

Section 1

All available borehole logs and well construction information from original site investigation reports.

1986	:	86/1	1996:	96/1		
		86/2		96/2/		
		86/3		96/3		
		86/4		96/4;	96/4A	96/4B
		86/5		96/5;	96/5A	
		86/6		96/6		
		86/7				
		86/8				
		86/9				
1998	:	G1	2000:	RC6		
		G2				
		G3				
		G5				
		MW				
2004	:	G1/04	2005:	G1/05		
		G2/04		G2/05		
2010	:	L 10/01				

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Ballymurtagh Landfill  
Boreholes from 1986

86/1

86/2

86/3

86/4

86/5

86/6

86/7

86/8

86/9

Note 1: Installed pre-landfill

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# COMPLETED WELL DESIGN

86/1

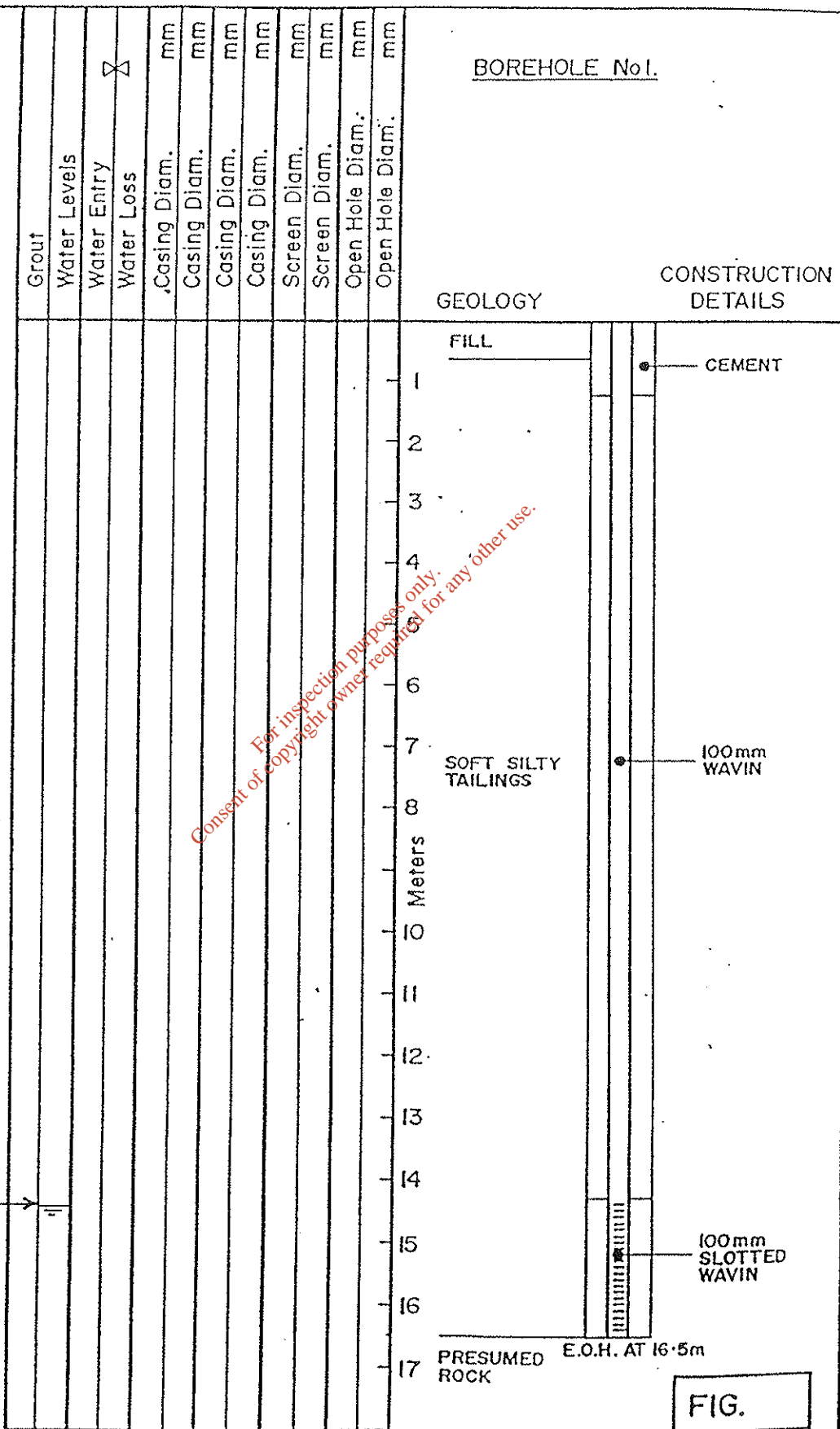
Client: WICKLOW COUNTY COUNCIL  
 Location: AVOCA  
 County: WICKLOW  
 Date: JUNE 1986  
 Driller: I.G.S.L.

Aquifer: TAILINGS  
 Output: \_\_\_\_\_ m<sup>3</sup>/day  
 Specific Capacity: \_\_\_\_\_ m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

MARKS

BOREHOLE No 1.

WHAT 70.12 m O.D.  
 GLAT 69.77 m O.D.



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SWL  
 L. AT 14.44m →

T. CULLEN

FIG.

# COMPLETED WELL DESIGN

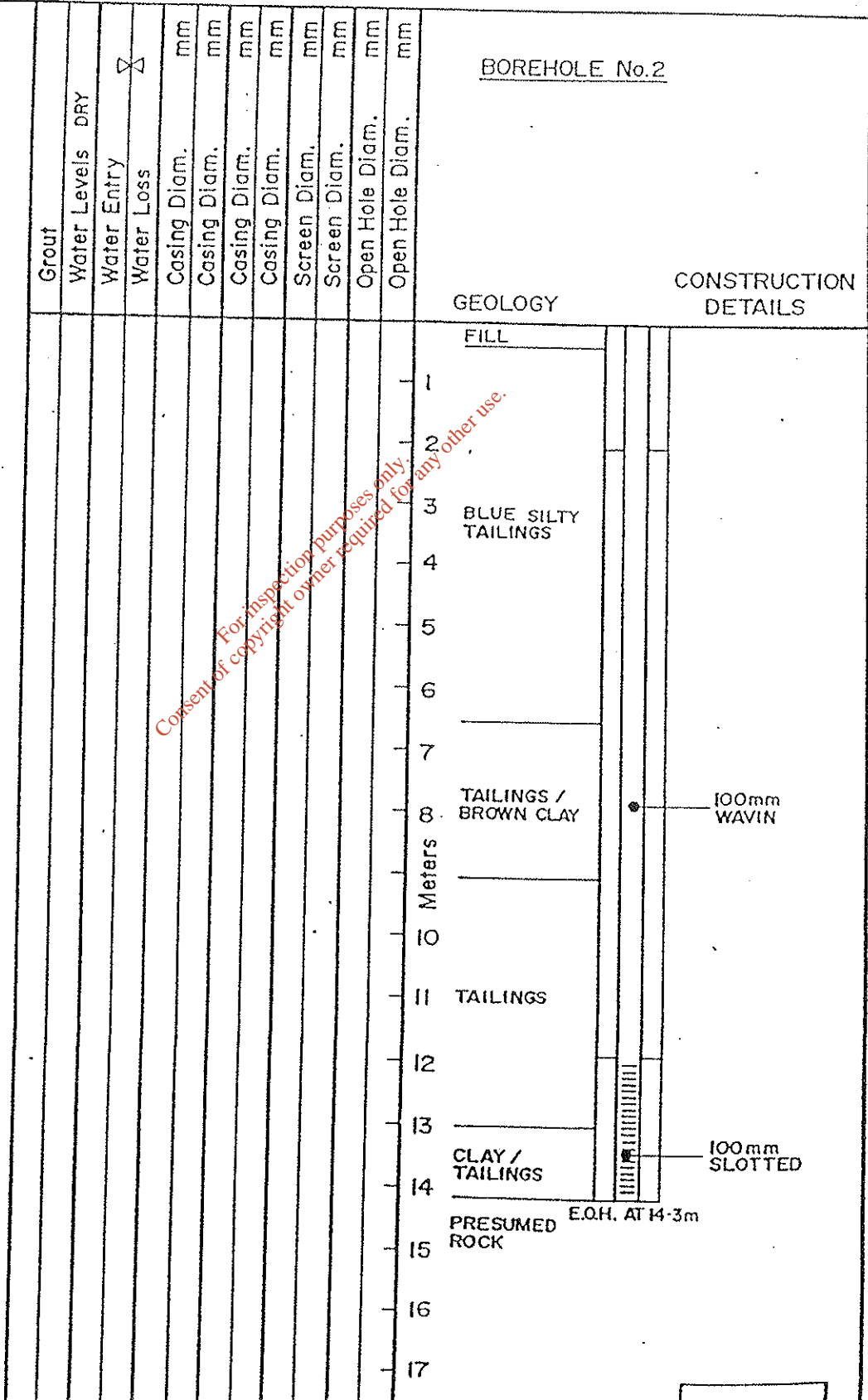
86/2

Client : WICKLOW COUNTY COUNCIL  
 Location : AVOCA  
 County : WICKLOW  
 Date : JUNE 1986  
 Driller : I.G.S.L.

Aquifer : TAILINGS  
 Output : \_\_\_\_\_ m<sup>3</sup>/day  
 Specific Capacity : \_\_\_\_\_ m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

REMARKS

W.H. AT 70.11 m O.D.  
 G.L. AT 69.83 m O.D.



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E.O.H. AT 14.3m

K.T. CULLEN

# COMPLETED WELL DESIGN

86/3

Client: WICKLOW COUNTY COUNCIL  
 Location: AVOCA  
 County: WICKLOW  
 Date: JUNE 1986  
 Driller: I.G.S.L.

Aquifer: TAILINGS  
 Output: \_\_\_\_\_ m<sup>3</sup>/day  
 Specific Capacity: \_\_\_\_\_ m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

MARKS

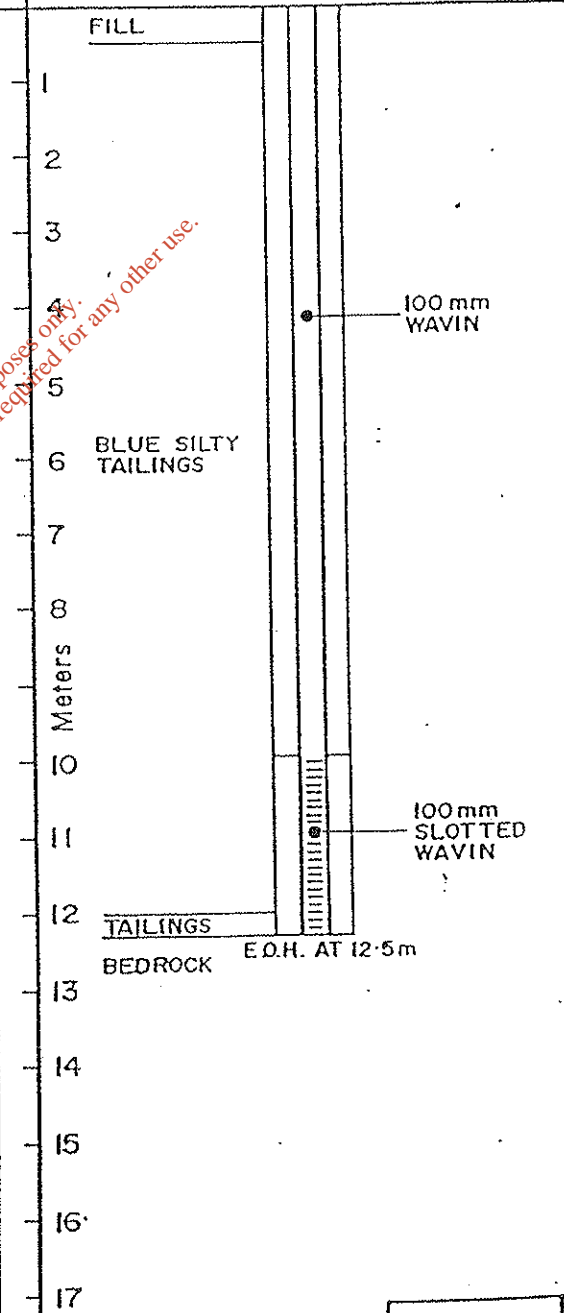
WH AT ↓  
 AT 69.59 m O.D.  
 AT 69.44 m O.D.  
 WL AT ↓

SWL AT ↓  
 L. AT 11.0m

Grout	Water Levels	Water Entry	Water Loss	Casing Diam.	Casing Diam.	Casing Diam.	Casing Diam.	Screen Diam.	Screen Diam.	Open Hole Diam.	Open Hole Diam.
		X		mm	mm	mm	mm	mm	mm	mm	mm

BOREHOLE No.3

GEOLOGY      CONSTRUCTION DETAILS



**T. CULLEN**

**FIG.**

# COMPLETED WELL DESIGN.

86/4

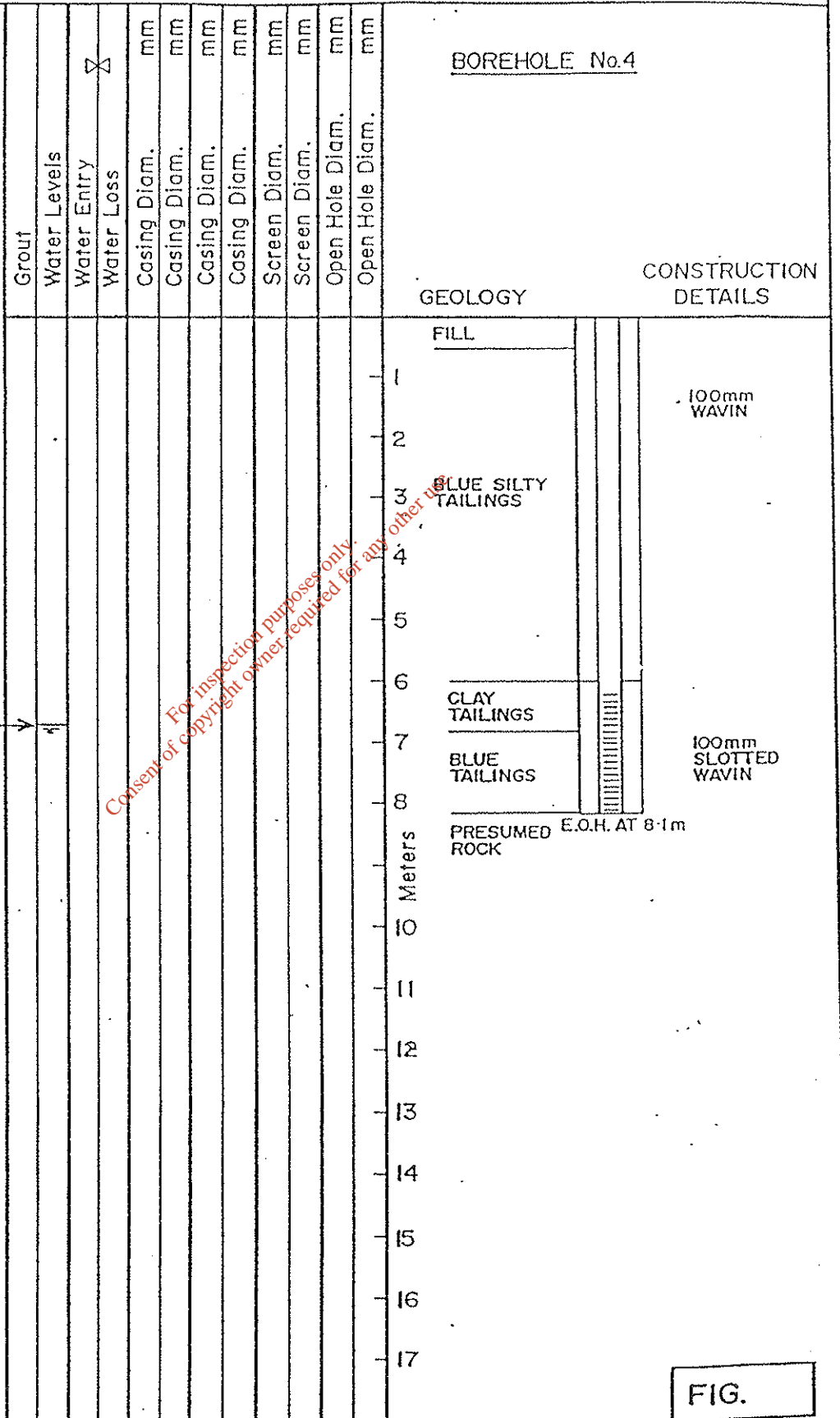
Client : WICKLOW COUNTY COUNCIL  
 Location : AVOCA  
 County : WICKLOW  
 Date : JUNE 1986  
 Driller : I.G.S.L.

Aquifer : TAILINGS  
 Output : \_\_\_\_\_ m<sup>3</sup>/day  
 Specific Capacity : \_\_\_\_\_ m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

REMARKS

W.H. AT 69.12 m O.D.  
 G.L. AT 68.87 m O.D.

S.W.L. AT 6.78 m →



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K.T. CULLEN

FIG.

# COMPLETED WELL DESIGN

86/5

Client : WICKLOW CO. COUNCIL  
 Location : AVOCA  
 County : WICKLOW  
 Date : JUNE 1986  
 Driller : I.G.S.L.

Aquifer : TAILINGS  
 Output : \_\_\_\_\_ m<sup>3</sup>/day  
 Specific Capacity : \_\_\_\_\_ m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

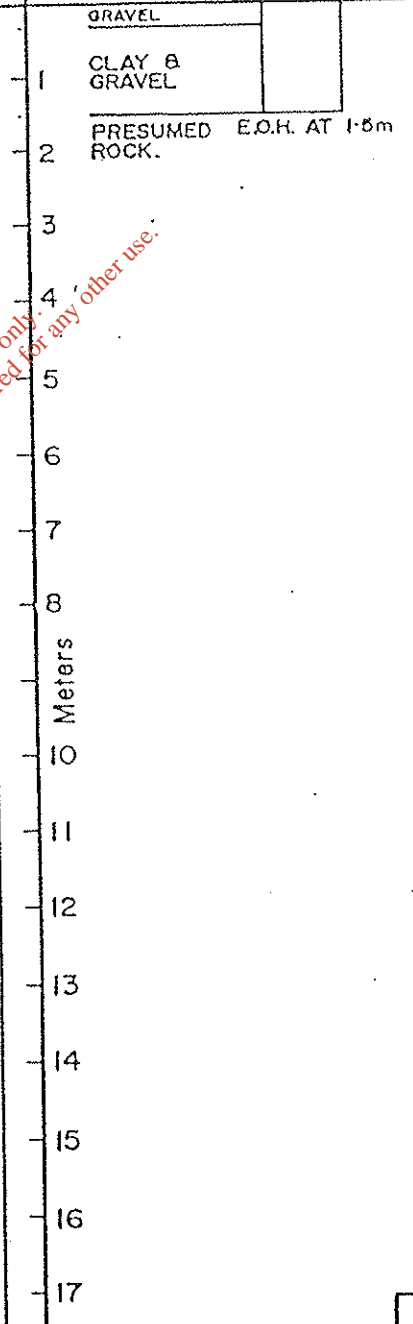
EMARKS

WH<sub>2</sub>  
 H. AT 69.18 m O.D.  
 L. AT 69.18 m O.D.  
 GL

Grout	Water Levels	Water Entry	Water Loss	Casing Diam.	Casing Diam.	Casing Diam.	Casing Diam.	Screen Diam.	Screen Diam.	Open Hole Diam.	Open Hole Diam.
	DRY	X		mm	mm	mm	mm	mm	mm	mm	mm

BOREHOLE No.5

GEOLOGY



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FIG.

# COMPLETED WELL DESIGN

86/6

Client : WICKLOW COUNTY COUNCIL  
 Location : AVOCA  
 County : WICKLOW  
 Date : JUNE 1986  
 Driller : I.G.S.L.

Aquifer : TAILINGS  
 Output : \_\_\_\_\_ m<sup>3</sup>/day  
 Specific Capacity : \_\_\_\_\_ m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

REMARKS

W.H. AT 69.49 m O.D.  
 G.L. AT 68.99 m O.D.

BOREHOLE No.6

	Grout	Water Levels	Water Entry	Water Loss	Casing Diam.	Casing Diam.	Casing Diam.	Casing Diam.	Screen Diam.	Screen Diam.	Open Hole Diam.	Open Hole Diam.	GEOLOGY	CONSTRUCTION DETAILS
		DRY	✕		mm	mm	mm	mm	mm	mm	mm	mm	FILL	
													1 TAILINGS	
													2	
													3	
													4 GLAY / TAILINGS	
													5	
													6 PRESUMED ROCK	E.O.H. AT 5.75 m
													7	
													8	
													9 Meters	
													10	
													11	
													12	
													13	
													14	
													15	
													16	
													17	

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K.T. CULLEN

FIG.



# COMPLETED WELL DESIGN

86/7

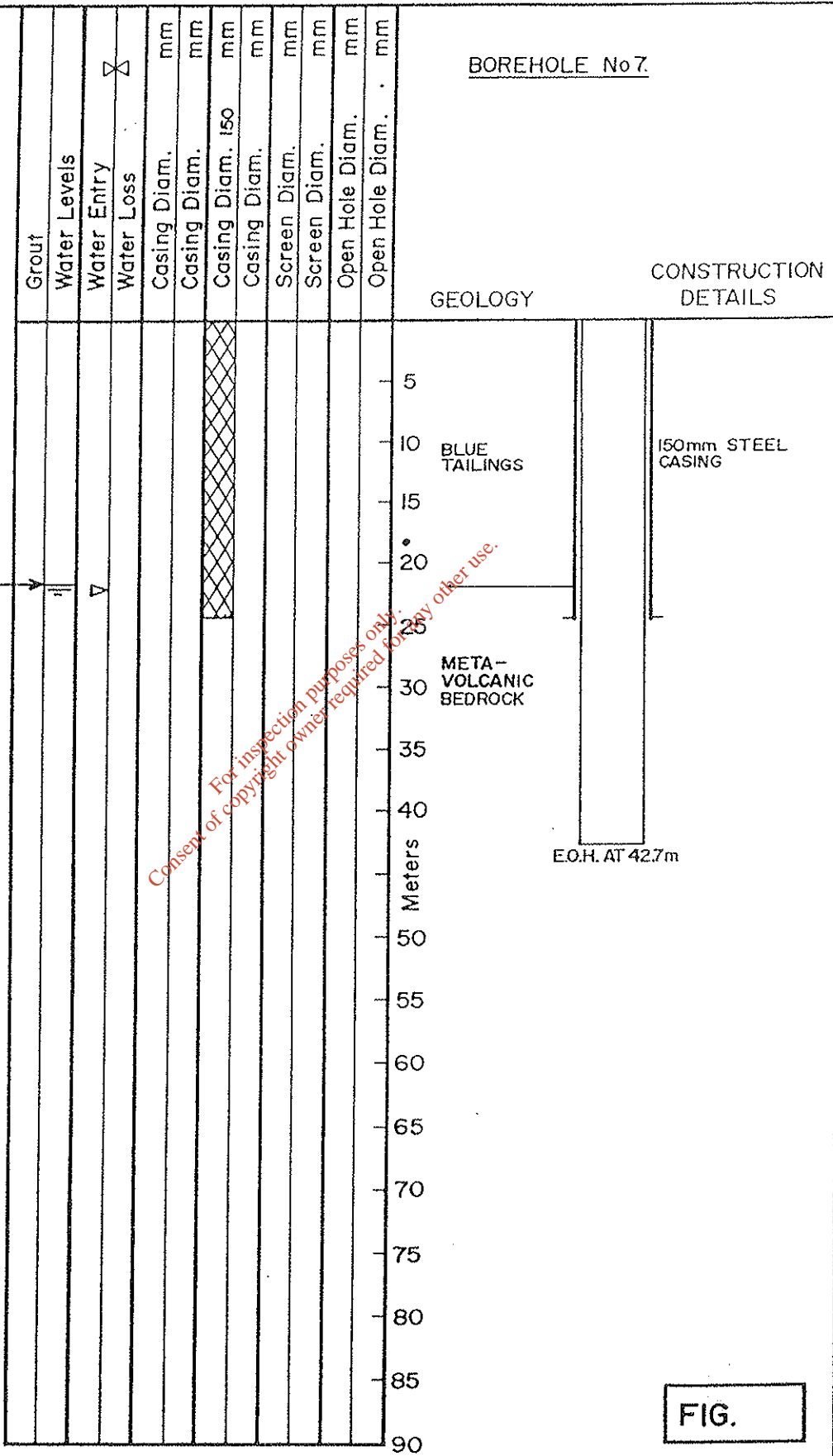
Client : WICKLOW CO. COUNCIL  
 Location : AVOCA  
 County : WICKLOW  
 Date : JUNE 1986  
 Driller : O'DONOGHOE

Aquifer : SHALE  
 Output : 10 m<sup>3</sup>/day  
 Specific Capacity : m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

REMARKS

W.H. AT 70.06m O.D.  
 G.L. AT 69.94 m O.D.

S.W.L. AT 21.66 m



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**FIG.**

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# COMPLETED WELL DESIGN

86/8

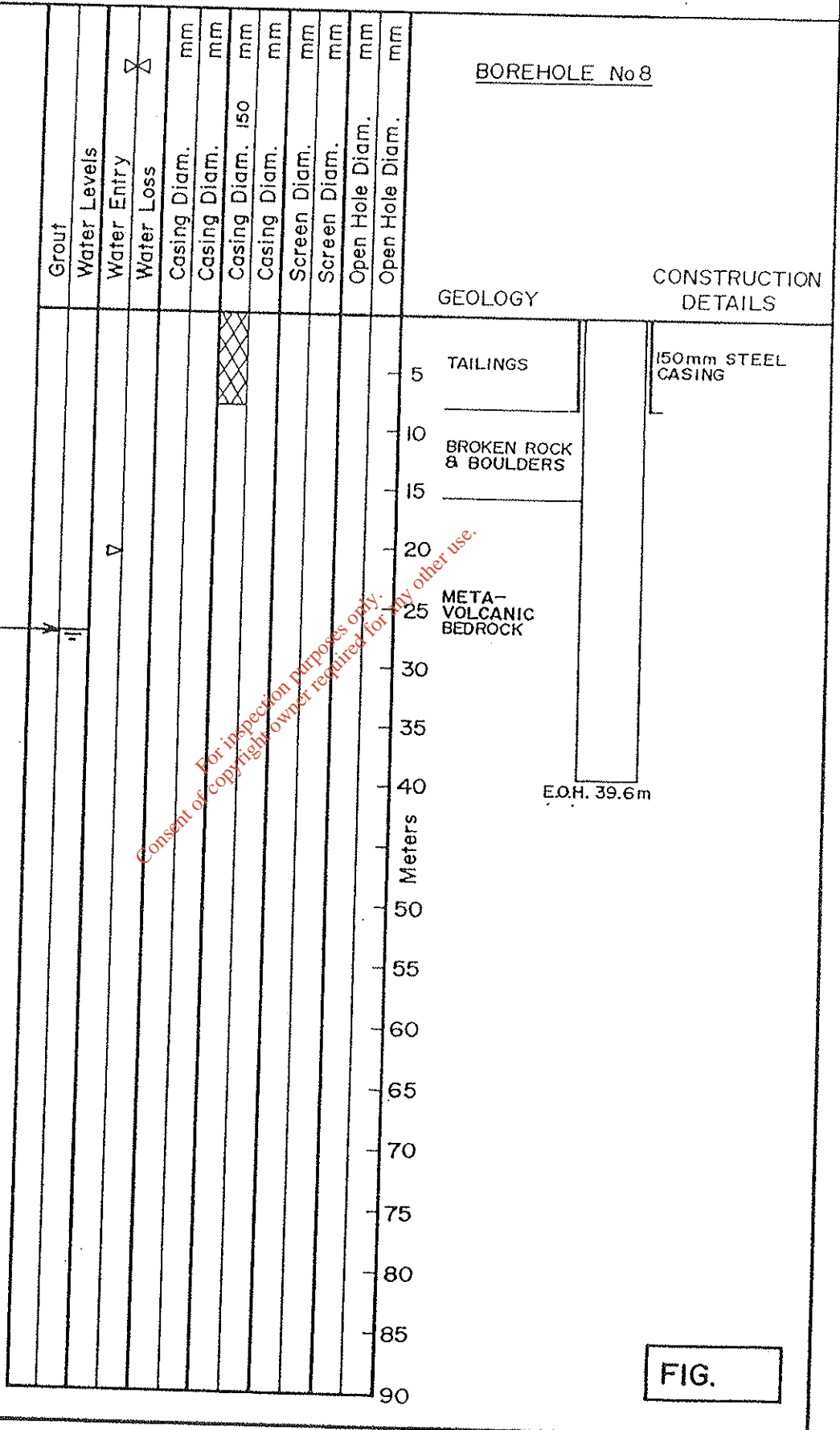
Client : WICKLOW CO. COUNCIL  
 Location : AVOCA  
 County : WICKLOW  
 Date : JUNE 1986  
 Driller : O'DONOGHOE

Aquifer : SHALE  
 Output : TRACE m<sup>3</sup>/day  
 Specific Capacity : \_\_\_\_\_ m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

REMARKS

W.H. AT 69.85 m O.D.  
 G.L. AT 69.60 m O.D.

S.W.L. AT 27.29 m



**K.T. CULLEN**

**FIG.**

# COMPLETED WELL DESIGN

86/9

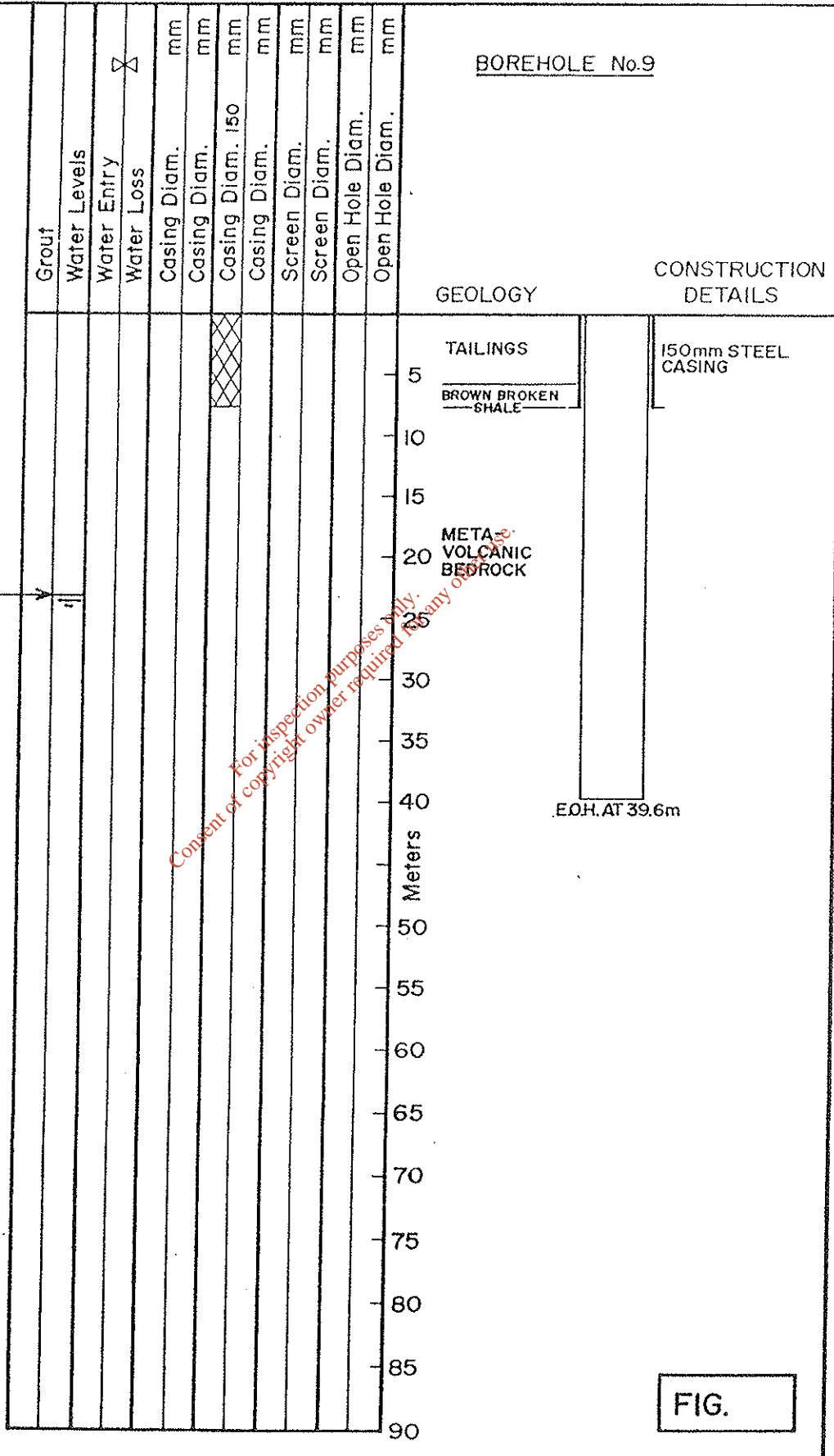
Client : WICKLOW CO. COUNCIL  
 Location : AVOCA  
 County : WICKLOW  
 Date : JUNE 1986  
 Driller : O'DONOGHUE

Aquifer : SHALE  
 Output : TRACE m<sup>3</sup>/day  
 Specific Capacity :            m<sup>3</sup>/day/m  
 National Grid } 318,700 E.  
 Co-ordinates } 181,200 N.

REMARKS

W.H. AT 69.35 m O.D.  
 G.L. AT 69.05 m O.D.

S.W.L. AT 23.4 m



**K.T. CULLEN**

**FIG.**

Ballymurtagh Landfill  
Boreholes from 1996

96/1

96/2

96/3

96/4; 96/4A; 96/4B

96/5; 96/5A

96/6

Note 1: Installed for a slope stability assessment in 1996. Obstructions were encountered at locations 96/4 and 96/5 and final proven boreholes were located at 96/4B and 96/5A respectively.


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Sampling					Strata			
Depth / Drill Run	Type / TCR(SCR)	Casing (ROD)	Date/ Water	SPT N (Cu)	Description	Depth (Thickness)	Level	Legend
			07/08 1996		MADE GROUND: Broken rock and cobbles	G.L.	84.41	
0.60-0.80	B					(0.60)		
0.82	C			23	MADE GROUND: Stiff grey/brown angular gravelly clay with cobbles	(0.50)	83.81	
1.10-1.30	B					1.10	83.31	
1.44	C			32	MADE GROUND: Stiff brown angular gravelly clay with many angular cobbles	(1.00)		
2.10-2.40	B					2.10	82.31	
2.40	C			41	MADE GROUND: Stiff brown sandy clay with some to much fine to coarse angular to subangular gravel and occasional cobbles			
3.92	C			47		(3.90)		
4.52-4.82	B							
4.98	C			48				
6.00			09/08		MADE GROUND: Gravelly clay with boulders	6.00	78.41	
						(2.50)		
8.50					SOFT weathered rock*	8.50	75.91	

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Equipment: Shell & Auger Rotary Coring Rig	Groundwater No. Struck Behaviour Sealed	Ground Level 84.41 m OD
Borehole Dia (mm) 200 to 6.00m 100 to 14.00m	Casing Dia (mm) 200 to 6.00m 100 to 14.00m	Drilled by JC PS DW Logged by JC RL Checked by

**Remarks**  
 1. Chiselling hard strata from 0.20m - 0.60m (.75 hours); at 1.30m (.5 hours); at 2.52m (.75 hours); at 4.72m (.5 hours) and from 4.98m - 6.00m (1.5 hours)  
 1. \*Denotes drillers descriptions  
 2. Standpipe installed to 14.00m  
 See key sheet and appendices for explanations.

<b>Borehole Record</b>	<b>Project</b> Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	<b>Contract</b> 176043
 <b>GEOTECH Specialists Ltd</b>		<b>Borehole</b> 1(1 of 2)

96/1 (2 of 2)

Sampling					Strata		Depth (Thickness)	Level
Well Run	TCR (SCR)	Casing (RQD)	Date/ Water	SPT N	Description			
11.00			09/08		(See previous sheet)			
	0% (0%)	(0%)						
14.00					End of Borehole.	14.00	70.41	

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Equipment: Shell & Auger Rotary Coring Rig	Groundwater No. Struck Behaviour	Sealed	Ground Level 84.41 m OD
Borehole Dia (mm) 200 to 6.00m 100 to 14.00m	Casing Dia (mm) 200 to 6.00m 100 to 14.00m		Drilled by JC PS DW Logged by JC RL Checked by

Remarks

See key sheet and appendices for explanations.

Form 1/0

Borehole Record	Project	Contract
	Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	176043
		Borehole
		1 (2 of 2)

**GEOTECH** Specialists Ltd

Sampling					Strata			
Depth / Drill Run	Type / TCR/SCR	Casing (ROD)	Date / Water	SPT N (Cu)	Description	Depth (Thickness)	Level	Legend
0.50	C		08/08 1996	25	MADE GROUND: Stiff brown angular gravelly clay with alot of cobbles	G.L. (1.00)	74.83	
1.00-1.30	B					1.00	73.83	
1.33	C			21	MADE GROUND: Stiff brown sandy clay with much angular to subangular fine to coarse gravel and occasional cobbles At 1.00m: occasional plastic			
2.00-2.25	B							
2.25	C			18				
2.45-2.70	B					(3.00)		
2.86	C			43				
3.81	C			REF				
4.00						4.00	70.83	
5.00	60%		10/08		MADE GROUND recovered as angular limestone boulders and cobbles	(1.00)		
6.00	80%				MADE GROUND: fragments of plastic bags, paper, cloth, timber and wire with a strong odour	5.00	69.83	
7.00	30%				Below 7.00m open hole drilling			
					.....	9.30	65.53	
					End of Borehole.			

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Equipment: Shell & Auger Rotary Coring Rig	Groundwater No. Struck Behaviour	Sealed	Ground Level 74.83 m OD
Borehole Dia (mm) 200 to 4.00m 100 to 9.30m	Casing Dia (mm) 200 to 4.00m 100 to 9.30m	No groundwater encountered	Drilled by JC PS DW Logged by JC RL Checked by

**Remarks**  
 1. Chiselling hard strata from 0.50m - 1.00m (1 hour); at 3.15m (.83 hours) and from 3.81m - 3.90m (2.5 hours)  
 2. Water seepage at 3.84m  
 1. Unable to advance borehole below 9.30m  
 See key sheet and appendices for explanations.

Form 1/0

<b>Borehole Record</b>	<b>Project</b> Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	<b>Contract</b> 176043
		<b>Borehole</b> 2(1 of 1)

GSCS Specialists Ltd

Borehole					Strata		Legend		
Depth (m)	Type	Casing Depth	Date/Water	SPT N (Cu)	Description	Depth (Thickness)	Level		
0.00-0.70	B		09/08 1996		MADE GROUND: stiff brown gravelly clay with cobbles	6.1	75.76		
0.75	C			17		(1.40)			
1.42-1.62	B					1.40	74.36		
1.81	C			17	MADE GROUND: Firm brown slightly sandy clay with much angular to subangular fine to coarse gravel and occasional cobbles				
2.42-2.73	B					(2.00)			
2.73	C			20					
3.42-3.62	B					3.40	72.36		
3.69	C			29	MADE GROUND: Firm to stiff dark brown clay with much angular gravel	(0.80)			
4.25-4.50	B					4.20	71.56		
4.72	C			16	MADE GROUND: Stiff black/brown gravelly clay with some cobbles	(0.50)			
4.72-5.00	B					4.70	71.06		
5.11	C			27	MADE GROUND: Firm to stiff black gravelly clay with fragments of timber, cloth and wire	(0.88)			
5.70-6.00	B					5.58	70.18		
6.05	C			22	MADE GROUND: consisting of fragments of plastic bags, paper, cloth, timber, and wire with a strong odour	(2.12)			
7.00-7.60	B								
7.64	C			27		7.70	68.06		
7.75-8.40	B				Dense fine to coarse rounded and angular GRAVEL with cobbles				
8.94	C			38		9.25	66.51		
					End of Borehole.				

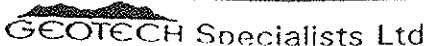
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Equipment: Shell & Auger	Groundwater No. Struck Behaviour	Sealed	Ground Level 75.76 m OD
Borehole Dia (mm) 200 to 9.25m	Casing Dia (mm) 200 to 9.25m	Drilled by JC Logged by JC Checked by	

Remarks  
 1. No recovery from 6.30m - 7.00m  
 2. Standpipe installed  
 3. Chiselling hard strata at 0.40m (.66 hours); at 6.31m (.5 hours); at 7.40m (.5 hours) and from 9.20m - 9.25m (.5 hours)

Borehole Record	Project	Contract
	Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	176043
	Borehole	3(1 of 1)



Sampling					Strata				
Depth	Type	Casing Depth	Date/ Water	SPT N (Cu)	Description	Depth (Thickness)	Level	Legend	
0.32-0.62	B		10/08 1996		Large BOULDERS	G.L.	52.90		
0.65	C			58	Brown angular GRAVEL with broken rock Below 0.65m: very dense	0.30	52.60		
					End of Borehole.	0.86	52.04		
Equipment: Shell & Auger					Groundwater No. Struck Behaviour		Sealed	Ground Level 52.90 m OD	
Borehole Dia (mm) 200 to 0.86m		Casing Dia (mm) 200 to 0.86m					Drilled by JC Logged by JC Checked by		
Remarks					1. Borehole relocated 1 metre away to BH 4A 2. Chiselling hard strata from 0.00m - 0.30m (.5 hours) and at 0.86m (.83 hours)				
See key sheet and appendices for explanations.					Form 1/0				
Borehole Record					Project		Contract		
					Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.		176043		
							Borehole 4(1 of 1)		

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Sampling					Strata				
Depth	Type	Casing Depth	Date/ Water	SPT N (Cu)	Description	Depth (Thickness)	Level	Legend	
0.60	c		10/08 1996	49	Brown angular GRAVEL with broken rock	G.L.	52.90		
1.10			12/08		Below 0.60m: dense				
					.....	1.30	51.60		
					End of Borehole.				

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Equipment: Shell & Auger	Groundwater	Sealed	Ground Level 52.90 m 00
Borehole Dia (mm) 200 to 1.30m	No. Struck Behaviour		Drilled by JC Logged by JC Checked by
Casing Dia (mm) 200 to 1.30m			

Remarks 1. Chiselling hard strata at 0.80m (.5 hours) and from 1.10m - 1.30m (2 hours)

See key sheet and appendices for explanations. Form 1/0

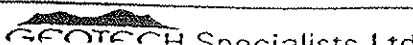
Borehole Record	Project	Contract
	Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	176043
Borehole		4A(1 of 1)


Sampling				Strata			
Drill Run	TCR (SCR)	Casing (ROD)	Date/Water	Description	Depth (Thickness)	Level	Legend
			29/08 1996	BOULDERS	G.L. (0.50)	52.90	
				Reinforced CONCRETE	0.50	52.40	
				MADE GROUND: with boulders	0.85	52.05	
					(5.15)		
				MADE GROUND	6.00	46.90	
					(3.00)		
				MADE GROUND: with clay	9.00	43.90	

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Equipment: Rotary Coring Rig	<b>Groundwater</b>	No. Struck	Behaviour	Sealed	Ground Level	52.90 m OD
Borehole Dia (mm) 150 to 12.00m	Casing Dia (mm) 150 to 12.00m	No groundwater encountered			Drilled by	PS DW
					Logged by	PS
					Checked by	

**Remarks**  
 1. Installed 2" slotted plastic pipe from 8.00m  
 2. Rock bit becoming fast down borehole in loose fill and unable to move casing through boulders, unable to continue borehole  
 See key sheet and appendices for explanations.

<b>Borehole Record</b>	<b>Project</b> Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	<b>Contract</b>	176043
		<b>Borehole</b>	4B(1 of 2)

Sampling				Strata			
Drill Run	TCR (SCR)	Casing (ROD)	Date/Water	Description	Depth (Thickness)	Level	Legend
			29/08	(See previous sheet)			
				End of Borehole.	12.00	40.90	

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Equipment: Rotary Coring Rig	Groundwater	No. Struck	Behaviour	Sealed	Ground Level	52.90 m OD
Borehole Dia (mm) 150 to 12.00m	Casing Dia (mm) 150 to 12.00m				Drilled by	PS DW
					Logged by	PS
					Checked by	

Remarks

See key sheet and appendices for explanations.

Form 1/0

Borehole Record	Project	Contract	176043
	Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	Borehole	4B(2 of 2)

Sampling					Strata				
Depth	Type	Casing Depth	Date/ Water	SPT N (Cu)	Description	Depth (Thickness)	Level	Legend	
			10/08 1996		Brown angular GRAVEL with many cobbles and broken rock	G.L.	84.61		
					..... End of Borehole.	0.60	84.01		
Equipment: Shell & Auger					Groundwater No. Struck Behaviour	Sealed	Ground Level	84.61 m OD	
Borehole Dia (mm) 200 to 0.60m		Casing Dia (mm) 200 to 0.60m					Drilled by	JC	
							Logged by	JC	
							Checked by		
<b>Remarks</b>					1. Engineer told driller to relocate to BH 4 2. Chiselling hard strata at 0.60m (.66 hours)				
See key sheet and appendices for explanations.									
<b>Borehole Record</b>					<b>Project</b>		<b>Contract</b>		
					Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.		176043		
							<b>Borehole</b>		
							5/1 of 11		

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Sampling				Strata			
Drill Run	TCR (SCR)	Casing (RQD)	Date/ Water	Description	Depth (Thickness)	Level	Legend
0.00			12/08 1996	MADE GROUND: Gravelly clay	G.L.	84.61	
	Open Holed				(5.00)		
5.00				Grey slightly weathered TUFF strong, occasional calcite veins up to 10mm. Discontinuities are irregular, rough stained, dipping 10° - 20° and 60° - 70°	5.00	79.61	
6.00	Open Holed						
	7% (5%)	(4%)					
9.00				End of Borehole.	9.00	75.61	

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Equipment: Rotary Coring Rig	Groundwater No. Struck Behaviour	Sealed	Ground Level 84.61 m OD
Borehole Dia (mm) 150 to 9.00m	Casing Dia (mm) 150 to 9.00m	No groundwater encountered	Drilled by PS DW Logged by RL Checked by

Remarks 1. Standpipe installed to 9.00m

See key sheet and appendices for explanations. Form 1/0

Borehole Record	Project	Contract
	Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	176043
		Borehole
		5A(1 of 1)

Sampling					Strata				
Depth	Type	Casing Depth	Date/Water	SPT N (Cu)	Description	Depth (Thickness)	Level	Legend	
			12/08 1996		MADE GROUND: Gravel	G.L. (0.40)	63.07		
0.61-0.81	B					0.40	62.67		
0.94	C			26	Stiff brown slightly sandy CLAY with much angular to subangular fine to coarse gravel and many cobbles (Possible Made Ground)				
1.22-1.42	B								
1.50	C			23					
2.30-2.50	B				Stiff brown sandy CLAY with some to much gravel and angular cobbles (Possible Made Ground)				
2.51	C			20					
3.25	C			74					
3.52-3.82	B				Below 3.52m: with occasional boulders				
4.31	C			REF					
4.35			13/08		End of Borehole.	4.42	58.65		

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Equipment: Shell & Auger	Groundwater	Sealed	Ground Level	63.07 m 00
Borehole Dia (mm) 200 to 4.42m	No. Struck Behaviour	No groundwater encountered	Drilled by	JC
Casing Dia (mm) 200 to 4.42m			Logged by	JC
			Checked by	

**Remarks**  
 1. Chiselling hard strata from 0.62m - 0.91m (.5 hours); at 3.53m (.75 hours); at 4.31m (1 hour) and from 4.35m - 4.42m (1.5 hours)  
 2. Standpipe installed at 4.42m  
 See key sheet and appendices for explanations.

<b>Borehole Record</b>	<b>Project</b>	<b>Contract</b>	176043
	Slope Stability at West Avoca, Co. Wicklow John Barnett & Associates Ltd.	<b>Borehole</b>	6 (1 of 1)

Ballymurtagh Landfill  
Boreholes form 1998

G1

G2

G3

G5

MW

Note 1: G, boreholes were installed as gas monitoring boreholes

MW: Was installed as a groundwater monitoring borehole

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**REPORT (REV)** **GEOTECHNICAL CORE LOG RECORD** **I.G.S.L.**

CONTRACT: Ballymurtagh Landfill Site investigation  
 CLIENT: M.C.O'Sullivan & Co.  
 ENGINEER: M.C.O'Sullivan & Co.  
 LOCATION: Ballymurtagh  
 CORE DIAMETER (mm): PQ(87mm)  
 GROUND LEVEL (mOD):  
 INCLINATION: Vertical  
 FLUSH: Air-Mist  
 DRILLHOLE NO.: RC G1  
 SHEET: 1 of 3  
 DATE STARTED: May-98  
 DATE COMPLETED: May-98  
 DRILLED BY: EDD  
 LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
0	0.00									0.00	OVERBURDEN Open hole drilling to 2.00m
3	3.00	100	44	0		Well developed foliation dipping at 30° rough planar, narrow clean apertures				2.00	Brown, medium grained, foliated, moderately to slightly weathered micaceous SCHIST moderately strong to strong
4	3.90										
5	5.35	100	48	20						5.00	Green grey, medium grained, foliated, slightly weathered, micaceous SCHIST strong
6	6.55	91	50	25							
7		84	61	39							
8	8.10										
9		66	25	9							
10	9.60	100	66	32						10.00	

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REMARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
 ▲ Point Load Test Sample

**KEY TO SYMBOLIC LOG**

	OVERBURDEN
	SCHIST

G-1  
1998 (2 of 3)

REPORT NO. GEOTECHNICAL CORE LOG RECORD I.G.S.L.

CONTRACT: Ballymurtagh Landfill Site investigation  
 CLIENT: DRILLHOLE NO.: RC G1  
 ENGINEER: M.C.O'Sullivan & Co. SHEET: 2 of 3  
 LOCATION: Ballymurtagh CORE DIAMETER (mm): PQ(87mm)  
GROUND LEVEL (mOD): DATE STARTED: May-98  
INCLINATION: Vertical DATE COMPLETED: May-98  
FLUSH: Air-Mist DRILLED BY: EDD  
LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
10					0 250 500						
10.60	100	66	32			Well developed foliation dipping at 30° rough planar, narrow clean apertures				10.00	Green grey, medium grained, foliated, slightly weathered, micaceous SCHIST strong
11	100	86	14								
11.90	100	93	47								
13.40	100	90	47								
14.40	100	100	48								
15.65	77	52	0								
16.90	100	73	8								
18.00	80	60	15								
19.00	80	8	0								
										20.00	

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MARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
 ◀ Point Load Test Sample

**KEY TO SYMBOLIC LOG**  
 [Hatched Box] OVERBURDEN  
 [Dotted Box] SCHIST

REPORT NO.		GEOTECHNICAL CORE LOG RECORD						I.G.S.L.			
CONTRACT: Ballymurtagh Landfill Site investigation							DRILLHOLE NO.: RC G1				
CLIENT:							SHEET: 3 of 3				
ENGINEER: M.C.O'Sullivan & Co.				CORE DIAMETER (mm): PQ(87mm)		DATE STARTED: May-98					
LOCATION: Ballymurtagh				GROUND LEVEL (mOD):		DATE COMPLETED: May-98					
				INCLINATION: Vertical		DRILLED BY: EDD					
				FLUSH: Air-Mist		LOGGED BY: IGSL					
DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
20		53	5	0						20.00	(See previous sheet)
	20.50					End of corehole				20.50	
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
REMARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986										KEY TO SYMBOLIC LOG	
▲ Point Load Test Sample											

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**WATER DETAILS:**  
No observed groundwater seepages encountered. Water level at end of shift: Dry  
Slight water intrusion overnight.

- Installation details**
1. 50mm screen 20.5 - 3.0m
  2. Gravel Pack 23.5 - 3.0m
  3. 50mm casing 3.0 - GL
  4. Bentonite Seal 3.0 - 0.50m
  5. Steel cover 0.50 - GL

<b>REPORT NO.</b>	<b>GEOTECHNICAL CORE LOG RECORD</b>	<b>I.G.S.L.</b>
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CONTRACT: Ballymurtagh Landfill Site investigation		DRILLHOLE NO.: RC G2
CLIENT:		SHEET: 2 of 2
ENGINEER: M.C.O'Sullivan & Co.	CORE DIAMETER (mm): PQ(87mm)	DATE STARTED: May-98
LOCATION: Ballymurtagh	GROUND LEVEL (mOD):	DATE COMPLETED: May-98
	INCLINATION: Vertical	DRILLED BY: EDD
	FLUSH: Air-Mist	LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD $q_p$ (50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
10										10.00	OVERBURDEN Open hole to 15m
										10.70	Drillers description: Gravel
11											OVERBURDEN Open hole to 15m
											Drillers description: Sand
12											
13											
14											
15	15.00					End of corehole				15.00	
16											WATER DETAILS: Water strike at 14.70 Stopped drilling to monitor inflow: after 20 mins: 13.92
17											
18											<b>Installation details</b> 1. 50mm screen 14.8 - 2.0m 2. Gravel Pack 14.8 - 2.0m 3. 50mm casing 2.0 - GL 4. Bentonite Seal 3.0 - 0.50m 5. Steel cover 0.50 - GL
19											
20											

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**REMARKS:** Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
 ▲ Point Load Test Sample

**KEY TO SYMBOLIC LOG**


REPORT NO.	<b>GEOTECHNICAL CORE LOG RECORD</b>	<b>I.G.S.L.</b>
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CONTRACT: Ballymurtagh Landfill Site investigation		DRILLHOLE NO.: RC G2
		SHEET: 1 of 2
CLIENT:	CORE DIAMETER (mm): PQ(87mm)	DATE STARTED: May-98
ENGINEER: M.C.O'Sullivan & Co.	GROUND LEVEL (mOD):	DATE COMPLETED: May-98
LOCATION: Ballymurtagh	INCLINATION: Vertical	DRILLED BY: EDD
	FLUSH: Air-Mist	LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R. %	S.C.R. %	R.Q.D. %	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
0					0 — 250 500					0.00	OVERBURDEN Open hole to 15.00m Drillers description: Gravel to sand at 10.70m

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<b>REMARKS:</b> Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986 ◀ Point Load Test Sample	<b>KEY TO SYMBOLIC LOG</b> <div style="background-color: #cccccc; width: 20px; height: 10px; margin: 2px;"></div> OVERBURDEN
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REPORT NO.  **GEOTECHNICAL CORE LOG RECORD** **I.G.S.L.**

CONTRACT: Ballymurtagh Landfill Site Investigation		DRILLHOLE NO.: RC G3
		SHEET: 1 of 1
CLIENT:	CORE DIAMETER (mm): PQ(87mm)	DATE STARTED: May-98
ENGINEER: M.C.O'Sullivan & Co.	GROUND LEVEL (MOD):	DATE COMPLETED: May-98
LOCATION: Ballymurtagh	INCLINATION: Vertical	DRILLED BY: EDO
	FLUSH: Air-Mist	LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD $q_{(60)}$ MPa	SYMBOLIC LOG	ELEVATION (MOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
0	0.00				0 — 250 500					0.00	OVERBURDEN Open hole to 7.00m Drillers description: Gravels and quarry fill
7	7.00					End of corehole				7.00	WATER DETAILS: Water Strike at 5.90m Stopped drilling to monitor inflow 5 mins: 5.51m 10 mins: 5.05m 15 mins: 4.75m 20 mins: 4.61m
						<b>Installation details</b> 1. 50mm screen 7.0 - 2.0m 2. Gravel Pack 7.0 - 2.0m 3. 50mm casing 2.0 - GL 4. Bentonite Seal 2.0 - 0.50m 5. Steel cover 0.50 - GL					

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REMARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986	<b>KEY TO SYMBOLIC LOG</b>
◀ Point Load Test Sample	

G5  
1998 (1 of 2)

REPORT NO. \_\_\_\_\_ GEOTECHNICAL CORE LOG RECORD I.G.S.L.

CONTRACT: Ballymurtagh Landfill Site investigation

CLIENT:	CORE DIAMETER (mm): PQ(87mm)	DRILLHOLE NO.: RC G5
ENGINEER: M.C.O'Sullivan & Co.	GROUND LEVEL (mOD):	SHEET: 1 of 2
LOCATION: Ballymurtagh	INCLINATION: Vertical	DATE STARTED: May-98
	FLUSH: Air-Mist	DATE COMPLETED: May-98
		DRILLED BY: EDD
		LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
0										0.00	OVERBURDEN Open hole to 10.20m Drillers description: Quarry waste
1										2.50	Drillers description: gravel
2										3.70	Drillers description: CLAY, occasional cobbles and large boulders.
3											
4											
5											
6											
7											
8											
9											
10											

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REMARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
 ▲ Point Load Test Sample

KEY TO SYMBOLIC LOG  
 OVERBURDEN

GS  
1998 (2 of 2)

**REPORT NO.** **GEOTECHNICAL CORE LOG RECORD** **I.G.S.L.**

CONTRACT: Ballymurtagh Landfill Site investigation  
 CLIENT: M.C.O'Sullivan & Co.  
 ENGINEER: M.C.O'Sullivan & Co.  
 LOCATION: Ballymurtagh

CORE DIAMETER (mm): PQ(87mm)  
 GROUND LEVEL (mOD):  
 INCLINATION: Vertical  
 FLUSH: Air-Mist

DRILLHOLE NO.: RC G5  
 SHEET: 2 of 2  
 DATE STARTED: May-98  
 DATE COMPLETED: May-98  
 DRILLED BY: EDO  
 LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.C.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD $is(60)$ MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
10	10.20					End of Corehole				10.20	
11											
12											WATER DETAILS: Water strike at 10.00m Stopped drilling to observe inflow. 5 mins: 8.60m 10 mins: 8.32m 15 mins: 8.20m 20 mins: 8.13m
13											
14											
15											
16											<b>Installation details</b> 1. 50mm screen 10.2 - 2.0m 2. Gravel Pack 10.2 - 2.0m 3. 50mm casing 2.0 - GL 4. Bentonite Seal 2.0 - 0.50m 5. Steel cover 0.50 - GL
17											
18											
19											
20											

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REMARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
 ▲ Point Load Test Sample

**KEY TO SYMBOLIC LOG**



MW  
1998 (1 of 4)

**REPORT NO.** \_\_\_\_\_ **GEOTECHNICAL CORE LOG RECORD** **I.G.S.L.**

CONTRACT: Ballymurtagh Landfill Site Investigation

CLIENT: \_\_\_\_\_ DRILLHOLE NO.: MW

ENGINEER: M.C.O'Sullivan & Co. CORE DIAMETER (mm): PQ(87mm) SHEET: 1 of 4

LOCATION: Ballymurtagh GROUND LEVEL (mOD): \_\_\_\_\_ DATE STARTED: May-98


INCLINATION: Vertical DRILLED BY: EDD

FLUSH: Air-Mist LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)			DISCONTINUITIES	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
					0	250	500						
0	0.00	..									0.00	OVERBURDEN Open hole to 33.00m  0 - 23.5 Drillers description: MADE GROUND ( Comprised of rock fill with some clay layers )	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

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REMARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
▲ Point Load Test Sample

**KEY TO SYMBOLIC LOG**  
 OVERBURDEN

REPORT NO.		GEOTECHNICAL CORE LOG RECORD						I.G.S.L.					
CONTRACT: Ballymurtagh Landfill Site Investigation							DRILLHOLE NO.: MW						
CLIENT:				CORE DIAMETER (mm): PQ(87mm)		SHEET: 2 of 4							
ENGINEER: M.C.O'Sullivan & Co.				GROUND LEVEL (mOD):		DATE STARTED: May-98							
LOCATION: Ballymurtagh				INCLINATION: Vertical		DATE COMPLETED: May-98							
				FLUSH: Air-Mist		DRILLED BY: EDD							
						LOGGED BY: IGSL							
DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)			DISCONTINUITIES	POINT LOAD $I_s(50)$ MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
					0	250	500						
10													OVERBURDEN Open hole to 33.00m
11													0 - 23.6 Drillers description: MADE GROUND ( Comprised of rock fill with some clay layers )
12													
13													
14													
15													
16													
17													
18													
19													
20													

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REMARKS: Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986

KEY TO SYMBOLIC LOG

▲ Point Load Test Sample

OVERBURDEN

**REPORT NO.**  **GEOTECHNICAL CORE LOG RECORD** **I.G.S.L.**

CONTRACT: Ballymurtagh Landfill Site Investigation		DRILLHOLE NO.: MW
CLIENT:	CORE DIAMETER (mm): PQ(87mm)	SHEET: 3 of 4
ENGINEER: M.C.O'Sullivan & Co.	GROUND LEVEL (MOD):	DATE STARTED: May-98
LOCATION: Ballymurtagh	INCLINATION: Vertical	DATE COMPLETED: May-98
	FLUSH: Air-Mist	DRILLED BY: EDD
		LOGGED BY: IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD Is(60) MPa	SYMBOLIC LOG	ELEVATION (MOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
20					0 250 500						OVERBURDEN Open hole to 33.00m
21											0 - 23.6 Drillers description: MADE GROUND ( Comprised of rock fill with some clay layers )
22											
23										23.50	
24											23.5 - 27.2 Drillers description: Brown sandy gravel
25											
26											
27										27.20	
28											27.2 - 33.0 Drillers description: Red brown very gravelly CLAY ( Poss clayey gravel )
29											
30										10.00	

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**REMARKS:** Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
▲ Point Load Test Sample

KEY TO SYMBOLIC LOG	
█	OVERBURDEN

MW  
1998 (A of 4)

**REPORT NO.** \_\_\_\_\_ **GEOTECHNICAL CORE LOG RECORD** **I.G.S.L.**

**CONTRACT:** Ballymurtagh Landfill Site Investigation **DRILLHOLE NO.:** MW  
**CLIENT:** \_\_\_\_\_ **CORE DIAMETER (mm):** PQ(87mm) **SHEET:** 4 of 4  
**ENGINEER:** M.C.O'Sullivan & Co. **GROUND LEVEL (mOD):** \_\_\_\_\_ **DATE STARTED:** May-98  
**LOCATION:** Ballymurtagh **INCLINATION:** Vertical **DATE COMPLETED:** May-98  
**FLUSH:** Air-Mist **DRILLED BY:** EDD  
**LOGGED BY:** IGSL

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	DISCONTINUITIES	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
30					0 250 500						OVERBURDEN Open hole to 33.00m
31											
32											
33									33.00		Borehole Terminated
34											
35											
36											
37											
38											
39											
40											

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- Installation details**
1. 50mm screen 33.0 - 3.0m
  2. Gravel Pack 33.0 - 3.0m
  3. 50mm casing 3.0 - GL
  4. Bentonite Seal 3.0 - 0.50m
  5. Steel cover 0.50 - GL

**REMARKS:** Core logged in accordance with BS 5930 except for definition of solid core which is taken as that defined by Norbury et al 1986  
 ▲ Point Load Test Sample

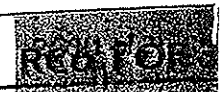
KEY TO SYMBOLIC LOG	
	OVERBURDEN

Ballymurtagh Landfill  
Borehole from 2000

RC/6

Note 1: Installed as a groundwater monitoring borehole

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Sampling					Strata			
Drill Run	TCR (SCR)	Casing (ROD)	Date/ Water	FI	Description	Depth (Thickness)	Level	Legend
0.00			05/05 0000		0/H	G.L.		
2.10	77%				MADE GROUND: recovered as angular medium to coarse gravel and cobble size fragments of rock with much iron oxide staining. 2.10-6.0m, with much sand size particles.	(2.10)		
3.00	41%							
4.45	39%							
6.00	27%							
7.50	40%							
9.00	48%							
Equipment: B40 Rotary Rig Borehole Dia (mm) 100 to 24.70m      Casing Dia (mm)					Groundwater No. Struck Behaviour		Sealed	Drilled by EB Logged by Checked by
Remarks See key sheet and appendices for explanations.								
Borehole Record					Project			Borehole
					Ballymurtagh Landfill MCOS			

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Sampling					Strata		Depth (Thickness)	Level	Legend
Drill Run	TCR (SCR)	Casing (ROD)	Date/ Water	FI	Description				
10.45		10.00	05/05						
		10.00	06/04						
	39%					(18.50)			
12.00									
	20%								
13.50									
	47%								
15.00									
	20%								
16.50									
	66%								
18.00									
	0.0%								
19.50									

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Equipment: B40 Rotary Rig	<b>Groundwater</b> No. Struck Behaviour	Sealed
Borehole Dia (mm) 100 to 24.70m	Casing Dia (mm)	Drilled by EB Logged by Checked by

**Remarks**  
See key sheet and appendices for explanations.

<b>Borehole Record</b>	<b>Project</b> Ballymurtagh Landfill MCOS	<b>Borehole</b> RC6 2000
------------------------	-------------------------------------------------	-----------------------------

Sampling				Strata					
Drill Run	TCR (SCR)	Casing (ROD)	Date/ Water	FI	Description	Depth (Thickness)	Level	Legend	
21.00 2.50	46% (65%)	0.00%	06/04	10	Moderately strong (where intact) orange brown moderately weathered igneous rock (schist) with much iron oxide staining through out. 20.60-22.50m, faulted zone with much angular fault breccia in a cemented sandy matrix. Secondary discontinuities are closely to very closely spaced, irregular, rough and dipping subhorizontal to 60 degrees.	20.60			
	100% (35%)	27%		10					
24.00				NI	23.1-23.3m, Conjugate 45 degree joint set with associated clay infilling.	(4.10)			
24.70	0% (0%)	0%		NR		24.70			
					End of Borehole.				
Equipment: B40 Rotary Rig					Groundwater		Sealed		
Borehole Dia (mm) Casing Dia (mm) 100 to 24.70m					No. Struck Behaviour		Drilled by EB Logged by Checked by		
Remarks See key sheet and appendices for explanations.									
Borehole Record				Project Ballymurtagh Landfill MCOS			Borehole		<b>RC63.DF</b>

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Ballymurtagh Landfill  
Boreholes from 2004

G1/04

G2/04

Note 1: Both boreholes installed as groundwater monitoring boreholes as part of the works for the repair of the Ballymurtagh Road Adit.

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G1/04  
(1 of 3)

REPORT NO.		9643		GEOTECHNICAL CORE LOG RECORD						IGSL Ltd.			
CONTRACT: Ballymurtagh Landfill, Avoca.								DRILLHOLE NO: 04/RC1		SHEET: Sheet 1 of 3			
CLIENT: MC O' Sullivans				CORE DIAMETER (mm): 74		DATE STARTED: 01/04/2004		DATE COMPLETED: 02/04/2004					
ENGINEER: MC O' Sullivans				GROUND LEVEL (MOD):		INCLINATION (Degrees): 90		D.FILLED BY: IGBI					
CO-ORDINATES:				FLUSH:		LOGGED BY: DO'S							
DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.O.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD (kg) MPa	SYMBOLIC LOG	ELEVATION (MOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
1													OPEN HOLE DRILLING: No recovery, observed by driller as returns of made ground consisting of boulder fill.
2													
3													
4													
5													
6													
7													
8													
9													
10													
REMARKS: Water at 25.3m at end of drilling. Driller 1 hr locating BH positions with engineer.							INSTALLATION DETAILS Installation Type: SP Depth to Response Zone top (m): 20.60 Depth to Response Zone bottom (m): 28.80 Comments: Gravel 26.6-28.6m, gravel 20.6-28.0m, headworks.						

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Continued next sheet

GA/04 (2 of 3)

REPORT NO.		9643		GEOTECHNICAL CORE LOG RECORD						IGSL Ltd.			
CONTRACT: Ballymurbagh Landfill, Avoca.								DRILLHOLE NO: 04/BC1		SHEET: Sheet 2 of 3			
CLIENT: MC O' Sullivans				CORE DIAMETER (mm): 74		DATE STARTED: 03/04/2004		DATE COMPLETED: 02/04/2004					
ENGINEER: MC O' Sullivans				GROUND LEVEL (MOD):		INCLINATION (Degrees): 80		DRILLED BY: IGSL					
CO-ORDINATES:				FLUSH:		LOGGED BY: DO'S							
DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.O.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD (50) MPa	SYMBOLIC LOG	ELEVATION (MOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
10													OPEN HOLE DRILLING: No recovery, observed by driller as returns of made ground consisting of boulder fill.
11		0	0	0									
12													
13													
14													
15													
16													
17													
18													
19													
<b>REMARKS:</b> Water at 25.3m at end of drilling. Driller 1hr locating BH positions with engineer.							<b>INSTALLATION DETAILS</b> Installation Type : SP Depth to Response Zone top (m) : 20.60 Depth to Response Zone bottom (m) : 26.60 Comments : Gravel 25.6-20.6m, seal 20.6-0.0m, headworks.						

Continued next sheet

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G1/04 (3 of 3)

REPORT NO.		3643		GEOTECHNICAL CORE LOG RECORD						IGSL Ltd.			
CONTRACT: Ballymurtagh Landfill, Avoca.				DRILLHOLE NO: 04/RC1				SHEET: Sheet 3 of 3					
CLIENT: MC O' Sullivan				CORE DIAMETER (mm): 74				DATE STARTED: 01/04/2004					
ENGINEER: MC O' Sullivan				GROUND LEVEL (MOD):				DATE COMPLETED: 02/04/2004					
OO-COORDINATES:				INCLINATION (Degrees): 90				DRILLED BY: IGSI					
				FLUSH:				LOGGED BY: DO'S					
DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.O.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD (50) (MPa)	SYMBOLIC LOG	ELEVATION (MOD)	DEPTH (m)	SPT (N values)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
19													OPEN HOLE DRILLING: No recovery, observed by driller as returns of made ground consisting of boulder fill
20													OPEN HOLE DRILLING: No recovery, observed by driller as returns of rock
21										21.00			
22	22.00									22.00			Strong, thinly laminated to thinly bedded, grey/green/blue (brown 22.0-23.5m), very fine-grained, PHYLLITE (Fine-grained Metamorphic rock), fresh to locally moderately weathered (at 22.0-23.5m & 24.96-25.2m) intersected by smooth to locally rough, planar to stepped, tight to narrow, locally clay-enslaved, commonly iron-oxide stained fractures of 60° & vary locally sub-horizontal dip.
23		67	25	7									
24	23.60												
25		100	74	21									
26	24.80												
27		82	33	0									
28	26.60												
29		100	84	38									
30	26.60									26.60			End of Borehole at 26.60m
REMARKS: Water at 25.3m at end of drilling. Driller 1hr locating BH positions with engineer.						INSTALLATION DETAILS Installation Type: SP Depth to Response Zone top (m): 20.60 Depth to Response Zone bottom (m): 26.60 Comments: Gravel 25.6-26.0m, sand 20.6-0.0m, headworks.							

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G2/04 (1 of 3)

<b>REPORT NO.</b> 9643		<b>GEOTECHNICAL CORE LOG RECORD</b>					<b>IGSL Ltd.</b>	
<b>CONTRACT:</b> Ballymurtagh Landfill, Avoca.						<b>DRILLHOLE NO:</b> RC2 <b>SHEET:</b> Sheet 1 of 3		
<b>CLIENT:</b> <b>ENGINEER:</b> MC O' Sullivans			<b>CORE DIAMETER (mm):</b> 74 <b>GROUND LEVEL (mOD):</b>		<b>DATE STARTED:</b> 06/04/2004 <b>DATE COMPLETED:</b> 07/04/2004			
<b>CO-ORDINATES:</b>			<b>INCLINATION (Degrees):</b> 90 <b>FLUSH:</b>		<b>DRILLED BY:</b> IGSI <b>LOGGED BY:</b> DO'S			

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.O.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD Is (50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
1					250 500			SYMBOLIC LOG					OPEN HOLE DRILLING: No recovery, observed by driller as returns of madeground consisting of boulder fill and clay bands.
2													
3													
4													
5													
6													
7													

<b>REMARKS:</b> Water at 21.85m at end of drilling. Driller standing 2hrs waiting for machine to clear position.	<b>INSTALLATION DETAILS</b> Installation Type : SP Depth to Response Zone top (m) : 13.95 Depth to Response Zone bottom (m) : 22.95 Comments : Gravel 22.95-13.95m, eel 13.95-0.0m, headworks.
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Continued next sheet

G2/04 (2 of 3)

REPORT NO.		9843		GEOTECHNICAL CORE LOG RECORD					IGSL Ltd.				
CONTRACT: Ballymuragh Landfill, Avoca.							DRILLHOLE NO: RC2		SHEET: Sheet 2 of 3				
CLIENT: MC O' Sullivans				CORE DIAMETER (mm): 74		DATE STARTED: 06/04/2004		DATE COMPLETED: 07/04/2004					
ENGINEER: MC O' Sullivans				GROUND LEVEL (mOD):		INCLINATION (Degree): 90		DRILLED BY: IGSI					
CO-ORDINATES:				FLUSH:		LOGGED BY: DO'S							
DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.O.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD I <sub>s(50)</sub> (MPa)	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
10		0	0	0									OPEN HOLE DRILLING: No recovery, observed by driller as returns of madeground consisting of boulder fill and clay bands.
11													
12													
13													
14													
16										16.50			OPEN HOLE DRILLING: No recovery, observed by driller as returns of possible rock
10													Continued next sheet
REMARKS: Water at 21.95m at end of drilling. Driller standing 2hrs waiting for machine to clear position.							INSTALLATION DETAILS Installation Type: SP Depth to Response Zone top (m): 13.95 Depth to Response Zone bottom (m): 22.95 Comments: Gravel 22.95-13.95m, seal 13.95-0.0m, headworks.						

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REPORT NO.		9643		GEOTECHNICAL CORE LOG RECORD						IGSL Ltd.			
CONTRACT: Ballymurtagh Landfill, Avoca.								DRILLHOLE NO: RC2		SHEET: Sheet 3 of 3			
CLIENT: ENGINEER: MC O' Sullivans				CORE DIAMETER (mm): 74		GROUND LEVEL (mOD):		DATE STARTED: 06/04/2004		DATE COMPLETED: 07/04/2004			
CO-ORDINATES:				INCLINATION (Degrees): 90		FLUSH:		DRILLED BY: IGSI		LOGGED BY: DO'S			
DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.O.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
18.50										18.50			OPEN HOLE DRILLING: No recovery, observed by driller as returns of possible rock
19.00										19.00			No recovery, driller scrubbing bit - Possible rock
20.00		13	0	0						20.00			OPEN HOLE DRILLING: No recovery, observed by driller as returns of possible rock
20.30		67	0	0						20.30			Returns of angular gravel - Possible highly weathered rock
21.00		35	0	0									Returns of gravel and clay - Possible highly weathered rock
22.00		100	0	0						22.00			Returns of angular gravel - Possible highly weathered rock
22.15		20	0	0						22.15			Returns of gravel and clay - Possible highly weathered rock
22.65		67	33	0						22.65			Returns of angular cobbles - Possible highly weathered rock
22.95										22.95			End of Borehole at 22.95 m
REMARKS: Water at 21.95m at end of drilling. Driller standing 2hrs waiting for machine to clear position.								INSTALLATION DETAILS					
								Installation Type: SP					
								Depth to Response Zone top (m): 13.95					
								Depth to Response Zone bottom (m): 22.95					
								Comments: Gravel 22.95-13.95m, seal 13.95-0.0m, headworks.					

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Ballymurtagh Landfill  
Boreholes from 2005

G1/05

G2/05

Note 1: Boreholes installed as groundwater monitoring wells.

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G1/05 (1 of 2)

# Glover Site Investigations Ltd

Site Ballymurtagh Landfill Site, County Wicklow	Borehole Number 2
Client Wicklow County Council	Job Number 05-201
Engineer RPS MCOS	Sheet 1/2

Boring Method Down The Hole Rotary	Casing Diameter 150mm cased to 31.00m	Ground Level (mOD)
	Location As Plan	Dates 23/03/05- 24/03/05

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							OVERBURDEN: Brown sandy CLAY		
				Water strike(1) at 7.00m.		7.00	OVERBURDEN: Brown sandy gravelly CLAY with cobbles and boulders		Σ1
						(13.00)			
						20.00			

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Remarks  
Installed standpipe to 31.00m - see installation log for details

Scale (approx) 1:100	Logged By DC/CM
Figure No. 05-201.2	

# Glover Site Investigations Ltd

Site  
Ballymurtagh Landfill Site, County Wicklow  
Borehole Number  
2

Boring Method Down The Hole Rotary	Casing Diameter 150mm cased to 31.00m	Ground Level (mOD)	Client Wicklow County Council	Job Number 05-201
	Location As Plan	Dates 23/03/05- 24/03/05	Engineer RPS MCOS	Sheet 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							OVERBURDEN: Brown sandy gravelly CLAY with cobbles and boulders		
						4.00			
						24.00	ROCK: Dark grey SLATE		
						7.00			
				24/03/05		31.00	Complete at 31.00m		

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Remarks	Scale (approx) 1:100	Logged By DC/CM
	Figure No. 05-201.2	

# Glover Site Investigations Ltd

Site Hallymurtagh Landfill Site, County Wicklow		Borehole Number 2
Client Wicklow County Council		Job Number 05-201
Fugheor DPC/MCOS		Sheet 1/1

Installation Type  
Standpipe

Diameters  
Internal Diameter of Tube 57.3mm  
Diameter of Filter 25mm

Location  
As Plan

Final Level (mOD)

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
				0.00	Surface
				7.00	Gravel
				20.00	Hardened Soil
				24.00	Fine Gravel Sand
				25.00	
				31.00	Well Screen

Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)
		5 min	10 min	15 min	20 min	

Start of Shift			End of Shift				
Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
				31.00			

Instrument (A)	Depth (m)	Level (mOD)

Remarks

Remarks  
Flush lockable cover fitted

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# Glover Site Investigations Ltd

Site  
Ballymurlagh Landfill Site, County Wicklow

Borehole Number  
3

Client  
Wicklow County Council

Job Number  
05-201

Boring Method  
Down The Hole Rotary

Casing Diameter  
150mm cased to 10.00m

Ground Level (mOD)

Location  
As Plan

Dates  
24/03/05

Engineer  
RPS MCOS

Sheet  
1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							OVERBURDEN: Brown sandy CLAY		
				Water strike(1) at 7.00m.		7.00	OVERBURDEN: Brown gravelly sandy CLAY		Σ1
				24/03/05		10.00	Complete at 10.00m		

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Remarks  
Installed standpipe to 10.00m - see installation log for details

Scale (approx)  
1:100

Logged By  
DC/CM

Figure No.  
05-201.3

G-2/05 (Well details)

<b>Glover Site Investigations Ltd</b>			Site Ballymurtagh Landfill Site, County Wicklow	Borehole Number 3
Installation Type Standpipe	Dimensions Internal Diameter of Tube (A) = 50 mm Diameter of Filter Zone = 150 mm		Client Wicklow County Council	Job Number 05-201
	Location As Plan	Ground Level (mOD)	Engineer RPS MCOS	Sheet 1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling											
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)		
				2.00	Bentonite Seal			7.00									
				4.00	Fine Gravel Filter	Groundwater Observations During Drilling											
						Start of Shift					End of Shift						
						Date	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	
						24/03/05							10.00				
						Instrument Groundwater Observations											
						Inst. (A) Type :											
						Instrument (A)				Remarks							
					Date	Time	Depth (m)	Level (mOD)									
				10.00	Well Screen												

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Remarks  
Flush lockable cover fitted

Ballymurtagh Landfill  
Borehole from 2010

L 10/01

Note 1: Borehole has been installed to assess current leachate level.

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Glover Site Investigations Ltd						Site Ballymurtagh Landfill, Co. Wicklow		Borehole Number GW02B	
Boring Method Cable Percussion		Casing Diameter 250mm cased to 15.00m		Ground Level (mOD)		Client Wicklow County Council		Job Number 10-259	
		Location		Dates 23/07/2010		Engineer Wicklow County Council - Environment Section		Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(1.60)	MADE GROUND: Clay Capping Layer		
						1.60	MADE GROUND: Landfill		
						(8.40)			
						10.00			

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<b>Remarks</b> Hand dug inspection pit excavated to 1.20m. Standpipe installed. Chiselling from 6.00m to 6.80m for 1.5 hours.	Scale (approx)	Logged By
	1:50	JC/HH
	Figure No. 10-259.GW02B	

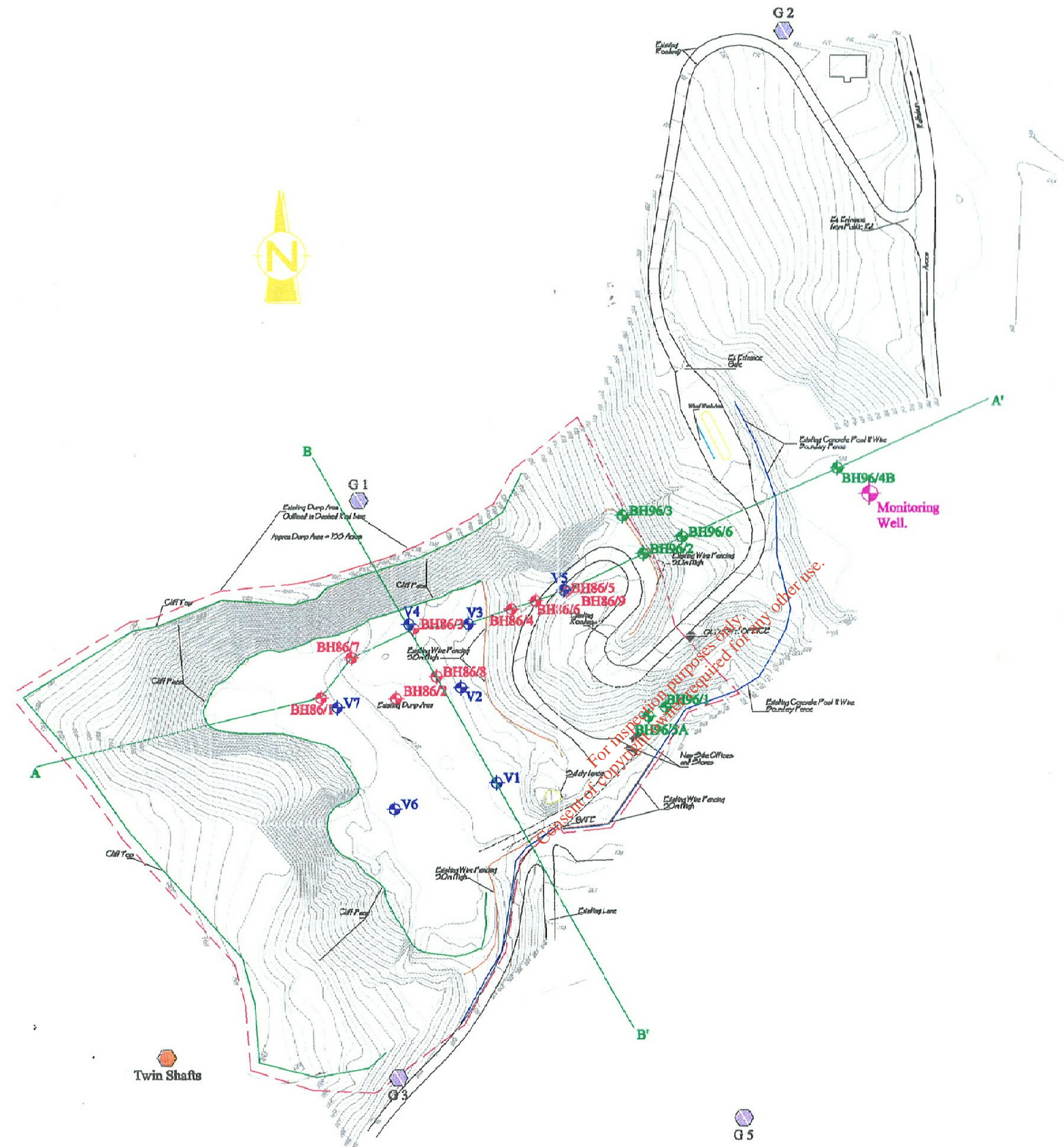


<b>Glover Site Investigations Ltd</b>					Site Ballymurlagh Landfill, Co. Wicklow		Borehole Number GW02B	
Boring Method Cable Percussion		Casing Diameter 250mm cased to 15.00m		Ground Level (mOD)		Client Wicklow County Council		Job Number 10-259
		Location		Dates 23/07/2010		Engineer Wicklow County Council - Environment Section		Sheet 2/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
				Water Strike(1) at 13.00m.		(4.80)	MADE GROUND: Landfill	▽1
				23/07/2010:		14.40 0.20 15.00	MADE GROUND: Mine Waste (Driller's description)	
							Complete at 15.00m	
Remarks Chiselling from 14.40m to 15.00m for 1.5 hours.							Scale (approx) 1:50	Logged By JC/HH
							Figure No. 10-259.GW02B	

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<b>Glover Site Investigations Ltd</b>					Site Ballymurtagh Landfill, Co. Wicklow					Borehole Number <b>GW02B</b>										
Installation Type Standpipe Piezometer			Dimensions Internal Diameter of Tube [A] = 100 mm Diameter of Filter Zone = 250 mm			Client Wicklow County Council					Job Number 10-259									
Location			Ground Level (mOD)			Engineer Wicklow County Council - Environment Section					Sheet 1/1									
Legend	Work	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling														
						Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)					
				0.30	Concrete Bentonite Seal															
				1.00	Fine Gravel Filter			13.00		Water Strike										
				2.00																
Groundwater Observations During Drilling																				
Date		Start of Shift						End of Shift												
		Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)									
23/07/10								15.00												
Instrument Groundwater Observations																				
Inst. [A] Type																				
Slotted Standpipe					Instrument [A]				Remarks											
					Date	Time	Depth (m)	Level (mOD)												
Remarks Upright cover fitted.																				

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**Notes.**

- Shaft
- Twin Shafts**
- Gas Monitoring Well
- G 5**
- Roads
- Ground Level Contours
- Boreholes (1986)
- BH86/2**
- Boreholes (1996)
- BH96/4B**
- V2 Gas Vents / Leachate Monitoring Wells.
- Proposed Monitoring Well.
- Monitoring Well.**

**Note:**  
 This map is a copy of Map No. 4 taken from Appendix A "Geology & Hydrogeology" in Volume 3 (Technical Appendices) of the EIS for Ballymurtagh Landfill (Nov. 1998).

**NOTES**

1. Verifying Dimensions.  
The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.
2. Existing Services.  
Any information concerning the location of existing services indicated on this drawing is intended for general guidance only. It shall be the responsibility of the contractor to determine and verify the exact horizontal and vertical alignment of all cables, pipes, etc. (both underground and overhead) before work commences.
3. Issue of Drawings.  
Hard copies, dxf and pdf will form a controlled issue of the drawing. All other formats (dwg, dxf etc.) are deemed to be an uncontrolled issue and any work carried out based on these files is at the recipient's own risk. RPS will not accept any responsibility for any errors arising from the use of these files, either by human error by the recipient, listing of un-dimensioned measurements, compatibility issues with the recipient's software, and any errors arising when these files are used to aid the recipient's drawing production, or setting out on site.
4. Datum: Ordnance Survey Datum, Malin Head


No.	Date	Drn. Cnk.	Amendment / Issue	App
A01	Sept.'10	HF/CC	Issue for Approval	CC

Client



Wicklow County Council  
 County Buildings,  
 Wicklow,  
 Co. Wicklow

Drawn By	Checked By	Approved By	Date
HF	CC	CC	Sept.'10



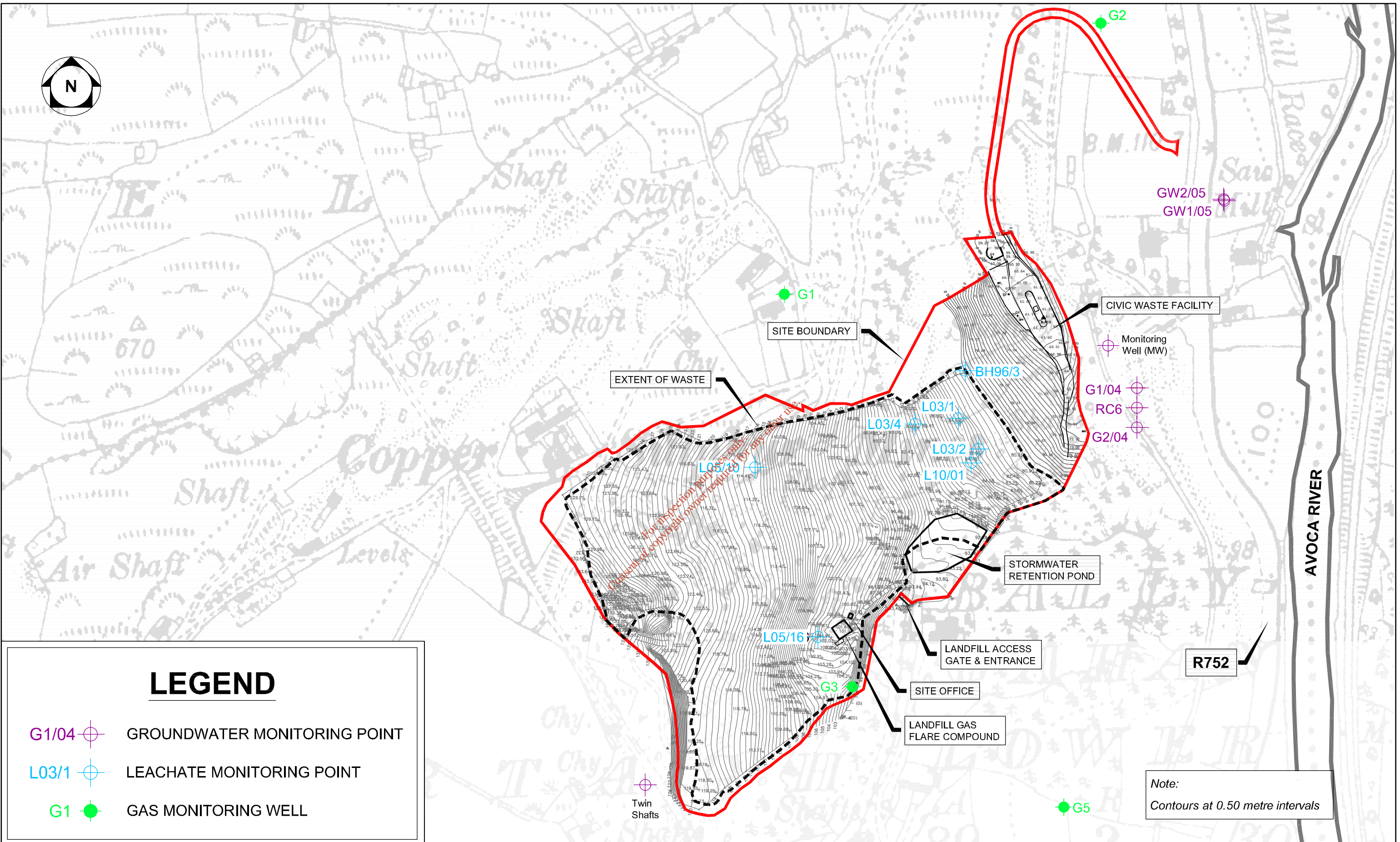
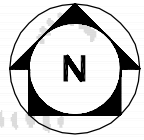
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Project **Ballymurtagh Landfill**

Drawing Status	Sheet Size	Scale
FINAL	A3	NTS

Drawing Number	Rev
MDE0046/FG0006	F01
Title	
MAP 1 MONITORING WELL LOCATIONS - 1986 TO 1996	



## LEGEND

- G1/04 GROUNDWATER MONITORING POINT
- L03/1 LEACHATE MONITORING POINT
- G1 GAS MONITORING WELL

*Note:*  
Contours at 0.50 metre intervals

NOTES				
1. Verifying Dimensions. The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.	3. Issue of Drawings. Hard copies, dxf and pdf will form a controlled issue of the drawing. All other formats (dwg, dxf etc.) are deemed to be an uncontrolled issue and any work carried out based on these files is at the recipient's own risk. RPS will not accept any responsibility for any errors arising from the use of these files, either by human error by the recipient, listing of un-dimensioned measurements, compatibility issues with the recipient's software, and any errors arising when these files are used to aid the recipient's drawing production, or setting out on site.			
2. Existing Services. Any information concerning the location of existing services indicated on this drawing is intended for general guidance only. It shall be the responsibility of the contractor to determine and verify the exact horizontal and vertical alignment of all cables, pipes, etc. (both underground and overhead) before work commences.	4. Datum: Ordnance Survey Datum, Malin Head			

No.	Date	Drn. Chk.	Amendment / Issue	App
A01	Sept.'10	HF	Issue for Approval	CC

Client				
 Wicklow County Council County Buildings, Wicklow, Co. Wicklow				
Drawn By	Checked By	Approved By	Date	
HF	CC	CC	Sept.'10	

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Project		Ballymurtagh Landfill	
Drawing Status	Sheet Size	Scale	
FINAL	A3	1:2000	

Drawing Number	Rev
MDE0046/FG0005	F01
Title	
MAP 2 MONITORING WELL LOCATIONS - 1998 TO 2010	