Environmental Impact Statement

Restoration and Filling of Quarry

At

Hollywood Great, Naul, Co. Dublin

on behalf of

Murphy Environmental

Volume Two

Prepared By

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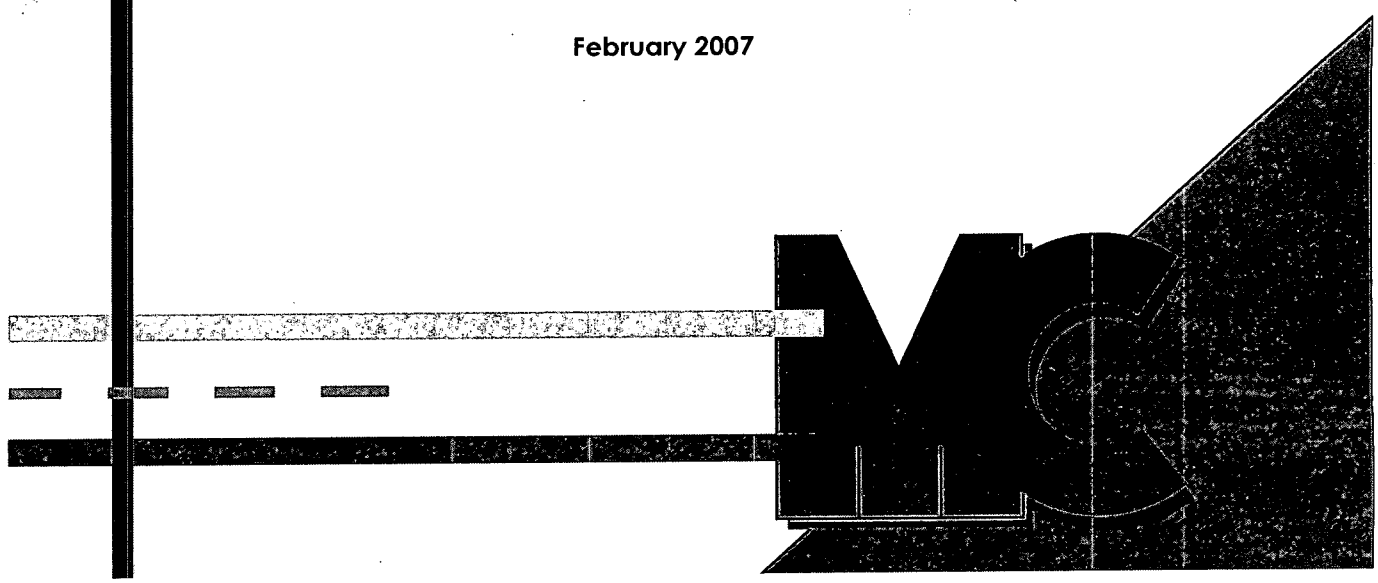
February 2007



Appendix A

EPA Licensed Sites Accepting Construction and Demolition Waste in Ireland 2005

The table below is derived from the EPA National Waste Report 2005 (published in 2006), based on Construction & Demolition waste tonnages accepted at EPA-licensed waste facilities in 2005.

Local Authority/ Operator	Facility Name	Waste Licence Reg No.	Construction & Demolition Waste Disposal (Tonnes) 2005	Construction & Demolition Waste Recovery (Tonnes) 2005
Murphy Concrete Manufacturing Limited	***Murphy Concrete Manufacturing Ltd. (Hollywood)***	***W0129-01***	***326,891***	
Murphy Concrete Manufacturing Limited	***Murphy Concrete Manufacturing Ltd. (Gormanston)***	***W0151-01***		***686,662***
Carlow County Council	Powerstown Landfill	W0025-01		15,151
Cavan County Council	Corranure Landfill	W0077-02		5,790
Clare County Council	Ballyduff Beg Inagh	W0109-01		3,200
Cork county Council	East Cork Landfill	W0022-01		47,774
Cork county Council	Raffeen Landfill	W0023-01		180,000
Cork county Council	Youghal Landfill	W0068-02		14,655
Cork County Council	Derryconnell Landfill	W0089-01	13	1,089
Donegal County Council	Ballynacarrick Landfill	W0024-01	6	10,400
Donegal County Council	Glenalla Landfill	W0125-01		34,474
Donegal County Council	Muckish Landfill	W0126-01		34,667
Dun Laoghaire-Rathdown	Ballyogan Landfill/Recycling Centre	W0015-01		483,412
Fingal County Council	Dunsink Landfill	W0127-01		206,900
Galway County Council	Pollboy Landfill	W0027-02		65,379
Kerry County Council	North Kerry Landfill	W0001-03	474	
Kilkenny County Council	Dunmore Landfill	W0030-02	123	2,956
Laois County Council	Kyletalesha Landfill	W0026-02	363	21,764
Limerick County Council	Gortadroma	W0001-03		14,555
Louth County Council	Whiteriver	W0060-02	439	20,441
Monaghan County Council	Scotch Corner Landfill	W0020-01	214	527
Offaly County Council	Derryclure	W0029-02		27,837
Roscommon County Council	Ballaghaderreem	W0059-02		1,488
South Dublin County Council	Arthurstown	W0004-03		7,500

Table Continued

Local Authority/ Operator	Facility Name	Waste Licence Reg No.	Construction & Demolition Waste Disposal (Tonnes) 2005	Construction & Demolition Waste Recovery (Tonnes) 2005
South Tipperary County Council	Donohill Landfill	W0074-02	365	
Waterford County Council	Kilbarry Landfill	W0019-01	1,008	12,603
Waterford County Council	Dungarvan Waste Disposal Site	W0032-02		1,380
Waterford County Council	Tramore Waste Disposal Site	W0075-01		65,041
Westmeath County Council	Ballydonagh Landfill	W0028-02		28,907
Westmeath County Council	Marlinstown Landfill	W0071-02		4,686
Wicklow County Council	Ballymurtagh Landfill Facility	W0011-01		76,380
Wicklow County Council	Rampere Landfill	W0066-02		535
Dundalk Town Council	Dundalk Landfill/Civic Waste Facility	W0034-02		97,198
Neiphin Trading Ltd	Kerdiffstown	W0047-01		363,129
KTK Landfill Limited	KTK Landfill Limited	W0081-02	5,302	56,474
KTK Sand & Gravel Ltd	KTK Sand and Gravel Ltd	W0156-01		241,965
Swalcliffe	Swalcliffe	W0181-01		4,454
Greenstar Holdings Ltd	Knockharley Landfill	W0146-01		33,562
Bord Na Mona	Srahmore Peat Deposition Site	W0199-01	113,227	
Total Construction & Demolition Waste Disposed/Recovered (Tonnes) 2005			**448,425**	**2,872,933**
Total Construction & Demolition Waste (Tonnes) 2005			**3,321,358**	
% of Total C&D Waste <u>Disposed</u>, which was accepted by Murphy Concrete Manufacturing (Hollywood) in 2005			**73%**	
% of Total C&D Waste <u>Recovered</u>, which was accepted by Murphy Concrete Manufacturing (Gormanston) in 2005			**24%**	
% of <u>Total</u> Construction & Demolition Waste Accepted by Murphy Concrete Manufacturing Facilities (Hollywood & Gormanston) in 2005			**31%**	

Appendix B

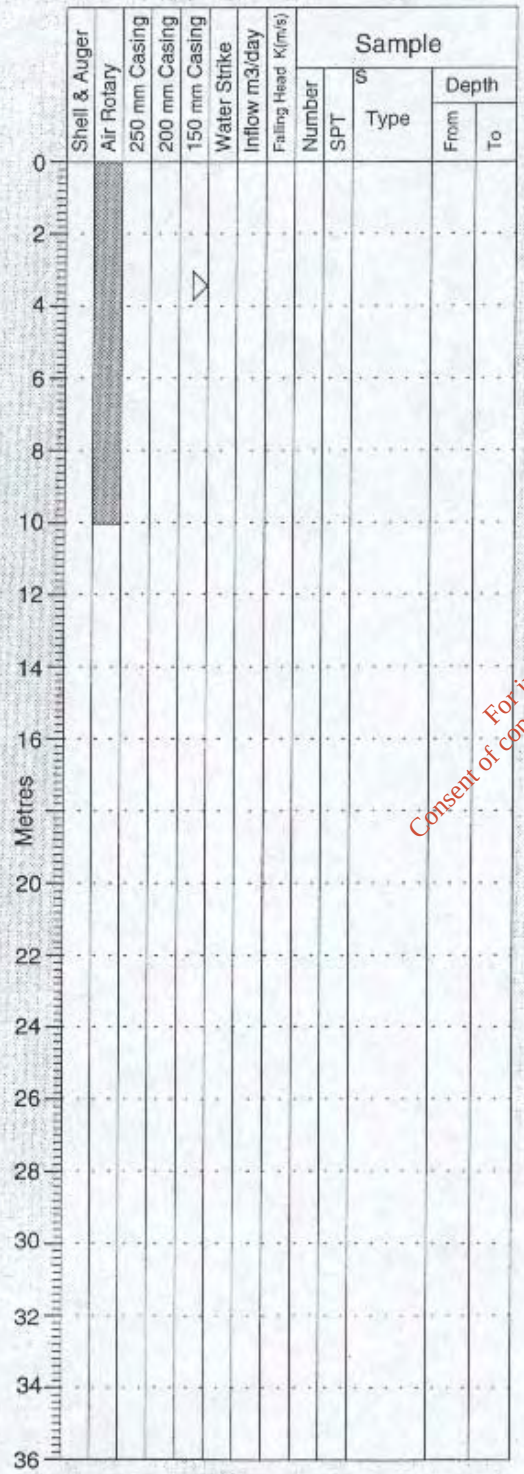
Readings of Monitoring Well Log

Monitoring Well Log

Monitoring Well BH 4

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 326044 East 257842 North
Ground Surface Elev. : 96.9 m OD Malin Head
Logged by : Clare Glanville



Drilling Notes and Strata Description

0-3m TILL

3-10m Limestone BEDROCK

Construction Details

Sample / Test Legend
U - U100 Tubes
SS - Slit Spoon
SPT - Standard Penetration Test

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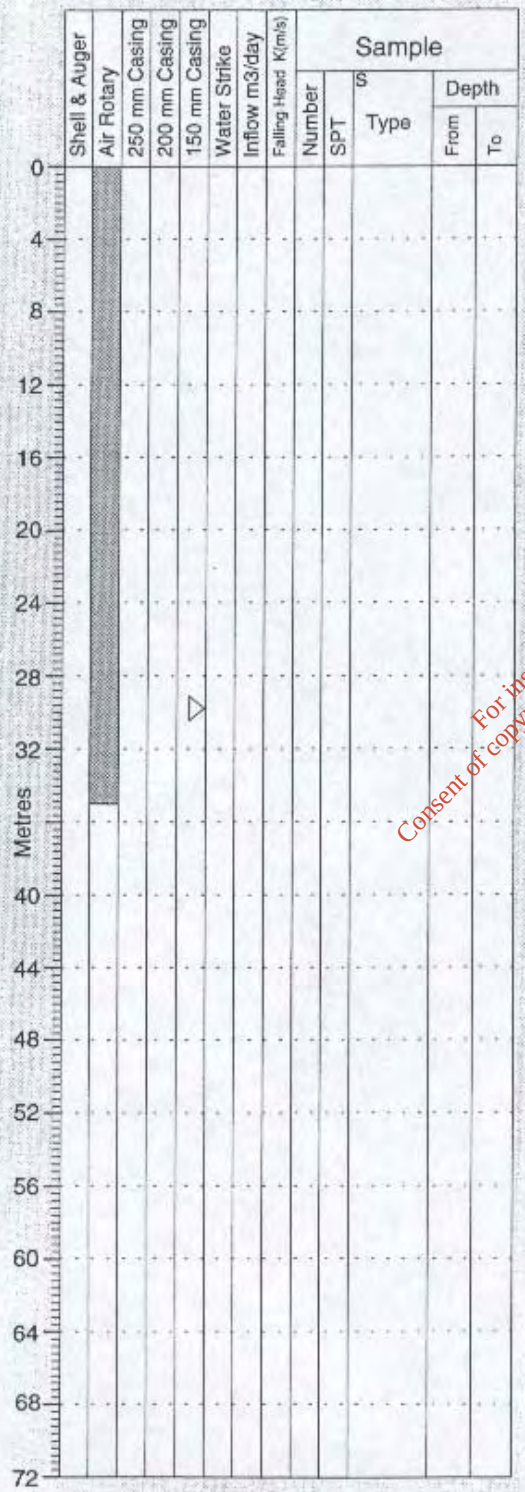
Figure No.

Monitoring Well Log

Monitoring Well BH 5

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315796 East 258328 North
Ground Surface Elev. : 118.2 m OD Malin Head
Logged by : Clare Glanville



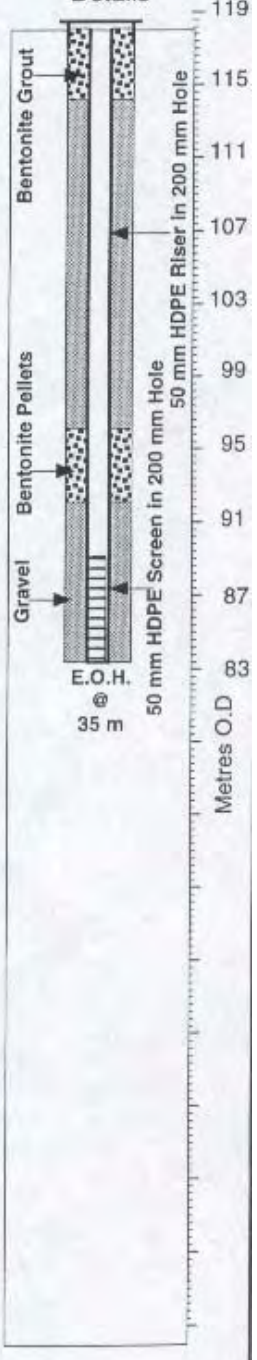
Drilling Notes and Strata Description

0 - 6 m Brown silty clayey matrixed TILL with gravel clasts

6 - 10 m Black Highly Weathered Shale , silty and clayey

10 - 35 m Black Weathered Shale

Construction Details



Sample / Test Legend
U - U100 Tubes
SS - Slit Spoon
SPT - Standard Penetration Test

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Hydrogeological & Environmental Consultants

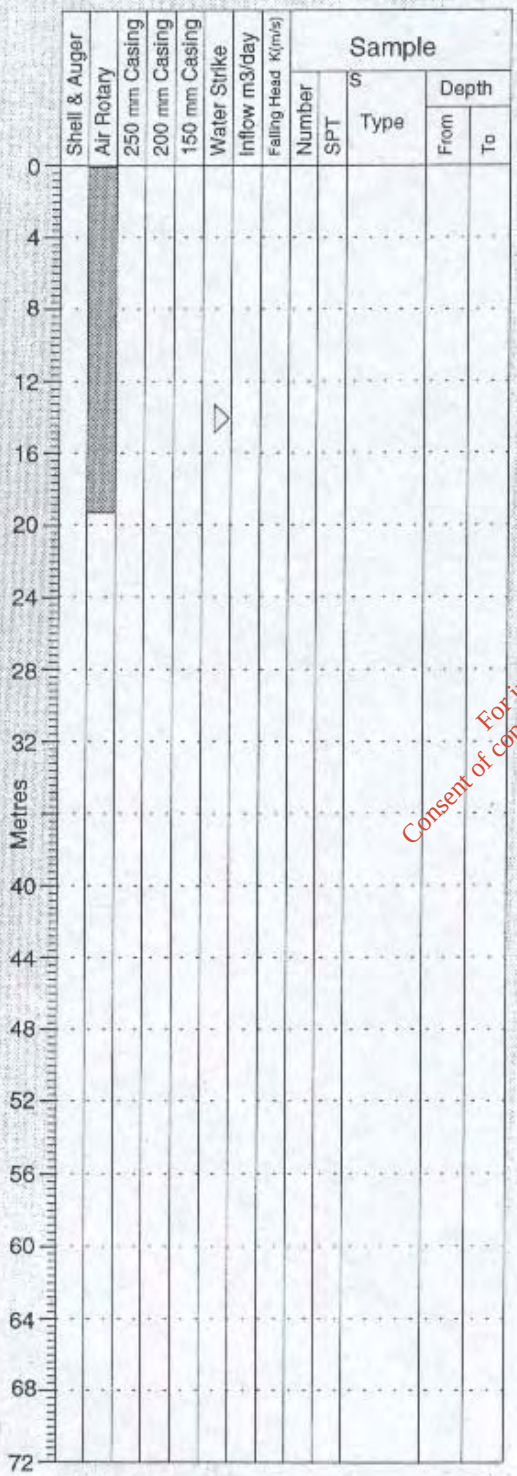
Figure No.

Monitoring Well Log

Monitoring Well BH 6

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315644 East 258506 North
Ground Surface Elev. : 117 m OD Malin Head
Logged by : Clare Glanville



Drilling Notes and Strata Description

0 - 4 m Brown/Grey Clayey TILL

4 - 12 m Black Silty Clay with WEATHERED ROCK

12 - 19.5 m Black Shale BEDROCK

Construction Details

Sample / Test Legend
U - U100 Tubes
SS - Slit Spoon
SPT - Standard Penetration Test

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Hydrogeological & Environmental Consultants

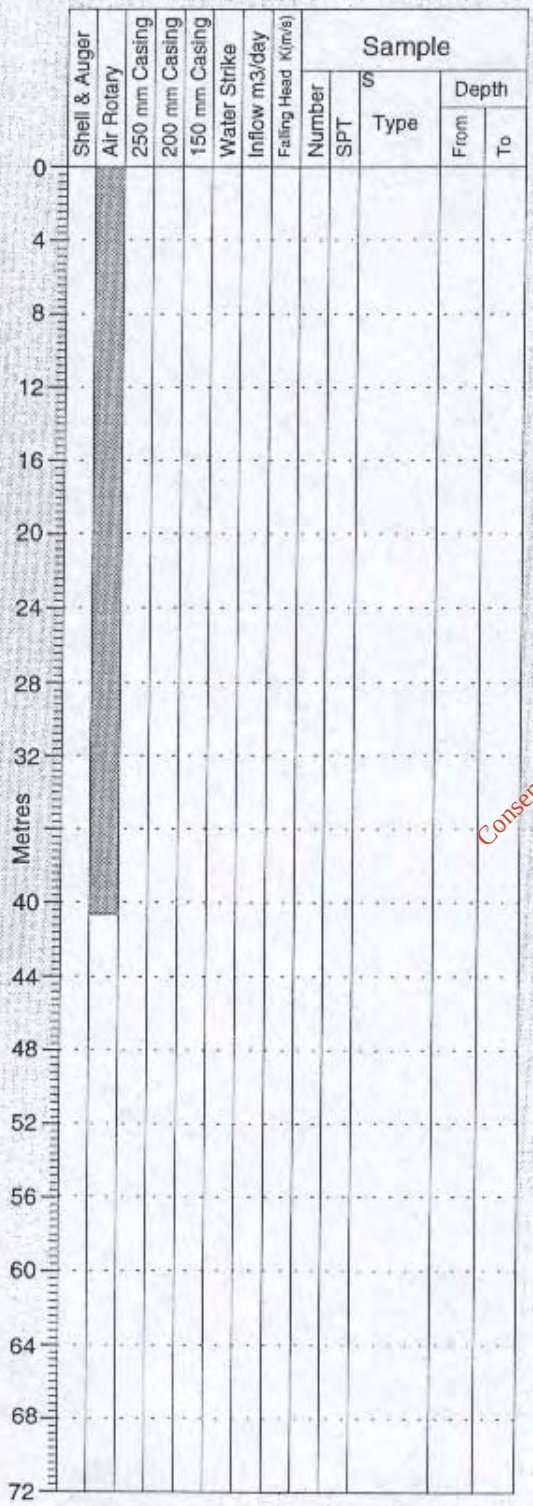
Figure No.

Monitoring Well Log

Monitoring Well BH 7

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 7/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : East North
Ground Surface Elev. : 132 m OD Malin Head
Logged by : Clare Glanville



Drilling Notes and Strata Description

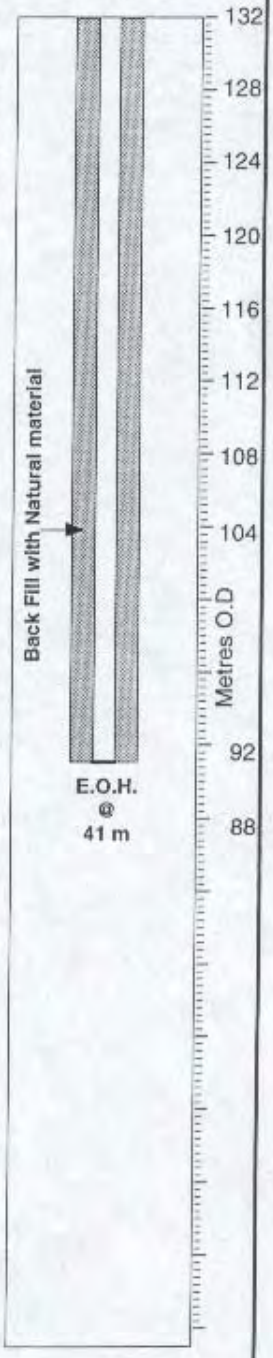
0 - 2 m Brown TILL with a silty to Clayey matrix

2 - 18 m Grey/Brown Silty weathered shale

18- 26 m Grey/Black weathered shale

No Further samples taken -Hole abandoned at 41 m

Construction Details



Sample / Test Legend
U - U100 Tubes
SS - Slit Spoon
SPT - Standard Penetration Test

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Figure No.

Well Log

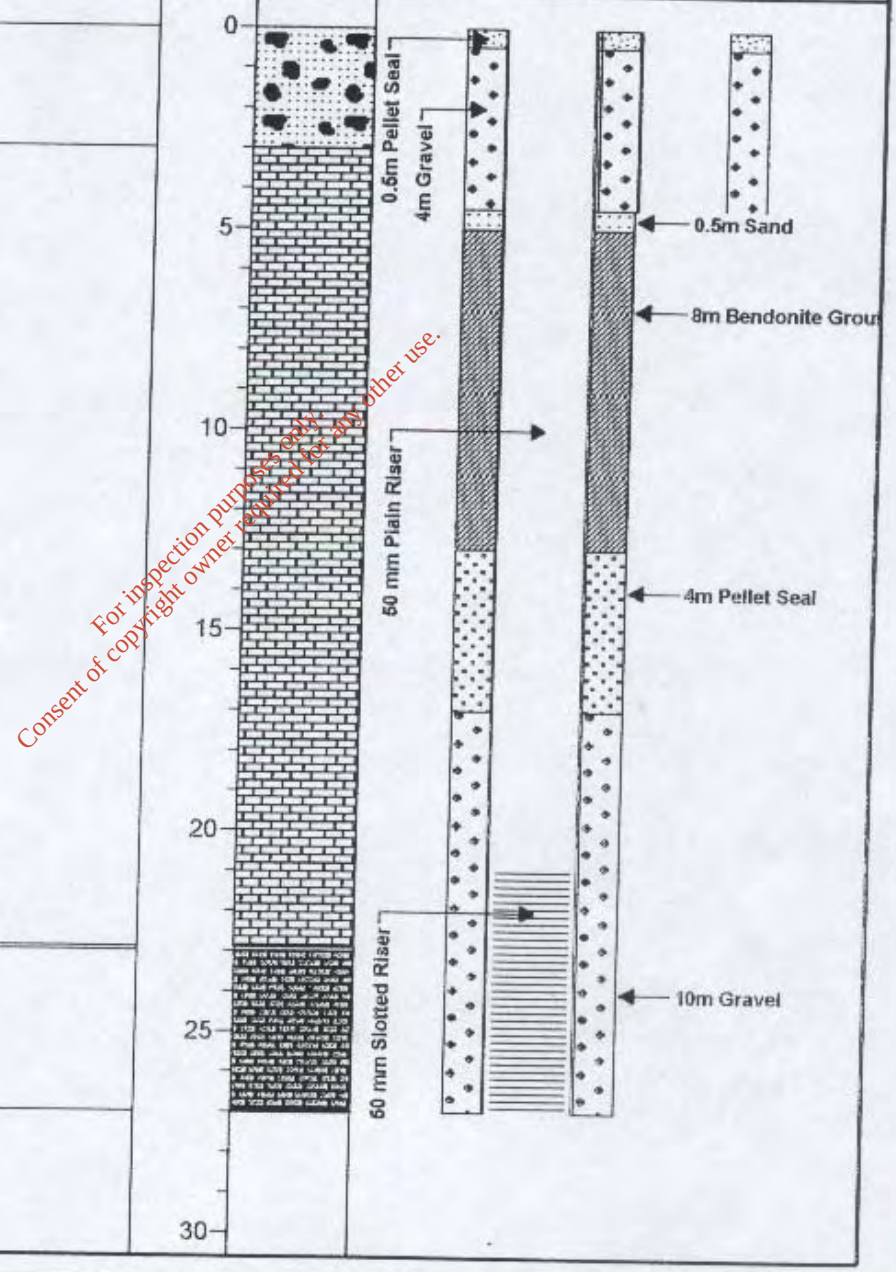
Well No. BH8 New | **Grid Reference** | | **Drill Date** 17/08/01

Project No. 1698 | **Client** Seamus Murphy

Well Type Groundwater Monitoring | **Location** Hollywood Great Quarry | **Geologist** F White

SUBSURFACE PROFILE

Description	Depth	Symbol	Well Construction
Ground Surface	0		
OVERBURDEN Overburden BOULDER CLAY			
SHALE Black SHALE bedrock	5		
	10		
	15		
	20		
SHALE Broken Black SHALE	25		
End of Borehole	30		



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Drill Method Air Rotary | **Hole Size (mm)**

Casing Length (m) | **Ground Level (mOD)**

Driller Glover Site Investigations | **Static Water Level (bgl)**

Well Log

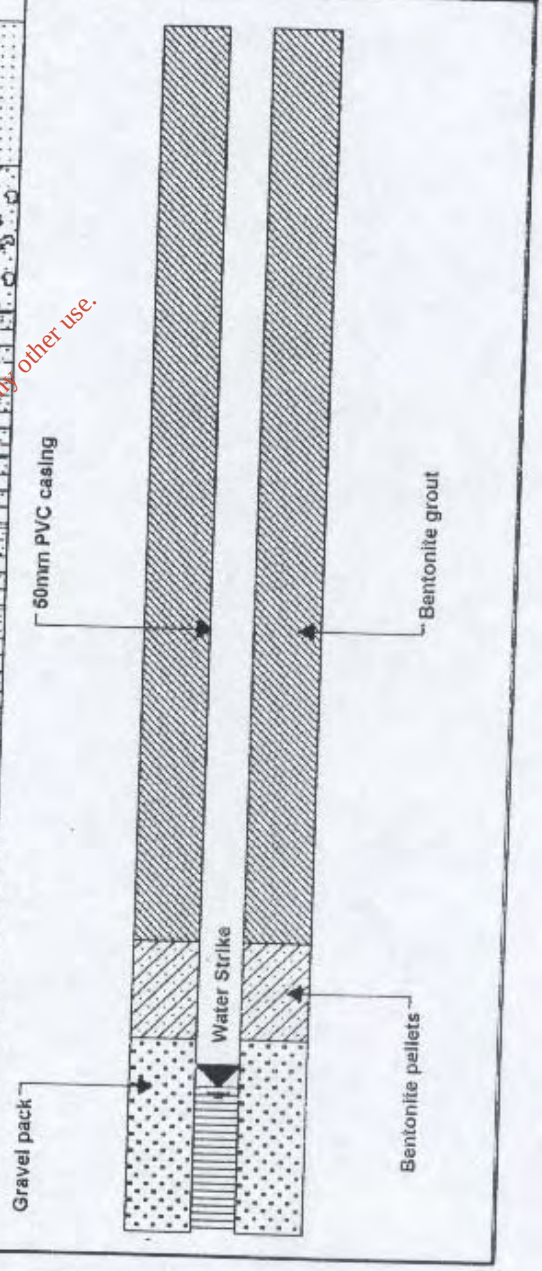
Well No. BH9 **Grid Reference**

Project No. 1698 **Client** Seamus Murphy **Drill Date** 3/8/01

Well Type **Location** Hollywood Great **Geologist** Ben Whitfield

SUBSURFACE PROFILE

Description	Depth	Symbol
Ground Surface		
Colluvium and highly weathered shale black loamy fine to medium sand easy drilling; moist		
light brown/dark brown gravelly medium clay; moist Gravel dominantly black shale Very moist thin layer 10.0 - 10.5 easy to medium drilling		
Shale bedrock black sand to gravel (granulated shale), moist medium drilling		
black sand to gravel, as above gravel sized chips dominant		
brown sand to gravel gravel shale and minor calcareous siltstone minor clay, moist		
black sand to gravel dominantly shale		
black coarse sand to gravel shale chips very moist@42 very easy drilling 40 - 41m Water table 44m Yield 500 gal/hr		
End of Borehole		



M.T.Cullen & Co. Ltd.

Drill Method Air rotary **Hole Size (mm)** 200

Casing Length (m) 50 **Ground Level (mOD)**

Driller Glovers Site Investigations **Static Water Level (bgl)**

Well Log

Well No. BH10 **Grid Reference**

Project No. 1698 **Client** Seamus Murphy **Drill Date** 4/8/01

Well Type **Location** Hollywood Great **Geologist** C Connery

SUBSURFACE PROFILE

Description	Depth	Symbol	Well Construction
Ground Surface			
Boulder clay stiff brown very sandy gravelly clay containing cobbles and boulders	0		
Limestone Bedrock Limestone	5		
	10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
End of Borehole	85		

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Drill Method Air rotary **Hole Size (mm)** 200

Casing Length (m) 84 **Ground Level (mOD)**

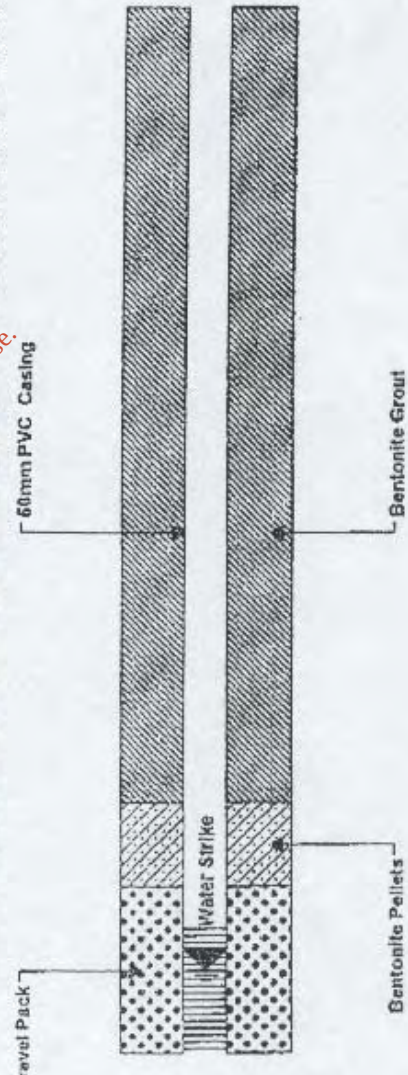
Driller Glovers Site Investigations **Static Water Level (bgl)**

Well Log

Well No. BH11	**Grid Reference**	
Project No. 1698	**Client** Seamus Murphy	**Drill Date** 3/8/01
Well Type	**Location** Hollywood Great	**Geologist** Ben Whitfield

SUBSURFACE PROFILE

Description	Depth (m)	Symbol	Well Construction
Ground Surface	0.0		
Fill Fill			
Clay Firm to stiff grey brown sandy gravelly CLAY containing cobbles and boulders	5.0		
	10.0		
Shale Brown SHALE	15.0		
	20.0		
Shale Black SHALE	25.0		
	30.0		
	35.0		
	40.0		
	45.0		
	50.0		
	55.0		



White Young Green

Drill Method Air Rotary — Hole Size (mm) 200

Casing Length (m) 50 — TOC (mOD)

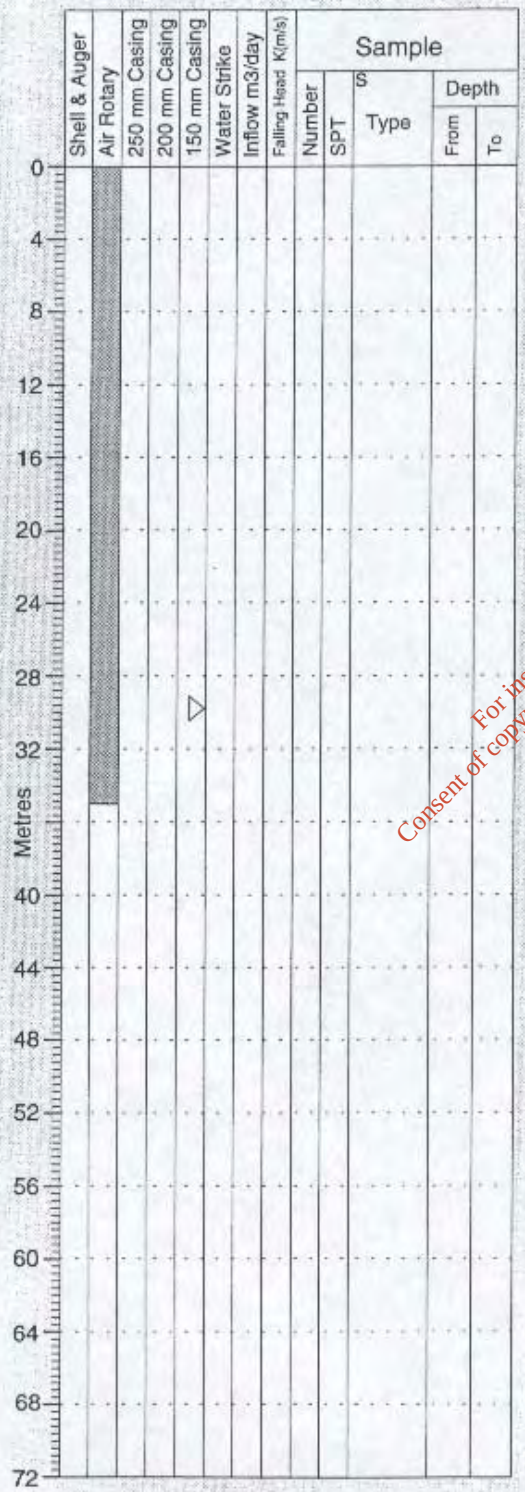
Driller Glovers Site Investigations — Static Water Level (bgl)

Monitoring Well Log

Monitoring Well BH 5

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315796 East 258328 North
Ground Surface Elev. : 118.2 m OD Malin Head
Logged by : Clare Glanville



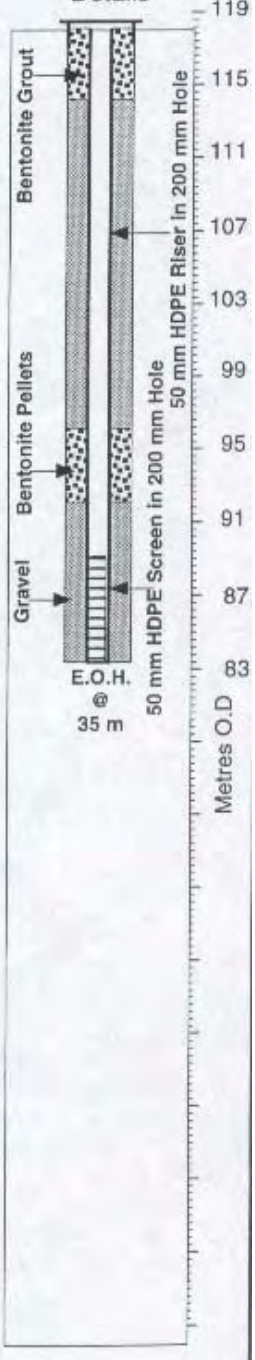
Drilling Notes and Strata Description

0 - 6 m Brown silty clayey matrixed TILL with gravel clasts

6 - 10 m Black Highly Weathered Shale , silty and clayey

10 - 35 m Black Weathered Shale

Construction Details



Sample / Test Legend
U - U100 Tubes
SS - Slit Spoon
SPT - Standard Penetration Test

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Figure No.

Monitoring Well Log

Monitoring Well BH 6

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315644 East 258506 North
Ground Surface Elev. : 117 m OD Malin Head
Logged by : Clare Glanville

Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m3/day	Falling Head K(m/s)	Sample Number	Sample SPT	Sample Type	Depth From	Depth To

Metres: 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72

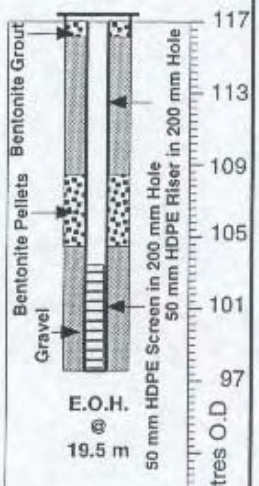
Drilling Notes and Strata Description

0 - 4 m Brown/Grey Clayey TILL

4 - 12 m Black Silty Clay with WEATHERED ROCK

12 - 19.5 m Black Shale BEDROCK

Construction Details



Sample / Test Legend
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SS - Slit Spoon
SPT - Standard Penetration Test

K.T.Cullen & Co. Ltd.
Hydrogeological & Environmental Consultants

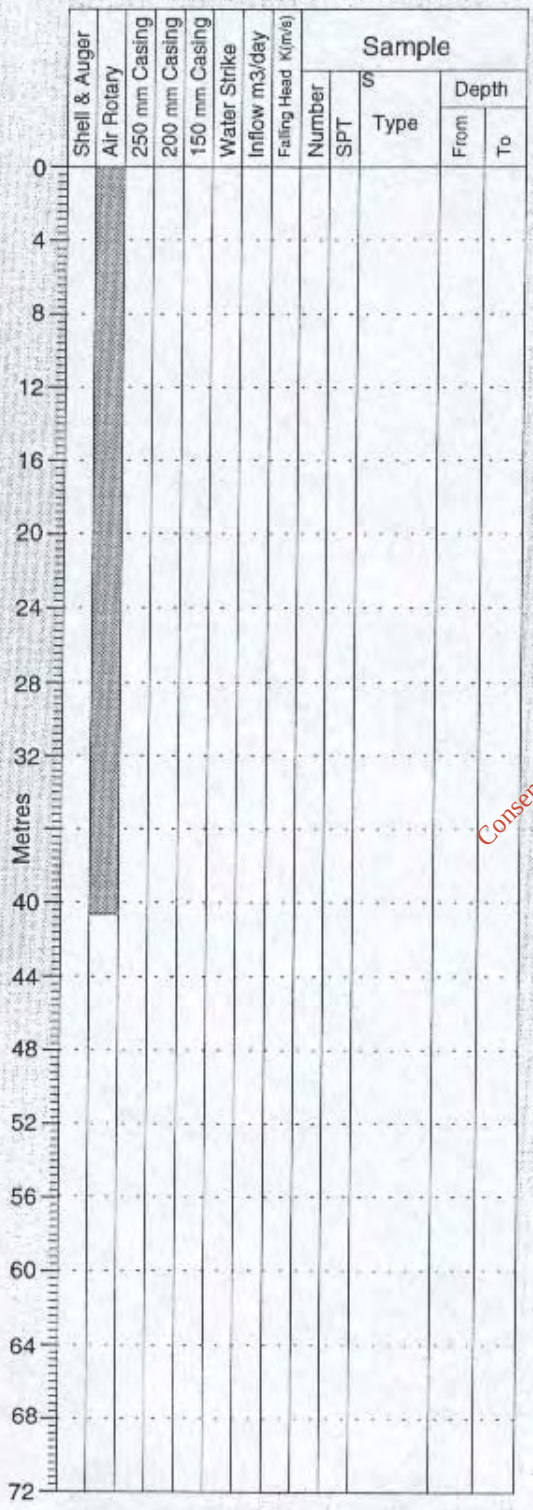
Figure No.

Monitoring Well Log

Monitoring Well BH 7

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 7/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : East North
Ground Surface Elev. : 132 m OD Malin Head
Logged by : Clare Glanville



Drilling Notes and Strata Description

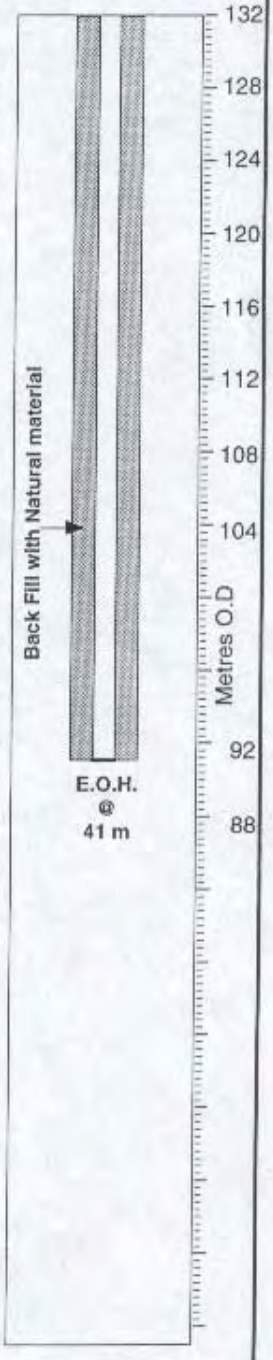
0 - 2 m Brown TILL with a silty to Clayey matrix

2 - 18 m Grey/Brown Silty weathered shale

18- 26 m Grey/Black weathered shale

No Further samples taken -Hole abandoned at 41 m

Construction Details



Sample / Test Legend
U - U100 Tubes
SS - Slit Spoon
SPT - Standard Penetration Test

K.T.Cullen & Co. Ltd.
Hydrogeological & Environmental Consultants

Figure No.

Well Log

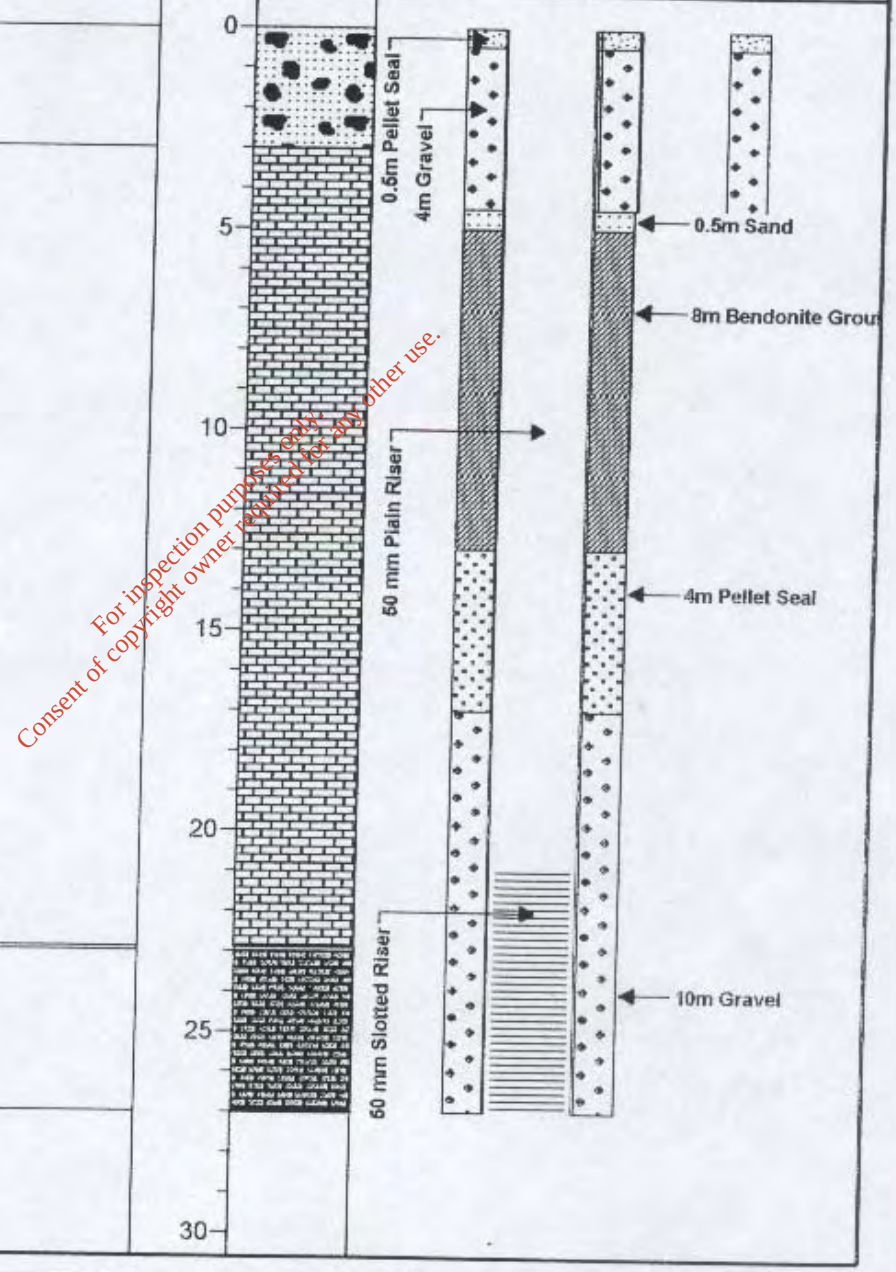
Well No. BH8 New | **Grid Reference** | | **Drill Date** 17/08/01

Project No. 1698 | **Client** Seamus Murphy | **Geologist** F White

Well Type Groundwater Monitoring | **Location** Hollywood Great Quarry

SUBSURFACE PROFILE

Description	Depth	Symbol	Well Construction
Ground Surface	0		
OVERBURDEN Overburden BOULDER CLAY			
SHALE Black SHALE bedrock	5		
	10		
	15		
	20		
SHALE Broken Black SHALE	25		
End of Borehole	30		



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Drill Method Air Rotary | **Hole Size (mm)**

Casing Length (m) | **Ground Level (mOD)**

Driller Glover Site Investigations | **Static Water Level (bgl)**

Well Log

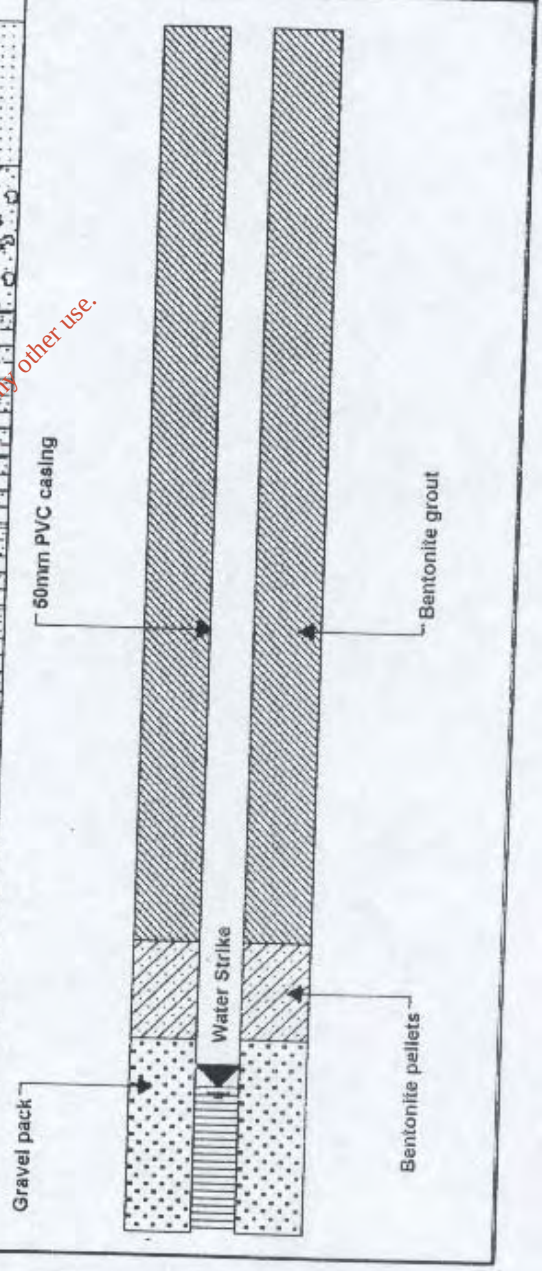
Well No. BH9 **Grid Reference**

Project No. 1698 **Client** Seamus Murphy **Drill Date** 3/8/01

Well Type **Location** Hollywood Great **Geologist** Ben Whitfield

SUBSURFACE PROFILE

Description	Depth	Symbol
Ground Surface		
Colluvium and highly weathered shale black loamy fine to medium sand easy drilling; moist		
light brown/dark brown gravelly medium clay; moist Gravel dominantly black shale Very moist thin layer 10.0 - 10.5 easy to medium drilling		
Shale bedrock black sand to gravel (granulated shale), moist medium drilling		
black sand to gravel, as above gravel sized chips dominant		
brown sand to gravel gravel shale and minor calcareous siltstone minor clay, moist		
black sand to gravel dominantly shale		
black coarse sand to gravel shale chips very moist@42 very easy drilling 40 - 41m Water table 44m Yield 500 gal/hr		
End of Borehole		



M.T.Cullen & Co. Ltd.

Drill Method Air rotary **Hole Size (mm)** 200

Casing Length (m) 50 **Ground Level (mOD)**

Driller Glovers Site Investigations **Static Water Level (bgl)**

Well Log

Well No. BH10 **Grid Reference**

Project No. 1698 **Client** Seamus Murphy **Drill Date** 4/8/01

Well Type **Location** Hollywood Great **Geologist** C Connery

SUBSURFACE PROFILE

Description	Depth	Symbol	Well Construction
Ground Surface			
Boulder clay stiff brown very sandy gravelly clay containing cobbles and boulders	0		
Limestone Bedrock Limestone	5		
	10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
End of Borehole	85		

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Drill Method Air rotary **Hole Size (mm)** 200

Casing Length (m) 84 **Ground Level (mOD)**

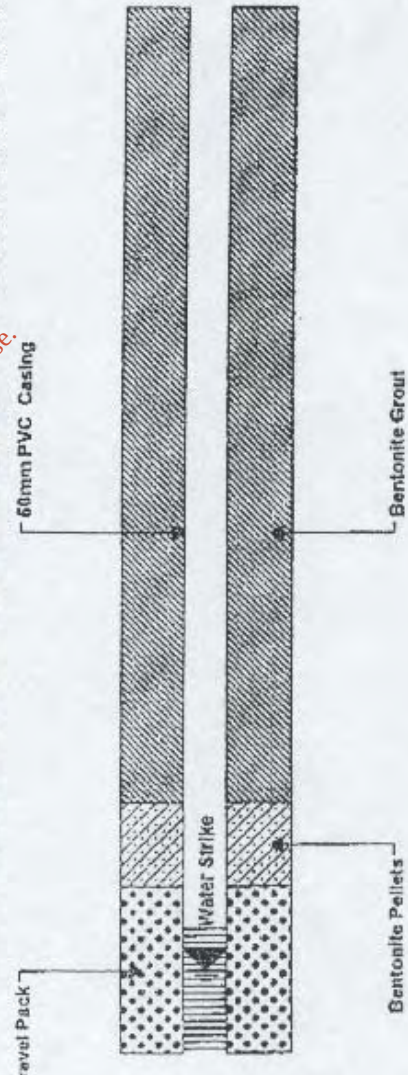
Driller Glovers Site Investigations **Static Water Level (bgl)**

Well Log

Well No. BH11	**Grid Reference**	
Project No. 1698	**Client** Seamus Murphy	**Drill Date** 3/8/01
Well Type	**Location** Hollywood Great	**Geologist** Ben Whitfield

SUBSURFACE PROFILE

Description	Depth (m)	Symbol	Well Construction
Ground Surface	0.0		
Fill Fill			
Clay Firm to stiff grey brown sandy gravelly CLAY containing cobbles and boulders	5.0		
	10.0		
Shale Brown SHALE	15.0		
	20.0		
Shale Black SHALE	25.0		
	30.0		
	35.0		
	40.0		
	45.0		
	50.0		
	55.0		



White Young Green

Drill Method Air Rotary — Hole Size (mm) 200

Casing Length (m) 50 — TOC (mOD)

Driller Glovers Site Investigations — Static Water Level (bgl)

Appendix C

Chemical Analysis of Ground Water and Surface Water

Surface water 1: Chemical Analysis of Surface Water.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439	Surface water	Salmonid water	Quarter 2	Quarter 4	Quarter 2	Quarter 4	Quarter 2	Quarter 4	Quarter 1	Quarter 4
DATE OF SAMPLE	-		-	Drinking Water	regulations Class 3	regulations	2003 (Baseline)	2003	2004	2004	2005	2005	2006	2006
FIELD ANALYSIS														
General Water Quality Parameters														
Conductivity @ 25°C	**uS/cm**	1000	2500	2500	1	N/A	-	-	-	-	-	-	290	653
Dissolved Oxygen	**O_2 mg/l**	-	-	-	N/A	>9	-	-	-	-	-	-	9.33	7.74
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	5.5 – 9.0	6 – 9	-	-	-	-	-	-	8.07	7.93
LABORATORY ANALYSIS														
General Water Quality Parameters														
Temperature	**deg C**	-	-	-	>25	N/A	-	-	-	10	-	11	9.1	12
Conductivity @ 20°C	**uS/cm**	1000	2500	2500	1	N/A	446	545	251	579	499	958	-	-
Dissolved Oxygen	**O_2 mg/l**	-	-	-	N/A	>9	5.7	5.3	5.3	5.9	6.6	5.4	-	-
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	5.5 – 9.0	6 – 9	7.7	7.74	7.29	7.93	7.91	7.48	-	-
Total Alkalinity	**$CaCO_3$ mg/l**	-	-	-	N/A	N/A	-		210	-	-	180	-	-
Total Suspended Solids	**mg/l**	1,500	-	-	-	25	60	<10	16	<10	85	15	33	<10
COD	**mg/l**	-	-	-	40	N/A	16	<15	<15	18	<15	31	<15	17
Inorganics														
Ammoniacal Nitrogen	**N mg/l**	**-**	-	0.2329494	3.11	0.7	**0.3**	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloride	**Cl mg/l**	30	250	250	250	N/A	53	38	18	43	39	45	41	41
Orthophosphate	**PO_4 mg/l**	-	-	-	N/A	N/A	-	-	0.72	-	-	0.05	-	-
Sodium	**Na mg/l**	10.8	200	200	N/A	N/A	-	-	19	-	-	25	-	-
Sulphate	**SO_4 mg/l**	15	250	250	200	N/A	-	-	31	-	-	**299**	-	-
Metals														
Magnesium	**Mg mg/l**	50	-	-	N/A	N/A	-	-	<0.05	-	-	16.82	-	-
Manganese	**Mn mg/l**	0.05	0.05	0.05	1	N/A	-	-	0.006	-	-	0.308	-	-
List I/II														
Total 6 PAHs1	**mg/l**	-	-	0.001	0.001	N/A	-	-	-	<0.2	-	-	-	-

LEGEND

- = No data reported or no analyses conducted

< = Less Than

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Bold text= exeedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

Surface water 2: Chemical Analysis of Surface Water.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439	Surface water	Salmonid water	Quarter 2	Quarter 4	Quarter 2	Quarter 4	Quarter 2	Quarter 4	Quarter 2	Quarter 4
DATE OF SAMPLE	-		-	Drinking Water	regulations Class 3	regulations	2003 (Baseline)	2003	2004	2004	2005	2005	2006	2006
FIELD ANALYSIS														
General Water Quality Parameters														
Conductivity @ 25°C	**uS/cm**	1000	2500	2500	1	N/A	-	-	-	-	-	-	668	798
Dissolved Oxygen	**O_2 mg/l**	-	-	-	N/A	>9	-	-	-	-	-	-	9.13	8.66
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	5.5 – 9.0	6 – 9	-	-	-	-	-	-	8.12	8.12
LABORATORY ANALYSIS														
General Water Quality Parameters														
Temperature	**deg C**	-	-	-	>25	N/A	-	-	10	-	-	-	10.7	11.5
Conductivity @ 20°C	**uS/cm**	1000	2500	2500	1	N/A	375	457	671	700	753	1223		
Dissolved Oxygen	**O_2 mg/l**	-	-	-	N/A	>9	6	9.4	5.3	6.1	7.6	5.9		
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	5.5 – 9.0	6 – 9	7.8	7.57	8.24	8.15	8.12	7.57	8.12	8.12
Total Alkalinity	**$CaCO_3$ mg/l**	-	-	-	N/A	N/A	-	-	270	-	130	-	-	
Total Suspended Solids	**mg/l**	1,500	-	-	-	25	<10	<10	<10	<10	17	31	131	<10
COD	**mg/l**	-	-	-	40	N/A	<15	<15	<15	<15	<15	18	<15	<15
Inorganics														
Ammoniacal Nitrogen	**N mg/l**	**-**	-	0.2329494	3.11	0.7	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2
Chloride	**Cl mg/l**	30	250	250	250	N/A	42	41	30	38	34	61	38	33
Orthophosphate	**PO_4 mg/l**	-	-	-	N/A	N/A	-	-	0.29	-	<0.03	-	-	-
Sodium	**Na mg/l**	10.8	200	200	N/A	N/A	-	-	15.5	-	32.5	-	-	-
Sulphate	**SO_4 mg/l**	15	250	250	200	N/A	-	-	110	-	**254**	-	-	-
Metals														
Magnesium	**Mg mg/l**	50	-	-	N/A	N/A	-	-	<0.05	-	17.76	-	-	-
Manganese	**Mn mg/l**	0.05	0.05	0.05	1	N/A	-	-	0.011	-	0.018	-	-	-
List I/II														
Total 6 PAHs1	**mg/l**	-	-	0.001	0.001	N/A	-	-	-	<0.2	-	-	-	-

LEGEND

- = No data reported or no analyses conducted

< = Less Than

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Bold text= exeedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

Surface water LC 1: Chemical Analysis of Surface Water.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439	Surface water	Salmonid water	Quarter 3	Quarter 2	Quarter 3	Quarter 1	Quarter 3
DATE OF SAMPLE	**-**		**-**	**Drinking Water**	**regulations Class 3**	**regulations**	**2004**	**2005**	**2005**	**2006**	**2006**
FIELD ANALYSIS											
General Water Quality Parameters											
Conductivity @ 25°C	**uS/cm**	1000	2500	2500	1000	N/A	-	-	-	**11800**	-
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	5.5 – 9.0	6 – 9	-	-	-	6.21	6.35
Odour	**-**	-	-	see note 2	N/A	N/A	None	None	None	Musty	None
Colour	**-**	-	-	-	N/A	N/A	Orange, high sediment	Bright yellow - orange / high sediment	Orange tint. High solids, cloudy	Orange	Orange, high sediment
Leachate Level	**m**	-	-	-	N/A	N/A	-	-	93.1	-	93.27
Temperature	**deg C**	25	-	-	N/A	N/A	11	11	13	12	15.2
LABORATORY ANALYSIS											
General Water Quality Parameters											
Conductivity @ 20°C	**uS/cm**	1000	2500	2500	1000	N/A	**8725**	**13160**	**10890**	-	-
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	5.5 – 9.0	6 – 9	7.48	**5.59**	**4.64**	-	-
COD	**mg/l**	-	-	-	40	N/A	61	-	56	18	78
Total Oxidised Nitrogen	**N mg/l**	-	-	-	N/A	N/A	<0.3	2	<0.3	<0.3	<0.3
Inorganics											
Ammoniacal Nitrogen	**N mg/l**	**-**	-	0.2329494	0.11	0.7	**8.7**	**2**	**7.8**	**7.3**	**9**
Chloride	**Cl mg/l**	30	250	250	250	N/A	**2090**	**2787**	**2871**	**1864**	**2555**
Sodium	**Na mg/l**	10.8	200	200	N/A	N/A	**650**	**900**	**2500**	**2720**	**1500**
Sulphate	**SO_4 mg/l**	15	250	250	200	N/A	**1847**	**2901**	**2585**	**2032**	**2101**
Potassium	**K mg/l**	1	-	-	N/A	N/A	150	60	42	81	103
Metals											
Barium	**Ba mg/l**	-	-	-	1	-	<0.05	-	-	-	-
List I/II											
Total 6 PAHs1	**mg/l**	-	-	0.001	0.001	N/A	<0.2	-	-	-	-
Total Phenols	**mg/l**	<0.01	-	-	0.1	-	<0.01	<0.01	<0.01	<0.01	<0.01

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Note 2: Acceptable to consumers & no abnormal change

$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.

Bold text= exeedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

MONITORING WELL BH-4: Chemical Analysis of Groundwater.

PARAMETERS	UNIT	EPA Trigger Levels	MAC	2000 EC S.I.439 Drinking Water	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
DATE OF SAMPLE	-		see note 1		2003 (Baseline)	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006
FIELD ANALYSIS																			
General Water Quality Parameters																			
Colour	-	-	-	-	-	-	Brown	Reddish Brown	Brown	Brown / Sediment	Brown	Brown	Light brown / Sediment	Light brown to clear	Reddish	Brown	Red / High Sediment	Orange / High Sediment	Brown
Conductivity @ 25°C	uS/cm	1000	2500	2500	-	-	-	-	-	-	-	-	-	-	-	-	751	612	636
Dissolved Oxygen	O_2 mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9	2.3	4.34
Odour	-	-	-	see note 2	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	7.46	7.27	7.53
Temperature	deg C	25	-	-	-	-	9	10	9.2	-	9	9	9	9	10	9	9.7	13.4	11.5
Water level	mOD	-	-	-	97.22	96.27	95.85	95.89	94.57	94.01	94.2	93.96	93.78	93.12	93.52	92.89	92.89	92.34	91.92
LABORATORY ANALYSIS																			
General Water Quality Parameters																			
Temperature	deg C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity @ 20°C	uS/cm	1000	2500	2500	577	578	444	565	561	586	722	645	666	612	571	702	-	-	-
Dissolved Oxygen	O_2 mg/l	-	-	-	4.4	8.5	9.1	7.1	3.3	5.7	5.5	-	4.8	4.1	5.4	5.5	-	-	-
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	7.73	7.47	7.33	7.1	7.06	7.56	8.05	7.5	7.73	6.59	7.42	6.9	-	-	-
Total Alkalinity	$CaCO_3$ mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxidised Nitrogen	N mg/l	-	-	-	<0.3	<0.3	<0.03	1.9	0.4	0.4	1.3	0.5	2.6	1.1	<0.3	3.9	5.6	3.9	3.3
Total Solids	mg/l	1,500	-	-	-	-	-	1007	-	-	-	361	-	-	-	790	-	-	-
Total Organic Carbon	C mg/l	-	-	-	14	3	<2	6	4	2	<2	<2	<2	6	5	<2	7	<2	2
COD	mg/l	-	-	-	-	-	158	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																			
Ammoniacal Nitrogen	N mg/l	-	-	0.2329494	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**0.4**	<0.2	**0.3**	<0.2	<0.2	<0.2	<0.2
Calcium	Ca mg/l	200	-	-	116.4	108.4	110.2	78.31	100.7	108	99.9	125	109	95	108	120	34	128	119
Chloride	Cl mg/l	30	250	250	19	25	19	20	18	20	22	20	29	24	20	35	42	27	29
Fluoride	F mg/l	1	1	1[$]	<0.5	-	-	0.3	-	-	-	0.4	-	-	-	0.3	-	-	-
Total Phenols	mg/l	<0.01	-	-	<0.01	0.04	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phosphorous	P mg/l	-	-	-	<0.05	-	-	0.06	-	-	-	<0.05	-	-	-	0.48	-	-	-
Ortho Phosphates	PO_4 mg/l	-	-	-	<0.03	-	-	<0.03	-	-	-	<0.03	-	-	-	0.03	-	-	-
Potassium	K mg/l	1	-	-	1.3	1.4	1.6	1.6	1.6	1.8	1.6	1.2	1.2	1.2	1.6	1.4	1.4	1.6	1.5
Sodium	Na mg/l	10.8	200	200	11.3	13.8	10.6	7.5	11	14	49	13	13	13	10.5	12.5	8.5	15	10
Sulphate	SO_4 mg/l	15	250	250	19	20	18	19	28	22	28	33	40	31	19	51	61	56	57
Metals																			
Boron	B mg/l	1	1	1	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.022	-	-	-
Cadmium	Cd mg/l	0.005	0.005	0.005	<0.0004	-	-	<0.0004	-	-	-	0.0039	-	-	-	0.001	-	-	-
Chromium (Total)	Cr mg/l	0.03	0.05	0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.01	-	-	-
Copper	Cu mg/l	0.03	0	0	<0.005	-	-	**0.005**	-	-	-	<0.005	-	-	-	<0.001	-	-	-
Cyanide (Total)	Cn mg/l	0.01	0.05	0.05	**0.27**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	Fe mg/l	0.2	0.2	0.2	<0.001	0.059	0.002	0.001	0.005	0.007	0.061	0.006	0.005	<0.005	<0.005	0.005	<0.002	<0.002	<0.002
Lead	Pb mg/l	0.01	0.01	0.01	0.006	-	-	<0.005	-	-	-	<0.005	-	-	-	<0.001	-	-	-
Magnesium	Mg mg/l	50	-	-	5.47	-	-	5.46	-	-	-	6.47	-	-	-	6.57	-	-	-
Manganese	Mn mg/l	0.05	0.05	0.05	0.004	**0.151**	**0.068**	**0.081**	**0.203**	**0.254**	0.047	**0.216**	**0.216**	**0.139**	**0.149**	0.008	<0.001	<0.001	0.003
Mercury	Hg mg/l	0.001	0.001	0.001	<0.00005	-	-	<0.00005	-	-	-	<0.00005	-	-	-	<0.00005	-	-	-
Zinc	Zn mg/l	0.1	-	-	<0.005	-	-	<0.005	-	-	-	0.005	-	-	-	0.014	-	-	-
Arsenic	As mg/l	-	-	0.01	<0.2	**0.014**	0.003	**0.025**	0.003	0.002	0.003	0.004	0.001	0.002	0.002	0.003	<0.001	0.005	0.004
Barium	Ba mg/l	-	-	-	-	-	-	-	-	<0.05	<0.05	0.05	0.05	0.04	0.04	0.04	<0.001	0.04	0.04
Bacteria																			
Faecal Coliforms	cfu/100ml	-	-	0	-	-	-	<1	-	-	-	<15	-	-	-	<15	-	-	-
Total Coliforms	cfu/100ml	-	-	0	-	-	-	**2**	-	-	-	<1	-	-	-	**1**	-	-	-
List I/II																			
Semi Volatile Organics + TICS	µg/l	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Semi volatile organic compounds	µg/l	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Organochlorine Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Organophosphorous Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
List 1 and 11 Substances	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Total 6 PAHs	mg/l	-	-	0.001	-	-	-	-	-	<0.2	<0.2	-	-	-	<0.00001	<0.00006	<0.00006	<0.00006	<0.00006

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Note 2: Acceptable to consumers & no abnormal change

$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.

Bold text= exceedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

MONITORING WELL BH-5: Chemical Analysis of Groundwater.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439 Drinking Water	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
DATE OF SAMPLE	-				**2003 (Baseline)**	**2003**	**2003**	**2004**	**2004**	**2004**	**2004**	**2005**	**2005**	**2005**	**2005**	**2006**	**2006**	**2006**	**2006**
FIELD ANALYSIS																			
General Water Quality Parameters																			
Colour	-	-	-	-	-	Clear	Clear	Clear	Blackish Grey	Clear	Dark brown / Black	Dark Black	Black / Oily sheen	Black / Oily Sheen	Black	Black	Black / High Sediment	Black / Oily sheen	Black / Oily sheen
Conductivity @ 25°C	uS/cm	1000	2500	2500	-	-	-	-	-	-	-	-	-	-	-	-	666	582	620
Dissolved Oxygen	O_2 mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.2	2.46	4.16
Odour	-	-	-	see note 2	-	None	None	None	None	None	None	Oily odour	None	None	None	None	None	None	None
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	6.93	6.95	7.71
Temperature	deg C	25	-	-	-	-	-	9.3	10	10	9	10	9	11	10	9	8.6	14.5	10.8
Water level	mOD	-	-	-	99.92	99.39	98.98	99.32	98.28	96.36	95.22	94.45	93.51	93.12	92.87	92.95	92.32	91.82	91.12
LABORATORY ANALYSIS																			
General Water Quality Parameters																			
Temperature	deg C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity @ 20°C	uS/cm	1000	2,500	2,500	485	656	615	648	634	642	765	740	671	654	660	665	-	-	-
Dissolved Oxygen	O_2 mg/l	-	-	-	4.5	9.1	8.9	7.1	3.8	5	6.3	-	2.8	4.1	5.2	4.5	-	-	-
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	7.64	7.31	6.97	6.96	7.06	7.27	7.74	7.13	7.36	7.02	7.06	6.52	-	-	-
Total Alkalinity	$CaCO_3$ mg/l	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxidised Nitrogen	N mg/l	-	-	-	<0.3	<0.3	<0.3	5.5	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.3	0.8
Total Solids	mg/l	1,500	-	-	-	-	888	538	-	-	-	691	-	-	-	1955	-	-	-
Total Organic Carbon	C mg/l	-	-	-	44	2	3	4	5	3	<2	3	5	11	7	3	5	<2	4
COD	mg/l	-	-	-	-	-	334	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																			
Ammoniacal Nitrogen	N mg/l	-	-	0.2329494	**0.3**	<0.2	**0.4**	<0.2	<0.2	<0.2	<0.2	<0.2	**0.4**	0.2	<0.2	0.2	<0.2	**0.8**	0.2
Calcium	Ca mg/l	200	-	-	106.5	116.3	117.5	104.8	101.8	105.6	92.49	117	108	106.1	119	111	116	113	131
Chloride	Cl mg/l	30	250	250	22	31	24	25	23	23	22	22	24	23	23	23	24	24	22
Fluoride	F mg/l	1	1	1[$]	<0.5	-	-	0.5	-	-	-	0.5	-	-	-	0.5	-	-	-
Total Phenols	mg/l	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phosphorous	P mg/l	-	-	-	1.19	-	-	2.38	-	-	-	0.96	-	-	-	2.49	-	-	-
Ortho Phosphates	PO_4 mg/l	-	-	-	<0.03	-	-	<0.03	-	-	-	1.43	-	-	-	2	-	-	-
Potassium	K mg/l	1	-	-	1.4	1.2	1.4	1.6	1.4	1.8	1.6	1.4	1.2	1.2	1.4	1.3	1.4	1.3	1.3
Sodium	Na mg/l	10.8	200	200	25	19	20.4	32	20.5	13.5	18	43	17	22	18	18	14	19	14
Sulphate	SO_4 mg/l	15	250	250	18	20	21	20	23	24	22	36	28	29	28	27	26	26	24
Metals																			
Boron	B mg/l	1	1	1	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.022	-	-	-
Cadmium	Cd mg/l	0.005	0.005	0.005	<0.0004	-	-	<0.0004	-	-	-	**0.0054**	-	-	-	0.003	-	-	-
Chromium (Total)	Cr mg/l	0.03	0.05	0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.01	-	-	-
Copper	Cu mg/l	0.03	0	0	<0.005	-	-	**0.005**	-	-	-	<0.005	-	-	-	**0.009**	-	-	-
Cyanide (Total)	Cn mg/l	0.01	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.05
Iron	Fe mg/l	0.2	0.2	0.2	<0.001	0.023	<0.001	0.001	<0.001	0.006	0.051	0.005	<0.005	<0.005	0.005	<0.002	<0.002	<0.002	<0.002
Lead	Pb mg/l	0.01	0.01	0.01	<0.005	-	-	0.001	-	-	-	0.001	-	-	-	0.005	-	-	-
Magnesium	Mg mg/l	50	-	-	8.52	-	-	10.66	-	-	-	12.57	-	-	-	11.18	-	-	-
Manganese	Mn mg/l	0.05	0.05	0.05	**0.137**	**0.164**	**0.178**	**0.217**	**0.197**	**0.173**	**0.159**	**0.19**	**0.175**	**0.179**	**0.212**	**0.199**	**0.182**	**0.172**	**0.267**
Mercury	Hg mg/l	0.001	0.001	0.001	<0.00005	-	-	<0.00005	-	-	-	<0.00005	-	-	-	<0.00005	-	-	-
Zinc	Zn mg/l	0.1	-	-	0.017	-	-	<0.005	-	-	-	<0.005	-	-	-	0.01	-	-	-
Arsenic	As mg/l	-	-	0.01	<0.002	0.006	0.006	0.007	0.008	0.005	0.006	<0.002	0.009	0.007	0.007	0.008	0.007	0.006	0.009
Barium	Ba mg/l	-	-	-	-	-	-	-	-	0.05	0.05	0.07	0.07	0.057	0.067	0.06	0.07	0.07	0.07
Bacteria																			
Faecal Coliforms	cfu/100ml	-	-	0	-	-	-	<1	-	-	-	<15	-	-	-	**66**	-	-	-
Total Coliforms	cfu/100ml	-	-	0	-	-	-	**1**	-	-	-	<1	-	-	-	<1	-	-	-
List I/II																			
Semi Volatile Organics + TICS	µg/l	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Semi volatile organic compounds	µg/l	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Organochlorine Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Organophosphorous Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
List 1 and 11 Substances	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Total 6 PAHs	mg/l	-	-	0.001	-	-	-	-	-	<0.2	<0.2	-	-	-	-	<0.00006	<0.00006	<0.00006	<0.00001

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Note 2= Acceptable to consumers & no abnormal change

$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.

Bold text= exceedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

MONITORING WELL BH-6: Chemical Analysis of Groundwater.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439 Drinking Water	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
DATE OF SAMPLE	-				2003 (Baseline)	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006
FIELD ANALYSIS																			
General Water Quality Parameters																			
Colour	-	-	-	-	-	Clear	Slightly Brown	Clear	Black	Black / Sediment	Black	Black Oily Film	Black Oily Film	Black Oily Film	Black Oily Film	Clear	Clear	Clear / Trace of Sediment	Light brown / yellow
Conductivity @ 25°C	uS/cm	1000	2500	2500	-	-	-	-	-	-	-	-	-	-	-	-	745	624	647
Dissolved Oxygen	O_2 mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.54	3.39	1.55
Odour	-	-	-	see note 2	-	None	None	None	None	None	None	None	None	None	None	None	None	None	None
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	7.12	7.06	7.22
Temperature	deg C	25	-	-	-	-	-	9.1	9	9	9	8	8	11	10	8	10.4	12.7	10.6
Water level	mOD	-	-	-	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31	117.31
LABORATORY ANALYSIS																			
General Water Quality Parameters																			
Temperature	deg C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity @ 20°C	uS/cm	1000	2,500	2,500	725	747	553	737	724	767	879	793	737	739	731	745	-	-	-
Dissolved Oxygen	O_2 mg/l	-	-	-	4.6	8.3	9.3	7.2	4.3	6.7	6	-	4.3	8	5.4	5.9	-	-	-
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	7.49	7.47	7.17	7.21	7.04	7.47	8.18	7.52	7.75	6.79	7.54	6.89	-	-	-
Total Alkalinity	$CaCO_3$ mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxidised Nitrogen	N mg/l	-	-	-	<0.3	<0.3	<0.3	0.6	<0.3	<0.3	<0.3	0.4	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	<0.3
Total Solids	mg/l	1,500	-	-	-	-		1668	-	-	-	414	-	-	-	358	-	-	-
Total Organic Carbon	C mg/l	-	-	-	36	<2	<2	<2	4	2	<2	<2	<2	4	6	<2	3	<2	<2
COD	mg/l	-	-	-	-	-	37	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																			
Ammoniacal Nitrogen	N mg/l	-	-	0.2329494	**0.3**	**0.4**	**0.3**	**0.4**	<0.2	**0.3**	0.2	**0.4**	**0.4**	**0.3**	<0.2	**0.3**	0.2	0.2	**0.4**
Calcium	Ca mg/l	200	-	-	117	107.8	121.1	61.02	105.9	117.2	102.6	130.1	88.83	95.32	113.1	105.9	125.8	111.7	110
Chloride	Cl mg/l	30	250	250	18	29	20	22	20	21	19	20	20	19	20	20	21	21	20
Fluoride	F mg/l	1	1	1[$]	<0.5	-	-	0.3	-	-	-	0.4	-	-	-	0.4	-	-	-
Total Phenols	mg/l	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phosphorous	P mg/l	-	-	-	0.08	-	-	1.37	-	-	-	0.11	-	-	-	0.07	-	-	-
Ortho Phosphates	PO_4 mg/l	-	-	-	<0.03	-	-	<0.03	-	-	-	<0.03	-	-	-	0.03	-	-	-
Potassium	K mg/l	1	-	-	5.6	6.6	7	6.8	6.4	8	6.8	8.2	7.2	7	6.4	6.1	6	5.7	5.5
Sodium	Na mg/l	10.8	200	200	24.5	19.5	27.5	21	21	14	18.5	22	19	21	18.5	17.5	20	23	16.5
Sulphate	SO_4 mg/l	15	250	250	51	61	44	45	46	54	49	45	41	47	48	46	51	36	35
Metals																			
Boron	B mg/l	1	1	1	<0.05	-	-	<0.05	-	-	-	0.06	-	-	-	0.076	-	-	-
Cadmium	Cd mg/l	0.005	0.005	0.005	<0.0004	-	-	0.0007	-	-	-	0.0049	-	-	-	<0.001	-	-	-
Chromium (Total)	Cr mg/l	0.03	0.05	0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.01	-	-	-
Copper	Cu mg/l	0.03	0	0	<0.005	-	-	**0.005**	-	-	-	<0.005	-	-	-	**0.013**	-	-	-
Cyanide (Total)	Cn mg/l	0.01	0.05	0.05	0.28	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	Fe mg/l	0.2	0.2	0.2	0.007	0.021	<0.001	<0.001	<0.001	0.005	0.055	0.005	0.196	<0.005	0.011	<0.002	<0.002	<0.002	<0.002
Lead	Pb mg/l	0.01	0.01	0.01	<0.005	-	-	0.001	-	-	-	<0.005	-	-	-	<0.001	-	-	-
Magnesium	Mg mg/l	50	-	-	17.01	-	-	19.24	-	-	-	21.66	-	-	-	19.07	-	-	-
Manganese	Mn mg/l	0.05	0.05	0.05	0.025	**0.257**	**0.207**	**0.303**	**0.365**	**0.427**	0.039	**0.453**	**0.406**	**0.17**	**0.309**	**0.282**	**0.277**	<0.001	<0.001
Mercury	Hg mg/l	0.001	0.001	0.001	<0.00005	-	-	<0.00005	-	-	-	<0.00005	-	-	-	<0.00005	-	-	-
Zinc	Zn mg/l	0.1	-	-	<0.005	-	-	<0.005	-	-	-	0.007	-	-	-	0.017	-	-	-
Arsenic	As mg/l	-	-	0.01	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.091**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	Ba mg/l	-	-	-	-	-	-	-	-	0.05	0.05	0.08	0.21	0.05	0.06	0.05	0.06	0.05	0.05
Bacteria																			
Faecal Coliforms	cfu/100ml	-	-	0	-	-	-	<1	-	-	-	<15	-	-	-	<15	-	-	-
Total Coliforms	cfu/100ml	-	-	0	-	-	-	<1	-	-	-	**1**	-	-	-	<1	-	-	-
List I/II																			
Semi Volatile Organics + TICS	µg/l	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Semi volatile organic compounds	µg/l	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Organochlorine Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Organophosphorous Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
List 1 and 11 Substances	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Total 6 PAHs	mg/l	-	-	0.001	-	-	-	-	-	<0.2	<0.2	-	-	-	-	<0.00006	<0.00006	<0.00006	<0.00001

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Note 2= Acceptable to consumers & no abnormal change

$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.

Bold text= exceedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

MONITORING WELL BH-8 (Shallow): Chemical Analysis of Groundwater.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439 Drinking Water	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
DATE OF SAMPLE	**-**				**2003 (Baseline)**	**2003**	**2003**	**2004**	**2004**	**2004**	**2004**	**2005**	**2005**	**2005**	**2005**	**2006**	**2006**	**2006**	**2006**
FIELD ANALYSIS																			
General Water Quality Parameters																			
Colour	**-**	-	-	-	-	Very Brown / High Sediment	Brown / High Sediment	Brown	High Sediment	Brown / High Sediment	Brown / High Sediment	Brown / High Sediment	Brown / High Sediment	Dry	Brown	Brown	Dark Brown / High Sediment	Dry	Brown
Conductivity @ 25°C	**uS/cm**	1000	2500	2500	-	-	-	-	-	-	-	-	-	-	-	-	211	Dry	525
Dissolved Oxygen	**O_2 mg/l**	-	-		-	-	-	-	-	-	-	-	-	-	-	-	5.88	Dry	3.89
Odour	**-**	-	-	see note 2	-	None	None	None	None	None	None	None	None	Dry	None	None	None	Dry	None
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	**6.11**	Dry	6.6
Temperature	**deg C**	25	-	-	-	-	-	10	10	11	10	10	9	Dry	12	9	11.1	Dry	13.6
Water level	**mOD**				133.36	133.49	133.59	133.45	132.88	133.44	133.38	133.15	133.44	Dry	132.38	133.23	133.53	Dry	133.46
LABORATORY ANALYSIS																			
General Water Quality Parameters																			
Temperature	**deg C**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity @ 20°C	**uS/cm**	1000	2,500	2,500	442	618	373	422	557	440	540	606	455	Dry	748	633	-	-	-
Dissolved Oxygen	**O_2 mg/l**	-	-	-	4.8	7.8	9	7.1	3.5	5.8	5.2	-	5.8	Dry	5.7	4.6	-	-	-
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	6.79	6.77	**6.33**	**6.22**	**6.34**	**6.43**	6.67	**6.47**	6.74	Dry	6.73	**5.9**	-	-	-
Total Alkalinity	**$CaCO_3$ mg/l**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxidised Nitrogen	**N mg/l**	-	-	-	10.7	4.4	10	10	8.2	11	10.8	7.9	9.7	Dry	16.2	8	8.9	Dry	5.1
Total Solids	**mg/l**	1,500	-	-	-	-		579	-	-	-	382	-	-	-	2710	-	-	-
Total Organic Carbon	**C mg/l**	-	-	-	5	8	6	5	7	8	7	5	6	Dry	12	5	5	Dry	8
COD	**mg/l**	-	-	-	-	-	190	-	-	-	-	-	-	Dry	-	-	-	Dry	-
Inorganics																			
Ammoniacal Nitrogen	**N mg/l**	**-**	-	0.2329494	0.2	**0.3**	**0.9**	**0.3**	<0.2	**0.9**	**0.7**	<0.2	<0.2	Dry	<0.2	<0.2	<0.2	Dry	<0.2
Calcium	**Ca mg/l**	200	-	-	40.84	86.89	53.32	33.19	71.56	43.91	40.46	28.01	42.81	Dry	109.6	74.65	44.73	Dry	79.68
Chloride	**Cl mg/l**	30	250	250	58	24	46	57	26	49	53	42	58	Dry	31	39	60	Dry	28
Fluoride	**F mg/l**	1	1	1[$]	<0.5	-	-	0.1	-	-	-	<0.1	-	-	-	<0.01	-	-	-
Total Phenols	**mg/l**	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Dry	<0.01	<0.01	<0.01	Dry	<0.01
Total Phosphorous	**P mg/l**	-	-	-	<0.05	-	-	0.27	-	-		0.18	-	-	-	2.02	-	-	-
Ortho Phosphates	**PO_4 mg/l**	-	-	-	<0.03	-	-	<0.03	-	-		0.03	-	-	-	0.12	-	-	-
Potassium	**K mg/l**	1	-	-	2.3	8.8	5.6	2.6	4.4	4.6	3.4	3.8	2	Dry	5.6	3.8	3.8	Dry	5.1
Sodium	**Na mg/l**	10.8	200	200	26	20	29.5	29.5	23.5	17.5	23.5	36	25	Dry	26.5	26.5	27.5	Dry	18
Sulphate	**SO_4 mg/l**	15	250	250	66	187	73	33	134	59	50	122	52	Dry	172	171	74	Dry	142
Metals																			
Boron	**B mg/l**	1	1	1	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.026	-	-	-
Cadmium	**Cd mg/l**	0.005	0.005	0.005	0.0004	-	-	<0.0004	-	-	-	0.0036	-	-	-	<0.001	-	-	-
Chromium (Total)	**Cr mg/l**	0.03	0.05	0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.004	-	-	-
Copper	**Cu mg/l**	0.03	0	0	<0.005	-	-	<0.005	-	-	-	**0.005**	-	-	-	<0.001	-	-	-
Cyanide (Total)	**Cn mg/l**	0.01	0.05	0.05	**0.47**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Dry	<0.05	<0.05	<0.05	Dry	<0.05
Iron	**Fe mg/l**	0.2	0.2	0.2	0.042	0.028	0.022	0.008	<0.001	0.032	0.097	0.007	<0.005	Dry	0.011	0.008	<0.002	Dry	<0.002
Lead	**Pb mg/l**	0.01	0.01	0.01	<0.005	-	-	<0.005	-	-	-	<0.005	-	-	-	<0.001	-	-	-
Magnesium	**Mg mg/l**	50	-	-	6.69	-	-	7.45	-	-	-	12.86	-	-	-	13.14	-	-	-
Manganese	**Mn mg/l**	0.05	0.05	0.05	0.087	**0.177**	**0.105**	**0.146**	**0.219**	**0.207**	0.002	0.034	0.021	Dry	**0.054**	**0.099**	0.005	Dry	0.012
Mercury	**Hg mg/l**	0.001	0.001	0.001	<0.00005	-	-	<0.00005	-	-	-	<0.00005	-	-	-	<0.00005	-	-	-
Zinc	**Zn mg/l**	0.1	-	-	0.021	-	-	<0.005	-	-	-	0.014	-	-	-	0.021	-	-	-
Arsenic	**As mg/l**	-	-	0.01	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.001	Dry	<0.001	<0.001	<0.001	Dry	<0.001
Barium	**Ba mg/l**	-	-	-	-	-	-	-	-	0.05	<0.05	0.08	0.04	Dry	0.088	0.074	0.053	Dry	0.054
Bacteria																			
Faecal Coliforms	**cfu/100ml**	-	-	0	-	-	-	<1	-	-	-	<15	-	-	-	<15	-	-	-
Total Coliforms	**cfu/100ml**	-	-	0	-	-	-	**13**	-	-	-	<1	-	-	-	<1	-	-	-
List I/II																			
Semi Volatile Organics + TICS	**µg/l**	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Semi volatile organic compounds	**µg/l**	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Organochlorine Pesticides	**µg/l**	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Organophosphorous Pesticides	**µg/l**	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
List 1 and 11 Substances	**µg/l**	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Total 6 PAHs	**mg/l**	-	-	0.001	-	-	-	-	-	<0.2	<0.2	-	-	Dry	-	<0.00006	<0.00006	Dry	<0.00001

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Note 2= Acceptable to consumers & no abnormal change

$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.

Bold text= exceedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

MONITORING WELL BH-9: Chemical Analysis of Groundwater.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439 Drinking Water	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
DATE OF SAMPLE	-				2003 (Baseline)	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006
FIELD ANALYSIS																			
General Water Quality Parameters																			
Colour	-	-	-	-	-	Clear	Clear	Clear	Clear	Slightly Brown	Clear	Light Yellow	Clear / Light brown	Light brown	Light brown	Clear - Yellow	Clear - Yellow	Clear - Yellow	Light Brown
Conductivity @ 25°C	uS/cm	1000	2500	2500	-	-	-	-	-	-	-	-	-	-	-	-	251	449	458
Dissolved Oxygen	O_2 mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.67	1.61	2.74
Odour	-	-	-	see note 2	-	None	None	None	None	None	None	None	None	None	None	None	None	None	None
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	6.76	6.9	7.01
Temperature	deg C	25	-	-	-	-	-	9.1	10	10	9	10	9	10	10	10	11.4	13.5	12
Water level	mOD	-	-	-	103.22	102.64	102.37	103.97	103.37	102.22	103.21	103.92	103.41	102.46	101.4	102.87	102.71	102.39	101.2
LABORATORY ANALYSIS																			
General Water Quality Parameters																			
Temperature	deg C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity @ 20°C	uS/cm	1000	2,500	2,500	516	569	419	525	520	502	638	633	626	529	504	519	-	-	-
Dissolved Oxygen	O_2 mg/l	-	-	-	5.2	8.3	9.1	7	4.3	5.4	5.6	-	3.2	3.4	5.6	5.5	-	-	-
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5	7.22	7.14	6.8	6.67	6.57	7.04	7.17	7	7.25	**6.27**	6.94	6.52	-	-	-
Total Alkalinity	$CaCO_3$ mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxidised Nitrogen	N mg/l	-	-	-	<0.3	<0.3	<0.3	0.6	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total Solids	mg/l	1,500	-	-	-	-		346	-	-	-	334	-	-	-	334	-	-	-
Total Organic Carbon	C mg/l	-	-	-	27	3	3	4	6	3	2	3	3	7	6	3	4	2	4
COD	mg/l	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																			
Ammoniacal Nitrogen	N mg/l	-	-	0.2329494	<0.2	<0.2	<0.2	**0.3**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**0.3**	<0.2	<0.2	0.2	<0.2
Calcium	Ca mg/l	200	-	-	78.73	87.83	97.42	81.15	81.57	89.39	85.78	111	93	83	97.59	88.55	94.36	95.32	93.27
Chloride	Cl mg/l	30	250	250	40	31	19	20	18	20	20	20	29	21	20	21	22	21	18
Fluoride	F mg/l	1	1	1[$]	<0.5	-	-	0.4	-	-	-	0.2	-	-	-	0.1	-	-	-
Total Phenols	mg/l	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phosphorous	P mg/l	-	-	-	<0.05	-	-	0.27	-	-	-	0.15	-	-	-	0.23	-	-	-
Ortho Phosphates	PO_4 mg/l	-	-	-	<0.03	-	-	<0.03	-	-	-	0.074	-	-	-	<0.003	-	-	-
Potassium	K mg/l	1	-	-	0.7	1	0.6	0.6	0.8	1	0.8	0.4	0.8	0.8	0.7	0.6	0.5	0.6	0.6
Sodium	Na mg/l	10.8	200	200	14.5	17.5	26.5	44.5	19	8.7	13.8	27	19	16	15	14.5	15.5	18.5	12.5
Sulphate	SO_4 mg/l	15	250	250	34	59	44	34	35	31	46	50	73	42	35	37	39	38	34
Metals																			
Boron	B mg/l	1	1	1	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.013	-	-	-
Cadmium	Cd mg/l	0.005	0.005	0.005	<0.0004	-	-	<0.0004	-	-	-	0.0037	-	-	-	<0.001	-	-	-
Chromium (Total)	Cr mg/l	0.03	0.05	0.05	<0.001	-	-	<0.05	-	-	-	<0.05	-	-	-	0.006	-	-	-
Copper	Cu mg/l	0.03	0	0	<0.005	-	-	<0.005	-	-	-	**0.005**	-	-	-	<0.001	-	-	-
Cyanide (Total)	Cn mg/l	0.01	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	Fe mg/l	0.2	0.2	0.2	**0.49**	0.023	0.004	<0.001	<0.001	0.004	0.054	0.003	<0.005	<0.005	0.006	0.009	**0.01**	<0.002	<0.002
Lead	Pb mg/l	0.01	0.01	0.01	<0.005	-	-	<0.005	-	-	-	<0.001	-	-	-	<0.005	-	-	-
Magnesium	Mg mg/l	50	-	-	3.65	-	-	6.66	-	-	-	5.87	-	-	-	4.03	-	-	-
Manganese	Mn mg/l	0.05	0.05	0.05	0.022	**0.055**	0.033	**0.08**	**0.067**	0.02	0.007	**0.066**	**0.147**	0.024	0.007	0.021	0.022	<0.001	<0.001
Mercury	Hg mg/l	0.001	0.001	0.001	<0.00005	-	-	<0.00005	-	-	-	<0.00005	-	-	-	<0.00005	-	-	-
Zinc	Zn mg/l	0.1	-	-	0.023	-	-	<0.005	-	-	-	0.009	-	-	-	0.018	-	-	-
Arsenic	As mg/l	-	-	0.01	<0.05	<0.002	<0.002	0.006	<0.002	0.004	0.005	**0.024**	<0.001	0.006	0.003	0.003	0.002	0.005	0.004
Barium	Ba mg/l	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	0.015	0.005	0.006	0.004	0.003	0.005	0.004
Bacteria																			
Faecal Coliforms	cfu/100ml	-	-	0	-	-	-	**5**	-	-	-	<15	-	-	-	<15	-	-	-
Total Coliforms	cfu/100ml	-	-	0	-	-	-	**60**	-	-	-	<1	-	-	-	<1	-	-	-
List I/II																			
Semi Volatile Organics + TICS	µg/l	-	-		-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Semi volatile organic compounds	µg/l	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Organochlorine Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Organophosphorous Pesticides	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
List 1 and 11 Substances	µg/l	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Total 6 PAHs	mg/l	-	-	0.001	-	-	-	-	-	<0.2	<0.2	-	-	-	-	<0.00006	<0.00006	<0.00006	<0.00001

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Note 2= Acceptable to consumers & no abnormal change

$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.

Bold text= exceedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

MONITORING WELL BH-10: Chemical Analysis of Groundwater.

This borehole was dry for all the monitoring quarters

PARAMETERS	UNIT	EPA Trigger Levels	MAC	2000 EC S.I.439	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
DATE OF SAMPLE	-		see note 1	Drinking Water	2003 (Baseline)	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006
FIELD ANALYSIS																			
General Water Quality Parameters																			
Colour	-	-	-	-															
Conductivity @ 25°C	uS/cm	1000	2500	2500															
Dissolved Oxygen	O_2 mg/l	-	-																
Odour	-	-	-	see note 2															
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5															
Temperature	deg C	25	-	-															
Water level	mOD																		
LABORATORY ANALYSIS																			
General Water Quality Parameters																			
Temperature	deg C	-	-	-															
Conductivity @ 20°C	uS/cm	1000	2,500	2,500															
Dissolved Oxygen	O_2 mg/l	-	-																
pH	pH Units	6.5-9.5	6.5-9.5	6.5-9.5															
Total Alkalinity	$CaCO_3$ mg/l	-	-																
Total Oxidised Nitrogen	N mg/l	-	-	-															
Total Solids	mg/l	1,500	-	-															
Total Organic Carbon	C mg/l	-	-	-															
COD	mg/l																		
Inorganics																			
Ammoniacal Nitrogen	N mg/l	-	-	0.2329494															
Calcium	Ca mg/l	200	-	-															
Chloride	Cl mg/l	30	250	250															
Fluoride	F mg/l	1	1	1$^{\$}$															
Total Phenols	mg/l	<0.01	-	-															
Total Phosphorous	P mg/l	-	-	-															
Ortho Phosphates	PO_4 mg/l	-	-																
Potassium	K mg/l	1	-	-															
Sodium	Na mg/l	10.8	200	200															
Sulphate	SO_4 mg/l	15	250	250															
Total 6 PAHs1	mg/l			0.001															
Metals																			
Boron	B mg/l	1	1	1															
Cadmium	Cd mg/l	0.005	0.005	0.005															
Chromium (Total)	Cr mg/l	0.03	0.05	0.05															
Copper	Cu mg/l	0.03	0	0															
Cyanide (Total)	Cn mg/l	0.01	0.05	0.05															
Iron	Fe mg/l	0.2	0.2	0.2															
Lead	Pb mg/l	0.01	0.01	0.01															
Magnesium	Mg mg/l	50	-																
Manganese	Mn mg/l	0.05	0.05	0.05															
Mercury	Hg mg/l	0.001	0.001	0.001															
Zinc	Zn mg/l	0.1	-																
Arsenic	As mg/l			0.01															
Barium	Ba mg/l																		
Bacteria																			
Faecal Coliforms	cfu/100ml			0															
Total Coliforms	cfu/100ml			0															
List I/II																			
Semi Volatile Organics + TICS	µg/l																		
Semi volatile organics	µg/l																		
Semi volatilie organic compounds	µg/l																		
Organochlorine Pesticides	µg/l																		
Organophosphorous Pesticides	µg/l																		
List 1 and 11 Substances	µg/l																		

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)
Note 2= Acceptable to consumers & no abnormal change
$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.
Bold text= exceedance of 2000 EC S.I. 439 limit.
Underlined text= Detection limit above 2000 EC S.I. 439 limit.

MONITORING WELL BH-11: Chemical Analysis of Groundwater.

PARAMETERS	UNIT	EPA Trigger Levels	MAC see note 1	2000 EC S.I.439 Drinking Water	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
DATE OF SAMPLE	**-**				**2003 (Baseline)**	**2003**	**2003**	**2004**	**2004**	**2004**	**2004**	**2005**	**2005**	**2005**	**2005**	**2006**	**2006**	**2006**	**2006**
FIELD ANALYSIS																			
General Water Quality Parameters																			
Colour	**-**	-	-	-	-	Slightly Brown	Slightly Brown	Black	Blackish Grey	Clear	Brown	Clear	Clear	Slightly cloudy	Slightly cloudy	Clear	Clear	Slightly yellow	Yellow particles
Conductivity @ 25°C	**uS/cm**	1000	2500	2500	-	-	-	-	-	-	-	-	-	-	-	-	438	441	491
Dissolved Oxygen	**O_2 mg/l**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.68	2.81	2.85
Odour	**-**	-	-	see note 2	-	None	None	None	None	None	None	None	None	Slight Odour	Slight "eggy smell"	Slight "eggy smell"	Slight "eggy smell"	Slight "eggy smell"	Slight "eggy smell"
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	6.69	6.96	7.45
Temperature	**deg C**	25	-	-	-	-	-	9.2	11	10	9	10	9	10	10	9	10.4	12.8	10.9
Water level	**mOD**	-	-	-	100.07	99.59	99.24	99.44	98.28	95.73	94.08	96.78	95.9	95.53	95.31	92.28	91.78	91.26	90.52
LABORATORY ANALYSIS																			
General Water Quality Parameters																			
Temperature	**deg C**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity @ 20°C	**uS/cm**	1000	2,500	2,500	373	328	251	336	341	338	389	500	410	530	447	430	-	-	-
Dissolved Oxygen	**O_2 mg/l**	-	-	-	5	7.4	9.3	7	4.8	6.3	6.1	-	3.5	3.4	5.6	3.8	-	-	-
pH	**pH Units**	6.5-9.5	6.5-9.5	6.5-9.5	6.81	6.88	7.29	**6.41**	6.67	6.86	7.1	7.95	6.88	6.82	6.86	**6.49**	-	-	-
Total Alkalinity	**$CaCO_3$ mg/l**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxidised Nitrogen	**N mg/l**	-	-	-	<0.3	<0.3	<0.3	0.4	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total Solids	**mg/l**	1,500	-	-	-	-		454	-	-	-	260	-	-	-	253	-	-	-
Total Organic Carbon	**C mg/l**	-	-	-	5	<2	<2	3	4	<2	<2	<2	4	44	6	3	3	<2	4
COD	**mg/l**	-	-	-	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																			
Ammoniacal Nitrogen	**N mg/l**	**-**	-	0.2329494	**0.7**	<0.2	<0.2	**0.3**	<0.2	<0.2	<0.2	<0.2	**0.3**	**1**	**0.3**	<0.2	0.2	<0.2	**0.3**
Calcium	**Ca mg/l**	200	-	-	47.12	41.25	45.18	41.47	45.26	49.44	49.37	67	55	74	68	58	74.97	68.89	70.83
Chloride	**Cl mg/l**	30	250	250	41	31	18	18	16	16	15	20	27	28	20	19	19	19	17
Fluoride	**F mg/l**	1	1	1[$]	<0.5	-	-	0.1	-	-	-	0.1	-	-	-	0.1	-	-	-
Total Phenols	**mg/l**	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phosphorous	**P mg/l**	-	-	-	<0.05	-	-	0.17	-	-	-	0.16	-	-	-	0.09	-	-	-
Ortho Phosphates	**PO_4 mg/l**	-	-	-	<0.03	-	-	<0.03	-	-	-	0.12	-	-	-	0.06	-	-	-
Potassium	**K mg/l**	1	-	-	1.4	1.4	1.4	0.8	1.6	1.8	1.4	4.6	3	4.2	2.9	2	5.6	8.4	13
Sodium	**Na mg/l**	10.8	200	200	12	15	13	8.8	13.5	7.8	11.4	38	15	26	17	16	14	19	16.5
Sulphate	**SO_4 mg/l**	15	250	250	72	42	34	43	54	29	22	19	15	27	13	8	12	11	13
Metals																			
Boron	**B mg/l**	1	1	1	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	0.023	-	-	-
Cadmium	**Cd mg/l**	0.005	0.005	0.005	0.0145	-	-	0.0092	-	-	-	0.0042	-	-	-	<0.001	-	-	-
Chromium (Total)	**Cr mg/l**	0.03	0.05	0.05	<0.001	-	-	<0.05	-	-	-	<0.05	-	-	-	0.006	-	-	-
Copper	**Cu mg/l**	0.03	0	0	<0.005	-	-	<0.005	-	-	-	**0.005**	-	-	-	<0.001	-	-	-
Cyanide (Total)	**Cn mg/l**	0.01	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	**Fe mg/l**	0.2	0.2	0.2	**0.49**	0.023	0.004	<0.001	<0.001	<0.001	0.046	0.002	<0.005	0.009	0.015	0.021	<0.002	<0.002	<0.002
Lead	**Pb mg/l**	0.01	0.01	0.01	<0.005	-	-	<0.005	-	-	-	<0.005	-	-	-	<0.001	-	-	-
Magnesium	**Mg mg/l**	50	-	-	4.57	-	-	4.37	-	-	-	9.21	-	-	-	9.13	-	-	-
Manganese	**Mn mg/l**	0.05	0.05	0.05	**0.09**	**0.099**	**0.098**	**0.149**	**0.174**	**0.136**	**0.07**	**0.358**	**0.242**	**0.378**	**0.371**	**0.312**	**0.426**	**0.364**	**0.379**
Mercury	**Hg mg/l**	0.001	0.001	0.001	<0.00005	-	-	<0.00005	-	-	-	<0.00005	-	-	-	<0.00005	-	-	-
Zinc	**Zn mg/l**	0.1	-	-	0.016	-	-	0.153	-	-	-	0.008	-	-	-	0.022	-	-	-
Arsenic	**As mg/l**	-	-	0.01	<0.05	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	**0.299**	**0.078**	**0.071**	**0.047**	**0.011**	**0.012**	**0.025**	**0.025**
Barium	**Ba mg/l**	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	0.019	0.028	0.023	0.019	0.022	0.023	0.022
Bacteria																			
Faecal Coliforms	**cfu/100ml**	-	-	0	-	-	-	<1	-	-	-	<15	-	-	-	**18**	-	-	-
Total Coliforms	**cfu/100ml**	-	-	0	-	-	-	<1	-	-	-	**3**	-	-	-	<1	-	-	-
List I/II																			
Semi Volatile Organics + TICS	**µg/l**	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Semi volatile organic compounds	**µg/l**	-	-	-	-	-	-	<1	-	-	-	<0.001	-	-	-	<0.001	-	-	-
Organochlorine Pesticides	**µg/l**	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Organophosphorous Pesticides	**µg/l**	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
List 1 and 11 Substances	**µg/l**	-	-	-	-	-	-	<0.01	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-
Total 6 PAHs	**mg/l**	-	-	0.001	-	-	-	-	-	<0.2	<0.2	-	-	-	-	<0.00006	<0.00006	<0.00006	<0.00001

LEGEND

- = No data reported or no analyses conducted

< = Less Than

NDP = No Determination Possible

Note 1: MAC = Maximum Admissable Concentration, European Communities (Drinking Water)

Note 2= Acceptable to consumers & no abnormal change

$=Value is 1mg/L for fluoridated supplies. Where fluoride is naturally occuring, the value is 1.5mg/L.

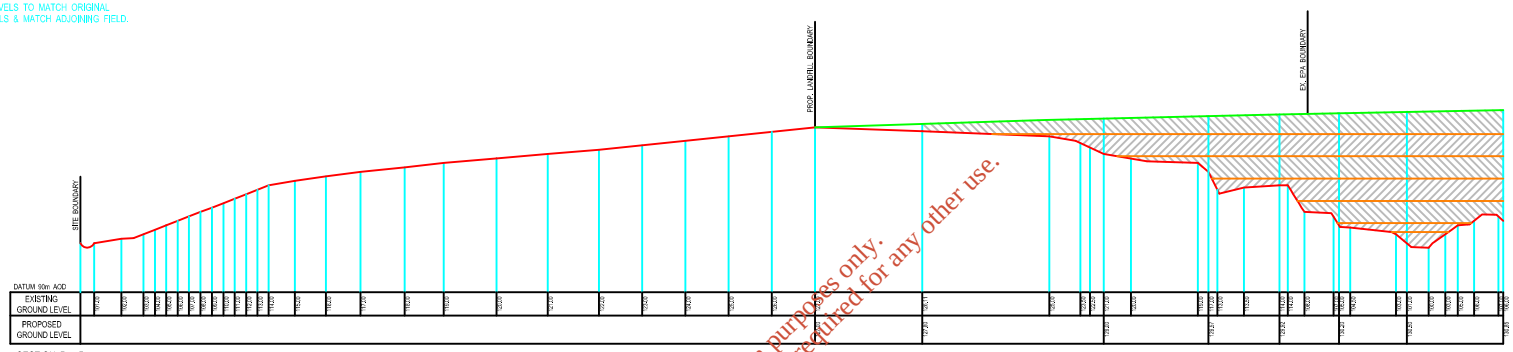
Bold text= exceedance of 2000 EC S.I. 439 limit.

Underlined text= Detection limit above 2000 EC S.I. 439 limit.

Appendix D

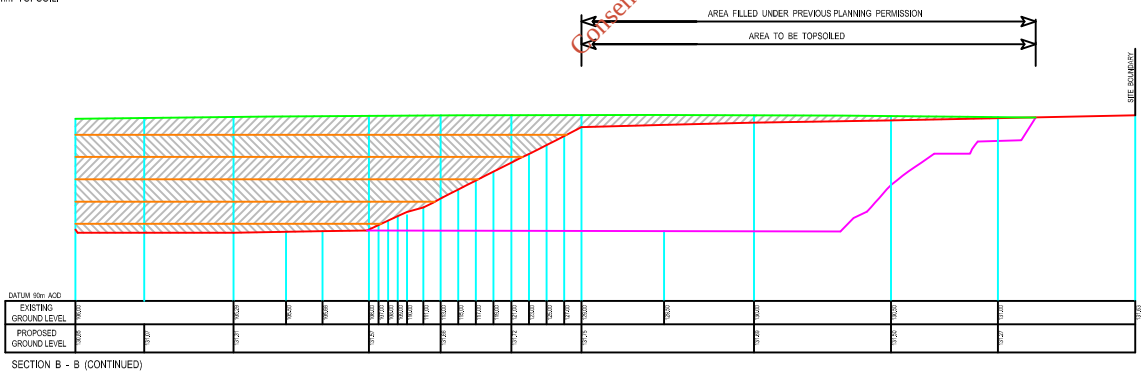
Copy of Planning Application Drawings

NOTE:
PROPOSED LEVELS TO MATCH ORIGINAL GROUND LEVELS & MATCH ADJOINING FIELD.



SECTION B - B

TYPICAL CELL CONSTRUCTION:
5m HIGH BUND TO SURROUND CELL
MINIMUM 1m BLUE CLAY LINEAR BASE TO CELL.
CAPPING LAYER - 500mm SUBSOIL & 500mm TOPSOIL.



SECTION B - B (CONTINUED)

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Mob 086 854 6814 Email info@fpc.ie
www.fpc.ie

Figured dimensions only to be taken from this drawing.
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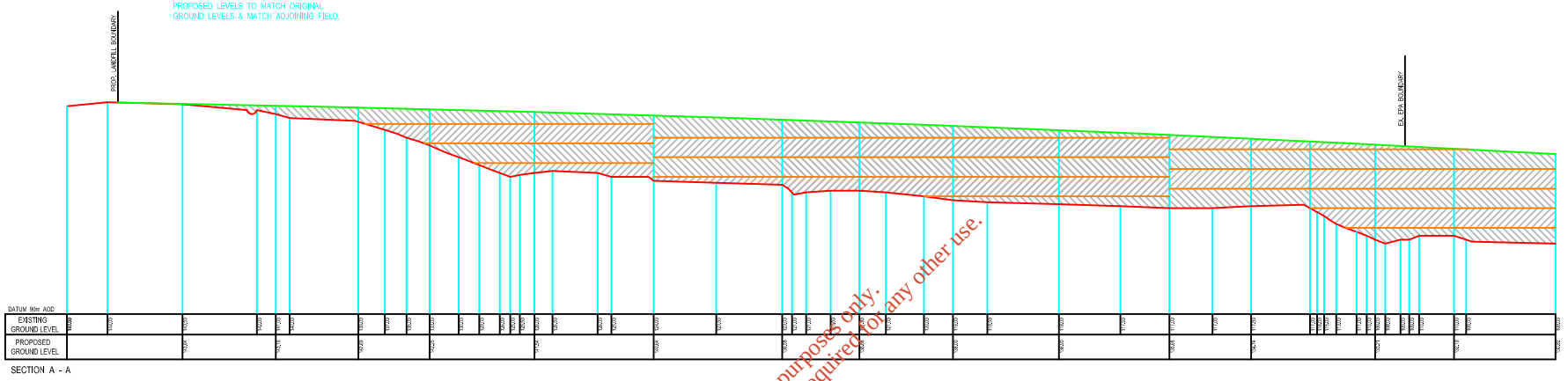
PROJECT: REVISED QUARRY RESTORATION @ HOLLYWOOD GREAT, NAUL

TITLE: SECTION B-B

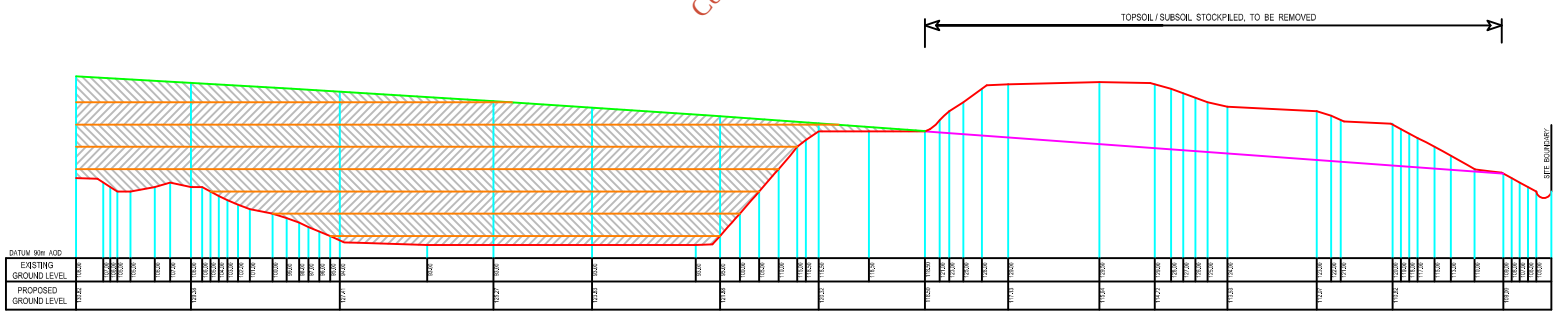
SCALE	DATE	DRAWING NUMBER	ISSUE
1:500	FEB. '07	07/810/13	

NOTE:
PROPOSED LEVELS TO MATCH ORIGINAL GROUND LEVELS & MATCH ADJOINING FIELD.



SECTION A - A

TYPICAL CELL CONSTRUCTION:
5m HIGH BUND TO SURROUND CELL
MINIMUM 1m BLUE CLAY LINEAR BASE TO CELL.
CAPPING LAYER - 500mm SUBSOIL & 500mm TOPSOIL.



SECTION A - A (CONTINUED)

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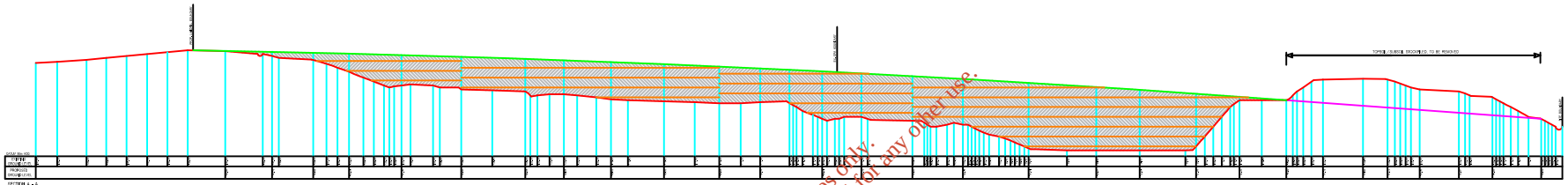
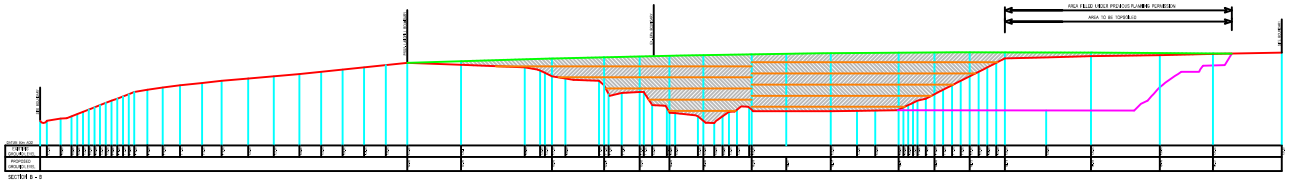
PROJECT: REVISED QUARRY RESTORATION @ HOLLYWOOD GREAT, NAUL

TITLE: SECTION A-A

SCALE	DATE	DRAWING NUMBER	ISSUE
1:500	FEB. '07	07/810/12	





ISSUE	REVISION HISTORY	DRAWN	DATE

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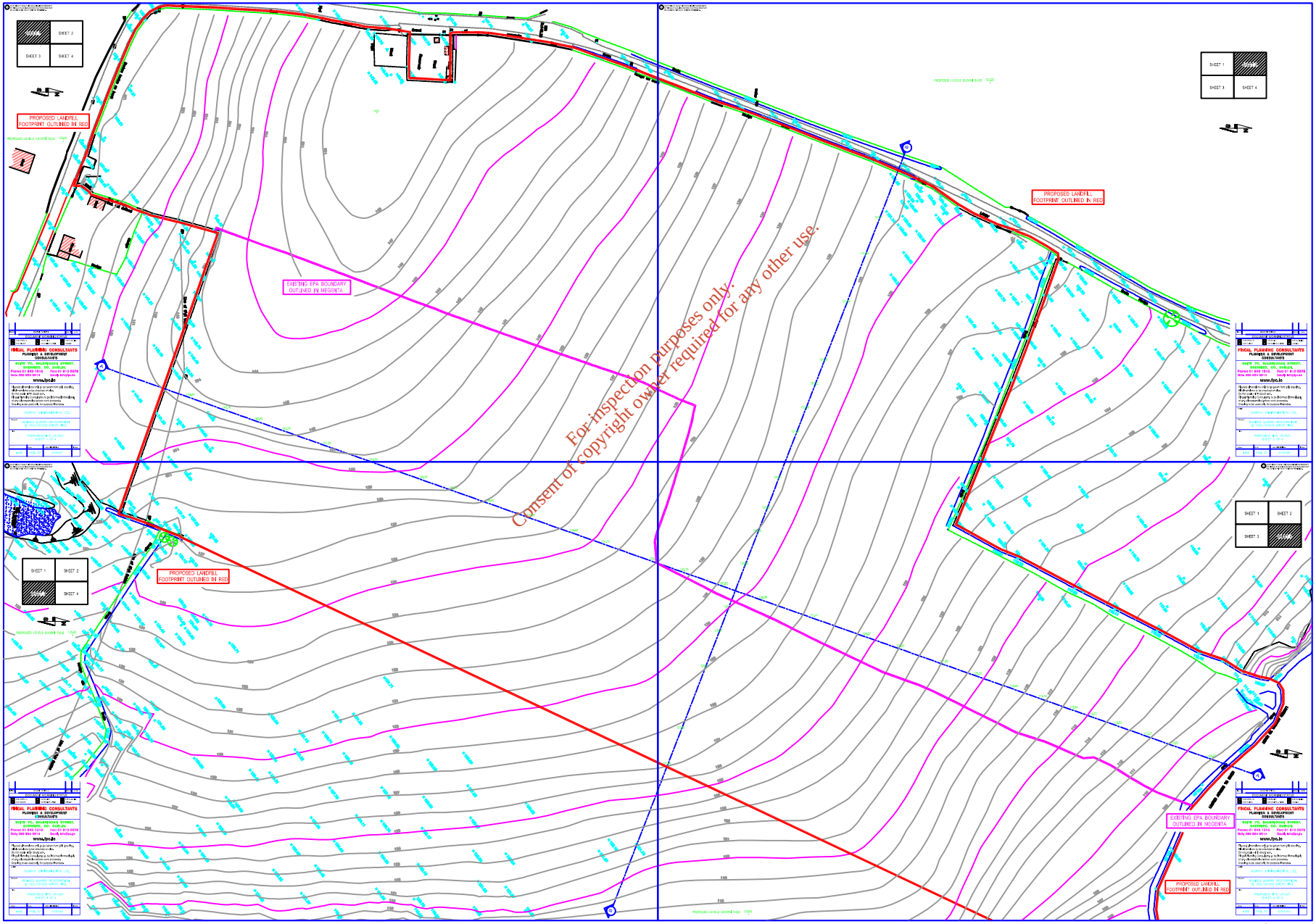
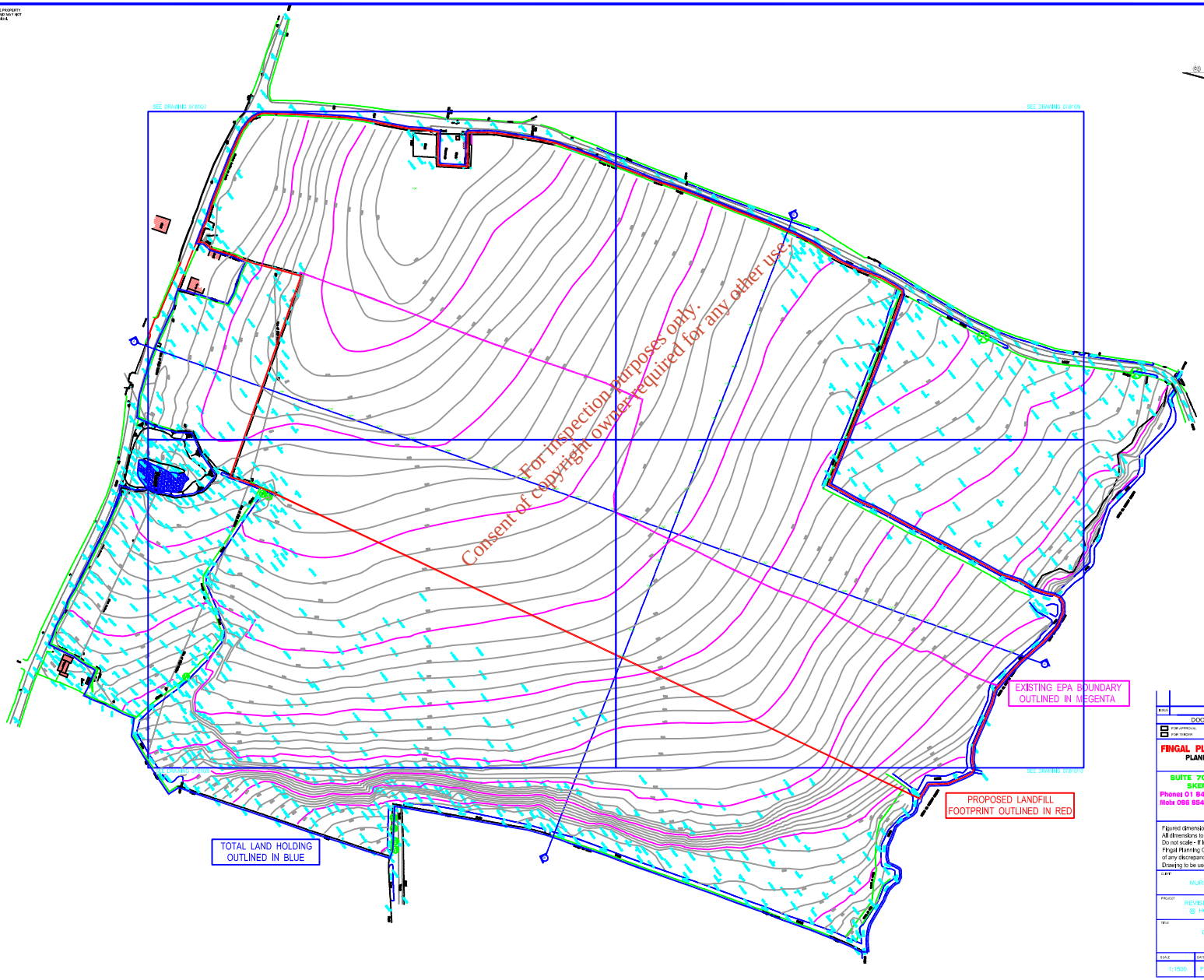
PROJECT: REVISED QUARRY RESTORATION @ HOLLYWOOD GREAT, NAUL

TITLE: SECTIONS A-A & B-B

SCALE	DATE	DRAWING NUMBER	ISSUE
1:1000	FEB. '07	07/810/11	





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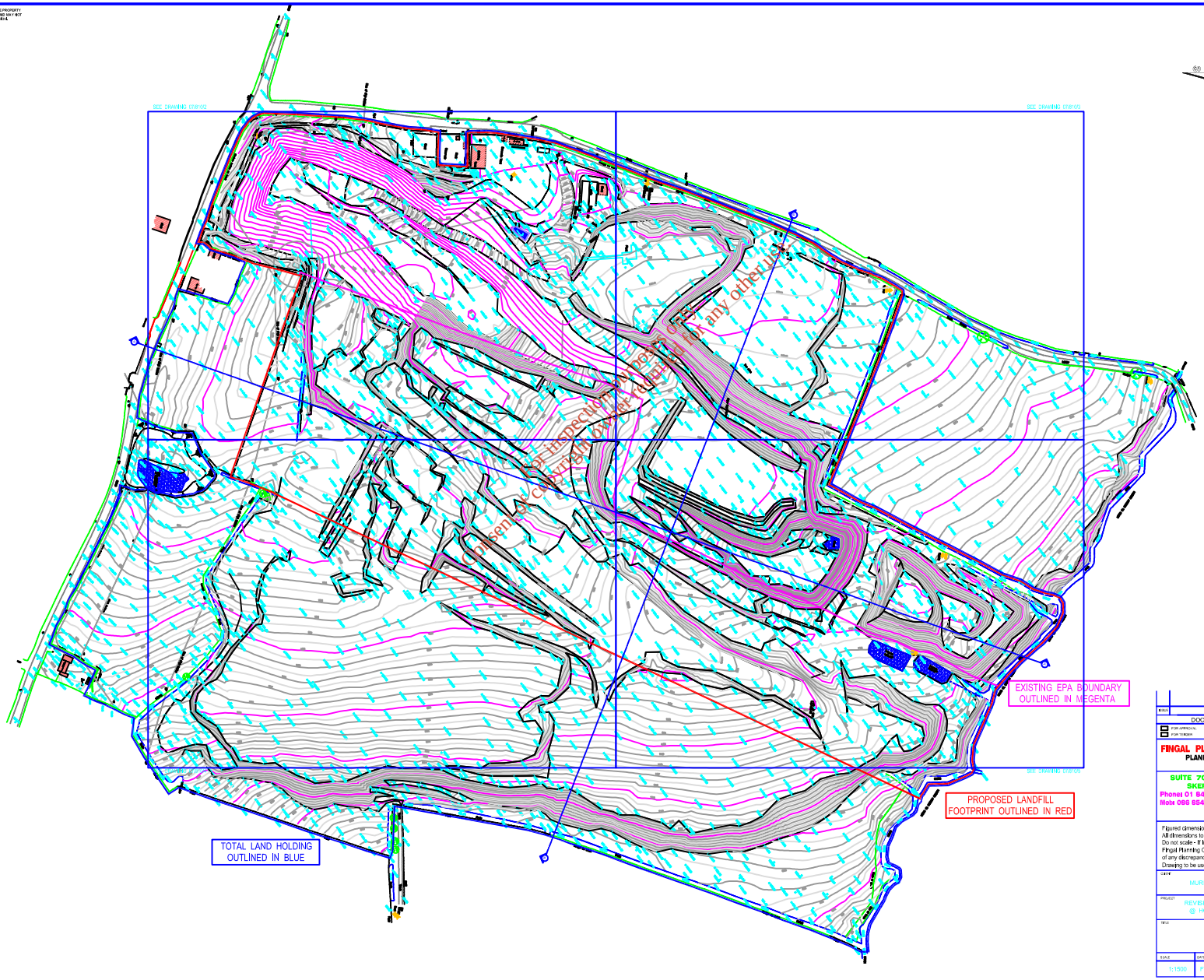
CLIENT: MURPHY ENVIRONMENTAL LTD.

PROJECT: REVISED QUARRY RESTORATION @ HOLLYWOOD GREAT, NAUL

TITLE: OVERALL PROPOSED SITE LAYOUT

SCALE	DATE	DRAWING NUMBER	ISSUE
1:1500	FEB. '07	07/8106	



ISSUE	REASON FOR ISSUE	DRAWN	DATE

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CLIENT: MURPHY ENVIRONMENTAL LTD.

PROJECT: REVISED QUARRY RESTORATION @ HOLLYWOOD GREAT, NAAS.

TITLE: OVERALL EXISTING SITE LAYOUT

SCALE	DATE	DRAWING NUMBER	ISSUE
1:1500	FEB. '07	07/810/1