

# COMHAIRLE CONTAE PHORT LAIRGE

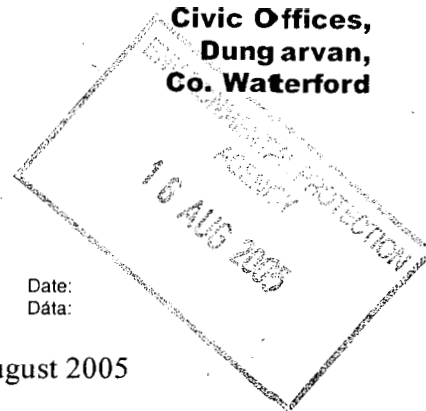
Stiurthoir Pleanála, Comhshaoil & Seirbhísi Eigeandála

# WATERFORD COUNTY COUNCIL

Director of Planning, Environment & Emergency Services

**Oifigí Cathartha,  
Dun Garbhan,  
Co. Phort Láirge**

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Fax: 058-45606  
E-mail: dmccarty@waterfordcoco.ie



My Reference:  
Mo Thag

Your Reference:  
Do Thag

Date:  
Dáta:

PD: 04/1831

15<sup>th</sup> August 2005

E.P.A.  
Environmental Protection Agency  
PO Box 3000  
Johnstown Castle  
Wexford

Re: PD. 04/1831 plant for the treatment of effluents and for composting organic wastes. The facility will require modifications including some demolition and extension to the existing building, relocation of electrical substation, an in vessel composting system and biofilter, weighbridge and kiosk. An Environmental Impact Statement accompanies this application. The development will also require a waste licence at Kilowen, Portlaw, Co Waterford – AES (Irl) Ltd.

A Chara,

I refer to the above file and the further information received by the Planning Authority as attached for your attention. As the E.P.A were the governing body over the previous Tannery facility on site, your comments in relation to the above are requested. It is understood that the E.P.A. previously requested an investigation be undertaken at agreed locations and that samples be analysed for a range of potential contaminants within the site. The Planning Authority therefore wish to clarify if the information previously requested by the E.P.A. and the information presented under the further information request are consistent. Given the time constraints involved the Planning Authority would be obliged for your response within three weeks.

Is mise le meas

  
p.p. Director of Services

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**'APPENDIX 7'**

**Soils and Groundwater Investigation and Analysis**

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## Submission in response to Waterford County Council request for 'Further Information' re the proposed development in Portlaw

### Addendum to EIS – Soil, Geology and Groundwater

***The EIS should detail the current condition of the soils on site and determine if any contamination has resulted on site as a result of Michell Tannary.***

In order to comply with this request, the applicant contracted the independent consultants *Geotechnical and Environmental Services (GES) Limited* to investigate the site in order to sample and analyse soil and groundwater at the facility. This response to Waterford County Council contains the results from these independent investigations at the site. GES undertook *two* distinct investigative campaigns, Groundwater in late 2004 and Soil in 2005; their reports are appended to this EIS.

- Groundwater Report 3<sup>rd</sup> December 2004
  - Additional explanatory note from FBA laboratories (on sample from 3/12/04 report)
- Residual Contamination Assessment Report – April 2005

#### Groundwater Report 3<sup>rd</sup> December 2004

This original assessment was requested and carried out under the instruction and supervision of the Environmental Protection Agency. The report is appended to this EIS, in summary the conclusions state that *"there is no indication of significant impact on the groundwater environment from previous activities [Tanning] on the site"*

The additional explanatory note from FBA laboratories was forwarded to the EPA following a request from the Agency as to the methodologies employed in the analysis of the groundwater samples in the above report.

#### Residual Contamination Assessment Report – April 2005

Again this report was requested and carried out under the instruction and supervision of the Environmental Protection Agency. A schedule of works was agreed with the EPA and carried out by **GES** during March and April 2005. This report which is also appended to this EIS is primarily concerned with an examination of soil samples from potentially vulnerable areas around the Portlaw facility. The salient conclusions from this report state that *"a comprehensive investigation has been undertaken, which demonstrates consistent ground conditions across the area investigated. The results of the analysis do not indicate residual contamination, that may impact the environment or have an affect on structure associated with future development of the site"*

#### Conclusion

It is therefore evident from the independent reports that the previous activities carried out by Michell Tannery did **not** result in any contamination to the soil or groundwater at the facility.

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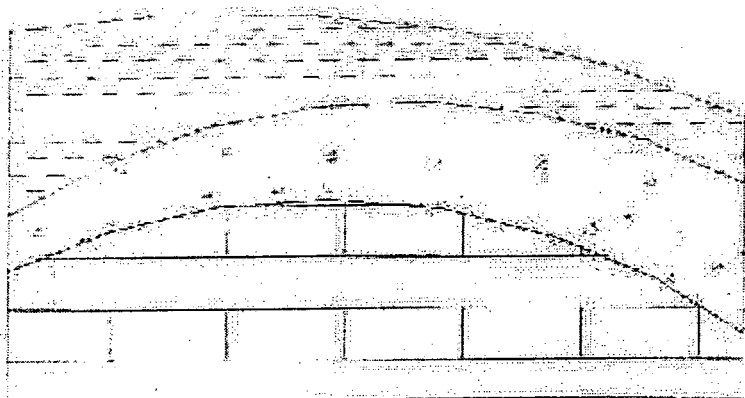


Geotechnical & Environmental  
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Fax: 059 91 40499  
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**GES Limited**  
Ground and water environment consultants

Job No: 04-66  
Report No: 04-66-01  
Date: 03 Dec-04  
Site: Michel Ireland site, Portlaw,  
Co. Waterford  
Client: AES Landfeeds Environmental

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4. Pumping and Analysis
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3. Groundwater Analysis

Report prepared and checked by:

  
Jer Keohane

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## 1. INTRODUCTION

Geotechnical and Environmental Services Limited were requested by AES Landfeeds Environmental to co-ordinate an assessment of down gradient groundwater quality on the former Michel Ireland site at Portlaw, Co. Waterford.

The assessment was requested by the Environmental Protection Agency, as part of the return of the licence, covering the previous activities on site (Tannery).

## 2. WORK UNDERTAKEN

A borehole location was identified on 16 September 2004 and approval sought from the agency for the location and proposed method of drilling. Approval was received with a request to move the location 30m to 40m to the east on 27 September 2004.

The borehole was drilled by Fogarty Drilling of Gowran between 13<sup>th</sup> and 16<sup>th</sup> October 2004.

A pump was installed in the well and a sample recovered, which was analysed by FBA Laboratories of Cappoquin, Co. Waterford.

This report has been prepared to summarise and interpret the findings.

## 3. DRILLING

A log of the borehole is provided in the appendices. The borehole encountered 10.3m of silty CLAY over LIMESTONE Bedrock. The borehole was drilled to 50m total depth. A fissure at 43m yielded approximately 1m<sup>3</sup> per hour. The overburden is effectively sealed out, which means that only groundwater from the aquifer is allowed to enter the borehole.

## 4. PUMPING and ANALYSIS

A pump was fitted to the borehole and the borehole pumped for 5 hours. A sample was recovered and sent to FBA Laboratories for analysis. The results of analysis are provided in the appendices.

The results demonstrate a good quality groundwater, with low concentrations for the main pollution indicators of Chloride, Phosphate, Potassium, Sodium, Ammonia, Nitrite and Nitrate. Very low concentrations of total Chromium were encountered in the sample.

## 5. CONCLUSIONS

The findings from the borehole indicate **LOW** groundwater vulnerability conditions, with confined conditions, indicating an upward hydraulic pressure.

The works confirm that there is no indication of a significant impact on the groundwater environment from previous activities on the site.

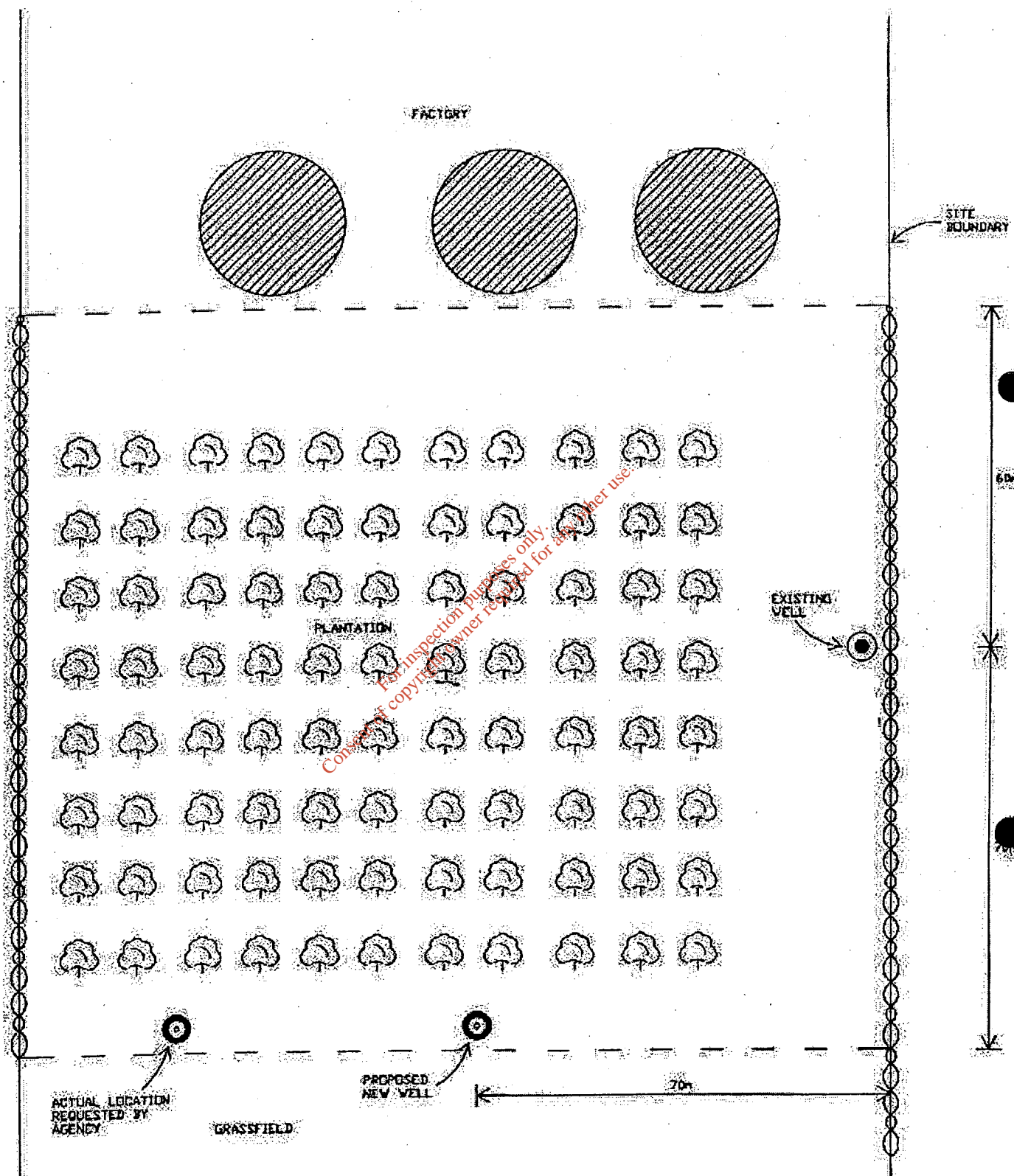
# Appendices

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# Appendix 1

## Borehole Location Map

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**Geotechnical & Environmental Services Ltd.**  
 Experts in Geotechnics, Hydrogeology & Environmental Soils

G&E Ltd.  
 Campus Innovation Centre,  
 Green Rd.,  
 Carrrow.  
 Ph: 059-9130314  
 Fax: 059-9140499  
 E-mail: geoenviron@eircom.net



<b>Project Title:</b> Monitoring Borehole @ Michel Site Portlao					
<b>Project Address:</b> Michel Island, Killowen, Portlao					
<b>Client:</b> Landfeeds AES					
<b>Dwg. Title:</b> Location of Proposed Downgradient Borehole					
<b>Dwg. Scale:</b> 1/1,000	<b>Date:</b> 17/08/04	<b>Dwg. No.:</b> 04-86-01	<b>Job No.:</b> 04-68	<b>Revision:</b> A	<b>Drn By:</b> LM

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Borehole Log

Appendix 2





**Geotechnical & Environmental Services**

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Carlow.

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Borehole Log

BHE1

Sheet 1 of 1

Method: Rotary		Date: 13to16/10/04	Site: Michel Ire Ltd, Portlao
Dia. mm: 250-160	Coords:	G.L.mO.D.	Client: Landfeeds Environmental Ltd.

Water and Progress	Completion	Depth	Description of Strata	Legend
		0.00m		
250mm open hole		-1.50	Dark brown CLAY topsoil and roots	
250mm steel casing to 10.6m Grout		-5.00	Soft red-brown silty CLAY with limestone boulders and sub-angular gravels	
160mm steel casing to 13.6m		-10.00	Dark shaley - Limestone	
160mm open hole		-13.60	Dark muddy Limestone with dark shale layers. Limestone is dry.	
125mm uPVC 13.6m to 49.6m		-15.00	Increasing layers of clean Limestone with depth.	
		-20.00		
		-25.00		
		-30.00		
		-35.00		
		-40.00		
		-43.20	Fissure in clean Limestone layer	
		-45.00	Dark shaley Limestone	
		-51.60	End of Borehole	

**Remarks:**  
 1. Upon reaching the 49.6m depth the borehole was airlifted for 1 hour until the water ran clear. Output estimated at 1 cubic m/hour.  
 2. After development 49.6m of 125mm uPVC casing was installed consisting of: 13.6m of casing and 30m of screen to bottom of BH.

Logged by: T.F.	Scale: 1/250	End Casing Depth:	Job No: 04-66
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## Appendix 3

### Groundwater Analysis

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# FBA Laboratories Ltd.

ANALYSTS: Agricultural and Environmental

CONSULTANTS: Agricultural and Nutritional

Carrigeen  
Industrial Estate,  
Cappoquin,  
Co. Waterford.

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Fax: 05-8-52865  
fbalabs@iol.ie

## CERTIFICATE OF ANALYSIS

Landfeeds,  
Unit 16 Hebron Ind Est,  
Co. Kilkenny.

Ground water sample received 03.11.04

Ref: Mitchell Ireland

Lab Ref: WC0165

Parameter	Units of analysis	Result
pH	pH	7.1
Conductivity	$\mu$ S/cm @ 25°C	564
Chloride	mg/l Cl	22.5
Phosphate	mg/l P	0.15
Potassium	mg/l K	2.30
Sodium	mg/l Na	10.6
Ammonia	mg/l NH <sub>3</sub> -N	0.04
Total Chromium	$\mu$ g/l Cr	< 1.0
Nitrites	$\mu$ g/l NO <sub>2</sub>	8.0
Nitrates	mg/l NO <sub>3</sub> -N	4.8

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COMMENT: Due to very low level of Total Chromium present it is unfeasible to do further analysis for hexavalent Chromium as detection limits are in the range ppm and Total Chromium was analysed as < 1.0 ppb.

Signed M. Kelly

Date 5/11/04

DIRECTORS: T.M. BUTLER M. Agr. Sc., PhD  
C.M. BUTLER Dip. Sci.

Co. Reg. No. 250639





# FBA Laboratories Ltd

Carrigeer  
Industrial Estate  
Cappoquin  
Co. Waterford

ANALYSTS: Agricultural and Environmental

CONSULTANTS: Agricultural and Nutritional

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## CERTIFICATE OF ANALYSIS

John Mc Namara,  
Landfeeds,  
Unit 16 Hebron Ind Est,  
Co. Kilkenny.

Ground water sample received 03.11.04

Lab Ref: WC0165

Parameter	Units of analysis	Result
pH	pH	7.1
Conductivity	$\mu\text{S/cm}$ @ 25°C	564
Chloride	mg/l Cl	225
Phosphate	mg/l P	0.15
Potassium	mg/l K	2.30
Sodium	mg/l Na	106
Ammonia	mg/l NH <sub>3</sub> -N	0.04
Total Chromium	$\mu\text{g/l}$	< 1.0
Nitrites	mg/l NO <sub>2</sub>	8.0
Nitrates	mg/l NO <sub>3</sub> -N	4.8

COMMENT: Due to very low level of Total Chromium present it is unfeasible to do further analysis for hexavalent Chromium as detection limits are in the range ppm and Total Chromium was analysed as < 1.0 ppb.

Signed

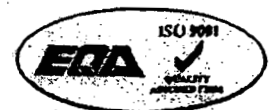
  
Oonagh Mee

Date

14/2/05

DIRECTORS: T.M. BUTLER M.AGR.SCI., PHD  
C.M. BUTLER DIP SCI.

Co. REG. No: 250639



# FBA Laboratories Ltd.

ANALYSTS: Agricultural and Environmental

CONSULTANTS: Agricultural and Nutritional

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John Mc Namara,  
Landfeeds,  
Unit 16 Hebron Ind Est,  
Co. Kilkenny.

With regard to ground water sample received 03.11.04 ref; Mitchell Ireland, Lab Ref: WC0165 analytical methods used are from the "Standard Methods for the Examination of Water & Wastewater, 20<sup>th</sup> edition. Individual reference numbers for analysis are listed below. The only exception is Ammonia Nitrogen which is analysed using a Hach DR/2500 with the method adapted from *Clin. Chim. Acta*, 14, 403 [1966]. We partake in the EPA Intercalibration Scheme which monitors our analysis on all of the parameters you requested except nitrate nitrogen.

pH	pH	4500-H&B
Conductivity	$\mu\text{S/cm}$ @ 25°C	2510 B
Chloride	mg/l Cl	4500- Cl B
Phosphate	mg/l P	4500- P B&E
Potassium	mg/l K	3120 B ICP-OES
Sodium	mg/l Na	3120 B ICP-OES
Total Chromium	$\mu\text{g/l}$	3120 B ICP-OES
Nitrites	$\mu\text{g/l NO}_2$	4500-NO <sub>3</sub> -B
Nitrates	mg/l NO <sub>3</sub> -N	4500-NO <sub>2</sub> -B
Ammonia	mg/l NH <sub>3</sub> -N	see above

Signed

  
Oonagh Mee

Date

14/2/05

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2. Trial Pit and Borehole Logs (TP 1 and 2, BH 1, 3 and 5 and RC 1 and 2)

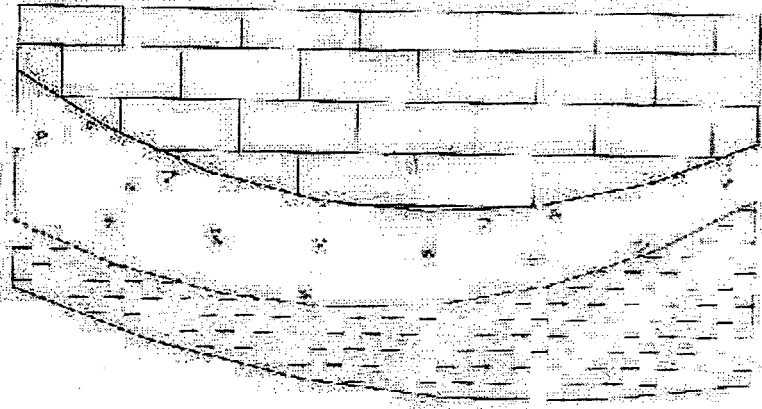
3. Soil Analysis Results

4. Plates - Trial Pits 1 and 2

Report prepared by:

Jer Keohane

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Client: AES Landfills Environmental

Site: Michel Ireland site, Portlaoigh  
Co. Waterford

Date: 29/4/2005

Report No: 04-66-02

Job No: 04-68

## Residual Contamination Assessment

**GES Limited**  
Ground and water environment consultants

Geotechnical & Environmental  
Services Ltd,  
Campus Innovation Centre  
Green Road,  
Carlow  
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there appears to be variable chloride concentrations with higher values measured at the factory. However the chloride concentrations are not considered likely to affect concrete have any adverse environmental effect.

The Total Chromium concentrations are consistently low ranging from 10mg/kg to 20 mg/kg, well below the Dutch intervention concentration.

The total ammonia concentration is generally low, only slightly elevated at TP1, which is considered to be related to breakdown of vegetation close to the surface and not related to any influence from the burial pit.

#### 4. CONCLUSIONS

A comprehensive investigation has been undertaken, which demonstrates consistent ground conditions across the area investigated.

The results of analysis do not indicate residual contamination, that may impact the environment or have an affect on structures associated with future development of the site.

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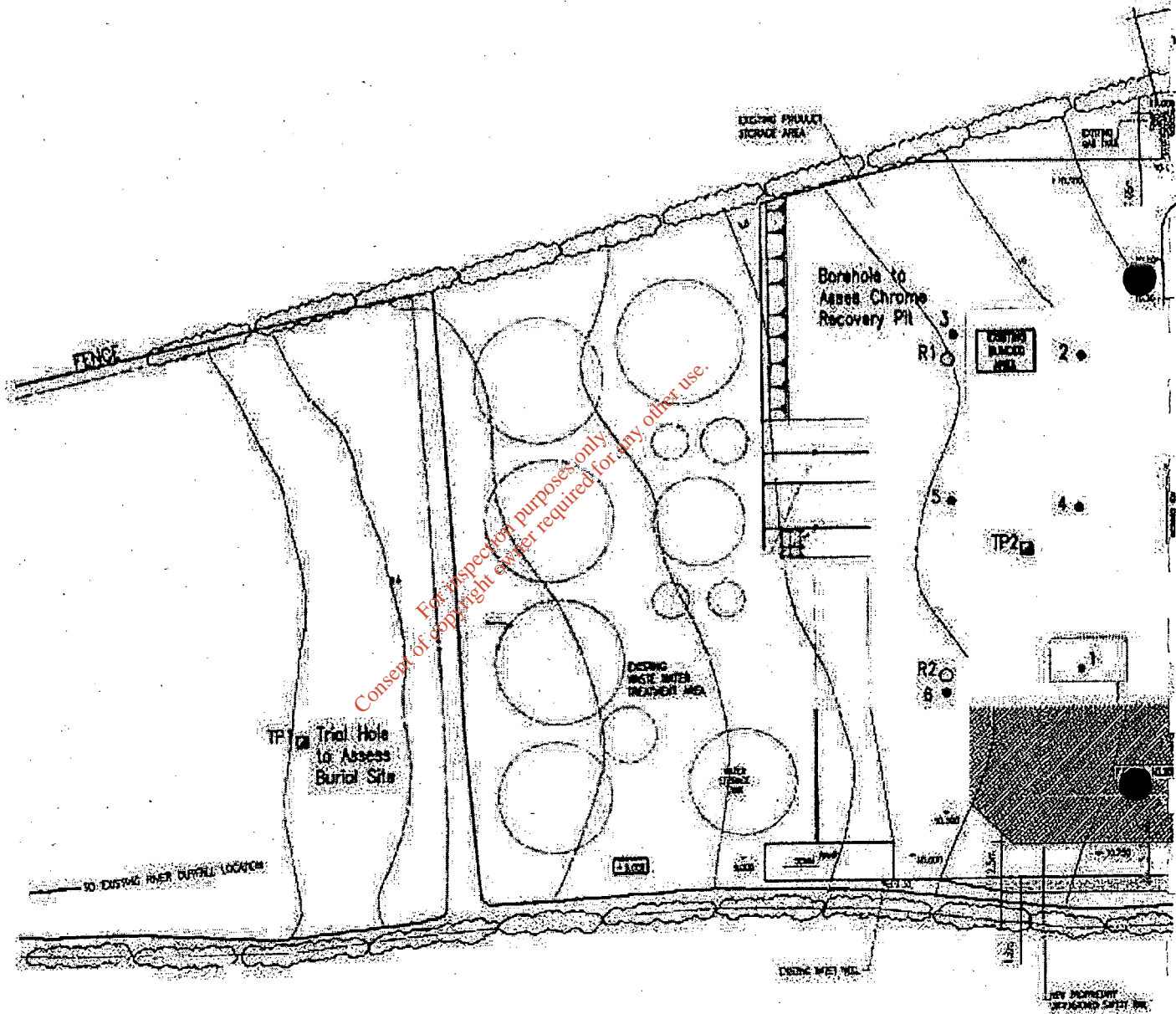
# Appendices

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## Appendix 1

### Site Map detailing Actual Investigation Points

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# Actual Investigation Points

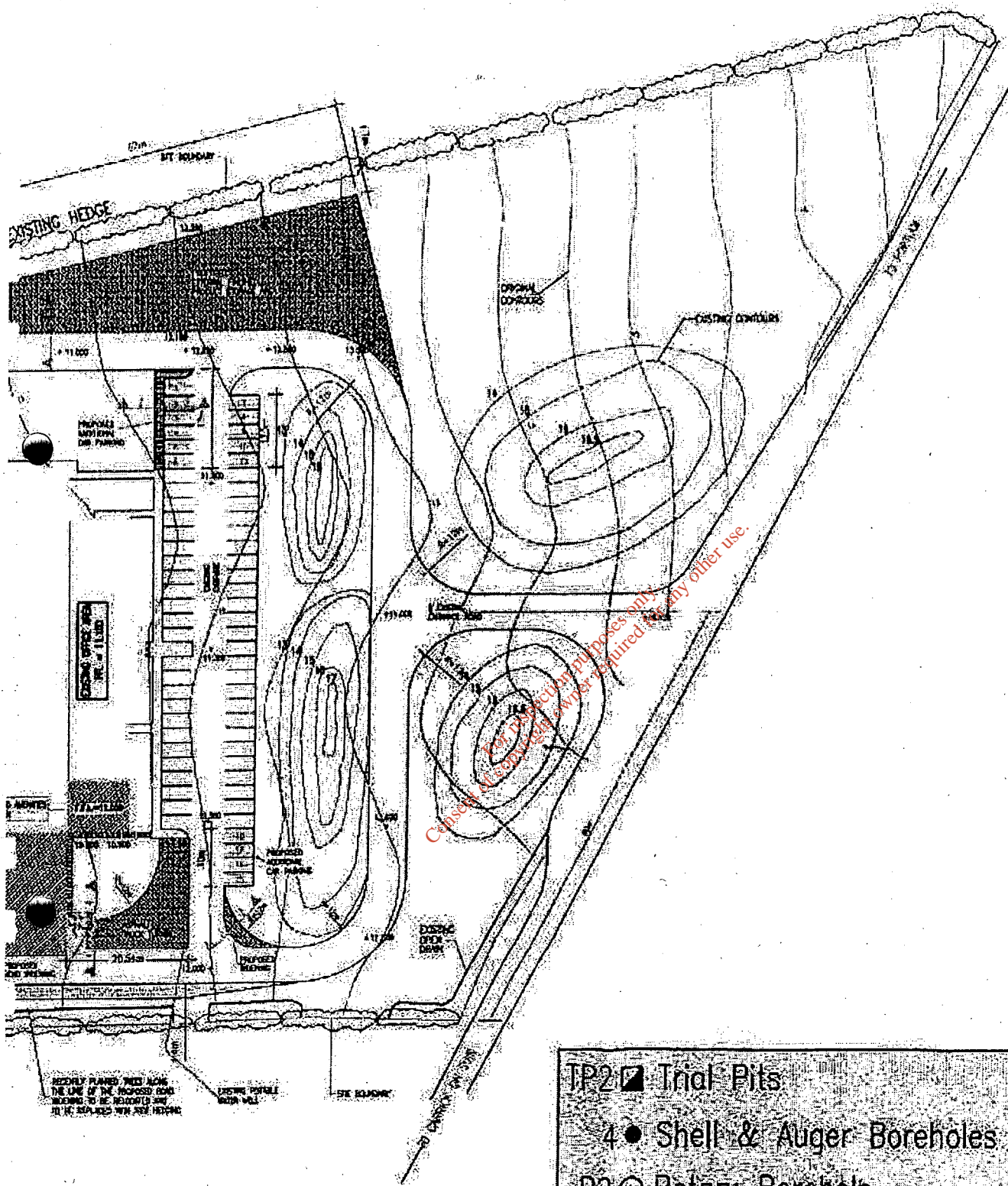
**Geotechnical &**  
 Experts in Geotechnical

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 Campus Innovation Centre,  
 Green Rd,  
 Garton.

PI  
 Fa  
 E-

MHA Exempt 25/07/2015 18/11/17





**Environmental Services Ltd.**  
 Geology & Environmental Studies

130814  
 7140499  
 eoenv@eircom.net



<b>Project Title:</b> Monitor Borehole @ Michel Site Portlao	
<b>Project Address:</b> Killowen, Portlao, Co. Waterford	
<b>Client:</b> Landfood AES	
<b>Dr. Title:</b> Actual Investigation Points (Fig. 1)	
<b>Dwg. Scale:</b> 1/1000	<b>Date:</b> 24/02/05
<b>Dwg. No.:</b> 04-68-02	<b>Job No.:</b> 04-68
<b>Revision:</b> A	<b>Dwg. By:</b> LM

## Appendix 2

### Trial Pit and Borehole Logs

(TP 1 and 2, BH 1, 3, 5 and RC 1 and 2)

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**Geotechnical & Environmental Services**

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Trial Pit

TP 11

Sheet 1 of 1

Method: Excavation Date: 07/03/05 Site: Portlao

Dia. mm: Coords: G.L. m O.D. Client: AES

Soil Samples		Water & Progress	Depth (m)	Description of Strata	Legend
Type test	Depth				

			-0.00	TOPSOIL	
			-0.20	Light brown gravelly CLAY	
			-0.50		
			-0.80		
Sample taken Ø1.0m			-1.00	Grey brown gravelly CLAY	
			-1.50		
			-2.00		
Sample taken Ø2.5m			-2.50		
			-3.00		
			-3.20	End of Trial Pit	
			-3.50		
			-4.00		
			-4.50		
			-5.00		
			-5.50		
			-6.00		

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**Remarks:**

- Slight wet patches in sandier lenses.
- No evidence of strong groundwater flow.
- Samples taken Ø 1.0m & 2.5m.

Logged by:	Scale:	End Casing Depth:	Job No:
JK	1/50		04-66



**Geotechnical & Environmental Services**

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Trial Pit

TP 2

Sheet 1 of 1

Method: Excavation Date: 07/03/05 Site: Portlaoise

Dia.mm: Coords: G.L.m.O.D. Client: AES

Soil Samples		Water & Progress	Depth (m)	Description of Strata	Legend
Type test	Depth				

			-0.00		
			-0.15	CONCRETE	
			-0.50	Yellow brown sandy gravelly CLAY	
Sample taken @ 0.8m			-1.00	End of Trial Pit	
			-1.50		
			-2.00		
			-2.50		
			-3.00		
			-3.50		
			-4.00		
			-4.50		
			-5.00		
			-5.50		
			-6.00		

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Remarks: 1. No groundwater encountered. 2. Sample taken @ 0.80m.	Logged by:	Scale:	End. Coring Depth:	Job No:
	JK	1/50		04-66



# Borehole Log

## ĐI Ô Ô Ô Ò B I C



Call No. JC Log No. 15 Checked		Start 07/03/2005 End 07/03/2005		Equipment, Methods and Remarks Cable percussion, 200mm diameter from 3.00m to 4.00m		Depth from to 5.00m 4.50m Diameter 300mm Casing Depth 3.30m		Ground Level Coordinates National Grid			
Samples and Tests				Strata							
Depth	Type & No.	Records	Date Casing	Time Water	Description	Depth (m)	Log No.	Remarks			
0.10					MADE GROUND: Concrete	0.10					
0.50					MADE GROUND: Hardcore	0.50					
0.60					Brown yellow sandy gravelly CLAY with rare to occasional cobbles. Gravel is subangular to subrounded fine to medium. Cobbles are subangular to subrounded of limestone.	0.60					
1.10	D1				Brown yellow slightly sandy slightly gravelly CLAY with occasional cobble. Gravel is subangular to subrounded fine to coarse. Cobbles are subangular of limestone.	1.10					
1.20	D2					1.20					
1.60	D3					1.60					
2.00	D4					2.00					
2.30	D5					2.30					
2.90	D6					2.90					
3.40	D7					3.40					
3.90						3.90					
4.00					EXPLORATORY HOLE ENDS AT 4.00m	4.00					
Date: 07/03/2005 Time: 18:25 Depth sealed (m): 3.90				Depth Related Remarks: None				Chiselling Depth (m): 3.30 to 3.50 Time: 30 mins			
Name of Contractor: No. 50/000 - Post-sink behaviour No. 10/000 - (see Key Sheet)				Project: Project No.: 1505118 Carried out for: GEC				Borehole: BH-1 Sheet 1 of 1			

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# ĐI ỨỒ ĐỒ BỊ C



## Borehole Log

Borehole No. / Checked		Start / End	Equipment, Methods and Remarks		Depth from / to	Diameter	Casing Depth	Ground Level Coordinates National Grid		
07/03/2005		07/03/2005	Cable percussion 200mm diameter from 0.00m to 4.12m		0.00	4.12m	200mm	4.00m		
Samples and Tests				Strata						
Depth	Type & No	Records	Date Casing	Time Water	Description			Depth (m)	Legend	Soil No.
					MADE GROUND: Concrete*			0.10		
					MADE GROUND: Hardcore and cobble**			1.00		
0.10	U5				Brown grey sandy slightly silty gravelly COBBLES. Gravel is subangular to subrounded fine to coarse. Cobbles are angular to subangular lot of irregular.			1.50		
1.00	U2				Brown yellow slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			2.00		
1.50	U3				Brown yellow slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			3.00		
3.00					EXPLORATORY HOLE END 4.12m			4.12		
No. Sample / For Make behaviour / Observations (see Key Sheet)				Date Casing / Time Water		Depth sealed (m) / From Water			Casing Depth (m) / Time / Test / No.	
									Borehole <b>BH3</b> Sheet 1 of 1	
Project: <b>Phu</b> Project No: <b>NC103</b> Carried out for: <b>GES</b>										

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# ĐI ƯỚC XÂY DỰNG



## Borehole Log

Editor Checked		Start Date End	Equipment, Methods and Remarks Cable percussion, 200mm diameter PPH 100mm x 100mm		Depth from	to	Diameter	Casing Depth	Ground Level	Coordinates	National Grid	
Depth	Samples and Tests			Strata								
	Type & No	Records	Date Casing	Time Water	Description	Depth (Thickness)	Logging	Notes				
					MADE GROUND: Concrete**	0.70						
					MADE GROUND: Hardcore**	0.80						
					MADE GROUND: Concrete and fill**	0.90						
1.10	B1				BROWN sandy gravelly CLAY with occasional cobbles. Gravel is subangular to subround fine to coarse. Cobbles are micaceous limestone.							
1.40	B2											
1.80	B3											
2.40	B4											
			26.03.2008	1400								
			1.30									
					EXPLORATORY HOLE END AT 3.00m							
					<i>For inspection purposes only. Consent of copyright owner required for any other use.</i>							
Date		Type & No	Records	Date Casing	Time Water	Depth Related Remarks From to set			Casing Depth (m)	Time	Test date	
Borehole Water Ends		Nil - Excellent Post Strike behaviour (N)			Depth related				0.20-0.50	30 mins		
None observed (See Key Sheet)									3.00-5.00	60 mins		
Notes for interpretation of symbols and abbreviations see key sheet. All depths and reduced levels are in metres. Strata thickness given in brackets in sample column.				Project Project No. Carried out for		Purdue KC 3078 GCS		Borehole BH5 Sheet 1 of 1				





# PRELIMINARY



## Borehole Log

Core No. TR Logged Checked		Start 02/04/2006 End 02/04/2006	Equipment, Methods and Remarks (entry in pen hole 142.3m near 0.00m to 4.00m, Rotary core 75mm diameter from 4.00m to 8.00m)				Depth from 0.00m 4.00m	to 1.00m 3.00m	Diameter 142.3mm 75mm	Casings Depth 4.00m	Ground Level Coordinates National Grid
Samples and Tests			Strata								
Depth	Type & No	Receipts	Date Casing	Time Water	Description	Depth Level (thickness)	Legend	Notes/Remarks			
					SOFT CLAY with occasional cobbles**	4.00					
4.00-5.15	28 00 0										
5.35-6.70	27 00 0										
6.50-8.05	21 00 0										
8.05-8.05	52 00 0										
			02/04/2006	1300	EXPLORATORY HOLE END AT 8.00m	8.00					
Se-231	22 00 0	Records/Samples	Date Casing	Time Water							
Sample Details No. 231-000-000 Post hole behaviour (N/A) (N/A) (see Key Sheet)			Depth sealed (m)	Depth Related Remarks From 3.00m		Casing Depth (m) Time Test No.					
Notes by manufacturer of records and observations on key sheet. All samples and retained sections preserved and returned to client. (N/A)			Project Project No. NC 5038 Carried out for GES	Part No.		Borehole RC 2 Sheet 1 of 1					

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## Soil Analysis Results

## Appendix 3

AES Landfill Potentially  
Soil Analysis

Parameter	Units	Soil Sediment Ditch List		BHS D-1		BHS D-3		BHS D-1		BHS D-3		R1 D-1		R2 D-1	
		Intervention Level	Action Level	Sampled: 1.0m	Sampled: 2.0m	Sampled: 2.0m	Sampled: 3.0m	Sampled: 4.0m	Sampled: 2.0m	Sampled: 1.0m	Sampled: 2.0m	Sampled: 0.5m	Bulk Sampled at 6 m	Bulk Sampled at 6 m	
pH	pH Units			9.6	7.9	11.9	9.1	8.4	8.6	7.8	8.4	8.0	8.7	8.6	
Chloride	mg/kg Cl			154	515	171	120	618	404	39	24	77	109	229	
Chromium	mg/kg Cr	100	200	177	18.9	38.9	20.3	10.2	12.4	13.6	4.8	17	14	16.4	
Total Ammonia	mg/kg NH <sub>3</sub>			7.8	2.0	1.5	1.0	0.7	1.1	0.3	0.7	0.7	0.3	0.4	

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TES ID Number	Client Sample Description	Units:	mg/kg	mg/g	PPM	PPM													
		Method Codes:	FLA/HSS	ICP/MS	YS/MS	YS/MS													
		Mailed Reporting Limit:	LS	LS	LS	LS													
UKAS Accredited:	Yes	Yes	Yes	Yes															
		Ammoniacal Nitrogen	Chromium (As)	pH units	Chloride														
0507015	BH1 D 1	1.8	12.7	3.6	154														
0507016	BH1 D 2	2.9	18.9	7.9	610														
0507017	BH1 D 3	5	15.9	17.3	171														
0507018	BH1 D 3A	0	20.2	9.1	120														
0507019	BH1 D 4	0.7	10.4	3.5	515														
0507020	BH1 D 5	1	17.4	1.6	424														
0507021	TP1 D 1	5.1	12.1	7.6	40														
0507021	TP1 D 2	0.7	14.8	6.4	24														
0507022	TP2 D 1 (A)	1.7	1	6.1	72														

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**Contact:** Mr J. Vassil

**Portlaw**

**Soils Sample Analysis**

**Date Printed:** 05-Apr-05  
**Report Number:** EFS054676  
**Table Number:** 1





Method Code		Method Name	Units	Method Code	Method Name	Units	Method Code	Method Name	Units	Method Code	Method Name	Units
11000	11000	Ammoniacal Nitrogen	mg/L	11000	Ammoniacal Nitrogen	mg/L	11000	Ammoniacal Nitrogen	mg/L	11000	Ammoniacal Nitrogen	mg/L
11000	11000	Chloride	mg/L	11000	Chloride	mg/L	11000	Chloride	mg/L	11000	Chloride	mg/L
11000	11000	Electrical Conductivity	µS/cm	11000	Electrical Conductivity	µS/cm	11000	Electrical Conductivity	µS/cm	11000	Electrical Conductivity	µS/cm
11000	11000	Fluoride	mg/L	11000	Fluoride	mg/L	11000	Fluoride	mg/L	11000	Fluoride	mg/L
11000	11000	Iron	mg/L	11000	Iron	mg/L	11000	Iron	mg/L	11000	Iron	mg/L
11000	11000	Lead	mg/L	11000	Lead	mg/L	11000	Lead	mg/L	11000	Lead	mg/L
11000	11000	Nickel	mg/L	11000	Nickel	mg/L	11000	Nickel	mg/L	11000	Nickel	mg/L
11000	11000	Sulfate	mg/L	11000	Sulfate	mg/L	11000	Sulfate	mg/L	11000	Sulfate	mg/L
11000	11000	Total Dissolved Solids	mg/L	11000	Total Dissolved Solids	mg/L	11000	Total Dissolved Solids	mg/L	11000	Total Dissolved Solids	mg/L
11000	11000	Total Suspended Solids	mg/L	11000	Total Suspended Solids	mg/L	11000	Total Suspended Solids	mg/L	11000	Total Suspended Solids	mg/L
11000	11000	Zinc	mg/L	11000	Zinc	mg/L	11000	Zinc	mg/L	11000	Zinc	mg/L
11000	11000	Ammoniacal Nitrogen	mg/L	11000	Ammoniacal Nitrogen	mg/L	11000	Ammoniacal Nitrogen	mg/L	11000	Ammoniacal Nitrogen	mg/L
11000	11000	Chloride	mg/L	11000	Chloride	mg/L	11000	Chloride	mg/L	11000	Chloride	mg/L
11000	11000	Electrical Conductivity	µS/cm	11000	Electrical Conductivity	µS/cm	11000	Electrical Conductivity	µS/cm	11000	Electrical Conductivity	µS/cm
11000	11000	Fluoride	mg/L	11000	Fluoride	mg/L	11000	Fluoride	mg/L	11000	Fluoride	mg/L
11000	11000	Iron	mg/L	11000	Iron	mg/L	11000	Iron	mg/L	11000	Iron	mg/L
11000	11000	Lead	mg/L	11000	Lead	mg/L	11000	Lead	mg/L	11000	Lead	mg/L
11000	11000	Nickel	mg/L	11000	Nickel	mg/L	11000	Nickel	mg/L	11000	Nickel	mg/L
11000	11000	Sulfate	mg/L	11000	Sulfate	mg/L	11000	Sulfate	mg/L	11000	Sulfate	mg/L
11000	11000	Total Dissolved Solids	mg/L	11000	Total Dissolved Solids	mg/L	11000	Total Dissolved Solids	mg/L	11000	Total Dissolved Solids	mg/L
11000	11000	Total Suspended Solids	mg/L	11000	Total Suspended Solids	mg/L	11000	Total Suspended Solids	mg/L	11000	Total Suspended Solids	mg/L
11000	11000	Zinc	mg/L	11000	Zinc	mg/L	11000	Zinc	mg/L	11000	Zinc	mg/L

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### Portlaw

Date Printed: 22-Apr-13  
 Report Number: ETS/051354  
 Table Number: 1

### Soils Sample Analysis



# Report Notes

## Soil/Solid analysis specific:

Results expressed as mg/kg unless stated otherwise  
SMA analysis not conducted in accordance with BS1362 unless otherwise stated  
Water Soluble Sulphate on P-1 water soil extract  
AR analysis not conducted on the As Received sample  
\* to eluted with benzo(difuran)ene  
\*\* co-eluted with minnoc(123-cd)pyrene  
HTFX analysis expressed as mg/kg As Received  
Phenol HPLC result expressed as mg/kg As Received

## Water analysis specific:

Results expressed as mg/l unless stated otherwise

## Oil analysis specific:

Results expressed as mg/kg unless stated otherwise  
S.G. determined as g/cm<sup>3</sup> @ 15°C

## Filter analysis specific:

Results expressed as mg on filter unless stated otherwise

## VOC analysis specific:

Explanatory codes for data flagging:  
U = undetected above reporting limit  
J = concentration of instrument was below known calibration standard  
E = concentration at instrument was above the calibration standard  
B = compound was detected in method blank

## Gas (Tedlar bag) analysis specific:

Results expressed as ppm unless stated otherwise

## Air (Carbon tube) analysis specific:

Results expressed as ug on tube unless stated otherwise

## Asbestos analysis specific:

CH denotes Chrysotile  
CR denotes Crocidolite  
AM denotes Amosite  
NADIS denotes No Asbestos Detected in Sample  
NBFO denotes No Bulk fibres Observed  
T Trace  
L Low (< 1%)  
M Medium (1% - 50%)  
H High (> 50%)

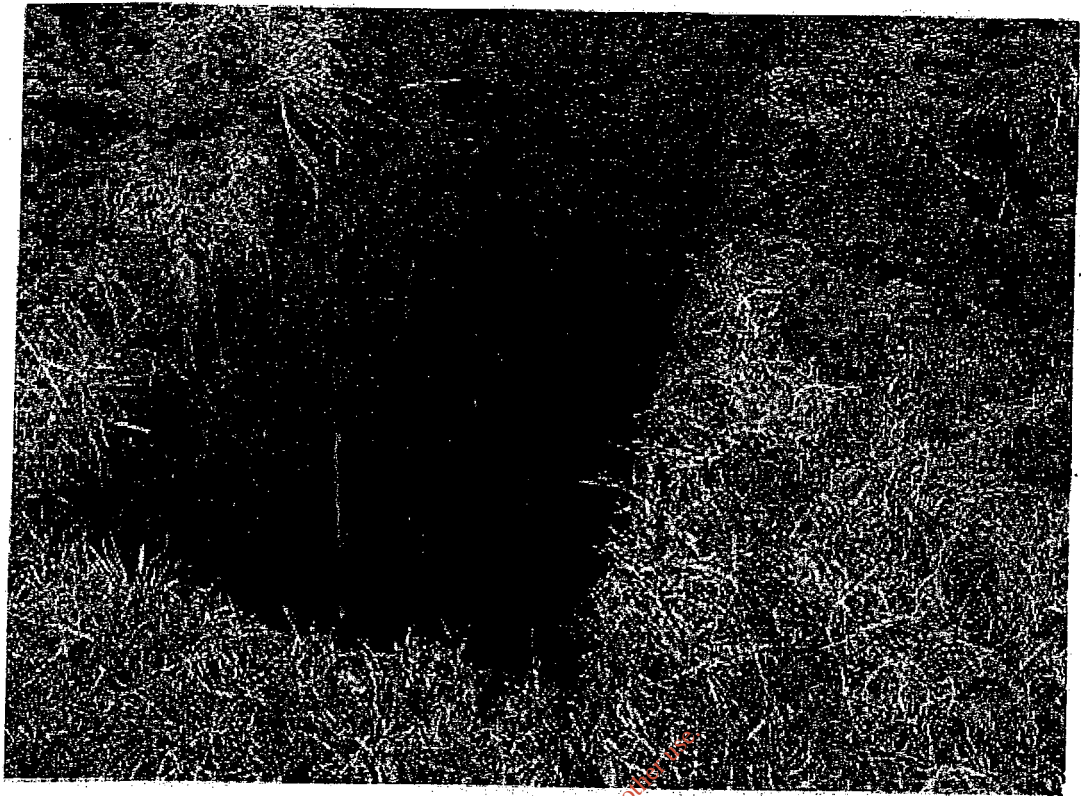
## General notes:

\* While analysis was subcontracted to another laboratory  
\$ Within laboratory tolerances  
\$\$ unable to analyse due to nature of sample  
\* Results for guidance only, possible interference  
& Blank corrected  
! S insufficient sample for analysis  
! Int. Unable to analyse due to interference  
N.D. Not determined  
N.R. Not recorded  
N.Det Not detected  
Req. Analysis Requested - see attached sheet for details  
\* denotes this result not UKAS accredited on this sample  
H Released detection limit due to nature of sample  
? Denotes that an element of the quality control systems currently within the established bias from its normal working pattern. The QC has not failed again, the cause of the bias has not been investigated and rectified.  
This does not invalidate the current quality policy specifies that you will be kept informed when this happens

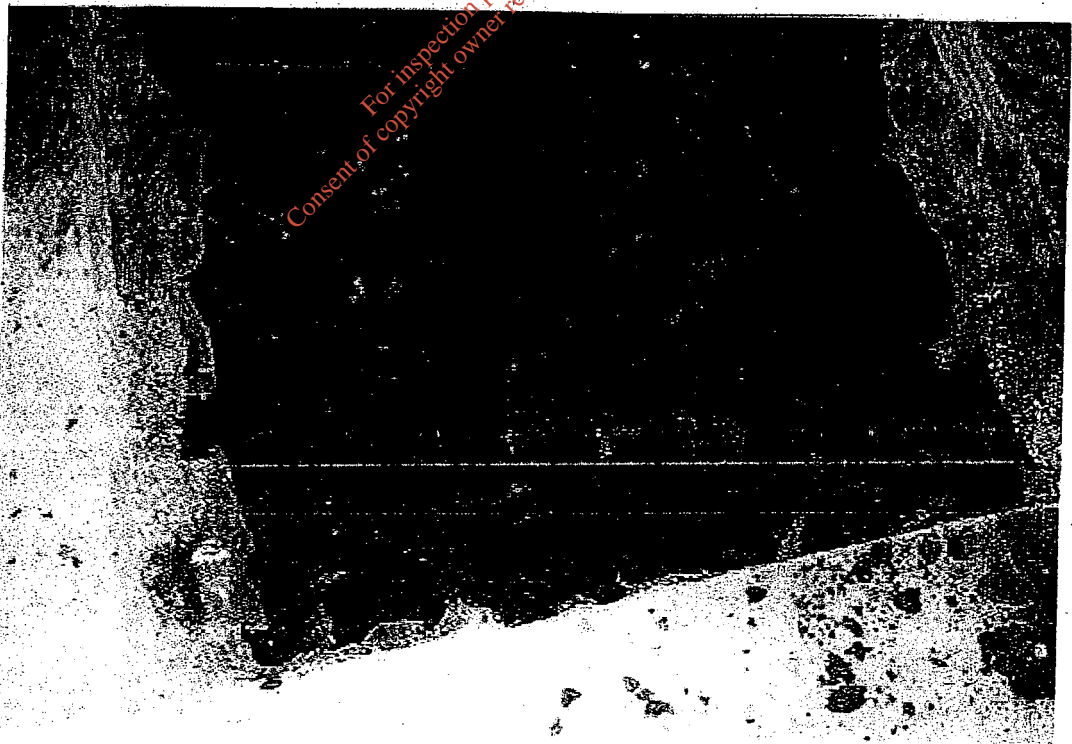
## Appendix 4

### Plates of Trial Pits 1 and 2

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**Trial Pit TP1**



**Trial Pit TP2**