. Other symptoms may also become evident, but all should disappear once exposure has ceased.

**Long Term Exposure:** No data for health effects associated with long term ingestion.

#### Carcinogen Status:

**SWA:** No significant ingredient is classified as carcinogenic by SWA.

**NTP:** No significant ingredient is classified as carcinogenic by NTP.

**IARC:** No significant ingredient is classified as carcinogenic by IARC.

### Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Conc, %	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )
Oxalic acid	144-62-7	>60	1	2
Other non hazardous ingredients	secret	to 100	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The SWA TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that may be equalled (but should not be exceeded) for no longer than 15 minutes and should not be repeated more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak" is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

### Section 4 - First Aid Measures

#### General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

**Inhalation:** No first aid measures normally required. However, if inhalation has occurred, and irritation has developed, remove to fresh air and observe until recovered. If irritation becomes painful or persists more than about 30 minutes, seek medical advice.

**Skin Contact:** Quickly and gently brush away excess solids. Wash gently and thoroughly with warm water (use non-abrasive soap if necessary) for 10-20 minutes or until product is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands and belts) and completely decontaminate them before reuse or discard.

**Eye Contact:** Quickly and gently brush particles from eyes. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the product is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately. Take special care if exposed person is wearing contact lenses.

**Ingestion:** If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor.

### SAFETY DATA SHEET

Issued by: Clearbore Pty Ltd

AUS Freecall 1800 013 210

NZ Freecall 0800 443 537

Poisons Information Centre: 13 1126 from anywhere in Australia, 0800 764 766 in New Zealand.



### Section 5 - Fire Fighting Measures

**Fire and Explosion Hazards:** There is no risk of an explosion from this product under normal circumstances if it is involved in a fire. Violent steam generation or eruption may occur upon application of direct water stream on hot liquids.

Fire decomposition products from this product may be toxic if inhaled. Take appropriate protective measures.

**Extinguishing Media:** Not Combustible. Use extinguishing media suited to burning materials.

**Fire Fighting:** If a significant quantity of this product is involved in a fire, call the fire brigade.

**Flash point:** Combustible solid.

**Upper Flammability Limit:** No data.

**Lower Flammability Limit:** No data.

**Autoignition temperature:** No data.

**Flammability Class:** Combustible solid.

### Section 6 - Accidental Release Measures

**Accidental release:** In the event of a major spill, prevent spillage from entering drains or water courses. Wear full protective clothing including eye/face protection. All skin areas should be covered. See below under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include rubber, Nitrile, butyl rubber, neoprene. Eye/face protective equipment should comprise as a minimum, protective goggles. If there is a significant chance that dusts are likely to build up in cleanup area, we recommend that you use a suitable Dust Mask. Use a P1 mask, designed for use against mechanically generated particles eg silica & asbestos. Otherwise, not normally necessary.

Stop leak if safe to do so, and contain spill. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. Consider vacuuming if appropriate. Recycle containers wherever possible after careful cleaning. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. This material may be suitable for approved landfill. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

### Section 7 - Handling and Storage

**Handling:** Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

**Storage:** This product is a Scheduled Poison. Observe all relevant regulations regarding sale, transport and storage of this schedule of poison. Store packages of this product in a cool place. Make sure that containers of this product are kept tightly closed. Keep containers dry and away from water. Make sure that the product does not come into contact with substances listed under "Incompatibilities" in Section 10. Check packaging - there may be further storage instructions on the label.

### Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Occupational Protective Clothing: **AS/NZS 4501** set 2008, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

SWA Exposure Limits	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )
Oxalic acid	1	2

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

**Ventilation:** This product should only be used in a well ventilated area. If natural ventilation is inadequate, use of a fan is suggested.

**Eye Protection:** Protective glasses or goggles should be worn when this product is being used. Failure to protect your eyes may cause them harm. Emergency eye wash facilities are also recommended in an area close to where this product is being used.

**Skin Protection:** Prevent skin contact by wearing impervious gloves, clothes and, preferably, apron. Make sure that all skin areas are covered. See below for suitable material types.

**Protective Material Types:** We suggest that protective clothing be made from the following materials: rubber, nitrile, butyl rubber, neoprene.

### SAFETY DATA SHEET

Issued by: Clearbore Pty Ltd

AUS Freecall 1800 013 210

NZ Freecall 0800 443 537

Poisons Information Centre: 13 1126 from anywhere in Australia, 0800 764 766 in New Zealand.



**Respirator:** If there is a significant chance that dusts are likely to build up in the area where this product is being used, we recommend that you use a suitable Dust Mask. Otherwise, not normally necessary.  
 Eyebaths or eyewash stations and safety deluge showers should be provided near to where this product is being used.

### Section 9 - Physical and Chemical Properties:

<b>Physical Description &amp; colour:</b>	Blue crystalline solid.
<b>Odour:</b>	No odour.
<b>Boiling Point:</b>	No specific data. Expected to decompose before boiling.
<b>Freezing/Melting Point:</b>	187°C
<b>Volatiles:</b>	No specific data. Expected to be low at 100°C.
<b>Vapour Pressure:</b>	Negligible at normal ambient temperatures.
<b>Vapour Density:</b>	No data.
<b>Specific Gravity:</b>	1.65 at 20°C
<b>Water Solubility:</b>	Soluble.
<b>pH:</b>	2 approx (concentration not given)
<b>Volatility:</b>	Negligible at normal ambient temperatures.
<b>Odour Threshold:</b>	No data.
<b>Evaporation Rate:</b>	No data.
<b>Coeff Oil/water Distribution:</b>	No data.
<b>Autoignition temp:</b>	No data.

### Section 10 - Stability and Reactivity

**Reactivity:** This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.

**Conditions to Avoid:** This product should be kept in a cool place, preferably below 30°C. Keep containers tightly closed. Containers should be kept dry.

**Incompatibilities:** strong oxidising agents, zinc, tin, aluminium and their alloys.

**Fire Decomposition:** Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Water. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death.

**Polymerisation:** This product will not undergo polymerisation reactions.

### Section 11 - Toxicological Information

#### Local Effects:

**Target Organs:** There is no data to hand indicating any particular target organs.

### Classification of Hazardous Ingredients

Ingredient	Risk Phrases
Oxalic Acid	Conc>=5%: Xn; R21/22

### Section 12 - Ecological Information

This product is biodegradable. It will not accumulate in the soil or water or cause long term problems. This product is unlikely to accumulate in body tissues.

### Section 13 - Disposal Considerations

**Disposal:** This product may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. If neither of these options is suitable, consider controlled incineration, or landfill.

### Section 14 - Transport Information

**ADG Code:** This product is not classified as a Dangerous Good. No special transport conditions are necessary unless required by other regulations.

### Section 15 - Regulatory Information

**AICS:** All of the significant ingredients in this formulation are compliant with NICNAS regulations. The following ingredient: Oxalic acid, is mentioned in the SUSMP.

#### SAFETY DATA SHEET

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AUS Freecall 1800 013 210

NZ Freecall 0800 443 537

Poisons Information Centre: 13 1126 from anywhere in Australia, 0800 764 766 in New Zealand.

### Section 16 - Other Information

This MSDS contains only safety-related information. For other data see product literature.

**Acronyms:**

<b>ADG Code</b>	Australian Code for the Transport of Dangerous Goods by Road and Rail (7 <sup>th</sup> edition)
<b>AICS</b>	Australian Inventory of Chemical Substances
<b>SWA</b>	Safe Work Australia, formerly ASCC and NOHSC
<b>CAS number</b>	Chemical Abstracts Service Registry Number
<b>IARC</b>	International Agency for Research on Cancer
<b>NTP</b>	National Toxicology Program (USA)
<b>R-Phrase</b>	Risk Phrase
<b>SUSMP</b>	Standard for the Uniform Scheduling of Medicines & Poisons
<b>UN Number</b>	United Nations Number

THIS MSDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE. EACH USER MUST REVIEW THIS MSDS IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE.

IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY SO WE CAN ATTEMPT TO OBTAIN ADDITIONAL INFORMATION FROM OUR SUPPLIERS. OUR RESPONSIBILITY FOR PRODUCTS SOLD IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS, A COPY OF WHICH IS SENT TO OUR CUSTOMERS AND IS ALSO AVAILABLE ON REQUEST.

Please read all labels carefully before using product.

This MSDS is prepared in accord with the SWA document "Preparation of Safety Data Sheets for Hazardous Chemicals - Code of Practice" (December 2011)

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<http://www.kilford.com.au/> Phone +61 2 9251 4532

#### SAFETY DATA SHEET

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AUS Freecall 1800 013 210

NZ Freecall 0800 443 537

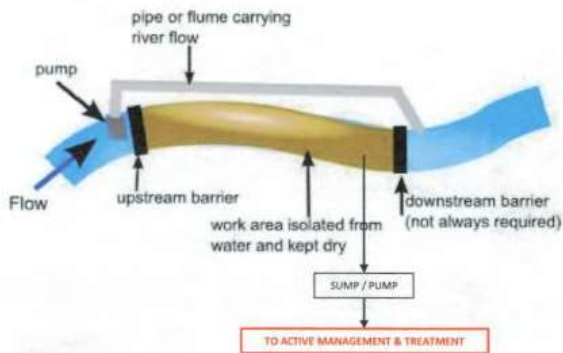
Poisons Information Centre: 13 1126 from anywhere in Australia, 0800 764 766 in New Zealand.



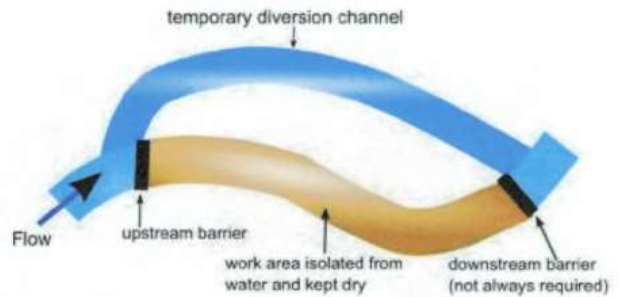
**APPENDIX 9.6:**

**CONCEPTUAL AND INFO GRAPHICS**

**Full Isolation Over Pumping – Plan**



**Full Isolation by Diversion – Plan**



**NOTES:**

- Full isolation over pumping / siphon. A whole section of the channel is isolated using barriers that span the full width of the river. This keeps a stretch of the river dry and the water is transferred downstream of the works area by mechanical assistance (pumping or siphon). The pump and associated pipework need not be located in the isolated area.
- This method is the preferred method for channel diversion during instream works, for example, during watercourse crossing / culvert construction. However, the pumping equipment deployed must be capable of the surface water feature discharge rate, including back up equipment and fail safe protocols.

**NOTES:**

- Full isolation temporary diversion channel. A whole section of the channel is isolated and kept dry, and the water is transferred downstream of the works area by excavating a temporary open channel.
- This is the less preferred method due to the destructive nature of constructing temporary diversion channels. However, in some instances where discharge rates are high, this method will negate the requirement for large volume pumping and associated inherent risks.

SEPA (2008) Engineering in the Water Environment Good Practice Guide – Temporary Construction Methods.

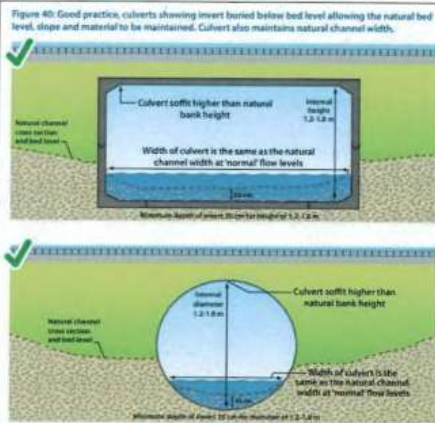
Site Name: <b>Inchamore Wind Farm, Co. Cork</b>	Project No.	603679	Drawn By:	Sven Klinckenbergh Principal Environmental Consultant
	Client:	JOD	Reviewed By:	SK
	Date:	4/4/2023		
	Revision:	00		



Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



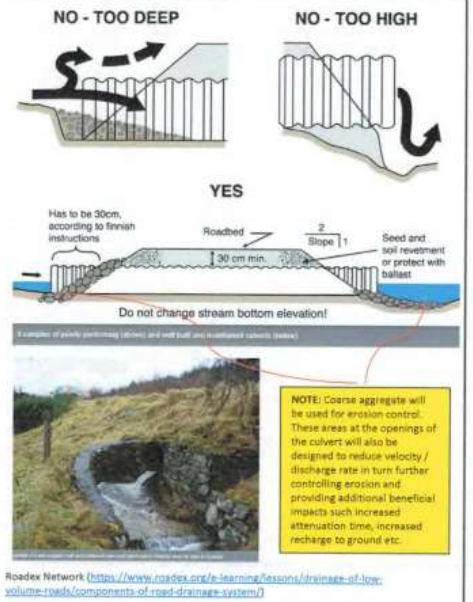
**Closed Culvert Good Practice Design Considerations – Section**



**Closed Culvert Good & Bad Examples – Section**



**Closed Culvert Erosion Control Good & Bad Examples – Section**



SEPA (2010) Engineering in the Water Environment Good Practice Guide – River Crossings.

SEPA (2010) Engineering in the Water Environment Good Practice Guide – River Crossings.

NOTE: Coarse aggregate has been used for erosion control. Silt fencing has been used to mitigate against the entrainment and mobilisation of solids during the construction process



TrueNorth Steel (2021)

Site Name: Inchamore Wind Farm, Co. Cork	Project No. 603679	Drawn By: Sven Klinkenbergh Principal Environmental Consultant
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 2 Culverting – General Considerations	Client: JOD	Reviewed By: SK
	Date: 4/4/2023	
	Revision: 00	




Conceptual Graphics & Design for consideration at detailed design phase and engineering specification of required infrastructure. Not to scale.



Example of a clear-span bridge which retains the existing river channel, abutments are set back from the river bank (AT&F, 2022)

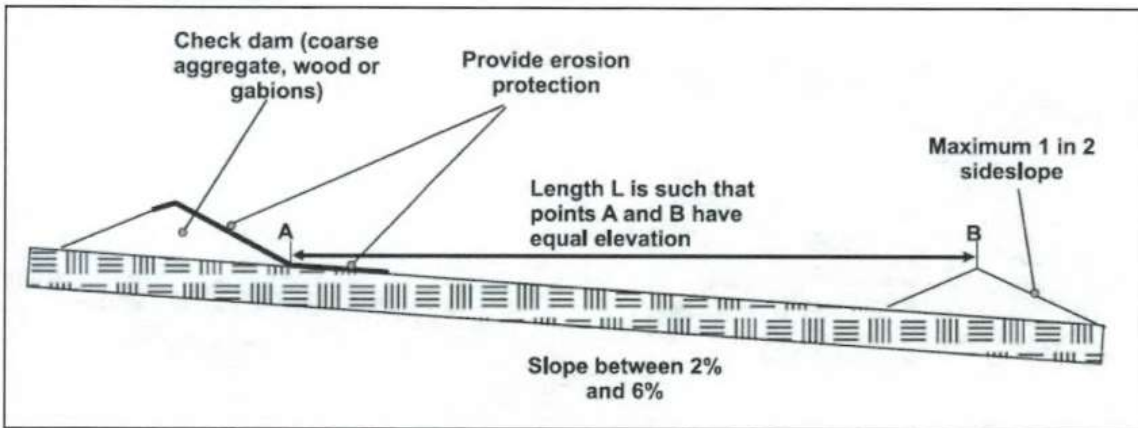


Example of a clear-span bridge, which retains the existing river channel and column set back from the river bank (National Roads Authority, 2008)

Site Name: Inchamore Wind Farm, Co. Cork	Project No.	603679	Drawn By:	Sven Klinkenbergh Principal Environmental Consultant
	Client:	JOD	Reviewed By:	SK
	Date:	4/4/2023		
	Revision:	00		
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 3 Example of Clear Span Bridges				

Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.

Constructed Drain and Check Dams – Section



Check Dam Design Consideration (CIRIA, 2004)

Site Name: Inchmore Wind Farm, Co. Cork	Project No.:	603679	Drawn By:	Sven Klinkenbergh Principal Environmental Consultant
	Client:	JOD		
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 4 Check Dams – General Considerations	Date:	4/4/2023	Reviewed By:	SK
	Revision:	00		



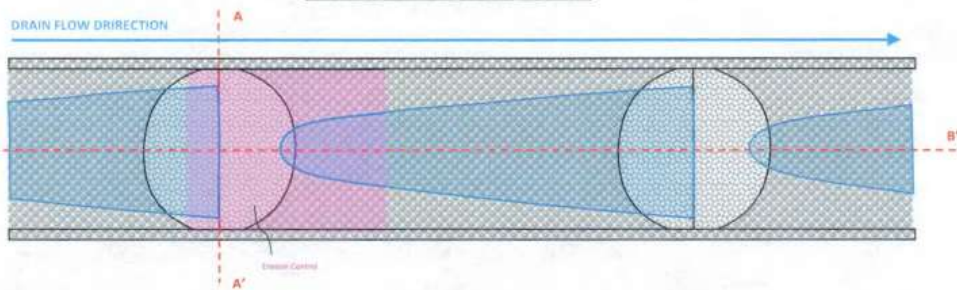
Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



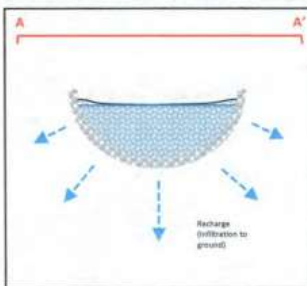
**NOTES:**

- The extensive use of check dams is recommended for the following reasons:
  - Management of runoff in terms of reducing flow velocity and minimising channel erosion, or erosion at drainage outfalls.
  - Maximise attenuation of runoff with a view to enhancing runoff quality i.e. settlement of suspended solids.
  - Maximise attenuation of runoff with a view to reducing the hydrological response to rain fall at the site.
  - Maintain or improve the site hydrological/hydrogeological regime with a view to maintaining recharge to ground and increasing groundwater levels locally. This is particularly relevant for peatland areas.
- Check dams will be constructed with the following features and specifications:
  - 4 low flow pipe or small orifice to allow for low flows through the check dam.
  - Check dams will be permanent (life of development) and will be constructed with crushed rock with appropriate geo-chemistry (local) for peatland coarse aggregate (300-600 mm). Wooden boards, gallets can also be used.
  - Erosion protection and energy dissipaters (concrete / boulder 100-150mm diameter) which will extend approximately 1.2 = 1.5m downstream of the dam and applied to both the base and side walls of the drain / soak.
  - Erosion control can be enhanced with the in-combination use of geotextile base layers (but consider low flow through).
  - It is recommended that the drainage channels / soaks are erodibly lined with coarse aggregate / erosion control. This will enhance mitigation in terms of attenuation, erosion control, and recharge to ground. Alternatively, allowing drains / soaks to vegetate will achieve similar effects.

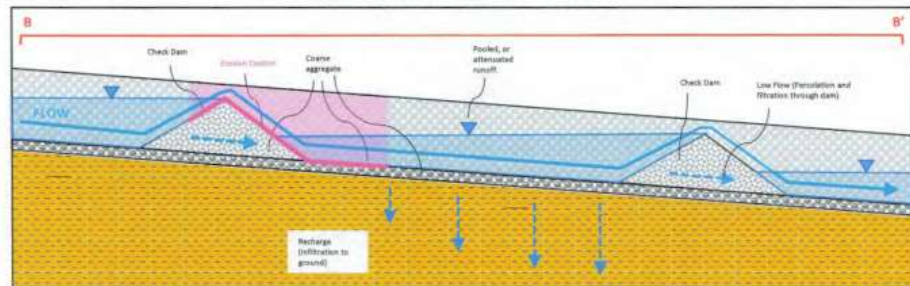
**Constructed Drain and Check Dams – Plan View**



**Constructed Drain and Check Dams – Section A-A'**



**Constructed Drain and Check Dams – Section B-B'**



Site Name:  
Inchmore Wind Farm, Co. Cork

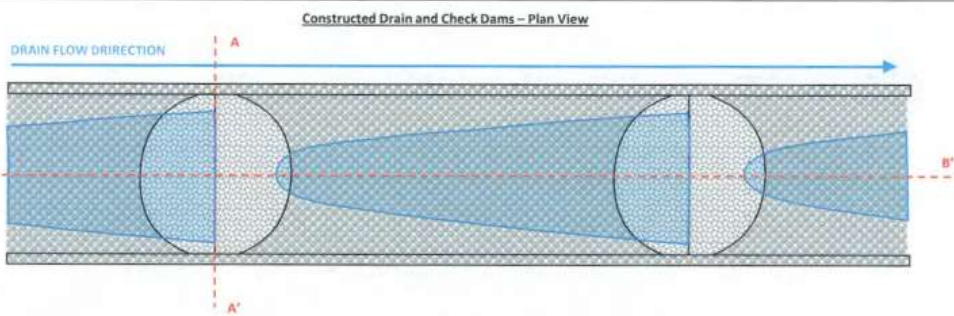
Project No. 603675  
Client: JOD  
Date: 4/4/2023  
Revision: 00

Drawn By: Sven Klinkenbergh  
Principal Environmental Consultant  
Reviewed By: SK

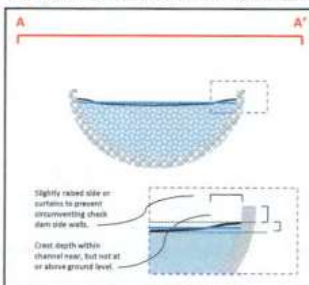
Figure Name:  
Appendix 9.6 – Conceptual & Information Graphics – Tile 5  
Check Dams – General Considerations



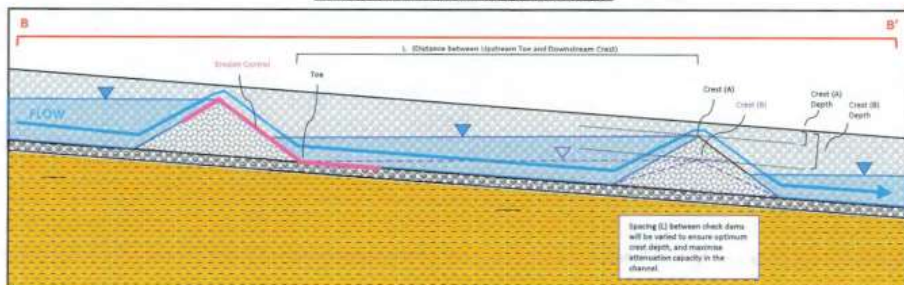
- NOTES:**
- It is recommended to align the elevation of the upstream toe and downstream crest. Therefore the spacing (L) of check dams will be dependent on the on the slope angle of a particular length (L) of drainage, whereby; on shallow slopes check dams will have larger spacing and on steeper slopes (up to 15 degrees \*) spacing will be smaller.
  - The purpose of aligning the toe and crest of respective check dams is recommended with a view to maximising cooling, or attenuation capacity of the drainage channel. The conceptual section presented here is designed with the downstream crest (A) higher than the upstream toe, as opposed to the crest (B) which is aligned with the toe. The purpose of this is to further enhance attenuation capacity at the dam, and to maximise hydraulic head \*\* and infiltration / penetration of runoff to ground water (recharge). However, this approach has limitations including the potential to adversely impact undermine the integrity of the upstream dam through erosion etc, or the downstream dam through loading / excess weight. Mitigation measures including material selection, erosion control, and variable flow (V-notch) \*\*\* will be used where relevant to mitigate such impacts.
  - (\*) Check dams are recommended for drainage channels with slope angle up to 15 degrees. Drainage and runoff on steeper slopes (>15 degrees) will require different drainage velocity control features, for example: rock terraces.
  - (\*\*\*) Attenuation of runoff in drainage channels is an opportunity to enhance recharge and reduce the hydrological response to rainfall at the site. However, detailed design will consider environmental and geological constraints, for example; enhanced recharge is not recommended in areas of elevated or high landslide susceptibility or risk.
  - (\*\*\*) V-notch weirs discussed. Conceptual Design – Drainage Infrastructure Check Dams – With Variable Flow Rate / V – Notch Weirs



**Constructed Drain and Check Dams – Section A-A'**



**Constructed Drain and Check Dams – Section B-B'**



Site Name: Inchamore Wind Farm, Co. Cork	Project No.	603679	Drawn By: Sven Klinkenbergh Principal Environmental Consultant
	Client:	JOD	
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 6 Check Dams – Design Specifications and Considerations	Date:	4/4/2023	Reviewed By: SK
	Revision:	00	

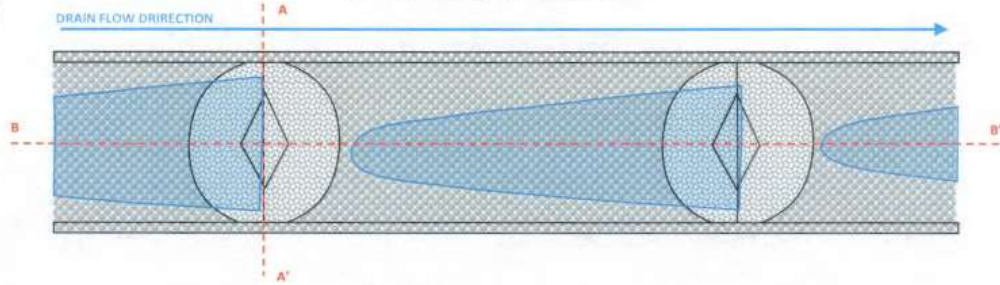


Conceptual Graphics & Design for consultation at detailed design phase and engineered specification of required infrastructure. Not to scale.

**NOTES:**

- V-notch weirs can be included in design as a control to mitigate against upland or peak flows / drainage discharge rates.
- V-notch can also be employed to correct the elevation differential between Toe and Crest of respective in the check dams.

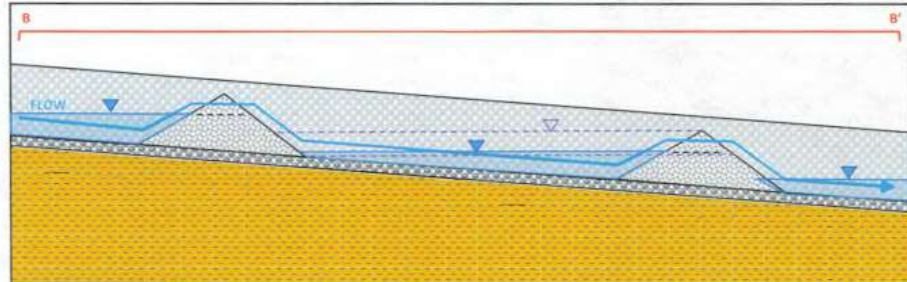
**Constructed Drain and Check Dams – Plan View**




**Constructed Drain and Check Dams – Section A-A'**



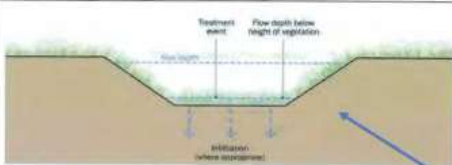
**Constructed Drain and Check Dams – Section B-B'**



Site Name: Inchamore Wind Farm, Co. Cork	Project No.	603679	Drawn By:	Sven Klinkenberg Principal Environmental Consultant
	Client:	JOD	Reviewed By:	SK
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 7 Check Dams – With Variable Flow Rate / V – Notch Weirs	Date:	4/4/2023		
	Revision:	00		

Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



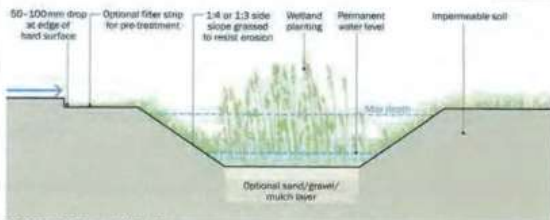


CIRIA SuDS Manual (2015)

A swale can have check dams installed at measured intervals across the flow path, that temporarily pond runoff to increase pollutant retention and infiltration and further decrease flow velocity.

Swale channels are broad and shallow and covered by vegetation, which slows the flow of water and facilitates sedimentation as well as filtration through the roots and soil matrix, evapotranspiration and infiltration into the underlying soil.

Shallow, vegetated, open channel designed to direct, treat and attenuate surface water runoff with a potential for biodiversity benefits.



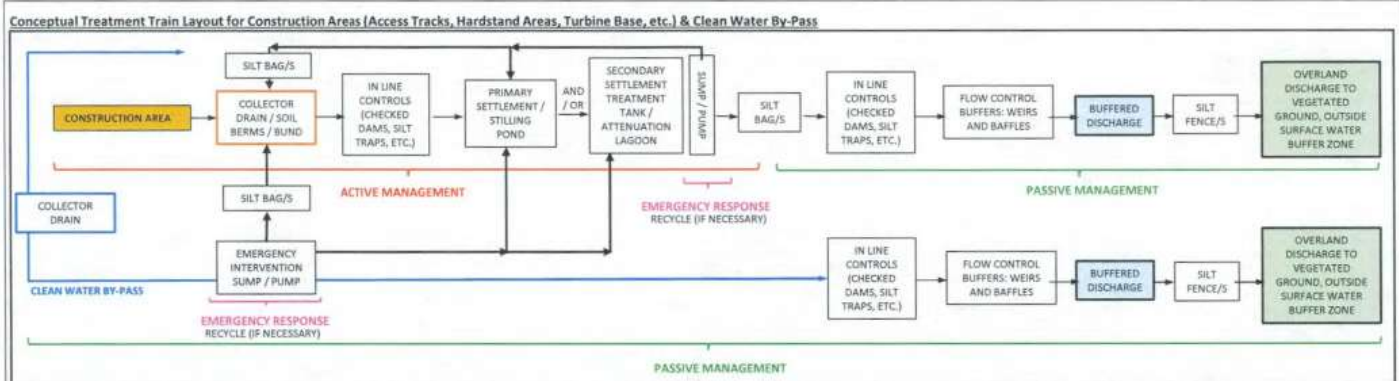
CIRIA SuDS Manual (2015)



Image Source: Massachusetts Department of Environmental Protection (2023)  
<https://megamanual.geosyntec.com/npsmanual/checkdams.aspx>

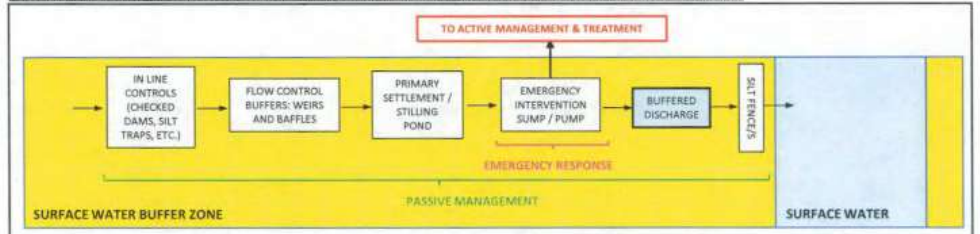
Site Name: Inchamore Wind Farm, Co. Cork	Project No.:	603679	Drawn By:	Colleen McClung Graduate Project Scientist		
	Client:	JOD		Reviewed By:		Sven Klinkenbergh Principal Environmental Consultant
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 8 Check Dams – General Considerations	Date:	15/03/2023				
	Revision:	00				

Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



- NOTES:**
- Whenever possible, outfalls will be positioned outside of Surface Water Buffer Zones.
  - For areas of the development footprint within Surface Water Buffer Zones, in-line measures such as silt screens will be over specified e.g. double / triple silt screens, and access to emergency intervention sump / pumps will be facilitated through design and/or emergency response.
  - Quality of runoff entering buffer zones will be good i.e. suspended solids <25mg/l. Where runoff quality is poor, emergency response will be to use an intervention sump / pump and pump divert runoff to an area of the drainage network where it will be treated before redistribution and discharge.

### Conceptual Treatment Train Layout for Construction Areas & Associated Infrastructure within Surface Water Buffer Zones



Site Name:  
Inchamore Wind Farm, Co. Cork

Project No. 603679  
Client: JOD  
Date: 4/4/2023  
Revision: 00

Drawn By: Sven Klinkenbergh  
Principal Environmental Consultant  
Reviewed By: SK

Figure Name:  
Appendix 9.6 – Conceptual & Information Graphics – Tile 9  
Water Treatment Train Layouts



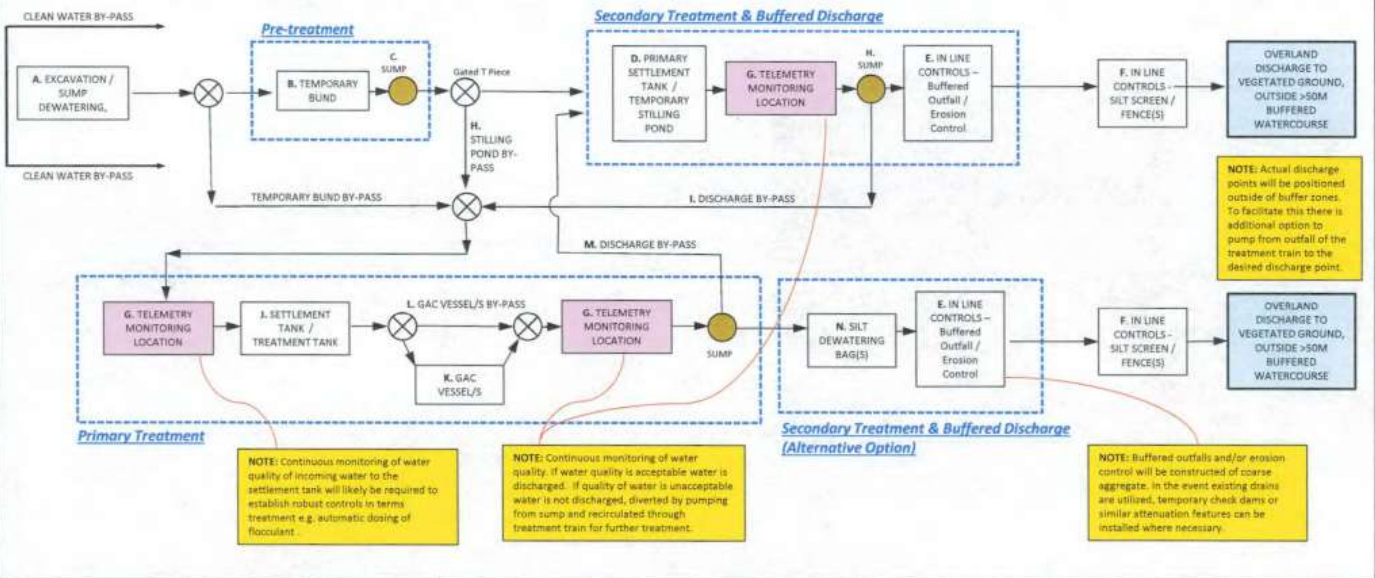
Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.





### Conceptual Dewatering and Treatment Train Flow Diagram

Contaminated water arising from construction works, namely, excavations and temporary stockpiling, will be contained and treated prior to release or discharge. The schematic presented here is a conceptual model of measures implemented to manage arisings and runoff.



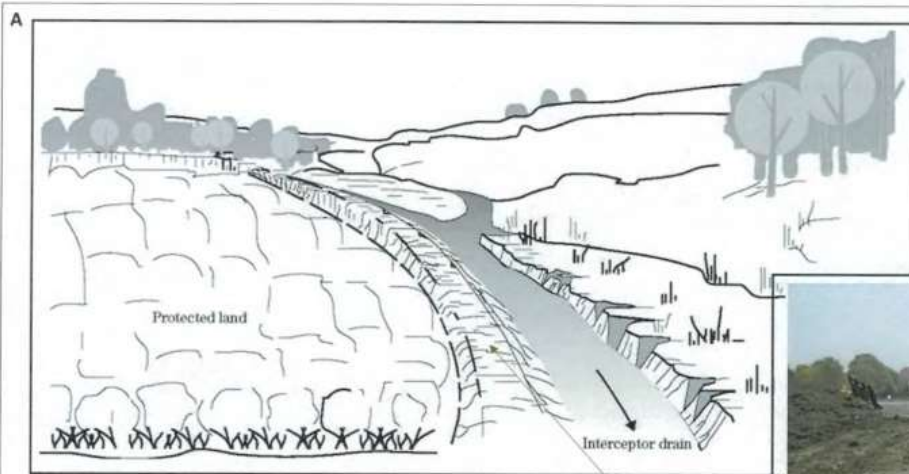
Site Name:  
Inchmore Wind Farm, Co. Cork

Project No.: 603679  
Client: JDD  
Date: 4/4/2023  
Revision: 00

Drawn By: Sven Klinkenbergh  
Principal Environmental Consultant  
Reviewed By: SK

Figure Name:  
Appendix 9.6 – Conceptual & Information Graphics – Tile 11  
Conceptual Dewatering and Treatment Train Flow Diagram





Conceptual graphic of an Interceptor drain  
 (NRCS/USDA.gov, 2007) Available at: [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs141p2\\_017651.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_017651.pdf)

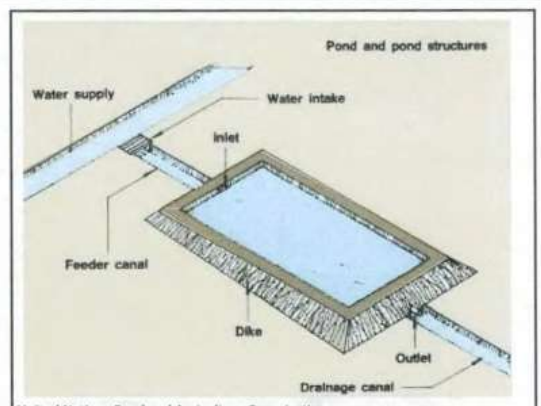
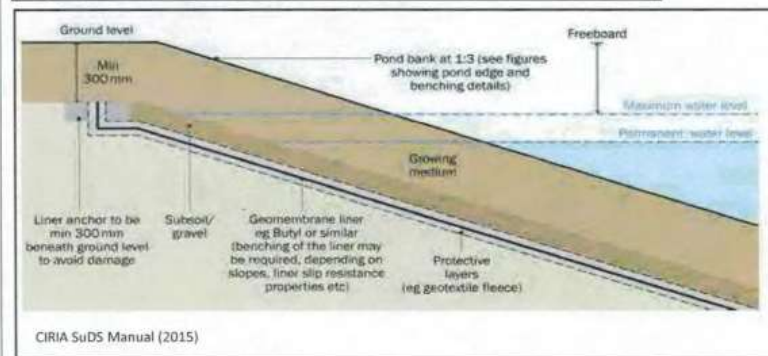
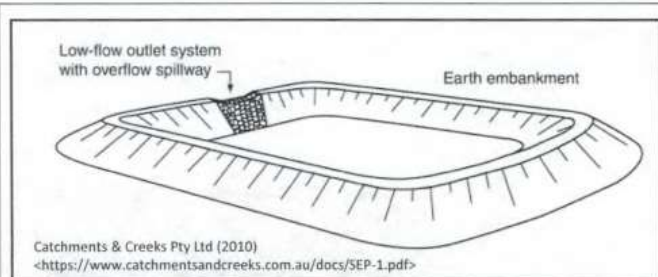
Example of a temporary berm  
 (Green Infrastructure Ontario, 2012) Available at:  
<https://greeninfrastructureontario.org/infiltration-trench-swale-construction/>



Site Name: <b>Inchamore Wind Farm, Co. Cork</b>	Project No. 6037679	Drawn By: Colleen McClung Graduate Project Scientist
	Client: JOD	
Figure Name: <b>Appendix 9.6 – Conceptual &amp; Information Graphics – Tile 12          Interceptor Drain &amp; Spoil berms</b>	Date: 01/09/2022	Reviewed By: Sven Klinkenbergh Principal Environmental Consultant
	Revision: 00	



Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



United Nations Food and Agriculture Organization  
[https://www.fao.org/fishery/docs/CDrom/FAO\\_Training/FAO\\_Training/General/x6708e/x6708e01.htm](https://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e01.htm)

Ponds should be designed to mimic natural forms and have varying depths which can provide a range of different habitats.

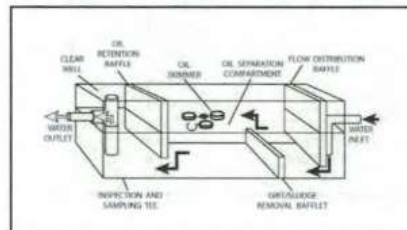
Site Name: Inchamore Wind Farm, Co. Cork	Project No.: 603679	Drawn By: Colleen McClung Graduate Project Scientist	
Client: JOD	Date: 28/02/2023	Reviewed By: Sven Klinkenbergh Principal Environmental Consultant	
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 13 Settlement Ponds	Revision: 00		

Conceptual Graphics & Design for consideration; at detailed design phase and engineered specifications of required infrastructure. Not to scale.





Example of an oil-water separator  
Minerex Environmental Limited, an RSK Group company



Cross-section of oil-water separator  
Mohr, Kirby S. (2014)

Siltbuster \* (2017) "Solutions for Suspended Solids Removal: Hire, Sales & Technical Support" Siltbuster Ltd. Available at: <https://www.siltbuster.co.uk/wp-content/uploads/2020/10/Solutions-for-Suspended-Solids-Removal.pdf>.

Site Name: <b>Inchmore Wind Farm, Co. Cork</b>	Project No.: 603679	Drawn By: Colleen McClung Graduate Project Scientists	
Client: JOD	Date: 28/03/2023	Reviewed By: Sven Klänkenbergh Principal Environmental Consultant	
Figure Name: <b>Appendix 9.6 – Conceptual &amp; Information Graphics – Tile 14 Settlement Tank</b>	Revision: 00		

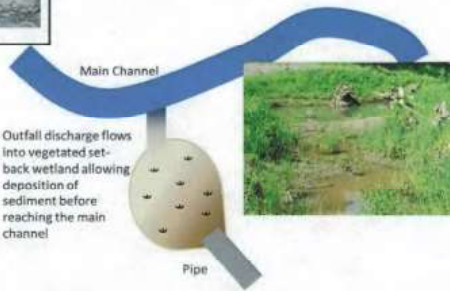
Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



Example of buffered outfall with coarse aggregate  
(Catchments and Creeks Pty Ltd., 2020)



Example of a silt bag  
(Cascade Geotechnical Inc., 2022)

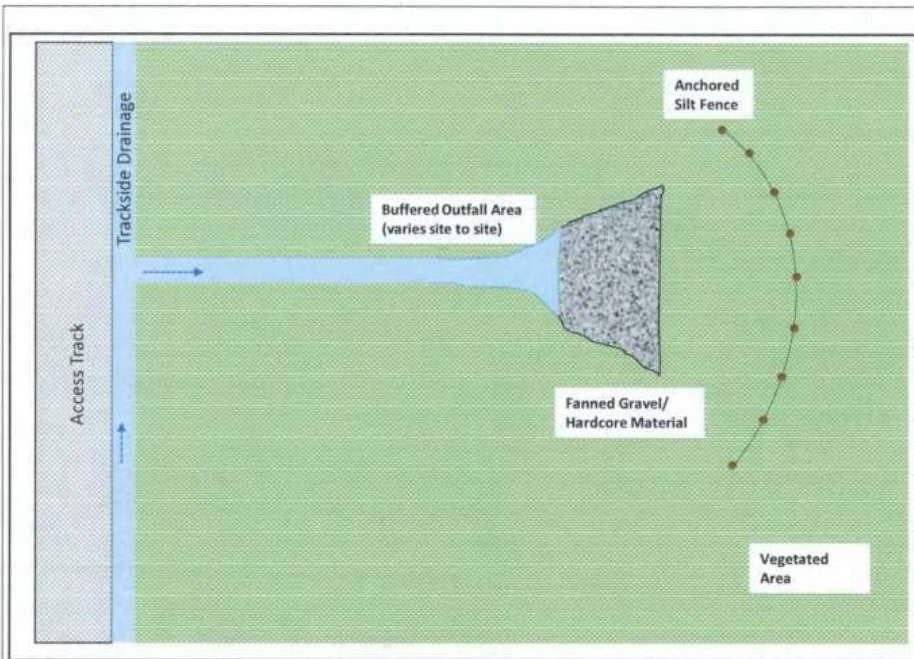


Conceptual graphic of a discharge to vegetated outfall  
(Janes-Bassett et al., 2016)

Site Name: <b>Inchamore Wind Farm, Co. Cork</b>	Project No.: 603679	Drawn By: Colleen McClung Graduate Project Scientist
	Client: JOD	Reviewed By: Sven Klinkenbergh Principal Environmental Consultant
Figure Name: <b>Appendix 9.6 – Conceptual &amp; Information Graphics – Tile 15          Examples of Mitigation Measures to Reduce Sediment Transport</b>	Date: 28/02/2023	
	Revision: 00	



Conceptual Graphics & Design for consideration at detailed design phase and engineering specification of required infrastructure. Not to scale.

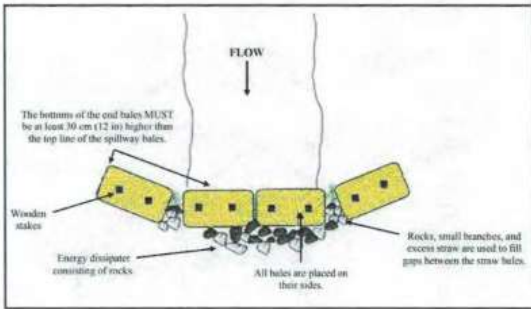


Site Name: <b>Inchamore Wind Farm, Co. Cork</b>	Project No.	603679	Drawn By: Colleen McClung Graduate Project Scientist
	Client:	JOD	
Figure Name: <b>Appendix 9.6 – Conceptual &amp; Information Graphics – Tile 16          Collector Drains and Buffered Outfalls</b>	Date:	28/02/2023	Reviewed By: Sven Klinkenbergh Principal Environmental Consultant
	Revision:	00	

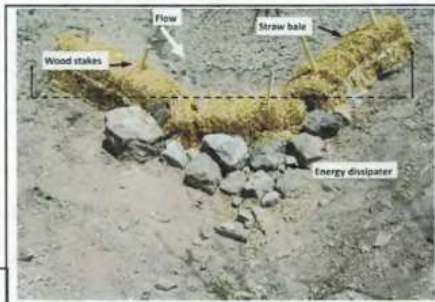


Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.





Conceptual graphic of a straw bale checked dam (Storrar, 2013)



Example of a Strawbale Checked Dam Robichaud, et al. (2019)

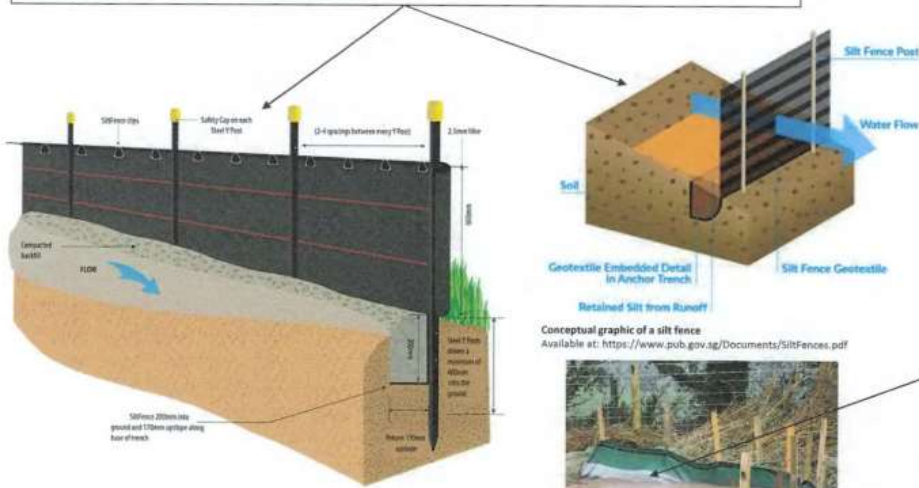


Example of a Strawbale Checked Dam (Kawartha Conservation, 2020)

Site Name: Inchamore Wind Farm, Co. Cork	Project No.	603679	Drawn By:	Colleen McClung Graduate Project Scientist	
	Client:	JOD		Reviewed By:	
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 17 Examples of Mitigation Measures to Reduce Sediment Transport – Straw Bales	Date:	28/02/2023			
	Revision:	00			

Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.

Temporary barrier fabric used to retain erosion of sand, silt, and clay. Geotextile silt fencing acts as a vertical, permeable, interceptor to sediment-laden waters from construction.



Conceptual graphic of a silt fence  
Tech Weave (2020) Available at: <<https://techweave.com/silt-fences/>>



Example of Silt fencing in use  
Bowman Construction Supply (2023) Available at: <<https://www.bowmanconstructionssupply.com/products/silt-fence/>>

Silt fences control runoff by allowing water to pass through the fabric while collecting leftover sediment.



Example of Silt fencing in use  
[EnviroPro, 2022] Available at: <<https://www.enviropro.co.uk/entry/153977/Siltbuster/Terrastop-silt-fences-for-erosion-and-runoff-control/>>

Site Name: Firlough Green Energy – Wind Farm	Project No.	603679	Drawn By:	Colleen McClung Graduate Project Scientist
	Client:	JDD / Mercury Renewables		Reviewed By:
Figure Name: Appendix 9.6 – Conceptual & Information Graphics – Tile 18 Silt Fencing	Date:	21/12/2022		
	Revision:	00		





Example of a temporary spill pallet bund (Road Ware, 2023)

Available at: <[https://www.roadware.co.uk/bp4c-covered-4-drum-spill-pallet-bund-sump/?gclid=Cj0KCOjA8aOeBhCWARisANRf-rQFNE1gbCB9OUZHLprieKCFDNjrup\\_u5Nz\\_fmRka1WbNXXM178BaAn-4EALw\\_wcB](https://www.roadware.co.uk/bp4c-covered-4-drum-spill-pallet-bund-sump/?gclid=Cj0KCOjA8aOeBhCWARisANRf-rQFNE1gbCB9OUZHLprieKCFDNjrup_u5Nz_fmRka1WbNXXM178BaAn-4EALw_wcB)>




Example of a temporary spill pallet bund (Road Ware, 2023)

Available at: <[https://www.roadware.co.uk/lbc-storage-tank-pallet-spill-containment-bund-stand/?gclid=Cj0KCOjA8aOeBhCWARisANRf-rQFTcOISEUrkAndov4TcTBQOwN2gulshp9-yj6\\_qx9NexUXnAv6ONkaAq8ZEALw\\_wcB](https://www.roadware.co.uk/lbc-storage-tank-pallet-spill-containment-bund-stand/?gclid=Cj0KCOjA8aOeBhCWARisANRf-rQFTcOISEUrkAndov4TcTBQOwN2gulshp9-yj6_qx9NexUXnAv6ONkaAq8ZEALw_wcB)>



Example of a temporary spill pallet bund (Road Ware, 2023)

Available at: <[https://www.roadware.co.uk/gsp2/lbc-galvanized-steel-double-IBC-spill-pallet-bund/?gclid=Cj0KCOjA8aOeBhCWARisANRf-rQGfh5e3IU9TcRUMAcEhILo5gFmK1b0\\_dhB17MRkwiMOCU7F2oaAKDSEALw\\_wcB](https://www.roadware.co.uk/gsp2/lbc-galvanized-steel-double-IBC-spill-pallet-bund/?gclid=Cj0KCOjA8aOeBhCWARisANRf-rQGfh5e3IU9TcRUMAcEhILo5gFmK1b0_dhB17MRkwiMOCU7F2oaAKDSEALw_wcB)>

Site Name: <b>Inchmore Wind Farm, Co. Cork</b>	Project No. 603679	Drawn By: Colleen McClung Graduate Project Scientist	
	Client: JOD		
Figure Name: <b>Appendix 9.6 – Conceptual &amp; Information Graphics – Tile 19</b> <b>Examples of Mitigation Measures During Construction Phase- Environmental</b> <b>“Good Practice” of Bunded Materials</b>	Date: 21/12/2022	Reviewed By: Sven Klinkenberg Principal Environmental Consultant	
	Revision: 00		





**Polymer Spill Kit**  
 (Yellow Shield Ltd., 2023) Available at:  
<https://www.yellowshield.co.uk/polymer-spill-kit>



**Maintenance Spill Kit**  
 (Hyde Park Environmental, 2023) Available at: [https://hydepark-environmental.com/1100-litre-maintenance-emergency-spill-kit?utm\\_source=email&utm\\_medium=email&utm\\_campaign=HMK234%2F03.23](https://hydepark-environmental.com/1100-litre-maintenance-emergency-spill-kit?utm_source=email&utm_medium=email&utm_campaign=HMK234%2F03.23)

**Example of a spill kit deployed in surface water**  
 (Oracle Environmental Experts Ltd., 2022)  
 Available at: <https://www.oracle-environmental.com/spill-kits>



Site Name: <b>Inchamore Wind Farm Co., Cork</b>	<b>Project No.</b> 603679	<b>Drawn By:</b> Colleen McClung Graduate Project Scientists
	<b>Client:</b> JGD	
	<b>Date:</b> 07/03/2023	
Figure Name: <b>Appendix 9.6 – Conceptual &amp; Information Graphics – Tile 20          Emergency Spill Kits</b>	<b>Revision:</b> 00	<b>Reviewed By:</b> Sven Klinkenberg Principal Environmental Consultant



Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



Site Name:  
Inchmore Wind Farm Co., Cork

Project No.: 603679

Drawn By: Colleen McClung  
Graduate Project Scientist

Figure Name:  
Appendix 9.6 – Conceptual & Information Graphics – Tile 21  
Wheel Washout Station

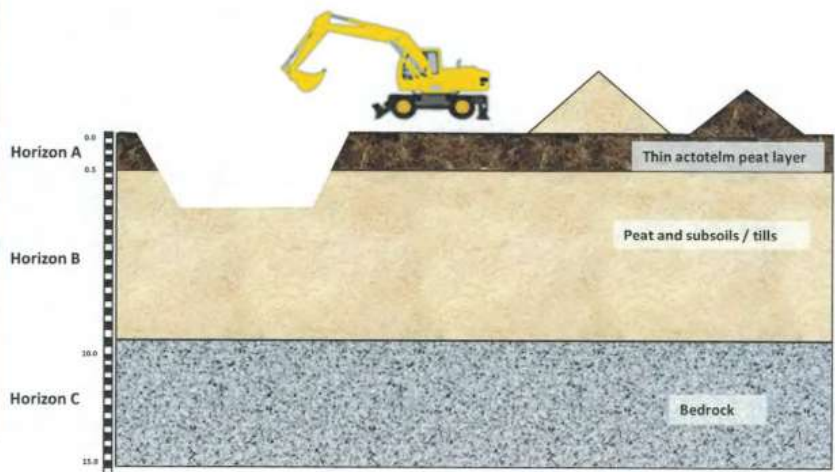
Client: JDD  
Date: 01/09/2022  
Revision: 00

Reviewed By: Sven Klinkenbergh  
Principal Environmental Consultant



Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.

- The three principal materials excavated in order of depth will include topsoil at the surface, subsoils, and weathered and broken bedrock (Horizons A-C, respectfully).
- A suitably qualified geotechnical / soil scientist will supervise all excavation and the principal material types (topsoil, subsoil and bedrock) will be segregated as they arise.
- Temporary storage locations and stockpiled arisings will be managed in such a way that as to not mix individual soils types which will, in turn will facilitate reuse on Site. Some measures which will be taken include;
  - Designated areas for each type of material which will be adequately sized based on Material Balance Assessment calculations and planned storage height.
  - Incorporating the planned movement of materials for example; actotelm peat will be the first material to be excavated and the last to be used in reinstatement.
  - Adequate space between stockpiles to reduce the potential of mixing when material is being deposited or removed, or if localized stability issues arise for example; stockpile collapse.
  - It is also important to mitigate against the entrainment of solids in runoff (EIA Chapter 9 – Hydrology & hydrogeology).
- In order to reduce the amount of arisings to be managed or stored at any one time during the construction phase, a Materials Balance Assessment and Materials Management Plan will be developed with a view to identifying suitable locations for permanent reinstatement as early as possible, for example; as the construction phase progresses, opportunities to move arisings to a permanent reinstatement area in one movement will be taken as often as possible.
- Backfilling in layers will be carried out at the designated reinstatement locations, this will include; use of material as fill under infrastructure, backfill around newly installed infrastructure e.g. foundations, and potentially in improvement areas.
- Infilling with material in identified soil horizons to revert these areas to baseline levels.

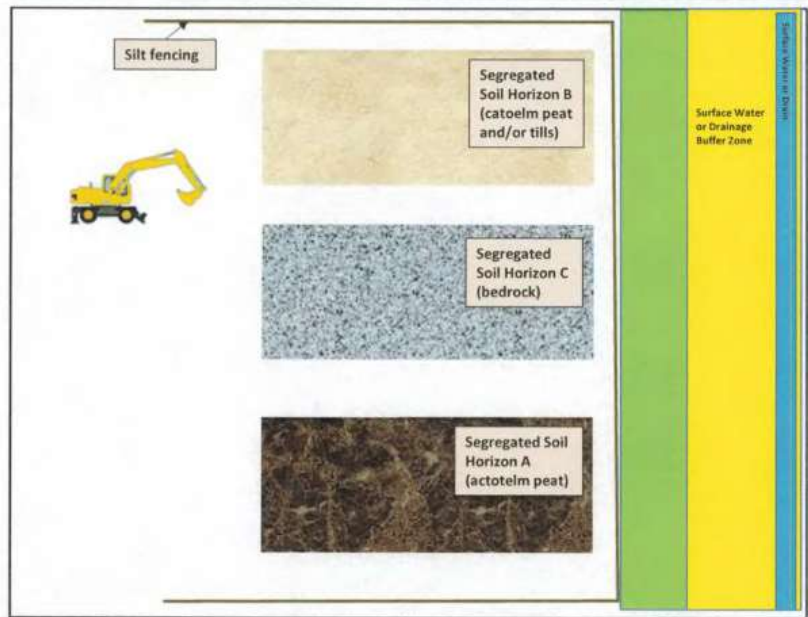



Site Name: Inchmore Wind Farm, Co. Cork	Project No.	603673	Drawn By:	Colleen McClung Graduate Project Scientist
	Client:	JOD		Reviewed By:
Figure Name: Appendix 9.6 - Conceptual & Information Graphics – Tile 22 Conceptual Soil Horizon Graphic	Date:	07/03/2023		
	Revision:	00		

Conceptual Graphics & Design for consideration at detailed design phase and engineered specification of required infrastructure. Not to scale.



- All stockpiles will be covered with high-grade polythene sheeting to prevent run-off of rainwater and leaching of potential contaminants from the stockpiled material generation and/or the generation of dust.
- Recovered material destined for reuse off site will comply with Article 27 or Article 28 of the EPA to be classified as a by-product or as end-of-life waste, or Certificate of Registration for soils.
- Excess soils which cannot be reused will be tested and classified as a waste and disposed of appropriately.
- Temporary stockpiles will avoid areas on Site near artificial drainage channels (outside designated surface water buffer zones and will adhere to mitigation measures outline in **EIAR Chapter 9 Hydrology and Hydrogeology**, in dealing with entrainment of soils in surface water runoff.



Site Name: <b>Inchmore Wind Farm, Co. Cork</b>	Project No.	603679	Drawn By:	Colleen McClung Graduate Project Scientist	
	Client:	JOO			
	Figure Name: Appendix 9.6 - Conceptual & Information Graphics - Tile 23 Conceptual Management of Stockpiles Graphic	Date:	07/03/2023	Reviewed By:	
	Revision:	00			

Conceptual Graphics & Design for consideration at detailed design phase and engineering specification of required infrastructure. Not to scale.