

AGL Upstream Investments Pty Ltd

Phase 2 Groundwater Investigations

Stage 1 Gas Field Development Area Gloucester Gas Project

January 2012





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02	Final DRAFT	19/12/2011	JCD/WMC/SB
03	FINAL	11/01/2012	JCD

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Contents

				Page number
Glo	ssary			viii
Exe	cutive	e summary	y	xxiii
1.	Intro	1		
	1.1	Backgrou	nd	1
	1.2	Importanc	ce of groundwater studies	1
	1.3	Project ap	oprovals	5
	1.4	Report str	ructure	6
2.	Pre	vious stud	lies	7
	2.1	Previous	desktop studies	7
		2.1.1	URS hydrogeological review	7
		2.1.2	SRK preliminary assessment	8
	2.2	Previous	CSG pilot/flow testing programs	11
	2.3	Previous	water sampling programs	13
3.	Site	character	risation	14
	3.1	Site locati	ion	14
	3.2	Topograp	hy and surface hydrology	16
	3.3	Climate a	nd rainfall	16
	3.4	Land use		19
	3.5	Geologica	al setting	20
	3.6	3.5.1 3.5.2 3.5.3 Hydrogeo	Regional Geology Stratigraphy of the investigation area Geological structure of the investigation area logical setting	20 22 24 28
		3.6.1 3.6.2 3.6.3 3.6.4 3.6.5 3.6.6	Hydrogeological units Structural controls Groundwater levels Recharge and discharge Local groundwater use Groundwater dependent ecosystems	28 30 30 30 31 31
4.	Inve	stigation	scope of works, methodology, and completions	33
	4.1	Part 3A a	pproval requirements	33
	4.2	Objective	s and scope of works	36



	4.3	Methodology & overview of program	37
	4.4	Groundwater monitoring bore drilling program	41
	4.5	 4.4.1 Approvals, licences and permits 4.4.2 Health, Safety & Environment 4.4.3 Monitoring bore completions Stream gauge installation 	42 43 46 49
	4.6	Survey	49
	4.7	Groundwater level monitoring	50
	4.8	Hydraulic testing	51
	4.9	 4.8.1 Rising/falling head testing 4.8.2 Packer testing 4.8.3 Laboratory permeability testing Groundwater quality monitoring 	51 52 54 55
	4.10	 4.9.1 Sampling methods 4.9.2 Chemical analysis of water 4.9.3 Quality assurance Surface water quality monitoring 	55 55 57 58
	4.11	4.10.1 Rivers4.10.2 Tiedman and Stratford storage damsShallow gas monitoring	58 58 61
	4.12	Coal analysis	61
5	4.12	Coal analysis	61 62
5.	4.12 Upd a	Coal analysis ated geological model	61 62
5.	4.12 Upda 5.1	Coal analysis ated geological model Alluvium	61 62 67
5.	4.12 Upda 5.1 5.2	Coal analysis ated geological model Alluvium Shallow rock	61 62 67
5.	4.12 Upda 5.1 5.2 5.3	Coal analysis ated geological model Alluvium Shallow rock Interburden	61 62 67 67
5.	4.12 Upda 5.1 5.2 5.3 5.4	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams	61 62 67 67 67 68
5.	4.12 Upda 5.1 5.2 5.3 5.4 5.5	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams Geological structure	61 62 67 67 67 68 68
5.	4.12 Upda 5.1 5.2 5.3 5.4 5.5 Hydu	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams Geological structure ated geological structure	61 62 67 67 68 68 68
5.	4.12 Upda 5.1 5.2 5.3 5.4 5.5 Hydu 6.1	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams Geological structure raulic testing results Rising/falling head testing	61 62 67 67 68 68 68 69
5.	4.12 Upda 5.1 5.2 5.3 5.4 5.5 Hydu 6.1 6.2	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams Geological structure rulic testing results Rising/falling head testing Quality Assurance	61 62 67 67 68 68 68 69 69 70
5.	4.12 Upda 5.1 5.2 5.3 5.4 5.5 Hydu 6.1 6.2	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams Geological structure raulic testing results Rising/falling head testing Quality Assurance 6.2.1 Raw measurements 6.2.2 Correction for slowly recovering bores 6.2.3 Oscillation effect in high hydraulic conductivity bores Packer testing	61 62 67 67 68 68 68 69 70 70 70 70 71 71 71
5.	4.12 Upda 5.1 5.2 5.3 5.4 5.5 Hydi 6.1 6.2	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams Geological structure raulic testing results Rising/falling head testing Quality Assurance 6.2.1 Raw measurements 6.2.2 Correction for slowly recovering bores 6.2.3 Oscillation effect in high hydraulic conductivity bores Packer testing 6.3.1 Hydraulic conductivity results 6.3.2 Observations	61 62 67 67 68 68 68 69 70 70 70 70 71 71 72 72 75
5.	4.12 Upda 5.1 5.2 5.3 5.4 5.5 Hydu 6.1 6.2 6.3	Coal analysis ated geological model Alluvium Shallow rock Interburden Coal seams Geological structure raulic testing results Rising/falling head testing Quality Assurance 6.2.1 Raw measurements 6.2.2 Correction for slowly recovering bores 6.2.3 Oscillation effect in high hydraulic conductivity bores Packer testing 6.3.1 Hydraulic conductivity results 6.3.2 Observations Laboratory permeability testing	61 62 67 67 68 68 69 70 70 70 70 71 71 71 72 72 75 75

77



	7.1	Baselir	ne groundwater level monitoring	79		
	7.2	7.1.1 7.1.2 7.1.3 7.1.4 Aquifer	Alluvial aquifers Shallow rock units Interburden units Coal seams r interactions	79 80 80 80 81		
	7.3	7.2.1 7.2.2 7.2.3 7.2.4 7.2.5 7.2.6 Fault z	Stratford 4 Monitoring Bores (S4MB) Stratford 5 Monitoring Bores (S5MB) Tiedman core hole monitoring bores (TCMB) Bignell monitoring bores Waukivory Road monitoring bores Rombo monitoring bores cone effects	81 82 83 84 85 86 86		
	7.4	Baselir	ne surface water level monitoring	87		
8.	Wate	er quali	ity monitoring	88		
	8.1	Ground	dwater quality	88		
	8.2	8.1.1 8.1.2 8.1.3 8.1.4 Aquifer	Alluvial aquifers Shallow rock aquifers Interburden units Coal seams r and deeper water bearing zone interactions	89 95 100 103 108		
	83	8.2.1 8.2.2 8.2.3 8.2.4 8.2.5 8.2.6 Surface	Stratford 4 Monitoring Bores (S4MB) Stratford 5 monitoring bores (S5MB) Tiedman core hole monitoring bores (TCMB) Bignell monitoring bores Waukivory Road monitoring bores Rombo monitoring bores	111 111 112 112 112 112 113 113		
	8.4	Tiedma	e water quality	115		
	0.4	8.4.1 8.4.2 8.4.3 8.4.4	Summary Tiedman Dams Stratford Dams Seepage assessment	115 115 118 119 120		
9.	Coa	l and ga	as chemistry	122		
	9.1	TCMB	04 coal analysis	122		
	9.2	Gas sa	ampling	122		
10.	Upda	ated hy	drogeological conceptual model	123		
	10.1	Hydrog	geological units	123		
	10.2	Alluvial	l aquifers	128		
	10.3	Shallov	130			
	10.4	4 Interburden confining units				



10.5	Coal seam water bearing zones	131
10.6	Groundwater dependant ecosystems	132
10.7	Significance of fault zones	132
Conc	lusions	133
State	ment of limitations	136
12.1	Scope of services	136
12.2	Reliance on data	136
12.3	Environmental conclusions	136
12.4	Report for benefit of client	136
12.5	Other limitations	137
	10.5 10.6 10.7 Conc State 12.1 12.2 12.3 12.4 12.5	 10.5 Coal seam water bearing zones 10.6 Groundwater dependant ecosystems 10.7 Significance of fault zones Conclusions Statement of limitations 12.1 Scope of services 12.2 Reliance on data 12.3 Environmental conclusions 12.4 Report for benefit of client 12.5 Other limitations

13. References

138



List of tables

		Page number
Table 2-1	Summary Results from Stratford Pilot Well Program	13
Table 3-1	Agricultural land suitability classes	19
Table 3-2	Stratigraphy of the Gloucester Basin	22
Table 3-3	Hydrogeological units of the Stage 1 GFDA (after SRK, 2010)	28
Table 4-1	Schedule of water management conditions and technical studies completed	34
Table 4-2	Groundwater monitoring bore construction details	41
Table 4-3	Monitoring bore licences	43
Table 4-4	Monitoring bores and stream gauge survey coordinates	50
Table 4-5	TCMB04 Packer test zones	53
Table 4-6	Pressure steps applied for each packer test	54
Table 4-7	Core samples from TCMB04	54
Table 4-8	Laboratory chemical and isotope analytical suite	56
Table 4-9	Sample containers for chemical and isotopic analytes	57
Table 5-1	Four key hydrostratigraphic units	67
Table 6-1	Hydraulic conductivity results from slug tests	69
Table 6-2	TCMB04 Packer test results	72
Table 6-3	Laboratory permeability testing results	75
Table 6-4	Hydrogeological units of the Stage 1 GFDA (updated)	76
Table 7-1	Manual groundwater levels (June 2011)	78
Table 8-1	Water quality summary – alluvial aquifers	89
Table 8-2	Isotope summary – alluvial aquifers	94
Table 8-3	Water quality summary – rock aquifers	96
Table 8-4	Isotope summary – shallow rock aquifers	99
Table 8-5	Water quality summary - inter-bedded sandstone/siltstone water bearing zones	100
Table 8-6	Isotope summary – interburden units	103
Table 8-7	Water quality summary – coal seams	104
Table 8-8	Isotope summary – coal seams	107
Table 8-9	Surface water quality	114
Table 8-10	Water quality parameters for Tiedman and Stratford dams	116
Table 8-11	Trace metal concentrations, seepage water (TMB04 and TMB05) and dam water	er 121
Table 9-1	Gas sample composition (ppm)	122
Table 10-1	Hydrogeological units of the Stage 1 GFDA (updated)	123

List of figures

Figure 1-1	Regional location map showing PEL 285 and the Stage 1 GFDA.	4
Figure 2-1	Location of AGL's Stratford pilot gas wells	12
Figure 3-1	Regional location of the Stage 1 GFDA	15
Figure 3-2	Site topography and surface water	16
Figure 3-3	Long term mean monthly precipitation for Gloucester Hiawatha, Post Office, and	
	evaporation at Chichester Dam for all monitoring years (1888-2011)	17
Figure 3-4	Monthly cumulative deviation rainfall for Hiawatha (BoM Station 060112) for all monitor	ing
	years (1977-2010)	18
Figure 3-5	Long term mean monthly temperature for Dungog Post Office (BoM Station 061288) fo	r all
	monitoring years (1897-2011)	18
Figure 3-6	Regional geology map of the Gloucester Basin in the vicinity of the Stage 1 GFDA	21
Figure 3-7	E-W seismic section through the Stage 1 GFDA	26
Figure 3-8	SW-NE seismic section through the Stage 1 GFDA	27
Figure 4-1	Summary of investigation objectives and scope	37



Figure 4-2	Groundwater and surface water monitoring network	40
Figure 4-3	Typical drill pad layout	45
Figure 4-4	Schematic cross section of the S5MB nested monitoring site	47
Figure 4-5	Slug testing: rising and falling head test (after Waterra 2011)	52
Figure 4-6	Double packer test with wireline assembly	53
Figure 4-7	Storage dam locations	60
Figure 5-1	Simplified regional NE-SW geological cross-section through the Stage 1 GFDA	63
Figure 5-2	Simplified E-W geological cross-section through the Stage 1 GFDA	64
Figure 5-3	N-S geological cross-section through the Tiedman property	65
Figure 5-4	E-W geological cross-section through the Tiedman property	66
Figure 6-1	Example of raw measurements during the test procedure	71
Figure 6-2	Example of a slow recovery	71
Figure 6-3	Oscillation following rapid recovery in highly permeable aquifers	72
Figure 6-4	Packer test geometry and variables	73
Figure 6-5	Conductivity coefficients for semispherical flow in saturated materials through a partially	_ /
	penetrating cylindrical test well	74
Figure 7-1	Combined groundwater levels and rainfall at the Tiedman/Atkins alluvial bores	79
Figure 7-2	Groundwater levels at Stratford 4	81
Figure 7-3	Groundwater levels at Stratford 5	82
Figure 7-4	Groundwater and rainfall levels at Tiedman core hole site	83
Figure 7-5	Groundwater and rainfall levels at Bignell	84
Figure 7-6	Groundwater levels at the Waukivory Road site	85
Figure 7-7	Groundwater levels at the Rombo site	86
Figure 7-8	Surface water levels from the Avon River stream gauges	87
Figure 8-1	Piper diagram showing major ion composition of groundwater and surface water	89
Figure 8-2	Cross-section showing major ion chemistry and age of alluvial aquifers	92
Figure 8-3	A bivariate plot of $\delta^2 H vs. \delta^{10}O$ for groundwater samples	95
Figure 8-4	Cross-section through the Tiedman property (W-E) showing major ion chemistry and	
	groundwater age	109
Figure 8-5	Cross-section through the Tiedman property (N-S) showing major ion chemistry and	110
	Groundwater age	110
Figure 0-0	Diser diserver showing major ion composition of holding dome	114
Figure 8-7	Piper diagram showing major ion composition of holding dams	118
Figure 8-8	cross-section showing major ion composition of fredman South holding dam and seepa	ige 120
Figure 10-1	Permeability summary	125
Figure 10-2	Conceptual cross-section through the Tiedman property (SW-NE)	126
Figure 10-3	Conceptual cross-section through the Tiedman property (W-E)	127
Figure 10-4	Alluvial aquifer groundwater level contours	129
Figure 10-5	Alluvial groundwater levels and river levels	130
90.0 10 0		

Summary Tables

Summary Table 1	AGL Pilot test wells water quality results
Summary Table 2	Field results April 2011 groundwater monitoring event
Summary Table 3	Laboratory results April 2011 groundwater monitoring event
Summary Table 4	Tiedman Dams laboratory and field results
Summon Toble F	Stratford Dome Johanstony and field regults

Summary Table 5 Stratford Dams laboratory and field results



Appendices

- Appendix A AGL Pilot test wells laboratory analyses
- Appendix B Bore logs
- Appendix C Test bore licences
- Appendix D TCMB04 Core photographs
- Appendix E Geophysical logs
- Appendix F Australian Laboratory Services analytical results
- Appendix G GNS Stable Isotope Laboratory analytical results
- Appendix H Rafter Radiocarbon Laboratory analytical results
- Appendix I ANSTO and GNS Tritium and Water Dating Laboratory analytical results
- Appendix J Quality assurance/quality control
- Appendix K Isotech Laboratory Report gas sample analysis
- Appendix L ALS Coal Analytical Reports
- Appendix M Hydraulic conductivity testing figures
- Appendix N Packer test charts
- Appendix O Groundwater monitoring bore hydrographs
- Appendix P Tiedman Dam profiling figures

Appendix A

AGL Pilot test wells laboratory analyses

ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

ALS)

CERTIFICATE OF ANALYSIS

Work Order	: ES1021779	Page	: 1 of 4
Client		Laboratory	: Environmental Division Sydney
Contact	: MR JOHN ROSS	Contact	: Charlie Pierce
Address	P.O BOX 67 MENANGLE MENANGLE NSW 2568	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Telephone	: 4633 5200	Telephone	: +61-2-8784 8555
Facsimile	:	Facsimile	: +61-2-8784 8500
Project	: GLOUCESTER GAS PROJECT-POND WATER QUALITY ASSESSMENT	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	:		
C-O-C number	:	Date Samples Received	: 29-OCT-2010
Sampler	: TL	Issue Date	: 04-NOV-2010
Site	:		
		No. of samples received	: 5
Quote number	: SY/456/10	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



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General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society. LOR = Limit of reporting ^ = This result is computed from individual analyte detections at or above the level of reporting

- ED041G: LOR raised for SO4 analysis on sample Id:TiedNth/201010/1/TL due to sample matrix
- ED-093F:LCS recovery for Potassium falls outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.
- EP080:Level of Reporting raised for toluene due to ambient background levels in the laboratory.



Analytical Results

Sub-Matrix: WATER		Clie	ent sample ID	TiedNth/201010/1/TL	TiedSth/201010/1/TL	STRAT1/201010/1/TL	STRAT3/201010/1/TL	CRAV6/201010/1/TL
	CI	ient sampli	ng date / time	26-OCT-2010 15:00	26-OCT-2010 15:00	26-OCT-2010 15:00	26-OCT-2010 15:00	26-OCT-2010 15:00
Compound	CAS Number	LOR	Unit	ES1021779-001	ES1021779-002	ES1021779-003	ES1021779-004	ES1021779-005
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C		1	μS/cm	4280	2790	2160	2300	6440
EA016: Non Marine - Estimated TDS	Salinity							
^ Total Dissolved Solids (est.)		1	mg/L	2780	1810	1410	1500	4180
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	454	314	212	220	270
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	901	464	393	463	2850
Total Alkalinity as CaCO3		1	mg/L	1360	778	605	683	3120
ED041G: Sulfate (Turbidimetric) as S	O4 2- by DA							
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	22	21	10	<1
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	569	425	332	338	515
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	3	2	3	10
Magnesium	7439-95-4	1	mg/L	<1	1	<1	1	3
Sodium	7440-23-5	1	mg/L	769	624	504	524	1620
Potassium	7440-09-7	1	mg/L	323	43	12	27	11
EN055: Ionic Balance								
^ Total Anions		0.01	meq/L	43.1	28.0	21.9	23.4	76.9
^ Total Cations		0.01	meq/L	41.7	28.5	22.4	23.7	71.4
^ Ionic Balance		0.01	%	1.70	0.85	1.01	0.62	3.77
EP080/071: Total Petroleum Hydroca	rbons							
C6 - C9 Fraction		20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction		50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction		100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction		50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)		50	µg/L	<50	<50	<50	<50	<50
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<5	<5	<5	<5	<5
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortno-Aylene	95-47-6	2	µg/L	<2	< <u><</u>	< <u><</u>	< <u><</u>	<2
EP080S: TPH(V)/BTEX Surrogates		0.1	0/					
1.2-Dichloroethane-D4	17060-07-0	0.1	%	108	110	91.9	85.2	90.8
1 Oluene-D8	2037-26-5	0.1	%	106	112	102	96.4	103
4-Bromofluoropenzene	460-00-4	0.1	70	104	106	98.0	95.2	101
							Д	Campbell Brothers Limited Company



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)				
Compound	CAS Number	Low	High			
EP080S: TPH(V)/BTEX Surrogates						
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1			
Toluene-D8	2037-26-5	79.6	126.8			
4-Bromofluorobenzene	460-00-4	79.1	125.0			

Appendix B

Bore logs



BORE NO.

AMB01

SHEET 1 OF 1

Client: Project: Bore Location:			A H	GL Er lydror	nergy Li geologic	mited al Assessment - Gloucester Gas Project	Date Date	Comme Comple	enced: eted:	1/2/11 31/1/11
Bor Pro	e Loca ject N	ation: umber:	G 2	louce	ster - A 6A	tkins property	Reco Log	orded By Checke	/: d By:	NPH JCD
Drill Drill	ing Me ling Cc	ethod:	A H	vir Har Iighlai	nmer - l nd Drilli	_ongyear 850 ng Borehole Diameter: 140 mm	Surfa Co-c	ace RL: ords:	107.88 n E 40165	nAHD 9.1 N 6448639.73 MGA56
В	ore Inf	formation	n			Field Material Description		1		
WATER	WELL CO	ONSTRUCTION	RL (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FOF (App	RMATION roximate)	HYDROGEOLOGY
		50 mm ID Class 18 uPVC & grout Drill cuttings backfill	- 107 - 106 - 105	1 - 2 - 3 -		TOPSOIL - Grey, dry sandy topsoil - low organic content CLAY - Light brown, mottled sandy clay - dry CLAY - Grey brown, sticky medium plasticity		Avon F Alluviu	River	
		Bentonite seat Gravel 5 mm	- 104 - 103	4 - 5 -						
		graded 50 mm ID, 0.5 mm aperture uPVC screen	- 102	6 - 7 -		MIXED GRAVELS - Brown & white, fine grained mixed, clean gravels with so fine grained sand Some grey, blue, white and brown pebbles up to 4 cm	ome			
			- 99 - 98	8 - 9 - 10 -		MIXED GRAVELS - Brown & white, medium to fine grained mixed, clean grav with some grey, blue, white and brown pebbles up to 4 cm resistance during drilling, indicative of siltstone	vels			
∠		Sump/ bentonite plug	- 97	11 -		OU TOTANT Durd and a Blatcopy (2001) with 40% light goay medium grains	1	0.000		pH: 7.46 EC: 2953 µS/cm
			- 95	13 -		SILISTONE - Dah grey, situatione (ou %) with 40 % light grey, meaning graine	20	Coal N	ester Aeasures	Temp: 24.38 °C redox: -27.9 mV pH: 7.37 EC: 2988 µS/cm Temp: 23.45 °C redox: -99.4 mV
			- 93	14 -		END OF BOREHOLE AT 12.60 m	ffs 2000	moonving	standard n	otes



BORE NO.

AMB02

		YEARS ®								SHEET 1 OF 1	
Clie Pro Bor Pro	ent: iject: re Loc iject N	ation: lumber:	A H G 2'	GL Ei ydrog louce 16240	nergy Li geologic ster - A 6A	imited cal Assessment - Gloucester Gas Project tkins property	Date Date Reco Log C	Commo Comple rded By Checkeo	enced: 31 eted: 1/2 /: NF d By: JC	1/11 /11 H D	
Dril	ling M	lethod:	A	ir Har	nmer - I	Longyear 850	Surfa	ce RL:	111.48 mA		
Dril	ling C lore Ir	ompany:	н -	igniar	na Drilli	ng Borehole Diameter: 140 mm	Co-or	rds:	E 400693.9	9 N 6447946.05 MGA56	
			•								
WATER	WELL C	ONSTRUCTION	RL (AHDm) AH	DEPTH (BGLm	GRAPHIC LOG	LITHOLOGY		FOF (App	MATION roximate)	HYDROGEOLOGY	
		50 mm ID Class 18 uPVC & grout	- 111 - 110	1 –		CLAY TOPSOIL - Brown, sandy clay topsoil, medium plasticity		Avon F Alluviu	River		
			- 109	2 -	· / · · /	SAND - Light brown, very fine grain sand with some clay					
			- 108	4 –	· · · · · · · · · · · · · · · · · · ·	SANDY CLAY - Light brown, very fine grained sand with dark grey clay (me	dium				
			- 107	5 -		CLAY - Light grey and brown, low/medium plasticity clay with light brown ver grained sand	ry fine				
		Bentonite seal	- 106	6 -							
		Gravel 5 mm graded	- 104	7 –		MIXED GRAVELS/CLAY - Mixed gravels up to 3mm with grey, sticky, moist	t clay				
		50 mm ID, 0.5 mm aperture uPVC screen	- 103	8 -		MIXED GRAVELS - Green/black/brown, medium gravels and pebbles up to t with some medium to fine grained sandstone	5mm,				
		Sump/	- 102	10 —		MIXED GRAVELS/CLAYSTONE - Multi-coloured, fine to medium grain mixe	d				
		plug	- 101	11 –		SANDSTONE - Light grey, fine to medium grained sandstone		Glouce	ester Jeasures	pH: 7.34	
\forall		•	- 100 - 99	12 –						EC: 387 µS/cm Temp: 20.92 °C redox: 12.4 mV	
			- 98	13 –							
			- 97	14 –							
<u> </u>						END OF BOREHOLE AT 11.50 m					
				This bo	orehole log	g should be read in conjunction with Parsons Brinckerho	ff's accon	npanying	standard notes	S.	



BORE NO.

BMB01

Client: Project: Bore Location: Project Number: Drilling Method: Drilling Company: Bore Informatio		AGL E Hydrog Glouce 216240 Air Hau Highla		nergy Li geologic ster - B 6A nmer - L nd Drillin	mited al Assessment - Gloucester Gas Project ignall property -ongyear 850 ng Borehole Diameter: 140 mm	Date Date Reco Log (Surfa Co-o	Comme Comple Irded By Checked Ice RL: rds:	enced: 1 eted: 1 r: 1 by: 1 108.95 m/ E 401366.	SHEET 1 OF 1 11/1/11 12/1/11 NPH JCD AHD 46 N 6449378.81 MGA56
Bore	Information	า			Field Material Description				
WATER	. CONSTRUCTION	RL (АНDm) АНD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FOR (App	MATION oximate)	HYDROGEOLOGY
	Sump/ bentonite screen Sump/ bentonite screen	- 108 - 107 - 106 - 105 - 104 - 103 - 102 - 101 - 100 - 99 - 98 - 97 - 96 - 97 - 96 - 97 - 96 - 97 - 98 - 98 - 97 - 98 - 98 - 97 - 98 - 88 - 8	1 - 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3		TOPSOIL/DRILLPAD - Grey, drill pad WEATHERED CLAY - Light grey, weathered mottled clay WEATHERED SANDY CLAY - Dark brown/black/cream/creamy green/yellow weathered mottled clay - sandy WEATHERED CLAY - Black and light brown, weathered clay with weathered WEATHERED CLAY - Black and light prown, weathered clay with weathered WEATHERED SILTSTONE - Light grey, weathered siltstone/claystone WEATHERED SANDSTONE - Grey, fine grained weathered sandstone, silts and claystone SANDSTONE and SILTSTONE - Grey, fine grained light grey sandstone (50%) SANDSTONE and SILTSTONE - Grey, fine grained light grey sandstone (50%) SILTSTONE - Dark grey, siltstone (70%) and sandstone (30%) and some cl SANDSTONE - Grey to light grey, medium to fine grained sandstone and da fine grained sandstone (30%) SILTSTONE - Dark grey, siltstone (80%) and light grey medium grain sandstone (20%) SANDSTONE - Light grey, medium to fine grained sandstone becoming grey SANDSTONE - Dark grey, siltstone (80%) and fine grained sandstone SILTSTONE - Dark grey, siltstone (80%) and fine grained sandstone SILTSTONE - Dark grey, siltstone (80%) and fine grained sandstone SHALE - Dark grey, siltstone (80%) and fine grained sandstone	w w ed istone 0%) and arker stone	LELON FORM (upper	AA ATION)	pH: n/a (pH probe failed) EC: 3190 µS/cm Temp: 30.77 °C Redox: -17.4 mV DO: 67.3 % Sat DO: 4.92 mg/L
		- 79 - 78	30 — 31 –		United Forte - Grey, the granied satisticite (60%) and sitistone				pH: n/a EC: 4339 µS/cm Temp: 30.16 °C Redox: 8.00 mV DO: 65.0 % Sat DO: 4.84 mg/L
					END OF BOREHOLE AT 30.00 m				

GROUNDWATER BOREHOLE LOG

BORE NO.

BMB02

SHEET 1 OF 6

Client: Project: Bore Location: Project Number: Drilling Method:			AG Hy Gla 21	GL Er drog ouce 6240	nergy Li jeologic ster - B 6A	mited al Assessment - Gloucester Gas Project ignall property	Date Date Recor Log C	Commeno Complete rded By: Checked B	ced: :d: 3y:	ed: 12/1/11 : 12/1/11 NPH : JCD		
Dril Dril	ling lina	Method: Company	Air Hid	[.] Han ahlar	nmer - l nd Drilliu	Longyear 850 10 Borehole Diameter: 140 mm	Surfa	ce RL: 10	08.83 n 40136	nAHD 37 89 N 6449384 04 I	MGA56	
В	ore	Information	1 1	9.1101		Field Material Description	00 01	uo. E	40100			
			머	(u	U	· · · · · · · · · · · · · · · · · · ·						
WATER	WEL	L CONSTRUCTION	RL (AHDm) A	DEPTH (ВGLr	GRAPHIC LO	LITHOLOGY		Format (Approxin	TION nate)	HYDROGEOLOGY		
		SommiD Class 18 grout	- 108 - 107 - 106 - 105 - 104 - 103 - 102 - 101 - 100 - 99 - 98 - 97 - 98 - 98 - 97 - 98 - 98 - 97 - 98 - 88 - 88 - 88 - 85 - 88 - 85 - 88 - 85 - 88	1 - 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3		DRILL PAD - Grey, drill pad fill SANDY CLAY - Light grey/brown, sandy clay, brown mottling - alluvial clays claystone pebbles WEATHERED SILTSTONE - Grey, weathered siltstone and claystone, grey of and black organic clay WEATHERED SANDSTONE - Grey, very fine grained sandstone - some weathered sandstone and clay WEATHERED CLAYSTONE - Dark grey, claystone WEATHERED SANDSTONE/CLAYSTONE - Light grey, very fine grained sandstone/Claystone, some weathered rock SANDSTONE - Light grey, hard claystone SANDSTONE - Light grey, hard claystone SANDSTONE - Light grey, wet solid rock zone - fine grained sandstor some very fine grained sandstone SANDSTONE - Grey and light grey, wet solid rock zone - fine grained sandstore some dark grey/black shale 20%		LELOMA FORMAT (upper)	TION			
			Т	his bo	rehole log	g should be read in conjunction with Parsons Brinckerhoff	's accom	npanying sta	andard n	notes.		



BORE NO.

BMB02

		YEARS ®									SHEET 2 OF 6
Client:AGL EnProject:HydrogBore Location:Glouce:Project Number:2162400			GL Er ydrog louce 16240	GL Energy Limited Date C vdrogeological Assessment - Gloucester Gas Project Date C oucester - Bignall property Record 62406A Log Ch			Comme Comple orded By Checkee	enced: eted: /: d By:	12/1/11 12/1/11 NPH JCD		
	- na	Mathod	Δ	ir Uar			Surf		100 03 m	- ^цг	<u> </u>
Drim Drilli	ing	Methou.	л н	lr ⊓aı iαhlar	nmei - i nd Drillii	_Ongyear oou na Borebole Diameter: 140 mm	Suna Co-c	ace r.L.	100.00 m	ארו⊾ 89	ν 6449384 04 MGΔ56
	n ig	Information		iginai			00-0	103.	L 401307	.05	
D	bre	mormation	1			Field Material Description					
			AHD	Ê	Ö						
WATER	WEL	L CONSTRUCTION	RL (AHDm) /	DEPTH (BGI	GRAPHIC LO	LITHOLOGY		FOR (App	MATION roximate)		HYDROGEOLOGY
	7					SANDSTONE - Grey, fine - medium grained sandstone (99%) and some blac	k	I FLO	ЛА		
	X		. 02			organic matter		FORM	ATION		
	Ч	l l	- 03	26 -		SHALE - Dark grey/black, shale with dark grey and black laminations and fine	e to	(upper)		
			- 82			medium grey sandstone and sitistone (30%)					
	Y	Ч		27 -							
	$\sum_{i=1}^{n}$		- 81	20							
	Q	IQ		28 -							
		64	- 80	20 -							
	(fd		29 -	· · · · · · · · · · ·	SANDSTONE - Grey, fine and medium grained sandstone (90%) and dark bla shale	ack				
	Å	N Oral	- 79	30 —			(-h-l-				
	Ň	Grout				SANDSTONE/SILTSTONE - Grey, very fine grained sandstone and siltstone/ with blackish organic staining	/shale				
	X		- 78	31 -							
	Ŋ.										
	X.		- 77	32 -							
	ÿ.										
	$\langle \langle \rangle$		- 76	33 -		SANDSTONE/SHALE - Grev 50-50 fine grained sandstone and dark shale					
	\mathbb{R}										
	$\langle \langle \rangle$		- 75	34 -	••••	SANDSTONE/SILTSTONE - Grey, 50-50 fine-medium grained sandstone plus	s				
	\mathbb{X}					organic siltstone					
	\mathfrak{A}		- 74	35 -		SHALE - Dark grey, shale with organic staining (85%) and fine grained sands	stone				
	X		70			(15%)					
	Ň		- 73	36 -							
	X		- 72								
	Ŋ.		12	37 –		SANDSTONE - Grey to light grey, fine to medium grained sandstone - some					
			- 71			organic stanning					
	\mathbb{R}			38 -							
	$\langle \langle $		- 70	20							
	X			55 -							
	\mathfrak{A}		- 69	40 —							
	X			-10		some grey claystone fragments and dark shale (20%)					
	Ň		- 68	41 -							
	X										
	Ŋ.		- 67	42 -							
	X										
	\mathbb{R}		- 66	43 -							
	$\langle \langle \rangle$										
	\mathbb{X}		- 65	44 -		SHALE - Dark grey/black, shale (90%) and fine grain sandstone (10%)					
	\mathbb{X}		~ ~								
	X		- 64	45 -		SANDSTONE - Grey, fine grained sandstone (90%) and shale (10%)					
	X		62								
	X		03	46 -		some organic staining					
	3		- 62								
	Ø		52	47 –	<u> </u>	SILTSTONE - Dark grey, siltstone (80%) and medium grained light grey sand	Istone				
	ÿ		- 61		· _ · _						
	$\langle \langle $			48 -		SANDSTONE - Grey to dark grey, very fine grained, hard sandstone					
	\mathbb{X}		- 60	40							
	$\langle\!\langle$			49 –		trace of dark grey shale					
	\mathbb{X}		- <u>5</u> 9								
						END OF BOREHOLE AT 138.00 m					



BORE NO.

BMB02

	YEARS ®								SHEET 3 OF 6	
Clien Proje Bore Proje	Client: Project: Bore Location: Project Number: Drilling Method:		AGL E Hydrog Glouce 216240	nergy L geologi ester - E 6A	imited cal Assessment - Gloucester Gas Project bignall property	Date (Date (Recor Log C	Commenced Completed: ded By: hecked By:	d: 12/1/11 12/1/11 NPH : JCD		
Drillir Drillir	ng Method:	A	Air Har Jighlar	nmer - nd Drilli	Longyear 850 ng Borebole Diameter: 140 mm	Surfac	ce RL: 108.	83 mAH	D N 6449384 04 MGA56	
Bo	re Informatio	n	igna		Field Material Description	00 01		1007.00	N 0713004.04 MOA00	
WATER	ELL CONSTRUCTION	RL (AHDm) AHI	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FORMATION (Approximate		HYDROGEOLOGY	
		- 58 - 57	51 – 52 –		SANDSTONE - Grey to dark grey, very fine grained, hard sandstone <i>(contir</i> , SILTSTONE - Dark grey, soft siltstone (90%) plus fine-medium grained grey sandstone	ued) ,	LELOMA FORMATIO (upper)	N		
X///X//		- 55	53 - 54 -		SANDSTONE - Light grey, medium grained sandstone (80%) and dark grey, siltstone/shale SILTSTONE - Light and dark grey, siltstone (90%) and medium grained light	/black				
		- 54 - 53	55 - 56 -		SANDSTONE - Grey, fine and medium grained sandstone (60%) and dark g siltstone	rey				
		- 52	57 -		some dark grey shale					
		- 51 - 50	58 - 59 -		some black shale					
		- 49	60 —		darker with organics					
		40	61 –	· _ · _	SILTSTONE - Grey/dark grey, siltstone - darker with organics (70%) and fir grained sandstone	ie				
		- 47 - 46	62 - 63 -		SANDSTONE - Grey and light grey, fine to medium grained (80%) and dark siltstone	grey				
X////X//		- 45	64 –							
		- 44	65 - 66 -		organic staining			p E T	H: 8.91 C: 1662 µS/cm ēmp: 28.39 °C &edox: 176.1 mV	
		- 42	67 -)O: 76.9 % Sat)O: 5.84 mg/L	
		- 40	68 - 69 -							
		- 39 - 38	70 —		silty					
		- 37	72 –		trace of black shale			p E T F	H: 9.22 EC: 1584 µS/cm °emp: 28.31 °C Redox: 202 mV)O: 73.3 % Sat	
		- 36 - 35	73 - 74 -		some soft siltstone			ſ	DO: 5.61 mg/L	
	8									

END OF BOREHOLE AT 138.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

BMB02

SHEET 4 OF 6

	YEARS ®							SHEET 4 OF 6
Client: AGL Project: Hydr Bore Location: Glou Project Number: 2162 Drilling Method: Air H				nergy Li geologic ster - B 6A	mited al Assessment - Gloucester Gas Project ignall property	Date Date Reco Log	Commenced: Completed: orded By: Checked By:	12/1/11 12/1/11 NPH JCD
Drilling	g Method:	A	ir Har	nmer - l	_ongyear 850	Surfa	ace RL: 108.83 n	nAHD
Drilling	g Company:	н	ighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-c	ords: E 40136	7.89 N 6449384.04 MGA56
Bor	e Information	n		T	Field Material Description			
		ę	Ê	0				
WATER	ELL CONSTRUCTION	RL (AHDm) Ał	DEPTH (BGLn	GRAPHIC LO	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
					CONGLOMERATE - Several colours, equal shares - cream/green/grey clays medium grained light grey sandstone and dark grey siltstone	stone,	LELOMA FORMATION	
		- 33	76 -		SILTSTONE/SANDSTONE - Light grey, 50-50 medium grained sandstone an	nd	(upper)	pH probe re-calibrated
		- 32		· ·	siltstone			
		02	77 –		SANDSTONE - Grey, coarse sandstone and green claystone			pH: 8.29
		- 31	78 -	· · · · · · · · · · · · · · · · · · ·				EC: 1320 µS/cm Temp: 28.68 °C
			70	· _ · _	SILTSTONE - Grey, siltstone (50%) plus brown/cream/green claystone (30% coarse grained sandstone (20%)	6) and		Redox: 196.2 mV DO: 78 % Sat
	X	- 30	79 –	·				DO: 5.9 mg/L
				<u> </u>				
		- 29	80 —		SANDSTONE - Grey, fine grained sandstone (50%), cream/brown/green clay	ystone		
		- 28		· · · · · · · · · · · · · · · · · · ·				
		20	81 –	• • • • • • • • •	trace of white opaque rock [sample]			
		- 27	82 -					
			02		some coarse grained sandstone introduced			
		- 26	83 -		SANDSTONE . Gray, madium and fine grained candstone , fine grained light	er in		
				· · · · · · · · · · · · · · · · · · ·	colour			pH: 8.88 EC: 1203 uS/cm
		- 25	84 -	· <u>···</u> ·	SILTSTONE - Dark grey and black, soft siltstone			Temp: 28.11 °C Redox: 218.9 mV
		- 24		· _ · _				DO: 69.5 % Sat DO: 5.35 mg/L
			85 –		SANDSTONE - Grey, fine to medium grained sandstone (80%) and siltstone			, , , , , , , , , , , , , , , , , , ,
		- 23	86 -					
			00					
		- 22	87 –	· · · · · · · · · · · · · · · · · · ·	SII TSTONE _ Crav/black sittetone (00%) and medium grained grav sandsto			
				· — · —		i ic		
		- 21	88 -		CLAYSTONE/TUFF - Light brown/cream, claystone/tuff (50%) and medium g	rained		
		- 20			grey sandstone and dark grey siltstone			
		20	89 –		SANDSTONE - Grey, fine grained sandstone (70%) and dark grey siltstone			pH: 8.94
		- 19	00					EC: 1275 μS/cm Temp: 28.26 °C
	X		90					Redox: 196.5 mV DO: 69.5 % Sat
		- 18	91 –	· · · · · · · · · · · · · · · · · · ·	darker grav and black eilitetane			DO: 5.36 mg/L
		- 17	92 -					
Ň		_ 16						
		- 10	93 -					
		- 15	0.4					
			94 –	· _ · _	SILTSTONE - Dark grey, siltstone (80%) and fine grained grey sandstone			
		- 14	95 –					
	X				SANDSTONE - Grey, medium to fine grained sandstone (80%) and dark silts (20%)	tone		pH: 9.01
		- 13	96 -					Temp: 28.22 °C
		10						DO: 71.2 % Sat
		- 12	97 –		black shale lens			DO: 5.5 mg/L
		- 11						
			98 -					
		- 10	00					
			35 -					
	K	- 9						
					END OF BOREHOLE AT 138.00 M			



BORE NO.

BMB02

	YEARS ®								SHEET 5 OF 6	
Clie Proj Bor Proj	Client: A Project: H Bore Location: C Project Number: 2 Drilling Method: A			nergy Li geologic ester - B 16A	mited al Assessment - Gloucester Gas Project ignall property	Date Commenced: 12/1/11 Date Completed: 12/1/11 Recorded By: NPH Log Checked By: JCD				
Drill Drill	ing Method: ing Company:		Air Har Highlar	nmer - <mark>I</mark> nd Drillii	Longyear 850 ng Borehole Diameter: 140 mm	Surfa Co-o	ace RL: 10 rds: E	08.83 m/ 401367.	ahd 89 N 6449384.04 Mga56	
B	ore Informatio	n	J	-	Field Material Description					
				0						
WATER	WELL CONSTRUCTION	RL (AHDm) AH	DEPTH (BGLm	GRAPHIC LOC	LITHOLOGY		Format (Approxin	TION nate)	HYDROGEOLOGY	
		- 8 - 7	101 -		SANDSTONE - Grey, medium to fine grained sandstone (80%) and dark siltstor (20%) (continued)	ne	LELOMA FORMAT (upper)	TION	pH: 9.12 EC: 818 μS/cm Temp: 27.58 °C	
		6			SHALE AND SANDSTONE - Dark grey and light grey, 50-50 dark grey shale an fine to medium grained light grey sandstone	nd			Redox: 203.9 mV DO: 73 % Sat DO: 5.73 mg/L	
		- 5	103 - 104 -		SANDSTONE - Grey, fine to medium sandstone (90%) and black/dark grey siltstone (10%)					
		- 4	105 -		SANDSTONE AND SILTSTONE - Grey, fine grained sandstone (65%) and siltstone					
		- 3	106 –	•••••						
		- 2	107 –						pH: 8.94	
		- 1	108 -	· · · · · · · · · · · · · · · · · · ·					Temp: 27.31 °C Redox: 204 mV DO: 75.4 % Sat	
		- 0	109 -						DO: 5.82 mg/L	
		1 2	110 —							
		3	111 -							
		4	113 -		SANDSTONE - Grey, fine to medium grained sandstone				pH: 9.03	
		5	114 –		dark shale lens				EC: 974 µS/cm Temp: 27.34 °C Redox: 150 mV DO: 71.5 % Sat	
		6	115 -						DO: 5.62 mg/L	
		8	116 -							
		9	118 –		trace of shale					
	Bentonite	10	119 -	<u> </u>	SILTSTONE AND SANDSTONE - Grey, 50-50 siltstone and fine grained sandstone				pH: 9	
		11	120 —	· ·	SANDSTONE - Grey, medium to fine grained sandstone (85%) and shale/siltsto	one			EC: 913 μS/cm Temp: 27.1 °C Redox: 193.2 mV	
		12	121 –		(15%)				DO: 72.3 % Sat DO: 5.7 mg/L	
	Gravel 5 mm graded	13	122 –							
		14	123 –	· _ · _	SILTSTONE - Dark grey, siltstone (80%) and fine grained sandstone (20%)					
	50 mm ID, 0.5 mm aperture uPVC	16	124 –		SANDSTONE - Dark grey, fine to very fine grained sandstone (90%) and siltstc (10%)	one			pH probe failed	
					END OF BOREHOLE AT 138.00 m					



BORE NO.

BMB02

	YEARS ®								SHEET 6 OF 6		
Clie Pro Bor Pro	nt: ject: e Location: ject Number:	A H G 2	GL Er ydrog ilouce 16240	nergy Li geologic ster - B 6A	mited al Assessment - Gloucester Gas Project ignall property	Date Date Reco Log	e Comme e Comple orded By Checked	enced: ited: : I By:	ed: 12/1/11 d: 12/1/11 NPH y: JCD		
Drill	ing Method:	A	ir Har	nmer - I	Longyear 850	Surfa	ace RL:	108.83 m			
Drill	ing Company:	n 1	igniar	na Driilli	Borenole Diameter: 140 mm	C0-0	oras:	E 40136/	7.89 N 6449384.04 MGA56		
WATER	WELL CONSTRUCTION	RL (AHDm) AHI	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FORI (Appri	MATION oximate)	HYDROGEOLOGY		
	Screen	17 18 19 20 21 22 23	126 - 127 - 128 - 129 - 130 - 131 - 132 -		SANDSTONE - Dark grey, fine to very fine grained sandstone (90%) and s (10%) (continued) SHALE - Black/dark grey, shale (80%) and fine grained sandstone (20%) SANDSTONE AND SILTSTONE - Grey, 50-50 fine grained sandstone and siltstone SANDSTONE - Light grey, fine grained sandstone (90%) sand siltstone SANDSTONE - Grey, very fine grained sandstone with some organic stair	d	LELOM FORM (upper)	IA ATION	pH: n/a EC: 1362 μS/cm Temp: 25.99 °C Redox: -238.7 mV DO: 58.5 % Sat DO: 4.73 mg/L pH: n/a EC: 1436 μS/cm Temp: 27.56 °C Padox: -241.6 mV		
	Sump/ bentonite	24 25 26 27 28	133 - 134 - 135 - 136 - 137 -		some dark siltstone/shale trace siltstone trace dark siltstone SII TSTONE AND SANDSTONE - Grev 50-50 medium to fine grained san	dstone			DO: 80.4 % Sat DO: 6.28 mg/L		
		29	138 -	· _ · _	(lighter) and sitstone	astone			pH: n/a EC: 1529 µS/cm Temp: 27.7 °C Redox: -267.5 mV DO: 84.4 % Sat		
		31	139 – 140 –						_ 5. 5.55 mg/L		
		32	141 –								
		33 34	142 -								
		35	143 -								
		36	145 –								
		37	146 -								
		38	147 –								
		39	148 -								
			149 –								



BORE NO.

RMB01

		YEARS ®									SHEET 1 OF 2
Clie Pro Bor Pro	int: ject: e Loc ject N	cation: Number:	AC Hỵ G 2'	GL En ydrog louce 16240	iergy Li jeologic ster - R 6A	mited al Assessment - Gloucester Gas Project ombo property	Date Date Reco Log	Comme Comple orded By Checke	enced: eted: y: d By:	3/2/1 4/2/1 NPH JCD	1 1
Dril	ling M	lethod:	Ai	ir Han	nmer - I	Longyear 850	Surfa	ace RL:	128.68 m	nAHD	
Dril	ing C	ompany:	Hi	ighlan	nd Drillin	ng Borehole Diameter: 140 mm	Co-c	ords:	E 40021	5.21	N 6443387.43 MGA56
В	ore Ir	normation	<u> </u>			Field Material Description		<u> </u>			
			AHD	(m)	00						
WATER	WELL C	ONSTRUCTION	RL (AHDm)	DEPTH (BG	GRAPHIC I	LITHOLOGY		FOF (App	≀MATION roximate)		HYDROGEOLOGY
		50 mm ID Class 18	- 128			TOPSOIL - Brown/grey, mottled clay/ topsoil		LELO			
		grout	- 120	1 -		CLAY - Red/ grey, mottled, stiff clay		(upper	ATION .)		
) K	- 127	2 -	/ /						
			- 126	3 -	ľ / '						
			- 125		/ /						
] [- 124	4 -	/ / ·						
	\mathbb{X}			5 -							
			- 123	6 -	6-6-1	WEATHERED MIXED GRAVEL - Yellow/brown, clayey alluvial gravels wit	.h — — —				
		i K	- 122	7 -	$[0,0]_{4}$	rounded pebbles (volcanic and sedimentary in origin)					
	\mathbb{X}	€	- 121	° –	007						
			- 120	8 -	[0,0]						
		K		9 -		WEATHERED SHALE - Black, weathered carbonaceous shale (70%) with anav/brown mudstone	1 30%				
			- 119	10 —		SILTSTONE - Dark grey, weathered siltstone with lighter grey claystone (7	20%) and				
			- 118	11 –	·	10% coal fines					
	Ŭ [i k	- 117	10 -	·_·-		_				
		<pre>4</pre>	⊢ 116	12 -	[] []	SILTSTONE - Dark grey, siltstone					
				13 -	!						
	Ŭ [j k	- 115	14 -	 !						
		3	- 114	15 –		SUALE Dark groutblack carbonaceous shale					
			- 113	16 -		SHALE - Dark greyiblack, carbonaceous snare					
			⊢ 112	10 -	[]	SILTSTONE - Grey, siltstone (80%) with 20% coal					
	Ř			17 –	 					h nH·	7.04
\triangleright			- 111	18 -	 !					EC	7.94 ∷ 9182 µS/cm mp: 31.99 °C
	\mathbb{X}	\$	- 110	19 -	 					rec	lox: -26.3 mV
			r 109		!						
		[{	⊢ 108	20-	·_!						
				21 –	⁺	SILTSTONE/SANDSTONE - Grey, fine grained sandstone (50%) with 50%	6 grey				
			- 107	22 –							
			- 106	23 -	··_						
		1 k	- 105		··					pH:	8.16 • 10113 uS/cm
			L 104	24 -	·_·_					Ter	mp: 30.61 °C lox: -54.6 mV
) [25 -		SHALE - Black, carbonaceous shale (70%) with 30% grey siltstone					
		3	- 103	26 -	+ +	SILTSTONE - Dark grey, siltstone					
			- 102	27 -	·						
		3	r 101	20	·	trace of black shale					
		3	- 100	28 -		SANDSTONE - Grey, fine grained sandstone (80%) and black carbonaceo	ous shale				
			100	29 -	<u> </u>	SILTSTONE - Grey, siltstone (60%) with 40% black shale				nH.	8
			- 99	30 —		SILTSTONE - Dark grey, siltstone				EC Te	: 7563 μS/cm mp: 29.51 °C
			- 98	31 -	·					rec	lox: -40.3 mV
		X I	- 97	l	E	STALE - DIACK, CARDONACEOUS STAILE (/U%) WITH 30% grey, fine grained sa	andstone				

END OF BOREHOLE AT 50.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

RMB01

YEARS ®							SHEET 2 OF 2
Client: Project: Bore Location: Project Number:	AGL E Hydro Glouc 21624	Energy L ogeologic ester - R 06A	imited cal Assessment - Gloucester Gas Project combo property	Date Date Reco Log	e Comme e Comple orded By Checked	nced: 3 ted: 4 : N By: J	/2/11 /2/11 IPH CD
Drilling Method:	Air Ha	mmer -	Longyear 850	Surfa	ace RL:	128.68 mA	HD
Drilling Company	Highla	and Drilli	ng Borehole Diameter: 140 mm	Co-c	ords:	E 400215.	21 N 6443387.43 MGA56
Bore Information	on		Field Material Description				
	Ž RL (AHDm) AHD DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FORI (Appro	/ATION xximate)	HYDROGEOLOGY
	- 96		SHALE - Black, carbonaceous shale (70%) with 30% grey, fine grained sar (continued)	ndstone	LELON		
	- 95 33 - - 95 34 - - 94 35 - - 93 36 - - 92 37 -		SILTSTONE - Dark grey, siltstone some fine grained grey sandstone		(upper)	ATION	pH: 8.09 EC: 9710 μS/cm Temp: 28.48 °C redox: -25.2 mV
Bentonite	- 91 - 38 -	- - -	black carbonaceous shale lens SANDSTONE - Grey, fine grained sandstone (70%) with 30% dark grey silt	tstone			
seal	- 90 39 - - 89 40 -		SILTSTONE - Dark grey, siltstone (70%) with fine grained sandstone (30% SHALE - Black, carbonaceous shale (60%) with 40% grey siltstone)			
Gravel 5 mm graded 50 mm ID 0.5 mm aperture			SILTSTONE - Grey, siltstone (60%) with 40% black shale				pH: 8.19 EC: 8289 µS/cm Temp: 28.33 °C redox: -13.6 mV
	- 85 - 84 - 84 - 83 - 83		SANDSTONE - Grey, fine to medium grained sandstone (70%) with 30% gr siltstone SILTSTONE - Grey, siltstone (60%) with 20% grey, fine grained sandstone	e and			
	- 82 47 -	- · _ · _ · _ · _ · _ · _ · _ · _ · _ ·	20% black carbonaceous shale SILTSTONE - Grey, siltstone (80%) with with claystone/tuff (20%) and a fe of feldspar	w chips			pH: 8.13
Sump/ bentonite plug	- 48 - - 80 49 -	-	SANDSTONE/SILTSTONE - Grey, fine to medium grained sandstone (50% 50% dark grey siltstone) with			Temp: 27.19 °C redox: -10.8 mV
	- 79 - 50 -	-					pH: 8.2 EC: 6144 µS/cm Temp: 26.53 °C redox: -4.5 mV
	51 - - 77 52 -	-					
	- 76 53 -	-					
	- 74 - 55 -	-					
	- 73 56 -	_					
	- 72 57 -	_					
	- 71 58 -	-					
	- 70 59 -	-					
	60 -	-					
	61 - 67	-					
	62 - - 66	-					
	- 65	_					

END OF BOREHOLE AT 50.00 m



BORE NO.

RMB02

SHEET 1 OF 4

Client: Project: Bore Location: Project Number:			A F Q	AGL Er lydrog Glouce 216240	nergy Li geologic ster - R 6A	mited Da al Assessment - Gloucester Gas Project Da ombo property Re Log	e Comme e Comple corded By Checked	Commenced:3/2/11Completed:3/2/11orded By:NPHChecked By:JCD		
Dril Dril	ling	Method:	А Н	Air Har	nmer - l Drillin	Longyear 850 Sul	face RL:	128.49 mA ⊏ 400220 4		
В	ore	Informatio	1	ligi i.a.		Field Material Description	0103.	L 400440.		
			д Н	(L	U	-				
WATER	WELI	L CONSTRUCTION	RL (AHDm) AI	DEPTH (BGLr	GRAPHIC LO	LITHOLOGY	FOR (App	MATION roximate)	HYDROGEOLOGY	
	X	50 mm ID Class 18 uPVC &	- 128		{{}}	SANDY TOPSOIL - Brown, sandy topsoil, moderately organic	LELON FORM	MA IATION		
		grout	- 127	1 –		CLAY - Red/grey, mottled, sticky clay	– (upper)		
			- 126	2 –						
			125	3 -		some fine grained sand				
			- 125	4 -						
			- 124	5 -		grey, medium plasticity clay				
			- 123	6 -						
			- 122	7 –		some graveis				
			- 121	,		some claystone pebbles				
			- 120	8 –		CLAYSTONE - Grey, soft claystone with a few chips of white medium grained sandstone				
			- 119	9 -		COAL - Black, coal (90%) with 10% grey siltstone	-			
			- 118	10 —		SILTSTONE - Dark grey, siltstone (50%) with 30% light grey claystone and 20% black coal	-			
			- 117	11 -		CLAYSTONE - Grey, claystone (60%) with clay and coal fines	-		al lu 7 77	
\triangleright			- 116	12 –		CLAY - Grey , clay with dark grey claystone chips	-		EC: 8859 μS/cm Temp: 27.19 °C redox: 82.3 mV	
			115	13 -	/ /					
			- 115	14 –		SILTSTONE - Dark grey, siltstone with chips of black shale and coal fines	_			
			- 114	15 -	· _ · _					
			- 113	10	· _ · _					
			- 112	16 –						
				17 -	<u> </u>					
	Ň	Š.	- 111	10	· _ · _					
			- 110	18 –	· _ · _					
				19 -	· _ · _					
	Š.		- 109		· _ · _					
			- 108	20 —		SANDSTONE - Grey, medium to fine grained sandstone (80%) with white soft claystone (20%)				
	Ř	X		21 -	<u></u> -	SILTSTONE - Grey, siltstone (70%) with 30% black shale	-			
			- 107	22 -	·_·_					
	Ň	Ň	- 106	~~ ~	·_·_					
	[\bowtie		23 -						
			- 105		·_·_				pH: 8.14	
	Ď		- 104	24 -	· _ · _ · _ · _	some grey claystone			EC: 9618 μS/cm Temp: 29.36 °C redox: 50.6 mV	
	IV									



BORE NO.

RMB02

Client: Projec Bore L Projec	vears ® t: _ocation: t Number:	A H G 2′	GL Er ydrog louce 16240	nergy Li jeologic ster - R 6A	mited al Assessment - Gloucester Gas Project ombo property	Date Date Reco Log	Comme Comple orded By Checked	enced: 3 eted: 3 r: N I By: J	3/2/11 3/2/11 NPH JCD		
Drilling	g Method:	А н	ir Har Ighlar	nmer - l nd Drilliu	Longyear 850	Surfa	ace RL:	128.49 m/			
Bor	e Informatior	יי ו	iyinai		Field Material Description	0-00	ius.	E 400220.	11 N 0445500.91 NGA50		
		0									
WATER	LL CONSTRUCTION	RL (AHDm) AH	DEPTH (BGLm	GRAPHIC LOG	LITHOLOGY		FOR (Appr	MATION oximate)	HYDROGEOLOGY		
		- 103 - 102 - 101	26 - 27 -		SILTSTONE - Grey, siltstone (70%) with 30% black shale (continued) SANDSTONE - Grey, fine and medium grained sandstone		LELON FORM (upper	/A ATION)			
		— 100 - 99	29 - 30-		SHALE - Black, laminated shale (90%) with 10% medium grained light grey sandstone SANDSTONE - Grey, medium to fine grained sandstone with a few dark grey				pH: 7.98 EC: 8120 µS/cm Temo: 28.87 °C		
		- 98 - 97	31 - 32 -		siltstone chips SILTSTONE - Black, siltstone with a few chips of light grey claystone				redox: 40.8 mV		
		- 96 - 95	33 - 34 -	· ·	SANDSTONE / SILTSTONE - Grey, siltstone (50%) with 50% light grey, mediu grained sandstone	um					
		- 94 - 93	35 -		SIL ISI ONE - Dark grey, sinstone and 20% grey, medium gramed sandstone				pH: 7.93 EC: 9146 µS/cm		
		- 92 - 91	37 -						Temp: 24.45 °C redox: 42.1 mV		
		- 90 - 89	38 - 39 -		SANDSTONE/SILTSTONE - Grey, fine grained sandstone with dark grey sillst	tone					
		- 88	40 — 41 —								
		- 87	42 - 43 -		some brown mudstone				pH: 8.15 EC: 9582 µS/cm Temp: 27.76 °C redox: 34.9 mV		
		- 85 - 84	44 -								
		- 83 - 82	46 -		SANDSTONE - Grey, medium and fine grained sandstone with 10% white soft claystone						
		- 81 - 80	47 - 48 -		SILTSTONE - Grey, siltstone (80%) with 20% light grey, medium grained sandstone				pH: 8.16 EC: 8875 µS/cm Temp: 28.75 °C redox: 31.4 mV		
		- 79	49 -	· _ · _	trace of black laminated shale						

100

GROUNDWATER BOREHOLE LOG

BORE NO.

RMB02

SHEET 3 OF 4

Cliei Proj Bore Proj Drilli Drilli	nt: ect: ∋ Location: ect Number: ng Method: ng Company:	AGL Hydr Glou 2162 Air H High	Energy L ogeologi cester - F 406A lammer - land Drill	ate Commenced: ate Completed: ecorded By: og Checked By: urface RL: 128.49 m o-ords: E 400220	3/2/11 3/2/11 NPH JCD NAHD 0.11 N 6443386.91 MGA56	
Bo	ore Information	1		Field Material Description		
WATER	WELL CONSTRUCTION	RL (AHDm) AHD DEPTH (RGI m)	GRAPHIC LOG	LITHOLOGY	FORMATION (Approximate)	HYDROGEOLOGY
		\sim - 78 - 77 - 76 - 77 - 76 - 74 - 74 - 73 - 74 - 73 - 74 - 73 - 71 - 70 - 69 - 68 - 67 - 69 - 68 - 67 - 69 - 68 - 61 - 67 - 64 - 63 - 65 - 64 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 - 64 - 65 -	1 0 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td>SANDSTONE - Light grey, medium grained sandstone (60%) with 40% dark grey siltstone trace of black shale SILTSTONE - Dark grey, siltstone (75%) with 15% grey, fine grained sandstone SILTSTONE - Light grey, medium grained sandstone SILTSTONE - Dark grey, siltstone with carbonaceous shale SILTSTONE - Dark grey, siltstone with 40% medium grained grey sandstone SILTE - Black , coal / shale (60%) with 40% medium grained grey SILTE - Black , shale (60%) with 40% grey, medium grained sandstone SANDSTONE - Grey, fine grained sandstone</td> <td>LELOMA FORMATION (upper)</td> <td>pH: 8.21 EC: 9427 µS/cm Temp: 27.26 °C redox: 35.6 mV PH: 8.19 EC: 8386 µS/cm Temp: 26.7 °C redox: 25.9 mV PH: 8.22 EC: 8450 µS/cm Temp: 26.85 °C redox: 28.6 mV</td>	SANDSTONE - Light grey, medium grained sandstone (60%) with 40% dark grey siltstone trace of black shale SILTSTONE - Dark grey, siltstone (75%) with 15% grey, fine grained sandstone SILTSTONE - Light grey, medium grained sandstone SILTSTONE - Dark grey, siltstone with carbonaceous shale SILTSTONE - Dark grey, siltstone with 40% medium grained grey sandstone SILTE - Black , coal / shale (60%) with 40% medium grained grey SILTE - Black , shale (60%) with 40% grey, medium grained sandstone SANDSTONE - Grey, fine grained sandstone	LELOMA FORMATION (upper)	pH: 8.21 EC: 9427 µS/cm Temp: 27.26 °C redox: 35.6 mV PH: 8.19 EC: 8386 µS/cm Temp: 26.7 °C redox: 25.9 mV PH: 8.22 EC: 8450 µS/cm Temp: 26.85 °C redox: 28.6 mV
		- 58 71 - 57 72 - 56 73 - 55 74		SILTSTONE - Grey , siltstone with some black carbonaceous staining SANDSTONE / COAL - Black, coal with some grey fine grained sandstone SANDSTONE - Grey, medium grained sandstone SILTSTONE/SANDSTONE - Grey, siltstone with some grey medium grained	-	pH: 8.16 EC: 9176 µS/cm Temp: 27.37 °C redox: 24.9 mV
		- 54		END OF BOREHOLE AT 93.00 m	ccompanying standard po	ntes



BORE NO.

RMB02

		YEARS ®								SHEET 4 OF 4		
Client: Project: Bore Location: Project Number:			A H Q 2	GL Ei Iydrog Glouce 16240	nergy Li geologic ster - R 6A	mited al Assessment - Gloucester Gas F ombo property	Da Project Da Re Log	Date Commenced:3/2/11Date Completed:3/2/11Recorded By:NPHLog Checked By:JCD				
Drilling Method:			Air Hammer - Longyear 850 Sur						Surface RL: 128.49 mAHD			
Drilling Company:			H	lighlar	nd Drillin	ng Borehole Diameter: 140 n	nm Co	-ords:	E 400220.	11 N 6443386.91 MGA56		
В	ore In	formatio	n		, I	Field Material Description		_				
			모	Ê	ų							
WATER	WELL C	ONSTRUCTION	RL (AHDm) A	DEPTH (BGL	GRAPHIC LC	LITHOLOGY		FOF (App	RMATION roximate)	HYDROGEOLOGY		
		Bentonite seal Gravel 5 mm graded 0.5 mm aperture uPVC screen	- 53 - 52 - 51 - 50 - 49 - 48 - 47 - 46 - 45 - 44 - 43 - 42 - 41 - 40 - 39 - 42 - 41 - 40 - 39 - 34 - 33 - 35 - 34 - 33 - 32 - 31	76 - 77 - 78 - 79 - 80 - 81 - 82 - 83 - 84 - 85 - 86 - 85 - 86 - 87 - 88 - 88 - 88 - 90 - 91 - 92 - 92 - 93 - 92 - 93 - 94 - 93 - 94 - 95 - 96 - 97 - 98 -		SILTSTONE/SANDSTONE - Grey, siltstone with some gres sandstone (continued) SANDSTONE - Grey, fine grained sandstone (80%) with 2 SHALE/SILTSTONE - Dark grey, carbonaceous shale (60 medium grained sandstone SANDSTONE - Light grey, medium to fine grained sandst some black carbonaceous staining some dark grey siltstone SILTSTONE - Grey, siltstone (60%) with 40% medium gra COAL/SHALE - Black, coal with some dark grey siltstone SANDSTONE - Light grey, fine and medium grained sandst	y medium grained		MA IATION)	pH: 8.21 EC: 7314 µS/cm Temp: 27.08 °C redox: 20.7 mV pH: 8.26 EC: 7748 µS/cm Temp: 26.49 °C redox: 12.2 mV pH: 8.26 EC: 8134 µS/cm Temp: 26.75 °C redox: 8.3 mV		
			- 30	99 –								
			- 29									
	1					END OF BOREHOLE A	T 93.00 m					



BORE NO.

S4MB01

	YEARS ®									SHEET 1 OF 3
Client: Project: Bore Location: Project Number:		A H Q 2	AGL Energy Limited Hydrogeological Assessment - Gloucester Gas Project Gloucester - Tiedeman property 2162406A		Date Date Reco Log	e Comm e Compl orded B Checke	enced: eted: y: d By:	5/1/1 ⁻ 6/1/1 ⁻ NPH JCD	1	
Dril	ing Method:	A	vir Hai	mmer - l	_ongyear 850	Surf	ace RL:	118.38	mAHD	
Dril	ing Company:	Н	lighla	nd Drillin	ng Borehole Diameter: 140 mm	Co-c	ords:	E 40258	31.82	N 6449409.83 MGA56
В	ore Informatio	on 🗌			Field Material Description					
		AHD	Ê	OG						
WATER	WELL CONSTRUCTION	RL (AHDm)	DEPTH (BG	GRAPHIC L	LITHOLOGY		FOI (App	RMATION proximate)		HYDROGEOLOGY
	PVC 50mm ID Class 18	- 118			DRILL PAD		LELO FORM	MA /ATION		
	uPVC & grout	117	1 -	<u>}}}}</u>	TOPSOIL - Light brown/yellow, sandy clayey soil medium plasticity with o	chips of				
			2 -	$\langle \rangle \langle \rangle \rangle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle \langle \rangle \langle \rangle \langle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle $						
		- 116	-	83333						
		115	3 -	$\langle \langle $						
		F 115	4 -	$\langle \langle $						
		- 114	4 -		WEATHERED ROCK - Light grey, weathered rock with chips of hard brow clay (up to 3 mm)	wn dry				
			5 -							
		- 113								
		- 112	6 –							
			7 -							
		- 111								
		- 110	8 -							
			9 -							
		- 109								
		- 108	10 —							
			11 -							
		- 107								
		- 106	12 –							
			13 -							
		- 105		· — · —	SILISIONE/SANDSIONE - Light grey, medium grained sandstone, 50% siltstone	grey				
		- 104	14 –	· _ · _						
			15 -	· _ · _						
		- 103		· _ · _	SILISIONE - Dark grey, soft sittstone with a few chips of cream/white tu	111				
		L 102	16 -	· · · · · · · · · · · · · · · · · · ·	TUFF - Cream/green, medium to fine grained tuff, 40% dark grey/black		LELO	MA		
		- 102	17 -	7 : X 7 : X	sitstone/shale		FORM	/IATION th Tuff		
		- 101		· L L.						
		100	18 –							
		- 100	10 -	. L L. 						
		- 99	19 -							
			20 —							
		98	~	1. X . Y						
		- 97	21 -	·						
			22 –	· · · ×						
		- 96		·						
		- 95	23 -	$\overline{\Delta} \cdot \overline{\Delta}$	TUFF - Cream/green/grey, fine grained smooth tuff, 50% green/grey med grained tuff	lium — —				
			24 -		TUFF - Green and brown, very fine grained triff					
		- 94		$ \mathcal{A} \cdot \mathcal{A} $						

END OF BOREHOLE AT 66.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB01

		YEARS ®							SHEET 2 OF 3	
Clie	nt:		A	GL Er	nergy Li	mited	Date	Commenced:	5/1/11	
Proj	ect	:	Н	ydrog	jeologic	al Assessment - Gloucester Gas Project	Completed: 6/1/11			
Bore	e Lo	ocation:	G	louce	ster - Ti	edeman property	Reco	orded By:	NPH	
Project Number: 21				16240	6A		Log	Checked By:	JCD	
Drilli	ing	Method:	Α	ir Han	nmer - L	₋ongyear 850	Surfa	ace RL: 118.38 m	AHD	
Drilli	ng	Company:	Н	ighlar	nd Drillin	Borehole Diameter: 140 mm	Co-c	ords: E 402581	.82 N 6449409.83 MGA56	
В	ore	Information	ı		·	Field Material Description				
			n) AH	3GLm	CLOG					
TER	WELL		AHDn	TH (E	VPHIC	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY	
WA			RL (DEF	GR∕			V PP 1 2		
	.,									
	N.		- 93			TUFF - Green and brown, very fine grained tuff (continued)		LELOMA		
	X		L	26 -	N D			Jo Doth Tuff		
	ÿ		- 92		1.1					
k	\langle	X		27 –						
	\aleph		- 91		· L · · · L					
	\mathfrak{A}		L 90	28 -		TUFF - Grey, medium grained tuff, 30% cream/green medium grained tuff				
	X		- 50	20	1					
F	Ň.	× I	- 89	29 -	<u></u>	TUFF/SILTSTONE - Green/grey, medium grained tuff, 50% black siltstone			pH: 7.73	
	$\langle \langle \rangle$	X	I.	30 —	· · · · ·				EC: 2457 μS/cm Temp: 25.76 °C	
	\Im		- 88			SILTSTONE - Dark grey, siltstone, 30% light grey medium grained sandsto cream/green tuff	one, 10%	LELOMA	Redox: 98.4 mV DO: 39 % Sat	
	$\langle \langle \rangle$		L	31 -		SANDSTONE - Grey medium to fine grained sandstone. 10% dark grey sil	ltstone		DO: 3.14 mg/L	
	X		- 87			a few chips of green/cream tuff	11510110,			
	Ň.			32 -		SILTSTONE - Dark grey, siltstone, 20% grey fine grained sandstone				
	X		- 86							
	ÿ		⊢ 85	33 -	$ \cdot - \cdot - $					
k	\langle		- 00	24 -						
	\mathbb{X}		- 84	34 -						
	\mathfrak{A}		I.	35 -						
	X		- 83						pH: 7.67	
	Ň	Ň	L	36 -			50%		Temp: 25.25 °C	
e i	$\langle \rangle$		- 82		$ \cdot - \cdot -$	dark grey siltstone	0070		DO: 54.4 % Sat	
	\mathbb{R}		4	37 -		SILTSTONE - Dark grey and black, soft siltstone			DO: 4.4 mg/∟	
	$\langle \langle \rangle$		- 81							
	X		⊢ 80	38 -		SILTSTONE/SANDSTONE - Grey, siltstone, 20% light grey medium grainer	<u>d</u> — —			
	Ň.			30 -		Sendstone				
	X		- 79	29 -						
	\Im		L	40 —	$ \cdot - \cdot - $					
k I	$\langle \langle \rangle$		- 78		- <u>-</u> -	SILTSTONE - Dark grey and black, (organic matter) son sinstone				
	\mathbb{X}		I.	41 -		SII TSTONE/SANDSTONE - Grey, fine to medium grained sandstone, 50%				
	×		- 77		· _ · _	siltstone			pH: 7.86 EC: 2396 μS/cm	
	Ø		76	42 -					Temp: 23.56 °C Redox: 123.6 mV	
	ÿ		- /0						DO: 59.6 % Sat DO: 4.96 mg/L	
	$\langle \langle \rangle$	K	⊢ 75	43 –		н			-	
	\mathbb{R}		• •	44 -						
F	\mathfrak{A}		- 74	44						
	Ŋ		I.	45 -						
ł	Ň		- 73			Some Clay				
	X		I	46 -	·· · 	SANDSTONE - Light grey, medium grained unconsolidated sandstone, 40%	% brown			
	\Im		- 72		• • • • • • • • •	and grey siltstone, 10% light grey medium grained sand				
	\mathfrak{S}		74	47 –		SANDSTONE/SILTSTONE - Light grey, fine to medium grained sandstone	and grey		nH: 8.02	
	X		- 71			Siltstone			EC: 2454 μS/cm	
	×.		- 70	48 -					Redox: 131.2 mV	
	Z		1	49 -					DO: 7.01 mg/L	
	3		- 69	45 -						
	<u> </u>									
						END OF BOREHOLE AT 66.00 m				


BORE NO.

S4MB01

	YEARS @						SHEET 3 OF 3
Client: Project: Bore Location: Project Number:		AGL E Hydrog Glouce 21624(nergy Li geologic ester - T 06A	mited al Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	Commenced: Completed: orded By: Checked By:	5/1/11 6/1/11 NPH JCD
Dril/	ling Method:	Air Ha	mmer -	Longyear 850	Surfa	ace RL: 118.38 m	AHD
Drill	ling Company:	Highla	nd Drilli	ng Borehole Diameter: 140 mm	Co-c	ords: E 402581	.82 N 6449409.83 MGA56
В	ore Information	n		Field Material Description			
			\square				
WATER	WELL CONSTRUCTION	RL (AHDm) AHI DEPTH (BGLm	GRAPHIC LOG	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
	Bentonite seal	- 68 51 - - 67 - 66 - 65 - 65 - 64 - 55 -		SANDSTONE/SILTSTONE - Light grey, fine to medium grained sandstone siltstone (continued)	e and grey	LELOMA FORMATION	pH: 8.03 EC: 2433 µS/cm Temp: 21.78 °C Redox: 135.7 mV DO: 102.2 % Sat DO: 8.81 mg/L
	Gravel 5 mm graded 	- 53 56 - - 62 - 61 - 61 - 60 - 59 - - 59 - 60 -					pH: 8.01 EC: 2451 µS/cm Temp: 22.53 °C
		- 58 61 - - 57 - 56 - 55 - 55 - 64 - - 54 - 55		SANDSTONE - Grey, fine grained sandstone			Redox: 122 mV DO: 71 % Sat DO: 6.1 mg/L
		- 53 66 - - 52 67 - - 51	-	siltstone, some grey medium grained sand	<u>g</u> iey		pH: 7.85 EC: 2491 μS/cm Temp: 23.36 °C Redox: 156 mV DO: 80.9 % Sat DO: 6.79 mg/L
		68 - - 50 69 -	_				
		- 49 70 - 48					
		- 47					
		72 - - 46 - 73 -	-				
		- 45 74 - - 44					

END OF BOREHOLE AT 66.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB02

,	YEARS ®								SHEET 1 OF 4
Client: Project: Bore Loca Project N	A H G 2'	GL Ei ydrog ilouce 16240	nergy Li geologic ester - Ti 06A	mited al Assessment - Gloucester Gas Project edeman property	Date Commenced:4/1/11Date Completed:5/1/11Recorded By:NPHLog Checked By:JCD				
Drilling Me	ethod:	Α	ir Har	nmer - l	ongyear 850	Surfa	ace RL: 118	.44 mAHI)
Drilling Co	ompany:	н	ighla	nd Drilliı	Borehole Diameter: 140 mm	Co-c	ords: E4	02586.74	N 6449408.84 MGA56
Bore In	formatior	١		1	Field Material Description				
		_무	Ê	U					
METT CO	ONSTRUCTION	RL (AHDm) AI	DEPTH (BGLr	GRAPHIC LO	LITHOLOGY		FORMATIO (Approximat	N e)	HYDROGEOLOGY
	50 mm ID Class 18 uPVC & grout	- 118 - 117 - 116 - 115	1 - 2 - 3 -		DRILL PAD CLAY SOIL - Grey/brown, dry medium plasticity, dry, not sticky WEATHERED ROCK/SOIL - Grey/light grey, well weathered rock very fine, brown/grey clay chips (medium plasticity - dry)	,		DN DN	
		- 114 - 113 - 112	4 - 5 - 6 -		WEATHERED ROCK - Light grey, well weathered rock		Jo Doth Tu	ff	
		- 111 - 110 - 109	7 - 8 - 9 -						
	Gravel backfill	- 108 - 107 - 106	10 — 11 — 12 —		SILTSTONE - Grey, 90% medium-fine grained grey siltstone plus light grey grained sandstone and shale	medium			
		- 105	13 - 14 -	· _ · _	THEE/SILTSTONE Off white/green 50 50 off white/green amorphous tuff	nlue			
		- 104 - 103	15 -	<u> </u>	TUFF - White/green, medium-fine grained tuff plus chips dark grey siltstone				
		- 102 - 101	16 – 17 –						
		- 100 - 99	19 - 20 -		SANDSTONE - Light grey, medium grained sandstone plus 40% green tuff				
		- 98 - 97 - 96	21 - 22 -	0 0 0 0 0 0	TUFF - Green/cream, tuff (70%) plus light green/cream medium grained san (30%)	ndstone			
		- 95 - 94	23 -		TUFF - Green, medium and fine grained tuff (some grey tuff) plus 50% chips dark grey/black siltstone/shale	s of			
1					END OF BOREHULE AT 97.00 M				



BORE NO.

S4MB02

TOO YEARS ®											SHEET 2 OF 4	
Client: Project: Bore Location: Project Number:			AC Hy GI 21	GL Er ydrog louce 6240	nergy Li geologic ster - Ti 6A	mited al Assessment - Gloucester Gas Project edeman property	Date Commenced Date Completed: Recorded By: Log Checked By:			4/1/11 5/1/11 NPH JCD		
Dril Dril	ling Method: ling Company	/:	Ai Hi	r Har ghlar	nmer - l nd Drilliı	Longyear 850 ng Borehole Diameter: 140 mm	Surfa Co-c	ace RL: ords:	118.44 E 40258	mAHD 36.74	N 6449408.84 MGA56	
В	ore Informati	ion				Field Material Description						
_		-	2	Ê	ų							
WATER	WELL CONSTRUCTION	ON	אר (וווחשא) א	DEPTH (ВGLI	GRAPHIC LO	LITHOLOGY		FOR (App	MATION roximate)		HYDROGEOLOGY	
		-	93 92	26 -	0.0.0	TUFF - Green, medium and fine grained tuff (some grey tuff) plus 50% chips dark grey/black siltstone/shale (continued) a small amount of orange/red clay	of	LELON FORM Jo Dot	Ma Iation h Tuff			
	rq rq bq bq	-	91	27 –		CONGLOMERATE - Cream/green/brown, tuff (60%) plus grey and brown fine grained siltstone and black siltstone/shale	9	LELON FORM	MA IATION			
		-	90	28 -	· _ · _	SILTSTONE - Dark grey, siltstone 90% plus medium light grey sandstone tuff (green)	f					
		-	89	20 30 —		SANDSTONE/SILTSTONE - Light grey, 50-50 medium grained sandstone an siltstone	d dark					
		-	88	31 –		of tuff (green/brown) SANDSTONE/SILTSTONE - Light grey, 50/50 medium-grained sandstone plu						
		-	87	32 -		darker siltstone SILTSTONE/SHALE - Black, 90% siltstone/shale plus tuff (green and brown)	and					
			86	33 –	· — · — — · —	grey suistone (poor return) SILTSTONE - Black/dark grey, siltstone (organic) and clay plus green tuff						
			84	34 -		SILTSTONE - Grey, siltstone plus some darker organic pieces, clay and light medium grained sandstone	t grey					
		-	83	35 –	· _ · _							
		-	82	36 -	· _ · _							
	Pd Pd	-	81	37 –	· _ · _ _ · _ · _							
	P3 P3	-	80	38 -	· _ · _							
	PG PG	-	79	39 - 40 -		SANDSTONE/SILTSTONE - Light and dark grey, 50-50 medium and fine sandstone and siltstone						
	PG PG	-	78	41 –	· — · —	SILISTONE - Dark grey, slitstone 90% (black organic staining) + 10% lighter siltstone/sandstone	and					
	PG PG	-	77	42 -	· · ·	darker grey plus chips of mudstone? light/medium brown very grained SANDSTONE/SILTSTONE - Light grey, 50-50 medium grained sandstone an	nd dark					
	PG PG	-	76	43 –	— —	grey and black siltstone SILTSTONE - Dark grey, siltstone 90% and black siltstone/shale and a few or	chips					
	Pa Pa		75	44 -	· ·	SANDSTONE - Light grey, medium grained sandstone (60%), 30% fine grain grey sandstone. 10% grey silistone + black silistone/shale chips + medium	ned					
	A A		73	45 –	· _ · _	grained sand SILTSTONE - Dark grey, siltstone (70%) and medium grained light grey sand (30%)	dstone					
	Pa Pa	-	72	46 -	·	SANDSTONE - Grey, fine grained sandstone (90%) and dark grey/black siltstone/shale (10%)						
		+	71	47 –	 	SILTSTONE - Dark grey/black, siltstone (60%) and fine to medium grained gr sandstone (40%)	rey					
		+	70	48 -								
		+	69	49 –	· _ · _							

END OF BOREHOLE AT 97.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB02

	YEARS ®									SHEET 3 OF 4	
Client: Project: Bore Location: Project Number:		4 F 0 2	AGL Ei Iydrog Glouce 16240	nergy Li geologic ster - T 6A	mited al Assessment - Gloucester Gas Project iedeman property	Jate Date Date Date Date Date Date Date D			4/1/11 5/1/11 NPH JCD		
Dril Dril	ling Method:	4	Air Har	nmer - l nd Drilliu	Longyear 850 Day Borebole Diameter: 140 mm	Surf	ace RL: '	l18.44 n ⊑ 40258	nAHD	N 6449408 84 MGA56	
B	Bore Informatio	n '	Igria		Field Material Description	00-0	Ju3.	- 40230	0.74	11 0440400.04 1110450	
		9 9	Ê	U							
WATER	WELL CONSTRUCTION	Z RL (AHDm) A	DEPTH (BGLI	GRAPHIC LO	LITHOLOGY		FORM (Appro:	ATION (imate)		HYDROGEOLOGY	
		- 68		· _ · _	SILTSTONE - Dark grey/black, siltstone (60%) and fine to medium grained g sandstone (40%) (continued)	rey	LELOM. FORMA	A JTION			
		- 67	51 -	· _ · _							
	Pa Pa		52 –	· ·							
		- 66	50	·_·_							
	[] []	- 65	53 -	· _ · _							
	Pa Pa		54 -	<u> </u>							
		64	55 -	<u> </u>							
	p p	- 63		· _ · _							
	ba ba	- 62	56 -								
			57 -	·_·_							
	d d	- 61	58 -	·_·_							
	53 53	- 60		· ·							
		- 59	59 -		SANDSTONE - Light grey, very fine grained sandstone				pH:	7.77	
\triangleright	Pd Pd		60 —	•••••	SANDSTONE - Light grey, fine grained sandstone				EC Ter Re	:: 2452 µS/cm mp: 19.7 °C dox: 173 7 mV	
	53 53	- 58	61 -						DC DC): 63.1 % Sat): 5.72 mg/L	
		- 57	01		a few chips of tuff				EC Tei	7.6 ∷ 2494 µS/cm mp: 21.66 °C	
	Pà Pà	- 56	62 -						Re	dox: 168.7 mV): 72.2 % Sat): 6.27 mg/l	
	6464		63 -							2. 0.27 mg/L	
	rg rg	- 55									
		- 54	64 -		SANDSTONE/SILTSTONE - Grey/dark grey, 50-50 fine grained sandstone a siltstone	ind					
		5	65 -		SANDSTONE - Grey, fine grained sandstone (90%) and dark grey siltstone ((10%)			nH.	7 75	
	d d	- 53	66 -						EC	:: 2573 µS/cm mp: 21.55 °C	
	2 2	- 52		· _ · _	SIL 15 TONE - Dark grey, sittstone (70%) and time & medium grained light gre sandstone	:y			Re DC DC	dox: 151.5 mV): 96 % Sat): 8.1 mg/L	
		- 51	67 –	•••••	SANDSTONE - Light grey, medium grained sandstone (90%) plus dark grey/l siltstone (10%)	black				C C	
	rd rd	50	68 -								
	2 2	- 50	69 -								
		- 49		•••••							
	Grout	- 48	70 —	· · · · · · ·	SILTSTONE - Grey, siltstone (60%) plus light grey fine grained sandstone (4	0%)					
			71 -								
		- 47	70	 					pH: EC	7.85 ∷ 2569 µS/cm mp: 21.84 °C	
		- 46	12 -	· _ · _					Re	dox: 138.6 mV): 91.1 % Sat	
		AE	73 -		SANDSTONE - Light grey, fine grained sandstone (80%) and dark grey siltst	one —			DC): 7.76 mg/L	
		40	74 –	·····	SII TSTONE - Dark gray siltstone (80%) and fine grained light gray condition	ne					
		- 44		· ·	(20%) plus small amount of clay						

END OF BOREHOLE AT 97.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB02

	YEARS ®						SHEET 4 OF 4
Client: Project: Bore Location: Project Number:		AGL Hydr Gloue 21624	Energy Li ogeologic cester - T 406A	mited al Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	Commenced: Completed: orded By: Checked By:	4/1/11 5/1/11 NPH JCD
Drill Drill	ing Method: ing Company:	Air H Highl	ammer - I land Drilliı	Longyear 850 ng Borehole Diameter: 140 mm	Surfa Co-c	ace RL: 118.44 ords: E 4025 8	mAHD 36.74 N 6449408.84 MGA56
В	ore Informatio	n	I	Field Material Description			
		무 @	ີ ບ				
WATER	WELL CONSTRUCTION	RL (AHDm) A DFPTH (RGL	GRAPHIC LO	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
		- 43 76 - 42 77 - 41 78 - 40 79 - 39 80 - 38		SILTSTONE - Dark grey, siltstone (80%) and fine grained light grey sandstor (20%) plus small amount of clay (continued) CONGLOMERATE - Several colours, coal, siltstone (dark grey & brown)/sha (black), light grey medium grained sandstone COAL/SILTSTONE - Dark grey/black, 50-50 coal and siltstone/shale COAL - Black/dark grey, coal (50%), grey siltstone (25%) and medium grain light grey sandstone (25%)	ne	LELOMA FORMATION LELOMA FORMATION Bindaboo Coal	pH: 7.84 EC: 2638 µS/cm Temp: 23.08 °C Redox: 162.4 mV DO: 69.1 % Sat DO: 5.84 mg/L
		81 - 37 - 36 - 36 - 35		SILTSTONE - Grey, siltstone (80%) plus fine grained grey sandstone and co fines SANDSTONE - Light grey, fine grain sandstone (80%) and dark grey siltston	ne	LELOMA FORMATION	рН: 7.78 ЕС: 2573 µS/ст
	Bentonite seal	- 34 - 34 - 33 - 33 - 32		SILTSTONE - Dark grey, siltstone (80%) plus 20% fine and medium grained grey sandstone	light —		Temp: 22.5 °C Redox: 166.7 mV DO: 71.3 % Sat DO: 6.11 mg/L
	Gravel 5 mm graded	- 31 - 31 - 30 - 30 - 89 - 29		SANDSTONE/SILTSTONE - Light grey, 50-50 medium grained sandstone ar grey and black siltstone SANDSTONE - Light grey, coarse-medium grained sandstone plus soft and medium grained grey sand	nd dark		pH: 7.8 EC: 2592 µS/cm
	UPVC screen	90 - 28 91 - 27 92 - 26		SANDSTONE - Grey, coarse-medium grained sandstone (90%) plus dark gre siltstone (10%) SILTSTONE - Dark grey, siltstone (80%) and medium grained light grey sand (20%)	ey		Temp: 22.49 °C Redox: 265.1 mV DO: 84.4 % Sat DO: 7.17 mg/L
	Sump/ bentonite	93 - 25 94 - 24 - 23		SANDSTONE - Light grey, medium-fine grained sandstone (90%) plus dark siltstone (10%)			pH: 7.82 EC: 2688 µS/cm Temp: 24.08 °C Redox: 94.1 mV DO: 83 % Sat DO: 6 93 m/l
		96 - 22 - 97 - 21 - 20 - 20 - 19		SANDSTONE/SILTSTONE - Light grey, 50-50 fine grained sandstone and da siltstone with small amount of coal fines	ark		pH: 7.68 EC: 2564 µS/cm Temp: 23.3 °C Redox: 109 mV DO: 86 % Sat DO: 7.14 mg/L

END OF BOREHOLE AT 97.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB03

	YEARS ®									SHEET 1 OF 8
Client: Project: Bore Location: Project Number:		AC Hy GI 21	GL Er /drog ouce 6240	nergy Li geologic ster - Ti 6A	imited cal Assessment - Gloucester Gas Project Tiedeman property Longyear 850		Date Commenced: Date Completed: Recorded By: Log Checked By: Surface RI : 118.3		15/12/10 16/12/10 NPH JCD	
Dril	ling Method:	Ai	r Har	nmer - l	Longyear 850	Surfa	ace RL:	118.37	mAHD	N 6440407 84 MC 666
Dni	ing Company:		gniar	ia Driilli	Eiold Material Description	C0-0	oras:	E 4025	91.91	N 6449407.84 MGA56
WATER	WELL CONSTRUCTION	Z RL (AHDm) AH	DEPTH (BGLm	GRAPHIC LOG	LITHOLOGY		FOR (Appi	MATION oximate)		HYDROGEOLOGY
	S0 mm ID Class 18 grout grout grout Class 18 grout Class 18 grout	 118 117 116 115 114 113 112 111 112 111 110 109 101 106 107 108 107 108 107 108 107 109 101 101 100 99 	1 - 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3		TOPSOIL/DRILLPAD - Dark brown, clay - hard and fill chips CLAY - Beige, clay, medium plasticity with dry and fine grained sand SAND - Beige, medium grained sand and small hard clay chips WEATH-ERED ROCK - Light grey/brown, weathered rock. fine - medium grained low plasticity chips WEATH-ERED ROCK - Dark brown, fine grained and hard clay dark chips WEATH-ERED ROCK - Dark brown, fine grained and hard clay dark chips WEATH-ERED ROCK - Light grey, medium grained weathered sillstone/sard and siltstone/sandstone chips WEATH-ERED ROCK - Light grey, medium grained weathered sillstone/sard and siltstone/sandstone chips, plus clay WEATH-ERED ROCK - Light grey, rock, very fine well weathered SANDSTONE - Light grey, medium-coarse grained sandstone 80% and 20 grained SILTSTONE - Dark grey/ brown, medium grained sillstone and fine grained sillstone/shale and small amount of clay TUFF/SHALE - Light grey, medium-fine grained sandstone 90% and sillston grey), shale, off-white tuff SANDSTONE - Light grey, medium-fine grained sandstone 90% and sillston grey), shale, off-white tuff TUFF - Greeny cream, smooth tuff 90% and 10% light grey sandstone	ained	LELON FORM Jo Dot	AATION AATION ATION h Tuff	pH:: EC: Ten Rec DO: DO:	7.08 2694 µS/cm 1p: 27.42 °C 1o: 92 mV 80.3 % Sat 6.15 mg/L
		- 98 - 97	20 -	D. D. D. I.						

END OF BOREHOLE AT 170.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB03

	YEARS ®							SHEET 2 OF 8
Client: Project: Bore Lo	: ocation:	A H G	GL Ei ydrog ilouce	nergy Li geologic ester - T	mited al Assessment - Gloucester Gas Project edeman property	Date Date Reco	Commenced: ' Completed: ' rded By: I	15/12/10 16/12/10 NPH
Project	Number:	2	16240	6A		Log (Checked By:	JCD
Drilling	Method:	Α	ir Har	nmer - I	ongyear 850	Surfa	ice RL: 118.37 m	AHD
Drilling	Company:	Н	ighlaı	nd Drilli	ng Borehole Diameter: 140 mm	Co-o	rds: E 402591	.91 N 6449407.84 MGA56
Bore	Information	n			Field Material Description			1
		д Д	Ê	g				
WATER MATER	CONSTRUCTION	RL (AHDm) /	DEPTH (BGL	GRAPHIC LC	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
	2	- 96		<u> </u>	TUFF - Greeny cream, smooth tuff 90% and 10% light grey sandstone (contin	nued)	LELOMA FORMATION	
p	P		23 -	. A . A			Jo Doth Tuff	
6	59	- 95						pH: 7.46
p	P		24 -	· · · · ·				EC: 2174 µS/cm Temp: 26.52 °C
5	59	- 94			SANDS FONE - Cream green, line grained sandstone and medium sand (up to 6mm)		FORMATION	Redox: 80 mV DO: 82.1 % Sat
9	9		25 -					DO. 6.48 mg/L
b		- 93						
g	Y I		26 -		SHALE/SILTSTONE - Dark grey black, 50% shale and 50% very fine grained			
	5	- 92			siltstone			
<u> </u>	Y I		27 -		SANDSTONE - medium light grey 80% fine sandstone and dark grey siltstone			
22	22	- 91						
			28 -					
Pà	27	- 90						
		L	29 -	*******	SANDSTONE - Dark grey, coarse grained sandstone			
6	R	0.5						
		- 88	30 —		SANDSTONE - Grey, coarse grained sandstone 90% and sand and a small amount (5%) dark shale/ siltstone chips			
d	d		31 -					
4	4	- 87	51 -	· _ · _	SILTSTONE - Dark grey, siltstone (up to 3 mm) and clay			
Ó	D		32 -					
69	69	- 86			SANDS I ONE - Light grey, the grained sandstone and small amount of clay			
p	P		33 -	····	SII TSTONE - Dark grey, very fine grained siltstone 95% and black shale			
5	59	- 85		· _ · _				
9	[9]		34 -	· _ · _				
b		- 84		· _ · _				
Q	Y I		35 -	· _ · _				
P2	22	- 83						
		_ 02	36 -		CONGLOMERATE - Light grey, fine grained sandstone, shale and mudstone			
Pa	Pa	02						
		- 81	37 -		SANDSTONE/SILTSTONE - Dark grey, fine grained siltstone 50% and 50% fi grained sandstone	ind		
d	d		20 -	•••••				
7		- 80	30 -		small tuff chips			
d	d		39 -					
4	4	- 79						
M	rd		40 —					
6	6	- 78			איזעט דיראב - Lignic grey, ווופ-וופטונוזו grained sandstone 80% and 20% sitt	SUINE		
p	rq		41 -		SANDSTONE/SILTSTONE - Dark grey, brittle siltstone and light grey fine-me			
6	5	- 77			sandstone with a few tuff chips			pH: 7.26
p	[] []		42 -					Temp: 25.42 °C Redox: 78.1 mV
5	69	- 76						DO: 66 % Sat DO: 5.1 mg/L
ļ ļļ	Ч		43 -					Ĭ
		- 75						
					END OF BOREHOLE AT 170.00 m			

100

GROUNDWATER BOREHOLE LOG

BORE NO.

S4MB03

		YEARS ®								SHEET 3 OF 8
Clie Pro Bor	Client: AGL Ener Project: Hydroged Bore Location: Glouceste					mited [al Assessment - Gloucester Gas Project [iedeman property]	Date Date Recc	Commenced: Completed: orded By:	15 16 NF	/12/10 /12/10 PH
Pro	jec	t Number:	2	16240	6A	l	_og (Checked By:	JC	D
Dril	ling	Method:	Α	ir Har	nmer - I	_ongyear 850	Surfa	ace RL: 118.37	' mAł	łD
Dril	ling	Company:	н	ighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-o	rds: E 402	591.9 [,]	1 N 6449407.84 MGA56
В	ore	e Information	n			Field Material Description				
			Q.		()					
			m) AF	BGLm	CLOC					
ATER	WEI	LL CONSTRUCTION	(AHD	PTH (APHIC	LITHOLOGY		FORMATION (Approximate)		HYDROGEOLOGY
Ň			RL	DE	GR GR					
						SANDSTONE - Dark grey, fine grained 90% and dark grey shale and tuff			_	
	þ		- 74					FORMATION		
	Ы			45 -		SANDSTONE/SILTSTONE - hard and dark siltstone/shale 50% and 50% fine-				
	27	22	- 73			medium grained sandstone				
	2			46 -		SANDSTONE - Light grey, fine grained sandstone and small amount of shale				
	PA	Pà I	- 72							
	2		- 71	47 -		SILTSTONE/SANDSTONE - Dark grey, very fine grained sand/siltstone				
	H	R	71						· · ·	pH: 7.26 EC: 2182 μS/cm Torm: 25.78 %
	μ	4	- 70	48 -		brown shale lens				Redox: 64.2 mV DO: 84.4 % Sat
	M	ſd		40 -	· _ · _					DO: 6.51 mg/L
	μ	6	- 69	45 -		SANDSTONE - Light grey, fine-medium coarse sandstone and darker siltstone a brown shale	and			
	ſŊ	ÍQ		50 —						
	6	5	- 68							
	9	9		51 -		trace of tuff				
	bJ		- 67							
	Ŋ			52 -						
	27	22	- 66							
	2		65	53 -						
	PA	Pa	00						· · ·	pH: 7.76 EC: 2442 μS/cm Tomm: 26 51 %
	7		- 64	54 -						Redox: 49.5 mV
	M	łd		55 -						DO: 5.96 mg/L
	μ	6	- 63	00	· _ · _	SILTSTONE - Dark, siltstone 80% and fine grained sandstone and shale				
	ſŊ	ÍQ		56 -	<u> </u>	trace of hiff				
	6	5	- 62		<u> </u>					
	P	[]		57 –	·	SANDSTONE - Light grey, fine grained sandstone and guartz, minor tuff and				
	þĴ		- 61			siltstone				
	N			58 -						
			- 60							
	17		- 50	59 -						
	PA	Pa I	55	~~						μπ. 7.09 EC: 159 μS/cm Temp: 26.28 °C
	7		- 58	60 —						Redox: 159 mV DO: 94 % Sat
	łd	łd		61 -						DO: 7.34 mg/L
	64	6	- 57							
	ŕd	rd		62 -						
	61	b	- 56							
	[]	[]		63 -						
	bJ		- 55							
	Ŋ		4	64 -	000	CONGLOMERATE - Dark grey, siltstone and fine grained sandstone and brown	tuff			
	벩	P1	54		$\int \bigcup_{i}$					
	ĽJ		- 53	65 -	h^{\prime}					
	h	Ы			$\begin{bmatrix} \bigcup \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $					
						END OF BOREHOLE AT 170.00 m				



BORE NO.

S4MB03

Client Projec Bore I Projec Drillinc	: ct: Location: ct Number: g Method: g Company:	AGL Energy L Hydrogeologi Gloucester - T 2162406A Air Hammer - Highland Drilli			mited al Assessment - Gloucester Gas Project edeman property ongyear 850 Borehole Diameter: 140 mm	Date Com Date Com Recorded Log Checl Surface R Co-ords:	menced: pleted: By: <ed by:<br="">L: 118.37 r E 40259</ed>	15/12/10 16/12/10 NPH JCD mAHD i91.91 N 6449407.84 MGA56		
Bor	e Information	יייי וויז	grinai		Field Material Description	00 0103.	L 40203	1.51 11 07-07-07.07 1110/00		
WATER	ELL CONSTRUCTION	RL (AHDm) AHE	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY		
	Grout	- 52 - 51 - 50 - 49 - 48 - 47 - 46 - 45 - 44	67 - 68 - 69 - 70 - 71 - 72 - 73 - 74 -		SANDSTONE - Grey, fine grained sandstone and 10% dark grey siltstone SILTSTONE - Dark grey, siltstone 80% and 20% fine grained lighter sandstone SANDSTONE/SILTSTONE - Light grey, very fine grained sandstone 60% and dark grey siltstone	e 40%	OMA RMATION	pH: 7.69 EC: 2499 µS/cm Temp: 25.99 °C Redox: 341.9 mV DO: 96.6 % Sat DO: 7.63 mg/L		
		- 43 - 42	75 – 76 –		SILTSTONE - Dark grey, hard siltstone 80 % and light grey sandstone CONGLOMERATE - Dark and laminated black, siltstone 80% and sandstone w tuff and light brown shale	vith				
		- 41 - 40 - 39	77 – 78 – 79 –		SHALE/SILTSTONE - Black, siltstone/shale and dark grey shale with coal fines and light fine sandstone COAL and siltstone - Bimaboo coal and dark grey siltstone CONGLOMERATE - Dark grey, siltstone, light grey tuff and coal and shale	s LEL FOI Bin Sea	OMA RMATION daboo Coal am	pH: 7.89 EC: 2851 µS/cm Temp: 32.5 °C Redox: 292.3 mV DO: 70.6 % Sat DO: 5.05 mg/L		
		- 38	80 —		SILTSTONE - Very dark, siltstone 50% and dark fine grained siltstone 50%	LEL	.oma Rmation			
		- 37	81 -		CONGLOMERATE - Light grey, fine grained sandstone 60% and highly organic dark siltstone and shale SANDSTONE/SILTSTONE - Light grey, fine grained sandstone and dark siltsto	c one				
		- 35	83 - 84 -		SII TSTONE - Dark arey, 95% silisione and 5% fine arained sandstone and da	<u></u>		pH: 7.88 EC: 2491 µS/cm Temp: 24.68 °C		
		- 34 - 33	85 -		SANDSTONE/SILTSTONE - Light grey, fine grained sandstone 70% and 30% siltstone	dark		DO: 70 % Sat DO: 5.71 mg/L		
		- 32 - 31	87 -		trace of light shale and coal END OF BOREHOLE AT 170.00 m					



BORE NO.

S4MB03

	YEARS ®								SHEET 5 OF 8		
Client: Project: Bore Location: Project Number:		AC Hy GI 21	3L Er /drog louce 6240	nergy Li jeologic ster - Ti 6A	mited al Assessment - Gloucester Gas Pr edeman property	Dat oject Dat Rec Log	Date Commenced: 15/12/10 Date Completed: 16/12/10 Recorded By: NPH Log Checked By: JCD				
Drill	ing Method:	Ai	r Har	nmer - I	ongyear 850	Sur	face RL:	118.37 m	nAHD		
Drill	ing Company:	Hi	ghlar	nd Drillin	ng Borehole Diameter: 140 m	m Co-	ords:	E 40259	1.91 N 6449407.84 MGA56		
в	ore Informatio	n		,	Field Material Description						
WATER	WELL CONSTRUCTION	RL (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FOF (App	RMATION roximate)	HYDROGEOLOGY		
		- 30 - 29 - 28 - 27	89 - 90 - 91 -		SANDSTONE/SILTSTONE - Light grey, fine grained sandsto siltstone (continued) SILTSTONE - Dark, 80% siltstone, fine-med grained light sa SANDSTONE - Dark, 80% sandstone, 20% siltstone/shale	ne 70% and 30% dark	LELOI FORM	MA IATION	pH: 8.2 EC: 2695 µS/cm Temp: 25.5 °C Redox: 210.7 mV DC: 99.1 % Sat DO: 7.93 mg/L		
		- 26 - 25 - 24	92 - 93 - 94 - 95 -		SILTSTONE - Dark and light, - some dark laminations, 80% grained light sandstone and shale Shale with leaf prints	siltstone, 20% fine	_				
		- 23 - 22 - 21	96 – 97 –		SHALE - Dark, highly organic shales, small amount of tuff SANDSTONE - Light grey, 50% fine to medium sandstone, 5 shale/siltstone (coal)	50% dark	_		pH: 8.3 EC: 2914 μS/cm Temp: 27.4 °C Redox: 138.2 mV DO: 80.4 % Sat DO: 6.36 mg/L		
		— 20 - 19	98 – 99 –		SILTSTONE/SHALE - Dark, 60% siltstone/shale/coal, 40% sandstone	ned-light grey	_				
		- 18	100 — 101 —		SANDSTONE - Light grey, 80% medium sandstone, 20% da SILTSTONE - Light grey, 90% siltstone, 10% medium sands	rk grey siltstone	-				
		- 16	102 -						pr: 8.22 EC: 2897 µS/cm Temp: 26.26 °C Redox: 89.2 mV DC: 108.4 % Sat DC: 8.55 mg/L		
		- 15 - 14	103 -		SANDSTONE - Light grey, 80% medium sandstone, 20% da	rk grey siltstone					
		- 13	105 - 106 -		SILTSTONE - Dark and light grey, 90% siltstone, 10% light g	grey, fine sandstone	-				
		- 11	107 - 108 -		SANDSTONE - Light grey, fine grained sandstone and 40%	darker siltstone	_		pH: 8.33 EC: 3004 µS/cm Temp: 25.97 °C Redox: 80.4 mV DO: 94 % Sat DO: 7.59 mg/L		
		- 9	109 -		SANDSTONE/SILTSTONE - Grey, fine grained sandstone, of trace of red/brown mudstone	lark grey siltstone and					

END OF BOREHOLE AT 170.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB03

	YEARS ®							SHEET 6 OF 8
Client Proie	: ct:	/	AGL Ei Hvdrod	nergy Li xeologic	mited al Assessment - Gloucester Gas Proiect	Date Date	Commenced:	15/12/10 16/12/10
Bore Proie	Location:	(Glouce	ster - Ti	edeman property	Reco	orded By:	NPH
Drillin	g Method:		Air Har	nmer - L	Longyear 850	Surfa	ace RL: 118.37 m	AHD
Drillin	g Company:	ł	lighlaı	nd Drillir	Borehole Diameter: 140 mm	Co-o	rds: E 402591	.91 N 6449407.84 MGA56
Bor	e Information	n		1	Field Material Description			
		дH	Ê	ų				
WATER	ELL CONSTRUCTION	RL (AHDm) A	DEPTH (ВGLr	GRAPHIC LO	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
X					SANDSTONE/SILTSTONE - Grey, fine grained sandstone, dark grey siltstor	ne and	LELOMA	
		- 8			trace of red/brown mudstone (continued)		FORMATION	
			111 -					
		- 7						
			112 –		SHALE - Dark, hard shale/siltstone-leaf prints 5% darker fine sandstone			
		- 6						
			113 -					
K		- 5						pH: 8.22
			114 -					EC: 2929 µS/cm Temp: 25.55 °C
K		- 4						Redox: 92.9 mV DO: 98.9 % Sat
			115 -					DO: 7.84 mg/L
		- 3	115 -	 	SILTSTONE/SHALE - Dark black, siltstone/shale			
			110	·				
		- 2	110 -		SANDSTONE - Light grey, 80% fine to medium sandstone, 20% dark grey s leaf prints	shale-		
		-						
		- 1	117 –					
		0	118 -		SHALE - Dark grey, silty shale (90%) and medium light grey sandstone			
		- 0						
			119 -		CONGLOMERATE - Light grey, fine to medium sandstone, shale, siltstone			
		1		103				pH: 8.3 EC: 3009 µS/cm
K		_	120 —	1º00				Temp: 25.27 °C Redox: 91.2 mV
		2						DO: 111.3 % Sat DO: 8.8 mg/L
K			121 -		SILTSTONE - Dark and lighter grey, siltstone (shale) 95%, 5% coarse light			· ·
		3		· ·	sandstone and quartz chips			
			122 -		SANDSTONE/SILTSTONE - Light, fine grained sandstone 50%, 50% dark si	iltstone		
		4						
			123 -		trace of quartz			
K		5						
			124 -					
K		6						
			125 –					
Ř		7						pH: 7.98
			126 -					EC: 2955 μS/cm Temp: 26.27 °C
Ň		8						Redox: 142 mV DO: 99 % Sat
K			127 -					DO: 7.86 mg/L
		9						
K			100					
		10	120 -					
Ř								
		11	129 -					
Ř		-11						
K		40	130 —		COAL/SHALE - Dark black, coal/shale 50%, 50% dark grey siltstone and fin sandstone	ne light	LELOMA	
		-12			ounderend		FORMATION	
K			131 -		SILTSTONE - 95% dark grey, 5% brown - up to 1mm, grey up to 5mm		Seam	
		13						pH: 8.07 EC: 2967 μS/cm
K				I	END OF BOREHOLE AT 170.00 m			



BORE NO.

S4MB03

	YEARS ®								SHEET 7 OF 8
Client: Project: Bore Location: Project Number:		4 F 0 2	GL E Iydrog Glouce 16240	nergy Li geologic ester - T 06A	mited al Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	ate Commenced: ate Completed: ecorded By: g Checked By: Irface RL: 118.37		15/12/10 16/12/10 NPH JCD
Drill	ing Method:	A	ir Hai	nmer - I	Longyear 850	Surfa	ace RL: 1	118.37 m	
Drill	ing Company:	- T	lignia	na Driilli	Borenole Diameter: 140 mm	Co-0	ords:	- 402591	.91 N 6449407.84 MGA56
D					Field Material Description				
WATER	WELL CONSTRUCTION	ERL (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FORM. (Approx	ATION kimate)	HYDROGEOLOGY
		14	133 -		SANDSTONE - Light grey, medium-fine grained sandstone 95% and 5% da siltstone	rk	LELOM FORMA Deards	A TION Coal	Temp: 25.43 °C Redox: 83.4 mV DO: 92.8 % Sat DO: 7.52 mg/L
		15	134 -		CUNGLUMERATE - Grey, tine - medium sanostone, sinstone, snale		Seam		
		16	135 -		SII TSTONE/SHAI F - Linhter rrev. siltstone dark rrev /black shale				
		17	136 -	· _ · _	CONGLOMERATE - Light fine sandstone, shale, siltstone, brown				
		18	137 –		siltstone/mutatione Light, mit canadata, industry, one of the second state of the seco	siltstone			
		19	138 -						pH: 7.98 EC: 2962 µS/cm Temp: 24.54 °C Podov: 101.2 mV
		20	139 -						DO: 115.9 % Sat DO: 9.15 mg/L
		21	140 —		COAL - Black, coal plus black shale				
		22	141 -						
		23	142 –		SILTSTONE/SHALE - Light, medium grained sandstone 50%, 50% medium	sand			
		25	143 -		SANDSTONE - Light grey, fine grained sandstone 80%, 20% darker siltstor sand	ne +			
		26	144 –						PΠ. 0.1 EC: 2946 μS/cm Temp: 25.16 °C Redox: 89 mV DO: 79 % Sat
		27	145 –		SILTSTONE/SHALE - Dark brown/black, siltstone/shale 95%, 5% light, coarse-medium sandstone				DO: 6.43 mg/L
		28	146 -	· _ · _					
		29	147 –		COAL - Black, coal and dark siltstone/shale				
		30	148 -		SANDSTONE/SILTSTONE - Light grey, medium grained sandstone 50%, 50 siltstone + coal fines	0% dark	LELOM FORMA	A TION	-
		31	149 -		SANDSTONE - Dark grey, fine and light medium sandstone				pH: 8.19 EC: 3077 μS/cm
		32	150 —	· _ · _	SILTSTONE - Light and dark grey, siltstone 80%, light fine grained sandsto tuff chips	ne +			remp: 25.15 °C Redox: 93 mV DO: 89.4 % Sat DO: 7.24 mg/L
		33	151 -						
		34	152 -		SANDSTONE/SILTSTONE - Light grey, medium-fine sandstone 50%, 50% siltstone	dark			
		35	153 -	· _ · _	SILTSTONE/SHALE - Dark grey and black, siltstone/shale 90% and 10% lig medium grained sandstone	ght grey			

END OF BOREHOLE AT 170.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S4MB03

Client: Project: Bore Location: Project Number:			A H Q 2	GL Er lydrog louce 16240	nergy Li geologic ster - Ti 6A	mited al Assessment - Gloucester Gas Project iedeman property	Date Commenced:15/12/10Date Completed:16/12/10Recorded By:NPHLog Checked By:JCD			
Drill	ling M	lethod:	A	vir Har	nmer - l	_ongyear 850	Surfac	e RL:	118.37 m/	AHD
Drill	ling C	ompany:	H	lighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-oro	ds:	E 402591.	.91 N 6449407.84 MGA56
В	ore In	nformation	n		1	Field Material Description				
WATER	WELL C	ONSTRUCTION	RL (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FOR (Appr	MATION oximate)	HYDROGEOLOGY
		Bentonite	36 37 38 39 40	155 - 156 - 157 - 158 -		SANDSTONE - Dark grey, fine grained sandstone 90% and 10% dark siltstone	ie —	LELON	IA ATION	pH: 6.66 EC: 2686 µS/cm Temp: 21.66 °C Redox: 5360 mV DO: 96.1 % Sat DO: 8.3 mg/L
		Gravel 5 mm graded	41 42 43	159 - 160 - 161 -		CONGLOMERATE - Dark, fine grained sandstone. light grey, medium grained sandstone and siltstone and shale		JILLEC FORM Clovero Seam)N ATION Jale Coal	pH: 8.07
		50 mm ID, 0.5 mm aperture uPVC screen	44	162 - 163 -		COAL - coal (80%) and shale/siltstone				EC: 2682 µS/cm Temp: 21.21 °C Redox: 225.1 mV DO: 58.4 % Sat DO: 5.14 mg/L
			46 47	164 - 165 -		COAL - coal (90%) and shale/siltstone				
			48	166 - 167 -	· _ · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · / · · / · / · / · / / / /	SILTSTONE - Dark and light grey, siltstone and coal fines				-U- 8 03
		Sump/ bentonite plug	50	168 - 169 -		SILTSTONE - Dark grey, siltstone 60% and 40% fine dark and medium light sandstone		JILLEC)N ATION	EC: 2734 µS/cm Temp: 22.08 °C Redox: 223.5 mV DO: 73.1 % Sat DO: 6.31 mg/L
			51 52	170 —	· · · · ·					pH: 8.39 EC: 2828 µS/cm Temp: 21.72 °C Redox: 204 mV DO: 101.2 % Sat DO: 8.62 mg/L
			53	171 – 172 –						
			55	173 -						
			56 57	174 – 175 –						
						END OF BOREHOLE AT 170.00 m				



BORE NO.

S5MB01

	YEARS ®									SHEET 1 OF 2	
Client: Project: Bore Location: Project Number:		AG Hy Glo 210	iL Er drog ouce 6240	nergy Li jeologic ster - Ti 6A	mited al Assessment - Gloucester Gas Project iedeman property	Date Date Rec Log	Date Commenced: Date Completed: Recorded By: Log Checked By:			I: 13/12/10 14/12/10 NPH / JCD JCD	
Dri	lling Method:	Air	Han	nmer - l	_ongyear 850	Surf	ace RL:	129.98	mAHE)	
Dri	lling Company:	Hię	ghlar	nd Drillin	Borehole Diameter: 140 mm	Co-	ords:	E 4031	55.96	N 6449250.34 MGA56	
Bore Information		1			Field Material Description		1				
		СH.	Ê	g							
WATER	WELL CONSTRUCTION	RL (AHDm) A	DEPTH (BGL	GRAPHIC LC	LITHOLOGY		FOR (Appr	MATION oximate)		HYDROGEOLOGY	
	50 mm ID Class 18			m	TOPSOIL - Dark brown, medium/low plasticity brown clay and fill		JILLEO	DN ATION			
	S0 mm 10 class 18 uPVC & grout	 129 128 127 126 125 124 123 122 121 120 111 112 111 112 111 111 112 111 111 112 111 112 111 112 111 112 111 111 112 111 111	1 - 2 - 3 - 3 - 3 - 5 - 5 - 5 - 5 - 5 - 5 - 5		TOPSOIL - Dark brown, medium/low plasticity brown clay and fill WEATHERED ROCK - Red/brown/grey, well weathered rock and sandy cla clumps few small dark sillstones WEATHERED SILTSTONE - Dark grey, fine grained siltstone covered in cl	ay	FOMR	ON ATION			
		- 101	29 -	· _ · _							
		- 100	30 —	· ·	SANDSTONE - Light grey, fine - coarse grained sandstone, dark brown and fine grained siltstone, sand and quartz, small amount of clav	d grey	-				
		- 99	31 -								
		- 98	32 -								
		- 97	33 -								
		- 96	34 –								

END OF BOREHOLE AT 60.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

PP IOO VEARS®

GROUNDWATER BOREHOLE LOG

BORE NO.

S5MB01

SHEET 2 OF 2

TEARS @							
Client: Project: Bore Location: Project Number:	AGL Er Hydrog Glouce 216240	nergy Lin geologica ster - Tio 6A	mited al Assessment - Gloucester Gas Project edeman property	Date Commenced:13/12/10Date Completed:14/12/10Recorded By:NPH / JCDLog Checked By:JCD			
Drilling Method:	Air Har	nmer - L	ongyear 850	Surface RL	: 129.98 n	nAHD	
Drilling Company:	Highlar	nd Drillin	g Borehole Diameter: 140 mm	Co-ords:	E 40315	5.96 N 6449250.34 MGA56	
Bore Information			Field Material Description				
<u> </u>	E ê	U					
	RL (AHDm) A DEPTH (BGLI	GRAPHIC LO	LITHOLOGY	Fi (A	DRMATION pproximate)	HYDROGEOLOGY	
Bentonite seal Bentonite seal Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication Communication	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ $		SANDSTONE - Light grey, fine - coarse grained sandstone, dark brown and gre fine grained siltstone, sand and quartz, small amount of clay (continued) SILTSTONE - Dark grey, fine grained siltstone small amount of clay SANDSTONE - Light grey, coarse grained sandstone plus sand and quartz some fine grained sandstone small amount of dark siltstone SILTSTONE - Dark grey, fine grained siltstone plus fine and coarse light grey sandstone minor clay SANDSTONE - Light grey, coarse and fine grained sandstone (both light grey) minor dark grey siltstone SILTSTONE - Light grey, coarse and fine grained sandstone (both light grey) minor dark grey siltstone SILTSTONE/SHALE - Dark grey, siltstone/shale SILTSTONE - Light grey, medium grained sandstone SILTSTONE - Light grey, medium grained sandstone	⁹ JILLI FOM	EON RATION	pH: 8.00 EC: 4335 µS/cm Temp: 24.05 °C Redox 43.7 mV DO: 3.2 % Sat DO: 6.04 mg/L pH: 8.09 EC: 4323 µS/cm Temp: 24.72 °C Redox 54.7 mV DO: 98.1 % Sat DO: 7.82 mg/L pH: 8.05 EC: 4240 µS/cm Temp: 24.76 °C Redox 55.4 mV DO: 81.5 % Sat DO: 6.60 mg/L pH: 7.85 EC: 4439 µS/cm Temp: 27.41 °C Redox 66.9 mV DO: 6.27 mg/L pH: 8.39 EC: 3445 µS/cm Temp: 26.19 °C Redox 65.9 mV DO: 6.27 mg/L	
	67 63 66 64 65 65 64 66 63 67 62 68						
	61 69 -						

END OF BOREHOLE AT 60.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S5MB02

	YEARS (B									SHEET 1 OF 5
Client: Project: Bore Location: Project Number:		A H G 21	GL Er ydrog louce 16240	nergy Li geologic ster - T 6A	mited al Assessment - Gloucester Gas Project edeman property	Date Date Rec Log	e Comm e Comple orded B Checke	mmenced: mpleted: d By: cked By:		9/12/10 13/12/10 NPH / JCD JCD	
Drill	ing Method	d:	Ai	r Har	nmer - I	ongyear 850	Surf	ace RL:	129.87 ו	mAHE)
Drill	ing Compa	any:	H	ighlar	nd Drilli	ng Borehole Diameter: 140 mm	Co-o	ords:	E 40315	53.45	N 6449244.93 MGA56
В	ore Inform	nation				Field Material Description					
			AHD	Ê	ő						
WATER	WELL CONSTRU	JCTION	RL (AHDm) /	DEPTH (BGI	GRAPHIC LO	LITHOLOGY		FOI (App	RMATION proximate)		HYDROGEOLOGY
	50 n Clas uPV	mm ID ss 18 /C &			$\langle \langle \langle \rangle \rangle \rangle$	TOPSOIL - Light brown, low organic content and drill pad		JILLE	ON 1ATION		
	grou	ut –	129	1 -		WEATHERED ROCK/CLAY - Light yellow, weathered rock with red/c	cream sticky,				
			128			high plasticity clay					
			.20	2 -							
		ŀ	127	3 -							
			100								
		ſ	126	4 -	1 7 1 1						
		-	125	5 -							
				0							
		ŀ	124	6 -							
			123	_							
				7 -							
		ŀ	• 122	8 -							
			101								
		Γ	121	9 -							
			- 120	10 —							
		kfill									
	99	t	• 119	11 -	1,1,1,1,1						
		Ļ	118	12 -							
				12							
	Pà Pà	ŀ	• 117	13 -	11						
			116								
	h h		110	14 –							
	64 64	ŀ	115	15 -							
	p p										
	69 69	Γ	• 114	16 –							
	99	-	113	17 -	1,1,4,4						
		F	112	18 -							
	PA PA		· 111	40							
				19 -	· · · · · · · · · ·	SANDSTONE - Light grey, fine grained sandstone (60%) and dark gr (40%), plus a small amount of clay	rey siltstone	-			
	rd rd	ŀ	- 110	20 —	••••	SANDSTONE - Light grey, medium to fine grained sandstone (90%)	and dark				
	646		100			grey/black siltstone (5%), plus some medium grained sand and brown	n clay				
	rd rd	ľ	109	21 -		SILTSTONE - Dark grey, siltstone, with a small amount of clay		-			
	69 69	ŀ	108	22 –							
	P] []										
	Ed Ed	f	107	23 -							
	Y Y	Ļ	106	24							
	N N			24 -		black organic staining					
	VI VI	1	405		ı · — · —						

END OF BOREHOLE AT 114.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

DD 1000 VEARS &

GROUNDWATER BOREHOLE LOG

BORE NO.

S5MB02

SHEET 2 OF 5

Clien Proje Bore Proje Drillir	t: Location: Location: tot Number:	AGI Hyc Glo 216 Air	L Er drog uce 240 Han	nergy Li Jeologic ster - Ti 6A nmer - L	mited al Assessment - Gloucester Gas Project edeman property 	Date Commenced: Date Completed: Recorded By: Log Checked By: Surface RL: 129.87 m			9/12/10 13/12/10 NPH / JCD JCD nAHD	
Drillir	g Company:	Hig	hlan	nd Drillin	ng Borehole Diameter: 140 mm	Co-c	ords: E	403153.	45 N 6449244.93 MGA56	
Bo	re Informatio	n I			Field Material Description					
WATER	ELL CONSTRUCTION	RL (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FORMAT (Approxim	TON nate)	HYDROGEOLOGY	
×		\overrightarrow{a} - 104 - 103 - 102 - 101 - 100 - 99 - 98 - 97 - 96 - 97 - 96 - 97 - 96 - 97 - 97 - 96 - 97 - 96 - 97 - 97 - 90 - 88 - 87 - 88 - 87 - 86 - 85 - 85 - 85 - 85 - 85 - 85 - 85 - 85	\square 26 - 27 - 28 - 29 - 30 - 31 - 32 - 33 - 33 - 33 - 33 - 33 - 33 - 40 - 41 - 42 - 43 - 44 - 45 -		SILTSTONE - Dark grey, siltstone, with a small amount of clay (continued) SILTSTONE - Dark grey/black, siltstone (60%) and 40% fine grained sandy of SILTSTONE - Dark grey, siltstone (70%) and fine grained grey sandstone (30 SANDSTONE - Light grey, medium to fine grained sandstone (60%) and dark siltstone SILTSTONE - Dark grey, siltstone (80%) with 20% grey, medium to fine grain sandstone SANDSTONE - Light grey, medium grained sandstone (80%) and dark grey siltstone (20%) SILTSTONE - Dark grey, siltstone, with some black organic staining (90%). 11 ight grey medium grained sandstone	lay	JILLEON FORMAT	ION	pH: 8.01 EC: 4025 µS/cm Temp: 26.58 °C Redox: 93 mV DO: 65.9 % Sat DO: 5.19 mg/L	
		- 83 , - 82 , - 81 ,	47 – 48 – 49 –		SANDSTONE - Light grey, fine grained sandstone (80%) with 20% grey siltsto	one				
					END OF BOREHOLE AT 114.00 M					



BORE NO.

S5MB02

Clien Proje Bore Proje	t: ct: Location: ct Number:	AC Hy GI 21	GL Er /drog ouce 6240	nergy Li jeologic ster - Ti 6A	mited [al Assessment - Gloucester Gas Project [edeman property F L	Date Comm Date Compl Recorded B ₋og Checke	enced: 9/* eted: 13 y: NF d By: JC	9/12/10 13/12/10 NPH / JCD JCD		
Drillin	g Method:	Ai	r Han	nmer - L	Longyear 850	Surface RL: 129.87 mAHD				
Drillin	g Company:	HI	ghlar	nd Drillin	ng Borehole Diameter: 140 mm (Co-ords:	E 403153.4	5 N 6449244.93 MGA56		
БО	re information	1			Field Material Description					
WATER	ELL CONSTRUCTION	RL (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY	FOI (Apj	RMATION proximate)	HYDROGEOLOGY		
		- 79 - 78 - 77 - 76 - 75 - 74 - 73 - 72 - 71 - 70 - 69 - 68	51 - 52 - 53 - 54 - 55 - 56 - 57 - 58 - 59 - 60 - 61 - 62 -		SANDSTONE - Light grey, fine grained sandstone (80%) with 20% grey siltstone (continued) SILTSTONE - Dark grey, siltstone with a few chips of light grey fine grained sandstone SANDSTONE - Grey, medium grained sandstone SILTSTONE - Dark grey, siltstone (90%) with 10% light grey, fine grained sandstone	³ JILLE FORM		pH: 8.2 EC: 4014 µS/cm Temp: 28.43 °C Redox: 31.9 mV DO: 83 % Sat DO: 6.29 mg/L PH: 8.05 EC: 3817 µS/cm Temp: 27.27 °C Redox: 22.7 mV DO: 66.5 % Sat DO: 5.22 mg/L		
	Grout	- 67 - 66 - 65 - 64 - 63 - 62 - 61 - 60 - 59 - 58 - 57 - 56 - 55	63 - 64 - 65 - 66 - 67 - 68 - 70 - 71 - 72 - 73 - 74 -		SANDSTONE - Light grey, fine grained sandstone (60%) with 40% dark grey siltstone SHALE - Black, hard shale and coal fines (85%) with 15% grey siltstone and sandstone COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale COAL/SHALE - Black/dark brown, reflective, soft coal and hard shale	JILLE FORM Clove Seam	ON MATION rdale Coal	pH: 8.09 EC: 3456 µS/cm Temp: 26.88 °C Redox: 29.2 mV DO: 66.2 % Sat DO: 5.23 mg/L		



BORE NO.

S5MB02

SHEET 4 OF 5

YEARS ®						SHEET 4 OF 5			
Client: Project: Bore Location: Project Number:	AGL E Hydro Glouce 216240	inergy Li geologic ester - Ti 06A	mited al Assessment - Gloucester Gas Project edeman property	Date Date Reco Log	Date Commenced:9/12/10Date Completed:13/12/10Recorded By:NPH / JCDLog Checked By:JCD				
Drilling Method:	Air Ha	mmer - L	ongyear 850	Surfa	ace RL: 129.87 m	AHD			
Drilling Company:	Highla	nd Drillir	ng Borehole Diameter: 140 mm	Co-c	ords: E 403153	.45 N 6449244.93 MGA56			
Bore Information	n		Field Material Description		1	1			
	무 c	U							
	RL (AHDm) AH DEPTH (BGLn	GRAPHIC LO	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY			
X()XX()XX()XX()XX()XX()XX()XX()XX()XX()	- 54 76 - - 53 77 - - 52 78 - - 51 79 - - 50 80 - - 49 81 -	-	SANDSTONE - Grey, fine grained sandstone (90%) with 10% grey siltst	one	JILLEON FORMATION Cloverdale Coal Seam	pH: 8.21 EC: 3739 µS/cm Temp: 28.83 °C Redox: 36.4 mV DO: 70.6 % Sat DO: 5.37 mg/L			
	- 48 ₈₂ - - 47 ₈₃ - - 46 ₈₄ - - 45 ₈₅		SILTSTONE - Grey, siltstone (90%) with 10% medium to fine grained sa COAL/SHALE - Black, coal and shale (90%) with 10% dark grey siltston COAL/SHALE - Black, soft coal and hard shale	e		pH: 8.3 EC: 3416 µS/cm Temp: 27.82 °C Redox: 32 mV DO: 71.8 % Sat DO: 5.56 mg/L			
	- 44 86 - - 43 87 - - 42 88 -		COAL/SHALE - Black, soft coal and hard shale (70%) with 30% grey silt SANDSTONE - Grey, fine grained sandstone (100%) SANDSTONE/SILTSTONE - Grey, medium to fine grained sandstone (50 50% grey siltstone		JILLEON FORMATION	-			
	- 41 89 - - 40 90 - - 39 91 - - 38 92 -		SANDSTONE - Grey, fine grained sandstone SILTSTONE - Grey, siltstone (90%) with 10% grey fine grained sandsto SANDSTONE/SILTSTONE - Grey sandstone (50%) and grey siltstone (t	ne		pH: 8.43 EC: 3288 µS/cm Temp: 27.82 °C Redox: 31.2 mV DO: 71.3 % Sat DO: 5.56 mg/L			
	- 37 _{93 -} - 36 _{94 -} - 35 _{95 -}	-							
Bentonite seal	- 34 96 - - 33 97 -		CUOAL/SHALE - Black, soft coal and hard shale (60%) with 30% grey sa and siltstone SILTSTONE - Black, siltstone (organic staining) with some coal fines	ndstone					
Gravel 5 mm graded	- 32 98 - - 31 99 -		SILTSTONE - Grey, siltstone						

END OF BOREHOLE AT 114.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S5MB02

SHEET 5 OF 5

Client: Project: Bore Location: Project Number:		A H Q 2	GL Er lydrog ilouce 16240	nergy Li geologic ster - Ti 6A	mited al Assessment - Gloucester Gas Proj edeman property	Date ect Date Rec Log	e Comme e Comple orded By Checked	enced: eted: /: d By:	2/10 12/10 H / JCD D		
Drilli	ng Me	ethod:	A	ir Har	nmer - l	ongyear 850	Surf	ace RL:	129.87	mAHD	
Drilli Bo	ng Co ore Inf	ompany: formatior	א ו	ligniar	na Driilli	Field Material Description	C0-0	ords:	E 40315	53.45	N 6449244.93 MGA56
_	-		₽.	ê	U						
WATER	WELL CO	ONSTRUCTION	RL (AHDm) Aŀ	DEPTH (BGLn	GRAPHIC LO	LITHOLOGY		FOR (Appr	MATION roximate)		HYDROGEOLOGY
		Sump/ bentonite plug	- 29 - 28 - 27 - 26 - 25 - 24 - 23 - 21 - 20 - 19 - 18 - 17 - 19 - 18 - 17 - 19 - 18 - 17 - 10 - 12 - 11 - 12 - 11 - 12 - 11 - 12 - 12	101 - 102 - 103 - 104 - 105 - 106 - 107 - 108 - 109 - 110 - 111 - 112 - 113 - 114 - 115 - 115 - 116 - 117 - 116 - 117 - 118 - 119 - 120 - 121 - 121 - 122 - 122 - 123 - 124 -		SANDSTONE - Grey, fine grained sandstone SANDSTONE - Grey, fine grained sandstone (60%) with 40% of SILTSTONE - Dark grey, siltstone with a small amount of grey, sandstone SILTSTONE - Dark grey, siltstone with a small amount of grey, sandstone SILTSTONE - Dark grey, siltstone with a small amount of grey, sand SILTSTONE - Dark grey, siltstone with a small amount of grey, sand	Tark grey Siltstone	JILLEC	DN ATION	pH: EC EC Ree DC DC	: 7.55 : 3610 µS/cm mp: 25.74 °C :dox: 21 mV): 82.5 % Sat): 6.62 mg/L : 4207 µS/cm mp: 30.52 °C :dox: 32.6 mV): 77.6 % Sat): 5.72 mg/L

END OF BOREHOLE AT 114.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

S5MB03

SHEET 1 OF 6

Clie Pro Bor Pro	e Location: ject Number:	AGL Er Hydrog Glouce 216240	nergy Li geologic ster - T 6A	mited Date Date Date Date Date Date Date Date	Date Commenced: 8/12/10 Date Completed: 9/12/10 Recorded By: NPH / JCD Log Checked By: JCD Surface RI : 129.79 mAHD				
Drill	ling Company:	Highlar	nd Drilli	ng Borehole Diameter: 140 mm Co	o-ords:	E 403151	.18 N 6449240.24 MGA56		
В	ore Information	ı		Field Material Description	1				
WATER	WELL CONSTRUCTION	RL (AHDm) AHD DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY	FORI (Appr	MATION oximate)	HYDROGEOLOGY		
	So mai 19 uPVC & grout	-129 $1 -128$ $2 -127$ $3 -126$ $4 -125$ $5 -124$ $6 -123$ $7 -122$ $8 -121$ $9 -120$ $10 -111$ $12 -117$ $13 -116$ $14 -117$ $13 -111$ $16 -111$ $19 -111$ $19 -111$ $19 -110$ $20 -101$ $20 -101$ $20 -100$ $21 -100$ $22 -100$ $22 -101$ $20 -102$ $28 -103$ $27 -104$ $26 -103$ $27 -100$ $30 -100$ $30 -99$ $31 -99$ <td></td> <td>TOP SOIL - Dark brown, top soil with clay chips and fill from the drill pad WEATHERED ROCK/LOAM - Light grey, fine, soft weathered rock. siltstone and mudstone chips present SILTY CLAY - Cream, very fine grained silty clay with weathered siltstone (hornogeneous) SAND - Crey, silty coarse sand with grey siltstone chips (up to 6 mm) SAND - Grey, silty coarse sand with grey siltstone chips (up to 6 mm) SILTSTONE - Dark grey, and black (highly organic) siltstone chips (up to 8 mm) SAND - Light grey, fine grained sand with medium grained grey sandstone chips SILTSTONE - Dark grey, allistone, organic content present some coarse grained light sand SILTSTONE/SHALE - Very dark grey, siltstone, organic content present END OF BOREHOLE AT 160.00 m g should be read in conjunction with Parsons Brinckerhoff's ar</td> <td>Cccompanying</td> <td>Standard no</td> <td>tes.</td>		TOP SOIL - Dark brown, top soil with clay chips and fill from the drill pad WEATHERED ROCK/LOAM - Light grey, fine, soft weathered rock. siltstone and mudstone chips present SILTY CLAY - Cream, very fine grained silty clay with weathered siltstone (hornogeneous) SAND - Crey, silty coarse sand with grey siltstone chips (up to 6 mm) SAND - Grey, silty coarse sand with grey siltstone chips (up to 6 mm) SILTSTONE - Dark grey, and black (highly organic) siltstone chips (up to 8 mm) SAND - Light grey, fine grained sand with medium grained grey sandstone chips SILTSTONE - Dark grey, allistone, organic content present some coarse grained light sand SILTSTONE/SHALE - Very dark grey, siltstone, organic content present END OF BOREHOLE AT 160.00 m g should be read in conjunction with Parsons Brinckerhoff's ar	Cccompanying	Standard no	tes.		



BORE NO.

S5MB03

Clie Pro	nt: ject	vears ®	A	GL Er lydrog	nergy Li geologic	mited [al Assessment - Gloucester Gas Project [Date Comp Date Comp	nenced:	SHEET 2 OF 6 8/12/10 9/12/10	
воі Pro	e L ject	t Number:	2	16240	6A	edeman property	.og Check	ed By:	JCD	
Drill	ing	Method:	Α	ir Har	nmer - l	_ongyear 850	Surface RL: 129.79 mAHD			
Drill	ing	Company:	Н	Highland Drilling Borehole Diameter: 140 mm				E 403151	.18 N 6449240.24 MGA56	
В	ore	Informatio	า			Field Material Description				
			AHD	(m)	90-					
WATER	WEL	L CONSTRUCTION	RL (AHDm)	DЕРТН (ВС	GRAPHIC I	LITHOLOGY	F((A	ORMATION pproximate)	HYDROGEOLOGY	
	74	4				SILTSTONE - Dark grey, siltstone, organic content present, 20% fine grained sandstone	JILLE	EON		
	ď	d	- 97	33 -			FOR	MATION		
	5	5	- 96	34 -						
	9	[]	- 95	35 -	· · ·					
\sim		2	- 94	26 -	· · ·				pH: 8.2 EC: 2105 uS/cm	
	Y		- 03	30 -					Temp: 27.4 °C redox: 82 mV	
	27	Pà	55	37 -	<u> </u>					
	7		- 92	38 -	 					
	ď	d	- 91	39 -	<u> </u>					
	6	69	- 90	40 —	<u> </u>					
	P	rq 🛛	- 89	44	· _ · _					
		2	- 88	41 -	 					
	Ŋ			42 –	· _ · _					
	27	Pà	- 87	43 -	· _ · _	minor clay				
	7		- 86	44 -						
	ď	d	- 85	45 -	· _ · _					
	5	6	- 84	46 -	· _ · _					
	9	[]	- 83	40	· _ · _					
		22	00	47 -	· _ · _					
			- 82	48 -	· _ · _					
	Pd	Pa	- 81	49 -	· <u> </u>	SANDSTONE - Light grey, fine grained sandstone				
	2	2	- 80	50 —						
	ď	Ŋ	- 79	51 -						
	5	5	- 78	50						
	Ŋ		- 77	52 -						
	껆	2		53 -		SILTSTONE - Dark grey, siltstone (60%), plus light grey medium grained sandstone (40%)				
	L		- 76	54 -						
	K	řd	- 75	55 -						
	Ь¢	6	- 74	56 -	 					
	Q	ρ	- 73	57 -	· _ · _					
	bß	2	- 72			SANDSTONE - Light grey, fine grained sandstone plus dark grey siltstone chips (20%) and fine grained sand				
	Y	1		58 -						
	거	2	- /1	59 -						
	L		- 70	60 —	<u> </u>	SILTSTONE - Grey, siltstone (80%) with light grey sandstone, medium grained a	nd			
	K	řd 🛛	- 69	61 -	· ·	sand				
	6	<u>b</u>	- 68	62 -	··_					
	p	[] []	- 67	02	··_					
	þ		_ 66	63 -	·_·_					
			00		· — · —	END OF BOREHOLE AT 160.00 m				



BORE NO.

S5MB03

SHEET 3 OF 6

Client: Project: Bore Location: Project Number:		A H G 2	GL Er Iydroç 3louce 216240	nergy Li jeologic ster - Ti)6A	mited al Assessment - Gloucester Gas Project iedeman property	Date Date Reco	Commenced: 8 Completed: 9 Orded By: 1 Checked By: 4	3/12/10 9/12/10 NPH / JCD JCD
Drilli	ng Method:	A	vir Har	nmer - I	Longyear 850	Surfa	ace RL: 129.79 m	AHD
Drilli	ng Company:	H	lighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-o	ords: E 403151.	.18 N 6449240.24 MGA56
Bo	ore Informatio	<u>n</u>			Field Material Description		<u> </u>	1
		AHD	L II	ő				
WATER	WELL CONSTRUCTION	RL (AHDm)	DEPTH (BG	GRAPHIC L	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
				+	SILTSTONE - Grey, siltstone (80%) with light grey sandstone, medium grained	d and	JILLEON	
	Crout	- 65	65 -		SILTSTONE/SHALE - Dark grey, siltstone/shale (60%) with lighter grey sands	stone	FORMATION	
		- 64	66 -	· _ · _	(20%), quartz and clay			
		- 63			SILTSTONE - Grey, siltstone with fine grained light grey sand (20%)			
	38		67 -	<u> </u>	ł			
	I I I I I I I I I I I I I I I I I I I	- 62	68 -	<u> </u>	ł			
K		- 61	69 -	<u> </u>	ł			
	38	- 60	70 —	<u> </u>	ł			
	3 B	- 59		<u> </u>	ł			
R	38		71 -		COAL - Black, coal fragments with shale (60%) plus light grey fine grained sand		JILLEON	-
	88	- 58	72 -		COAL - Black, soft coal and shale (90%) plus fine grained light grey sand	· — —	FORMATION Cloverdale Coal	
	I II I	- 57	73 -		COAL - Black soft coal (70%) and hard black shale		Seam	
	38	- 56	74 –		COPE - DiBon, Soli Court (1079) and hard Stack Strate			
		55	14					
		F 33	75 –	_ · _	SILTSTONE - Grey, siltstone (50%) and fine grained grey sandstone. plus coa	al		
	38	- 54	76 -					
		- 53	77 -	· — · —	an and the second			
		- 52	70 -		SANDSTONE - Light grey, medium graineu sanusione (ou%) with oark grey siltstone			
		51	78 -		1			
		- 51	79 -		4			
		- 50	80 —		4			
	38	- 49	81 -		4			
	38	48			4			
			82 -					
	38	- 47	83 -	<u> </u>	SILTSTONE/SHALE - Dark grey/black, siltstone/shale (high organic matter), p	Jus		
	3 B	- 46	84 -	· — · —	COAL - Black coal cloverdale seam soft and highly reflective			
R		- 45	85 -					
	88	44						
	I II I		86 -		COAL - Black, coal and shale			
	38	- 43	87 -		SANDSTONE - Light grey, medium grained sandstone (60%), dark grey siltstc	one	JILLEON	
		- 42	88 -	·····	(organic) (up to 3 mm)		FORMATION	
		- 41	20 -		grained sand	TINE		
	38	10	89 -		ł			
		- 40	90 —		ł			
		- 39	91 -	 	ł			
	38	- 38	92 -	<u> </u>	ł			
	S S	- 37	-	<u> </u>	ł			
	88		93 –		ł			
	38	- 36	94 -		SANDSTONE - Light grey, medium grained sandstone (60%) plus dark grey			
[3 B	- 35	95 -	·····	siltstone (up to 2 mm) SII TSTONE/SHALE - Dark grey/black, angular siltstone/shale (highly organic)	with		
	2 KI					, with		

END OF BOREHOLE AT 160.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

GROUNDWATER BOREHOLE LOG

BORE NO.

S5MB03

SHEET 4 OF 6

Client: Project: Bore Location: Project Number:			A H Q 2	GL Er lydrog Glouce 16240	nergy Li jeologic ster - Ti 6A	mited Da cal Assessment - Gloucester Gas Project Da iedeman property Re Lo	Date Commenced:8/12/10Date Completed:9/12/10Recorded By:NPH / JCDLog Checked By:JCD				
Dril	ling	Method:	A	vir Han	nmer - l	Longyear 850 St	Inface RL: 129.79 r				
B	ing ore	Information	<u>г</u>	ligniar	ia Driilli	Field Material Description	-oras: E 40315	1.18 N 6449240.24 MGA56			
WATER	WEL	L CONSTRUCTION	RL (AHDm) AH	DEPTH (BGLm	GRAPHIC LOG	LITHOLOGY	FORMATION (Approximate)	HYDROGEOLOGY			
					·	SILTSTONE/SHALE - Dark grey/black, angular siltstone/shale (highly organic) with coal fines (continued)	JILLEON				
			- 33	97 -	= =	SILTSTONE - Light grey, siltstone with clay and fine grained sand	- FORMATION				
	Ň.	Ň	- 32	98 -	· ·						
	\mathbb{N}		- 31	00 -	· _ · _						
			_ 30	99	· ·						
	Ň.		- 30	100 —	· _ · _						
	×.	×	- 29	101 -	· — · —						
			- 28	102 -	· _ · _			EC: 2300 uS/cm			
	Ň		- 27	100	· _ · _						
	X		26	103 -	· _ · _						
			- 20	104 -	· _ · _						
	[- 25	105 -	· _ · _						
	Ø		- 24	106 -	· _ · _						
			- 23		· _ · _						
	\mathbb{X}			107 -		SANDSTONE - Dark grey, fine grained sandstone (60%) with darker siltstone and fine grained grey sandstone	-				
			- 22	108 -	<u> </u>	SILTSTONE - Grey, siltstone with grey, fine sandstone	—	EC: 3300 µS/cm			
		\bigotimes	- 21	109 -	· _ · _						
	\mathbb{N}		- 20	110 —	· _ · _						
	Ø		- 19		· _ · _						
		\square		111 -	· _ · _						
	X		- 18	112 -	· — · —						
	Ø		- 17	113 -	· _ · _						
	Ň.	Ň	- 16	114 -	· ·		_	EC: 2100 uS/am			
	[]		- 15	. 17	· _ · _	SILTSTONE - Dark grey, (organic) siltstone		20. 3100 μο/οπ			
			10	115 -	· _ · _						
	Ň.	\bowtie	- 14	116 -	<u> </u>						
	[]		- 13	117 –	<u> </u>						
			- 12	118 -	<u> </u>						
			_ 11	10 -	<u> </u>						
	$\left \right\rangle$			119 -	<u> </u>						
			- 10	120 —				EC: 2800 µS/cm			
	[- 9	121 -							
			- 8	100							
			_ 7	122 -							
			「	123 -							
			- 6	124 -							
			- 5	125 –							
	[- 4	105	· _ · _						
				126 -				EC: 2900 µS/cm			
		\boxtimes	- 3	127 -	· _ · _	SILTSTONE - Light grey, (organic) siltstone with medium plasticity clay	-				
	КЛ	κΛ	L 2		$ \cdot - \cdot -$						



BORE NO.

S5MB03

	YEARS ®							SHEET 5 OF 6
Clie Pro Bor Pro	nt: ect: e Location: ect Number:	4 F 0 2	AGL Ei Iydrog Glouce 216240	nergy Li geologic ester - T 16A	imited cal Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	Commenced: 8 Completed: 9 Drded By: 1 Checked By: 4	3/12/10 9/12/10 NPH / JCD JCD
Drill	ing Method:	A	ir Har	nmer - I	Longyear 850	Surfa	ace RL: 129.79 m	AHD
Drill	ing Company:	H	lighlar	nd Drilli	ng Borehole Diameter: 140 mm	Co-o	ords: E 403151	18 N 6449240.24 MGA56
В	ore Information	n		1	Field Material Description		Γ	Ι
		유	Ê	g				
WATER	WELL CONSTRUCTION	RL (AHDm) A	DEPTH (BGL	GRAPHIC LC	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
				· _ · _	SILTSTONE - Light grey, (organic) siltstone with medium plasticity clay (continu	ued)		
	38		129 -	· _ · _			FURIMATION	
		- 0	130 —	<u>_:</u>	SILTSTONE - Dark grey (graanic) siltstone with a small fine grained sand and			
		1	404	· _ · _		Ciay		
			131 -					
		2	132 -	· _ · _				EC: 2900 µS/cm
		3	133 -	· _				
			100	·				
	A	-4	134 -					
		5	135 -					
		6	126 -	· _ · _	-			
		_	130 -	· _ · _				
		/	137 -	· _ · _				
	A	8	138 -	······	SANDSTONE Light gray, madium grained sandstone (60%) (up to 5 mm) with			EC: 2900 µS/cm
		9	100		dark grey siltstone and sand			
	88		139 -					
		10	140 —					
	I II	11	141 -					
		12	141					
		- 12	142 -	<u> </u>	SILTSTONE/SHALE - Black, siltstone/shale (up to 2 mm), angular			
		13	143 -		SII TSTONE - Dark grey/black siltstone (70%) with light grey medium grained			
		14	111	· — · –	siltstone and coal fines			pH: 8.1 FC: 3715 uS/cm
	38		144 -	· _ · _				Temp: 26.6 °C
		15	145 -	· _ · _				
		16	146 -	· _ · _	-			
		17						
			147 -					
	I II	18	148 -					
		19	149 -	· ·				
		L _20			UUAL - Black, coal with light brown siltstone chips (up to 1 mm)		JILLEON FORMATION	pH: 8.4
			150 —	— · —	SILTSTONE - Light and dark grey, siltstone (70%) with fine grained light grey sandstone		Roseville Coal	EC: 3385 µS/cm Temp: 27.6 °C
		21	151 -		SANDSTONE - Light grey, coarse grey sandstone (60%) (up to 7 mm) with dar	·k	Seam	redox: 17.4 mV
	Š Š	22	152 -		and light grey siltstone			
	Gravel 5 mm		152 -					
	Bentonite	23	153 -					
	300	24	154 -					
		25	155					
			155 -		SILTSTONE - Dark grey, siltstone (60%) (up to 1 mm) with light grey medium grained sandstone			pH: 8.3
	Gravel 3-5	26	156 -		SANDSTONE - Light grey, medium grained sandstone (60%) with dark grey			EC: 3488 μS/cm Temp: 28.7 °C
	graded	27	157 -		siltstone			redox: 26 mV
		20			UUAL - Black, coal with black shale chips			
	50 mm ID, 0.5 mm	-20	158 -		SHALE - Dark brown and black, shale with coal fines			
	aperture uPVC	29	159 -	<u> </u>				
	: : screen			<u> </u>	4			

END OF BOREHOLE AT 160.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

GROUNDWATER BOREHOLE LOG

BORE NO.

S5MB03

SHEET 6 OF 6

Clie Pro Bor Pro	ent: ject: e Location: ject Number:	AGL Hydr Glou 2162	Energy L ogeologic cester - T 406A	imited cal Assessment - Gloucester Gas Project ïedeman property	Date C Date C Record Log Ch	Commenced: Completed: ded By: necked By:	8/12/10 9/12/10 NPH / JCD JCD mAHD		
Dril	ling Company:	High	and Drilli	ng Borehole Diameter: 140 mm	Co-ord	ls: E 40315 1	I.18 N 6449240.24 MGA56		
В	ore Information	۱		Field Material Description	1				
WATER	WELL CONSTRUCTION	RL (AHDm) AHD	GRAPHIC LOG	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY		
WATE	WELL CONSTRUCTION	$\begin{array}{c} + \\ + \\ + \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$		COAL - Black, coal with black shale chips SANDSTONE - Light grey, fine grained sandstone with coal fines COAL - Black, soft coal with black shale (up to 3 mm) SILTSTONE - Light and dark, siltstone (60%) with light grey fine grained s	sandstone	JILLEON FORMATION Roseville Coal Seam JILLEON FORMATION	HYDROGEOLOGY pH: 8.3 EC: 3581 µS/cm Temp: 29 °C redox: 27 mV pH: 8.3 EC: 3465 µS/cm Temp: 28.3 °C redox: 49 mV		
		59 189 60 190 61 191 62	-						



BORE NO.

TCMB02

	YEARS ®									SHEET 1 OF 6
Client: Project: Bore Location: Project Number:		A H G 2	GL Ei Iydrog Glouce 16240	nergy Li geologic ster - T 6A	mited al Assessment - Gloucester Gas Project iedeman property	Date Commenced: Date Completed: Recorded By: Log Checked By:			18/3/11 21/3/11 NPH JCD	
Dril	ling Method:	A	vir Har	nmer - I od Drillin	Longyear 850	Surfa	ace RL:	123.16 n	nAHE) N 6449004 4 MCAE6
В	ore Information	n n	iigiiiai		Field Material Description	0-0	nus.	E 40230	2.42	N 0440904.4 WIGA30
		٥		(1)						
WATER	WELL CONSTRUCTION	RL (AHDm) AH	DEPTH (ВGLm	GRAPHIC LOC	LITHOLOGY		FOR (Appi	MATION roximate)		HYDROGEOLOGY
MA	S0 mm ID galvanized steel & grout	1)12 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \end{array}\\ \end{array}\\ \end{array}\\ \end{array}\\ 1 \\ 2 \\ \end{array}\\ \\ \end{array}\\ \\ 3 \\ - \\ \end{array}\\ \\ 1 \\ - \\ 1 \\ 1 \\ - \\ 1 \\ 1 \\ - \\ 1 \\ 1$		DRILL PAD WEATHERED TUFF - Light cream/green, weathered tuff with clay WEATHERED TUFF - Clight cream/green, weathered tuff with clay WEATHERED TUFF - Clight cream/green, weathered tuff with clay WEATHERED ROCK - Grey and black, well weathered rock (siltstone and coor with clay WEATHERED SILTSTONE - Dark grey, siltstone with light grey clay WEATHERED SILTSTONE - Light grey, siltstone with light grey clay WEATHERED SILTSTONE - Light grey, fine to medium grained sandstone w clay and weathered rock WEATHERED SILTSTONE - Dark grey, siltstone partially weathered, clay and black shale, clay and weathered rock WEATHERED SILTSTONE - Dark grey, siltstone partially weathered, clay and black shale WEATHERED SILTSTONE - Dark grey, siltstone partially weathered, clay and black shale WEATHERED SILTSTONE - Dark grey, siltstone partially weathered, clay and black shale WEATHERED SILTSTONE - Dark grey, siltstone partially weathered, clay and black shale WEATHERED SILTSTONE - Dark grey, siltstone partially weathered, clay and black shale WEATHERED SILTSTONE - Dark grey, siltstone partially weathered, clay and black shale	d d vith d 5%	LELON FORM Jo Dot			
		- 92	31 -	· — · — [].].].	weathered rock and clay WEATHERED TUFF - Light grey, medium grained (50%) with 30% grey siltsto and 10% black shale, and weathered rock and clay	one				
	KI KI				· · · · · · · · · · · · · · · · · · ·					

END OF BOREHOLE AT 183.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

TCMB02

SHEET 2 OF 6

		YEARS ®									SHEET 2 OF
Client: Project: Bore Location: Project Number:			AGL E Hydrog Glouce 216240	nergy Li geologic ester - T 06A	mited al Assessment - Gloucester Gas Project edeman property	Date Date Reco Log (Comme Comple rded By Checked	enced: eted: r: I By:	18/3/ 21/3/ NPH JCD	11 11	
Dr	illing	Method:		Air Har	mmer - I	ongyear 850	Surfa	ice RL:	123.16 r	n AHD	
Dr	illing	Company:		Highla	nd Drilli	ng Borehole Diameter: 140 mm	Co-o	rds:	E 40250	2.42	N 6448904.4 MGA56
E	Bore	Informatio	n		1	Field Material Description					
			무	Ê	g						
WATER	WEL	L CONSTRUCTION	RL (AHDm) A	DEPTH (BGL	GRAPHIC LC	LITHOLOGY		FOR (App	MATION oximate)		HYDROGEOLOGY
			- 9	1		WEATHERED SILTSTONE - Dark grey, siltstone with weathered rock and cla	ay	LELON			
	XXIIXXIIXXIIXX		- 91 - 81 - 81 - 81	₂₀ 33 – ₉ 34 – ₈ 35 – ₇ 36 – ₆ 37 –		SILTSTONE - Grey, siltstone (90%) with 10% light grey, fine grained sandsto and clay SILTSTONE - Dark grey, siltstone (50%) with 40% light grey, fine grained sandstone and 10% black shale and clay		FORM	ATION		
			- 8	5 38 - 4 39 -		SANDSTONE - Grey, very fine grained sandstone					
			- 8:	3 40 —							
			- 82	2	· _ · _	SILTSTONE - Dark grey, carbonaceous stained siltstone					
	Ň	Ň	- 8	1 42 -		SANDSTONE - Grey & light grey, very fine grained, carbonaceous stained sandstone (90%) with 10% dark grey siltstone and a few chips of hard white	quartz				
			- 81	0 43 -							
			- 79	9 44 -							
			- 7	8 45 -		SILTSTONE - Dark grey, siltstone (70%) with 30% light grey, fine grained sandstone					
			- 7	7 46 -		SANDSTONE - Light grey, fine grained sandstone (60%) with 40% dark grey siltstone and white clay					
			- 70	6 47 -	· _ · _	SILTSTONE - Dark grey, siltstone (90%) with 10% light grey, fine grained sandstone and white clay					
			- 7	5 48 -	· _ · _						
			- 74	49 -		SANDSTONE - Light grey, fine to medium grained sandstone (90%) with 10% grey/black siltstone/shale	dark				
			- 7:	3 50							
			- 7:	2 51 -		SILTSTONE - Dark grey & black, siltstone					
1			- 7 [.]	1 52 -		SHALE - Black, shale (70%) with dark grey sittstone (30%) and coal fines					
			- 7	₀ 53 –		SILTSTONE - Dark grey, siltstone (80%) with 20% black shale					
		\bigotimes	- 6	9 54 -							
			- 6	₈ 55 –	 •						
			- 6	7 56 -		SANDSTONE - Light grey, very fine grained sandstone (80%) with 20% black shale	<u>, </u>				
			- 6	₆ 57 -		SHALE - Black, shale (40%) with 30% grey sittstone and 30% grey, fine grain sandstone	ned				
			- 6	5 58 -	<u> </u>	TUFF - Light brown, fine grained tuff (50%) with 50% black shale and white cl	lay				
		\boxtimes	- 64	4 59 -	7.	SANDSTONE - Light grey, fine to medium grained sandstone (70%) with 30%	grey				
			- 6:	₃ 60 —		SINSIONE - Light grey, medium grained sandstone (60%) with 40% grey sittstone	·				
			- 63	2 61 -		SILTSTONE - Grey, siltstone (80%) with 20% grey, fine to medium grained sandstone					
			- 6	1 62 -		SANDSTONE - Light grey, fine to medium grained sandstone (60%) with 40% grey siltstone	dark				
			- 61	₀ 63 –		.					

END OF BOREHOLE AT 183.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

TCMB02

Clinit: Add: Desc: United Date: Complete: 12/3/11 Bore Location: Prove-1 Mundes:		YEARS ®							SHEET 3 OF 6
Diffinition Markamental Surface RL: 123.16 mAHD Diffinition Diffinition Co-ords E 402502.42 MedBa00.41 MGA06 Evention Image: Surface RL: 123.02 markamental 123.0	Client: AGL Project: Hydr Bore Location: Glou Project Number: 2162			GL Er ydrog ilouce 16240	nergy Li jeologic ster - T 6A	mited al Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	Commenced: Completed: orded By: Checked By:	18/3/11 21/3/11 NPH JCD
Drifting Company: Highend Drifting Bore Information E 402502.42 N 6448904.44 MGA66 Bore Information Field Material Description Image Company: Image Company: Image Company: Field Material Description Field Material Description Field Material Description Image Company: Image Company: Image Company: Image Company: Field Material Description Field Material Description Field Material Description Image Company: Image Company: Image Company: Image Company: Field Material Description Field Material Description <td>Drillin</td> <td>g Method:</td> <td>Α</td> <td>ir Har</td> <td>nmer - I</td> <td>_ongyear 850</td> <td>Surfa</td> <td>ace RL: 123.16 m</td> <td>AHD</td>	Drillin	g Method:	Α	ir Har	nmer - I	_ongyear 850	Surfa	ace RL: 123.16 m	AHD
Build Material Description Field Material Description Image: Internation of the set of th	Drillin	g Company:	Н	ighlar	nd Drilli	ng Borehole Diameter: 140 mm	Co-o	ords: E 402502	2.42 N 6448904.4 MGA56
Image: Second multiple Image: Second multiple<	Bor	e Information	า			Field Material Description		[
Bit AL CONTINUENT Profile of the second			무	Ê	g				
19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <th1< th=""> 1 <th1< th=""> <th1< th=""></th1<></th1<></th1<>	WATER	ELL CONSTRUCTION	RL (AHDm) A	DEPTH (ВGL I	GRAPHIC LO	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
FORMATION FORMATION 57 60	X		- 59		— · —	SILTSTONE - Grey, siltstone (80%) with 20% grey, very fine grained sandst	one	LELOMA	
Product Product <t< td=""><td></td><td></td><td>- 58</td><td>65 -</td><td>· ·</td><td>SANDSTONE - Grey, predominantly fine with some fine to medium grained</td><td></td><td>FORMATION</td><td></td></t<>			- 58	65 -	· ·	SANDSTONE - Grey, predominantly fine with some fine to medium grained		FORMATION	
Product Product Product Construction (PON) with 19th gay, the to medual granted and the set of a gay. Product Construction (PON) with 19th gay, the to medual granted and the set of a gay. Product Construction Product Construction (PON) with 19th gay, the to medual granted and the set of a gay. Product Construction (PON) with 19th gay, fire to medual granted and the set of a gay. Product Construction (PON) with 19th gay, fire to medual granted and the set of a gay. Product Construction Product Construction (PON) with 19th gay, fire to medual granted and the set of a gay. Product Construction (PON) with 19th gay, fire to medual granted and the set of a gay. Product Construction Product Construction (PON) with 19th gay, fire to medual granted and the set of a gay. Product Construction (PON) with 19th gay, fire to medual granted and the set of a gay. Product Construct Construct Construct Construct (PON) with 19th gay gay, fire to medual granted and the set of a gay. Product Construct Construct Construct (PON) with 19th gay gay, fire to medual granted construct (PON) with 19th gay, fire to medual granted construct (PON) with 19th gay gay, fire to medual granted construct (PON) with 19th gay gay medual granted construct (PON) with 19th gay. Product Construct Construct Construct Construct Construct Construct (PON) with 19th gay gay, fire to medual granted construct (PON) with 19th gay gay. Product Construct Const			00	00		sandstone			
			- 57	66 -		SILTSTONE - Grey, siltstone (90%) with 10% grey, fine to medium grained sandstone			
Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product Product ProdUC P			- 56	67 -		SANDSTONE - Grey, fine to medium grained sandstone			
Bit STORE Status Stat				68 -					
Point of the second state of the second sta			- 55	00					
0			- 54	69 -	<u> </u>	SILTSTONE - Grey, siltstone (90%) with black shale and light grey, fine to m	edium		
Image: Second			52	70 —	· _ · _	grained sandstone			
Prime 6.2 7.1 Prime 6.64 Prime 6.64 6.0 7.3	Ň		- 55		· _ · _				
Image: State in the s			- 52	71 -	· _ · _				pH: 6.48
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\triangleright		- 51	72 -					EC: 3433 µS/cm Temp: 25.78 °C
- 50 73			0.	70	· _ · _				redox: 70 mV TDS: 2.21 g/L
49 74 48 75 48 75 47 76 48 77 48 77 48 78 48 78 44 79			- 50	75 -					
48 72			- 49	74 -					
48 70 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -				75 -	· _ · _				
47 76			- 48	15	· _ · _				
- 46 77 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - </td <td></td> <td></td> <td>- 47</td> <td>76 -</td> <td></td> <td>SANDSTONE - Light grey, fine grained sandstone</td> <td></td> <td></td> <td></td>			- 47	76 -		SANDSTONE - Light grey, fine grained sandstone			
40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 <td< td=""><td></td><td></td><td>- 46</td><td>77 -</td><td></td><td></td><td></td><td></td><td></td></td<>			- 46	77 -					
- 46 78 - ibbek state is a - 44 79 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <			40						pH: 6.64 EC: 3660 µS/cm
Add 79 - 1000 SANDSTONES/LISTONE - Gey, silistone (50%) with light gray, fine to medium TDS: 2.29 gll. Add 80 - 1000 SULTSTONE - Dark gray, silistone (50%) with 10% black shale and coal fines PH: 7.1 Add 81 - 1000 SANDSTONE - Light gray, fine to medium grained sandstone (65%) with 10% black shale and coal fines PH: 7.1 Add 83 -1000 SANDSTONE - Light gray, fine to medium grained sandstone (65%) with 10% black shale and coal fines PH: 7.1 Add -1000 -1000 SANDSTONE - Light gray, fine to medium grained sandstone (65%) with 15% gray PH: 7.1 -38 85 -1000 -1000 SANDSTONE - Light gray, medium grained, carbonaceous stained sandstone PH: 7.1 -38 87 -1000 SANDSTONE - Light gray, medium grained, carbonaceous stained sandstone PH: 7.1 -38 87 -1000 SANDSTONE - Light gray, medium grained, carbonaceous stained sandstone PH: 7.1 -39 90 -1000 SANDSTONE - Light gray, fine to medium grained, carbonaceous stained sandstone PH: 7.1 -30 90 -1000 SANDSTONE - Light gray, fine to medium grained, carbonaceous stained PH: 7.1 -31 92 -1000 SANDSTONE - Light gray, fine to m			- 45	78 -		black shale lens			Temp: 27.11 °C redox: -13 mV
grained sandstone grained sandstone			- 44	79 -		SANDSTONE/SILTSTONE - Grev. siltstone (50%) with light grev. fine to mer			TDS: 2.29 g/L
- 43 60 SILTSTONE - Dark grey, siltstone (60%) with 10% black shale and coal fines - 42 81 - 41 82 - 40 83 - 40 83 - 40 83 - 39 84 - 38 85 - 38 85 - 38 85				00		grained sandstone			
- 41 82 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -			- 43	80 -		SILTSTONE - Dark grey, siltstone (90%) with 10% black shale and coal fines	s		
- 41 82 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td></td> <td></td> <td>- 42</td> <td>81 -</td> <td><u> </u></td> <td></td> <td></td> <td></td> <td></td>			- 42	81 -	<u> </u>				
Image: Problem in the image: Proble				82 -	_ · _				
Adv 83 - SANDSTORE - Light grey, fine to medium grained sandstone (85%) with 15% grey pH: 7.1 EC:293 µS/cm - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -			- 41		· _ · _				
39 94 - Sector Se			- 40	83 -		SANDSTONE - Light grey, fine to medium grained sandstone (85%) with 15% siltstone and shale	% grey		pH: 7.1
- 38 85 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -			- 39	84 -					EC: 2893 µS/cm Temp: 26.03 °C
- - - - SILTSTONE - Grey, silistone (70%) with black shale and light grey medium grained - - - - - - - - 36 67 - - - - - 36 87 - - - - - - 36 87 - - - - - - - 36 87 - - - - - - - - 36 88 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -				85 -	<u></u>				redox: -46.9 mV TDS: 1.842 g/L
- 37 86 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -			- 38	65 -		SILTSTONE - Grey, siltstone (70%) with black shale and light grey medium g sandstone	rained		
Bill TSTONE / Light grey, medium grained, carbonaceous stained sandstone PH: 7.1 Bill TSTONE/SANDSTONE - Light grey, medium grained, carbonaceous stained sandstone PH: 7.1 Bill TSTONE/SANDSTONE - Crey, siltstone (50%) with 50% grey, fine to medium Temp: 25.75 °C Bill TSTONE/SANDSTONE - Light grey, fine to medium grained, carbonaceous stained Temp: 25.75 °C Bill TSTONE/SANDSTONE - Light grey, fine to medium grained, carbonaceous stained Temp: 25.75 °C Bill TSTONE/SANDSTONE - Light grey, fine to medium grained, carbonaceous stained Sandstone Bill TSTONE/SANDSTONE - Light grey, fine to medium grained, carbonaceous stained Sandstone Bill TSTONE/SANDSTONE - Light grey, fine to medium grained, carbonaceous stained Sandstone Bill TSTONE/SHALE - Dark grey/black, siltstone/shale (70%) with 30% light grey, LELOMA FORMATION Bindaboo Coal Seam Seam			- 37	86 -					
SANDSTONE - Light grey, medium grained, carbonaceous stained sandstone 35 88 - 34 89 - 33 90 - 33 90 - 32 91 - 32 91 - 31 92 - 30 93 - 30			26	87 -					
- 35 88 - - 34 89 - - 33 90 - - 33 90 - - 32 91 - - 31 92 - - 31 92 - - 30 93 - - 30 93 - - 30 93 - - 30 93 - - 30 93 - - 30 93 - - 30 93 - - 30 93 - - 30 93 - - 30 93 - - 31 92 - - 31 92 - - 32 91 - - 30 93 - - 30 93 - 5000000000000000000000000000000000000			- 30		•••••	SANDSTONE - Light grey, medium grained, carbonaceous stained sandston	e		
- 34 89 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - </td <td></td> <td></td> <td>- 35</td> <td>88 -</td> <td></td> <td></td> <td></td> <td></td> <td></td>			- 35	88 -					
90			- 34	89 -					
- 33 90 -			0.	00					pH: 7.1 EC: 3107 μS/cm
TDS: 1.993 g/L TDS: 1.993 g/L			- 33	90 —		SILTSTONE/SANDSTONE - Grey, siltstone (50%) with 50% grey, fine to me grained sandstone	dium		Temp: 25.75 °C redox: -62.8 mV
some grey sittstone - 30 93 - - 30 93 - - 29 94 - - 28 95 - 			- 32	91 -		SANDSTONE - Light grey, fine to medium grained, carbonaceous stained			TDS: 1.993 g/L
- 31			. .	92 -		sandstone			
- 30 93 - some grey siltstone - 29 94 - - - - 28 95 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -			- 31						
- 29 94 - - SILTSTONE/SHALE - Dark grey/black, siltstone/shale (70%) with 30% light grey, fine grained sandstone LELOMA - 28 95 - - - - - Bindaboo Coal Seam END OF BOREHOUE AT 183.00 m - - - - - -			- 30	93 -		some grey siltstone			
END OF BORFHOLE AT 183.00 m			- 20	94 -		SII TSTONE/SHALE - Dark may/hlack eittetona/chala (70%) with 20% links			-
END OF BORFHOLE AT 183.00 m			23	~-	· _ · _	fine grained sandstone	gi⊂y,	FORMATION	
M I I Seam FND OF BOREHOLE AT 183 00 m Image: Contract of the second se			- 28	95 –				Bindaboo Coal	
	L K∕	1 164			·			Seam	

100

GROUNDWATER BOREHOLE LOG

BORE NO.

TCMB02

		YEARS ®								SHEET 4 OF 6
Clier	t:		Α	GL Er	nergy Li	mited	Date	Commenced	i: 18	8/3/11
Proje	ect:		н	lydrog	geologic	al Assessment - Gloucester Gas Project	Date	Completed:	21	/3/11
Bore	Loc	ation:	G	louce	ster - Ti	edeman property	Reco	orded By:	NF	PH
Proje	ect N	lumber:	2	16240	6A		Log	Checked By:	JC	D
Drillir	na M	ethod:	Α	ir Har	nmer - L	_ongvear 850	Surfa	ace RI : 123.	16 mAl	HD
Drillir	na C	ompany:	Н	lighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-o	rds: E 40 2	2502.4	2 N 6448904.4 MGA56
Bo	re Ir	formatio	n	•		Eiold Material Description				
		ionnatio								
			АНР	(m)	00					
щ			(m D	H (BG	l L L			FORMATION		
VATE	/ELL C	ONSTRUCTION	L (AF	EPTH	RAPI	LITHOLOGY		(Approximate)		HYDROGEOLOGY
			R	Ω	U					
	a k	1	- 27			SHALE - Black/dark brown, shale/siltstone and coal				
	38	K K		07 -				FORMATION	N	
K	18		- 26	51				Bindaboo Co	al	
	36		- 25	98 -		SILTSTONE - Grey, siltstone (60%) with 40% black shale/siltstone		Seam		
	38			99 -	· — · —					
	10		- 24		· _ · _					
	38		- 23	100 —		SANDSTONE - Grey, fine grained sandstone				
Ŕ	2 R			101 -						
	36		- 22		• • • • • • • •					pH: 6.91 EC: 2501 µS/cm
K	1 K		- 21	102 -		black shale lens				Temp: 25.94 °C redox: 16 7 mV
	36		- 20	103 -		SILTSTONE - Grav siltetone (80%) with 20% light grav fine to medium grain	ed			TDS: 1.597 g/L
	38		20		· _ · _	sandstone	eu			
	88		- 19	104 -	<u> </u>					
	98	3	- 18	105 -	<u> </u>	coal fines				
R	18			100	— · —					
	36	3	- 17	100 -	· — · —	Bindaboo Coal				
X	8 K		- 16	107 -	• •					nH: 7.40
	36			108 -	· _ · _					EC: 3366 µS/cm
K	3 8		- 15	100		SHALE - Black, shale (50%) with 25% grey siltstone and 25% light grey, fine medium grained sandstone	to			redox: -47.7 mV
	36		- 14	109 -	<u> </u>	SILTSTONE - Grey, siltstone (90%) with 10% brown siltstone				IDS: 2.116 g/L
	98	3	12	110 —	· — · —					
R	2 R		15		· _ · _					
	36		- 12	111 –	· _ · _					
K	4 8		- 11	112 -						
				113 -						
		4	- 10		— · —					pH: 7.68 EC: 3328 uS/cm
R	1 R		- 9	114 -		SANDSTONE - Light grey, fine grained sandstone (80%) with 20% dark grey silfstone				Temp: 26.61 °C redox: -57.2 mV
	36		- 8	115 -	·····	SILTSTONE - Dark grey/black, siltstone/shale with some coal fines				TDS: 2.1 g/L
K	4 8			440	· _ · _					
	36		- 7	110 -	· _ · _					
	4 6	4	- 6	117 -	<u> </u>					
	38		_	118 -						
	36	X	- 5			SHALE - Black, shale and coal (80%) with 20% light grey, medium grained sandstone				
K	8 K		- 4	119 -						pH: 7.73
	36		- 3	120 —		SANDSTONE - Light grey, medium grained sandstone (60%) with 40% dark of	Irev			EC: 3398 µS/cm Temp: 26.25 °C
	38			101 -		siltstone	, .,	FORMATION	N	redox: -87.8 mV TDS: 2.104 g/L
	16		- 2	121						
	9 Ř		- 1	122 -						
k	1 R			123 -						
	36	3	- 0	. 20						
k	4 K		1	124 -						
	36		L	125 -		SILITSTONE . Dark gray & brave sillatoos				
K	18		-2		· _ · _	SIL ISI ONE - Dalk grey α DOWI, SILSUNE				pH: 7.94 EC: 3457 μS/cm
	10		3	126 -		SHALE - Black				Temp: 26.44 °C redox: -94.5 mV
	3 8	3	4	127 -		SILTSTONE - Dark grey, siltstone				TDS: 2.177 g/L
k	18				$ \cdot - \cdot -$					
						END OF BOREHOLE AT 183.00 m				

GROUNDWATER BOREHOLE LOG

BORE NO.

TCMB02

SHEET 5 OF 6

	YEARS ®							3HEET 5 OF 6
Client: AGL E Project: Hydro Bore Location: Glouc Project Number: 21624				nergy Li geologic ster - Ti 6A	mited E al Assessment - Gloucester Gas Project E iedeman property F L	Date Commo Date Comple Recorded By Log Checkee	enced: eted: /: d By:	18/3/11 21/3/11 NPH JCD
Drillin	g Method:	A	Nir Har	nmer - l	Longyear 850	Surface RL:	123.16 n	nAHD
Drillin	g Company:	H	lighlar	nd Drillii	ng Borehole Diameter: 140 mm C	Co-ords:	E 40250	2.42 N 6448904.4 MGA56
Bor	e Informatio	n			Field Material Description			
					-			
WATER	ELL CONSTRUCTION	RL (AHDm) AH	DEPTH (BGLm	GRAPHIC LOG	LITHOLOGY	FOF (App	RMATION roximate)	HYDROGEOLOGY
×		5		— · —	SILTSTONE - Dark grey, siltstone (continued)	LELOI	MA	
			129 -	· ·	CANDETONE Crew fine grained conductors	FORM	IATION	
		-0			SANDSTONE - Grey, fine grained sandstone			
		7	130 —					
			131 -					
		8			SILISIONE - Grey, siltstone (80%) with 20% light grey, fine to medium grained sandstone			pH: 7.83 EC: 3154 uS/cm
		9	132 -		SANDSTONE - Grey, very fine grained sandstone with traces of black shale	—		Temp: 26.01 °C
			133 -	•••••				TDS: 2.009 g/L
		10	100					
		11	134 -		some grey siltstone			
			135 -					
		12	155					
		13	136 -		SILTSTONE - Grey, siltstone (80%) with 20% grey, very fine grained sandstone	_		
			107	· — · —				
		14	137 -					pH: 7.92
		15	138 -					EC: 3074 µS/cm Temp: 26.18 °C
				— · —				redox: -93.6 mV TDS: 1.951 a/L
		16	139 -	· — · —				
		17	140 —	· _ · _				
		-17		· _ · _				
		18	141 -		SANDSTONE - Light grey, fine grained sandstone			
		10	142 -					
		F -19						
		20	143 –		carbonaceous staining			pH: 7.98
		21	144 -					EC: 3233 µS/cm
		21						redox: -71.4 mV
		22	145 -					1DS. 2.004 g/L
			146 -					
		23						
		24	147 -		SILTSTONE - Grey, siltstone (60%) with 40% light grey, medium grained			
			148 -	· — · —				
		25		por	CONGLOMERATE - Grey, cream, green, medium, fine to medium grained sandstone, grey and dark grey siltstone			
		26	149 -	h				pH: 8.01
			150 —					EC: 3350 µS/cm
		27		$\mathcal{L} \cup \mathcal{L}$				redox: -38.8 mV
		28	151 -		SANDSTONE - Grey, medium grained sandstone (60%) with 40% dark grey/black	:k		1DS: 2.108 g/L
			152 -		siltstone/shale			
		29	152					
		30	153 -		SILTSTONE/SANDSTONE - Dark grey, siltstone (50%) with 50% grey fine and fi	ine		
			154	· — · —	to medium sandstone			
		31	104 -		SANDSTONE - Grey, fine grained sandstone			
		32	155 -					
			450					pH: 8 EC: 3185 μS/cm
		33	156 -					Temp: 25.86 °C redox: 8 mV
		34	157 -	<u></u>	SILTSTONE - Dark grev, siltstone			TDS: 2.035 g/L
				· _ · _		FORM	IATION	
		35	158 -		SILTSTONE/SHALE - Black, siltstone/shale with some coal fines (Deards Coal)	Deard	s Coal	
		36	159 -		SILTSTONE/SANDSTONE - Dark arey sitesone (50%) with 50% arey from to			
				$ \cdot - \cdot -$	medium grained sandstone	FORM	IATION	
					END OF BOREHOLE AT 183.00 m			



BORE NO.

TCMB02

6

	,	YEARS ®								SHEET 6 OF 6	
Clie Pro Bor Pro	Client: Project: Bore Location: Project Number:			AGL E Hydrog Glouce 216240	nergy L geologio ester - T 96A	imited cal Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	Commenced: Completed: orded By: Checked By:	d: 18/3/11 21/3/11 NPH JCD		
Dril Dril	ling M ling Co	ethod: ompany:		Air Har Highlar	nmer - nd Drilli	Longyear 850 ng Borehole Diameter: 140 mm	Surfa	ace RL: 123.1 0 rds: F 402	6 mAH	D N 6448904.4 MGA56	
В	ore In	formatio	n	J	-	Field Material Description					
WATER	WELL CO	ONSTRUCTION	RL (AHDm) AH	DEPTH (ВGLm	GRAPHIC LOG	LITHOLOGY		FORMATION (Approximate)		HYDROGEOLOGY	
		Bentonite seal	3 3; 4; 4; 4; 4; 4; 4;	7 $_{3}$ $161 _{9}$ $162 _{0}$ $163 _{1}$ $164 _{2}$ $165 _{3}$ $166 _{4}$ $167 _{5}$ $168 -$		SANDSTONE - Grey, fine to medium grained sandstone (90%) with 10% gre siltstone SILTSTONE - Dark grey, siltstone (60%) with 40% light grey, fine to medium grained sandstone SANDSTONE - Grey, fine to medium grained sandstone (90%) with 10% dat siltstone SILTSTONE - Grey, siltstone (80%) with 20% light grey, medium grained sandstone SILTSTONE - Grey, siltstone (80%) with 20% light grey, medium grained sandstone SILTSTONE - Grey, fine to medium grained sandstone (80%) with 20% dark siltstone	rk grey	LELOMA FORMATION	pi E T r r T	H: 8.01 IC: 2982 µS/cm iemp: 26.31 °C edox: -30.1 mV DS: 1.891 g/L IS: 1.891 g/L IC: 3098 µS/cm iemp: 26.09 °C edox: -76.1 mV	
		Gravel 5 mm graded 50 mm ID, 0.5 mm aperture stainless steel screen	44 4 44 54 55 55 55 55 55 55	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		SILTSTONE - Grey, siltstone (70%) with 30% grey, very fine grained sandst SANDSTONE - Grey, fine grained, carbonaceous stained sandstone SANDS TONE/SILTSTONE- Grey, siltstone (50%) with 50% light grey, fine to medium grained sandstone SANDSTONE - Grey, very fine grained, carbonaceous stained sandstone wi 10% grey siltstone	tone —		pi E T rr T	H: 7.89 IC: 3099 µS/cm emp: 25.67 °C edox: -93 mV DS: 1.988 g/L	
		Sump/ bentonite plug	51 51 51 51	₆ 179 – 7 180 – 8 181 – 9 182 – 1 183 –		SANDSTONE - Light grey, fine grained sandstone (80%) with 20% dark grey siltstone, carbonaceous staining SANDSTONE - Light grey, medium grained sandstone	<u> </u>		pi E T ra Pi B T	H: 7.81 IC: 3336 μS/cm emp: 26.29 °C edox: -88.5 mV DS: 2.116 g/L H: 7.98 IC: 3256 μS/cm emp: 25.94 °C	
			6 6: 6: 6: 6: 6:	- 1 184 - 2 185 - 3 186 - 4 187 - 5 188 - 5 188 - 6 189 - 7 190 - 3 191 -					T	edox: -59.8 mV DS: 2.075 g/L	

END OF BOREHOLE AT 183.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

TCMB03

Clent: Add: Derey Lumited: Date Commence: 14/3/11 Participation: Bore Location: Hydrogeological Adsessmenter: Clonester: Note Compatibility: Note Com		YEARS ®									SHEET 1 OF 8
Diffing letter With Hammer - Longyzer 850 Surface RL 121 Bam4LB Image letter High Hammer - Longyzer 850 Coords E 44250315 N 6448908.61 MA302 Image letter Image lette	Client: Project: Bore Location: Project Number:		A H G 2'	GL Er ydrog louce 16240	nergy Li geologic ster - Ti 6A	y Limited Da ogical Assessment - Gloucester Gas Project Da - Tiedeman property Re Log er - Longyear 850 Su			enced: eted: /: d By:	14/3/ 16/3/ NPH JCD	/11 /11 / JCD
Drilling Company, Highend Drilling Borehole Diameter: 140 rm Co.ords: E 402503.15 N 6448905.61 MGA65 Bore Information Field Material Description Field Material Description Field Material Description Field Material Description Image Company, Will, Constration (Image Company), State (Image Co	Drilling	g Method:	Α	ir Har	nmer - l	ongyear 850	Surfa	ce RL:	123.18	mAHD)
By Hormation Field Material Description 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Drilling	g Company:	Н	ighlar	nd Drillin	ng Borehole Diameter: 140 mm (Co-or	ds:	E 40250	03.15	N 6448909.61 MGA56
Bit NELL COMMUNITION District Office Distr	Bor	e Informatio	n		1	Field Material Description					
NULL CONSTRUCTION Not Construction Number of the Construction of the Constene Construction of the Construction of the Constructio			뒤	Ê	g						
Standard 122 1 Control File 112 1 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -	WATER AM	LL CONSTRUCTION	RL (AHDm) /	DEPTH (BGL	GRAPHIC LO	LITHOLOGY		FOR (App	MATION roximate)		HYDROGEOLOGY
89 34 - SILTSTONE - Grey, carbonaceous stained siltstone (60%) with 30% grey, fine grained sandstone and 10% black shale	*	S0 mm ID galvanized steel & grout	 22 123 122 121 120 119 119 118 117 116 115 114 113 112 111 110 109 108 101 109 108 101 100 103 102 104 105 104 105 104 105 104 99 99 99 99 99 91 90 	$\begin{array}{c} \square \\ 1 \\ 2 \\ - \\ 2 \\ - \\ 3 \\ - \\ - \\ 3 \\ - \\ - \\ - \\ - \\ -$		DRILL PAD TUFF - Cream, weathered tuff and clay WEATHERED COAL - Grey/brown, weathered coal with 15% coal fines WEATHERED COAL - Grey/brown, weathered coal (60%) with 40% well weathered grey siltsone/claystone WEATHERED COAL - Grey/brown, weathered coal (60%) with 40% well weathered black coal WEATHERED COAL - Grey, well weathered coal (60%) with 40% well weathered black coal WEATHERED COAL - Black, weathered coal (70%) with 30% dark brown claystone WEATHERED COAL - Black, weathered coal (70%) with 30% dark brown claystone WEATHERED COAL - Black, coal (95%) with 5% grey, very fine grained sandy weathered claystone WEATHERED COAL - Black, coal (95%) with 5% grey, very fine grained weathered claystone WEATHERED CLAYSTONE - Light grey, very fine grained, weathered claystone WEATHERED CLAYSTONE - Light grey, very fine grained, weathered claystone WEATHERED CLAYSTONE - Grey, very fine grained, sandy weathered claystone WEATHERED CLAYSTONE - Grey, very fine grained, sandy weathered claystone WEATHERED SILTSTONE - Grey, well weathered siltstone WEATHERED SILTSTONE - Grey, well weathered siltstone with some clay some coal fines fresh siltstone		LELON Jo Dot	AA ATION h Tuff		
			- 89	34 -	· ·	SILTSTONE - Grey, carbonaceous stained siltstone (60%) with 30% grey, fine grained sandstone and 10% black shale					

END OF BOREHOLE AT 269.00 m

100

GROUNDWATER BOREHOLE LOG

BORE NO.

TCMB03

8

	YEARS ®				mitod [Data Cam	manaadu	SHEET 2 OF 8
Pro	oject:	H	ydrog	jeologic	al Assessment - Gloucester Gas Project	Date Com	pleted:	16/3/11
Bo	re Location:	G		ster - Ti	edeman property F	Recorded	By:	NPH / JCD
	lling Mothod:	2 ^	10240 ir Har	omor - I	ongvoer 850		1 · 122 19 m	
Dri	lling Company:	H	lighlar	nd Drillin	ng Borehole Diameter: 140 mm 0	Co-ords:	E 402503	3.15 N 6448909.61 MGA56
E	Bore Informatio	n	-		Field Material Description			
		무	Ê	ge				
WATER	WELL CONSTRUCTION	RL (AHDm) A	DEPTH (BGL	GRAPHIC LC	LITHOLOGY		FORMATION Approximate)	HYDROGEOLOGY
		- 88			SILTSTONE/SHALE - Grey, carbonaceous stained sittstone (40%) with 40% bla shale and 20% grey, fine grained sandstone		.OMA	
		- 87	36 -		SILTSTONE - Dark grey, siltstone with clay and 5% black shale	FOI	RIVIATION	
		- 86	37 –	·				
		- 85	38 -					
		- 84	39 -	- <u></u>	SANDSTONE - Grey, fine to medium grained sandstone with 5% dark grey siltstone and black shale	—		
		- 83	40 —					
		- 82	41 -					
		- 81	42 -		SILTSTONE - Dark grey, siltstone with a few chips of black shale	—		
		- 80	43 -		SANDSTONE - Light grey, medium grained sandstone (60%) with 40% dark grey siltstone and some clay	,		
		- 79	44 -		SILTSTONE - Grey, siltstone with clay and 5% light grey, medium grained sandstone and a black shale	—		
		- 78	45 –		SANDSTONE - Grey, fine grained sandstone with some clay	—		
		- 77	46 -		SILTSTONE/SHALE - Grey, siltstone (50%) with 50% black shale and some clay	·		
		- 76	47 -		SILTSTONE/SANDSTONE - Grey, siltstone (50%) with 50% light grey, fine to medium grained sandstone	_		pH: 6.89
\triangleright		- 75	48 -					EC: 2408 µS/cm Temp: 30.11 °C redox: -117.7 mV
		- 74	49 -			—		TDS: 1.425 g/L
		- 73	50 —					
		- 72	51 –					
		- 71	52 -	· · · · · · · · · · · · · · · · · · ·	SILTSTONE - Dark grey, and dark brown siltstone (80%) with 20% black shale	—		
		- 70	53 -	· · · · · · · · · · · · · · · · · · ·				pH: 6.75
		- 69	54 -	• • • • • • • • •				Temp: 26.2 °C redox: 29.5 mV
		- 68	55 –		SILTSTONE/SANDSTONE - Light grey, fine to medium grained sandstone (50%) with 50% grey siltstone			TDS: 2.619 g/L
		- 67	56 -		SILTSTONE - Grey, siltstone (80%) with 20% light grey, fine to medium grained sandstone			
		- 66	57 –		black shale lens			
		- 65	58 -		SANDSTONE - Light grey, fine grained sandstone with some white clay and 10% black shale and light brown tuff	5		
		- 64	59 -		SILTSTONE - Grey, siltstone (90%) with 10% light grey, fine grained sandstone and 10% black shale	—		pH: 7.29
		- 63	60 —		SANDSTONE - Grey, medium and fine grained sandstone (90%) with 10% grey siltstone	—		Temp: 26.18 °C redox: -7.8 mV
		- 62	61 -					TDS: 2.157 g/L
		- 61	62 -		SILTSTONE - Grey, siltstone (80%) with 20% light grey, medium grained sandstone			
		- 60	63 -		SANDSTONE - Grey, light grey, medium grained sandstone (90%) with 10% siltstone	—		
		- 59	64 -					
		- 58	65 -		SILTSTONE - Grey, siltstone (60%) with 30% grey, fine grained sandstone and 10% black shale	—		pH: 7.62
		- 57	66 -		SANDSTONE - Light grey, fine to medium grained sandstone with some black carbonaceous staining	—		Temp: 25.39 °C redox: 10.3 mV
		- 56	67 -		SILTSTONE - Dark grey, siltstone with some black siltstone	—		TDS: 1.951 g/L
		- 55	68 -					
		- 54	69 –	· · · · · · · · · · · · · · · · · · · 	SILTSTONE - Grey, siltstone (80%) with 20% black shale			

END OF BOREHOLE AT 269.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

TCMB03

	YEARS ®							SHEET 3 OF 8	
Client: Project: Bore Location: Project Number:		A ⊢ 2	GL Er lydrog louce 16240	nergy Li jeologic ster - Ti 6A	mited cal Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	Commenced: Completed: orded By: Checked By:	14/3/11 16/3/11 NPH / JCD JCD	
Drillin	g Method:	A	vir Har	nmer - l	_ongyear 850	Surfa	ace RL: 123.18 m	AHD	
Drillin	g Company:	H	lighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-o	ords: E 402503	8.15 N 6448909.61 MGA56	
Bor	e Informatio	n			Field Material Description				
		모	Ê	U					
WATER	ELL CONSTRUCTION	RL (AHDm) A	DEPTH (ВGLI	GRAPHIC LO	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY	
	X	- 53			SILTSTONE - Grey, siltstone (80%) with 20% black shale (continued)				
		- 52	71 -	• • • • • • • • • • • • • • • • • • • •	few chips of white, hard quartz		FURMATION	pH: 7.65	
		- 51	72 –		SANDSTONE - Light grey, medium grained sandstone (60%) with 40% grey,	,		EC: 3275 µS/cm Temp: 25.71 °C	
		- 50	73 -	· · · · · · · · · · · · · · · · · · ·	carbonaceous stained siltstone	ad		TDS: 2.1 g/L	
			74 –	•.•	sandstone				
		- 49							
		- 48	75 -						
		- 47	76 -	• • • • • • • • • •	SANDSTONE - Light grey, fine to medium grained sandstone				
		- 46	77 -		carbonaceous staining				
			78 –					EC: 3250 μS/cm	
		- 45	70					redox: 32.5 mV	
		- 44	79 -		SILTSTONE - Dark grey, carbonaceous stained siltstone (70%) with 30% gr fine grained sandstone and some black shale	rey,		150. <u>2</u> g, 2	
		- 43	80 —		SANDSTONE - Grey, fine grained sandstone (90%) with 10% dark grey silts	stone			
		- 42	81 -	<u> </u>	SILTSTONE - Dark grey, siltstone (80%) with light grey claystone and black	shale			
		41	82 -	• _ • _					
			83 -	· _ · _					
		- 40		· — · —				pH: 7.66 EC: 3386 µS/cm	
		- 39	84 -		SANDSTONE - Grey, fine grained sandstone (70%) with 30% dark grey silts	stone		Temp: 26.41 °C redox: 28.1 mV	
		- 38	85 -	• <u>••</u> ••	SILTSTONE - Dark grey, siltstone (60%) with 30% light grey, fine to medium grained sandstone with 10% dark shale	ı		IDS: 2.154 g/L	
		- 37	86 -	•	SANDSTONE - Light & dark grey, medium grained sandstone (90%) with 10'	% dark			
		- 36	87 -		grey siltstone				
			88 -						
		- 35	00						
		- 34	69 -					pH: 7.68 FC: 3487 uS/cm	
		- 33	90 —					Temp: 26.36 °C redox: 3.6 mV	
		- 32	91 -	· · · · · · · · · · · · · · · · · · ·				TDS: 2.218 g/L	
		- 31	92 -						
			93 -						
		- 30			carbonaceous staining				
		- 29	94 –		SILTSTONE - Dark grey, siltstone (70%) with 30% grey, fine grained sandst	tone			
		- 28	95 -		SANDSTONE - Grey, fine grained sandstone (70%), 20% dark grey siltstone	e and		pH: 7.72	
		- 27	96 -	· · · · · · · · · · · · · · · · · · ·	SILTSTONE - Dark grey, siltstone (80%) with 10% grey, very fine grained			EC: 3399 µS/cm Temp: 26.16 °C	
		- 26	97 -	• •	sandstone and 10% black shale		FORMATION	TDS: 2.162 g/L	
		20	98 -	• •			Seam		
		- 25		· ·					
		- 24	99 -		SANDSTONE - Grey, very fine grained sandstone (90%) with 10% grey sitts	stone			
		- 23	100 —						
		- 22	101 -					pH: 7.67	
		21	102 –					EC: 5289 μS/cm Temp: 25.91 °C	
			103 -					redox: 38.7 mV TDS: 3.377 g/L	
		F 20							
		- 19	104 -	· ·	SILTSTONE - Dark grey, siltstone with 40% black coal/shale, bindaboo coal				

END OF BOREHOLE AT 269.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

TCMB03

<u><u> </u></u>	rEARS ®				wited	D-1	Comment	0.0.cl.	
Client: Project:		р Н	igl Ei İydrog	peologic	rnited al Assessment - Gloucester Gas Project	Date	e Commen e Complete	ed: '	14/3/11 16/3/11
Boi	e Location:	Ģ	louce	ster - T	edeman property	Rec	orded By:	<u> </u>	NPH / JCD
Pro	ject Number:	2	16240	6A		Log	Checked E	By:	JCD
Dril	ling Method: ling Company:	A H	vir Har Iighlar	nmer - l nd Drilliu	Longyear 850 Da Borehole Diameter [,] 140 mm	Surf	ace RL: 12	23.18 m 402503	AHD 15 N 6448909 61 MGA56
	ore Information	n	igna		Field Material Description	001			
		m) AH	BGLm	CLOG					
ATER	WELL CONSTRUCTION	(AHD	ртн (APHI	LITHOLOGY		FORMA (Approxin	TION mate)	HYDROGEOLOGY
\$		RL	DE	GF					
-		- 18			SILTSTONE - Dark grey, siltstone with 40% black coal/shale, bindaboo c	oal	LELOMA	۱	
		- 17	106 -				FORMA1 Bindaboo	FION Coal	
		- 16	107 –		SANDSTONE - Grey, very fine grained sandstone (70%) with 30% dark g	grey	Seam		pH: 7.66
		- 15	108 -	— · —	siltstone SILTSTONE - Dark grey, carbonaceous stained siltstone (90%) with 10%	6 brown			EC: 4606 µS/cm Temp: 26.88 °C
		- 14	109 -	· ·	siltstone and black shale SANDSTONE - Grev, very fine to fine sandstone (90%) with 10% siltston	ie			TDS: 2.888 g/L
		- 13	110 —		SILTSTONE - Dark rray, carbonacious stained siltstone (90%) with 10%	black			
		10	111 –	· _ · _	shale	DIACK			
		- 12	112 -	· _ · _					
		- 11	113 -	· _ · _					
		- 10	113 -	· _ · _					
		- 9	114 -	· · · · · · · · · · ·	SANDSTONE - Light grey, fine grained sandstone (80%) with 20% dark g siltstone	grey/black			
		- 8	115 –	· · · · · · · · · · · · · · · · · · ·	SHALE /SILTSTONE - Black, shale (50%) with 50% brown siltstone				
		- 7	116 -		SILTSTONE - Dark grey/black, siltstone (90%) with 10% grey, fine graine sandstone and black shale	ed			
		- 6	117 -						
		- 5	118 -						
		- 4	119 -	<u> </u>					
		- 3	120 —		SANDSTONE - Light grey, fine grained sandstone (60%) with 40% dark g	jrey			-
		- 2	121 –	* * * * * * * * *	siltstone SANDSTONE - Grey, fine to medium grained sandstone (90%) with 10%	grey — —	FORMAT	FOIN	
		- 1	122 –		siltstone				
			123 –						
			124 -		siltstone	grey			
		1	125 -						
		2	126						
		3	120 -						
		4	127 -		SILTSTONE - Dark grey/black, siltstone (60%) with 40% grey, very fine to grained sandstone	o fine			
	8 8	5	128 -		SANDSTONE - Grey, very fine to fine grained sandstone (80%) with 20% grey siltstone	ark dark			
		6	129 –	· · · · · · · · · · · ·					
		7	130 —	•••••					
		8	131 -	• • • • • • • • • • • • • • • • • • •					
		9	132 -	— · —	SILTSTONE - Dark grey/black, siltstone (80%) with 20% grey siltstone				
		10	133 –	· ·	SANDSTONE - Grey, very fine grained sandstone				
		11	134 -						
		12	135 -		SILTSTONE - Grey and black siltstone with 20% arev fine arained sand	stone			
		12	136 -	· _ · _					
		-13	137 –						
	1 I	14	138 -	·					pH: 7.96 EC: 3939 μS/cm Temp: 25 8 °C
		15	130	·_·-					redox: 118.6 mV TDS: 2.523 q/L
		16	108 -	· _ · _					

END OF BOREHOLE AT 269.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.


BORE NO.

TCMB03

	YEARS ®							SHEET 5 OF 8
Clie Pro Bor Pro	Client: Project: Project Number: Project Number: Drilling Method:		AGL Ei Iydrog Slouce 216240	nergy Li geologic ester - Ti 16A	mited al Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	e Commenced: e Completed: orded By: Checked By:	14/3/11 16/3/11 NPH / JCD JCD
Dril	ing Method:	F	Air Har	nmer - I	₋ongyear 850	Surfa	ace RL: 123.18 n	nAHD
Dril	ling Company:	ŀ	lighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-c	ords: E 40250	3.15 N 6448909.61 MGA56
В	ore Informatio	n			Field Material Description			
				(1)				
WATER	WELL CONSTRUCTION	RL (AHDm) AH	DЕРТН (ВGLm	GRAPHIC LOC	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
		17 18	141 -	· _ · _	SILTSTONE - Grey and black, siltstone with 20% grey, fine grained sandsto (continued)	one	LELOMA FORMATOIN	
		19	142 –	· ·	SANDSTONE - Grey, very fine grained sandstone (90%) with 10% grey silts	stone		
		20	143 -					pH: 8.25 EC: 3919 uS/cm
		21	144 –					Temp: 25.34 °C redox: 186.7 mV
		22	145 –		black shale lens			TDS: 2.53 g/L
		23	146 –	· _ · _	$\ensuremath{SILTSTONE}$ - Grey, siltstone (80%) with 20% grey, fine to medium grained sandstone			
		24	147 –	· _ · _				
		25	148 -	\tilde{r}	CONGLOMERATE - Green/white/grey, medium and fine grained sandstone, and brown siltstone	, grey		
		26	149 -					pH: 8.08 EC: 3866 μS/cm
		27	150 -	· _ · _	SILTSTONE - Grey, siltstone (60%) with 40% conglomerate			Temp: 25.42 °C redox: 194.4 mV TDS: 2 492 q/l
		28	151 -		SANDSTONE - Dark grey/black, siltstone (80%) with 20% light grey, mediun grained sandstone	n		120.2.102 9.2
		29	152 -					
		30	153 -					
		31	155 -					
		32	156 -					pH: 8.06 EC: 3922 μS/cm Temp: 26.05 °C
		33	157 -	• • • • • • • • •				redox: 134.2 mV TDS: 2.497 g/L
		34	158 -		SHALE - Black, shale			
		35	159 -					
		30	160 —		SHALE - Black, shale (60%) with 40% grey slitstone			
		-3/	161 -		SANUS I UNE - Light grey, medium grained sandstone			
		39	162 –		SILTSTONE/SANDSTONE Dark gray, siltstone (50%) with 50% gray, fine	to		pH: 8.36 EC: 3921 μS/cm Temp: 25.09 °C
		40	163 -	· _ · _	medium grained sandstone			redox: 167 mV TDS: 2.543 g/L
		41	164 –	· _ · _				
		42	165 -	· ·	SANDSTONE - Light grey, fine to medium grained sandstone (70%) with 30	% grey		
		43	166 -	· · · · · ·	siltstone SILTSTONE - Dark grey, siltstone (90%) with 10% light grey, fine to mediun	n		
		44	167 -	· _ · _	grained sandstone SHALE - Black, shale (90%) with 10% light grey, fine to medium grained sar	ndstone		pH: 8.29
		45	168 –		and some coal fines SILTSTONE - Grey, siltstone (60%) with 40% grey, fine grained sandstone			EC: 3824 µS/cm Temp: 25.49 °C
		46	169 -	··_				TDS: 2.47 g/L
		47	170 —	· ·	SANDSTONE - Light grey, medium grained sandstone 20% dark grey and bl	lack		
		48	171 -					
		49	172 –					
		50	173 –					
		51	174 –		SHALE - Black, hard shale (60%) with 40% light grey, very fine grained same	idstone		pH: 8.69 EC: 3751 μS/cm Temp: 25.91 °C

END OF BOREHOLE AT 269.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

100

GROUNDWATER BOREHOLE LOG

BORE NO.

TCMB03

	YEARS ®							SHEET 6 UF 6	
Clie Pro Bor Pro	ent: nject: re Location: nject Number:	4 F 0 2	AGL Ei Hydrog Glouce 216240	nergy Li geologic ster - T 6A	imited cal Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log	Commenced: Completed: orded By: Checked By:	14/3/11 16/3/11 NPH / JCD JCD	
Dril	ling Method:	A	Air Har	nmer - I	Longyear 850	Surfa	ace RL: 123.18 n	nAHD	
Dril	ling Company:	ŀ	lighlaı	nd Drilli	ng Borehole Diameter: 140 mm	Co-c	ords: E 40250	3.15 N 6448909.61 MGA56	
В	Bore Information	n			Field Material Description		1	1	
		무	Ê	g					
WATER	WELL CONSTRUCTION	RL (AHDm) A	DEPTH (BGL	GRAPHIC LC	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY	
		52			SILTSTONE - Grey, siltstone (60%) with 40% grey, fine grained sandstone		LELOMA	redox: 147.6 mV TDS: 2.431 g/L	
		53	176 -				FORMATOIN		
		54	177 –	<u> </u>					
		55	178 -						
		50	179 -						
		20	180		SANDSTONE - Light grey, tine to medium grained sandstone (70%) with 30% grey, carbonaceous stained siltstone	o dark		pH: 8.58 EC: 3725 µS/cm	
		57	100 -					redox: 191.3 mV	
		58	181 –		SILTSTONE - Dark grey, carbonaceous stained siltstone (60%) with 40% lig grey, fine grained sandstone	ht		103. 2.437 g/L	
		59	182 -						
		60	183 –						
		61	184 -		SHALE - Black, shale/coal with coal fines				
		62	185 –		SANDSTONE - Grey, medium grained sandstone (90%) with 10% black shak		FORMATION	nH: 8.42	
		63	186 -		SANDSTONE Light grey medium grained sandstone (80%) with 20% dark		Seam	EC: 3736 μS/cm Temp: 24.84 °C	
			187 -		grey/black sitestone			redox: 188.6 mV TDS: 2.437 g/L	
		64	199 -	· _ · _	 SIL1STONE - Dark grey/black, siltstone and shale and 10% light grey, tine to medium grained sandstone)			
		65	100 -	· _ · _					
		66	189 –	· _ · _					
		67	190 —		SANDSTONE - Grey, very fine grained sandstone (70%) with 30% grey silts	tone			
		68	191 –	<u> </u>	SILTSTONE - Grey, siltstone (90%) with 10% grey, fine grained sandstone			pH: 8.25	
		69	192 -	· <u> </u>	SANDSTONE - Grey, medium grained sandstone			Temp: 24.97 °C redox: 184.4 mV	
		70	193 –	••••••••••••••••••••••••••••••••••••••	SILTSTONE - Dark grey, siltstone (60%) with 40% grey, medium grained			TDS: 2.411 g/L	
		71	194 -	· _ · _	sanostone				
		72	195 –	· ·	SANDSTONE - Grey, very fine grained sandstone (80%) with 20% grey silts	tone			
		73	196 -		SILTSTONE - Dark arey sittetana (90%) with 10% arey fine arained condet	one			
			197 –		Sone go, silotine (Sone) min rohe grey, me graned salidst				
		-/4	198 -	·				pH: 8.5 EC: 3660 μS/cm	
		75	100	· _ · _				redox: 180.8 mV TDS: 2.399 g/L	
		76	199 -		SANDSTONE - Grey, very fine grained sandstone (60%) with 40% dark grey siltstone				
		77	200 —	· _ · _	SILTSTONE - Dark grey/black				
		78	201 -						
		79	202 –		COAL - Black (Deards Coal)				
		80	203 -		COAL - Black, coal with 10% grey siltstone			pH: 8.52	
		81	204 -		COAL/SHALE - Black, coal and shale with 15% grey siltstone			EC: 3693 μS/cm Temp: 24.83 °C	
		82	205 -					TDS: 2.406 g/L	
		22	206 -		SILTSTONE - Cray sillstope (80%) with 20% arou fine to motion are included				
		-00	207 –		sandstone orey, sinstone (ou //) with 20 // grey, the to requiringrained				
		84	208		SANUS I UNE - Light grey, medium grained sandstone and 20% grey siltstone	9			
	X X	85	200 -						
		86	209 -		SHALE - Black, shale/coal (90%) with 10% grey siltstone			pH: 8.18 EC: 3686 µS/cm	

END OF BOREHOLE AT 269.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

GROUNDWATER BOREHOLE LOG

BORE NO.

TCMB03

SHEET 7 OF 8

Clie Pro Bor Pro	Client: Project: Bore Location: Project Number: Drilling Method: Drilling Company:			AGL Ei Hydrog Glouce 216240 Air Har	nergy Li geologic ster - Ti 6A	mited al Assessment - Gloucester Gas Project iedeman property ongyear 850	roject Date Commenced: 14/3/11 Date Completed: 16/3/11 Recorded By: NPH / JCD Log Checked By: JCD Surface RL: 123.18 mAHD				
Drill	ing	Company:	ہم ۲	lighlai	nd Drillin	ng Borehole Diameter: 140 mm	Co-ords	E 40250	3.15 N 6448909.61 MGA56		
В	ore	Informatio	n		1	Field Material Description					
WATER	WEL	L CONSTRUCTION	RL (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY		
			87 88 89 90	211 - 212 - 213 -		SHALE - Black, shale/coal (90%) with 10% grey siltstone (continued) COAL - Black, coal (80%) with 20% dark grey siltstone	F F S	ELOMA ORMATION Deards Coal Seam	1emp: 25.17 °C redox: 157.6 mV TDS: 2.388 g/L		
			91 92 93 94 95 96	214 - 215 - 216 - 217 - 218 - 219 -		SILTSTONE/SHALE - Black, siltstone/shale SILTSTONE - Grey, siltstone SANDSTONE - Light grey, medium grained sandstone (60%) with 40% grey siltstone SANDSTONE/SILTSTONE - Light grey, medium grained sandstone (50%) with 50% grey siltstone SILTSTONE - Grey, siltstone (90%) with 10% light grey, medium grained sandstone	F	ELOMA ORMATION	pH: 8.17 EC: 2841 μS/cm Temp: 24.31 °C redox: 182.5 mV TDS: 1.871 g/L		
	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		97 98 99 100 101	220 - 221 - 222 - 223 - 224 - 225 -		SANDSTONE - Light grey, medium grained sandstone (80%) with 20% grey siltstone SILTSTONE - Grey, siltstone (80%) with 20% grey, fine to medium grained sandstone and clay			pH: 8.08 EC: 2909 μS/cm Temp: 24.58 °C redox: 8.2 mV TDS: 1.906 g/L		
			102 103 104 105 106 107	226 - 227 - 228 - 229 - 230 -		SANDSTONE - Light grey/white, medium grained sandstone (80%) with 20% gr siltstone	//////////////////////////////////////		pH: 7.1 EC: 2899 μS/cm Temp: 22.97 °C redox: 100 mV TDS: 1.96 g/L		
	ALKVIN VIN VIN		108 109 110 111 112 113	231 - 232 - 233 - 234 - 235 - 236 -		SANDSTONE - Light grey, fine to medium, carbonaceous stained sandstone (9 with 10% siltstone	90%)		pH: 7.82 EC: 3036 μS/cm Temp: 23.47 °C redox: 13.2 mV TDS: 2.034 g/L		
	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		114 115 116 117	237 - 238 - 239 - 240 -		sandstone SANDSTONE - Grey, fine to medium grained, carbonaceous stained sandstone (90%) with 10% grey siltstone SILTSTONE - Grey, siltstone (60%) with 40% grey, fine grained sandstone	e		pH: 7.75 EC: 3119 µS/cm Temp: 23.74 °C redox: 64 6 mV		
		XIIXXIIXXIIXX	118 119 120 121	241 - 242 - 243 - 244 -		SANDSTONE - Light grey, fine to medium grained, carbonaceous stained sandstone (70%) with 30% grey siltstone			TDS: 2.077 g/L		
						END OF BOREHOLE AT 269.00 m					



BORE NO.

TCMB03

	Ŷ	EARS ®								SHEET 8 OF 8
Clie Proj Bore Proj	Client: Project: Bore Location: Project Number: Drilling Method:		₽ - - 2	√GL Er łydrog ≩louce 216240	nergy Li geologic ster - T 16A	imited cal Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log (Commence Completed: orded By: Checked By:	1/3/11 5/3/11 PH / JCD CD	
Drill	ing Me	ethod:	A	vir Har	nmer - I	Longyear 850	Surfa	ace RL: 123	.18 mA	HD
Drilli	ing Co	ompany:	Η	lighlar	nd Drilli	ng Borehole Diameter: 140 mm	Co-o	rds: E4	02503.1	5 N 6448909.61 MGA56
B	ore Inf	formatio	n I		т	Field Material Description				
			AHD	Ê	ő					
WATER	WELL CO	NSTRUCTION	RL (AHDm)	DEPTH (BG	GRAPHIC L	LITHOLOGY		FORMATIO (Approximate	N e)	HYDROGEOLOGY
			122			SANDSTONE - Light grey, fine to medium grained, carbonaceous stained sandstone (70%) with 30% grey siltstone (continued)		LELOMA FORMATIC	ואר	pH: 7.79 EC: 2985 µS/cm
	88	}	123	246 -						Temp: 23.8 °C redox: -35.1 mV
	3 3		124	247 –						TDS: 1.986 g/L
	88		125	248 -		SILTSTONE - Grey and grey/brown, siltstone (70%) with 30% grey, fine gra	ained			
	88		126	249 -		sandstone				
	38	{	127	250 —	· — · —	-				
	88	{ {	-121	251 -		SANDSTONE - Grey, fine grained sandstone (70%) with 30% brown sillston	ne			
	38		128	201 -						pH: 7.71 FC: 3121 uS/cm
	$\Im \boxtimes$		129	252 -		SILTSTONE - Dark grey, siltstone (60%) with 40% light grey, fine to mediun grained sandstone	n			Temp: 24.09 °C redox: -86.8 mV
	88		130	253 -		SANDSTONE - Grey, fine to medium grained sandstone (90%) with 10% da	ark grey			TDS: 2.064 g/L
	88		131	254 -		sitstone				
	\mathbb{X}		-132	255 –		SUITSTONE . Grov eiltetone (00%) with 10% hrown siltstone				
	88		-102	256 -	- <u>-</u>					
		Bentonite seal	133	200		- -				
			134	257 -						pH: 7.7 FC: 3214 uS/cm
			135	258 -						Temp: 24.46 °C redox: -55.6 mV
		Gravel 5	136	259 -		COAL - Black, cloverdale coal/shale (90%) with 10% dark grey siltstone		JILLEON		TDS: 2.111 g/L
	ii Hii	graded	137	260 —				FORMATIC	ON Coal	
	目		- 138	261 –				Seam	Cuai	
				262 -						
			139	202		COAL/SHALE - Black, cloverdale coal/shale (60%) with 40% grey, tine grain sandstone	ined			
			-140	263 -		SILTSTONE - Dark grey, siltstone (60%) with 40% black coal/shale				pH: 7.9
			141	264 -		COAL - Black coal/shale (80%) with 20% dark brown siltstone				Temp: 23.91 °C redox: -24.1 mV
			142	265 -						TDS: 1.903 g/L
	i Pi	50_mm ID,	143	266 -		SANDSTONE - Light grey, fine to medium grained sandstone (50%) with 30'	% dark	JILL FON		
		0.5 mm aperture stainless	144	267 –		grey siltstone and 20% black coal/shale		FORMATIC	ON	-11-7-00
		steel screen	445	268 -						pH: 7.08 EC: 2999 μS/cm Temp: 24 17 °C
	<u>pg pg</u>	bore collapse/ infill	140	260 -						redox: -96.7 mV TDS: 1.981 g/L
			146	208 -						100.10019-
			147	270 —						
			148	271 -						
			149	272 -						
			150	273 –						
			151	274 -						
			152	275 -						
			-102	276 -						
			153	210						
			154	277 –						
			155	278 -						
			156	279 –						

END OF BOREHOLE AT 269.00 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

TGMB01

TEARS &							SHEET I OF I
Client: Project: Bore Location: Project Number:	AGL Er Hydrog Glouce 216240	nergy Lim geological ster - Tieo 6A	ited Assessment - Gloucester Gas Project deman property	Date Date Reco Log (Comme Comple orded By Checked	enced: 2 eted: 2 r: I d By: .	2/2/11 2/2/11 NPH JCD
Drilling Method:	Air Har	nmer - Lo	ngyear 850	Surfa	ace RL:	133.66 m	AHD
Drilling Company:	Highlar	nd Drilling	Borehole Diameter: 140 mm	Co-o	ords:	E 403323	.58 N 6448544.46 MGA56
Bore information	-		Field Material Description				
WELL CONSTRUCTION	RL (AHDm) AHC DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY		FOR (Appr	MATION oximate)	HYDROGEOLOGY
50 mm ID PVC Class 18 & grout	- 133 1 -	v v	VEATHERED CLAY - Red, brown and grey, hard dry clay		JILLEC	on Ation	
Bentonite seal	- 132 2 -						
	- 131 3 -	v	VEATHERED ROCK - Red and grey, weathered siltstone/claystone with so lay	ome			
UPVC Screen Screen	- 130 4 -						
	- 129 5 -						
	· 128 6 –	· _ ·					
_	- 127 7 –						
_	- 126 8 -						
	- 125 9 –						
-	124						



BORE NO.

TGMB02

	YEARS ®									SHEET 1 OF '
Clie Pro Bor Pro	nt: ject: e Location: ject Number:	A H G 2	GL Er lydrog Glouce 16240	nergy Li geologic ster - T 6A	mited cal Assessment - Gloucester Gas Project iedeman property	Date Date Reco Log (ate Commenced: ate Completed: ecorded By: og Checked By:		1/2/11 1/2/11 NPH JCD	
Dril Dril	ing Method: ing Company	А : Н	vir Har lighlar	nmer - I nd Drilli	Longyear 850 ng Borehole Diameter: 140 mm	Surfa Co-o	ace RL: ′ rds: I	133.83 m E 403330	nAHD).41 N	6448543.12 MGA5
В	ore Informati	on	•		Field Material Description				-	
WATER	WELL CONSTRUCTION	Z RL (AHDm) AHI	DEPTH (ВGLm)	GRAPHIC LOG	LITHOLOGY		FORM (Appro)	ATION ximate)		HYDROGEOLOGY
	50 mm IL Class 18 uPVC & grout	- 133	1 –		CLAY - Red/brown, mottled dry, low plasticity clay		JILLEO FORMA	N ATION		
		- 132	2 -							
		- 131	3 -		CLAY - White, dry, weathered clay with some red/brown/grey mottled clay					
		- 130	4 -		CLAY - Brown, dry, weathered clay with some red/brown/grey motiled clay					
		- 129	5 -							
		- 128	6 -		CLAY - Brown/green, dry weathered clay					
		- 127	7 –	· _ · _	WEATHERED SILTSTONE - Grey, well weathered siltstone					
		- 126	8 -	· _ · _						
		- 125	9 –	· _ · _ · _	WEATHERED SILTSTONE - Grey, weathered siltstone with some coal fines grey siltstone chips	s and —				
	Bentonite seal	- 123	10 —	· _ · _						
	Gravel 5	- 122	11 -	· _ · _						
	50 mm ID 0.5 mm uPVC screen), - 121	12 -		COAL - Black, weathered, dry coal with a small amount of sitstone		JILLEO FORMA Rosevill Seam	N ATION e Coal		
		- 120	14 -		SILTSTONE - Grey, weathered siltstone with some grey siltstone chips		JILLEO			
		- 119	15 -	· _ ·			TORWA			
		- 118	16 -							
		- 117	17 –							
		- 116	18 -							
		- 115	19 –							
		⊢ 114		1		I			1	

END OF BOREHOLE AT 15.40 m



BORE NO.

TMB01

SHEET 1 OF 1

Clie Pro Bor Pro	e Location: ject: ject Number:	AGL Hydr Glou 2162	Energy Li rogeologic Icester - Ti 2406A	mited al Assessment - Gloucester Gas Project edeman property	Date Comm Date Compl Recorded B Log Checke	enced: eted: y: d By:	18/1/11 18/1/11 NPH / JCD JCD	
Dril Dril	ling Method: ling Company:	Air H High	lammer - L Iland Drillir	.ongyear 850 ng Borehole Diameter: 140 mm	Surface RL: Co-ords:	106.82 r E 40199	mAHD 16.99 N 6449419.74 MGA56	
В	ore Information	1		Field Material Description				
WATER	WELL CONSTRUCTION	RL (AHDm) AHD	UEPTH (BGLM) GRAPHIC LOG	LITHOLOGY	FO (Ap	RMATION proximate)	HYDROGEOLOGY	
	Somm ID Class 18 uPVC & grout Bentonite seal Sump/ bentonite plug	$\begin{array}{c} -106 \\ -105 \\ 2 \\ -104 \\ -103 \\ -103 \\ -102 \\ -101 \\ -100 \\ -100 \\ -100 \\ -100 \\ -100 \\ -101 \\ -100 \\ -100 \\ -101 \\ -100 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 \\ -101 $	$1 = \frac{2}{2}$ $2 = \frac{2}{2}$ $3 = \frac{2}{2}$ $4 = \frac{2}{2}$ $6 = \frac{2}{2}$ $6 = \frac{2}{2}$ $7 = \frac{2}{2}$ $6 = \frac{2}{2}$ $7 = \frac{2}{2}$	TOPSOIL - Brown, organic, dry topsoil: small amounts of sand and clay pr CLAY - Brown and motified brown/grey, low to high plasticity clay VEATHERED CLAYSTONE - Black, organic rich, high plasticity clay with light grey weathered siltstone/claystone WEATHERED TUFF - Light green/cream, medium grained weathered tuff WEATHERED TUFF - Light green/cream, medium grained weathered tuff END OF BOREHOLE AT 12.00 m	some Glouc Coal f	ester Measures	pH: 6.91 EC: 3619 US/cm Temp: 26.82 °C Redox: -15 mV	



BORE NO.

TMB02

	YEARS ®						SHEET 1 OF 1		
Clie Pro Bor Pro	nt: ject: e Location: ject Number:	AGL Hydr Gloue 21624	Energy L ogeologic cester - T 406A	imited Da cal Assessment - Gloucester Gas Project Da iedeman property Re Lo	Date Commenced: 18/1/11 as Project Date Completed: 18/1/11 Recorded By: NPH Log Checked By: JCD				
Drill Drill	ling Method:	Air H Hiahl	ammer -	Longyear 850 St	Inface RL:	106.81 mA	HD N 6449100 65 MG456		
	ing company.	- Ingin			-0103.	L 401303	N 0445100.05 MICA50		
в	ore information	n		Field Material Description					
		д â) g						
WATER	WELL CONSTRUCTION	RL (AHDm) A DEPTH (BGI	GRAPHIC LC	LITHOLOGY	FORI (Appro	MATION oximate)	HYDROGEOLOGY		
	S0 mm ID Class 18 uPVC & grout Gravel C C C C C C C C C C C C C C C C C C C	\vec{x} \vec{x} - 106 1 - 105 2 - 104 3 - 103 4 - 102 5 - 101 6 - 100 7 - 99 8 - 99 8 - 99 8 - 99 10 - 96 11 - 95 12 - 94 13 - 95 12 - 94 13 - 93 14 - 92 15 - 91 16 - 91 16 - 90 17 - 89 18 - 88		TOPSOIL/CLAY - Brown, Ibarny, dry clay and topsoil CLAY - Grey, clay with brown, Ibarny, dry soil SANDY CLAY - Light brown/grey, sandy clay CLAY - Grey and brown/yellow, mottled, sticky, moist clay CLAY - Grey and brown/yellow, mottled, sticky, moist clay GRAVELS/CLAY - Grey/yellow/brown, mottled clay with medium grained mixed gravels MIXED GRAVELS - Grey and brown, predominantly coarse to medium grained mixed gravels (up to 4 cm) MIXED GRAVELS - Light brown, fine to medium grained mixed gravels, with a few pebbles (up to 2 cm) SILTSTONE - Dark grey, soft siltstone with a few pebbles (up to 2 cm) SILTSTONE - Dark grey, soft siltstone with a few pebbles (up to 2 cm) SILTSTONE/CLAYSTONE - Dark grey/light grey, 50% light grey, fine grained — sandstone, 50% dark grey siltstone SANDSTONE - Light grey, medium and fine grained sandstone	Avon R Alluviur	iver m ster easures	pH: 6.81 EC: 2413 µS/cm Temp: 27.4 °C Redox. 60.5 mV DO: 25.1 % Sat DO: 1.91 mg/L pH: 7.61 EC: 3905 µS/cm Temp: 18.63 °C Redox. 68.4 mV DO: 25.1 % Sat DO: 5.04 mg/L		
		19 - 87	-						



BORE NO.

TMB03

	, Y	IOO YEARS ®						SHEET 1 OF				
Clie Pro Bor Pro	Client: Project: Bore Location: Project Number: Drilling Method:		A H G 21	GL Er ydrog louce 16240	nergy Li geologic ster - T 6A	mited al Assessment - Gloucester Gas Project iedeman property	Date Commenced: Date Completed: Recorded By: Log Checked By:		ced: 19 ed: 19 NI By: JC	19/1/11 19/1/11 NPH JCD		
Dril Dril	ling Me ling Co	ethod: ompany:	Ai Hi	ir Har ighlar	nmer - <mark>I</mark> nd Drilliı	Longyear 850 ng Borehole Diameter: 140 mm	Surfa Co-o	ace RL: 1 rds: E	06.48 mA	HD N 6448755.09 MGA56		
В	ore In	formation	n			Field Material Description						
			DHA	Ê	g							
WATER	WELL CO	ONSTRUCTION	RL (AHDm) /	DEPTH (BGL	GRAPHIC LO	LITHOLOGY		Forma (Approxi	TION mate)	HYDROGEOLOGY		
		50 mm ID Class 18 uPVC & grout	- 106	1 –		TOPSOIL - Brown, brown, dry sandy clayey topsoil. clay is hard with low pla SANDY CLAY - Golden brown and grey, golden brown and grey, dry sandy c	asticity clay	Avon Riv Alluvium	er			
		Gravel backfill	- 105	2 -		CLAY - Red/brown sticky, red/brown sticky, medium plasticity clay						
		Bentonite seal	- 104	3 -		SANDY CLAY - Yellow/grey, mottled sandy clay with a few pebbles						
		Gravel 5	- 103	4 –		MIXED GRAVEL - Light brown, light brown, coarse grained gravels with large	e					
		mm graded	- 102	5 –		pebbles (up to 5 cm)						
\forall		0.5 mm aperture uPVC screen	- 101	6 -		SANDY GRAVEL - Gold, fine grained sandy gravel with a few larger pebbles	s (up to			pH: 7.28 EC: 5550 μS/cm Temp: 22.01 °C Redox: 8.8 mV		
			- 100	7 -		2 cm) MIXED GRAVEL - Grey, medium grained mixed gravel with a few pebbles ar	nd			DO: 53.5 % Sat DO: 4.6 mg/L		
			- 99	8 –		some clay MIXED GRAVEL/SHALE - Grey/black, 50% grey, fine to medium grained mix	xed			pH: 7.39 EC: 5564 μS/cm Temp: 21.3 °C Redox: 7.3 mV		
			- 98	9 –		gravel and 50% black shale SAND - Grey, 80% grey, fine grained sand with some grey siltstone and				DO: 65.4 % Sat DO: 5.61 mg/L		
			- 97 - 96	10 —		sandstone, and mixed gravels						
		Sump/ bentonite plug	- 95	11 –		SAND/MIXED GRAVELS - Grey/brown, 50% grey, fine grained sand and 50 brown mixed gravels	%					
			- 94	12 –	· _ ·	SILTSTONE/SANDSTONE - Grey, 50% grey siltstone and 50% grey, very fi grained sand with some brown mixed gravels	ine	Gloucest Coal Mea	er asures	pH: 7.73 EC: 6.029 µS/cm Temp: 21.59 °C Redox: -30.9 mV DO: 46.9 % Sat		
			- 93	13 -						DO: 4.06 mg/L		
				14 -								
			- 92									

END OF BOREHOLE AT 12.50 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

TMB04

		YEARS ®								SHEET 1 OF 1
Clie Pro Bor Pro	ent: ject: e Loc ject N	ation: Number:	A H G 2'	GL Er ydrog louce 16240	nergy Li geologic ster - Ti 6A	mited al Assessment - Gloucester Gas Project edeman property	Date Date Reco Log	Comme Comple orded By Checked	enced: 1 eted: 1 /: N d By: J	7/1/11 7/1/11 IPH CD
Dril	ling M	lethod:	A	ir Har	nmer - I	ongyear 850	Surfa	ace RL:	124.47 m/	AHD .
Dril	ling C	ompany:	Н	ighlar	nd Drillin	Borehole Diameter: 140 mm	Co-o	ords:	E 402558.	06 N 6448921.76 MGA56
В	ore Ir	nformatio	1		1	Field Material Description				
			DHA	Ê	g					
WATER	WELL C	CONSTRUCTION	RL (AHDm) /	DEPTH (BGL	GRAPHIC LO	LITHOLOGY		FOR (App	MATION roximate)	HYDROGEOLOGY
		50 mm ID Class 18 uPVC & grout	- 124			CLAY - Brown/yellow, brown/yellow, dry clay with chips of fill		LELON FORM	MA IATION	
		Gravel		1 -	· · /· ·	SANDY CLAY - Light brown/yellow, light brown/yellow, low plasticity sandy	y clay			
	Pd R		- 123		· .//.					
		\langle		2 -	(· · / · ·					
	fq ((- 122							
	ba b	4	101	3 –						
			- 121	4	· / · · · /					
	PH P		- 120	4 -		CLAY/LOAM - Dark brown, clay loam with some sticky grey clay				
		$\langle \rangle$		5 -	\angle					
	Kd K		- 119	-	$\langle \langle $	SOIL - Dark brown, organic clayey loamy soil				
	5	Bentonite		6 -		CLAY - Light brown/grev_soft clay				
		seal	- 118							
		· Gravel 5		7 -						
		graded	- 117							
		• 50 mm ID,		8 -		some weathered siltstone				
		aperture uPVC	- 116							
		•		9 -						
		· .	- 115							
			- 114	10 —	· _ · _	WEATHERED SILTSTONE - Grey to light grey, weathered siltstone and n	ninor clay			
		•	114	11 -	 					
		•	- 113		<u> </u>					
		•		12 –	<u> </u>					
			- 112		· _ · _					
	ŀ.₿:	·]		13 –	· _ · _					
		•	- 111							
	¦ <u> </u>	Sump/		14 -	· _ · _	SILTSTONE - Dark grey, siltstone				
		plug	- 110		··_					
				15 -	· _ · _					
			- 109							
				16 -						
			- 108							
			- 107	17 -						
			107	18 -						
			- 106	10 -						
				19 –						
-		- 105								



BORE NO.

TMB05

YEARS ®											SHEET 1 OF 1
Clie Pro Bor Pro	nt: ect: e Loc ect N	ation: lumber:	A H G 2 [⁄]	GL Er ydrog louce 16240	nergy Li jeologic ster - Ti 6A	mited al Assessment - Gloucester Gas Project iedeman property	Date Commenced: 17/1/11 Date Completed: 17/1/11 Recorded By: NPH Log Checked By: JCD				
Drill	ing M	ethod:	A	ir Han	nmer - l	Longyear 850	Surfa	ace RL:	118.63 n	nAHD	
Drill	ing Co	ompany:	Н	ighlar	nd Drillii	Borehole Diameter: 140 mm	Co-o	ords:	E 40265	0.17	N 6448725.4 MGA56
в	ore in	itormation	ו			Field Material Description					
			AHD	(m	OG						
WATER	WELL C	ONSTRUCTION	RL (AHDm)	DEPTH (BG	GRAPHIC L	LITHOLOGY		FOF (App	RMATION roximate)		HYDROGEOLOGY
	So mm ID Class 18 uPVC & grout Gravel backfill Bentonite seal Bentonite seal Gravel 5 mm graded So mm ID, 0,5 mm graded So mm ID, 0,5 mm graded So creen So creen		- 118 - 117 - 116 - 115 - 114 - 113 - 112 - 111	1 - 2 - 3 - 4 - 5 - 6 - 7 -		CLAYEY TOPSOIL - Dark brown, mottled clayey topsoil WEATHERED SILTSTONE - Grey, weathered siltstone, sandstone and ck with some dark brown clay Slightly sandy WEATHERED CLAYSTONE - Dark brown, sandy clay with some fine grain weathered sandstone chips SILTSTONE - Grey, soft siltstone with some sandy clay	aystone	LELO	MA IATION		
		Sump/ benionite plug	- 110 - 109 - 108 - 107 - 106 - 105 - 105	8 - 9 - 10 11 - 12 - 13 - 14 -							
						END OF BOREHOLE AT 10.00 m					



BORE NO.

WMB01

	Ÿ	ÉARS ®								SHEET 1 OF 1	
Clie Pro Bor Pro	ent: ject: re Loca ject N	ation: umber:		AGL E Hydrog Glouce 216240	nergy Li geologic ester - W 06A	mited al Assessment - Gloucester Gas Project /aukivory Road	Date Date Reco Log	Commo Comple orded By Checkee	enced: 20/ eted: 20/ /: NP d By: JC	20/1/11 20/1/11 NPH JCD	
Dril	ling Me	ethod:		Air Hai Highla	mmer - I nd Drillin	Longyear 850 Recebele Diameter: 140 mm	Surfa	ace RL:	111.06 mAH	ID 8 N 6454007 15 MC 456	
В	ore In	formation	<u>า</u>	Ingina		Field Material Description	0-0	105.	E 4047 90.03	5 N 0434007.13 MGA30	
			0		(1)						
WATER	WELL CO	ONSTRUCTION	RL (AHDm) AH	DEPTH (ВGLm	GRAPHIC LOO	LITHOLOGY		FOF (App	RMATION roximate)	HYDROGEOLOGY	
		50 mm ID Class 18 uPVC & grout Bentonite seal Gravel 5 mm graded 50 mm ID, 0.5 mm aperture uPVC screen Sump/ bentonite plug	- 11	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		CLAY - Brown/grey, mottled, sticky clay with brown, orange and white per GRAVEL - Brown/grey, mottled, sticky clay with brown, orange and white per grey, sandy, sticky clay and white, fine to medium mixed gravels with grey, sandy, sticky clay SAND - Grey, fine grained sand with some red and brown pebbles (up to the SANDSTONE/SAND - Light grey, fine to medium grained, soft, dry sandst light grey, fine grained sand	bbles bbles	Alluviu			
				This bo	orehole loo	END OF BOREHOLE AT 8.50 m g should be read in conjunction with Parsons Brinckerh	noff's acco	mpanying	standard notes.		

PP 100 VEARS ®

GROUNDWATER BOREHOLE LOG

BORE NO.

WMB02

SHEET 1 OF 1

Clier Proje Bore Proje	vears ® It: ect: Location: ect Number:	AG Hy Glo 216	iL En drog buce: 6240	nergy Li Jeologic ster - W 6A	mited al Assessment - Gloucester Gas Project /aukivory Road	Date Date Reco Log	e Commer e Complete orded By: Checked	nced: 24 ed: 24 Ni By: JC	SHEET 1 OF 1 #/1/11 PH CD
Drilliı Drilliı	ng Method: ng Company:	Air Hig	Han ghlan	nmer - L Id Drillir	Longyear 850 ng Borehole Diameter: 140 mm	Surfa Co-c	ace RL: 1 ords: E	106.13 mA E 403908.1	HD 3 N 6454390.73 MGA56
Bo	re Information	n			Field Material Description				
WATER	VELL CONSTRUCTION	B RF (AHDm) AHD	DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY CLAY - Brown, medium plasticity clay with some red/grey/yellow mottling		FORM. (Approx WENHA FORMA	ATION kimate)	HYDROGEOLOGY
	Bentonite seal Bentonite seal Bentonite seal Bentonite seal So mm ID, 0.5 mm graded So mm ID, 0.5 mm graded	$\begin{array}{ccccc} - 105 \\ - 104 \\ - 103 \\ - 102 \\ - 101 \\ - 100 \\ - 99 \\ - 99 \\ - 99 \\ - 99 \\ - 99 \\ - 97 \\ - 96 \\ - 97 \\ - 97 \\ - 97 \\ - 91 \\ - 90 \\ - 89 \\ - 88 \\ - 88 \end{array}$	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 10 - 17 - 18 - 10 - 10 - 10 - 10 - 10 - 10 - 10		SANDY CLAY - Light brown/gold, fine and medium grained sandy clay. less than above CLAY - Red/brown, low plasticity dry clay with some grey mottling SANDY CLAY - Light and dark brown, medium and fine grained sandy clay SANDY CLAY - Light brown, fine grained sandy clay. less clay than above SANDY CLAY - Dark brown, very fine grained sandy clay WEATHERED ROCK - Grey, very fine grained well weathered rock with a fi siltstone chips SANDSTONE - Dark grey, fine grained sandstone. poor return some soft mudstone	clay	FORMA	TION	pH: 7.46 EC: 5351 µS/cm Temp: 31.09 °C Redox: 55.1 mV DO: 3.16 mg/L
	Sump/ bentonite plug	- 87 - 86 - 85 - 84 - 83 - 82	20 21 - 22 - 23 - 24 -						pH: 7.78 EC: 4162 µS/cm Temp: 22.15 °C Redox: 30.1 mV DO: 56.8 % Sat DO: 4.88 mg/L
					END OF BOREHOLE AT 23.00 m		I		



BORE NO.

WMB03

Clie Pro Bor Pro Dril	ent: ject: ject Number: ling Method: ling Company:	AGL E Hydrog Glouce 216240 Air Ha Highla	AGL Energy Limited Da Hydrogeological Assessment - Gloucester Gas Project Da Gloucester - Waukivory Road Re 2162406A Log Air Hammer - Longyear 850 Su Highland Drilling Barehole Diameter: 140 mm			Commen Complete ded By: hecked E e RL: 1	aced: 25 ed: 25 NF By: JC 06.39 mAF	25/1/11 25/1/11 NPH JCD mAHD		
ГВ	ore Information	וופוות ו		Field Material Description	00 010	J.J. L	- +00017.0			
		<u> </u>	(1)	· ····						
WATER	WELL CONSTRUCTION	RL (AHDm) AF DEPTH (BGLm	GRAPHIC LOO	LITHOLOGY		FORMA (Approxi	ATION imate)	HYDROGEOLOGY		
	Somm ID Class 13 grout grout Gravel backfill C C C C C C C C C C C C C C C C C C	$\begin{array}{c} -106 \\ 1 \\ -105 \\ 2 \\ -104 \\ 3 \\ -103 \\ -102 \\ -101 \\ -102 \\ -101 \\ -100 \\ -101 \\ -99 \\ -99 \\ -99 \\ -99 \\ -99 \\ -99 \\ -99 \\ -97 \\ -99 \\ -99 \\ -97 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -11 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -10 \\ -$		TOPSOIL & CLAY - Brown, organic soil with some brown/grey, dry clay CLAY - Mottled red and grey, medium plasticity, sticky clay SANDY CLAY - Light brown, medium grained sand with some grey/red mott Red/brown Light brown/gold/grey WEATHERED ROCK - Grey, well weathered rock with a few chips of soft g CLAYSTONE - Grey, soft claystone CLAYSTONE - Grey, soft claystone	grey	WENHAI	MS TION			
l		This be	orehole log	should be read in conjunction with Parsons Brinckerho	off's accom	panying sta	andard notes			



BORE NO.

WMB03

Clie Pro Bor	vert: nject: re Location:	AGL E Hydrog Glouce	nergy Li geologic ester - W	mited [al Assessment - Gloucester Gas Project] /aukivory Road R	Date Commer Date Complet Recorded By:	nced: 25 ed: 25 NF	/1/11 /1/11 /H
Pro	ject Number:	216240)6A	L	og Checked	By: JC	D
Dril	ling Method:	Air Ha	mmer - l	Longyear 850 S	Surface RL: 1	106.39 mAH	
Din B	Ing Company.		חוו זע חמו	Ig Borenole Diameter. 140 mm	Jo-orus. I	E 403917.0	9 N 6454301.21 WGA30
				Field Material Description			
WATER	WELL CONSTRUCTION	RL (AHDm) AHD DEPTH (BGLm)	GRAPHIC LOG	LITHOLOGY	FORM. (Approx	IATION ximate)	HYDROGEOLOGY
WA VIEW	Grout Grout Bentonite seal Bentonite seal Gravel 5 mm graded So mm ID, 0.5 mm graded So mm ID, 0.5 mm graded	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		CLAYSTONE - Grey, soft claystone (continued) CLAYSTONE - Dark grey, sticky with a few claystone chips CLAYSTONE - Dark grey, 70 % dark grey soft claystone, 30% dark grey, fine grained sandstone COAL - Black, highly reflective soft coal	WENHA FORMA	AMS TION	pH: 7.01 EC: 4047 µS/cm Temp: 29.71 °C Redox: 58 mV DO: 43.9 % Sat DO: 3.3 mg/L EC: 3896 µS/cm Temp: 28.74 °C Redox: 22.1 mV DO: 30.1 % Sat DO: 2.28 mg/L
	Sump/ bentonite plug	- 72 - 71		CLAYSTONE - Dark grey, sticky with a few claystone chips CLAYSTONE - Light grey, soft claystone with some sticky clay	WENHA FORMA	AMS	pH: 7.24
		36 - 70 37 - 69 38 - 68 39 - 67					EC: 4263 µS/cm Temp: 29.41 °C Redox: 99 mV DO: 47.6 % Sat DO: 3.58 mg/L
				END OF BOREHOLE AT 36.00 m			



BORE NO.

WMB04

Clie Pro Bor Pro	nt: ject: e Lo ject)catic Num	on: ber:	A H G 2 ⁴	GL Er ydrog louce 16240	nergy Li jeologic ster - W 6A	mited al Assessment - Gloucester Gas Project /aukivory Road	Date Date Reco Log (Commo Comple orded By Checked	enced: eted: /: d By:	20/1/11 21/1/11 NPH / JCD JCD	<u> </u>
Drilling Method:		ig Method:		Air Har		nmer - L	ongyear 850 Borobole Diameter: 140 mm	Surfa	ace RL:	106.12 m ⊏ 40390	mAHD	5
В	ore	Info	matior	<u>ייי</u> ו	griiai		Field Material Description	0-0	105.	L 40330	13.44 N 0434332.31 MGA3	ĩ
						(1)						_
WATER	WELL	. CONST	TRUCTION	RL (AHDm) AF	DEPTH (BGLm	GRAPHIC LOC	LITHOLOGY		FOF (App	MATION roximate)	HYDROGEOLOGY	
			JU mm ID Class 18 JPVC & grout	- 105 - 105 - 104 - 103	1 - 2 - 3 -		CLAY - Red/grey/brown, mottled, hard dry clay SANDY CLAY - Brown, fine to medium grained sandy clay	ay	WENF FORM	IAMS IATION		
		NY N		- 102 - 101 - 100	4 - 5 - 6 - 7 -							
			Gravel	- 98 - 97 - 96	8 - 9 - 10 -							
			-	- 95 - 94 - 93 - 92	11 - 12 - 13 - 14 -		WEATHERED ROCK - Dark grey, very well weathered rock with a few clay and sandstone chips	istone				
\land			-	- 91 - 90 - 89 - 88	15 - 16 - 17 - 18 -		SANDSTONE - Dark grey, fine grained sandstone with a few chips of light b soft mudstone	brown,			pH: 7.44 EC: 4680 µS/cm Temp: 24.2 °C Redox: -12.5 mV	
				- 87 - 86 - 85	19 - 20 - 21 -						DO: 57 % Sat DO: 4.68 mg/L	
				- 84 - 83 - 82 - 81	22 - 23 - 24 - 25 -						pH: 7.62 EC: 4253 μS/cm Temp: 22.68 °C Redox: -62.9 mV DO: 55.7 % Sat DO: 4.72 mg/L	
				- 80 - 79 -	26 - 27 -		END OF BOREHOLE AT 80.50 m		monuina	etenderd n		



BORE NO.

WMB04

	YEARS ®							SHEET 2 OF 3
Client: Project: Bore Location: Project Number:		A H G 2'	AGL Energy Limited I Hydrogeological Assessment - Gloucester Gas Project Gloucester - Waukivory Road 2162406A		Date Date Reco Log (Date Commenced:20/1/11Date Completed:21/1/11Recorded By:NPH / JCDLog Checked By:JCD		
Drilling Method:		A	ir Har	nmer - l	ongyear 850	Surfa	ace RL: 106.12 m	AHD
Drilli	ng Company:	н	ighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-o	rds: E 403903	.44 N 6454392.51 MGA56
B	ore Information	n I			Field Material Description			
		AHD	(m	OG				
WATER	WELL CONSTRUCTION	RL (AHDm)	DEPTH (BG	GRAPHIC L	LITHOLOGY		FORMATION (Approximate)	HYDROGEOLOGY
	38	- 78		· _ · _	SILTSTONE - Dark grey, 70% dark grey siltstone and 30% medium to fine gr dark grey sandstone	rained	WENHAMS FORMATION	
		- 77	29 -					pH: 7.62
		- 76	30 —	· _ · _				EC: 4070 µS/cm Temp: 22.83 °C
	38			· _ · _				Redox: -16.4 mV DO: 50.6 % Sat
		- 75	31 -	· _ · _				DO. 4.20 mg/L
		- 74	32 -	· _ · _				
			33 -					
		- 73	33 -		SANDSTONE - Dark grey, fine grained sandstone			
		- 72	34 -	<u> </u>	SILTSTONE - Dark grey, siltstone			
	I II	- 71	35 -		SANDSTONE - Dark grey, very fine grained sandstone			
			26					pH: 7.75 EC: 4147 μS/cm Temp: 22.96 °C
		- 70	30 -		SILTSTONE - Dark grey, siltstone			Redox: -48 mV DO: 50.5 % Sat
) ()	- 69	37 -	· _ · _				DO: 4.23 mg/L
		- 68	38 -	· _ · _				
				· _ · _				
		- 67	39 -	· _ · _				
		- 66	40 —	· _ · _				
		65	41 –	· _ · _				
				· _ · _				pH: 7.72 EC: 4115 μS/cm
		- 64	42 -	· _ · _				Redox: 10.5 mV
		- 63	43 -	· _ · _				DO: 4.07 mg/L
			44 –	· _ · _				
	38	- 62		· _ · _				
		- 61	45 -	· ·				
		- 60	46 -	· _ · _				
	I II		47	· _ · _				
	<pre></pre>	- 59	47 -	· _ · _				pH: 7.73 FC: 4188 uS/cm
		- 58	48 -	· _ · _				Temp: 23.16 °C Redox: -48.3 mV
	I I	57	49 -	· ·				DO: 49.9 % Sat DO: 4.22 mg/L
		- 5/			SHALE - Black, 70% black, soft shale with 30% light brown, soft mudstone. p return	boor	WENHAMS FORMATION	
		- 56	50 —		SHALE/COAL - Black, 80% black, soft shale and coal with 20% light brown, s mudstone	soft —	Bowans Road Coal Seam`	
	I II	- 55	51 -				oou ocum	
			50 -					
		- 54	J2 -					
	38	- 53	53 -		MUDSTONE - Dark brown, mudstone with some grey clay		WENHAMS	- pH: 7.7
		- 52	54 -	$\models = =$			FORMATION	EC: 4253 µS/cm Temp: 21.03 °C
								Redox: 46.2 mV DO: 50.6 % Sat DO: 4 4 mc/l
		- 51	55 -		MUDSTONE/SILTSTONE - Dark grey, soft mudstone/siltstone			So. T.T IIIg/E
1 1		1						

END OF BOREHOLE AT 80.50 m This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.



BORE NO.

WMB04

Clie Pro Bor Pro Drill	int: ject: e Lo ject l	cation: Number:	A H G 2	GL Ei lydrog ilouce 16240 ir Har	nergy Li geologic ester - W 16A mmer - I	mited al Assessment - Gloucester Gas Project /aukivory Road _ongvear 850	Date Date Reco Log	Comme Comple orded By Checkee	enced: eted: /: d By: 106.12	20/1 21/1 NPH JCD	SHEET 3 OF 3 /11 /11 I / JCD
Drill	ing C	Company:	н	lighlar	nd Drillin	ng Borehole Diameter: 140 mm	Co-c	ords:	E 40390)3.44	N 6454392.51 MGA56
В	ore l	nformatio	ņ			Field Material Description					
	<u> </u>		P	Ê	(1)						
WATER	WELL (CONSTRUCTION	RL (AHDm) AF	DEPTH (ВGL ^л	GRAPHIC LOO	LITHOLOGY		FOF (App	RMATION roximate)		HYDROGEOLOGY
		Gravel 5 mm graded 50 mm ID, 50 mm ID, screen 	- 49 - 48 - 47 - 46 - 45 - 44 - 43 - 42 - 41 - 40 - 39 - 38	57 - 58 - 59 - 61 - 62 - 63 - 64 - 65 - 66 - 67 - 68 -		SILTSTONE/SANDSTONE - Light/dark grey, 50% light grey, medium graine sandstone and 50% grey siltstone SANDSTONE - Light/dark grey, 70% light grey fine to medium grained sand 30% grey siltstone SANDSTONE - Light grey, 90% light grey, fine to medium grained sandston dark grey siltstone	stone, ne, 10%	FORM	IATION	pH ETT R D D	: 7.75 : 3522 µS/cm :mp: 22.02 °C edox: 39.5 mV : 4.4 % Sat : 3.83 mg/L : 7.84 : 3951 µS/cm :mp: 21.64 °C : dox: 1.4 mV : 55.5 % Sat : 4.82 mg/L
			- 37 - 36 - 35 - 34 - 33 - 32 - 31 - 30	69 - 70 - 71 - 72 - 73 - 74 - 75 - 76 -		some black organic staining SANDSTONE - Light grey, fine to medium grained sandstone up to 60% wit organic staining	th black			pH E R D D	I: 7.89 C: 3864 μS/cm mp: 21.55 °C edox: 3864 mV D: 51.7 % Sat D: 4.49 mg/L
		Sump/ bentonite plug	- 29 - 28 - 27 - 26 - 25 - 24	77 - 78 - 79 - 80 - 81 - 82 - 83 -		SANDSTONE - Light grey, predominantly medium to fine grained, with some grained sandstone. some black organic staining, plus a few chips of dark gr siltstone SANDSTONE - Light grey, fine to medium grained sandstone with some bla organic staining	e fine — — — — — — — — — — — — — — — — — — —			pH Eie Rite Rite PH Eie Rite Di Di	: 7.89 C: 3921 μS/cm emp: 21.48 °C edox: -11.3 mV D: 57.6 % Sat D: 4.85 mg/L 1: 7.89 C: 3777 μS/cm edox: 27.9 mV D: 53.9 % Sat D: 4.66 mg/L
			- 23								
						END OF BOREHOLE AT 80.50 m					

Appendix C

Test bore licences

Hunter Region P O Box 2213

Dangar Phone: (02

NSW 2309)49042500

BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912 20BL172619



A G L Upstream Investments Pty Ltd Locked Bag 1837 St Leonards NSW 2065

LICENSE NUMBER
20BL172619
DATE LICENSE VALID FROM
01-Nov-2010
DATE LICENSE VALID TO
PERPETUITY
FEE
\$0.00
ABN 47661556763 GST NIL



CONDITIONS APPLYING TO THIS LICENSE ARE

ORIGINAL

CONDITIONS STATEMENT REFERRED TO ON 20BL172619 ISSUED UNDER PART V OF THE WATER ACT, 1912 ON 01-Nov-2010

(1) THE LICENCE SHALL LAPSE IF THE WORK IS NOT COMMENCED AND COMPLETED WITHIN THREE YEARS OF THE DATE OF THE ISSUE OF THE LICENCE.

(2) THE LICENSEE SHALL WITHIN TWO MONTHS OF COMPLETION OR AFTER THE ISSUE OF THE LICENSE IF THE WORK IS EXISTING, FURNISH TO NSW OFFICE OF WATER:-

(A) DETAILS OF THE WORK SET OUT IN THE ATTACHED FORM "A" (MUST BE COMPLETED BY A DRILLER).

(B) A PLAN SHOWING ACCURATELY THE LOCATION OF THE WORK, IN RELATION TO PORTION AND PROPERTY BOUNDARIES.

(C) A ONE LITRE WATER SAMPLE FOR ALL LICENCES OTHER THAN THOSE FOR STOCK, DOMESTIC, TEST BORES AND FARMING PURPOSES.

(D) DETAILS OF ANY WATER ANALYSIS AND/OR PUMPING TESTS.

× '

(3) THE LICENSEE SHALL ALLOW NSW OFFICE OF WATER OR ANY PERSON AUTHORISED BY IT, FULL AND FREE ACCESS TO THE WORKS, EITHER DURING OR AFTER CONSTRUCTION, FOR THE PURPOSE OF CARRYING OUT INSPECTION OR TEST OF THE WORKS AND ITS FITTINGS AND SHALL CARRY OUT ANY WORK OR ALTERATIONS DEEMED NECESSARY BY THE DEPARTMENT FOR THE PROTECTION AND PROPER MAINTENANCE OF THE WORKS, OR THE CONTROL OF THE WATER EXTRACTED AND FOR THE PROTECTION OF THE QUALITY AND THE PREVENTION FROM POLLUTION OR CONTAMINATION OF SUB-SURFACE WATER.

(4) IF DURING THE CONSTRUCTION OF THE WORK, SALINE OR POLLUTED WATER IS ENCOUNTERED ABOVE THE PRODUCING AQUIFER, SUCH WATER SHALL BE SEALED OFF BY:-

(A) INSERTING THE APPROPRIATE LENGTH(S) OF CASING TO A DEPTH SUFFICIENT TO EXCLUDE THE SALINE OR POLLUTED WATER FROM THE WORK.

(B) CEMENTING BETWEEN THE CASING(S) AND THE WALLS OF THE BORE HOLE FROM THE BOTTOM OF THE CASING TO GROUND LEVEL.

ANY DEPARTURE FROM THESE PROCEDURES MUST BE APPROVED BY THE DEPARTMENT BEFORE UNDERTAKING THE WORK.

(5) (A) THE LICENSEE SHALL NOTIFY NSW OFFICE OF WATER IF A FLOWING SUPPLY OF WATER IS OBTAINED. THE BORE SHALL THEN BE LINED WITH CASING AND CEMENTED AND A SUITABLE CLOSING GEAR SHALL BE ATTACHED TO THE BOREHEAD AS SPECIFIED BY NSW OFFICE OF WATER.

(B) IF A FLOWING SUPPLY OF WATER IS OBTAINED FROM THE WORK, THE LICENSEE SHALL ONLY DISTRIBUTE WATER FROM THE BORE HEAD BY A SYSTEM OF PIPE LINES AND SHALL NOT DISTRIBUTE IT IN DRAINS, NATURAL OR ARTIFICIAL CHANNELS OR DEPRESSIONS.

(6) IF A WORK IS ABANDONED AT ANY TIME THE LICENSEE SHALL NOTIFY NSW OFFICE OF WATER THAT THE WORK HAS BEEN ABANDONED AND SEAL OFF THE AQUIFER BY:-

(A) BACKFILLING THE WORK TO GROUND LEVEL WITH CLAY OR CEMENT AFTER WITHDRAWING THE CASING (LINING); OR

(B) SUCH METHODS AS AGREED TO OR DIRECTED BY NSW OFFICE OF WATER.

.

(7) THE LICENSEE SHALL NOT ALLOW ANY TAILWATER/DRAINAGE TO DISCHARGE INTO OR ONTO:-

- ANY ADJOINING PUBLIC OR CROWN ROAD;

- ANY OTHER PERSONS LAND;

- ANY CROWN LAND;

÷ (

- ANY RIVER, CREEK OR WATERCOURSE;

- ANY NATIVE VEGETATION AS DESCRIBED UNDER THE NATIVE VEGETATION CONSERVATION ACT 1997;

- ANY WETLANDS OF ENVIRONMENTAL SIGNIFICANCE.

(8) WATER SHALL NOT BE PUMPED FROM THE BORE AUTHORISED BY THIS LICENSE FOR ANY PURPOSE OTHER THAN GROUNDWATER INVESTIGATION.

End Of Conditions

Hunter Region P O Box 2213

.

Dangar NSW 2309 Phone: (02) 49042500 BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912 20BL172626

NSW Office of Water

A G L Upstream Investments Pty Ltd Locked Bag 1837 St Leonards NSW 2065

· · · · · · · · · · · · · · · · · · ·	
LICENSE NUMBER	
20BL172626	
DATE LICENSE VALID FROM	
01-Nov-2010	
DATE LICENSE VALID TO	
PERPETUITY	
FEE	
\$0.00	
ABN 47661556763 GST NIL	-

LOCATION OF WORKS Portion(s) or Lot/Section/DP COUNTY PARISH 85//979859 Avon Gloucester TYPE OF WORKS PURPOSE(S) FOR WHICH WATER MAY BE USED Test Bore Monitoring Bore NITES 1.18 ARTA RECENS PURA QUAM CONDITIONS APPLYING TO THIS LICENSE ARE



Hunter Region P O Box 2213

Dangar NSW 2309 Phone: (02)49042500 BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912



ORIGINAL

A G L Upstream Investments Pty Ltd Locked Bag 1837 St Leonards NSW 2065

	LICENSE NUMBER
	20BL172631
	DATE LICENSE VALID FROM
	22-Nov-2010
	DATE LICENSE VALID TO
	PERPETUITY
	FEE
	\$0.00
AB	N 47661556763 GST NIL



Hunter Region P O Box 2213

Dangar NSW 2309 Phone: (02)49042500 BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912

20BL172632



A G L Upstream Investments Pty Ltd Locked Bag 1837 St Leonards NSW 2065

	LICENSE NUMBER
	20BL172632
	DATE LICENSE VALID FROM
	22-Nov-2010
	DATE LICENSE VALID TO
	PERPETUITY
	FEE
	\$0.00
A	3N 47661556763 GST NIL

ORIGINAL



Hunter Region P O Box 2213

Dangar NSW 2309 Phone: (02) 49042500 BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912 20BL172667

NSW Office of Water

Bignell, Norman C/- A G L Upstream Invest P/I L 22, 101 Miller Street North Sydney NSW 2060

	LICENSE NUMBER
	20BL172667
	DATE LICENSE VALID FROM
	23-Dec-2010
	DATE LICENSE VALID TO
	PERPETUITY
	FEE
	\$0.00
ABI	V 47661556763 GST NIL

LICENCE MUR (DED

LOCATION OF WORKS Portion(s) or Lot/Section/DP PARISH COUNTY 96//979859 Avon Gloucester TYPE OF WORKS PURPOSE(S) FOR WHICH WATER MAY BE USED Test Bore Monitoring Bore g8TA RECENS MITES TURA QUAN

CONDITIONS APPLYING TO THIS LICENSE ARE

Hunter Region P O Box 2213

Dangar NSW 2309 Phone: (02)49042500 BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912 20BL172670

USW Office

Waukivory Road Pty Limited C/- A G L Upstream Invest P/I Level 22,101 Miller Street North Sydney NSW 2060

20BL172670
DATE LICENSE VALID FROM
13-Jan-2011
DATE LICENSE VALID TO
PERPETUITY
FEE
\$0.00
ABN 47661556763 GST NIL

LICENSE NUMBER

LOCATION OF WORKS
PORTION(3) OF LOU/Section/DP
REALSH
Gloucester
Gloucester
Gloucester
Gloucester
Gloucester
Gloucester
COUNTY
Gloucester
Gloucester
COUNTY
COUNTY
Gloucester
COUNTY
COU

ORIGINAL

Hunter Region P O Box 2213

NSW Office of Water

BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912

20BL172682

NSW Office

 Dangar
 NSW 2309

 Phone:
 (02)
)49042500

Gloucester Coal Limited C/- A G L Upstream Investments Lv 22, 101 Miller Street North Sydney NSW 2060

LICENSE NUMBER
20BL172682
DATE LICENSE VALID FROM
24-Jan-2011
DATE LICENSE VALID TO
PERPETUITY
FEE
\$0.00
ABN 47661556763 GST NIL

ORIGINAL



Appendix D

TCMB04 Core photographs







Photo 5: 110 - 114 m bgl



Photo 6: 114 - 118 m bgl AGL Gloucester Phase 2 Groundwater Investigations Job number: 2162406A



Figure AD-3: core hole depth 110 - 118 m bgl


Figure AD-4: core hole depth 118 - 126 m bgl







Figure AD-7: core hole depth 142 - 150 m bgl



Figure AD-8: core hole depth 150 - 158 m bgl





AGL Gloucester Phase 2 Groundwater Investigations Job number: 2162406A



Figure AD-10: core hole depth 166 - 174 m bgl





AGL Gloucester Phase 2 Groundwater Investigations Job number: 2162406A



Figure AD-12: core hole depth 182 - 190 m bgl



Figure AD-13: core hole depth 191 - 198 m bgl





Figure AD-15: core hole depth 206 - 214 m bgl



Figure AD-16: core hole depth 214 - 222 m bgl









Figure AD-20: core hole depth 246 - 254 m bgl









Figure AD-24: core hole depth 278 - 286 m bgl





Figure AD-26: core hole depth 294 - 302 m bgl



Figure AD-27: core hole depth 302 - 310 m bgl



Figure AD-28: core hole depth 310 - 318 m bgl



Figure AD-29: core hole depth 318 - 326 m bgl







