

Geotechnical Investigation

West Wyalong Solar Farm

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Executive Summary

This executive summary presents the findings of the geotechnical investigation (GI) undertaken by SMEC Australia Pty Ltd (SMEC) for the West Wyalong Solar Farm (WWSF) project, on behalf of Lightsource BP. The proposed site for WWSF is located approximately 20 km North West of West Wyalong, New South Wales.

It is understood that the proposed solar facility development is a 112 Megawatt utility-scale renewable energy project, covering an area of about 285 hectares.

The geotechnical investigation was conducted from the 24th July to 27th July 2018, where the fieldwork involved the drilling of thirty (30) boreholes to a nominal depth of 6 m or prior refusal. Electrical resistivity testing was undertaken at five locations with five traverses across the site to assess the in-situ electrical resistivity (ER) at the site.

A geotechnical ground model was developed from the investigations undertaken by SMEC and is summarised here:

Unit No.	Material Description	Depth of Unit (m bgl)
1	Topsoil Sandy Clay with grass root mat cover	0.0 to ^T 0.2
2a	Alluvial Soil CLAY / Sandy CLAY; dark to pale grey-brown; occasional bands of sandy silt; typically, stiff.	^T 0.2 to 2.5
2b	Alluvial Soil CLAY / Sandy CLAY; dark to pale grey-brown; occasional bands of sandy silt; typically, very stiff or better.	2.5 to *5.95
За	Residual Soil Clayey SILT / Sandy SILT; pale grey mottled brown; typically, very stiff to hard; only encountered in BH05 and BH08.	2.5 to ^R 4.8
3b	Residual Soil Silty CLAY / CLAY; red-brown mottled grey and orange; typically, hard; only encountered in BH06 and BH24.	2.5 to ^R 5.75

* Maximum depth of investigation; ^R Refusal on inferred granite rock / boulder (HW-MW), ^T Disturbed natural topsoil

From the geotechnical investigation it was apparent that the site primarily consisted of topsoil over stiff to very stiff alluvial clays, with residual soils encountered prior to refusal on inferred granitic rock or boulders (HW-MW) at five borehole locations (BH05, BH06, BH08, BH24 and BH28), between 3.25 m and 5.75 m bgl.

Soil resistivity ground models were developed from the electrical resistivity testing undertaken at the substation and the rest of the site. From the electrical resistivity testing at the substation, a soil model of two layers was prepared:

Lover	Depth	Resistivity
Layer	(m)	(Ω-m)
1	0-0.431	28.91
2	0.431 to infinite	6.86

From the electrical resistivity testing at the rest of the site, the following soil model of two layers was prepared:

Lever	Depth	Resistivity
Layer	(m)	(Ω-m)
1	0-0.276	68.35
2	0.276 to infinite	5.34

The durability criteria of AS2159-2009, indicate that for concrete piles, the ground conditions have an exposure classification of Mild. Results also indicate that for durability of steel piles, the ground conditions have an exposure classification of Moderate.

The soil materials encountered in the investigation can generally be excavated with conventional earth moving equipment such as excavators, backhoes, dozers, etc. Solid flight auger refusal was encountered towards the north-western and western portions of the site, with refusal not encountered towards the middle and east of the site.

Advice from experienced piling contractor must be sought if piling requires pre-drilling into rock. Given that current scope of works did not involve coring into rock, further investigation may be required to identify weathering grade, strength and discontinuity of rock. Additional geotechnical investigation may be required after preliminary design stage of the development to delineate lateral extent of shallow rock encountered if effected for pile foundation.

The excavatability of the rock mass (i.e. Granite) in unconfined situations is a function of several variables including rock strength, fracture spacing and size and orientation of the excavation. Depending on excavation depths, heavy ripping conditions should be expected which would require the use of larger plant (i.e. D9 or larger) together with rock breaking equipment to facilitate excavation and removal. It is recommended that a trial excavation be carried out to assess the general rippability of the rock and establish rates of production.

Temporary unsupported excavations in the site clay soils can be excavated at batters of 1 H: 1 V to a maximum depth of 2 m, provided that surcharge loads are kept well clear of the crest of batters. For long-term deeper excavations into soils where 2 H : 1 V batters are not feasible, the excavation should be reinforced or retained.

The geotechnical interpretive report must be read as a whole and the executive summary is not a substitute for this.

Table of Contents

2 SCOPE OF WORKS. 4 3 SITE DESCRIPTION. 5 3.1 General 5 3.2 Anticipated Geological Setting 5 4 INVESTIGATION METHODOLOGY 7 4.1 Fieldwork – Borchole Drilling 7 4.2 Geotechnical Laboratory Testing 9 4.3 Fieldwork – Electrical Resistivity Testing 9 5 Fieldwork – Electrical Resistivity Testing 9 5.1 Site Walkover 11 5.1 Site Walkover 11 5.3 Groundwater 11 5.4 Laboratory Test Results 11 5.5 Electrical Resistivity Test Results 11 5.6 1 Geotechnical Units 15 6.1 Geotechnical Design Parameters of Soil for Shallow Footings 16 6.4 Geotechnical Design Parameters of Soil for Shallow Footings 16 6.5 Foundation considerations 18 6.6 Site Trafficability. 21 6.7 Earthquake Loading. 16 6.8 Material Suitability for Reuse.	1	INTRODUCTION	. 3
3.1 General 5 3.2 Anticipated Geological Setting 5 4 INVESTIGATION METHODOLOGY 7 4.1 Fieldwork – Borehole Drilling 7 4.2 Geotechnical Laboratory Testing 9 4.3 Fieldwork – Electrical Resistivity Testing 9 5 FIELDWORK RESULTS 11 5.1 Site Walkover 11 5.2 Subsurface Conditions 11 5.3 Groundwater 11 5.4 Laboratory Test Results 11 5.5 Electrical Resistivity Test Results 11 5.6 Geotechnical Units 15 6.2 Site Classification 16 6.3 Earthquake Loading 16 6.4 Geotechnical Design Parameters of Soil for Shallow Footings 16 6.5 Foundation considerations 18 6.6 Site Trafficability 21 6.7 Earthworks and Subgrade preparation 22 6.8 Material Suitability for Reuse 23 6.9 Excavation of Material and Ground Support 24	2	SCOPE OF WORKS	. 4
4.1 Fieldwork – Borehole Drilling 7 4.2 Geotechnical Laboratory Testing 9 4.3 Fieldwork – Electrical Resistivity Testing 9 5 FIELDWORK RESULTS 11 5.1 Site Walkover 11 5.2 Subsurface Conditions 11 5.3 Groundwater 11 5.4 Laboratory Test Results 11 5.5 Electrical Resistivity Test Results 11 6 COMMENTS 15 6.1 Geotechnical Units 15 6.2 Site Classification 16 6.3 Earthquake Loading 16 6.4 Geotechnical Units 15 6.5 Foundation considerations 18 6.6 Site Trafficability 21 6.7 Earthworks and Subgrade preparation 22 6.8 Material Suitability for Reuse 23 6.9 Excavation of Material and Ground Support 24 6.10 Groundwater Control 24 6.11 Erosion and Drainage 24 6.12	3	3.1 General	. 5
5.1Site Walkover115.2Subsurface Conditions115.3Groundwater115.4Laboratory Test Results115.5Electrical Resistivity Test Results116COMMENTS156.1Geotechnical Units156.2Site Classification166.3Earthquake Loading166.4Geotechnical Design Parameters of Soil for Shallow Footings166.5Foundation considerations186.6Site Trafficability216.7Earthworks and Subgrade preparation226.8Material Suitability for Reuse236.9Excavation of Material and Ground Support246.10Groundwater Control246.11Erosion and Drainage246.12Subgrade Evaluation and Preliminary Pavement Assessment256.13Thermal Resistivity256.14Earth Resistivity Testing (Wenner Method)266.15Durability Assessment266.16Anticipated Construction Difficulties276.17Construction Inspections277CONCLUSION28	4	 4.1 Fieldwork – Borehole Drilling 4.2 Geotechnical Laboratory Testing 	. 7 . 9
6.1Geotechnical Units156.2Site Classification166.3Earthquake Loading166.4Geotechnical Design Parameters of Soil for Shallow Footings166.5Foundation considerations186.6Site Trafficability216.7Earthworks and Subgrade preparation226.8Material Suitability for Reuse236.9Excavation of Material and Ground Support246.10Groundwater Control246.11Erosion and Drainage246.12Subgrade Evaluation and Preliminary Pavement Assessment256.13Thermal Resistivity256.14Earth Resistivity Testing (Wenner Method)266.15Durability Assessment266.16Anticipated Construction Difficulties277CONCLUSION28	5	 5.1 Site Walkover	11 11 11 11
7 CONCLUSION	6	6.1Geotechnical Units6.2Site Classification6.3Earthquake Loading6.4Geotechnical Design Parameters of Soil for Shallow Footings6.5Foundation considerations6.6Site Trafficability6.7Earthworks and Subgrade preparation6.8Material Suitability for Reuse6.9Excavation of Material and Ground Support6.10Groundwater Control6.11Erosion and Drainage6.12Subgrade Evaluation and Preliminary Pavement Assessment6.13Thermal Resistivity6.14Earth Resistivity Testing (Wenner Method)6.15Durability Assessment6.16Anticipated Construction Difficulties	15 16 16 18 21 22 23 24 24 24 25 25 25 26 26 27
8 LIMITATION	7		
	8		

Appendices

APPENDIX A	BOREHOLE LOCATION PLAN
APPENDIX B	SITE PHOTOGRAPHS
APPENDIX C	BOREHOLE LOGS AND EXPLANATORY NOTES
APPENDIX D	LABORATORY RESULTS
APPENDIX E	ELECTRICAL RESISTIVITY TESTING RESULTS

List of Tables

Table 4-1: Summary of borehole locations (UTM 55H coordinate system)
Table 4-2: ERT Traverse Summary
Table 5-1: Summary of ground conditions (BH01 to BH15)
Table 5-2: Summary of ground conditions (BH16 to BH30)
Table 5-3: Summary of laboratory test results
Table 5-4: Laboratory Test Results (Aggressivity Results Summary)14
Table 5-5: Thermal Resistivity Test Results 14
Table 6-1: Interpreted Ground Model
Table 6-2: Geotechnical Preliminary Design Parameters 17
Table 6-4: Pile Design Parameters 19
Table 6-5: Individual Assigned Risk Factors - Site Conditions
Table 6-6: Fill Compaction Requirements 23
Table 6-7: Recommended Batter Angles 24
Table 6-8: Substation Measurements - Soil Model Thermal Resistivity
Table 6-9: Field Measurements - Soil Model Thermal Resistivity

List of Figures

Figure 1: Approximate site location	5
Figure 2: Extract of geological map of New South Wales, Wyalong sheet, 1:100,000 scale (Not To Scale)	6
Figure 3: Thermal Resistivity Findings	25

References

Jayasekara, S. and Mohajerani, A. (2003). SOME RELATIONSHIPS BETWEEN SHRINK-SWELL INDEX, LIQUID LIMIT, PLASTICITY INDEX, ACTIVITY AND FREE SWELL INDEX. *Australian Geomechanics Journal*, 53-58.

1 Introduction

This report presents the results of a geotechnical investigation performed by SMEC Australia Pty Ltd (SMEC) for the proposed West Wyalong Solar Farm (WWSF) development in West Wyalong, NSW. It is understood that the proposed solar facility development is a 112 Megawatt utility-scale renewable energy project, covering an area of about 285 hectares.

This geotechnical investigation and interpretive report provides comments to aid in the conceptual design of the solar plant, including assessing foundation types, earthworks, haul roads, resistivity and soil parameters to support the solar plant design and installation. The design development drawings were not available at the time of preparing this report. Indicative loads were also not available at the time of preparing this report.

The work has been commissioned by Lightsource BP (LBP) to undertake the geotechnical investigation under the SMEC Short-Form Consultancy agreement. The purpose of the investigation presented herein is to assess subsurface conditions relevant to design and construction of the solar farm. The work has been performed in general accordance with SMEC proposal 1031562 Rev0, dated 11 July 2018.

2 Scope of works

The scope of works for the geotechnical investigation are summarised below:

- Conduct a site walkover to obtain an understanding of the project site;
- Coordination of field investigation, including preparation of a site health and safety plan;
- Review of existing geological and geotechnical information;
- Underground services check for existing services across the site;
- Provide site supervision of field investigation works;
- Drill boreholes and carry out standard penetration tests (SPT);
- Electrical resistivity testing at nominated locations;
- Collection of representative soil samples for subsequent laboratory testing;
- Geotechnical laboratory testing, including thermal resistivity tests; and
- Prepare a report presenting the factual findings of the investigation, together with interpretation and advice pertaining to the project, including:
 - Location maps and site plans showing the logged locations of site investigation points;
 - Observation findings and site photographs from site walkover assessment;
 - Detailed description of surface and subsurface conditions likely to be experienced during construction of roads, foundations, and civil infrastructures;
 - Description of the presence/depth of groundwater and recommendations for groundwater management (if encountered);
 - Recommendations on earthquake site factor in accordance with AS1170.4 Structure Design Actions Earthquake action of Australia;
 - Foundation design parameters in accordance with Australian Standard AS2159-2009 Piling Design and Installation;
 - Laboratory test results;
 - Aggressivity characteristics of the in-situ soil on steel and concrete durability;
 - Electrical and thermal characteristics of the soils that relate to the design of electrical earthing and power reticulation network;
 - Recommendations for site preparation, road works, and earthwork including stripping, grubbing, compaction criteria, imported fill criteria, and suitability of the onsite soils for use as fill (if at all required); and
 - Recommendations for shallow foundations and equipment pads including bearing capacity, lateral resistance, and estimated total and differential settlement.

3 Site Description

3.1 General

The proposed site for WWSF is located approximately 20 km North West of West Wyalong, New South Wales. The site is bounded by Blands Lane to the North, Bodells Lane to the East, vacant lands to the South and Clear Ride Road to the West. The proposed site covers an area of approximately 285 hectares. The approximate extents of the site and location is shown in Figure 1.



Figure 1: Approximate site location

3.2 Anticipated Geological Setting

Reference to the Geological Survey of New South Wales 1:100,000 scale 'Wyalong' map indicates that the site is underlain by Tertiary age, Cainozoic Formation (Czr) that is described as shallow slope colluvial plains, some residual veneer, with inactive alluvial plains. This type of strata typically comprises of silt, sand and clay with gravels.

The Wyalong geological map also indicates that the areas to the east of the site comprise of Quaternary age Cainozoic Formation (Qa) that typically comprise - alluvium and west of the site comprise of Tertiary age Cainozoic Formation (Czg) that typically comprise highly weathered granite and colluvial sediments. An extract of the Geological Map of New South Wales, Wyalong (1:100,000 scale) is shown in Figure 2.

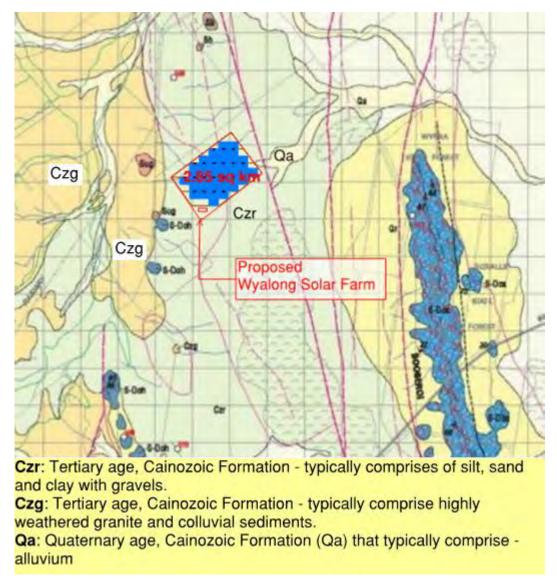


Figure 2: Extract of geological map of New South Wales, Wyalong sheet, 1:100,000 scale (Not To Scale)

4 Investigation Methodology

4.1 Fieldwork – Borehole Drilling

The geotechnical investigation was conducted from the 24th July to 27th July 2018. Based on the review of Dial Before You Digs (DBYD) plans and discussions with the land owner, it was confirmed that no underground services were present on-site which were at risk for the investigation works. The fieldwork involved the drilling of thirty (30) boreholes to depths of 6 m or prior refusal. All boreholes were completed in wheat fields.

The borehole co-ordinates and surface RL's are summarised in Table 4-1. No surveying of the subject locations was conducted; the coordinates of the boreholes were recorded using a hand-held GPS device and elevations were checked against google earth. It should be noted that the reported reduced levels are approximate only. A site locality plan and a borehole location plan is presented in Appendix A. Site photographs are presented in Appendix B.

The boreholes were drilled using a 4WD mounted drill rig, supplied and operated by Apex Drilling Pty Ltd. The boreholes were advanced using solid flight auguring techniques. Standard Penetration Tests (SPTs) were collected at nominal depth intervals in soil strata. The SPTs were conducted to assess soil consistencies and to collect disturbed samples at select depths. Bulk samples were collected via shallow pits excavated by hand.

Fieldwork was supervised by a SMEC Geotechnical Engineer who was responsible for positioning the boreholes at the nominated locations, preparing borehole logs in general accordance with AS1726-2017 'Geotechnical Site Investigations' and coordinating soil sampling. On completion of drilling, all boreholes were backfilled with drill cuttings and reinstated to match the existing ground surface.

The selected samples were sent for laboratory testing to assist in determining the engineering properties of site soils. The laboratory tests were undertaken in a NATA accredited laboratory.

Borehole engineering logs together with explanatory notes describing terms and symbols used in their preparation are provided in Appendix C.

Borehole ID	Easting (m)	Northing (m)	Final Depth (m)	Approximate Elevation m AHD
BH01	529681	6257971	5.95	235
BH02	530382	6259587	5.95	231
BH03	530110	6259399	5.95	234
BH04	529857	6259210	5.95	231
BH05	529576	6259028	4.80	233
BH06	529338	6258835	3.70	231
BH07	529594	6258646	5.93	232
BH08	529587	6258456	3.25	235
BH09	529855	6258460	5.95	234
BH10	530106	6258265	5.95	232
BH11	530379	6258948	5.95	233
BH12	530634	6258645	5.95	231
BH13	530622	6258828	5.95	230
BH14	530630	6259004	5.95	231
BH15	530884	6259067	5.95	231
BH16	530626	6259201	5.95	232
BH17	530382	6259394	5.95	233
BH18	530109	6259203	5.95	229
BH19	529856	6259010	5.95	233
BH20	529857	6258832	5.95	233
BH21	529854	6258646	5.95	232
BH22	530108	6258641	5.95	231
BH23	530365	6258645	5.95	233
BH24	529614	6259383	5.75	232

Table 4-1: Summary of borehole locations (UTM 55H coordinate system)

GEOTECHNICAL INVESTIGATION West Wyalong Solar Farm Prepared for Lightsource BP

Continued from previous page.					
Borehole ID	Easting (m)	Northing (m)	Final Depth (m)	Approximate Elevation * m AHD	
BH25	530380	6259021	5.95	232	
BH26	530111	6258981	5.95	233	
BH27	530108	6258829	5.95	231	
BH28	526921	6258271	3.60	235	
BH29	530883	6258830	5.95	231	
BH30	529338	6258643	5.95	234	

4.2 Geotechnical Laboratory Testing

Laboratory testing on selected soil samples was undertaken in a NATA registered Laboratory. The laboratory testing was undertaken in accordance with the relevant sections of AS1289 *"Methods of Testing Soils for Engineering Purposes"*. The laboratory testing completed include:

- 5 x Atterberg limits and linear shrinkage tests;
- 5 x Field moisture content tests;
- 5 x Particle size distribution tests (AS1289 3.6.1);
- 1 x Hydrometer test (AS1289 3.6.3)
- 8 x Emerson Dispersion tests (AS1289 3.8.1);
- 8 x pH, Chloride, Sulphate and Sulphide
- 3 x Thermal Resistivity tests
- 8 x Standard Compaction tests
- 8 x Californian Bearing Ratio (CBR) tests

The laboratory test result certificates are presented in Appendix D. There were 9 samples submitted for CBR and standard compaction testing, but one of the samples did not have sufficient material for CBR testing and standard compaction.

4.3 Fieldwork – Electrical Resistivity Testing

All electrical resistivity testing (ERT) locations were intended to spread out across the site. The ERT was conducted from 21st Aug to 22nd Aug 2018. All traverses were completed in dry wheat fields with damp soil below surface.

ERTs were undertaken at five locations with five traverses across the site to assess the in-situ electrical resistivity (ER) at the site. Testing was undertaken by a SMEC Electrical Engineers using the Wenner four Electrode Method in accordance with ASTM G57-06. Following steps were adopted for the Wenner method.

- Select a test site and mark a centre point as reference point of the test location;
- Insert four earth electrode rods into ground. The electrode rods to be inserted at equal spacing (a spacing = electrode spacing);

- Ensure that the test electrode rods are in a straight line and the inserted depth (b) is no more than 1/20th of the electrode spacing. (b = a / 20)
- Using appropriate testing equipment, current was injected into the earth via the two outer rods and the voltage between the two inner rods was measured.

Testing was conducted with two perpendicular axes (Traverse 1 and Traverse 2) at the substation area of the site to test for anisotropy in the results, such as might indicate lateral variations in site conditions contrary to the assumptions of the sounding method (i.e. horizontal, homogeneous and isotropic layering). Single traverses were conducted in the southwestern, northern and eastern portions of the site, outside the substation area. The orientation of the ERT axes are shown on the Test Site Location Plan, in Appendix A.

A summary of the ERT traverses is presented in Table 4-2.

Easting Northing **ERT Traverse ID ERT Traverse Direction** (m) (m) N/W Corner End Point 1 529604 6258059 Traverse 1 N/W Corner End Point 2 529749 6257876 N/E Corner End Point 1 529561 6257968 Traverse 2 N/E Corner End Point 2 529797 6257963 Traverse 3 **N-S Direction** 529651 6259018 **E-W Direction** Traverse 4 529586 6258460 Traverse 5 **N-S Direction** 530467 6259335

Table 4-2: ERT Traverse Summary

5 Fieldwork Results

5.1 Site Walkover

From the site walkover, the site was observed to be generally flat with dry wheat crops (vegetation) on the surface. Some undulations were observed towards the southern and south-eastern sides of the site (noted around boreholes BH29, BH15, BH21). There were large trees intermittently spread on site; most trees near boreholes BH26 and BH21. There was an abandoned structure near borehole BH26 and a small dam near borehole BH21. Site photographs are presented in Appendix B.

5.2 Subsurface Conditions

This section provides a general description of the subsurface conditions encountered across the site. For conditions encountered at specific borehole locations, reference should be made to the engineering borehole logs provided in Appendix C. The sub-surface conditions encountered in the boreholes were generally consistent with those anticipated from published geological sources. Summary tables of the encountered subsurface conditions are presented here in Tables 5-1 and 5-2.

5.3 Groundwater

Standpipe installation was not undertaken during the investigation as it was not in the scope of works. Groundwater was not observed during drilling within borehole drill depths. However, it should be noted that the boreholes were also not opened long enough to establish any groundwater inflows. Increased moisture content in soils was noted in borehole BH16 at 1 m below ground level.

5.4 Laboratory Test Results

Geotechnical laboratory test results of soils are summarised in Table 5-3. Aggressivity testing (pH, Sulphate, Chloride, and electrical conductivity) and Thermal Resistivity of soil are summarised in Table 5-4 and Table 5-5, respectively.

5.5 Electrical Resistivity Test Results

In accordance with accepted practice, the resistivity soundings were interpreted using standard industry inversion software (CDEGS) assuming a horizontally layered earth model. The software results are based on an algorithm converted into a two (2) layer soil model.

Resistivity calculations were made in accordance with the formula:

Pa = 2
$$\pi$$
 a R

- Pa = Apparent Earth Resistance (Ωm)
- a = Spacing in metres between each electrode (m)
- $R = Instrument resistance reading (\Omega)$

Results of electrical resistivity tests are presented in Appendix E.

Table 5-1: Summary of ground conditions (BH01 to BH15)

					Dept	h Below G	round Lev	el to the B	ase of the	Layer (m E	GL)				
Ground Condition	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	вн09	BH10	BH11	BH12	BH13	BH14	BH15
Top Soil / Grass root mat cover	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2 ^T	0.2 ^T	0.2 [⊤]	0.2 [⊤]	0.1	0.2 ^T
CLAY / Sandy CLAY / Silty CLAY; dark to pale grey-brown; occasional bands of sandy silt; typically, stiff to very stiff. Alluvial Deposits	5.95*	5.95*	5.95*	5.95*	2.5	2.5	5.93*	2.85	5.95*	5.95*	5.95*	5.95*	5.95*	5.95*	5.95*
Clayey SILT / Silty CLAY / Sandy SILT / CLAY; grey mottled brown; typically, hard. Residual Granitic Deposits	-	-	-	-	4.8 ^R	3.6 ^R	-	3.25 ^R	-	-	-	-	-	-	-

Notes: * Target Depth of Borehole, ^R Refusal on inferred granite rock / boulder (HW-MW), ^T Disturbed natural topsoil

Table 5-2: Summary of ground conditions (BH16 to BH30)

					Dept	h Below G	round Lev	el to the B	ase of the	Layer (m E	GL)				
Ground Condition	BH16	BH17	BH18	BH19	BH20	BH21	BH22	BH23	BH24	BH25	BH26	BH27	BH28	BH29	BH30
Top Soil / Grass root mat cover	0.1	0.2 ^T	0.2 [⊤]	0.2 [⊤]	0.1	0.2 [⊤]	0.2 ^T	0.1	0.1	0.2 ^T	0.2 ^T	0.1	0.2 [⊤]	0.2 ^T	0.2 ^T
CLAY / Sandy CLAY / Silty CLAY; dark to pale grey-brown; occasional bands of sandy silt; typically, stiff to very stiff. Alluvial Deposits	5.95*	5.95*	5.95*	5.95*	5.95*	5.95*	5.95*	5.95*	5.5	5.95*	5.95* ^{, A}	5.95*	3.6 ^R	5.95*	5.95*
Clayey SILT / Silty CLAY / Sandy SILT / CLAY; grey mottled brown; typically, hard. Residual Granitic Deposits	-	-	-	-	-	-	-	-	5.75 ^R	-	-	-	-	-	-

Notes: * Target Depth of Borehole, ^R Refusal on inferred granite rock / boulder (HW-MW), ^T Disturbed natural topsoil, ^A Sandy SILT from 0.2 m to 1.0 m

GEOTECHNICAL INVESTIGATION West Wyalong Solar Farm Prepared for Lightsource BP SMEC Internal Ref. 30041768 4 January 2019

Table 5-3	3: Summary of lal	boratory test results											
Borehole ID	Depth	Field Moisture Content	Standard Optimum Moisture Content	Field Moisture Variation	Standard Maximum Dry Density	CBR	CBR Swell	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage	Emerson Class No	Particle Size Passing 0.075mm
	(m)	(%)	(%)	(%)	t/m³	(%)	(%)	(%)	(%)	(%)	(%)		(%)
BH01	0.50 - 1.00	11.9	15.5	3.6 Dry	1.81	3.5	3.0	-	-	-	-	2	-
BH03	0.50 - 0.60	23.9	23.5	0.4 Wet	1.57	3.5	1.0	65	22	43	18.0	2	-
BH03	0.50 - 1.0	17.0	-	-	-	-	-	-	-	-	-	2	-
BH04	2.50	21.5	-	-	-	-	-	-	-	-	-	-	-
BH05	0.50 - 1.0	17.0	20.5	3.5 Dry	1.64	1.0	3.5	67	18	49	20.0	-	-
BH08	0.50-1.00	22.1	24.0	1.9 Dry	1.56	1.5	2.0	-	-	-	-	2	-
BH10	0.40-0.60	16.4	-	-	-	-	-	-	-	-	-	3	-
BH10	0.50	-	-	-	-	-	-	78	19	59	22.0	-	-
BH12	0.50	-	-	-	-	-	-	78	21	57	20.0	-	-
BH12	0.50-0.60	24.5	23.0	1.5 Wet	1.57	1.5	2.5	-	-	-	-	2	-
BH12	4.00	24.3	-	-	-	-	-	-	-	-	-	-	-
BH16	0.50	-	-	-	-	-	-	58	19	39	20.0	-	-
BH16	0.50-1.00	22.5	21.0	1.5 Wet	1.62	3.0	2.0	-	-	-	-	2	-
BH16	1.00	21.9	-	-	-	-	-	-	-	-	-	-	-
BH17	0.50	15.7	-	-	-	-	-	-	-	-	-	-	70
BH18	1.00	13.7	-	-	-	-	-	-	-	-	-	-	73
BH18	4.00	18.9	-	-	-	-	-	-	-	-	-	-	-
BH21	0.50-1.00	12.0	16.0	4.0 Dry	1.76	2.5	3.0	-	-	-	-	-	-
BH26	0.50-0.60	7.6	10.5	2.9 Dry	1.97	5.0	1.0	-	-	-	-	5	-
BH26	0.5	10.0	-	-	-	-	-	-	-	-	-	-	58
BH26	1.0	10.7	-	-	-	-	-	-	-	-	-	-	55
BH26	4.0	23.5	-	-	-	-	-	-	-	-	-	-	-
BH28	0.5	10.5	-	-	-	-	-	-	-	-	-	-	48

GEOTECHNICAL INVESTIGATION West Wyalong Solar Farm Prepared for Lightsource BP SMEC Internal Ref. 30041768

4 January 2019

Borehole ID	Depth	Field Moisture Content	рН	Chloride	Sulphate (So⁴)	Electrical Conductivity (EC)	Resistivity
	m	%		mg/kg	mg/kg	μS/cm	Ohm.cm
BH04	1.50	21	5.0	700	210	380	2,631.6
BH06	0.50	12	7.9	380	120	380	2,631.6
BH07	0.10	3.5	7.4	6.9	<30	48	20,833.0
BH16	1.00	17	7.4	590	180	370	2,702.7
BH17	0.10	4.5	6.4	42	<30	190	5,263.2
BH23	2.00	16	4.8	630	120	430	2,325.6
BH27	0.10	3.7	6.3	38	<30	110	9,090.9
BH28	0.50-0.70	15	8.4	330	72	290	3,448.3

Table 5-5: Thermal Resistivity Test Results

Test	Depth		Soil Thermal Properties										
Location	(m)	MC (%)	W / m K	m K / W	MC (%)	W / m K	m K / W	MC (%)	W / m K	m K / W	MC (%)	W / m K	m K / W
BH01	1.00-1.50	0.0	0.32	3.13	4.6	0.58	1.72	9.0	1.05	0.95	14.7	1.74	0.57
BH05	1.00-1.50	0.3	0.26	3.85	7.4	0.44	2.27	14.0	0.92	1.09	22.8	1.26	0.79
BH16	1.00-1.50	0.0	0.36	2.78	6.6	0.50	2.0	11.9	0.90	1.11	19.3	1.46	0.68

MC (%): Moisture content; W / m K: Thermal Conductivity; m K / W: Thermal Resistivity

6 Comments

6.1 Geotechnical Units

A geotechnical ground model was developed from the investigations undertaken by SMEC and is summarised in Table 6-1.

Table 6-1: Interpreted Ground Model

Unit No.	Material Description	Depth of Unit (m bgl)
1	Topsoil Sandy Clay with grass root mat cover	0.0 to ^T 0.2
2a	Alluvial Soil CLAY / Sandy CLAY; dark to pale grey-brown; occasional bands of sandy silt; consistency was typically stiff.	^T 0.2 to 2.5
2b	Alluvial Soil CLAY / Sandy CLAY; dark to pale grey-brown; occasional bands of sandy silt; consistency was typically very stiff or better.	2.5 to *5.95
3a	Residual Soil Clayey SILT / Sandy SILT; pale grey mottled brown; consistency was typically very stiff to hard; only encountered in BH05 and BH08.	2.5 to ^R 4.8
3b	Residual Soil Silty CLAY / CLAY; red-brown mottled grey and orange; consistency was typically very stiff to hard; only encountered in BH06 and BH24.	2.5 to ^R 5.75

* Maximum depth of investigation; ^R Refusal on inferred granite rock / boulder (HW-MW), ^T Disturbed natural topsoil

From the geotechnical investigation it was apparent that the site primarily consisted of topsoil over stiff to very stiff alluvial clays, over residual soils. Five out of thirty boreholes drilled across the site encountered solid flight auger refusal on inferred granitic rock or boulders (HW-MW) between 3.25 m and 5.75 m bgl.

The delineation of topsoil was done based on visual and tactile assessment made onsite; a significant portion of the site had disturbed topsoil extending to 0.2 m below ground level. This disturbed soil was classified as disturbed natural topsoil and not as fill, as there was no evidence of imported fill material onsite. The disturbed natural topsoil was evident in BH10 to BH13, BH15, BH17 to BH19, BH21, BH22, BH25, BH26, and BH28 to BH30. This was further confirmed with the land owner, that there was no imported fill onsite.

Refusal was reached in five of the thirty boreholes (BH05, BH06, BH08, BH24 and BH28), where refusal was inferred as reached on top of granitic rock or boulders (HW-MW). Four of the five boreholes where refusal was reached, had residual soils present. This was derived from visual and tactile assessment onsite. Solid flight auger refusal was encountered towards the north-western and western portions of the site, with refusal not encountered towards the middle and east of the site.

6.2 Site Classification

Although not strictly applicable to the proposed development, classification of the ground conditions in accordance with AS2870-2011 provides a means of estimating the level of soil reactivity and associated movement patterns and magnitude that should be considered in design.

The natural clays encountered in the investigation are considered to have a high potential for volume change with respect to variation in moisture content and are considered to be highly reactive. The site characteristic surface movement will depend on the thickness of natural clays below footings/slabs.

The laboratory Atterberg limit results were used to calculate the shrink-swell index, via the correlation provided by Jayasekera et al (2003). A site characteristic surface movement within the range of 60 mm to 70 mm was calculated. AS2870 notes that the surface movement arises from the possibility of moisture change at depths in excess of 1.8 m due to changing groundwater regimes. Note that the surface movement assumes there is no filling beneath footings/slabs.

It should be noted that the cutting of material, or placement of fill, may change the assessment of the characteristic surface movements for the areas disturbed. As a result, any changes to the existing surface profile will require reassessment based on the cut and fill profiles. It is recommended that any foundation systems be designed to accommodate any anticipated ground surface movements.

6.3 Earthquake Loading

In accordance with Australian Standard AS1170.4 Part 4 "Earthquake Actions in Australia", the site subsoil classification is considered to correlate to Class Ce for footings on soil. For earthquake design, a hazard factor (z) of 0.08 is recommended for the NSW area as per Figure 3.2(A) in AS 1170.4.

6.4 Geotechnical Design Parameters of Soil for Shallow Footings

The geotechnical design parameters presented in Table 6-2 may be adopted in conceptual design for shallow footings. However, further investigation should be conducted across the site to refine these parameters, if necessary for detailed design. These values have been determined based on the site conditions at the time of the investigation and may change if the soil is subject to prolonged rainfall or soaking during construction.

Unit	Material	Unit Weight ¹	SPT N- Value	Undrained Shear Strength ¹ (S _u)	Poisson's Ratio ¹	Young's Modulus (E')	Shallow Foundation Allowable Bearing Capacity	Effective Cohesion, C'	Effective Friction, Φ'	'At-rest' Pressure Co-eff.	Active Earth Pressure Co-eff.	Passive Earth Pressure Co-eff.
		(kN/m³)		(kPa)		(MPa)	(kPa)	(kPa)	(°)	Ко	Ка	Кр
1	Topsoil Sandy Clay	17	-	-	-	-	-	-	-	-	-	-
2a	Alluvial Soil CLAY / Sandy CLAY; stiff.	17	11 to 15	70	0.3	22	145	5	25	0.58	0.41	2.46
2b	Alluvial Soil CLAY / Sandy CLAY; very stiff or better.	17	24 to 35	150	0.3	45	300	5	25	0.58	0.41	2.46
За	Residual Soil Clayey SILT / Sandy SILT; very stiff to hard	17	20 to 30	150	0.3	45	300	3	25	0.58	0.41	2.46
Зb	Residual Soil Silty CLAY / CLAY; very stiff to hard	17	20 to 30	150	0.3	45	300	10	25	0.58	0.41	2.46

Table 6-2: Geotechnical Preliminary Design Parameters

Notes: (1) These parameters have been estimated based on SPT values and published data.

6.5 Foundation considerations

All the boreholes undertaken within the site have indicated that the ground conditions are likely to be suitable for shallow foundations (subject to the finished ground levels following development). As the design loads are expected to be greater than a residential type building for substation or similar, typical slab on ground stiffened raft footing design in accordance with AS2870-2011 for residential foundation cannot be utilised and hence undertaking an engineered design is recommended.

6.5.1 Shallow Foundations for Structures

Given the highly reactive nature of the site, it is recommended that a stiffened raft footing system equivalent to Class H2 be designed for the structures. The footing must be founded on natural subgrade. All foundations must extend through any uncontrolled fill or weak soils to be founded on competent subgrade (subject to design for potential shrink-swell movements).

Please note that the minimum footing embedment depth should also take consideration of the overturning bending moment and/or uplift forces. The allowable bearing capacities set out in Table 6-2 may be adopted for the design.

It is recommended that all allowable bearing capacities be confirmed by an experienced geotechnical professional familiar with this report at the time of construction, prior to placement of blinding concrete and/or reinforcing steel.

6.5.2 Settlement

The soil profile is typically stiff to very stiff clays up to about 5.95 m depth. The estimated total settlement of an individual footing proportioned on the basis of the recommended bearing pressures is expected to be in the order of 0.5%B, where B is the footing width. Differential movement is expected to be about 50% of the maximum pad settlement. Such settlements will occur immediately upon loading and will be built into the structure without impacting structural design. The ground water table is assumed not to be above the base of the footing.

6.5.3 Axially Loaded Piles

Bored, screw (non-displacement) or driven (displacement) piles may be required to endure the uplift forces caused by wind actions as well as highly reactive nature of the ground condition. Differential upward movements between posts are considered minimal if uniform ground conditions are encountered in the adjacent post supporting the structure. The subsurface profile encountered during pile excavation should be observed by a geotechnical engineer to confirm the design assumptions.

Advice from an experienced piling contractor must be sought if piling requires pre-drilling into rock. Given that current scope of works did not involve coring into rock, further investigation may be required to identify weathering grade, strength and discontinuity of rock.

It is recommended that all piles be designed in accordance with the requirements of AS2159 – 2009. Using methods described in Woodward & Boitono (1961), the geotechnical parameters recommended for the pile design are shown in Table 6-3.

Table 6-3: Pile Design Parameters

Unit	Material Type	¹ Average Ultimate Skin Friction f_s (kPa)	² Average Ultimate End Bearing at Strata Base f_b (kPa)
2a	Alluvial Soil CLAY / Sandy CLAY; stiff.	45	600
2b	Alluvial Soil CLAY / Sandy CLAY; very stiff or better.	50	1350
За	Residual Soil Clayey SILT / Sandy SILT; very stiff to hard	50	1350
Зb	Residual Soil Silty CLAY / CLAY; very stiff to hard	50	1350

Note: 1 Only applicable if L/D≥4

2 Based on SPT blow count (N)

In order to assess pile capacity, a geotechnical strength reduction factor (Φ_g) should be applied to the above ultimate unit stresses in accordance with Table 4.3.2 of AS2159-2009. Selection of the geotechnical strength reduction factor (Φ_g) in accordance with AS 2159-2009 Table 3.2(A) is based upon a series of individual risk ratings with the final value of Φ_g dependant on the following factors:

- a) Site: the type, quantity and quality of testing;
- b) Design: design methods and parameter selection;
- c) Installation: construction control and monitoring;
- d) Pile testing regime: testing benefit factor based on percentage of piles tested and the type of testing. If some testing is carried out, an increase in the value of Φ_g may be possible depending on the type and extent of the testing. It is noted that Table 8.2.4(B) of AS 2159-2009 requires that 5% to 15% of piles should be subject to integrity testing if the value of Φ_g adopted by the structural designer exceeds 0.4;
- e) Redundancy: whether other piles can take up load if a given pile settles or fails.

Of the above factors, SMEC can only comment directly upon the site factors under a). The designer must determine the remaining individual risk factors b) through e), inclusive, with knowledge of the pile construction specification that will be applied to the construction contract.

Table 6-4 presents the assessed individual AS2159-2009 risk factors assigned by SMEC to site conditions only.

It should be noted that unit stress design values will vary for different pile diameters and founding depths, and different values may be applied depending on the type of pile adopted, founding depth, installation method, level of supervision, static load and pull-out testing (depending on the design philosophy i.e. pile spacing and whether uplift is the critical load). Pile design should be checked for lateral loading that may potentially occur.

Risk Factor	Typical Description o	f Risk Circumstances f	for Individual Risk Rating	Assigned Risk Factor
	1 (Very Low Risk)	3 (Moderate Risk)	5 (Very High Risk)	Factor
Geological complexity of site	Horizontal strata, well defined soil and rock characteristics	Some variability over site, but without abrupt changes in stratigraphy	Highly variable profile or features or steeply dipping rock levels or faults present on site, or combinations of these	3
Extent of ground investigation	Extensive drilling investigation covering whole site to an adequate depth	Some boreholes extending at least five pile diameters below the proposed foundation level	Very limited investigation with few shallow boreholes	3
Amount and quality of geotechnical data	Detailed information on strength and compressibility of the main strata	Boreholes confirming rock quality at proposed founding level for piles	Limited amount of simple in-situ testing or index tests only	3

Table 6-4: Individual Assigned Risk Factors - Site Conditions

Note: 1 – Refer to Table 4.3.2(A) in AS2159-2009 for details on risk factors.

6.5.4 Lateral Pile Capacity

It must be noted that no specific loading data has been provided for the magnitude, direction or frequency of expected loading conditions.

The preliminary determination of lateral capacity would utilise the conventional closed-form solutions developed by Broms, with further detailed analysis carried out using computer-based numerical methods.

Section 4.4.7 of AS2159-2009 outlines the procedure to determine ultimate geotechnical strength for a laterally loaded pile. The ultimate strength is given as the lesser of two values, depending on whether piles conform to "short-pile" or "long-pile" behaviour.

In short-pile behaviour, the ultimate lateral resistance of the soil surrounding the pile is fully mobilised along the entire length of the pile. In long-pile behaviour, the structural strength of the pile itself is fully mobilised before the ultimate soil resistance is achieved.

For piles constructed of grade 350 MPa steel, short-pile behaviour is expected – the ultimate lateral resistance of the soil surrounding the pile will likely be fully mobilised along the entire embedded length before the structural strength of the pile is fully mobilised.

For pile groups, the standard shows that design ultimate geotechnical strength is also taken as the lesser of two values:

- i) The sum of the design ultimate geotechnical strength of the individual piles in the group;
- ii) The design ultimate geotechnical strength of a block containing the piles and the soil between them.

Consideration should be given to the possibility for loss of lateral load capacity in the near surface soil. Environmental effects may also reduce lateral resistance. Additionally, separation between the pile and the surrounding ground (near-surface) may occur for piles subjected to cyclic lateral loading.

In addition to the ultimate geotechnical capacity of the pile, the pile must also be designed such that lateral deflections under serviceability loads are within allowable limits.

Given that specific loading data has not been provided for the magnitude, direction or frequency of expected loading conditions lateral deflection under serviceability loads must be checked once the specific structure loadings are available.

6.5.5 Uplift Forces

The uplift resistance may be calculated using the shaft resistance parameters, but with a reduction factor applied.

If tension piles are required to resist the uplift forces, an average ultimate skin friction of 35 kPa for stiff clays, 40 kPa for very stiff (or better) clays and 40 kPa for residual silt and clay soils can be adopted. Again, geotechnical reduction factors should be adopted to modify these values. A further geotechnical reduction factor of 0.4 is recommended for the calculation of uplift resistance of the piles.

6.6 Site Trafficability

The site was trafficable for a four-wheel drive vehicle during the investigation.

Problems may arise from disturbance of the upper level soil fabric resulting from the removal of the existing vegetation. This may limit trafficability for light weight construction vehicles and create difficulties for earthworks operations during wet season. It is recommended that vegetation be trimmed (mowed) and shrubs be cut to the ground level, which will preserve the crust and improve trafficability. Whereas clearing and grubbing would present issues if the crust is breached, and this would be more pronounced after rainfall events.

Should the upper soils become saturated during construction, the removal of the topsoil layer and placement of a temporary working platform (consisting of a geotextile placed under rock fill) may be required to allow access for light weight construction plant and road vehicles.

It is recommended that the following steps be taken to improve trafficability:

- The exposed surface in the construction area is proof rolled to provide a seal and assist in identifying weak or soft areas for treatment;
- Dedicated construction tracks are used to control site traffic and limit trafficability issues; and
- Provision and maintenance of adequate drainage conditions at this site is essential. It should be ensured that runoff is diverted away from the construction and access tracks to prevent ponding of water.

To assist in maintaining a workable construction site, the placement of a working platform as a final layer across structure/building platforms is recommended. The potential trafficability problems with this site should not be underestimated. This site will very quickly become untrafficable if appropriate drainage control measures, along with construction practices appropriate for the site conditions, are not maintained.

The contractor performing the works should fully inform themselves of the ground conditions at the site prior to commencement of earthworks. This requirement should be explicit in any earthworks specifications or

contract. Allowance should be made for the design, construction, and maintenance of a suitable working platform to support construction plant and heavy equipment such as piling rigs. Further advice can be provided by SMEC once details pertaining to design levels and construction plant are available.

6.7 Earthworks and Subgrade preparation

It is understood that minor cut and filling may will be required to create a level platform for construction. Earthworks procedures must be carried out in accordance with AS3798-2007 'Guidelines on Earthworks for Commercial and Residential Developments'.

The standard compaction test results indicated the near surface soils are dry of optimum moisture ranging from 1.9% to 4.0% in five of the sample and 0.4% and 1.5% wet of optimum moisture in three of the samples. Onsite surface clayey material will cause problems with trafficability and workability should this material be wet prior to or during construction.

Onsite surface clayey material will cause problems with trafficability and workability should this material be wet prior to or during construction. Options for earthworks at the site include:

- 1. Low performance fill platform allowing construction of solar arrays and access tracks constructed from general fill; and
- 2. Normal performance fill platform to suit construction of pavements and structures constructed from structural fill.

Construction of Option 1 would adopt the following procedure:

- Prepare the areas beneath the proposed works by trimming any vegetation to the ground level. It is recommended that long grass be trimmed (mowed) and shrubs be cut to the ground level, which will preserve the crust and improve trafficability.
 - Any settlement caused by decomposition of organic material within the topsoil is expected to have a small effect on the proposed construction.
- Place general fill in layers no thicker than 300 mm loose and compact uniformly with moisture conditioned to Standard optimum moisture content (OMC) ± 2%, and to the required minimum dry density ratio as given in Table 6-5.
- If the ground is moist, it is possible that the first layer of fill will not achieve the specified degree of compaction. In this case, the layer can be considered as a bridging layer allowing subsequent placement and compaction of general fill. If the ground is wet, then a thicker bridging layer may be required or granular fill may be considered.

Construction of Option 2 would adopt the following procedure:

- Prepare the areas beneath the proposed works by trimming any vegetation to the ground level. It is recommended that long grass be trimmed (mowed) and shrubs be cut to the ground level, which will preserve the crust and improve trafficability.
 - Any settlement caused by decomposition of organic material within the topsoil is expected to have a small effect on the proposed construction.
- Proof roll exposed subgrade using fully loaded water cart or similar to detect whether any soft spots exist. Zones that undergo excessive deflection or are unstable would require further treatment, the extent of which is best assessed at the time of construction. The treatment may involve excavation, and replacement with select fill, the use of a bridging layer potentially with geogrid and geotextiles. An experienced engineer should witness the proof rolling.
- Any imported select fill should comprise a well graded sand, crushed rock equivalent to VicRoads Class 4 crushed rock, ripped sedimentary rock, or suitable site derived filling. The maximum particle size after compaction should be 50 mm.

• The filling required to raise the subgrade should be placed in horizontal layers not greater than 250 mm loose thickness, uniformly compacted throughout, moisture conditioned to Standard optimum moisture content (OMC) ± 2%, and to the required minimum dry density ratio as given in Table 6-5.

The use of low reactive granular fill material is usually preferred as a structural fill. If it is elected to import low or non-reactive filling for structural filling the material specification will depend on the sensitivity of the structure to movement and the requirements of the designers. In the absence of specific design requirements, the following material limits are suggested as a guide:

- Maximum liquid limit: 50%
- Maximum plasticity index: 25%
- PI x %< 0.425 mm < 1200
- Potential swell in 4 day soaked CBR test < 0.5% (4.5 kg surcharge)
- Less than 20% retained on the 37.5 mm sieve (this will allow the implementation of conventional compaction control testing).

The required compaction specification will depend on the nature of the material being worked and its location. Suggested requirements are given in Table 6-5.

Table 6-5: Fill Compaction Requirements

Location	Material Type	Minimum Dry Density Ratio %	Moisture Range
General Fill	Clays	95% Standard	±2% of Standard OMC*
	Granular (non-reactive)	95% Standard	N/A
Structural Fill	Clays	95% Standard	±2% of Standard OMC
	Granular (non-reactive)	95% Standard	N/A

* OMC - Optimum Moisture Content

In the absence of specific design requirements for general fill, the material specifications and limits as suggested for Type-B fill in VicRoads Section 204 – Earthworks, can be used as a guide. It is understood that general fill will not be used in or around structures.

To ensure that desired construction standards are achieved it is suggested that any filling be tested at the minimum test frequency suggested in Table 8.1 of AS 3798-2007. "Earthworks for Commercial and Residential Developments", for the appropriate scale of the earthworks being carried out.

6.8 Material Suitability for Reuse

All site won material will require laboratory testing to confirm contamination status for reusability.

The site primarily consisted of topsoil over stiff to very stiff Clays of high plasticity. The use of high plasticity onsite clays should consider the potential reactivity of these materials which are susceptible to shrink-swell movements with changes in moisture content (i.e. shrinkage on drying and swelling on wetting). For this reason, these clays are usually considered unsuitable for use as structural fill (i.e. behind retaining walls and beneath structures).

The site won material may be used as general filling for access track construction subject to adequate compaction and selective rejection of any unsuitably over-wet material.

6.9 Excavation of Material and Ground Support

The soil materials encountered in the investigation can generally be excavated with conventional earth moving equipment such as excavators, backhoes, dozers, etc.

The excavatability of the rock mass (i.e. Granite) in unconfined situations is a function of several variables including rock strength, fracture spacing and size and orientation of the excavation. Depending on excavation depths, heavy ripping conditions should be expected which would require the use of larger plant (i.e. D9 or larger) together with rock breaking equipment to facilitate excavation and removal. It is recommended that a trial excavation be carried out to assess the general rippability of the rock and establish rates of production.

For dry batters cut into the typical stiff to very stiff clay, the slope angles in Table 6-6 are recommended for short and long-term conditions. The batter angles presented assume surcharge loads are kept clear of batter crests and surface water is diverted away from batters.

Table 6-6: Recommended Batter Angles

Material Type	Batter Height (m)	Temporary Condition (H:V)	Long Term Condition (H:V)
Alluvial CLAY	< 2	1:1	1.5 : 1
stiff to very stiff	2 – 3	1.5 : 1	*2:1

*Flatter if vegetation and maintenance is required; i.e. 3 : 1

Batter angles of excavations must be witnessed, verified and best assessed by an experienced geotechnical engineer during works. Flatter batter angles may be required if adverse ground conditions are encountered.

6.10 Groundwater Control

Groundwater was not encountered during the site investigation. Localised flows associated with perched water layers are a possibility. If groundwater is encountered onsite it is anticipated that any flow emanating from these materials can be managed using sump pumping. This will require further assessment at the time of construction.

6.11 Erosion and Drainage

Eight Emerson class (EC) laboratory tests were carried out. Based on AS1289.3.8.1-2017, the results of the EC testing indicate that the soil samples have the following classifications:

- EC = 2 (moderately dispersive), for BH01, BH03, BH08, BH12 and BH16;
- EC = 3 (slightly dispersive), for BH10; and
- EC = 5 (non-dispersive), for BH26.

It is recommended to treat the site soil as moderately dispersive. Such soils are prone to erosion. To protect against erosion and dispersion exposed soils should be vegetated or covered. Proper site drainage will be required to divert surface water from sensitive areas in a controlled manner and prevent pooling water. It is recommended that where site construction drainage involves high concentration of flows, the drains be appropriately lined with geotextile or plastic to control erosion on the site.

Adequate site drainage will be required to remove runoff from site in a controlled manner and prevent pooling water. It is important that the site is well drained. The ground around all structures should slope away at a gradient of 1:50 for a minimum of 3 m, then fall into a stormwater collection system or overland flow paths to prevent water from ponding adjacent to structures.

SMEC Internal Ref. 30041768 4 January 2019

6.12 Subgrade Evaluation and Preliminary Pavement Assessment

Laboratory testing indicates CBR values of 1.0% to 5.0% for the subgrade materials in the upper profile over the site. Swell percentages in the range 1.0% to 3.0% were measured.

SMEC recommends an initial design CBR value of 2.0% for clay subgrade soils based on the laboratory results. Site specific CBR testing to confirm the assumed design values is recommended for any critical or highly trafficked sections of pavement. Consideration could be given for subgrade treatments for the clay subgrade materials to allow more economical pavement design. Site clays must be treated as expansive.

It should be noted that there may be fill placement over areas of the development. In the areas of fill, the CBR values will be dependent on the source, quality, and compaction of the fill material.

6.13 Thermal Resistivity

The thermal resistivity of soil varies with soil type, density, structure and moisture content. Laboratory testing of three bulk samples was undertaken using the Dry Out Curve procedure which provided thermal resistivity and moisture content results that are plotted on Figure 3.

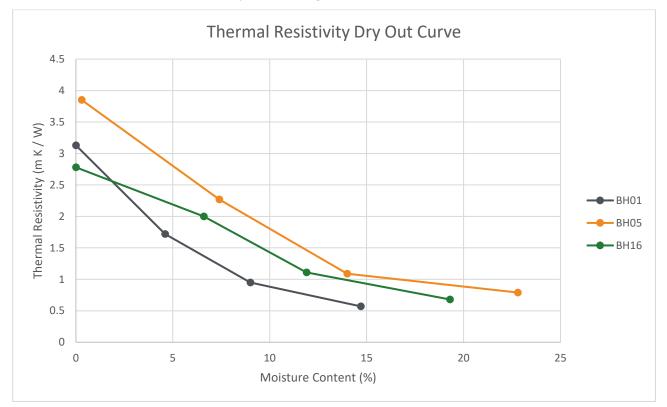


Figure 3: Thermal Resistivity Findings

Observations from the laboratory test results include:

- At field moisture content (FMC), thermal resistivity varies from 0.57 to 0.79 m K/W;
- Remoulded moisture contents (RMC) varied from 14.7% to 22.8%;
- Decreasing moisture content to 0.3% resulted in an increase in thermal resistivity of up to 3.85 m K/W; and
- Remoulded, compacted samples achieved approximately 95% density ratios of standard compaction.

Remoulding soil changes its structure and thermal resistivity and it is expected that soils used as fill or trench backfill may have a different thermal resistivity to that of the natural material onsite. Field measurements may be required if thermal resistivity's of natural materials are required.

6.14 Earth Resistivity Testing (Wenner Method)

The earth resistivity testing (ERT) of soil varies with soil type, density, structure and moisture content. Soil resistivity ground models were developed from the electrical resistivity testing undertaken at the substation and the rest of the site, and are summarised in Table 6-7 and Table 6-8.

Table 6-7: Substation Measurements - Soil Model Thermal Resistivity

Layer	Depth	Resistivity
	(m)	(Ω-m)
1	0-0.431	28.91
2	0.431 to infinite	6.86

Table 6-8: Field Measurements - Soil Model Thermal Resistivity

Layer	Depth	Resistivity
	(m)	(Ω-m)
1	0-0.276	68.35
2	0.276 to infinite	5.34

These results have been further assessed as part of the durability assessment in Section 6.15.

6.15 Durability Assessment

Based on our experience, soils of low permeability, which are not in the presence of groundwater would have a low probability of being aggressive; groundwater was not encountered at depths of the proposed maximum investigation.

Using the aggressivity results provided in Table 5-5, exposure classifications for concrete piles founded in soil have been determined in accordance with AS2159-2009. Results indicate that for durability of concrete piles, the ground conditions have an exposure classification of non-aggressive to mild; soil type B considered – low permeability soils (e.g. silts and clays) or all soils above groundwater, as per AS2159-2009.

- The samples tested between 0 to 1.0 m bgl were classified as non-aggressive.
- The samples tested between 1.5 to 2.0 m bgl were classified as mild.
- Assuming piled foundations would extend to 1.5 m or deeper, a mild classification is considered here for the durability of concrete onsite.
- For mild rating conditions, minimum concrete strength of 50 MPa with a minimum of 30 mm cover for precast and prestressed piles and a minimum concrete strength of 32 MPa with a minimum of 75 mm cover for cast in place piles for a design life of 100 years.

Using the aggressivity results provided in Table 5-5 and the ERT results provided in Tables 6-7 and 6-8, exposure classifications for steel piles founded in soil have been determined in accordance with AS2159-2009. Results indicate that for durability of steel piles, the ground conditions have an exposure classification of non-aggressive to moderate; soil type B considered – low permeability soils (e.g. silts and clays) or all soils above groundwater, as per AS2159-2009.

- The samples tested between 0 to 0.431 m bgl were classified as non-aggressive.
- The samples tested between 0.431 m to infinite were classified as moderate.
- Assuming piled foundations would extend to 1.5 m or deeper, a moderate classification is considered here for the durability of steel onsite.
- For moderate rating conditions, the durability of steel piles requires a uniform corrosion allowance of 0.02 to 0.04 mm/year. It is recommended that steel posts be galvanised to achieve design lives.

6.16 Anticipated Construction Difficulties

Large trees and other vegetation were also identified onsite during the site walkover. Removal of these trees and their associated roots will be required as their roots can be deleterious to foundations. Care should be taken when removing the tree roots, as incomplete removal could lead to under-draining and ground settlement when the roots decompose. Conversely, the removal of the trees can alter the moisture condition of the surrounding soils and consequently alter their engineering properties to varying degrees depending on the soil type, effects due to moisture change can be such as settlement and cracking of the ground due to shrink-swell.

6.17 Construction Inspections

It is recommended that construction inspection of the footings / pile excavations be undertaken by a SMEC geotechnical engineer to confirm that the ground conditions are consistent with those anticipated.

7 Conclusion

From the findings of the site investigations, factual information and recommended geotechnical design parameters are provided in this report.

Depending on the final development plans for the site, should any design changes occur during the construction phase then further targeted investigations may be required to confirm ground conditions across the site.

Additional geotechnical investigation may be required after preliminary design stage of the development to delineate lateral extent of shallow rock encountered if effected for pile foundation.

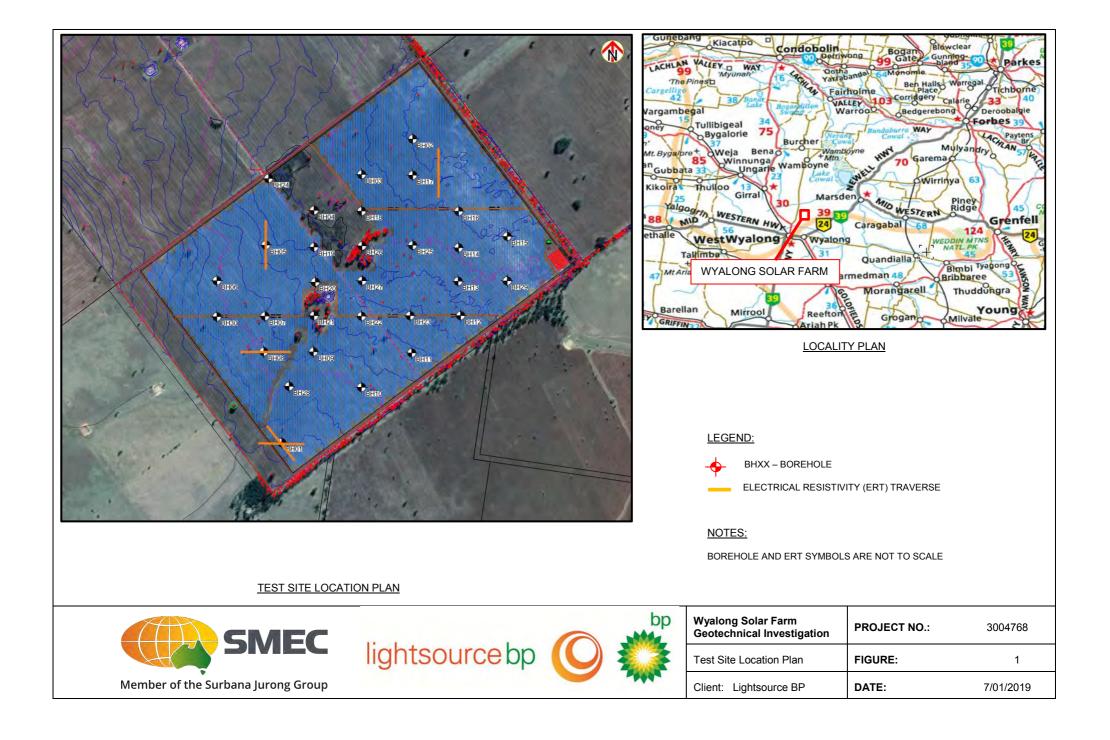
8 Limitation

This report has been prepared by SMEC, on behalf of Lightsource BP for the West Wyalong Solar Farm development project. This report has been prepared in accordance with the Services Contract between SMEC and Lightsource BP. This report is prepared exclusively for Lightsource BP for this project only. This report should not be used for other purposes and by any third party.

This report has been prepared based on data available to SMEC at the time of preparing this report. The subsurface conditions provided in this report are indicative only and are based on available sub-surface testing records (i.e. borehole, standard penetration tests). The sub-surface testings were undertaken at the specific location on specific time and only to the depths investigated. The accuracy of advice and sub-surface conditions provided in this report may be different from the actual sub-surface conditions due to the variable geological processes and undetected sub-surface conditions between the test points.

This report should be used as an entirety and the sections of this report should not be used separately. SMEC cannot be held responsible for any interpretations, decisions and conclusions made by others based on the contents provided in this report. SMEC endeavoured to identify the risks associated with the design and construction. SMEC cannot be held responsible for any risks associated with design and constructions. There may be risks associated with the design and constructions that are not documented or discussed in this report due to the unforeseen site conditions, variation of sub-surface conditions or beyond the knowledge of SMEC designers. However, should there be any risks arise during the design and/or construction SMEC would be endeavoured to carry out a risk assessment of the potential hazards, if requested.

Appendix A Test Site Location Plan



BOREHOLE INVESTIGATION SCHEDULE				
LOCATION ID	EASTING (M)	NORTHING (M)		
BH01	529681	6257971		
BH02	530382	6259587		
BH03	530110	6259399		
BH04	529857	6259210		
BH05	529576	6259028		
BH06	529338	6258835		
BH07	529594	6258646		
BH08	529587	6258456		
BH09	529855	6258460		
BH10	530106	6258265		
BH11	530379	6258448		
BH12	530634	6258645		
BH13	530622	6258828		
BH14	530630	6259004		
BH15	530884	6259067		
BH16	530626	6259201		
BH17	530382	6259394		
BH18	530109	6259203		
BH19	529856	6259010		

BOREHOLE INVESTIGATION SCHEDULE				
LOCATION ID	EASTING (M)	NORTHING (M)		
BH20	529857	6258832		
BH21	529854	6258646		
BH22	530108	6258641		
BH23	530365	6258645		
BH24	529614	6259383		
BH25	530380	6259021		
BH26	530111	6258981		
BH27	530108	6258829		
BH28	529721	6258271		
BH29	530883	6258830		
BH30	529338	6258643		

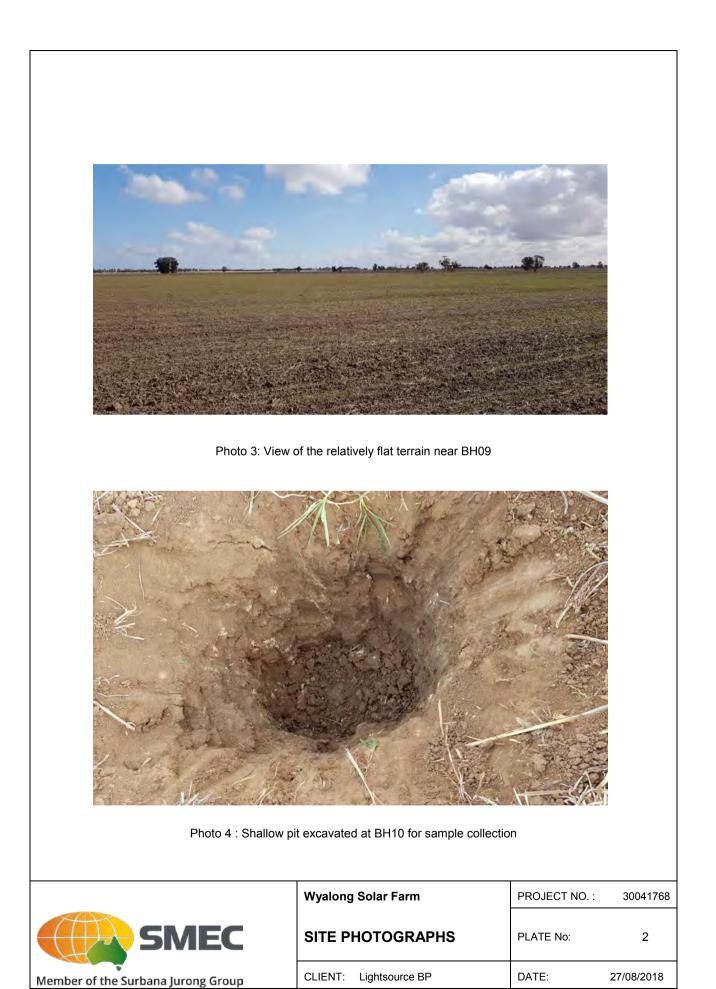
NOTES:

- 1. EASTING AND NORTHING ARE IN UTM ZONE 55H
- 2. COORDINATES WERE MEASURED WITH A HANDHELD GPS DEVICE WITH AN ACCURACY OF $\pm\,5$ M
- 3. NO SURVEY HAS BEEN UNDERTAKEN TO CONFIRM THE ACCURACY OF THE TEST SITE LOCATIONS AND THEIR REDUCED LEVELS



Appendix B Site Photographs





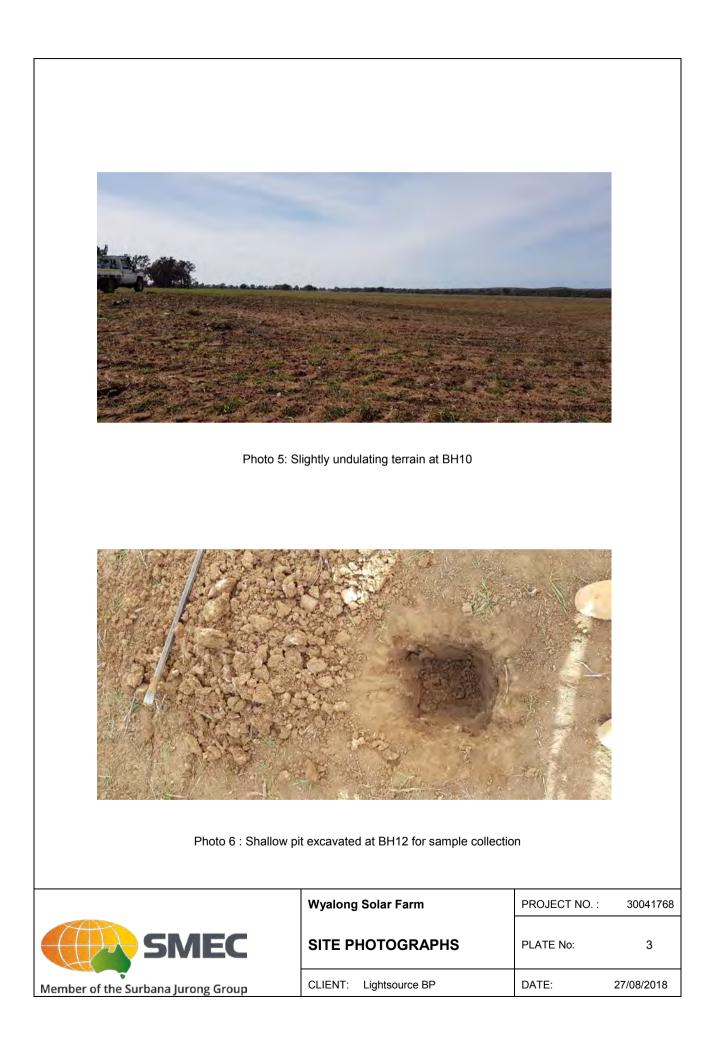




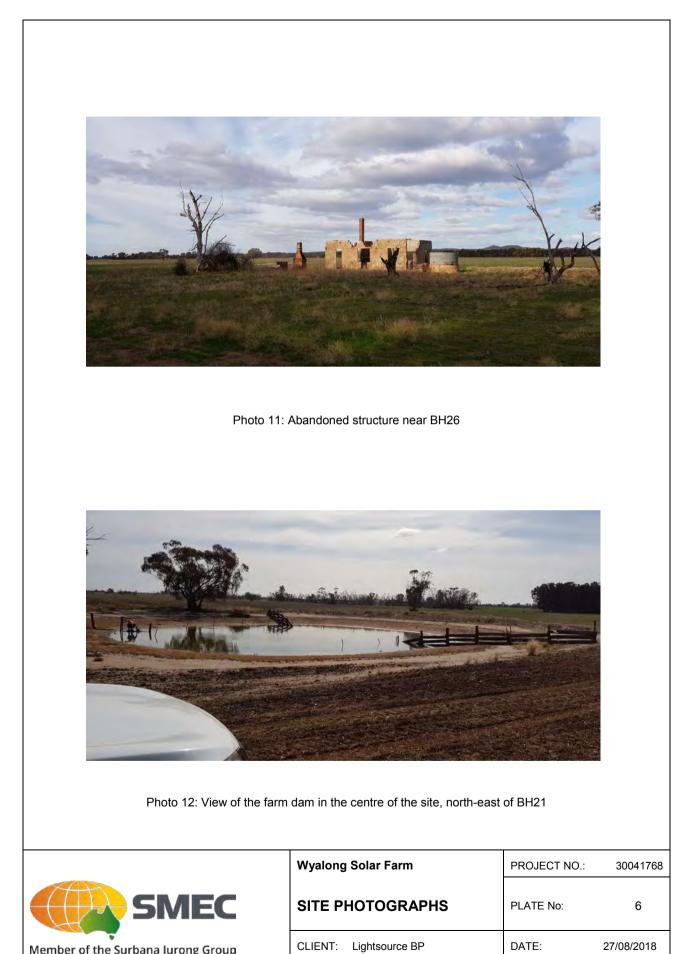


Photo 9: Looking North-East from BH20 towards the group of trees in the centre of the site



Photo 10: Group of trees in the centre of the site near BH26

	Wyalong Solar Farm	PROJECT NO. :	30041768
SMEC	SITE PHOTOGRAPHS	PLATE No:	5
Member of the Surbana Jurong Group	CLIENT: Lightsource BP	DATE:	27/08/2018



Member of the Surbana Jurong Group

Appendix C Borehole Logs and Explanatory Notes



Explanatory Notes of Abbreviations and Terms

Used on Borehole and Excavation Logs

General

Information obtained from site investigations is recorded on log sheets. The "Engineering Log – Borehole or Non Cored Borehole" presents data from drilling operations where a core barrel has not been used to recover material, and information is based on a combination of regular sampling and in-situ testing. The material penetrated in non-core drilling is commonly soil but may include rock. The "Engineering Log – Cored Borehole" presents data from drilling operations where a core barrel has been used to recover material – commonly rock. The "Engineering Log - Excavation" presents data obtained on the subsurface profile from observations of excavations, either natural or man-made. It may contain a scaled, graphical presentation of the typical excavation profile. Refusal of the excavation plant is noted should it occur.

As far as is practicable, the data contained on the log sheets is factual. Some interpretation is inevitable in the assessment of material boundaries in areas of partial sampling, the location of areas of core loss, description and classification of material, estimation of strength and identification of drilling induced fractures. Material description and classification is generally based on AS1726-2017.

Drilling Method

Code	Description
ADT	Auger drilling with TC-bit
ADV	Auger drilling V-bit
AS	Auger screwing
AT	Air track
CA	Casing advancer
CC	Concrete core
CTR	Cable tool rig
DB	Wash bore drag bit
HA	Hand auger
HAND	Hand methods
HF	Hollow flight auger
HMLC	Diamond core 62mm diameter
HQ	Wire line core barrel 64mm diameter
HQ3	Wire line core barrel 62mm diameter
NDD	Non destructive drilling
NMLC	Diamond core 52mm diameter
NQ	Wire line core barrel 47mm diameter
NQ3	Wire line core barrel 45mm diameter
PT	Continuous push tube
PQ	Wire line core barrel 85mm diameter
RAB	Rotary air blast
RC	Reverse circulation
RD	Rotary blade or drag bit
RR	Rock roller
RT	Rotary tricone bit
SD	Sonic drilling
TBX	Tube-X
VC	Vibro-core drilling
WB	Wash bore drilling

Drilling Penetration

Ease of penetration in non-core drilling

VE	Very easy
E	Easy
F	Firm
Н	Hard
VH	Verv hard

Support and Casing

Code	Description	Code	Description
С	Casing	Hw	114.3 mm
Μ	Mud	NW	88.9 mm
W	Water	PVC	150 mm

Core Run

Core lifts are identified by a line and depth with core loss per run as a percentage. Core loss is shown in the core run unless otherwise indicated.

Defect Spacing

The average distance between defects is measured parallel to the core axis in mm and may be expressed as a range or average.

Angle / Orientation

Angle from horizontal and orientation to magnetic north.

For inclined cored boreholes the Alpha and Beta angles are presented for orientated core. Alpha (α) is measured relative to the core axis, whilst Beta (β) is measured clockwise from the reference line looking down the core axis in the direction of drilling.

Excavation Method

Ν	Natural exposure
Х	Existing excavation
BB	Tractor mounted backhoe bucket
EX	Hydraulic excavator
EH	Hydraulic excavator with hammer
В	Bulldozer blade
R	Ripper

Water / Drilling Fluid

The drilling fluid used is identified and loss of return to the surface is estimated as a percentage, generally of each core lift.

Symbol	Description
	Water inflow
	Water outflow
	Water level: during drilling or immediately after completion of drilling
	Groundwater level with date observed prior to introduction of fluids or after standpipe construction
Not observed	The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole / test pit.
Not encountered	The borehole / test pit was dry soon after excavation, however groundwater could be present in less permeable strata. Inflow may have been observed had the borehole / test pit been left open for a longer period.

Colour

The colour of a soil or rock is described in a moist/wet condition using simple terms, such as black, white, grey, red, brown, orange, yellow green or blue. These are modified as necessary by 'pale', 'dark' or 'mottled'. Borderline colours are described as a combination of these colours (e.g. orange-brown). Where a soil or rock consists of a primary colour with a secondary mottling it is described as (primary colour) mottled (first colour) and (secondary colour).



Description of Soil

- i. Soil name (BLOCK LETTERS)
- ii. Plasticity or particle size of soil
- iii. Colour
- iv. Secondary soil components names & estimated proportions, including their plasticity / particle characteristics, colour
- v. Minor soil components name, estimated proportions, including their plasticity / particle characteristics, colour
- vi. Other minor soil components
- vii. Moisture condition
- viii. Consistency / density
- ix. Structure of soil, geological origin
- x. Additional observations

Particle Size

Term		Grain Size
Clay		< 2 µm
Silt		2 – 75 µm
	Fine	0.075 – 0.21 mm
Sand	Medium	0.21 – 0.6 mm
	Coarse	0.6 – 2.36 mm
	Fine	2.36 – 6.7 mm
Gravel	Medium	6.7 – 19 mm
	Coarse	19 – 63 mm
Cobbles		63 – 200 mm
Boulders		> 200 mm

Descriptive Terms for Secondary and Minor Components

	In coarse grained soils			In fine grained soils		
Designation of Components	% Fines	Terminology	% Accessory coarse fraction	Terminology	% Sand / Gravel	Terminology
	≤5	trace	≤15	trace	≤15	trace
Minor	>5, ≤12	with	>15, ≤30	with	>15, ≤30	with
Secondary	>12	prefix	>30	prefix	>30	prefix

Plasticity - Fine Grained Soils

Liquid Limit (LL) %	Description
≤ 35	Low plasticity (L)
>35 to ≤ 50	Medium plasticity (I)
> 50	High plasticity (H)

Plasticity Chart- Fine Grained Soils

Fine Grained and Coarse Grained Soils

Term	Description
Fine Grained Soil (cohesive)	More than 35% of the material less than 63 mm is smaller than 0.075 mm (silts and clays)
Coarse Grained Soil	More than 65% of the material less than 63 mm is larger than 0.075 mm (sands, gravels and cobbles)

Consistency Terms – Fine Grained Soils

Term	Undrained shear strength (kPa)	Indicative SPT (N) Blow Count	Field Guide to Co
Very Soft (VS)	<12	0 – 2	Easily penetrated s squeezed in fist
Soft (S)	12 – 25	2 – 4	Easily penetrated s finger pressure
Firm (F)	25 – 50	4 - 8	Can be penetrated moulded between
Stiff (St)	50 – 100	8 – 15	Readily indented by moulded by fingers
Very Stiff (VSt)	100 – 200	15 –30	Readily indented by
Hard (H)	>200	>30	Indented with diffic
Friable (Fr)	-		Can be easily crum

Density Terms – Coarse Grained Soils

Term	Density Index (%)	SPT (N) Blow Count
Very Loose (VL)	< 15	0 - 4
Loose (L)	15 – 35	4 – 10
Medium Dense (MD)	35 – 65	10 – 30
Dense (D)	65 – 85	30 – 50
Very Dense (VD)	> 85	>50

Particle Characteristics – Coarse Grained Soils

Term	Description
Well Graded	Having good representation of all particle sizes
Poorly graded	With one or more intermediate size poorly represented
Gap graded	With one or more intermediate sizes absent
Uniform	Essentially of one size

Angularity – Coarse Grained Soils

	Rounded
6	Sub-rounded
	Angular
	Sub-angular

Origin of Soil

Fill	Formed by humans
Aeolian	Formed by wind
Alluvial	Formed by streams and rivers
Colluvial Formed on slopes (talus)	
Estuarine	Formed in marine environments
Lacustrine	Formed in lakes
Residual Formed by weathering insitu	

4	Revision 0,	December	2017	SMEC	Soil	and	Rock	Logging	Explanatory	/ Notes.

Field Guide to Consistency
Easily penetrated several centimetres by fist, exudes between fingers when squeezed in fist
Easily penetrated several centimetres by thumb, easily moulded by light finger pressure
Can be penetrated several centimetres by thumb with moderate effort, and moulded between the fingers by strong pressure
Readily indented by thumb but penetrated only with difficultly. Cannot be moulded by fingers
Readily indented by thumb nail, still very tough
Indented with difficulty by thumb nail, brittle
Can be easily crumbled or broken into small pieces

Soil Moisture

	Term	Code	Description
q	Dry	D	Looks and feels dry and free running
Coarse Grained	Moist M		Soil feels cool, darkened in colour, soils tend to stick together, soil grains do not run freely through fingers and no visible free water
Соа	Wet W		Soil feels cool, darkened in colour, soils tend to stick together, free water on remoulding
	Moist, Less than Plastic W < PL Limit		Hard and friable or powdery, moisture content well below Plastic Limit
ined	Moist, Near Plastic Limit	W ≈ PL	Soil feels cool, darkened in colour, can be moulded, near Plastic Limit
Fine Grained	Moist, Wet of Plastic Limit W > PL		Soil feels cool, dark, usually weakened, free water, moisture content well above Plastic Limit
	Wet, Near Liquid Limit	W ≈ LL	Soil exudes easily
	Wet, Wet of Liquid Limit	W > LL	Soil behaves as a liquid

Boundary Classifications

Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well graded gravel-sand mixture with clay binder.

Graphic Symbols

	Asphalt	$\begin{smallmatrix} 1^{*}_{0}1^{*}_{0}1^{*}_{0}1^{*}_{1$	МН
	СН	600 100	ML
ℤ	CI	1997 1997 1997	ОН
	CL	197 전문 : 전문 전	OL
	Concrete	17. 77. : 72. 7	PT
***	Fill	W.	SC
	GC	\boxtimes	SM
1000 8900 8900	GM		SP
200	GP	F -1	SW
0.00	GW		

Soil Classification

Soils are described in general accordance with AS1726-2017 as shown below.

GROUP PRIMARY FIELD IDENTIFICATION PROCEDURES SYMBOL NAME (Excluding particles larger than 63 mm and basing fractions on estimated mass) Wide range in grain size and substantial amounts More than 65% of the material is less than 63 mm and is larger than 0.075 GW GRAVEL <u>0</u> of all intermediate particle sizes, not enough fines **GRAVELS** More than half of coarse fraction i larger than 2.36 mm to bind coarse grains, no dry strength; \leq 5% fines **CLEAN GRAVELS** Predominantly one size or a range of sizes with (Little or no fines) more intermediate sizes missing, not enough fines GP GRAVEL to bind coarse grains, no dry strength; $\leq 5\%$ fines particle size of 0.075 is about the smallest size distinguishable to the naked eye GRAVELS w/ 'Dirty' materials with excess of non-plastic fines, GM SILTY GRAVEL **FINES** none to medium dry strength; $\geq 12\%$ silty fines (Appreciable amount of fines) 'Dirty' materials with excess of plastic fines, CLAYEY GC GRAVEL medium to high dry strength; \geq 12% clayey fines Wide range in grain size and substantial amounts <u>.ഗ</u> SW SAND SANDS More than half of coarse fraction smaller than 2.36 mm of all intermediate particle sizes, not enough fines to bind coarse grains, no dry strength; \leq 5% fines **COARSE GRAINED SOILS CLEAN SANDS** Predominantly one size or a range of sizes with (Little or no fines) more intermediate sizes missing, not enough fines SP SAND to bind coarse grains, no dry strength; $\leq 5\%$ fines 'Dirty' materials with excess of non-plastic fines, SANDS w/ FINES SM SILTY SAND none to medium dry strength; \geq 12% silty fines (Appreciable amount of fines) 'Dirty' materials with excess of plastic fines, mm SC CLAYEY SAND medium to high dry strength; \geq 12% clayey fines **IDENTIFICATION PROCEDURES ON FRACTIONS** < 0.075 mm less than GROUP PRIMARY **DRY STRENGTH** DILATANCY TOUGHNESS SYMBOL NAME **SILTS AND CLAYS** Liquid Limit < 50% More than 35% of the material mm is less than 0.075 mm SILT None to low Slow to rapid I ow MI FINE GRAINED SOILS CLAY Medium to high ≥ 12% clayey fines Medium CL, CI $\overline{\triangleleft}$ Low to medium Slow Low OL ORGANIC SILT Liquid Limit > 50% SILT Low to medium None to slow Low to medium MH SILTS AND СН High to very high None High CLAY CLAYS ORGANIC Medium to high Low to medium OH None to very slow 63 CLAY

HIGHLY ORGANIC SOILS: readily identified by colour, odour, spongy feel and frequently fibrous texture

PT

PEAT

Description of Rock

- i. Rock name (BLOCK LETTERS)
- ii. Grain size and mineralogy
- iii. Colour
- iv. Fabric and texture
- v. Features, inclusions, minor components, moisture content and durability
- vi. Strength
- vii. Weathering and/or alteration
- viii. Rock mass properties discontinuities and structure of rock
- ix. Interpreted stratigraphic unit
- x. Additional observations including geological structure

Simple rock names are used to provide a reasonable engineering description, rather than a precise geological classification. The rock name is chosen by considering the nature and shape of the grains or crystals, the texture and fabric of the rock material, the geological structure and setting, and information from the geological map of the area. Further guidance on the naming of rocks can be found in AS1726-2017, Tables 15, 16, 17 and 18. Typical rock types are described below, though subject to site specific variations.

Rock Type	Description	Example of Rock Name
Sedimentary	Formed by deposited beds of sediments, have grains that are cemented together and often rounded. Significant porosity	COMMON: Conglomerate, Breccia, Sandstone, Mudstone, Siltstone, Claystone ≥90% CARBONATE: Limestone, Dolomite, Calcirudite, Calcarenite, Calcisiltite, Calcarenite, Calcisiltite, Calcilutite PYROCLASTIC: Agglomerate, Volcanic Breccia, Tuff
Igneous	Formed from molten rock and have a crystalline texture. Typically massive and low porosity. Rock types are from coarse to fine grained.	HIGH QUARTZ CONTENT: Granite, Microgranite, Rhyolite MODERATE QUARTZ CONTENT: Diorite, Microdiorite, Andesite LOW QUARTZ CONTENT: Gabbro, Dolerite, Basalt
Metamorphic	Formed when rocks are subject to heat and/or pressure and have typically have directional fabric. Typically have low porosity and crystalline structure. Rock types are from coarse to fine grained	FOLIATED: Gneiss, Schist, Phyllite, Slate NON-FOLIATED: Marble, Quartzite, Serpentinite, Hornfels
Duricrust	Formed as part of a weathering profile and show evidence of being cemented in situ. Cementation is typically irregular and exhibits replacement textures.	Ferricrete (Iron oxides and hydroxides) Silicrete (Silica) Calcrete (Calcium carbonate) Gypcrete (Gypsum)

Note: () denotes dominant cementing mineralogy

Grain Size

Terms describing dominate grain size in sedimentary rocks.

Term	Grain size	
Coarse Mainly 0.6 mm to 2 mm		
Medium	Mainly 0.2 mm to 0.6 mm	
Fine	Mainly 0.06mm (just visible) to 0.2 mm	

Terms describing dominate grain size in igneous and metamorphic rocks

Term Grain size	
Coarse Mainly greater than 2 mm	
Medium	0.06 mm to 2 mm
Fine	Mainly less than 0.06 mm (just visible) to 0.2mm

Texture and Fabric

Sedimentary rocks

Thickness	Bedding Term
< 6 mm	Thinly laminated
6 – 20 mm	Laminated
20 – 60 mm	Very thinly bedded
60 – 200 mm	Thinly bedded
0.2 – 0.6 m	Medium bedding
0.6 – 2 m	Thickly bedded
> 2 m	Very thickly bedded

Igneous rocks

Term	Definition		
Amorphous	Indicates that the rock has no obvious crystalline structure		
Crystalline	A regular molecular structure, showing crystal structure and symmetry.		
Cryptocrystalline	The texture comprises crystals that are too small to recognise under an ordinary microscope. Indistinctly crystalline.		
Porphyritic	Indicates the presence of phenocrysts (relatively large crystals in a fine grained ground mass) in igneous rocks.		
Flow banded	Indicates visible flow lines in volcanic rocks and some intrusive rocks		
Glassy	Entirely glass like. No crystalline units and without crystalline structure.		
Vesicular	A texture of volcanic rocks that indicates the presence of vesicles (small gas bubbles). Where the vesicles are filled with a mineral substance they are termed Amygdales and the texture is Amygdaloidal.		

Metamorphic

Term	Definition
Foliation	The parallel arrangement of minerals due to metamorphic process, which shall be defined by the terms in weak, moderate and strongly foliated.
Porphyroblastic	A texture indicating the presence of porphyroblasts (larger crystals formed by recrystallization during metamorphism, such as garnet or staurolite in a mica schist).
Cleavage	A type of foliation developed in fine grained metamorphic rocks such as slates.

6 Revision 0, December 2017 SMEC Soil and Rock Logging Explanatory Notes.

Bedding and Fabric Development

Туре	Definition		
Massive	No obvious development of bedding – rock appears homogeneous		
Poorly Developed	Bedding is barely obvious as faint mineralogical layering or grain size banding, but bedding planes are poorly defined.		
Well Developed	Bedding is apparent in outcrops or drill core as distinct layers or lines marked by mineralogical or grain size layering.		
Very Well Developed	Bedding is often marked by a distinct colour banding as well as by mineralogical or grain size layering.		
Indistinct fabric	There is little effect on strength properties		
Distinct Fabric	The rock may break more easily parallel to the fabric		

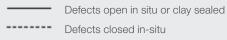
Rock Strength

Term (Code)	UCS (MPa)	Is ₍₅₀₎ (MPa)	Field Guide to Strength	
Very Low (VL)	0.6 – 2	> 0.03 to ≤0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 3 cm thick can be broken by finger pressure.	
Low (L)	2 - 6	> 0.1 to ≤ 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blow of the pick point; has dull sound under hammer. A piece of core 150 mm long 50 mm in diameter may be broken by hand. Sharp edges of core may be friable and break during handling.	
Medium (M)	6 - 20	> 0.3 to ≤ 1.0	Readily scored with a knife; a piece of core 150 mm long by 50 mm in diameter can be broken by hand with difficulty.	
High (H)	20 - 60	> 1 to ≤ 3	A piece of core 150 mm long by 50 mm in diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.	
Very High (VH)	60 -200	> 3 to ≤ 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.	
Extremely High (EH)	>200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.	

Rock strength is assessed by laboratory Uniaxial Compressive Strength (UCS) testing and/or Point Load Strength Index (PLT) testing to obtain the $I_{S_{(50)}}$ the strength table implies a 20 times correlation between $I_{S_{(50)}}$ and UCS used for classification. Note however, multiplier may range from 4 (e.g. some carbonated and low strength rocks) to 40 (e.g. some igneous rocks and/or some high strength rocks). A site specific correlation based on testing, previous investigation or literature may be used where available. These terms refer to the strength of the rock material and not to the strength of the rock mass which may be considered weaker due to the effect of rock defects.

Visual Log

A diagrammatic plot of defects showing type, spacing and orientation in relation to the core axis.



Drill induced fractures or handling breaks

Infilled seam

Rock Weathering and or Alteration Classification

Term (Code)		Definition		
Residual soil (RS)		Soil developed on extremely weathered rock. The rock mass structure and substance fabric are no longer evident but the soil has not been significantly transported.		
Extremely weathered (EW) Extremely altered (XA)		Rock is weathered to such an extent that it has 'soil' properties, i.e, it either disintegrates or can be remoulded in water, but the texture of original rock is still evident.		
Highly weathered (HW) Highly Altered (HA)	Distinctly weathered (DW)* Distinctly Altered (DA)	Whole rock material is discoloured usually by extent that iron staining or bleaching and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock usually as a result of iron leaching or deposition. The colour and strength of the original rock substance is no longer recognisable	*Where is it not practical to distinguish between 'HW' and MW'. Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of	
Moderately weathered (MW) Moderately Altered (MA)		Whole rock material is discoloured usually by staining that original colour of the fresh rock is no longer recognisable	weathering products in pores	
Slightly weathered (SW) Slightly altered (SA)		Rock is slightly discoloured but shows little or no change of strength from fresh rock		
Fresh rock (F)		Rock shows no sign of decomposition or staining.		

Rock Core Recovery

TCR = Total Core Recovery (%)

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Length of Core Recovered
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Length of Core run
```

SCR = Solid Core Recovery (%)

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Sum Length of Cylindrical Core Recovered x 100
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Length of Core run

RQD = Rock Quality Designation (%)

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Sum Length of Sound Core Pieces > 100mm in length x 100
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x 100

Length of Core run

Types of Discontinuities

Term	Code	Description		
Parting	Pt	A defect parallel or sub-parallel to a layered arrangement of mineral grains or micro- fractures, which has caused planar anisotropy in the rock substance.		
Joint	Jt	A defect across which the rock substance has little tensile strength, but that is not related to textural or depositional features within the rock substance.		
Sheared Zone	SZ	A zone with roughly parallel planar boundaries of rock substance consisting of closely spaced joints with smooth slickensided surfaces often curved. The joints divide the rock mass into un blocks usually of lenticular or wedge shape.		
Crushed Zone	CZ	A zone or seam with roughly parallel planar boundaries of rock substance composed of disoriented, usually angular, fragments of the host rock substance		
Seam	Se	A zone or seam with roughly parallel boundaries, infilled by soil (IS) or decomposed rock (DS)		
Fault	F	A fracture (defect) in rock along which there has been an observable amount of displacement.		
Vein	Ve	A zone of minerals intruded into a joint or fissures.		

Type of Structures

Term	Code	Description	
Bedding	Bg	A layered arrangement of minerals parallel to the surface of deposition which has caused planar anisotropy in the rock substance.	
Cleavage	С	An alignment of fine grained minerals caused by deformation.	
Schistosity	SH	A layered arrangement of minerals to each other	
Foliation	Fo	A planar alignment of minerals caused by deformation.	
Void	Vo	A completely empty space	
Dyke	DK	Sheet-like bodies of igneous rock that cut across sedimentary bedding or foliations in rocks. They may be single or multiple in nature	
Sill	SI	A sill is an intrusion of magma that spreads underground between the layers of another kind of rock	
Contact	Cn	A contact between intrusive and stratigraphic units.	
Boundary	Bd	A distinct boundary between two stratigraphic units	

Note: Drill breaks (DB) and handling breaks (HB) are not included as natural discontinuity.

Discontinuity Spacing

Spacing (mm)	Description	
>6000	Extremely Widely Spaced	
2000 - 6000	Very Widely Spaced	
600 - 2000	Widely Spaced	
200 - 600	Medium Spaced	
60 - 200	Closely Spaced	
20 - 60	Very Closely Spaced	
<20	Extremely Closely Spaced	

Discontinuity Planarity

Code	Description
Cu	Curved – A defect with a gradual change in orientation
lr	Irregular – A defect with many sharp changes in orientation
PI	Planar – Defect forms a continuous plane without variation in orientation
St	Stepped – A defect with distinct sharp steps or step
Un	Undulose – A defect with undulations
Vu	Vuggy – An open void with crystallisation
Wv	Wavy – A wavy defect surface

Discontinuity Roughness

Abbreviation	Description
Ro	Rough – Many small surface irregularities generally related to the grain size of the parent rock
Sm	Smooth – Few or no surface irregularities related to the grain size of the parent rock
Po	Polished – Planes have a distinct sheen or a smoothness
SI	Slickensided – Planes have a polished, grooved or striated surface consistent with differential movement of the parent rocs along the plane
VR	Very rough – many large surface irregularities, amplitude generally more than 1mm

Infill Material

Code	Name	Code	Name
Ca	Calcite	Gp	Gypsum
Ch	Chlorite	Mn	Manganese
CI	Clay	MS	Secondary mineral
Со	Coal	Ру	Pyrite
Fe	Limonite / Ironstone	Um	Unidentified mineral
Fe Cl	Iron oxide clay	Qz	Quartz
FI	Feldspar	Х	Carbonaceous

Discontinuity Observation

Term	Code	Description						
Clean	CN	No visible coating or infill						
Stain	SN	No visible coating or infill but surfaces are discoloured by mineral staining						
Veneer <1 mm	VNR	A visible coating or soil or mineral substance but usually unable to be measured. If discontinuous over the plane, patchy veneer.						
Coating >1 mm to <10 mm	СТ	A visible coating or infilling of soil or mineral substance. Describe composition and thickness.						
Filling (Filled) >10 mm	FLD	A visible filling of soil or mineral substance. Describe composition and thickness.						

Samples and Field Tests

Τ.

Code	Description
В	Bulk disturbed sample
BLK	Block sample
С	Core sample
DS	Small disturbed sample
ES	Soil sample for environmental testing
EW	Water sample for environmental testing
FP	Pressuremeter
G	Gas sample
Н	Hydraulic fracturing
HP	Hand penetrometer test
I	Impression device
IS(50)	Point Load Index
K	Permeability
LB	Large bulk disturbed sample
Ν	Standard penetration test result (N* denotes SPT sample recovery)
0	Core orientation
Ρ	Piston sample
PID	Photoionisation detector reading in ppm
R	Hammer bouncing / refusal
SPT	Standard Penetration Test
U	Undisturbed push in sample
UCS	Uniaxial Compressive Strength
U50	Undisturbed tube sample (50 mm diameter)
U75	Undisturbed tube sample (75 mm diameter)
VS	Vane shear test
• (A)	Axial Test
O (D)	Diametral Test
	Irregular Lump test

Laboratory Tests

Code	Description
ACM	Asbestos Containing Material
CD	Consolidated Drained
CU	Consolidated Undrained
LL	Liquid Limit
LS	Linear Shrinkage
MC	Moisture Content
MDD	Maximum Dry Density
OMC	Optimum Moisture Content
PBT	Plate Bearing Test
PI	Plasticity Index
PL	Plastic Limit
PSD	Particle Size Distribution
$ ho_{ m b}$	Bulk Density
$ ho_{ ho}$	Particle Density
ρ_{d}	Dry Density
UU	Undrained Unconsolidated

Backfill / Standpipe Detail

 Symbol	Description	Symbol	Description
	Cement seal		Filter pack: sand filter
	Grout backfill		Filter pack: gravel filter
	Blank pipe		Bentonite seal
	Slotted pipe		Cutting – excavated material backfill
	Surface Completion: Monument Above Ground		Surface Completion: Gatic Ground Monument

Completion Details

Туре	Description
Collapse	Exploratory hole collapsed before reaching planned depth
Equipment Failure	Boring or excavator equipment operational failure
Flooding	Flooding of excavation
Machine Limit	Limit of machine capability reached
Obstruction	Obstruction preventing further advancement
Possible services	Indication of possible services below
Services present	Services encountered during exploratory hole
Squeezing	Hole squeezing boring equipment
Target Depth	Depth reached as planned
Target Depth Instrumentation Installed	Depth reached as planned instrumentation installed
Target Depth Standpipe Installed	Depth reached as planned open standpipe constructed
Material Refusal	Material preventing further advancement



Member of the Surbana Jurong Group

	Lightsourc			Ν		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	IG I	_00	P S	IOLE NO : BH01 ROJECT NUMBER : 30041768 HEET : 1 OF 2
LOCATION : POSITION :			257971.	0 (M	GA94	Zone 55) SURFACE ELEVATION : 235.00 (AHD)		INC		INAL DEPTH : 5.95 m ° / ORIENTATION° : 90° / N/A
RIG TYPE :						G: 4WD CONTRACTOR : APEX DRILLING				IA: 100 mm
DATE START	ED: 26/07	7/2018 D	ATE CO	OMP	LETE	ED : 26/07/2018 DATE LOGGED : 26/07/2018 LOGGED	BY :	AS		CHECKED BY : NR
	DRILLING					MATERIAL				
DRILLING & CASING & CASING & CASING BRILLING FLUID FLUID FLUID FLUID FLUID	VH GROUND WATER LEVELS SAMPLES &	FIELD TESTS 266-0VATION	0 DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
			0.0		СН	Sandy CLAY high plasticity, grey-brown, fine grain sand, with 0.10m rootlets	D		TOPSOIL	
	 		0.5			CLAY: high plasticity, brown, trace fine to medium grain sand	D to N	F - St	O.30: rootlet:	s to 0.5 m -
	8,8,0 N*=8 <u>0.95n</u> 1.000 SPT: 10,12 N*=1:	234.0				0.50m: becoming mottled grey and orange, trace rootlets to 1m				- - - - -
- ADV	1.45n SPT 9.11.1.50n SPT 9.11.1.N'=1	0			СН	1.50m: becoming mottled pale orange-brown, trace fine to medium grained sand, trace sub-angular gravel	м	St	1.50: recove	- ory of quartz gravel - - - - - - - - - - - - - - - - - - -
	 	4 ,0 2 0				2.50m: becoming pale grey-brown mottled red, trace medium to coarse grained sand				-
	4.00	231.0 [231.5				4.00m			3.50: auger	grinding slightly
ADT Auger d HF Hollow f WB Wash-b RR Rock rol SD Sonic dr NDD Non des PT Continu HAND Hand m	ger rrewing illing with V bi illing with TC I ight auger ore drilling ler lilling tructive drilling ous push tub ethods	i bit	WA	SAMPLES & FIELD TESTS B Bulk Disturbed Sample CONSISTENCY/ RELATIVE DENSITY W B Bulk Disturbed Sample SOIL DESCRIPTION ReLATIVE DENSITY W D Disturbed Sample Based on Unified S Soil DESCRIPTION W Very Hard / Refusal Water Sample Water Sample Soil DESCRIPTION VS Very Soft MOISTURE Undisturbed Sample ES Water Sample HP Hand Penetrometer (kPa) St Stiff TER Molsturbed Sample Evel Inform N Result of SPT ("=sample taken)) D Dry H Level on Date shown U50 Undisturbed Sample (50mm dia) M Moist VL - Very Loose Water inflow VS Vane Shear, peak/remouded(kPa) PL Plastic limit MD - Medium Dense VS Vane Shear, content MC Moisture Content U Very Dense						
details of abbr & basis of des						SMEC AUSTRALIA				SMEC

	ENT			source Bl			Ν			RILL HOLE	- ENGINE	EERIN	GΙ	.00	PI PI	IOLE NO : ROJECT NUMB HEET : 2 OF :	ER: 30041768
			-	ong West 9681.0, N		57971	I.0 (M	GA94	Zone 55)	SURFACE ELEVAT	ION : 235.00	(AHD)		INCL		NAL DEPTH : ' / ORIENTAT	<u>5.95 m</u> TON°: 90° / N/A
		PE : H			18 D/				G : 4WD	CONTRAC [®] 8 DATE LOGGED	TOR : APEX D	RILLING LOGGED B	BY : .	AS	HOLE D	IA : 100 mm CHECKE	DBY:NR
			ORILL								ΜΑΤΕ						
PRO	GRES	-	1		NO	Ê	U	MATERIAL () A MATERIAL DESCRIPTION W Z Guis									
DRILLING & CASING	DRILLING	VE F PENETRATION	GROUND WATER	SAMPLES & FIELD TESTS	281.6VATION	0. DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	AME : plasticity or particle secondary and minor of NAME : grain size, colou eatures, inclusion and min	components ur, texture and fabric		MOISTUF	CONSISTENCY RELATIVE DENSITY		STRUCTU & Other Obse	
				SPT 5 15,14,0 N*=14		4.0 -			CLAY: high grain sand	plasticity, mottled red and	grey, with fine to me	dium			ALLUVIUM		
						_											
				4.45m	230.5	- 4.5 —											-
						-											
			lered			_								St			
ADV	No Fluid		t Encountered		230.0	- 5.0 —		СН					м				-
	Ż		Not			-											
						_											
				5.50m	229.5	- 5.5 —											-
				SPT 6 19,16,0 N*=16		-											
						_								VSt			
y	•			5.95m	229.0	6.0				nated at 5.95 m							
						-			Target Dept	h							
						_											
					228.5	- 6.5 —											_
						_											
						-											
0.00					228.0	- 7.0 —											-
LIJ. SMEC						-											
10.00.1						-											
					227.5	- 7.5 —											-
D.VN V0 -						-											
01020020 10						-											
יייאז אאדוטי					227.0	- 8.0				1							
	S A DV A DV A E H R R S D D R S D D R S D D C	And aug dand aug uger sci uger dri dollow fli Vash-boi Rock rolle Sonic dril Sonic dril Continuo land me	rewing lling wit ght aug re drillir er ling ructive us push	h TC bit er ng drilling			×uu ATER ×	dd/mm/	No Resistance Very Hard / Refusal yy n Date shown water level iflow	SAMPLES & FIELD B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample HP Hand Penetrome SPT Standard Penetrome SPT Standard Penetrome SPT Standard Penetrome V Nesuit of SPT (** R Hammer Bouncir U50 Undisturbed Sam V75 Undisturbed Sam V7 Vane Shear; pea PC Push Tube MC Moisture Content	ample ple phe ter (kPa) tition Test sample taken) g / Refusal ple (50mm dia) ple (75mm dia) k/remouded(kPa)	LL Liquid limit D - Dense				DENSITY - Very Soft - Soft - Firm - Stiff - Very Stiff - Hard - Friable - Very Loose - Loose - Medium Dense	
See deta & ba	ails of	lanator f abbre of desc	viation	าร						SMEC AUS	TRALIA						SMEC

	NON-CORE DRILL HOLE - ENGINEERING LOG HOLE NO : BH02 PROJECT NUMBER : 30041768									
CLIENT : L LOCATION : V	ightsource E Vyalong Wes			F	PROJECT: Wyalong Solar Farm			SHEET:1 OF 2 FINAL DEPTH:5.95 m		
POSITION : E RIG TYPE : H		N: 6259			I Zone 55) SURFACE ELEVATION : 231.00 (AHD) G : 4WD CONTRACTOR : APEX DRILLIN	G	INC	CLINATION° / ORIENTATION° : 90° / N/A HOLE DIA : 100 mm		
)18 DAT			ED : 27/07/2018 DATE LOGGED : 26/07/2018 LOGGE		AS	CHECKED BY : NR		
	RILLING ≝ ∞≌	z -		NO	MATERIAL MATERIAL DESCRIPTION		2 6			
DRILLING & CASING & CASING DRILLING FLUID FLUID FLUID FLUID FLUID FLUID FLUID FLUID FLUID FLUID FLUID	GROUND WATER LEVELS SAMPLES & FIELD TESTS	2BLBVATION		CLASSIFICATION	SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE		STRUCTURE & Other Observations		
				СН	0.10m Sandy CLAY high plasticity, brown, fine grain sand, with rootlets	D		TOPSOIL		
	0.50m	230.5		сн	Sandy CLAY high plasticity, dark grey-brown, fine grain sand		F - St	ALLUVIUM t 0.30: trace rootlets to 0.3m		
	SPT 3,4,6	0.1	5		CLAY: high plasticity, brown, mottled grey			-		
	N=10 0.95m 1.00m SPT	0.02	- - - 0-				St			
	4,8,8 N=16	2			1.00m: becoming mottled pale brown, trace fine to medium grained sand					
	1.50m SPT 3,7,8 N=15	.1.	5 <u>-</u>					-		
ADV	Not Encountered	0.622 2.9.0	- 0			м		-		
	2.50m SPT	228.5	- - 5-	СН	2.50m: becoming grey-brown		VSt	-		
	6,9,12 N=21	0								
	<u>2.95m</u>	3.	0					-		
		227.5 '.						-		
	4.00m	227.0			4.00m					
ADT Auger drillin HF Hollow fligh WB Wash-bore RR Rock roller SD Sonic drillir	r wing ng with V bit ng with TC bit it auger drilling ng ctive drilling s push tub			. ± ¥ dd/mm/ Level o	SAMPLES & FIELD TESTS CL/ No Resistance Bulk Disturbed Sample CL/ Undisturbed Sample D Disturbed Sample CL/ Very Hard / Water Sample MC Yery Hard / Water Sample MC Yyy Result of SPT ("=sample taken)) MC Yyy R Hammer Bouncing / Refusal M Yoy R Hammer Bouncing / Refusal M Model Sample Undisturbed Sample (S0mm dia) W Yoy R Hammer Bouncing / Refusal M Model Sample Result of SPT ("=sample taken)) M M Yoy R Hammer Bouncing / Refusal M Model Sample Result of SPT ("=sample taken)) M M Yoy Vene Shear, peak/remouded(kPa) PL	M Moist VL - Very Loose				
See Explanatory details of abbrev & basis of descri	iations				SMEC AUSTRALIA			SMEC		

	ENT			ource Bl			N			RILL HOLE	E - ENGIN	EERIN	G L	.00	Pi	OLE NO : ROJECT NUM HEET : 2 OF	BER : 30041768
-			-	ong West 0382.0, N		59587	7.0 (N	IGA94	Zone 55)	SURFACE ELEVA	ATION : 231.00	(AHD)		INCI		NAL DEPTH	<u>: 5.95 m</u> \TION° : 90° / N//
-		PE: H			10.5				G : 4WD						HOLE D	IA : 100 mr	
DAI	ES	IARI	=D : 2	26/07/20	18 D/	AIEC	COMF	LEIE	D : 27/07/2018	8 DATE LOGGED	: 26/07/2018	LOGGEDE	3Y : /	AS		CHECKE	DBY:NR
		C	RILL								MAT	ERIAL					
PROU & CASING		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2ELEVATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NA ROCK fe	MATERIAL DESG AME : plasticity or partion secondary and mino (NAME : grain size, col eatures, inclusion and n	cle characteristic, co r components our, texture and fabi		MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUC & Other Obs	
				SPT 7,16,20 N=36		4.0				plasticity, pale grey, mot	tled red-brown				ALLUVIUM	ands of sandy si	ilt to 5.95m
			Not Encountered	4.45m 5.50m SPT 11,16,25 N=41 5.95m	23.5 [224.0 [224.5 [225.0 225.5 [226.0			CH	5.95m	oming mottled yellow nated at 5.95 m th			м	н			
HA AS AD HF SD NC PT HA	A A A A A A A A A A A A A A A A A A A	D land aug luger scr uger dril lollow flig Vash-bor tock rolle onic drill lon destr continuou land met	ewing ling wit ht aug tht aug drillin r ing uctive o s push	h TC bit er g drilling			×uu ATER ↓	dd/mm/	• No Resistance Very Hard / Refusal ⁽ yy n Date shown water level nflow	R Hammer Bound U50 Undisturbed Sa U75 Undisturbed Sa	Sample ple imple Sample tration Test "=sample taken) ing / Refusal imple (50mm dia) imple (75mm dia) iak/remouded(kPa)	LL Liquid limit D - Dense					E DENSITY - Very Soft - Soft - Firm - Stiff - Very Stiff - Friable - Friable - Very Loose - Loose - Medium Dense
See deta & ba	ils of	lanator f abbre of desci	viatior	IS	_	•				SMEC AUS	STRALIA	- I					

CLIEN				rce BP			Ν			PRILL HOLE - E along Solar Farm	NGINE	ERIN	G L	00	PI SI	HEET : 1 OF	IBER : 30041768 - 2
LOCAT					625	9399.	0 (M	GA94	Zone 55)	SURFACE ELEVATION	: 234.00 (/	AHD)		INC		NAL DEPTH	<u>: 5.95 m</u> ATION° : 90° / N/A
RIG TY									: 4WD	CONTRACTOR					HOLE D	IA:100 m	
DATES	STAR	IED	: 26/	07/2018	3 DA	IE CO	ЭМР	LEIE	D : 26/07/201	8 DATE LOGGED : 26/	07/2018 LO	OGGED B	Y : /	AS		CHECK	ED BY : NR
		DRI	ILLING								MATE	RIAL		1	1		
PROGRE SUITLING SCASING BRILLING	ENETRATIO	VH GPOLIND WATED	LEVELS	SAMPLES & FIELD TESTS		O DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	MATERIAL DESCRIPTIO AME : plasticity or particle char. secondary and minor compo (NAME : grain size, colour, tex eatures, inclusion and minor co	acteristic, colou nents ture and fabric,	ur, ,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUC & Other Obs	
		_			0				Sandy CLA 0.10m rootlets	AY high plasticity, grey-brown, find	e grain sand, wit	th	D		TOPSOIL		
						_			CLAY: high	n plasticity, grey-brown					ALLUVIUM		
						-									0.30: trace re	potlets to 0.5m	
			0.5	0m	233.5	-											
			SP 4,5	T 1 ,7	0	0.5											-
			N= CB 0.5	R-1 m-0.6m													
						_											
				5m	233.0	-											
				T 2	1	.0-			1.00m: bec	coming mottled brown							-
			N=	9													
														St			
			1.4	5m	5.5	-											
				Т 3	787	.5 —											-
			N=	10		-											
			σ														
			ountere	5m 9	0	_											
- ADV -	lo Fluid		Not Encountered		0.282.0	.0		СН					м				-
			ž			-		СП					IVI				
						-											
					ņ												
		 	2.5	0m 0 T 4	1221 2	.5			0.50mm h		- d b				-		-
			4,7 N=	,9		-			2.50m: bed	coming pale grey-brown, mottled r	ed-brown						
						-											
					o.	-											
0.00			2.9	5m	5	.0											-
OMEC						-											
						-								VSt			
					0	-											
					1230.5	-											
NY OF					5	-											
0-00						-											
10200						-											
			4.0	0m	230.0				4.00m								
AS ADV ADT HF WB RR SD NDD PT	OD Hand au Auger s Auger d Hollow t Wash-b Rock ro Sonic d Non des Continu Hand m	crewi Irilling Irilling flight ore d ller rilling structious p	ng with V with TO auger rilling ive drilli	bit C bit	4		uuu: IER ¥ ⊔ V	ld/mm/	No Resistance Very Hard / Refusal // n Date shown water level flow	SAMPLES & FIELD TEST B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample W Water Sample HP Hand Penetrometer (kP SPT Standard Penetration T N Result of SPT ("=sampl R Hammer Bouncing / Re U50 Undisturbed Sample (75 U75 Undisturbed Sample (75 V Vane Shear, peak/remo PT P ush Tube MC Moisture Content	a) sst e taken) usal mm dia) mm dia)	W Wet L - Loose PL Plastic limit MD - Medium De LL Liauid limit D - Dense				E DENSITY - Very Soft - Soft - Firm - Stiff - Very Stiff - Hard - Friable - Very Loose - Loose - Medium Dense	
See Ex details of & basis	of abbr	revia	tions	or						SMEC AUSTR	ALIA						

CLIE	ENT	: [ights	ource BF	5		N			RILL HOL along Solar Farm	E - ENG	INEERIN	IG L	00	PF	OLE NO : ROJECT NUME HEET : 2 OF	BER : 30041768
			-	ng West)110.0, N		59399	9.0 (N		Zone 55)	SURFACE ELEV	ATION : 234	I.00 (AHD)		INCI	FI	NAL DEPTH :	
RIG	TYP	E : H	YND.	AGH			MOÙ	NTING	6 : 4WD	CONTRA	CTOR : APE	EX DRILLING				A : 100 mm	ı
DAT	E ST	TARTE	D:2	26/07/20	18 D.	ATE (COMF	PLETE	D : 26/07/201	8 DATE LOGGEI	0 : 26/07/201	18 LOGGED	3Y : .	AS		CHECKE	DBY:NR
			RILL		I			z			I	MATERIAL	1	.			
PRILLING & G		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	280.6VATION	(m) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	MATERIAL DES AME : plasticity or part secondary and min < NAME : grain size, co eatures, inclusion and	icle characteristi or components blour, texture and	d fabric,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obse	
				SPT 5 6,12,13 N=25		4.0 -			CLAY: high	n plasticity, pale grey-bro	wn, mottled red-b	brown			ALLUVIUM		
						-											-
				4.45m	9.5	_											
				4.45m	229.	4.5 —											-
						_											
			ered			_								VSt			
2	No Fluid		Encountered		229.0	-		СН					м				-
ADV	NoF		Not E			5.0											-
						_											-
					2	_											-
				5.50m SPT 6	228.	5.5 —			5 50m: trac	e medium grained, sub-	angular gravel						-
				13,20,20 N=40		-			5.50m. trac	e medium gramed, sub-	angular graver						-
						_								н			-
	V			5.95m	228.0	_			5.95m								-
					12	6.0 -			Hole Termi Target Dep	nated at 5.95 m th							_
						_											-
					5	-											-
					27.	- 6.5 —											-
						-											-
						-											-
					2.0	_											-
=C 1.06.0					227.	7.0 —											-
lib Prj: SM						_											-
VC 1.06.5						-											-
LID: SEI					226.5	- 7.5 —											-
K_NR.GP.						, .5 — -											-
62018 - S						-											-
					226.0	-											-
G SOLAR	тное				22	8.0 PE				SAMPLES & FIE					MBOLS &	CONSISTE	
HA AS AD	Ha Au	and aug iger scro iger drill	ewing	n V bit					No Resistance	B Bulk Disturbe D Disturbed Sar	d Sample nple	1	DIL DE Based o assifica	on Unif	ed	RELATIVE VS S	- Very Soft - Soft
AD HF WB	T Au Ho	iger drill bllow flig ash-bor	ing witl ht auge	n TC bit er			<u> </u>	-	Very Hard / Refusal	ES Environmenta W Water Sample HP Hand Penetro	e meter (kPa)	MOIST		.on 0y		F St VSt	- Firm - Stiff - Very Stiff
RR SD NDI	Ro So	ock rolle onic drill on destr	r ng					dd/mm/		R Hammer Bou	(*=sample taken) ncing / Refusal)ry Noist			H Fb VL	- Hard - Friable - Very Loose
	Co	ontinuou and met	s push	tub			◄	Drilling water ir	water level Iflow	U75 Undisturbed S	ample (50mm dia) ample (75mm dia) beak/remouded(kPa	a) PLF	Vet Plastic li			L MD D	- Loose - Medium Dense
See	Expla	anatory	/ Note	s for	_		-	water o	uttlow	MC Moisture Con			iquid lir	nit		D VD	- Dense - Very Dense
detai	ls of	abbrev f descr	/iatior	IS						SMEC AU	STRALI	۹					SMEC

CLIENT : Lightsource BP	NON-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	NG LO	HOLE NO : BH04 PROJECT NUMBER : 30041768 SHEET : 1 OF 2				
LOCATION : Wyalong West POSITION : E: 529857.0, N: 62592	210.0 (MGA94 Zone 55) SURFACE ELEVATION : 231.00 (AHD)	IN	FINAL DEPTH : 5.95 m ICLINATION° / ORIENTATION° : 90° / N/A				
RIG TYPE : HYNDAGH	MOUNTING : 4WD CONTRACTOR : APEX DRILLING		HOLE DIA : 100 mm				
DATE STARTED : 24/07/2018 DATI	E COMPLETED : 24/07/2018 DATE LOGGED : 24/07/2018 LOGGED	BY : AS	CHECKED BY : NR				
DRILLING	MATERIAL		-				
RALLING & CASILLING R CASILLING PRILLING PRILLING PRILLING COMPOWATER CASIANCIAN C		MOISTURE CONDITION CONSISTENCY	STRUCTURE STRUCTURE & Other Observations				
	CH 0.10m Sandy CLAY high plasticity, grey-brown, fine grain sand, with rootlets	D	TOPSOIL				
0.50m 0.50m 0.50m 0.50m SPT 1 4.5.6 1 4.5.6 1 1.00m 1 1.00m <td>CLAY: high plasticity, dark grey-brown CLAY: high plasticity, dark grey-brown 0.5m: becoming brown, mottled grey, trace fine to coarse grain sand 0.5m: becoming brown, mottled grey, trace fine to coarse grain sand</td> <td>D to M</td> <td>ALLUVIUM 0.30: trace rootlets to 0.5m</td>	CLAY: high plasticity, dark grey-brown CLAY: high plasticity, dark grey-brown 0.5m: becoming brown, mottled grey, trace fine to coarse grain sand 0.5m: becoming brown, mottled grey, trace fine to coarse grain sand	D to M	ALLUVIUM 0.30: trace rootlets to 0.5m				
2.50m SPT 4 10,13,15 N=28 0 2.95m 0 2.5 0 2.5 0 2.5 0 2.5 0 2.5 0 2.5 0 2.5 0 2.5 0 2.5 0 3.0 0 2.5 0 3.0 0 0 3.0 0 0 3.0 0 0 3.0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.50m: becoming pale brown, mottled red-brown	M	St				
METHOD 4.00m Normalized HA Hand auger 4.00m Normalized ADV Auger screwing ADV Auger drilling with V bit ADV Auger drilling with TC bit HF HF Hollow flight auger WB Wash-bore drilling WB Wash-bore drilling RR RCk roller SD Sonic drilling NDD Non destructive drilling PT Continuous push tub HAND Hand methods	ving g with V bit g with TC bit auger PENETRATION Summer Standard Penetration Test drilling SAMPLES & FIELD TESTS B CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System CONSISTENCY/ RELATIVE DENSITY Soil Description Based on Unified Classification System y with V bit g with TC bit auger Very Hard / Matter Very Hard / Refusal Sample D Bulk Disturbed Sample D Based on Unified Classification System CONSISTENCY/ RELATIVE DENSITY Soil Description y with TC bit auger Very Hard / Matter Water Sample HP MolSturbed Sample HP MolSTURE VS Very Soil S y water Water Sample HP N Result of SPT (*sample taken) N Moist VS Very Stit y bit of diffinition Vite of Date shown US Undisturbed Sample (50mm dia) M Moist VL Very Loc y bit of difficient for the form VI Very Loc Very Loc Very Loc						
details of abbreviations & basis of descriptions.	SMEC AUSTRALIA		SMEC				

	ENT			source Bl			N		-CORE DRILL HOLE - ENGINEERING ROJECT: Wyalong Solar Farm	G L	.00	B HOLE NO : BH04 PROJECT NUMBER : 30041768 SHEET : 2 OF 2
				ong West 9857.0, N		25921	0.0 (N	1GA94	Zone 55) SURFACE ELEVATION : 231.00 (AHD)		INC	FINAL DEPTH : 5.95 m LINATION° / ORIENTATION° : 90° / N/A
				-	10 ח				: 4WD CONTRACTOR : APEX DRILLING D : 24/07/2018 DATE LOGGED : 24/07/2018 LOGGED B	v · /	10	HOLE DIA : 100 mm CHECKED BY : NR
DAI	IE 3	IANI	<u>-</u> D.	24/07/20	10 D				D . 24/01/2016 DATE LOGGED . 24/01/2016 LOGGED B	1.7	40	
PRO	GRES	_	RILL ⊈		7			Z		-	≿	
BRILLING & CASING		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2 ELEVATION	6 DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL		MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	
				SPT 5 11,14,17 N=31		-			CLAY: high plasticity, pale brown, mottled red-brown, trace fine to coarse grain sand			ALLUVIUM 4.05: decreased moisture content
						-						-
				4.45m	6.5	_						
					1226.	4.5 —						-
						-						
			tered			-						
ADV	No Fluid		Encountered		226.0	-		СН		м	н	
	°N		Not			5.0 —						-
						-						
					.5	-						
				5.50m SPT 6	225.	5.5 —			5.50m: becoming pale grey, mottled red-brown and yellow-brown,			-
				13,17,19 N=36		-			trace fine grained sand			-
						_						
				5.95m	225.0	-			5.95m			-
					12	6.0			Hole Terminated at 5.95 m Target Depth			-
						-						
					5	-						
					224.	6.5						_
						-						
						_						
					224.0	-						
EC 1.00.0					22	7.0 —						-
IID F1J: SN						-						
NC 1.00.9						-						
					223.5	- 7.5 —						-
ANK.GP												
s - 61 170						-						
					223.0	-						
	тно			<u> </u>	22	8.0 P	ENET		I SAMDIES & FIELD TESTS I			YMBOLS & CONSISTENCY/
AD AD	A Ha S Au	D and aug uger scr uger dril	ewing	h V bit					B Bulk Disturbed Sample Ba	IL DES ased o	n Unif	fied VS - Very Soft (stem S - Soft
	DT Au F He	uger dri ollow flig /ash-boi	ling wit ght aug	h TC bit er				-	ES Environmental Sample Wery Hard / W Water Sample Refusal HP Hand Penetrometer (kPa) MOISTU	sificat	.on 3y	St - Stiff VSt - Very Stiff
	R R	ock rolle onic dril on desti	er ling				ATER	dd/mm/	N Result of SPT (*=sample taken) D Dr. N Result of SPT (*=sample taken) D Dr. R Hammer Bouncing / Refusal M Mr.	у		H - Hard Fb - Friable VL - Very Loose
PT HA	- C	ontinuo and me	us push	tub			►	Drilling water ir	Water level U75 Undisturbed sample (50mm dia) W We flow PT Puch Tube	et astic lir		L - Loose MD - Medium Dense
	Expl	anator	v Note	es for				water o	tflow MC Moisture Content LL Liq	quid lin	nit	D - Dense VD - Very Dense
deta & ba	ails of	abbre of desc	viatio	าร					SMEC AUSTRALIA			SMEC

			:	DI			N		-CORE DRILL HOLE - ENGINEERIN	IG L	.00	TROJECT NOMBER . 50041700
LOC		ON : \	Nyalo	ource Bl	t	5000			PROJECT: Wyalong Solar Farm			SHEET : 1 OF 2 FINAL DEPTH : 4.8 m
-		PE: F			N: 62				Zone 55) SURFACE ELEVATION : 233.00 (AHD) G : 4WD CONTRACTOR : APEX DRILLING		INC	LINATION° / ORIENTATION° : 90° / N/A HOLE DIA : 100 mm
DA	TE S	TARTE	D : 1	25/07/20	18 D	ATE	COMF	PLETE	D : 25/07/2018 DATE LOGGED : 25/07/2018 LOGGED	BY :	AS	CHECKED BY : NR
		C	RILL						MATERIAL			
PRILLING & CASING		_ 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	268.0VATION	0 DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	
						- 0.0		СН	Sandy CLAY high plasticity, grey-brown, fine grain sand, with rootlets, trace quartz gravel on surface Sandy CLAY high plasticity, dark grey-brown, fine grain sand			TOPSOIL ALLUVIUM
					32.5	-		сн		D		- 0.30: trace rootlets to 0.5m
				0.50m SPT 1 5,4,6 N=10 B-1 0.5m-1m	232.	0.5			0.50m CLAY: high plasticity, brown, mottled red-brown, trace fine to medum grain sand, trace fine grain, sub-angular gravel		St	-
				0.95m 1.00m SPT 2 4,6,8 N=14	232.0	- 1.0 — -						-
				1.45m 1.50m SPT 3 4,6,10	231.5	- - 1.5 —		сн	1.50m: becoming pale grey-brown, mottled red-brown	М		-
	SF13 4,6,10 N=16 □ 0 □ 0 □ 0 □ 0 □ 0 □ 0 □ 0 □ 0 □ 0 □ 0											-
ADV	No Fluid		Not Er	2.10m DS-1		2.0			2.10m: becoming red-brown	D	-	2.10: auger grinding noted by driller
					230.5	-						-
				2.50m SPT 4 2,9,10	5	2.5 —			2.50m Clayey SILT low plasticity, pale grey, mottled red and white			RESIDUAL SOIL
				N=19		-						-
						-					VSt	-
0.90.				2.95m	230.0	- 3.0						-
j: SMEC 1						-						-
06.5 lib Pi						-				D to N		-
: SEMC 1.					9.5	_						-
.GPJ LIb					229.	3.5 —						-
- SK_NR						-						-
02082016						-						
AR FARM				4.00	229.0	-						-
SOREHOLE 30041768 - WYALOI SOREHOLE 30041768 - WYALOI SOLE JA H TO SOLE LA TO SOLE 30041768 - WYALOI	S AI OV AI OT AI T HI B W R RI S NO S OD C	and aug uger scr uger dril	ewing ing wit ing wit ht aug e drillir r ing uctive is push	h TC bit er ig drilling	5		×uu ATER ↓	dd/mm/	SAMPLES & FIELD TESTS S B Bulk Disturbed Sample D D Disturbed Sample U Undisturbed Sample C Very Hard / W Water Sample Refusal HP Hand Penetrometer (kPa) MOIST yy N Result of SPT ("=sample taken) D n Date shown U Undisturbed Sample (50mm dia) M vitater level U/5 Undisturbed Sample (50mm dia) W	OIL DE Based (lassifica	SCRIP on Unif tion Sy	fied VS - Very Soft
See deta ba	ils of	anator abbre of desci	viatior	าร					SMEC AUSTRALIA			

	ATIO ITIOI			•		5902	8.0 (M	GA94	Zone 55)	SURFACE FI FV	ATION : 233.00 ((AHD)		INCI		<u>NAL DEPTH</u> / ORIENTA	<u>: 4.8 m</u> ATION° : 90° /
			YND				•		3 : 4WD		ACTOR : APEX D	. ,				A : 100 m	
ATE	E ST	ARTE	D: 2	5/07/20)18 D	ATE	COMPI	ETE	D : 25/07/2018	3 DATE LOGGEI	D : 25/07/2018 L	.OGGED E	BY : 7	AS		CHECKE	ED BY : NR
			RILLI	NG							MATE	RIAI					
ROGI	RESS				z	-		NO		MATERIAL DES				γ			
& CASING	DRILLING	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	22200VATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	ME : plasticity or part secondary and min	ticle characteristic, colo or components olour, texture and fabric		MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUC & Other Obs	
				SPT 5 2,12,14 N=26		4.0 —			(continued)	E low plasticity, pale gro	ey, mottled red and white)			RESIDUAL	iOIL	
			untered			-			4.20m: becc	oming pale-grey, mottle	d orange-brown						
	- No Fluid -		Not Encountered	4.45m	228.5	-		ML					D	VSt			
			2			4.5											
,				4.80m		-			4.80m								
1				SPT 6 5/140mm HB N=R	228.0	-			Hole Termin	ated at 4.80 m usal on inferred granite	rock / boulder (HW-MW))					
				4.94m	5	5.0 —											
						-											
					227.5	-											
					22	5.5 —											
						-											
					0	-											
					227.0	6.0 —											
						-											
					2	-											
					226.5	6.5 —											
						-											
						-											
					226.0	- 7.0											
						-											
						-											
					225.5	-											
					Γ	7.5 —											
						-											
					225.0	-											
ME1 HA AS ADV	Aud	nd aug	ewina	V bit	5	8.0 Pl	ENETR/		No Resistance	SAMPLES & FIE B Bulk Disturber D Disturbed Sar U Undisturbed S	d Sample mple Sample	SC	FICAT FICAT DIL DES ased c ssificat	SCRIP on Unifi	ed	VS S	ENCY/ E DENSITY - Very Soft - Soft
ADT HF WB	Hol Wa	llow flig sh-bor	ht auge e drilling	V bit TC bit r				-	Very Hard / Refusal	ES Environmenta W Water Sample HP Hand Penetro	al Sample e ometer (kPa)	MOISTU		aon oy		F St VSt	- Firm - Stiff - Very Stiff
RR SD NDE	Roo Sor Noi	ck rolle nic drill n destr	r ng uctive d	rilling			- L	d/mm/ evel o	yy n Date shown	U50 Undisturbed S	⁻ (*=sample taken) ncing / Refusal Sample (50mm dia)	M M	ry oist			H Fb VL	- Hard - Friable - Very Loos
PT Continuous push tub HAND Hand methods							rilling ater ir ater o	water level flow	U75 Undisturbed S VS Vane Shear; j PT Push Tube MC Moisture Con	Sample (75mm dia) peak/remouded(kPa)	PL P	/et lastic li quid lir			L MD D VD	- Loose - Medium D - Dense - Very Dens	

	ENT			source Bl			N			RILL HOLE - along Solar Farm	- ENGINE	ERIN	G L	00	PF SF	HEET : 1 OF	IBER : 30041768 - 1
				ong West 9338.0, N		8835.0) (M	GA94	Zone 55)	SURFACE ELEVATION	ON : 231.00 (A	AHD)		INC		NAL DEPTH	<u>: 3.7 m</u> \TION° : 90° / N//
		PE:I							G : 4WD		OR: APEX DR				HOLE DI	A : 100 m	
DAT	TE ST	TART	ED :	25/07/20	18 DA	TE CC	MP	LETE	D : 25/07/201	B DATE LOGGED :	25/07/2018 L0	OGGED B	Y:/	AS		CHECKE	ED BY : NR
		[ORILL	ING							MATE	RIAL					
& CASING & CASING		- 2	OH GROUND WATER LEVELS	SAMPLES & FIELD TESTS			LOG	CLASSIFICATION SYMBOL	SOIL NA ROCK fe	MATERIAL DESCRI ME : plasticity or particle of secondary and minor co NAME : grain size, colour, atures, inclusion and mino	characteristic, colou mponents , texture and fabric,	лг, '	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUC & Other Obs	
A					(СН		Y high plasticity, grey-brown	ı, fine grain sand, wit	th	D		TOPSOIL		
									CLAY: high sand	plasticity, dark grey-brown, t	trace fine to medium	grain			ALLUVIUM		
				0.50m SPT 1 7,7,7 N=14	230.5	- -).5 -			0.50m: trace sub-rounde	e fine to coarse grained sanc d gravel	I, trace fine grained			St	0.30: trace ro	potlets to 0.5m	
				0.95m 1.00m SPT 2 6.8.8 N=16	1 1 1			СН	1.00m: becc	oming brown, mottled orange	9-brown		м				
- ADV	No Fluid		Not Encountered	1.45m 1.50m SPT 3 5,6,10 N=16		- - - -			1.50m: beca	oming pale brown, mottled br	rown and red-brown			VSt			
			2	1.95m	 229.0	2.0 <u></u> - - -			2.00m: beca	oming orange and red-brown	ı, with silt		D	-			
				0.50-	228.5	-			0.50								
				2.50m SPT 4 4,14,17/130	T 4	2.5			2.50m Silty CLAY	high plasticity, red-brown, m	nottled grey and oran	ige			RESIDUAL	SOIL	
				HB N=R 2.93m	228.0			СН					м	н			
	v			3.60m SPT 5 8/100mm HB N=R 3.70m		- - 3.5 - - -			3.70m Hole Termir	oming red-brown nated at 3.70 m usal on inferred granite rock .	/ boulder (HW-MW)						
					227.0												
HA AS AD HF WE RR SD ND PT	AL V A	and aug uger sc uger dri	rewing Iling wi Iling wi ght aug re drillin er Iling ructive us pusl	ng drilling	1** <u>-</u>	TAW		ld/mm/	- No Resistance Nerusal Yyy n Date shown water level nflow	SAMPLES & FIELD T B Bulk Disturbed Sample U Undisturbed Sample U Undisturbed Sample ES Environmental Sam W Water Sample HP Hand Penetrometer SPT Standard Penetratik N Result of SPT (*=sa R Hammer Bouncing U50 Undisturbed Sampl V75 Vane Shear, peak/r PT Push Tube MC Moisture Content	nple e pple r (kPa) on Test ample taken) / Refusal e (50mm dia) e (75mm dia)	SO Ba Class MOISTU D Dr M Ma W Wa PL Pla	IL DES ased c ssificat IRE Y oist	SCRIP on Unif tion Sy	ied	CONSISTI RELATIVE VS F St VSt H Fb VL L MD D VD	ENCY/ E DENSITY - Very Soft - Soft - Firm - Stiff - Very Stiff - Hard - Friable - Very Loose - Loose - Medium Dense - Very Dense - Very Dense
See deta & ba	ils of	anato abbre f desc	viatio							SMEC AUST	RALIA						SME

		NOM		RILL HOLE - E	NGINEERII	NG L	00		OLE NO : BH07 ROJECT NUMBER : 30041768
CLIENT : Light LOCATION : Wyal	source BP ong West		PROJECT: Wya	along Solar Farm				SH	IEET: 1 OF 2 NAL DEPTH: 5.93 m
POSITION : E: 52 RIG TYPE : HYNE	-		94 Zone 55) NG:4WD	SURFACE ELEVATION :	232.00 (AHD) APEX DRILLING		INC		/ ORIENTATION° : 90° / N/A A : 100 mm
				B DATE LOGGED : 25/0		BY :	AS		CHECKED BY : NR
DRILL	ING				MATERIAL				
DRILLING & CASING DRILLING FLUID FLUID FLUID FLUID VH GRONDWATER LEVEN		GRAPHIC LOG CLASSIFICATION	ପ୍ଥ SOIL NA SOIL NA ROCK fe	MATERIAL DESCRIPTION ME : plasticity or particle charac secondary and minor compon NAME : grain size, colour, textu atures, inclusion and minor com	teristic, colour, ents re and fabric,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
		0.0 C⊦		Y high plasticity, grey-brown, fine g	grain sand, with	D		TOPSOIL	
	ISPI I			plasticity, dark grey-brown oming brown, mottled orange and b	plack		St - VSt	ALLUVIUM 0.30: trace ro	- otlets to 0.5m - -
	3712	- - - 1.0					VSt		- - - -
	6.5.5 N=10 <u>1.45m</u> 00	- - - 1.5 -							- - - -
ADV	<u>1.95m</u> 00 200 21		н			М	St		- - - -
	2.50m SPT 4 5,10,12 N=22		2.50m: becc	oming pale grey-brown, mottled ora	ange-brown			2.50: veins o	f orange-brown sandy silt
Loss pipelan	2.95m 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0						VSt		-
002018 - SK_MKLeiv-J LLID: 2400	228.5								- - -
R FARM US	0. 872 4.00m	-							-
METHOD METHOD HA Hand auger AS Auger screwing ADV Auger drilling wi ADV	th V bit th TC bit ger ng drilling	- ▼ Drillin water	— No Resistance Very Hard / Refusal	SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample W Water Sample HP Hand Penetrometer (KPa) SPT Standard Penetration Frample R Hammer Bouncing / Refus USO Undisturbed Sample (75m UT5 Undisturbed Sample (75m VS Vane Shear; peak/remouc PT Push Tube MC Moisture Content	t MOIS adken) D sal M m dia) W led(kPa) PL	SIFICAT SOIL DE Based d Classifica TURE Dry Moist Wet Plastic li Liquid li	SCRIP on Unif tion Sy	ied	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
details of abbreviation & basis of description	ns			SMEC AUSTRA	LIA				SMEC

CLI	ENT	: 1	_ights	ource BF	5		Ν		-CORE DRILL HOLE - ENGINEERI PROJECT: Wyalong Solar Farm	NG I	-00	D PF	OLE NO : BH07 ROJECT NUMBER : 30041768 HEET : 2 OF 2
				ong West 9594.0. N		58646	6.0 (M	GA94	Zone 55) SURFACE ELEVATION : 232.00 (AHD)		INC		NAL DEPTH : 5.93 m / ORIENTATION° : 90° / N/A
		E : ⊢							G: 4WD CONTRACTOR : APEX DRILLING	i			A:100 mm
DAT	E ST	TARTE	ED : 2	25/07/20	18 D <i>A</i>	ATE C	COMF	LETE	D : 25/07/2018 DATE LOGGED : 25/07/2018 LOGGED) BY :	AS		CHECKED BY : NR
		C	RILL	ING					MATERIAL				
& CASING 0		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2228.00VATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric,	OISTURE ONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
DRI & C	R	3 L H	. B	SPT 5	2228	⊡ 4.0 —		CLA		20	8"		
- ADV	No Fuid		Not Encountered	5.50m 5.50m 8.24,21,13	26.5 227.0 227.5	4.0		СН	CLAY high plasticity, dark grey-brown, trace red-brown, medium to coarse grain, sub-angular gravel	м	н	ALLUVIUM	-
¥	*			5.93m	225.5	6.0			5.93m Hole Terminated at 5.93 m Target Depth				
	0.7 [2520 .7. [252] .7. [2												
HA AD AD HF WE RFD ND PT	Au V Au T Au Ho B Wa So D No Co	and aug iger scr iger dril	ewing ling wit ling wit lht aug e drillin r ing uctive is push	h TC bit er g drilling	224.0			dd/mm/	SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample Very Hard / W Refusal HP SPT Standard Penetrometer (kPa) Yy N n Date shown US0 Ufoll Undisturbed Sample (50mm dia) M vitater level U/5 U/50 Undisturbed Sample (57mm dia) W Vs vane Shear; peak/remouded(kPa) PL Pute	SIFICAT SOIL DE Based Classifica STURE Dry Moist Wet Plastic I Liquid Ii	SCRIP on Unif tion Sy	ied	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense
deta	ils of	anator abbre f desci	viatior	IS		1 1	1		SMEC AUSTRALIA				VD - Very Dense

CLIE				ource B			N			RILL HOLE - ENGI along Solar Farm	NEERIN	GΙ	.00	PI SI	OLE NO : BH08 ROJECT NUMBER : 30041768 HEET : 1 OF 1
				-		258456	6.0 (N	1GA94	Zone 55)	SURFACE ELEVATION : 235.0	0 (AHD)		INC		NAL DEPTH : 3.25 m 7 / ORIENTATION° : 90° / N/A
-		PE:H							G : 4WD	CONTRACTOR : APEX				HOLE D	IA:100 mm
DAT	ES	TARTI	ED : 2	26/07/20	18 D	ATE C	COMF	PLETE	D : 26/07/2018	8 DATE LOGGED : 26/07/2018	LOGGED E	BY :	AS		CHECKED BY : NR
			RILL	ING						M	ATERIAL				
& CASING		S NOL	GROUND WATER	SAMPLES & FIELD TESTS	285. BVATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL		MATERIAL DESCRIPTION ME : plasticity or particle characteristic, secondary and minor components NAME : grain size, colour, texture and fa	colour,	DISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
DRIL & C∕			GRC	SA	2 B 5	В 0.0—	ڻ 	CLAS		atures, inclusion and minor components		Σö	0°°°		
Î						_		СН	0.10m rootlets	Y high plasticity, grey-brown, fine grain san	nd, with	D		TOPSOIL	
						_			CLAY: high	plasticity, dark grey-brown				ALLUVIUM	
						_								0.30: trace r	potlets to 0.5m
					4.5	_								0.50. trace in	
				0.50m SPT	234.	0.5							F		-
				4,3,3 N=6		_			0.50m: trace	e black organics					
				CBR-1 0.5m-1m		_									
						_									
				0.95m	0.1	_									
				0.95m 1.00m SPT	234.	1.0								-	-
				4,5,4 N=9		_			1.00m: beco	oming brown, mottled grey					
						_									
						_									
				4.45-11	3.5	_									
			Encountered	1.45m 1.50m	233.	1.5		СН				м			-
2	Fluid –		incoul	SPT 3,3,5 N=8		_									
- ADV	N N		Not E			_									
						_							St		
					o.	_			1.80m: becc	oming grey-brown, mottled red-brown					
				1.95m	233.0	2.0									
						2.0								2.00: increas	sed silt content noted off auger
						_									
						_									
					5										
				2.50m	232.	2.5 —									
				SPT 10,10/50m		2.5									
				N=R 2.70m											
					0	-	<u> </u>	<u> </u>	2.85m Sandy SII T	E low plasticity, pale grey mottled orange-br	own fine		н	RESIDUAL	SOIL
					232.0		EE	3	grain sand	a low plasticity, paie grey motiled orange of					
						3.0		ML				D			-
				3.20m				1							
_	1		-	SPT 6/50mm	1			-	3.25m Hole Termir	nated at 3.25 m		<u> </u>	-		
1				N=R 3.25m	2	-				usal on inferred granite rock / boulder (HW-	MW)				
1					231.5	25									
1						3.5 —									-
		1111				1									
1						-									
		1111			0	1									
					231.0										
HA AS AD	Ai V Ai	and aug uger scr uger dril	ewing	h V bit	1.4		NETF		No Resistance	SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmented Somple	SC	FICAT	SCRIF on Uni	fied	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft
AD HF	- He	ollow flig	ght aug	h TC bit er					Very Hard /	ES Environmental Sample W Water Sample HP Hand Penetrometer (kPa)					F - Firm St - Stiff
In Following Registry Weight and Provide (Ver) HP Hand Penetrometer (kPa) MOISTURE Ot Ot WB Wash-bore drilling WATER Refusal SPT Standard Penetration Test D Vst - Very Stiff RR Rock roller Image: Spt Standard Penetration Test D Dry H - Hard SD Sonic drilling Image: Spt Standard Penetration Test D Dry H - Hard															
SD ND PT	D N	onic dril on desti ontinuoi	ructive	drilling tub			-		n Date shown	R Hammer Bouncing / Refusal U50 Undisturbed Sample (50mm dia)	M N	loist			Fb - Friable VL - Very Loose
HA	ND H	and me	thods				▶_	water ir		U75 Undisturbed Sample (75mm dia) VS Vane Shear; peak/remouded(kPa) PT Push Tube	PL P	/et lastic li			L - Loose MD - Medium Dense
							-	water o	utflow	MC Moisture Content	LL L	iquid lii	mit		D - Dense VD - Very Dense
See deta & ba	ils of	anator abbre of desc	viatior	าร						SMEC AUSTRALIA					SMEC

CLIE	=NIT		iahte	ource Bl	D		Ν		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	IG I	_00	PROJ	ENO: BH09 ECT NUMBER : 30041768
LOC	CAT	ION :	Wyalo	ng West	t	E9460	0 (1)					FINAL	T : 1 OF 2 _ DEPTH : 5.95 m
		PE:F			N. 02				Zone 55) SURFACE ELEVATION : 234.00 (AHD) S : 4WD CONTRACTOR : APEX DRILLING		INC	HOLE DIA	DRIENTATION° : 90° / N/A : 100 mm
DAT	ΈS	START	ED : 2	25/07/20	18 D.	ATE C	OMF	PLETE	D : 25/07/2018 DATE LOGGED : 25/07/2018 LOGGED	BY :	AS		CHECKED BY : NR
		0	RILLI	NG					MATERIAL				
& CASING &		₽	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	284.0VATION		GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE	CONSISTENCY RELATIVE DENSITY	&	STRUCTURE Other Observations
Â						0.0		СН	Sandy CLAY high plasticity, grey-brown, fine grain sand, with 0.10m_ rootlets to 1m	D		TOPSOIL	
					233.5	-			CLAY: high plasticity, dark grey-brown, trace fine to medium grain sand, trace fine to medium grain, sub-angular gravel		St - VSt	ALLUVIUM	- ets to 0.5m -
				0.50m SPT 1 8,9,8 N=17	2	0.5					VSt	-	
				0.95m 1.00m SPT 2 5,6,6 N=12	233.0	- 1.0			1.00m: becoming brown, mottled orange-brown			1.00: quartz sand	- d recovery to 1.5m -
				1.45m 1.50m SPT 3 5,6,7 N=13	232.5	- - 1.5 - -							- - - -
ADV	Not End Not End 1232.0 232.0							сн		м	St		- -
				2.50m SPT 4 7,9,12 N=21	231.5	- - 2.5 -			2.50m: becoming pale brown, mottled red-brown			2.50: bands of re	d-brown sandy silt to 5.95m
1). OMEC 1.00.0				2.95m	1231.0								-
					230.5	- - 3.5 -					VSt		- - - -
5 - 61020020 MUNET VEDOC				4.00m	230.0	- - - 4.0			CLASS	SIFICAT		YMBOLS &	CONSISTENCY
HA AS AD AD HF WB RR SD PT		DD Hand aug Auger scr Auger dril Hollow flig Wash-bor Rock rolle Sonic drill Non destr Continuou Hand met	ewing ling with ling with ght auge e drillin er ing uctive c us push	n TC bit er g trilling		wA		dd/mm/	SAMPLES & FIELD TESTS S B Bulk Disturbed Sample D D Disturbed Sample Undisturbed Sample U Undisturbed Sample CI Very Hard / W Water Sample Refusal HP SPT Standard Penetrometra (KPa) YY N Result of SPT (*=sample taken) D Didisturbed Sample (50mm dia) M water level U50 Ufor Undisturbed Sample (50mm dia) W Vane Shear, peak/remouded(kPa) plow PS	OIL DE Based assifica	SCRIF on Unit ation Sy	rTION fied /stem	Consistence Consistence RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
See detai	ils o	olanator of abbre of desc	viation	IS					SMEC AUSTRALIA				SMEC

CLIE				ource Bl			N			RILL HOLE	- ENGINE	EERIN	GΙ	.00	PI PI	OLE NO : ROJECT NUMB HEET : 2 OF	BER : 30041768
				ong West		58460			Zone 55)	SURFACE ELEVA	TION · 234.00 (INC		NAL DEPTH :	<u>5.95 m</u> FION°: 90° / N/
		E : F			N. UZ.				3 : 4WD		TOR : APEX DF	. ,		intoi		IA : 100 mm	
DAT	E ST	ARTE	ED : 2	25/07/20	18 D/	ATE (COMF	PLETE	D : 25/07/2018	8 DATE LOGGED	: 25/07/2018 L	OGGED B	SY : /	AS		CHECKE	DBY:NR
		C	RILL	ING							MATE	ERIAL					
PROG		- 2	ATER	S & STS	NO	(m)	<u>∩</u>	VTION L					RE ON	∠ Γ			
DRILLING & CASING	DRILLING FLUID	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2B0.BVATION	O DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	ME : plasticity or partic secondary and minor NAME : grain size, colo atures, inclusion and m	components our, texture and fabric	5,	MOISTU CONDITI	CONSISTENCY RELATIVE DENSITY		STRUCTU & Other Obse	JRE rvations
				SPT 5 12,16,22 N=38		4.0 -			sand, trace	plasticity, dark grey-brow fine to medium grain, sub oming pale grey-brown	n, trace fine to medium -angular gravel <i>(contin</i>	n grain nued)			ALLUVIUM		
					5	-											
				4.45m	29.	- 4.5 -											
			0			-											
ADV	No Fluid		Encountered		229.0	-		СН					м	н			
- A	NoF		Not F			5.0 -							IVI				
						_											
				5.50m SPT 6 11,16,21	228.5	- 5.5 —											
				N=37		-											
				5.95m	228.0	-			5.95m								
						6.0 -			Hole Termir Target Dept	hated at 5.95 m h							
						_											
					227.5	6.5 -											
						-											
					227.0	-											
						7.0 -											
					5	-											
					226.5	7.5 —											
						-											
					226.0	-											
HA AS AD AD HF WB RR SD NDI PT	Au Au F Au Ho Wa Ro So D No Co	ind aug ger scr ger dril	ewing ling wit ht aug e drillin r ing uctive o s push	n TC bit er g drilling			×uu ATER	dd/mm/	No Resistance Very Hard / Refusal yy n Date shown water level flow	U75 Undisturbed Sa	Sample ble mple Sample eter (kPa) ration Test =sample taken) ing / Refusal mple (50mm dia) mple (75mm dia) ak/remouded(kPa)	SO B Cla MOISTU D Di M M W W PL PI	IL DES ased c ssificat	SCRIP on Unif tion Sy	ied	CONSISTEI RELATIVE VS S F St VSt H F b VL L L MD D VD	
See I detai & bas	ls of a	anator abbre desci	viatior	IS						SMEC AUS	STRALIA						SME SME

CLIE	ENT	: 1	_iahtso	ource BF	þ		Ν			RILL HOLE -	ENGINE	ERIN	G L	.00	D PI	OLE NO : ROJECT NUM HEET : 1 OF	BER : 30041768
LOC	CATIC) : NC	Nyalo	ng West		8265	0 (M		Zone 55)	SURFACE ELEVATION	I · 232 00 (A			INC	FI	NAL DEPTH :	
		PE:⊦			. 020				G : 4WD	CONTRACTOR						IA : 100 mr	
DAT	E SI	TARTE	D: 2	6/07/20 ⁻	18 DA	TE C	OMP	LETE	D : 26/07/201	8 DATE LOGGED : 26	/07/2018 LC	OGGED B	SY : A	AS		CHECKE	DBY:NR
		C	RILLI								MATER	RIAL			1		
& CASING		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS		O DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL N/ ROCK fe	MATERIAL DESCRIPT AME : plasticity or particle cha secondary and minor comp MAME : grain size, colour, te eatures, inclusion and minor c	racteristic, colour onents xture and fabric,	r,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obs	
1					(J.U _		СН		high plasticity, brown, with root	lets		D		TOPSOIL	ad natural tana	ail to 0.0 m
						+			0.20m CLAY: high	plasticity, brown, trace fine to m	nedium grain sand		D to M		ALLUVIUM	ed natural topso	511 to 0.2 m
				0.40m		-				······, ···· ··· ···			D 10 W		0.30: trace r	potlets to 0.5m	
				CBR-1 0.50m	231.5	0.5 -								F			-
				SPT 4,4,3 N=7		-								•			-
						-											-
						-											-
				0.95m 1.00m SPT	231.0	1.0 -											-
				3,4,5 N=9		-											-
						-											-
				1.45m	.5												-
			[1.50m SPT	230.	1.5 —											-
				3,4,6 N=10		-											-
			p											St			-
			countere	1.95m	230.0	-											-
- ADV -	- No Fluid		Not Encountered		123	2.0											-
								СН					м				-
						_											-
				0.50	229.5	-											-
				2.50m SPT 4,8,10 N=18		2.5 -											-
				N-10													-
						-											-
				2.95m	229.0												-
					[`	3.0											-
						-											-
					5	-											
					1228.5	3.5 -											-
						-											-
						-											-
					3.0												-
				4.00m	228.	<u>†.0 </u>			4.00m			CLASSI	FICATI	ON S	MBOLS &	CONSISTE	ENCY/
HA AS AD AD HF WE RR SD D PT	Au V Au T Au Ho B Wa R R R R R R R R R R R R R R R R R R R	D and aug uger scr uger drill ollow flig ash-bor ock rolle onic drill on destr ontinuou and met	ewing ing with ing with ht auge e drilling r ing uctive d is push	TC bit r I		WA		id/mm	- No Resistance Very Hard / Refusal /yy n Date shown water level nflow	SAMPLES & FIELD TES B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample W Water Sample HP Hand Penetrometer (kl SPT Standard Penetration 1 N Result of SPT ("=samp R Hammer Bouncing / R U50 Undisturbed Sample (7 VS Vane Shear, peak/rem PT Push Tube MC Moisture Content	Pa) Fest Ile taken) efusal 50mm dia) 55mm dia)	SO B Class MOISTU D Dr M Ma W W PL PL	IL DES ased o ssificat IRE ry oist	SCRIP in Unificion Sy	TION ied	RELATIVE VS S F VSt H Fb VL L MD D VD	
See deta & ba	ils of	anator abbre f desci	viation	S						SMEC AUSTR	RALIA						SMEC

	ENT			ource Bl			N			DRILL HOLI valong Solar Farm	E - EN	GINEE	RING	GL	00	PI SI	HEET : 2 OF	IBER : 30041768 = 2
POS	SITIC	ON :	E: 53						Zone 55)	SURFACE ELEVA					INCI	LINATION®		ATION° : 90° / N/A
		PE: F			18 D.				G : 4WD D : 26/07/201	CONTRA 18 DATE LOGGED	CTOR : A			Y : A	٩S	HOLE DI	A : 100 m CHECK	m ED BY:NR
			RILL			ĺ						MATERIA	^ 1					
PRO	GRES	_	1		NO	я́ш	U	TION		MATERIAL DES			-	N N	≻ ZUZ			
DRILLING & CASING	DRILLING	VE F PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2228.00VATION	O DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL N ROCI f	AME : plasticity or parti secondary and mino < NAME : grain size, co eatures, inclusion and r	r components lour, texture a	and fabric,		MOISTUF	CONSISTENCY RELATIVE DENSITY		STRUC & Other Obs	
				SPT 6,12,18 N=30		4.0				n plasticity, brown, trace f in sand	ine grain grave	el, trace fine to)			ALLUVIUM 4.05: bands	of red-brown s	andy silt
					5	_												
				4.45m	227	4.5												
			Pe			-												
ADV	No Fluid		Encountered		227.0	_		СН						м	н			
V	0N		Not			5.0 -												
						_												
				5.50m SPT 12,19,25	226.5	- 5.5 —												
				N=44		-												
				5.95m	226.0	_			5.95m									
					12	6.0 —			Hole Termi Target Dep	inated at 5.95 m oth								
						-												
					225.5	- 6.5 —												
						-												
					225.0	-												
					22	7.0												
						-												
					224.5	- 7.5 —												
						-												
MEE HA AS AD HFF SC NE PT HA See deta					224.0	-												
ME		and aug	er		22		ENETR ⊮⊔∟			SAMPLES & FIEL B Bulk Disturbed	Sample		SOI	L DES	SCRIP		CONSIST RELATIVI VS	ENCY/ E DENSITY - Very Soft
AS AD AD HF	DV Au DT Au = He	ollow flig	ling wit ling wit ght aug	h TC bit er					No Resistance	D Disturbed Sam U Undisturbed Sa ES Environmental W Water Sample HP Hand Penetror	ample Sample			sificat	n Unifi ion Sy		S F St	- Soft - Firm - Stiff
RF SD ND	R R So DD No	/ash-bor ock rolle onic drill on destr	r ing uctive	drilling			Ξμ		n Date shown	SPT Standard Pene N Result of SPT R Hammer Boun U50 Undisturbed Sa	etration Test (*=sample taker cing / Refusal ample (50mm d	n) ia)	D Dry M Mo	/ ist			VSt H Fb VL	- Very Stiff - Hard - Friable - Very Loose
PT HA	Ci AND Hi	ontinuou and met	is push hods				►_ \	Drilling water ir water o		U75 Undisturbed Sa VS Vane Shear; pr PT Push Tube MC Moisture Conte	ample (75mm d eak/remouded(l	ia)		et Istic lir uid lin			L MD D VD	- Loose - Medium Dense - Dense - Very Dense
See deta & ba	ails of	anator abbre of desc	viatior	าร						SMEC AUS	STRAL	IA						SME

	_IEI				ource Bl			Ν			RILL HOLE - E		ERIN	G L	.00	PI PI	OLE NO : ROJECT NUMB HEET : 1 OF :	ER : 30041768
_					ng West 379.0, N		58448.	.0 (M	GA94	Zone 55)	SURFACE ELEVATION	: 233.00 (A	HD)		INC		NAL DEPTH : / ORIENTAT	<u>5.95 m</u> TON°: 90° / N/A
			E : ⊦							G : 4WD	CONTRACTOR					HOLE D	IA:100 mm	
DA	ATE	ST	ARTE	ED : 2	24/07/20	18 D <i>i</i>	ATE C	OMP	LETE	D : 24/07/201	8 DATE LOGGED : 24/	J7/2018 LO	GGED B	Y : /	AS		CHECKEL	DBY : SC
			C	RILL		-				1		MATER	RIAL			1		
PRITTING			- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	288.6VATION	O DEPTH (m)	GRAPHIC	CLASSIFICATION SYMBOL	SOIL N/ ROCK fe	MATERIAL DESCRIPTI AME : plasticity or particle char secondary and minor compo NAME : grain size, colour, tex patures, inclusion and minor co	acteristic, colour, ments ture and fabric,	,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTL & Other Obse	
	·								СН		NY high plasticity, grey-brown, fin	grain sand, with	1	D		TOPSOIL	ad patural tangai	to 0.2 m
							#			0.20m	plasticity, dark brown-grey to bro	wn mottled arev			F - St	ALLUVIUM	ed natural topsoi	10 U.2 M
							-					ini, include groy			F - 5l	0.30: trace re	potlets to 1.5m	
					0.50m	232.5	-											
					SPT 1 5,4,4 N=8	Ť	0.5											-
					N=8													
							_											
					0.95m	232.0	-											
					1.00m SPT 2 3,4,5	0	1.0 —			1.00m: with	organics					1.00: slight ir	ncrease in moistu	ire -
					N=9													
							_											
					1.45m	231.5	-											
					1.50m SPT 3 3,3,5	5	1.5 —											-
					N=8		-											
				g														
				ountere	1.95m	1.0	_											
ADV -		No Fluid		Not Encountered	1.9011	1231.0	2.0 —							м				-
		Ĩ		ž			-		СН					IVI				
															St			
						ы.												
					2.50m SPT 4	230	2.5 —			0.50		t 6 t	-					-
					5,6,7 N=13 DS-1		-			2.50m: beco grained san	oming pale brown, mottled browr id	, trace fine to med	dium					
					00-1		-											
						0	-											
090.0					2.95m	- <u>8</u>	3.0 -											-
SMEC 1.							_											
.5 lib Prj:							-											
MC 1.06							-											
J LIb: SE						229.5	3.5 —											-
NR.GP,							J.J _											-
018 - SK							-											
M 02082							-											
LAR FAF					4.00m	229.0	1			4.00m								
30REHOLE 30041768 - WYALO	HA AS ADV ADT HF WB RR SD NDD PT	Au Au Ho Wa Ro So No Co	ind aug ger scr ger dril	ewing ing with ing with ht auge ht auge e drillin r ing uctive o is push	n V bit n TC bit er g Irilling		WA		id/mm/ _evel o	- No Resistance Very Hard / Refusal /yy n Date shown water level nflow	SAMPLES & FIELD TES' B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample HP Hand Penetrometer (KP SPT Standard Penetration T N Result of SPT (*=sample) R Hammer Bouncing / Re U50 Undisturbed Sample (5/ U75 Undisturbed Sample (5/ VS Vane Shear, peak/remc PT Push Tube MC Moisture Content	a) sst e taken) usal Imm dia) imm dia)	SO Ba Class MOISTU D Dr M Ma W Wa PL Pla	IL DES ased o ssificat RE y pist	SCRIP in Unif ion Sy	ied	CONSISTEN RELATIVE I VS S F St VSt H F b VL L MD D VD	DENSITY - Very Soft - Soft - Firm - Stiff - Very Stiff - Hard - Friable - Very Loose - Loose - Medium Dense - Dense
Second de &	tails	s of a	anator abbre desci	viatior	s		<u>. </u>				SMEC AUSTR	ALIA						- Very Dense

CL					ource Bl			Ν			RILL HOLE -	ENGINE	ERIN	G L	00	PI PI	IOLE NO : BH1 ROJECT NUMBER : 30 HEET : 2 OF 2	
-				-	ng Wes		58448	0 (M	GA94	Zone 55)	SURFACE ELEVATION	I · 233.00 (A			INC		INAL DEPTH : 5.95 m ° / ORIENTATION° :	90° / N/A
				YND		1. 02				G : 4WD	CONTRACTOR						IA : 100 mm	30 / 14//
DA	TE	ST	ARTE	D: 2	24/07/20	18 D.	ATE C	OMP	LETE	D : 24/07/2018	B DATE LOGGED : 24	/07/2018 LC	OGGED B	8Y : 7	AS		CHECKED BY :	SC
-				RILLI	NG							MATE	RIAI					
PRC	OGR	ESS		-		z	Ê	0	NOI		MATERIAL DESCRIPT			шz	≿			
DRILLING	& CASING	FLUID	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2229.00VATION	0. DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	ME : plasticity or particle cha secondary and minor comp NAME : grain size, colour, te atures, inclusion and minor c	racteristic, colou oonents xture and fabric,		MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations	
					SPT 5 7,8,10 N=18		4.0			CLAY: high orange-brov	plasticity, pale brown, mottled r vn, trace fine to medium grain s	ed-brown and and				ALLUVIUM		
							_											
							-											
					4.45m	228.5	-											
						5	4.5 —											-
							-											
				, p			-								VSt			
				Encountered		0												
ADV -		No Fluid		ot Enoc		228.0	5.0 —		сн					м				
		2 		Not			_											-
							-											-
							-											-
					5.50m	227.5	-											-
					SPT 6 14,12,20		5.5 —			5.50m: becc	oming pale grey					5.50: bands	of ferruginous sandy silt	_
					N=32													
							_								н			-
					5.95m	227.0	-			5.95m								-
						122	6.0 -				nated at 5.95 m h							_
							-											-
							-											-
						5												-
						226.	6.5 —											-
							_											-
							-											-
							-											-
2						226.0	-											-
2			1111				7.0 —											-
i i																		-
2.00							_											-
						5.5	-											-
5						225.	7.5 —											-
							-											-
							-											
						0												-
						225.	8.0				1		0			(400) 5 5	00101077	
M	A	HOD Har	nd aug	ər				NETR.			SAMPLES & FIELD TES B Bulk Disturbed Sample	TS	so	IL DE	SCRIP		CONSISTENCY/ RELATIVE DENSIT	
A A A	JDV JDV JDT	Aug	ger scro ger drill ger drill	ing with	n V bit n TC bit				1-	No Resistance	D Disturbed Sample U Undisturbed Sample ES Environmental Sample				on Unif tion Sy		VS - Ver S - Soft F - Firm	
H H	IF VB	Hol Wa	low flig sh-bor	ht auge e drillin	er			ATER	Ľ _ -	Very Hard / Refusal	W Water Sample HP Hand Penetrometer (kl SPT Standard Penetration	Pa)	MOISTU	IRE			St - Stiff VSt - Ver	y Stiff
R S N	R D IDD	Sor	ck rolle nic drill n destri		Irillina			v 19	ld/mm/ evel o	′yy n Date shown	N Result of SPT (*=samp R Hammer Bouncing / R	ole taken) efusal	D Di M M	ry oist			H - Han Fb - Fria VL - Ven	ble
P	т	Cor	ntinuou nd met	s push	tub					water level	U50 Undisturbed Sample (5 U75 Undisturbed Sample (7 VS Vane Shear; peak/rem	75mm dia)	w w		mit		L - Loo	y Loose se lium Dense
									vater o		PT Push Tube MC Moisture Content			quid lir			D - Den	
See det & b	ails	s of a	abbrev	/ Note /iation iption:	s						SMEC AUSTR	RALIA						SMEC

CLII	ENT	• :	Lights	ource Bl	5		Ν			RILL HOLE - along Solar Farm	ENGINE	ERIN	G L	00	PI PI	IOLE NO : ROJECT NUM HEET : 1 OF	BER : 30041768
				ong West 0634.0, N		58645	5.0 (M	GA94	Zone 55)	SURFACE ELEVATIO	N : 231.00 (A	AHD)		INCI	FI	NAL DEPTH :	
-		PE : H			(0 D				G: 4WD	CONTRACTO					HOLE D	IA : 100 mr	
DA	IES	TART	=D : 2	26/07/20	18 D.	ATEC	OMP	LEIE	D : 26/07/201	8 DATE LOGGED : 2	6/07/2018 LC	OGGED B	Y : A	45		CHECKE	DBY:SC
PDO					1_			z			MATE			~			
PRILLING & Q		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2BL/BVATION	O DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL N/ ROCK fe	MATERIAL DESCRIP AME : plasticity or particle ch secondary and minor com NAME : grain size, colour, t eatures, inclusion and minor	aracteristic, colou ponents exture and fabric,	ır,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obs	
						-		сн	Silty CLAY	high plasticity, brown, with roo	otlets		D		TOPSOIL 0.10: disturb	ed natural tops	- pil to 0.2 m
						+			0.20m Silty CLAY subrounded	high plasticity, dark brown to	prown, trace fine gr				ALLUVIUM	•	
					.5	-			subrounded	graver			D to M		0.30: trace r	ootlets to 0.5m	-
				0.50m SPT	230.5	0.5 —								F			_
				2,3,4 N=7 CBR-1 0.5m-0.6m		-											-
																	-
				0.95m 1.00m	230.0	-											-
				SPT 3,4,4 N=8		1.0			1.00m: bec	oming brown, mottled grey, tra	ce fine grained sar	nd					_
						-											-
					5	-											-
				1.45m 1.50m SPT	29.	1.5 —											_
				3,6,7 N=13		-											-
			P			-											-
			Not Encountered	1.95m	229.0	-											-
- ADV -	- No Fluid		Vot Eno		122	2.0 —											-
						-		СН									-
						-							М				-
				2.50m	228.5	-								~			-
				SPT 3,5,7 N=12		2.5								St			-
						-											-
					0												-
1.06.0				2.95m	28	3.0 —											_
Prj: SMEC						-											-
1.06.5 llb																	-
.Ib: SEMC					227.5	-											-
IR.GPJ L					12	3.5 —											-
18 - SK_1																	-
RM 020820						-											-
DLAR FAF				4.00m	227.0	4.0											-
BOREHOLE 30041768 - WYALOI TA TA T	S A DV A DV A H B R D D C	D Hand aug Auger sci Auger dri Auger dri Hollow fli Vash-boi Rock rolle Sonic dril Non dest Continuo Hand me	ewing ling with ght auge re drillin er fung ructive ous push	n TC bit er g drilling				ld/mm/ _evel o	- No Resistance Very Hard / Refusal /yy n Date shown water level nflow	SAMPLES & FIELD TE B Bulk Disturbed Sample D Disturbed Sample ES Environmental Samp W Water Sample HP Hand Penetrometer (SPT Standard Penetration N Result of SPT (*=san R Hammer Bouncing /1 U50 Undisturbed Sample U75 Undisturbed Sample V Vane Shear; peak/re PT Push Tube MC Moisture Content	le kPa) Test ple taken) Refusal (50mm dia) (75mm dia)	SO Ba Class MOISTU D Dr M Mo W Wo PL Pla	IL DES ased o ssificat RE y pist	SCRIP n Unifi ion Sy	ed	CONSISTE RELATIVE VS S F VSt H Fb VL L MD D VD	
See deta	ils of	lanator f abbre of desc	viatior	IS						SMEC AUST	RALIA						SMEC

CLI			:	_ights	ource BF	D		Ν			RILL HOLI along Solar Farm	E - ENGINI	EERIN	G L	.00	PI SI	OLE NO : ROJECT NUMBE HEET : 2 OF 2	ER : 30041768 2
				,	ong West 0634.0. N		8645	.0 (M	IGA94	Zone 55)	SURFACE ELEV	ATION : 231.00	(AHD)		INCL		NAL DEPTH : 5 / ORIENTAT	5.95 m ION°: 90° / N/A
				IYND						G : 4WD		CTOR : APEX D					IA : 100 mm	
DA	TE	STA	RTE	D : 2	26/07/20	18 DA	TE C	OMF	LETE	D : 26/07/2018	8 DATE LOGGED	: 26/07/2018 I	OGGED E	3Y : /	AS		CHECKED	BY : SC
			C	RILL	ING							MATE	ERIAL					
PRO	GRE	SS	NOI	TER	s & STS	NO	Ê	U	TION		MATERIAL DES			ШNO	×≞×			
DRILLING & CASING	DRILLING	FLUID	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS		DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	AME : plasticity or parti secondary and mino NAME : grain size, co eatures, inclusion and r	r components lour, texture and fabri		MOISTUR	CONSISTENCY RELATIVE DENSITY		STRUCTU & Other Obser	
					SPT 7,8,9 N=17	Γ	-0.+			Silty CLAY: subrounded	high plasticity, dark bro I gravel <i>(continued)</i>	wn to brown, trace fine	grain,			ALLUVIUM		
ADV		- No Fluid		Not Encountered	4.45m	26.0			СН					М	VSt			-
		V			5.50m SPT 11,17,17 N=34 5.95m	225.0 [225.5	- 5.5 — - - -			5.50m: becc	oming mottled red-browr	1			Н	5.50: bands	of sandy silt to 5.9	95m -
						6	3.0 — - -			Hole Termir Target Dept	nated at 5.95 m th							-
						224.5	- - 3.5 -											-
						224.0	- 7.0											-
							-											
						223.5	- 7.5											-
						223.0	-											
AS ALL HE WILL AS ALL ALL ALL ALL ALL ALL ALL ALL AL	S DV F B R D DD T AND	Han Aug Aug Holl Was Roc Son Non Con Han	er drill ow flig sh-bor k rolle ic drill destr tinuou d met	ewing ing witi ing witi ht aug e drillin r ing uctive o s push hods	n TC bit er g drilling tub		-,		dd/mm/	No Resistance Very Hard / Refusal yy n Date shown water level Iflow	U50 Undisturbed Sa	Sample ple ample Sample Itration Test (*=sample taken) cing / Refusal ample (50mm dia) ample (75mm dia) sak/remouded(kPa)	SO B Cla MOISTL D D M M W W PL PI	DIL DES Based of Issification	SCRIP on Unifi tion Sy	ed	CONSISTEN RELATIVE D VS S F St VSt H F b VL L L MD D VD	
deta	ails	of a	bbre	/ Note /iatior iption	IS						SMEC AUS	STRALIA						SMEC

						RILL HOLE - ENG	INEERIN	GΙ	00		IOLE NO : BH13 ROJECT NUMBER : 30041768	
CLIENT : I LOCATION : V	Lightsouro Wyalong V			F	PROJECT: Wy	along Solar Farm					HEET: 1 OF 2 INAL DEPTH: 5.95 m	
POSITION : I RIG TYPE : H					Zone 55)	SURFACE ELEVATION : 230 CONTRACTOR : AP			INCI		° / ORIENTATION°: 90° / N IA : 100 mm	/A
						8 DATE LOGGED : 25/07/20		BY : .	AS		CHECKED BY : SC	
C	RILLING						MATERIAL					
BRILLING & CASING BRILLING FLUID FLUID FLUID FLUID	GROUND WATER LEVELS	FIELD TESTS		LOG CLASSIFICATION SYMBOL	SOIL N/ ROCK fe	MATERIAL DESCRIPTION AME : plasticity or particle characterist secondary and minor components (NAME : grain size, colour, texture an eatures, inclusion and minor compone	d fabric,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations	
			0.0	СН		XY high plasticity, grey-brown, fine grain	sand, with	D	_	TOPSOIL	and natural tangail to 0.2 m	_
					0.20m CLAY: high	plasticity, brown, trace fine to coarse gra	ain sand, trace	-		ALLUVIUM	bed natural topsoil to 0.2 m	
		Ω.	-		fine grain, s	ub-angular gravel				0.30: trace ro	ootlets to 1.5m	-
	0.50 SPT	а 229	0.5									_
	5,5,7 N=12		-									-
			-									-
	0.95	.0.			0.00							_
	1.00 SPT	m 2	1.0 —		0.90m: bec	oming grey-brown, mottled orange-brown	1					
	5,7,7 N=14	1										-
									St			_
	1.45		-									_
	1.50 SPT 3,5,7 N=12	3	1.5									
	IN-1.	2	_									_
	tered		-									-
PV DV	Eucountered	[∃] 228.0	2.0-									-
	Not E		2.0	СН				м				
			-									_
		2	-									-
	2.50 SPT	≡ 227.	2.5									_
	4,7,9 N=10		-		2.50m: bec	oming grey-brown, mottled red-brown						-
			-									-
	2.05											_
	2.95	1227	3.0 —									
			-									-
									VSt			-
		226.5	-									-
		2	3.5 —									
												-
			-									-
	4.00	[∃] 226.0			4.00m							-
ADT Auger drill HF Hollow flig WB Wash-bor RR Rock rolle SD Sonic drill NDD Non destr	er ewing ling with V b ling with TC ght auger e drilling r ing uctive drillin, us push tub	it bit		dd/mm	- No Resistance Very Hard / Refusal /yy n Date shown water level nflow	SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample HP Hand Penetrometer (kPa) SPT Standard Penetration Test N Result of SPT ("=sample taken) R Hammer Bouncing / Refusal U50 Undisturbed Sample (50mm dia U50 Undisturbed Sample (75mm dia U50 Vane Shear, peak/remouded(kF PT Push Tube MC Moisture Content	SC E Cla D MOISTI M W W W PL PL	DIL DE Based o assifica	SCRIP on Unif tion Sy mit	ied	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense	se
See Explanator details of abbre & basis of descr	viations	r				SMEC AUSTRALI	A				SM	EC

	.IEN				ource Bl			N			RILL HOLE	- ENGINE	ERIN	G L	.00	PI	OLE NO : ROJECT NUME HEET : 2 OF	BER : 30041768
					ong West 0622.0, N		58828	3.0 (N	IGA94	Zone 55)	SURFACE ELEVA	TION : 230.00 ((AHD)		INCL		NAL DEPTH : / ORIENTA	5.95 m TION° : 90° / N/A
_						18 D				3 : 4WD	CONTRAC 8 DATE LOGGED	TOR : APEX DF		X ·	45	HOLE D	IA: 100 mm	DBY:SC
		017					/// _ <			0.20/07/2010				, . ,	10		ONEONE	
PRO	DGRI	ESS	1	RILL ff		z			NO		MATERIAL DESCI		RIAL		5			
DRILLING		FLUID	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	226.0VATION	(m) HLLH (m) 4.0	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK fe	AME : plasticity or particle secondary and minor of NAME : grain size, color eatures, inclusion and min	e characteristic, colo components ur, texture and fabric nor components	2,	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obse	
					SPT 5 8,9,13 N=22		-			CLAY: high sub-angular	plasticity, brown, with fine r gravel	grain sand, trace fine	grain,			ALLUVIUM		
							-											-
					4.45m	225.5	-											-
						123	4.5 —											-
							-											-
				Encountered			-								VSt			
ADV		No Fluid —		ot Encou		225.0	5.0		сн					м				-
		2 		Not			-			5.00m: beco	oming grey							-
							-											-
						224.5	-											-
					5.50m SPT 6 9,13,17 N=30	10	5.5 —											-
					N=30		-								н			-
							-											-
ľ	-	*			5.95m	1224.0	6.0				nated at 5.95 m							
							-			Target Dept	th							-
							-											
						23.5	-											-
						22	6.5											-
							-											-
							-											
0.00.1						223.0	7.0											-
rj: smec.							-											-
1 all 6:90.1							_											-
-ID: SEMC						222.5	_											-
NR.GPJ						12	7.5											-
018 - SK							-											-
VRM 02082						0	-											-
SOLAK H						222.(1		CLASS			MBOLS &	CONSISTE	
- WYALO	IETH IA S DV DT	Aug Aug	nd aug ger scro ger drill	ewing ing wit	h V bit h TC bit			NETR ∛⊔∟		No Resistance	SAMPLES & FIELD B Bulk Disturbed S D Disturbed Sampl U Undisturbed Sam ES Environmental Sa	ample	SO B	IL DE ased o	SCRIP SCRIP on Unifi tion Sys	FION ed	VS F	
3004170	IF VB RR	Hol Wa:	low flig	ht aug e drillin	er		w		-	Very Hard / Refusal	W Water Sample HP Hand Penetrome SPT Standard Penetra	ter (kPa) ttion Test	MOISTL				St VSt H	- Filli - Stiff - Very Stiff - Hard
	D	Sor Nor	nic drilli n destr		drilling tub			-		yy n Date shown water level	N Result of SPT (*= R Hammer Bouncir U50 Undisturbed Sam	sample taken) g / Refusal ple (50mm dia)		ry oist /et			Fb VL	- Hard - Friable - Very Loose - Loose
-COREDE) Har	nd met	hods					water ir water o	flow	U75 Undisturbed Sam VS Vane Shear; pea PT Push Tube MC Moisture Content	<td>PL PI</td> <td>lastic li quid lir</td> <td></td> <td></td> <td>L MD D</td> <td>- Medium Dense - Dense</td>	PL PI	lastic li quid lir			L MD D	- Medium Dense - Dense
Se Swec Non-	tails	of a	abbrev	/ Note /iatior iption	IS						SMEC AUS		<u> </u>				VD	- Very Dense

CLIENT		ghtsour			Ν			DRILL HC /along Solar Fa	DLE - ENG	INEERI	NG I	-00	D PI	OLE NO : ROJECT NUM HEET : 1 OF	IBER : 30041768
LOCATION				259004.	0 (M	GA94	Zone 55)	SURFACE E	LEVATION : 231	.00 (AHD)		INC		NAL DEPTH	: 5.95 m ATION° : 90° / N/A
RIG TYPE							i : 4WD		TRACTOR : APE		i			A : 100 m	
DATE STA	RTED): 27/0	7/2018 D	ATE CO	OMP	LETE	D : 27/07/201	18 DATE LOG	GED : 27/07/201	8 LOGGED) BY :	AS		CHECKE	ED BY : SC
	DR	ILLING	i						Ν	ATERIAL					
PROGRESS & CASING PRILLING PRILLING PRILLING	ve F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS 2ELEVATION		GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCI	IAME : plasticity or secondary and K NAME : grain siz	DESCRIPTION particle characteristic minor components e, colour, texture and and minor component	fabric,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUC & Other Obs	TURE servations
	> " >		<u> </u>	0.0			Silty CLA	f high plasticity, bro	own, with rootlets		D		TOPSOIL		
				Ī				n plasticity, brown, i ain sand	nottled white and black	, trace fine to			ALLUVIUM		
			∃ 230.5	-									0.30: trace r	potlets to 1.5m	-
		0.50 SPT 3,4, N=9	5	0.5 -			0.50m: bed sub-rounde		nge-brown and grey, tra	ice fine grained					-
			0	_											-
		0.95 1.00 SPT 4,4, N=1	m 🖸												-
				_								St			-
			5									51			-
		1.45 1.50 SPT	57 m	1.5 —											-
		3,5, N=1	6	-											-
		g		-											-
		Not Encountered	a. 229.0	_											-
- ADV -		Not Enc	22	2.0 —		сн					м				_
															-
				_											-
		2.50	а 228.5	-											-
		SPT 5,6,1 N=1		2.5 -									1		-
				-											-
			0	-											-
1.06.0		2.95	m [228.	3.0 -											
nj: swec				-											-
06.5 lb F												VSt			-
D: SEMC			27.5	_											-
R.GPU L			1227	3.5 —											_
18 - SK_N															-
0208201				-											-
AR FARM		4.00	≣ 227.0				4.00m								-
AS Auge ADV Auge ADT Auge HF Holic WB Was RR Rock SD Soni NDD Non PT Cont HAND Hand	er drilling ow flight h-bore o k roller ic drilling destruct tinuous p d metho	ing g with V b g with TC auger Irilling live drillin oush tub ds	it bit g	WA	uuu: TER ¥ [] ↓		No Resistance Very Hard / Refusal yy n Date shown water level flow	B Bulk Dis D Disturbe U Undistur ES Environr W Water S HP Hand Pe SPT Standar N Result o R Hammer U50 Undistur U75 Undistur	netrometer (kPa) I Penetration Test f SPT (*=sample taken) Bouncing / Refusal bed Sample (50mm dia) bed Sample (75mm dia) ear; peak/remouded(kPa be	Mois D M W	SIFICAT SOIL DE Based Classifica STURE Dry Moist Wet Plastic I Liquid Ii	SCRIP on Unit ation Sy	ied	CONSISTI RELATIVE VS F St VSt H Fb VL L MD D VD	ENCY/ E DENSITY - Very Soft - Firm - Stiff - Very Stiff - Hard - Friable - Very Loose - Loose - Medium Dense - Dense - Very Dense
See Explan details of at & basis of d	bbrevia	ations	r					SMEC A	USTRALIA	4					SMEC

	ENT			ource BF			Ν				RILL HC		NGINE	ERIN	GΙ	.00	D PI	OLE NO ROJECT NU HEET : 2 C	MBER : 30	
				ong West 0630.0, N		59004	.0 (M	GA94	Zone 55)	S	URFACE EL	EVATION	: 231.00 (AHD)		INC		NAL DEPTH	: 5.95 m	90° / N/A
		E:⊢							3 : 4WD	040		RACTOR			224		HOLE D	A : 100 n		~~
DAI	ESI	IARIE	=D : 2	27/07/20	18 DA	ATE C	OMP	LEIE	D: 27/07/2	2018	DATE LOG	JED : 27/0)//2018 L	OGGEDE	3Y : .	AS		CHECK	ED BY :	SC
	GRESS	_	RILL ∣ ∝		-			z					MATE	RIAL		~				
& CASING		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS			GRAPHIC LOG	CLASSIFICATION SYMBOL			MATERIAL E : plasticity or secondary and AME : grain size ures, inclusion a	minor compoi e, colour, text	cteristic, color nents ure and fabric	-	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY			CTURE oservations	
ADV8	No Fluid	5 5	Not Encountered	5.50m 5.50m 5.95m 5.95m	226.5 1226.0 1226.5	4.0		СН	sand, tr	ace fine	isticity, mottled r e grain, sub-rour ing mottled red-	nded gravel	e fine to mediu	ım grain	м	н	ALLUVIUM	of sandy silt t	o 5.95m	-
	.			5.95m	224.5	4.0					ed at 5.95 m									-
					224.0	- - 7.0 -														-
					223.0 [223.5	- - 7.5 - - -														-
HA AS AD HF WE RR SD ND PT HA	Au V Au T Au Ha B W C B Na D Na Ca ND Ha	and aug uger scru uger dril	ewing ling wit ht aug e drillin r ing uctive o is push hods	h TC bit er g drilling tub				Id/mm/ ∟evel o	No Resistance Very Hard / Refusal yy n Date shown water level iflow	2	D Disturbed U Undisturb ES Environm W Water Sa HP Hand Per SPT Standard N Result of R Hammer U50 Undisturb U75 Undisturb	Irbed Sample I Sample eed Sample ental Sample metrometer (kPa Penetration Te SPT (*=sample Bouncing / Refu eed Sample (50) eed Sample (75) ear; peak/remou e) st taken) sal nm dia) nm dia)	SC E Cla MOISTI D D M M W W PL P	DIL DE Based o assifica	SCRIP on Unif tion Sy	ied	CONSIS RELATIV VS S F St VSt H Fb VL L MD D VD	/E DENSITY - Very - Soft - Firm - Stiff - Very - Hard - Friab - Very - Loos - Medi - Dens	Soft Stiff le Loose e um Dense
deta	ils of	abbre f desci	viatior	ıs						S	SMEC A	USTR/	ALIA							SME

CLI	FNT	· .	Liahts	source BF	5		Ν		-CORE DRILL HOLE - ENGINEERIN ROJECT: Wyalong Solar Farm	IG L	-00	PRO.	LE NO : BH15 JECT NUMBER : 30041768 ET : 1 OF 2
LOC	CATI	ION :	Wyalo	ong West		59067	0 (M		Zone 55) SURFACE ELEVATION : 231.00 (AHD)		INC	FINA	<u>L DEPTH : 5.95 m</u> DRIENTATION° : 90° / N/A
RIG	TY	PE :	HYND	AGH		Ν	NOUN	ITING	: 4WD CONTRACTOR : APEX DRILLING			HOLE DIA	: 100 mm
DAT	ΓE S	TART	ED :	27/07/20	18 DA	ATE C	OMP	LETE	D : 27/07/2018 DATE LOGGED : 27/07/2018 LOGGED	BY :	AS		CHECKED BY : SC
			DRILL		1			7	MATERIAL			1	
PRILLING & CASING	_	_ 2	VH GROUND WATER LEVELS	SAMPLES & FIELD TESTS		0.0 DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE Other Observations
					Γ	0.0		СН	Silty CLAY high plasticity, brown, with rootlets, organics present	D	_	TOPSOIL	natural topsoil to 0.2 m
						+			0.20m CLAY: high plasticity, brown to brown mottled grey, trace fine to	-		ALLUVIUM	
					.5				medium grain sand			0.30: trace rootle	ets to 0.5m
				0.50m SPT	230.5	0.5 —							-
				3,3,6 N=9		-							-
													-
				0.95m	230.0	-							-
				1.00m SPT 3,6,8 N=14	3	1.0			1.00m: becoming mottled grey and brown, trace fine to coarse grained sand, trace organics				_
				IN-14		_							-
						-					St		-
				1.45m 1.50m SPT	229.5	1.5							-
				3,5,7 N=12		-							-
						_							-
			ountered	1.95m	229.0								-
- ADV -	No Fluid		Not Encountered	1.0011	122	2.0 —				м			-
								СН					-
						-							-
				2.50m	228.5	-							-
				SPT 5,7,12 N=19	Γ	2.5			2.50m: becoming pale grey, mottled red-brown and yellow				-
						-							-
					o.								-
				2.95m	1228.	3.0							-
						-							-
											VSt		-
					227.5	-							-
						3.5							-
						_							-
					0	-							-
				4.00m	227.0	 +.0			4.00m				-
AD AD AD AD AD HF SD ND PT	5 A 0 A 0 T A 5 H 5 H 5 H 6 H 6 H 6 H 6 H 6 H 6 H 6 H 6	Hand au Auger so Auger di	rewing illing wit ght aug re drillir er lling ructive us pust	th TC bit ler ng drilling				d/mm/	SAMPLES & FIELD TESTS S B Bulk Disturbed Sample D D Disturbed Sample U U Undisturbed Sample C Very Hard / W Water Sample Refusal HP SPT Standard Penetrometer (kPa) MOIST N Result of SPT ("=sample taken) D ID Date shown U50 Ufodisturbed Sample (50mm dia) W flow VS vane Shear; peak/remouded(kPa) PT Puek	OIL DE Based (assifica	SCRIP on Unif tion Sy	TION ied /stem	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VS - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
See deta & ba	ils o	lanato f abbro of deso	viatio	ns					SMEC AUSTRALIA				SMEC

CLI				ource Bl			Ν			RILL HOLE along Solar Farm	E - ENGI	NEERIN	GL	00	PI	OLE NO : ROJECT NUME HEET : 2 OF	BER : 30041768
				ong West)884.0, N		59067	'.0 (M	IGA94	Zone 55)	SURFACE ELEVA	TION : 231.0	00 (AHD)		INCI		NAL DEPTH : / ORIENTA	5.95 m TION°: 90° / N/A
		E : F			18 D/				3 : 4WD	CONTRAC 3 DATE LOGGED	TOR : APEX		3Y ·	AS	HOLE D	IA: 100 mn CHECKE	n DBY:SC
	1				. =1												
PROC	GRESS		RILL		z	ĉ	0	NOI		MATERIAL DESC		ATERIAL	u z	۵			
DRILLING & CASING	DRILLING	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2 BL BVATION	0. DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NA ROCK fea	ME : plasticity or partic secondary and minor NAME : grain size, colo atures, inclusion and m	le characteristic, components our, texture and fa	abric,	MOISTURI	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obse	
				SPT 10,13,17 N=30		4.0 -				plasticity, mottled red-bro in sand	own and pale grey,	, trace fine to			ALLUVIUM		
						_											
				4.45m	226.5	_											
					122	4.5 —											-
						_											
			Encountered			-								VSt			
– ADV –	No Fluid –		Not Encol		226.0	5.0 —		сн					м				_
						-											
				5.50m	225.5	- 5.5 —											
				SPT 10,18,21 N=39		5.5 — -											-
						-								н			
				5.95m	225.0	-			5.95m								
					122	6.0 —				ated at 5.95 m h							-
						-											
					5	-											
					24	6.5 —											
						-											
						-											
2					224.0	-											
- OWEG I.						7.0 —											-
00.0 10 11						-											
D. SEMC					3.5	-											
1010101					223.	7.5 —											-
						-											
					0	-											
					223.0	- ۹.0						CLASS			MBOLS &	CONSISTE	NCY/
AS AD	Au V Au T Au Ho B Wa B Ro D No Co	and aug iger scr iger dril	ewing ing wit ht aug ht aug drillin c drillin r uctive o s push	n TC bit er g drilling			× □	dd/mm/	• No Resistance Very Hard / Refusal ⁽ yy n Date shown water level	R Hammer Bound U50 Undisturbed Sa U75 Undisturbed Sa VS Vane Shear; pe	Sample ole mple Sample eter (kPa) ration Test =sample taken)	SC E Cla MOIST D C M M W V	DIL DE Based o assifica	SCRIP on Unifi tion Sy	FION ed	RELATIVE VS S F VSt H Fb VL L MD	
	<u> </u>			. 6				water o		PT Push Tube MC Moisture Conten			iquid lii			D VD	- Dense - Very Dense
deta & ba	ils of	anator abbre f desci	viatior	IS						SMEC AUS	TRALIA						SMEC

CLI	ENT	:	Liahtsa	ource BF	5		N			PRILL HOLE -	ENGINE	ERIN	G L	.00	Pi	OLE NO : BH16 ROJECT NUMBER : 30041768 HEET : 1 OF 2
LOC	CATI	ON :	Wyalo	ng West		0201 (N + 222.00 (A)				FI	NAL DEPTH : 5.95 m
-		ЭN : РЕ:Н			N: 625				Zone 55) : 4WD	SURFACE ELEVATIO CONTRACTO	R : APEX DRII			INCL		' / ORIENTATION°: 90° / N/ IA : 100 mm
DAT	ES	TART	ED: 2	6/07/20	18 DA	TE CO	OMP	LETED	0 : 26/07/201	8 DATE LOGGED : 2	6/07/2018 LO	GGED B	Y:/	٩S		CHECKED BY : SC
			RILLI								MATER					
PROC	GRES	_	<u>г т</u>		z	2		NO		MATERIAL DESCRIP			Z	≿		
DRILLING & CASING	DRILLING	VE COLO C	GROUND WATER LEVELS	SAMPLES & FIELD TESTS		O DEPTH (m)	LOG	CLASSIFICATION SYMBOL	ROCK	AME : plasticity or particle ch secondary and minor com (NAME : grain size, colour, t eatures, inclusion and minor	aracteristic, colour, ponents exture and fabric, components	5	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
									.10m	plasticity, grey-brown, with roo			D		TOPSOIL	
				0.50m SPT 2,3,4 N=7 0.95m 1.00m SPT 3,3,4 N=7 1.45m 1.50m SPT 5,4 N=9	230.5 [231.0				CLAY: high quartz sanc	plasticity, dark grey-brown, tra d to 1m		ain		F	ALLUVIUM	sed moisture content
				1.95m	229.5			сн	2.00m: bec	coming mottled orange			М			
				SPT 4,4,6 N=10 2.95m	1229.0	3.0			2.50m: bec	oming mottled red-brown				St		
AS AD		D land aug uuger dril uuger dril uuger dril vash-bor tock rolle onic drill on destr continuot	ewing ling with ling with ght auge e drilling er ing uctive di us push	TC bit r g rilling	228.0 228.5	K TAW	u ⊾ : IER IER	ATION	Date shown /ater level ow	SAMPLES & FIELD TE B Bulk Disturbed Sample U Undisturbed Sample ES Environmental Samp W Water Sample HP Hand Penetrometer (SPT Standard Penetration N Result of SPT ("=sam R Hammer Bouncing / U50 Undisturbed Sample U75 Undisturbed Sample VS Vane Shear, peak/rep PT Push Tube	le kPa) Test nole taken) Refusal (50mm dia) (75mm dia)	SOI Ba Class MOISTU D Dr M Mo W Wa PL Pla	IL DES ased o ssificat RE y bist et astic lii	SCRIP on Unifi tion Sy	ed	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense
See deta & ba	ils of	lanator f abbre of desc	viation	s				water out		MC Moisture Content	RALIA	LL Lic	quid lin			VD - Very Dense

	ENT			source Bl			N			RILL HOLE along Solar Farm	- ENGINE	ERIN	G L	.00	PI	IOLE NO : ROJECT NUME HEET : 2 OF	BER : 30041768
			-	long Wes ⁻ 30626.0, N		5920 ⁻	1.0 (N	1GA94	Zone 55)	SURFACE ELEVAT	ON : 232.00 (AHD)		INCL	FI	NAL DEPTH :	
				DAGH					G: 4WD		OR : APEX DF				HOLE D	IA : 100 mm	
DA	IES	IARI	ED :	26/07/20	18 D.	AIE	COMF	PLETE	D : 26/07/2018	3 DATE LOGGED :	26/07/2018 L	OGGED E	3Y : /	AS		CHECKE	DBY:SC
			-	LING	-			7			MATE	RIAL					
BRILLING A	GRES	2	CH GROUND WATER LEVELS		2228.00VATION	Ö DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	MATERIAL DESCR ME : plasticity or particle secondary and minor or NAME : grain size, colou atures, inclusion and min	characteristic, color omponents , texture and fabric		MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obse	
				SPT 6,9,10 N=19		4.0			CLAY: high to medium g	plasticity, pale grey-brown, rain sand	mottled red-brown, t	trace fine			ALLUVIUM		
						_											-
					5	_											-
				4.45m	27.	4.5 -											-
						-											-
			R I			_								VSt			-
			Encountered		0.	-											-
- ADV -	No Fluid		Not Eno		227.0	5.0 —		СН					м				_
						-											-
						-											-
					6.5	_											-
				5.50m SPT 10,17,13	226.	5.5 —			5.50m: becc	oming mottled red-brown, tr	ace fine to coarse gra	ained					-
				N=30		-			sand, trace t	fine to medium grained sub	-angular gravel						-
						_								н			-
v	V			5.95m	226.0	_			5.95m								-
					3	6.0 —			Hole Termin Target Dept	ated at 5.95 m h							-
			i 👘			1											-
		ÌÌÌ	i			-											-
			1		225.5	-											-
			1			6.5 -											-
			1			_											-
						-											-
0.90			1		225.0	7.0 —											-
SMECT			·														-
(14 all 6.0						-											-
EMC 1.0					5	_											-
PJ LID:					24	7.5 —											_
N. NY. C			· .			-											-
- 81.0280			1			-											-
FARM 02			i 👘		1.0	-											-
SULAR					224.0	8.0						CLASSI	FICAT	ION SY	MBOLS &	CONSISTE	NCY/
	5 A	land au Auger so	rewing				ENETR		No Resistance	B Bulk Disturbed Sa D Disturbed Sample	mple	SO B	IL DE ased o	SCRIP on Unifi	FION ed	RELATIVE VS	DENSITY - Very Soft
	A TC = ⊢	Auger di Hollow fl	illing w ight au	ith V bit ith TC bit ger			7		Very Hard /	U Undisturbed Samp ES Environmental Sam W Water Sample				tion Sy	stem	S F St	- Soft - Firm - Stiff
N W RI SI	BV RF DS	Vash-bo Rock rol Sonic dr	ore drilli er Iling	ing		Ŵ		dd/mm/	Refusal VV	HP Hand Penetrometer SPT Standard Penetrat N Result of SPT (*=s	ion Test ample taken)	D D	ry			VSt H Fb	- Very Stiff - Hard - Friable
	DD N F C	Von des Continue Hand me	tructive	drilling h tub			-	Level o Drilling	n Date shown water level	R Hammer Bouncing U50 Undisturbed Same U75 Undisturbed Same VS Vane Shear; peak	le (50mm dia) le (75mm dia)	w w	oist /et	m:+		VL L	- Very Loose - Loose
								water ir water o		VS Vane Shear; peak PT Push Tube MC Moisture Content	remouded(kra)		lastic li quid lir			MD D VD	- Medium Dense - Dense - Very Dense
See deta																	

CLIENT : Lightsource BP		E DRILL HOLE - ENGINEERII	NG LO	G HOLE NO : BH17 PROJECT NUMBER : 30041768 SHEET : 1 OF 2
LOCATION : Wyalong West POSITION : E: 530382.0, N: 62	59394.0 (MGA94 Zone 55)	SURFACE ELEVATION : 233.00 (AHD)	INC	FINAL DEPTH : 5.95 m CLINATION° / ORIENTATION° : 90° / N/A
RIG TYPE : HYNDAGH	MOUNTING : 4WD	CONTRACTOR : APEX DRILLING		HOLE DIA : 100 mm
DATE STARTED : 27/07/2018 D	ATE COMPLETED : 27/07	7/2018 DATE LOGGED : 27/07/2018 LOGGED	BY : AS	CHECKED BY : SC
DRILLING		MATERIAL		
DRILLING A & CASING A PRILLING A FLUID SS FLUID SS FLUID SS APPLES & FIELD TESTS FIELD TESTS FIELD TESTS	DEPTH GRAP LOO LOO SYMB	MATERIAL DESCRIPTION OIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION CONSISTENCY RELATIVE	STRUCTURE & Other Observations
DS-1	- CH Silty - CH 0.20m	CLAY high plasticity, brown, with rootlets	D	TOPSOIL 0.10: disturbed natural topsoil to 0.2 m ALLUVIUM
AC METHOD 4.00m SPT METHOD 4.00m SPT 5.50m SPT METHOD 4.00m SPT 5.50m SPT METHOD 4.00m SPT 5.50m SPT METHOD 4.00m SPT 5.51.2 SPT METHOD 4.00m SPT SPT SPT METHOD SPT SPT SPT SPT ME <td></td> <td>n: becoming grey-brown, mottled brown, trace medium grained</td> <td>M VSt</td> <td>0.30: trace rootlets to 1m 1.50: recovery of quartz sand to 2.5m</td>		n: becoming grey-brown, mottled brown, trace medium grained	M VSt	0.30: trace rootlets to 1m 1.50: recovery of quartz sand to 2.5m
METHOD HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit HF Hollow fight auger WB Wash-bore drilling RR Rock roller SD Sonic drilling NDD Non destructive drilling PT Continuous push tub HAND Hand methods	PENETRATION	SAMPLES & FIELD TESTS S B Bulk Disturbed Sample Disturbed Sample C D Disturbed Sample U Undisturbed Sample C ES Environmental Sample C C HP Hand Penetrometral Sample MOIS C R Hammer Bouncing / Refusal M MOIS In U50 Undisturbed Sample (50mm dia) W V VT Sundisturbed Sample (50mm dia) W V V75 Undisturbed Sample (50mm dia) W V V75 Undisturbed Sample (50mm dia) W V	SIFICATION S SOIL DESCRII Based on Un classification S TURE Dry Moist Wet Plastic limit Liquid limit	PTION RELATIVE DENSITY ified VS - Very Soft
See Explanatory Notes for details of abbreviations & basis of descriptions.	· · · · · · · · · · · · · · · · · · ·	SMEC AUSTRALIA		

CLI	ENT	: 1	_ights	ource BF	Þ		N			RILL HOLE	- ENGINE	ERIN	G L	.00	PI	OLE NO : ROJECT NUMBE HEET : 2 OF 2	ER : 30041768
LOC	CATIO) : NC	Wyalo	ong West	t	59394	4.0 (N		Zone 55)	SURFACE ELEVA	FION : 233.00 (/	AHD)		INCL	FI	NAL DEPTH : {	
		'E : ⊢							G : 4WD		TOR : APEX DF					IA:100 mm	
DAT	TE ST	FARTE	ED : 2	27/07/20	18 D.	ATE (COMF	PLETE	D : 27/07/201	8 DATE LOGGED	: 27/07/2018 L	OGGED B	SY : /	AS		CHECKED	BY : SC
		C	RILL								MATE	RIAL					
& CASING		- E	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2229.00VATION	(m) MEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	MATERIAL DESC AME : plasticity or particl secondary and minor NAME : grain size, colo eatures, inclusion and mi	e characteristic, colou components ur, texture and fabric,	ur, ,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTU & Other Obser	
				SPT 11,14,19 N=33		4.0 -			Silty CLAY sand	high plasticity, brown mot	tled yellow, trace fine g	grain			ALLUVIUM		-
						_											-
				4.45m	228.5	4.5											-
						-											-
	nid –		Encountered		228.0	-											-
ADV	No Fluid		Not E		12	5.0 -		СН					м	н			-
						-											-
				5.50m	227.5	_ 5.5 —										6 I 11 6	-
				SPT 10,14,20 N=34		-			5.5m: becor	ming mottled red-brown, tr	ace fine grained sand				5.50: bands	of sandy silt to 5.9	 -
					0	_											-
	V.			5.95m	227	6.0 —			5.95m Hole Termir Target Dept	nated at 5.95 m th							
						-											-
					26.5	-											-
					22	6.5											-
						_											-
0.00.1					226.0	7.0											-
IID PTJ; SMEC						_											-
SEMU 1.00.5					.5	-											-
NK.GPJ LID.					225.	7.5											-
Nc - 010700						_											-
					225.0	-											-
HA AS AD AD HF B R D D PT	METHOD HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit HF Hollow flight auger WB Wash-bore drilling RR Rock roller SD Sonic drilling NDD Non destructive drilling PT Continuous push tub HAND Hand methods								No Resistance Very Hard / Refusal yy n Date shown water level iflow	SAMPLES & FIELD B Bulk Disturbed S D Disturbed Sampl U Undisturbed Sampl ES Environmental S W Water Sample HP Hand Penetrome SPT Standard Penetr N Result of SPT (* R Hammer Bounci U50 Undisturbed Sam U75 Undisturbed Sam VS Vane Shear, pee PT Push Tube MC Moisture Conten	ample e pple ample tation Test sample taken) g / Refusal pple (50mm dia) pple (75mm dia) k/remouded(kPa)	SO B Cla MOISTU D DI M M W W PL PI	IL DES ased o ssificat IRE ry oist	SCRIP on Unifi tion Sy	ed	CONSISTEN RELATIVE D VS F St VSt H Fb VL L L MD D VD	
See deta & ba	ee Explanatory Notes for stails of abbreviations basis of descriptions. SMEC AUSTRALIA																

CLIE	ENT	: L	.ightso	ource Bl	Þ		Ν		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	G L	00	PRO-	LE NO : BH18 JECT NUMBER : 30041768 ET : 1 OF 2
LOC	ATI	ON : \	Vyalo	ng West	t	50203	0 (N		Zone 55) SURFACE ELEVATION : 229.00 (AHD)			FINA	L DEPTH : 5.95 m ORIENTATION° : 90° / N/A
		PE:H			N. UZ				G : 4WD CONTRACTOR : APEX DRILLING		INCI	HOLE DIA	
DAT	ES	TARTE	D: 2	7/07/20	18 D/	ATE C	OMF	PLETE	D : 27/07/2018 DATE LOGGED : 27/07/2018 LOGGED E	3Y : /	AS		CHECKED BY : SC
		D	RILLI	NG					MATERIAL				
BRILLING & CASING		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2229.00VATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	&	STRUCTURE Other Observations
▲			0	** LL	5	0.0			Silty CLAY: high plasticity, brown, trace fine grain sand, with rootlets	D	0	TOPSOIL	
						-		СН	0.20m		-	0.10: disturbed i	natural topsoil to 0.2 m
									Silty CLAY: high plasticity, grey-brown to brown, trace medium grain sand	D to M		ALLUVIUM	
					3.5	_						0.30: trace root	ets to 0.5 m
				0.50m SPT	228.	0.5 —					F		-
				3,2,3 N=5		-							
						-							-
				0.95m 1.00m	228.0	1.0 -							-
				SPT 4,5,7 N=12		-			1.00m: becoming mottled grey				
						_					~		
						-					St		
				1.45m 1.50m	227.5	-							-
				SPT 4,7,9		1.5 —			1.50m: becoming mottled grey and brown				-
				N=16									
			eq			_							
			counter	1.95m	227.0	-							-
- ADV	No Fluid		Not Encountered		122	2.0 —							-
			2			-		СН					
										м			
					.5								
				2.50m SPT	226	2.5			2.50m trace fine to medium grained cand				-
				5,9,12 N=21		-			2.50m: trace fine to medium grained sand				-
						-					VSt		-
						-							
0.00				2.95m	226.0	3.0 -							-
QMEC						_							-
o IID Prij.						-							-
D0-1 D04						-							
LID: SE					225.5	<u>_</u>							-
20.24						3.5-							-
vo - 01						4							
1020020						-							
				4.00m	225.0	-			4.00m				-
ME	тно			0011	1.4				SAMPLES & FIELD TESTS			YMBOLS &	CONSISTENCY/ RELATIVE DENSITY
HA AS AD	. H A	land auge uger scre uger drill	ewing	V bit			<u>ш</u> ш		No Resistance D Disturbed Sample E	DIL DE	on Unif	ied	VS - Very Soft S - Soft
AD HF	T A H	uger drill Iollow flig	ing with ht auge	TC bit r			<u> </u>		Verv Hard / ES Environmental Sample Verv Hard / W Water Sample	assifica	аон зу		F - Firm St - Stiff
RR SD SD	R	Vash-bore lock rolle onic drilli	r T	I		1	TER	dd/mm/	N Result of SPT (*=sample taken) D D)ry			VSt - Very Stiff H - Hard Fb - Friable
ND PT	D N C	lon destri ontinuou land metl	uctive di s push t				⊻	Level o Drilling	water level U75 Undisturbed Sample (50mm dia) W V	1oist Vet			VL - Very Loose L - Loose
	ло Н	anu meti	JUUS				I	water ir water o		lastic li iquid lir			MD - Medium Dense D - Dense VD - Very Dense
See deta & ba	ee Explanatory Notes for etails of abbreviations basis of descriptions. SMEC AUSTRALIA												

CLIENT : Lightsource		ON-CORE DRILL HOLE - ENGINE PROJECT: Wyalong Solar Farm	ERING LOG HOLE NO : BH18 PROJECT NUMBER : 30041768 SHEET : 2 OF 2									
LOCATION : Wyalong We POSITION : E: 530109.0	st		FINAL DEPTH : 5.95 m									
RIG TYPE : HYNDAGH	MOUN	ITING : 4WD CONTRACTOR : APEX DR	RILLING HOLE DIA : 100 mm									
DATE STARTED : 27/07/2	018 DATE COMPL	LETED : 27/07/2018 DATE LOGGED : 27/07/2018 L0	OGGED BY : AS CHECKED BY : SC									
DRILLING		MATE										
A CASING & CASING & CASING BRILLING PLUID F PENETRATION VH COUNDWATER CASING S S S S S S S S S S S S S	222520VATION 0° DEPTH (m) GRAPHIC LOG	KO MATERIAL DESCRIPTION OB SOIL NAME : plasticity or particle characteristic, colou SECONDARY and minor components SECONDARY and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	& Other Observations									
SPT 9,14,17 N=31	4.0	Silty CLAY high plasticity, pale grey, mottled orange-brown, fine to medium grain sand	, trace ALLUVIUM									
<u>4.45m</u>	4.5											
DV		СН	мн									
ADV - No Fluid Not Enoc	5.0-	Un	, , , , , , , , , , , , , , , , , , ,									
5.50m SPT			coarse 5.50: bands of silty sand to 5.95m									
8,18,23 N=41		5.50m: becoming mottled red-brown and grey, trace fine to c grained sand, trace fine to medium grained sub-angular grav										
5.95m		5.95m										
	6.0	Hole Terminated at 5.95 m Target Depth										
	_											
	222.5											
	6.5											
	_											
	-											
	-											
1.06.5 llb PG												
ID: SEMIC												
	7.5-											
M 0208201												
LAR FARM	221.0											
Bit Control of the second s		B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample U Undisturbed Sample Servironmental Sample W Water Sample W Water Sample W Water Sample H Hand Penetrometer (kPa) SPT Standard Penetration Test N Result of SPT ("=sample taken) R Hammer Bouncing / Refusal U75 Undisturbed Sample (50mm dia) V75 Vane Shear; peak/remouded(kPa) PT Push Tube	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System CONSISTENCY/ RELATIVE DENSITY VS CONSISTENCY/ RELATIVE DENSITY MOISTURE VS - Very Soft S - Soft F - Firm St - Soft F - Soft F - Very Stiff - Very Very Cose - Very Loose - Loose - Loose - Dense - Dense - Dense - Very Pense - Very Pense - Very Dense - Very Dense <t< td=""></t<>									
See Explanatory Notes for details of abbreviations & basis of descriptions.	Water outflow Mc Moisture Content LL Liquid limit VD - Very Dense											

CLI	ENT	:	_iahts	ource Bl	5		Ν		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	IG L	-00	PRO	LE NO: BH19 JECT NUMBER: 30041768 ET: 1 OF 2
LOC	CATI	ON : \	Nyalo	ng West		59010.	0 (M		Zone 55) SURFACE ELEVATION : 233.00 (AHD)		INC	FINA	L DEPTH : 5.95 m ORIENTATION° : 90° / N/A
		PE: H							G: 4WD CONTRACTOR : APEX DRILLING	D) (HOLE DIA	
DAI	IES	TART	=D : 2	24/07/20	18 D/	ATE C	ОМР	LEIE	D : 24/07/2018 DATE LOGGED : 24/07/2018 LOGGED	BY :	AS		CHECKED BY : SC
DROC	GRES	_	RILLI		-			z	MATERIAL		>		
& CASING		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	288.6VATION	O DEPTH (m)	GRAPHIC	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE Other Observations
						-		СН	Sandy CLAY high plasticity, brown, fine grain sand, with rootlets	D		TOPSOIL 0.10: disturbed	natural topsoil to 0.2 m
						+			0.20m CLAY: high plasticity, dark brown to brown, mottled black and grey, teap areas areain and the brown to brown, mottled black and grey,	-	St - VSt	ALLUVIUM	
					2.5				trace coarse grain sand			0.30: rootlets to	1 m -
				0.50m SPT 1	232.	0.5 —						-	-
				10,9,8 N=17		-							-
										D to N	1		-
				0.95m 1.00m	232.0	-							-
				SPT 2 5,7,8 N=15		1.0			1.00m: becoming mottled black, trace organics		VSt		-
						_							-
						-							-
				1.45m 1.50m SPT 3	231.5	1.5 —			4 Foreitaria anno anticada and			-	-
				4,4,6 N=10		-			1.50m: trace coarse grained sand				-
			g			-							-
	P 0000	Not Encountered	1.95m	231.0	_							-	
- ADV	- No Fluid		Not End		123	2.0 —					St		-
						_		СН					-
						-							-
				2.50m	230.5	- 2.5							-
				SPT 4 8,12,18 N=30		-			2.50m: becoming pale brown, mottled red-brown				-
						-				м			-
				0.05m	0.0								-
0.00.0				2.95m	1230.0	3.0 —							-
o Prj: SME													-
C 1.06.5 III											VSt		-
LID: SEM					229.5	-							-
NR.GPJ					Ľ	3.5							-
2018 - SK						-							-
ARM 020E					0.								-
SOLAR F				4.00m	229.	<u>†</u> .₀ ∥			4.00m CLASS			YMBOLS &	CONSISTENCY/
BOREHOLE 30041768 - WALO	HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit HF Hollow flight auger WB Wash-broge drilling						TER ₹ L	ld/mm/ .evel o Drilling vater ir	SAMPLES & FIELD TESTS S B Bulk Disturbed Sample D D Disturbed Sample U Undisturbed Sample CI Very Hard / W Water Sample Refusal HP SPT Standard Penetrometra (RPa) N Result of SPT ("=sample taken) yy N n Date shown U50 ufflow VS Very Hard / W Water Sample MOIST N Refusal HP Harmer Bouncing / Refusal M N Harmer Bouncing / Refusal M U50 Undisturbed Sample (50mm dia) W Iflow VS	OIL DE Based (assifica CURE Dry Moist Vet Plastic I	SCRIP on Unif tion Sy	TION ied	RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense
See deta & ba													

CLIENT : Lightsource BP	NON-CORE DRILL HOLE - ENGINEERI PROJECT: Wyalong Solar Farm	ING LOG HOLE NO : BH19 PROJECT NUMBER : 30041768 SHEET : 2 OF 2
LOCATION : Wyalong West POSITION : E: 529856.0, N: 62590	10.0 (MGA94 Zone 55) SURFACE ELEVATION : 233.00 (AHD)	FINAL DEPTH : 5.95 m INCLINATION° / ORIENTATION° : 90° / N/A
RIG TYPE : HYNDAGH	MOUNTING: 4WD CONTRACTOR: APEX DRILLING COMPLETED: 24/07/2018 DATE LOGGED: 24/07/2018 LOGGE	
DATE STARTED : 24/07/2018 DATE	COMPLETED : 24/07/2018 DATE LOGGED : 24/07/2018 LOGGE	D BY : AS CHECKED BY : SC
	MATERIAL	
DRILLING & CASING & CASING	O O	NOLLISSING VOLLISSIN VOLLISSIN VOLLISSIN VOLLISSIN VOLLISSIN VOLLISSIN VOLLIS
ACT 2	CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse grain sand CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse CLAY: high plasticity, pale grey, mottled yellow-brown, trace coarse Statement of the statement	M H
METHOD 0 0 0 0 HILL 0 0 0	Hole Terminated at 5.95 m Hole Terminated at 5.95 m Target Depth	SSIFICATION SYMBOLS & CONSISTENCY/
METHOD HA HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit HF Hollow flight auger WB Wash-bore drilling RR Rock roller SD Sonic drilling NDD Non destructive drilling PT Continuous push tub HAND Hand methods HAND Hand methods	PENE IRATION SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample Very Hard / W Water Sample	SOIL DESCRIPTION Based on Unified Classification System RELATIVE DENSITY Based on Unified Classification System VS - Very Soft F - Firm St - Soft ISTURE VSt - Very Stiff Dry H - Hard Moist VL - Very Loose L clausic limit MD - Medium Dense Liquid limit VD - Very Dense
See Explanatory Notes for details of abbreviations & basis of descriptions.	SMEC AUSTRALIA	SMEC

CLIE				ource Bl ng West			N			PRILL HOLE - El along Solar Farm	NGINEERIN	IG L	_00	PI SI	OLE NO : BH20 ROJECT NUMBER : 30041768 HEET : 1 OF 2
			-			58832.	0 (M	IGA94	Zone 55)	SURFACE ELEVATION :	233.00 (AHD)		INC		NAL DEPTH : 5.95 m ' / ORIENTATION° : 90° / N/A
RIG	TYF	PE : ⊦	IYND	AGH		М	IOUI	NTING	6 : 4WD	CONTRACTOR :	APEX DRILLING			HOLE D	IA:100 mm
DAT	ES	TARTE	ED : 2	25/07/20	18 D.	ATE CO	OMF	PLETE	D : 25/07/201	8 DATE LOGGED : 25/07	2/2018 LOGGED	BY :	AS		CHECKED BY : SC
		C	RILLI	NG							MATERIAL				
PRILLING & CASING		2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	288.00VATION		GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	MATERIAL DESCRIPTION AME : plasticity or particle charac secondary and minor compone (NAME : grain size, colour, textur eatures, inclusion and minor comp	eristic, colour, ents e and fabric,	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
I ∞	-					0.0		СН	Sandy CLA	AY high plasticity, grey-brown, fine g	rain sand, with	D		TOPSOIL	
				0.50m SPT 1 4,5,5 N=10	232.5					ı plasticity, brown				ALLUVIUM	- ootlets to 1.0 m - -
				0.95m 1.00m SPT 2 3,6,6 N=12	232.0				1.00m: trac	e fine to medium grained sand			St	1.00: Quartz	sand recovered to 1.5m
			untered	1.45m 1.50m SPT 3 3,4,5 N=9	.0 [231.5				1.50m: bec	roming brown					-
- ADV	- No Fluid -		Not Enco	1.95m	230.5 231.0	2.0		СН				м			-
0.00				2.50m SPT 4 7,9,14 N=23 2.95m	1230.0	2.5			2.50m: bec	oming pale grey-brown, mottled red				-	-
					229.5								VSt		- - - -
MEAS DATE STATES OF THE STATES	тно		er	4.00m	229.0				4.00m	SAMPLES & FIELD TESTS B Bulk Disturbed Sample		SIFICAT OIL DE		YMBOLS & TION	CONSISTENCY/ RELATIVE DENSITY
AS AD AD HF SD SD NDI HAI	AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit HF Hollow flight auger WB Wash-bore drilling WATE RR Rock roller WATE						₹	dd/mm/	n Date shown water level flow	B Bulk Disturbed Sample U Undisturbed Sample U Undisturbed Sample ES Environmental Sample W Water Sample W Water Sample W Barer Sample W Barer Sample W Barer Sample SPT Standard Penetration Test N Result of SPT ("=sample t R Hammer Bouncing / Refus U50 Undisturbed Sample (50m) V3 Vane Shear, peak/remoud PT Push Tube MC Moisture Content	kken) D al M n dia) W ed(kPa) PL	Based (lassifica	on Unif ation Sy	fied	VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
detai	ls of	lanator f abbre of desci	viation	IS						SMEC AUSTRA	LIA				SMEC

CLIEI				ource Bl			N		-CORE DRI ROJECT: Wyalong	LL HOLE - E g Solar Farm	NGINE	ERIN	G L	.00	P	IOLE NO : BH20 ROJECT NUMBER : 30041768 HEET : 2 OF 2	\$
				ng West 9857.0, N		58832	2.0 (N	1GA94	Zone 55) SUI	RFACE ELEVATION	: 233.00 (A	HD)		INCI		INAL DEPTH : 5.95 m ° / ORIENTATION° : 90° /	N/A
RIG 1 DATE					18 D/				; 4WD D · 25/07/2018 D	CONTRACTOR ATE LOGGED : 25/0		ILLING DGGED B	γ·	AS	HOLE D	IA : 100 mm CHECKED BY : SC	
					10 0/				. 20,011,2010 .				/				
PROGF	RESS	1	RILLI E		z	ê	~	NO		MATERIAL DESCRIPTIC	MATER			≿			
DRILLING & CASING	PRILLING	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2220.0VATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	sec ROCK NAM	plasticity or particle chara condary and minor compo IE : grain size, colour, text s, inclusion and minor cor	cteristic, colour nents ure and fabric,	,	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations	
			Not Encountered GRO	5.50m 5.50m 5.50m 5.50m 5.50m 5.95m 5.95m	225.5 226.0 226.5 227.0 227.5 228.0 228.5			CH CH	feature	is, inclusion and minor cor city, pale grey, mottled yello d, trace medium grain, sub- d	nponents w and red, trace		W	H CON	ALLUVIUM	e sand recovered to 5.95m	
MET	нор				225.0	- - 8.0 PE	ENETR		s	AMPLES & FIELD TEST	s				MBOLS &	CONSISTENCY/	
HA AS ADV HF WB RR SD NDD PT HAN	AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit HF Hollow flight auger WB Wash-bore drilling RR Rock roller SD Sonic drilling NDD Non destructive drilling						×uu ATER	dd/mm/	No Resistance	Bulk Disturbed Sample Disturbed Sample Undisturbed Sample Undisturbed Sample Environmental Sample Water Sample Hand Penetrometer (kPa Result of SPT (*=sample Result of SPT (*=sample) st taken) isal nm dia)	B: Clas MOISTU D Dr M Ma W W PL Pli	ased o ssifica RE y pist		ed	RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Den D - Dense VD - Very Dense	nse
See E details & bas	s of a	abbrev	/iation	IS					SN	AEC AUSTR	ALIA					(C)	IEC

CLIENT	· : I	_ightso	ource BF	5		Ν		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	GΙ	.00	PRO	DLE NO : BH21 DJECT NUMBER : 30041768 EET : 1 OF 2
LOCAT	ION : \	Wyalo	ng West		58646.	.0 (M		Zone 55) SURFACE ELEVATION : 232.00 (AHD)		INC	FIN	AL DEPTH : 5.95 m ORIENTATION° : 90° / N/A
RIG TY								G : 4WD CONTRACTOR : APEX DRILLING				: 100 mm
DATE S	STARTE	ED : 2	6/07/20 ⁻	18 D <i>i</i>	ATE C	OMP	LETE	ED : 26/07/2018 DATE LOGGED : 26/07/2018 LOGGED E	3Y : .	AS		CHECKED BY : SC
	C	RILLI					1-	MATERIAL			1	
PROGRES & CASING & CASING BRILLING	- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	282.8VATION	6 DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
					-		СН	Silty CLAY: high plasticity, grey-brown, with rootlets			TOPSOIL	natural topsoil to 0.2 m
					+			0.20m CLAY: high plasticity, grey-brown, trace fine grain sand	D		ALLUVIUM	
				5							0.30: trace root	tlets to 0.5 m
			0.50m SPT	231.5	0.5 —							_
			6,7,6 N=13 CBR-1		-							-
			0.5m-1m		-				D to M	St		-
			0.95m	0.1								-
			1.00m SPT	231.0	1.0 —					-		-
			5,6,5 N=11		-							-
												-
			1.45m	230.5	-							-
			1.50m SPT 3,7,10	2	1.5 —			1.50m: becoming mottled red-brown and yellow				-
	- No Fluid		N=17									-
		ared			_							-
> ind		Not Encountered	1.95m	230.0								-
- ADV		Not E		<u> </u>	2.0-		СН					
					_							-
				5	-							-
			2.50m	29.	2.5				м			-
			SPT 5,9,11 N=20		_							-
					-					VSt		-
				0								-
n:an:-			2.95m	53	3.0 -							-
JI: SMEC					-							-
1 011 0:000												-
Semo				8.5	_							-
				228.	3.5 —							-
					-							-
]							-
				228.0	-							-
METHO			4.00m	101				I SAMPLES & FIELD TESTS	FICAT		YMBOLS &	CONSISTENCY/ RELATIVE DENSITY
HA H AS A ADV A	Hand aug Auger scr Auger dril	ewing ling with	V bit			ш.	5	-No Resistance D Disturbed Sample E U Undisturbed Sample Cla	Based of assifica	on Unif	ied	VS - Very Soft S - Soft
ADT A HF H WB V	Auger dril Hollow flig Nash-bor	ling with ht auge e drilling	TC bit r			<u> </u>	_	Very Hard / W Water Sample Refusal HP Hand Penetrometer (kPa) MOISTL		-)		F - Firm St - Stiff VSt - Very Stiff
RR F SD SD S	Rock rolle Sonic drill Non destr	r ing			1 .	TER ₩	ld/mm/ _evel o	/vv D D D D	ry loist			H - Hard Fb - Friable VL - Very Loose
PT C HAND H	Continuou Hand met	is push	tub			<u>₹</u>	Drilling vater ir	water level U75 Undisturbed Sample (75mm dia) W W nflow VS Vane Shear, peak/remouded(kPa) PL P	/et lastic li			L - Loose MD - Medium Dense
METHOR SUDDAY AND A ADV ADV	water outflow MC Moisture Content LL Liquid limit D - Dense WC Moisture Content LL Liquid limit VD - Very Dense											
details o & basis	of abbre	viation	s					SMEC AUSTRALIA				SMEC

CLIEN				ource BF			N		-CORE DRILL HOLE - ENGINEER ROJECT: Wyalong Solar Farm	RINC	GL	.00	PF	OLE NO : BH21 ROJECT NUMBER : 30041768 IEET : 2 OF 2
			-	ng West 854.0, N		58646	6.0 (M	IGA94	Zone 55) SURFACE ELEVATION : 232.00 (AHD))		INCL	FI	NAL DEPTH : 5.95 m / ORIENTATION° : 90° / N/A
RIG T									: 4WD CONTRACTOR : APEX DRILLI		, ,		HOLE DI	A : 100 mm
DATE	STA	ARTE	D: 2	6/07/20	18 D <i>i</i>	AIEC	COMF	LEIE	D : 26/07/2018 DATE LOGGED : 26/07/2018 LOGG	GED BY	Y : A	45		CHECKED BY : SC
		D	RILLI		1			7	MATERIAL					
PROGRE S CASING & CASING BRILLING		VE F PENETRATION VH	GROUND WATER LEVELS		2228.00VATION	(m) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components		MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
				SPT 9,11,16 N=27 4.45m	27.5				CLAY: high plasticity, mottled red-brown, trace fine grain sand, tra fine grain, sub-rounded gravel	ace			ALLUVIUM	- - - -
ADV	No Fluid		Not Encountered		227.0	- - 5.0 - -		СН			М	VSt		- - - - - - - - - - - - -
	•			5.50m SPT 10,12,15 N=27 5.95m	226.0 226.5	- 5.5 - - -			5.50m: becoming pale grey mottled red and yellow					
					22	6.0 — - -			Hole Terminated at 5.95 m Target Depth					-
					225.5	- 6.5 — - -								-
					225.0	- - 7.0 — -								-
					224.5	- - 7.5 — -								-
					224.0	- - 8 .0					ICATI	01 6	(MBOLS &	- - - CONSISTENCY/
HA AS ADV ADT HF WB RR SD NDD PT	AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit HF Hollow flight auger WB Wash-bore drilling RR Rock roller SD Sonic drilling NDD Non destructive drilling PT Continuous push tub HAND Hand methods						×uu ATER ×	dd/mm/ Level or Drilling water in	SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample Very Hard / W Water Sample Partial Sample Very Hard / W Water Sample Very Hard / N Resture SPT Standard Penetrometer (kPa) N Result of SPT ("=sample taken) ID Date shown U50 Undisturbed Sample (50mm dia) Water level U75 Undisturbed Sample (275mm dia) Refue U75 Undisturbed Sample (275mm dia) Pare bhear, peak/remouded(kPa)	SOIL Ba Class MOISTUF D Dry M Moi W We PL Plas	L DES ised o sificat RE / ist et ist	SCRIP n Unifi ion Sy	TION ied	Consistence of a consistence of
See Ex details & basis														

CLIENT :	Lightsource B			ORE DRILL HOLE - DJECT: Wyalong Solar Farm	ENGINEERIN	IG L	-00	D PR	DLE NO : BH22 OJECT NUMBER : 30041768 EET : 1 OF 2
LOCATION :	Wyalong Wes	t			 Ι · 231.00 (ΔΗΠ)		INC	FIN	IAL DEPTH : 5.95 m / ORIENTATION° : 90° / N/A
RIG TYPE : H	HYNDAGH	моі	JNTING :	4WD CONTRACTOR	R : APEX DRILLING				A : 100 mm
DATE STARTE	ED: 24/07/20	18 DATE COM	PLETED :	: 24/07/2018 DATE LOGGED : 24	/07/2018 LOGGED I	BY :	AS		CHECKED BY : SC
	RILLING				MATERIAL	1	1	1	
PROGRESS & CASING PRILLING PRILLING PRILLING PRILLING PRILLING	GROUND WATER GROUND WATER LEVELS SAMPLES & FIELD TESTS	2BLEVATION C DEPTH (m) GRAPHIC	LUG CLASSIFICATION SYMBOL	MATERIAL DESCRIPT SOIL NAME : plasticity or particle che secondary and minor com ROCK NAME : grain size, colour, te features, inclusion and minor c	racteristic, colour, oonents xture and fabric,	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
			СН	Sandy CLAY high plasticity, grey-brown, fi rootlets	ne grain sand, with	D		TOPSOIL	d natural topsoil to 0.2 m
			0.201	CLAY: high plasticity, dark brown to brown	mottled grey, trace	-		ALLUVIUM	
	0.50m SPT 1 57,6 N=13 0.95m 1.00m SPT 2 5,6,8 N=14	- - - - - - - - - - - - - - - - - - -		medium grain, sub-angular gravel				0.30: trace ro	otlets to 0.5 m
ADV 	1.45m 1.50m SPT 3 3.4.6 N=10 1.95m 1.95m	- - - - - - - - - - - - - - - - - - -	СН			м	St		-
	2.50m SPT 4 5,6,11 N=17 2.95m	- - - - - - - - - - - - - - - - - - -		2.50m: becoming pale brown, mottled red-	ırown				-
METHOD HA Hand aug AS Auger sori ADT Auger dril ADT Auger dril ADT Auger dril MB Wash-bor RR Rock rolle SD Sonic dril NDD Non desti PT Continuon HAND Hand met See Explanator details of abbre		227.0 227.5 5					VSt		· · · · · · · · · · · · · · · · · · ·
METHOD HA Hand aug AS Auger scr ADV Auger dri ADT Auger dri HF Hollow flig WB Wash-bor RR Rock rolle SD Sonic drill NDD Non destr PT Continuou HAND Hand met	ewing ling with V bit ling with TC bit ght auger er drilling ar urctive drilling us push tub thods y Notes for	4.0	No I	SAMPLES & FIELD TES B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample Y Hard / W Usal HP Hand Penetrometral (Sample Vater Sample Usal SPT Standard Penetrometer (k N Result of SPT (*=sam Reflexition (Sample Content) VS Vater Sample Usal VS Vane Shear, peak/ren V VS Vane Shear, peak/ren W MC Moisture Content	Pa) MOIST Fest Pelsal M C L poundal W V soundal W V ouded(kPa) PL F	DIL DE Based o assifica	SCRIP on Unif tion Sy	ied	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
details of abbre & basis of desc				SMEC AUSTR	:ALIA				SMEC

CLII					ource Bl			N		-CORE DR			ERIN	G L	.00	PF	OLE NO : ROJECT NUM HEET : 2 OF	BER : 300417	768
					ng West		5864	10/1			IRFACE ELEVATION	ON · 231.00 (/			INC	FI	NAL DEPTH		^γ / N/Δ
		PE :				N. UZ				300 30 30 3 : 4WD		OR : APEX DR			INCI		A : 100 mr		/ 11/A
DAT	ΓE S	TAR	TEC): 2	4/07/20	18 D	ATE (COM	PLETE	D : 24/07/2018 D	DATE LOGGED :	24/07/2018 L	OGGED B	Y : /	٩S		CHECKE	DBY : SC	
			DR	ILLI	NG							MATE	RIAL						
PROC ഗല	_	£		GROUND WATER LEVELS	SAMPLES & FIELD TESTS	ATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME	MATERIAL DESCRI : plasticity or particle of condary and minor co	haracteristic, colou	ur,	TURE	STENCY VTIVE SITY		STRUCT	URE	
DRILLING & CASING	DRILLING		H			2 ELEVATION	4.0 —	GRA	CLASSIF	ROCK NAM	ME : grain size, colour, es, inclusion and mino	texture and fabric,	,	MOIS	CONSISTENCY RELATIVE DENSITY		& Other Obs	ervations	
					SPT 5 13,15,21 N=36		4.0 -				ottled red-brown, trace t rse grain, sub-angular fe		ı sand,			ALLUVIUM 4.05: Decrea	sed moisture c	ontent	
							-												
					4.45m	226.5	- 4.5 -												-
							-												
				Encountered			-												
- ADV	- No Fluid -			Not Encol		226.0	- 5.0 —		СН					м	н				-
							-												
						5	-												
					5.50m SPT 6 18,22,25	225.	5.5 —												-
					N=47		-												
					5.05	0.0	-												•
					5.95m	225.0	6.0 —			5.95m Hole Terminated Target Depth	l at 5.95 m								-
							-												
						4.5	-												
						224.	6.5												-
							-												
						224.0	-												
						2	7.0 —												-
							-												•
						223.5	_												
						Γ	7.5 —												-
							-												
						223.0	-												
AC AC AC AC	5 A 0V A 0T A 5 F	land a luger s luger c	crew Irillin Irillin flight	/ing g with g with : auge	TC bit r					No Resistance	SAMPLES & FIELD T B Bulk Disturbed Sam D Disturbed Sample U Undisturbed Sample ES Environmental Sam W Water Sample HP Hand Penetrometer	nple e iple c (kPa)	SO Bi	IL DES ased o ssificat	ION SY SCRIP on Unif	ied	CONSISTE RELATIVE VS S F St VSt		
RF SD ND PT	R F) S)D N	Rock ro Sonic d Ion de Continu Iand m	ller rilling struc ious	tive d	rilling		w	¥	dd/mm/ Level o	yy n Date shown water level iflow	SPT Standard Penetratic N Result of SPT (*=se Hammer Bouncing U50 Undisturbed Sampl U75 Undisturbed Sampl V5 Vane Shear, peak/r PT Push Tube MC Moisture Content	on Test ample taken) / Refusal e (50mm dia) e (75mm dia)	D Dr M Mo W W PL Pla	y oist			Fb Fb D VD	- Very Sun - Hard - Friable - Very Loo - Loose - Medium I - Dense - Very Den	se Dense
See deta & ba	ils o	lanate f abbi of des	evia	ation	s					SI	MEC AUST	RALIA						s (MEC

CLIENT : I	Lightsource Bl	D			DRILL HOLE - ENGINE	ERINO	g Lo	OG	
LOCATION :	Wyalong Wes	t			_				SHEET : 1 OF 2 FINAL DEPTH : 5.95 m
POSITION : I RIG TYPE : H		N: 625864	45.0 (MGA9 MOUNTIN	,	SURFACE ELEVATION : 233.00 (A CONTRACTOR : APEX DR		I	INCL	INATION° / ORIENTATION° : 90° / N/A HOLE DIA : 100 mm
DATE STARTE	ED: 25/07/20	18 DATE	COMPLET	ED : 25/07/201	8 DATE LOGGED : 25/07/2018 L	OGGED BY	Y : A	S	CHECKED BY : SC
C	RILLING				MATE	RIAL			
DRILLING & CASING & CASING RILLING FLUID FLUID FLUID FLUID FLUID	GROUND WATER GROUND WATER LEVELS SAMPLES & FIELD TESTS	288.6VATION	GRAPHIC LOG CLASSIFICATION	SOIL N	MATERIAL DESCRIPTION AME : plasticity or particle characteristic, colou secondary and minor components < NAME : grain size, colour, texture and fabric, eatures, inclusion and minor components	Jr,	MOISTURE CONDITION	CONSISTENCT RELATIVE DENSITY	STRUCTURE & Other Observations
	50 ···L	0.0-	СН		AY high plasticity, grey-brown, fine gained sand, v		D		TOPSOIL
		2.5			plasticity, dark grey, trace medium to coarse gra	in sand		St	ALLUVIUM 0.15: recovery of quartz sand to 0.5m 0.30: trace rootlets to 1.5 m
	0.50m SPT 1 3,6,9 N=15	0.5-	-	0.50m: bec	oming grey-brown			VSt	
	0.95m 1.00m SPT 2 5.6,6 N=12	0. 533 1.0-					_		- -
	<u>1.45m</u> 1.50m	231.5							-
	SPT 3 4,5,6 N=11	1.5-						St	
ADV	1.95m 2.00m DS Z	-0.2 231.0					М		-
	2.50m SPT 4	- 2.5 2.5							-
	6,9,11 N=20		-	2.50m: bec	oming mottled red-brown				-
	2.95m	0.0 3.0 -							-
(.04) LID: SEIMC 1.00.0		- 5.5 - - 5.5 -						VSt	-
FARM UZUBAU18 - Shmr		0.0							- - -
ADT Auger dril HF Hollow flig WB Wash-bor RR Rock rolle SD Sonic drill NDD Non destr	ewing lling with V bit lling with TC bit ght auger re drilling ar uctive drilling uctive drilling us push tub		Drilling	— No Resistance _ Very Hard / Refusal n/yy on Date shown g water level	SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample W Water Sample HP Hand Penetrometer (kPa) SPT Standard Penetration Test N Result of SPT ("=sample taken) R Hammer Bouncing / Refusal U50 Undisturbed Sample (75mm dia) V5 Vane Shear, peak/remouded(kPa) PT Push Tube MC Moisture Content	Ba Class MOISTUR D Dry M Moi W We PL Plas	L DESC ised on sificatio RE / ist	CRIPT I Unifie on Sys	HON RELATIVE DENSITY Hed VS - Very Soft
details of abbre	viations				SMEC AUSTRALIA				

CL					source Bl			N			PRILL HOLE	- ENGINE	EERIN	G L	.00	PI PI	OLE NO : ROJECT NUM HEET : 2 OF	BER : 30041768
					ong West		5864	5 0 (N	1GA94	Zone 55)	SURFACE ELEVA	TION · 233.00 (INC		NAL DEPTH :	<u>5.95 m</u> TION°: 90° / N/A
-			E : ⊢			1. 02				G : 4WD		TOR : APEX D	. ,				IA : 100 mr	
DA	ΤE	ST	ARTE	D : 1	25/07/20	18 D.	ATE (COMF	PLETE	D : 25/07/201	8 DATE LOGGED	: 25/07/2018 L	OGGED B	SY : 7	٩S		CHECKE	DBY:SC
			C	RILL	ING							MATE	ERIAL					
	_	ESS	TION	ATER	S & STS	NO	(m)	S	ATION L					RE ON	∠ ENCY			
DRILLING	SVICASING	FLUID	VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2229.00VATION	6 DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL		AME : plasticity or particl secondary and minor (NAME : grain size, colo eatures, inclusion and mi	components ur, texture and fabric nor components	с,	MOISTU	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obs	URE ervations
					SPT 5 11,16,20 N=36		4.0 -			CLAY: high fine to med	n plasticity, pale grey, mottl lium grain sand	ed brown and red-bro	wn, trace			ALLUVIUM 4.05: bands	of sandy silt to	5.95m
- ADV		No Fluid –		Not Encountered	N=36 4.45m 5.50m SPT 6 12,18,24 N=42	28.0			СН		iuli yraii sanu			м	Н			
		v			5.95m	227.0	-			5.95m								
						123	6.0 —			Hole Termin Target Dep	nated at 5.95 m th							
							-											
							-											
			1111			.5	_											
						226.	6.5 —											
							-											
			1111				_											
							-											
						226.0	-											
			1111				7.0											
							_											
							-											
						225.5	-											
						12	7.5 —											
1							-											
							-											
						0.0	-											
						225.0	8.0						CLASS	FICAT	ION S	YMBOLS &	CONSISTE	NCY/
H A A A H W R S N P	IA SDV DT IF B R DD T	Aug Aug Hol Wa Roo Sor Nor Cor	nd aug ger scr ger dril	ewing ling wit ling wit lht aug e drillir r ing uctive ls push	ng drilling		00000000	×uu ATER	dd/mm Level c	- No Resistance Very Hard / Refusal [/] yy n Date shown water level nflow	SAMPLES & FIELL B Bulk Disturbed S D Disturbed Samp U Undisturbed Sar ES Environmental S W Water Sample HP Hand Penetrom SPT Standard Penetr N Result of SPT (* R Hammer Bounci U50 Undisturbed Sar U75 Undisturbed Sar VS Vane Shear; pee PT Push Tube MC Moisture Conter	ample e nple attor (kPa) ation Test sample taken) g / Refusai nple (50mm dia) nple (75mm dia) kk/remouded(kPa)	MOISTL D D M M W W PL PI	IL DE ased o ssifica JRE	SCRIP on Unif tion Sy	TION ied	RELATIVE VS S F St VSt H Fb VL L MD D VD	
See det	ails	s of a	nator abbre desci	viatior	าร						SMEC AUS		<u> </u>					

	: Lightsource			N		-CORE C			NGINE	ERIN	G L	.00	D PI	IOLE NO : ROJECT NUN HEET : 1 OF	IBER : 30041768
	: Wyalong W : E: 529614.		59383.0) (MC	GA94	Zone 55)	SURFACE E		: 232.00 (/	AHD)		INC		INAL DEPTH	<u>: 5.75 m</u> ATION° : 90° / N/A
RIG TYPE :	HYNDAGH		M	OUN	TING	: 4WD	CON	ITRACTOR	: APEX DR	RILLING				IA : 100 m	
DATE STAR	RTED: 24/07	2018 DA	ATE CO	OMPL	ETE	D : 24/07/201	8 DATE LOG	GED : 24/0	07/2018 L	OGGED E	SY : /	AS		CHECK	ED BY : SC
	DRILLING								MATE	RIAL					-
PROGRESS & CASING PRILLING FLUID FLUID FLUID	F PENETRATION VH GROUND WATER LEVELS SAMPLES &	ZBLEVATION	_	LOG	CLASSIFICATION SYMBOL	ROCK	AME : plasticity of	d minor compo ize, colour, text	cteristic, colou nents ure and fabric,		MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUC & Other Ob	
	0.10m		0.0			Sandy CLA	AY high plasticity,	brown, fine grair	sand, with roc	otlets	D		TOPSOIL		
ADV No Fluid	0.10m 0.50m 1.00m 1.00m 1.00m 1.00m 1.00m 1.150m 1.150m <td>29.5 230.0 230.5 231.0</td> <td></td> <td></td> <td>СН</td> <td>2.50m: bec</td> <td>oming red, mottle b-angular gravel</td> <td>mottled dark gre</td> <td>y and pale gre</td> <td>у</td> <td>M</td> <td>F</td> <td>ALLUVIUM 0.30: trace r</td> <td>ootlets to 1.5 m</td> <td></td>	29.5 230.0 230.5 231.0			СН	2.50m: bec	oming red, mottle b-angular gravel	mottled dark gre	y and pale gre	у	M	F	ALLUVIUM 0.30: trace r	ootlets to 1.5 m	
ADV Auger ADT Auger	2.95m 2.95m 2.95m 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 4.00m	228.0 228.5				4.00m No Resistance Very Hard / Refusal	B Bulk Dis D Disturb U Undistu ES Environ W Water S	& FIELD TEST sturbed Sample ed Sample rbed Sample mental Sample sample enetrometer (kPa		SO B	ased c ssificat	ION SY SCRIP	ied	CONSIST RELATIV VS S F St VSt	E DENSITY - Very Soft - Soft - Firm - Stiff
RR Rock r SD Sonic NDD Non do PT Contin HAND Hand r	oller drilling estructive drilling uous push tub methods			Ľ do Le Ľ D W	d/mm/y evel on	/Y n Date shown water level flow	SPT Standal N Result of R Hamme U50 Undistu U75 Undistu VS Vane S PT Push T	rd Penetration Te of SPT (*=sample er Bouncing / Refu Irbed Sample (50 Irbed Sample (75 hear; peak/remou	st taken) Isal nm dia) nm dia)	D D M M W W PL PI	ry oist			H Fb VL MD D VD	- Very Stiff - Hard - Friable - Very Loose - Loose - Medium Dense - Dense - Very Dense
details of abb & basis of de							SMEC A	AUSTR							SMEC

CLIEN				ource BF			Ν	10				L HO Solar Far		ENGIN	IEERIN	IG L	.00	P	OLE NO ROJECT N HEET : 2	IUMBER	H24 : 3004176	8
				ng West 614.0, N		259383	3.0 (1	MGA	.94 Zone 5	55)	SURF	ACE EL	EVATION	: 232.00	(AHD)		INC	FI LINATION	NAL DEPT			/ N/A
RIG TY					400				NG:4WI		0 0 47			: APEX [40	HOLE D			V - 60	
DATES	51A		.U. 2	24/07/20		AIE		PLE	TED : 24	/07/2010	0 DAI	TE LOGG	ED . 24/	0772018	LOGGED	DT.	A5		CHEC	KED D	Y : SC	
PROOPE			RILL		1_			z							TERIAL		>					
PROGRE 9NISPD & 9NISPD & 9NIFLING	FLUID 6	F PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2228.00VATION	DEPTH (m)	GRAPHIC 1 OG	CLASSIFICATIO	SYMBOL	ROCK	AME : pl secor	lasticity or p ndary and r : grain size	ninor compo	acteristic, co onents (ture and fab		MOISTURE	CONSISTENCY RELATIVE DENSITY		STRI & Other (UCTURE Observat	ions	
			Not Encountered	SPT 5 8,12,16 N=28 4.45m	227.0 227.5 :	4.0			c	LAY: high rain sand,	plasticity trace me	y, pale grey	, mottled red	, with fine to d	coarse avel	D to M	VSt	ALLUVIUM 4.05: residua to 5.75m	al granite re	covered a	as trace grav	
				5.50m SPT 6 13,10/100m HB N=R 5.75m	226.5	- 5.5 — -			CH 5.75m	oarse grain	n, sub-ar	ngular grave	n, mottled gre	ey, trace med	lium to		н	RESIDUAL	SOIL			-
					226.0	- 6.0 -				ole Termir laterial refi			hite rock / bo	ulder (HW-M\	W)							
					225.5	- 6.5 — - -																-
					225.0	- 7.0																-
					224.5	- 7.5																_
					224.0	-																
AS ADV ADT HF WB RR SD NDD PT HAND	Hand Auge Auge Hollc Wasl Rock Sonic Non Cont Hand	er drill ow flig h-bore c roller c drilli destru destru d meth	ewing ing with ing with ht augo drillin ng uctive o s push nods	n TC bit g frilling tub	22			L I dd/n Leve Drill wate	ON No Resist Very Har Refusal nm/yy el on Date sh ing water lev er inflow er outflow	rd / nown	SAI B D U ES W HP SPT N R U50 U75 VS PT MC	Bulk Distu Disturbed Environme Water Sar Hand Pen Standard I Result of S Hammer E Undisturbe Vane She: Push Tube	ed Sample ental Sample nple etrometer (kP Penetration T SPT (*=sampl 3ouncing / Re ed Sample (50 ed Sample (75 ar; peak/remo	ra) est e taken) fusal Omm dia) 5mm dia)	MOIST D E M W V PL F	DIL DE Based o assifica	SCRIP on Unif tion Sy	ied				ense
See Ex details of & basis	of at	obrev	viatior	IS							SM	EC A	USTR	ALIA							I si	MEC

	ntsource BP			-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	NG L	-00	HOLE NO : BH25 PROJECT NUMBER : 30041768 SHEET : 1 OF 2
LOCATION : Wya POSITION : E: 5		6259021.0	(MGA94	Zone 55) SURFACE ELEVATION : 232.00 (AHD)		INC	FINAL DEPTH : 5.95 m LINATION° / ORIENTATION° : 90° / N/A
RIG TYPE : HYN				G : 4WD CONTRACTOR : APEX DRILLING D : 27/07/2018 DATE LOGGED : 27/07/2018 LOGGED	BV ·	۵S	HOLE DIA : 100 mm CHECKED BY : SC
					DT		
	LING ∞≌	z c u	NOI	MATERIAL MATERIAL DESCRIPTION	ш z	≿	
BRILLING CASING CASING PELUID FLUID	LEVELS SAMPLES & FIELD TESTS	C DEPTH (m)	LOG	SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	
			СН	Silty CLAY high plasticity, brown, with rootlets	D		TOPSOIL 0.10: disturbed natural topsoil to 0.2 m
				0.20m Silty CLAY, high plasticity, brown, trace fine grain sand	м		
	0.50-	0.122					0.30: trace rootlets to 0.5 m
	0.50m 0 SPT 3,3,6 N=9	0.5				St	_
		-					-
	0.05						-
	0.95m 1.00m SPT 4,8,11	0 1.0 -		1.00m: trace fine to medium grained sand			
	N=19	_					-
		_					-
	1.45m 1.50m SPT	c.o.c			м		-
	4,6,9 N=15	_		1.50m: becoming mottled pale brown			-
	5	-					-
- ADV	1.95m						-
		2.0-	СН				_
		-					-
	L	۰. ۱					-
	2.50m C SPT 5,9,12	2.5-			-	VSt	_
	N=21	-					-
		_					-
1.06.0	2.95m	0					-
Pri: SMEC		_					-
0.1.06.5 lb					м		-
		0					-
NR.GPJ		- 3.5					-
982018 - S		-					-
FARM 021		0.927					-
	4.00m c	PEN		SAMPLES & FIELD IESIS			YMBOLS & CONSISTENCY/ TION RELATIVE DENSITY
AS Auger drilling	with V bit		<u>u</u>	No Resistance	Based of Bas	on Unif	ied VS - Very Soft
ADT Auger drilling HF Hollow flight a WB Wash-bore dri RR Rock roller	uger	WAT	ER	Very Hard / W Water Sample Refusal SPT Standard Penetration Test MOIS			F - Film St - Stiff VSt - Very Stiff H - Hard
SD Sonic drilling NDD Non destructiv PT Continuous pu	ush tub		dd/mm/	yy N Result of SPT (*=sample taken) D R Hammer Bouncing / Refusal M U50 Undisturbed Sample (50mm dia)	Dry Moist Wet		Fb - Friable VL - Very Loose L - Loose
0001 3001 1 1	5		water ir water o	nflow VS Vane Shear; peak/remouded(kPa) PL	Plastic li Liquid lii		MD - Medium Dense D - Dense VD - Very Dense
See Explanatory No details of abbreviati	ions			SMEC AUSTRALIA			

CLIE				ource BF			Ν		-CORE D			NGINE	ERIN	G L	.00	PI PI	OLE NO : ROJECT NUM HEET : 2 OF	BER : 30041768
			<i>,</i>	ong West)380.0, N		59021	.0 (N	IGA94	Zone 55)	SURFACE E	LEVATION	: 232.00 (A	AHD)		INCI		NAL DEPTH : / ORIENTA	<u>: 5.95 m</u> TION° : 90° / N/A
-		E : H			40 D/				3 : 4WD					V	4.0	HOLE D	IA : 100 mr	
DAT	E 51	ARTE	:D : 4	27/07/20	18 DA	ATE C	OIVIF	LEIE	D : 27/07/201	8 DATE LOC	GED : 27/0	J//2018 LC	DGGED B	Y : /	45		CHECKE	DBY:SC
		1	RILL		1			z				MATER						
& CASING		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2228.00VATION		GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	AME : plasticity of	d minor compo ize, colour, text	icteristic, colou nents ure and fabric,	r,	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCI & Other Obs	
DF ADV	Dr Portugation - No Fluida		Not Encountered GI	Ø ⊑ SPT 13,16,20 N=36 4.45m 4.45m 5.50m SPT 10,18,23 N=41 5.95m 5.95m	5 1226.0 226.5 1227.0 1227.5			СН	CLAY: high 5.05m: bec	oming mottled rec	ey, trace fine to			M	н	ALLUVIUM 4.05: decrea	sed moisture of	
SEMIC LUCO IID FIJ SMEC LUCO					225.0	6.5 — - - - 7.0 — - - - - - -												
JAK FAKM UZUBZUT8 - SK_NK.GFU LID					224.0 [224.5	7.5												
	Au V Au T Au Ho B Wa Ro So D No Co ND Ha	nd aug ger scre ger drill	ewing ing witi ing witi ht aug e drillin r ng uctive o s push nods	n TC bit g drilling tub				dd/mm/	No Resistance Very Hard / Refusal Yy n Date shown water level flow	B Bulk Di D Disturb U Undistu ES Enviror W Water 3 HP Hand F SPT Standa N Result R Hamm U50 Undistu U75 Undistu VS Vane S PT Push T	enetrometer (kPa rd Penetration Te of SPT (*=sample er Bouncing / Refur irbed Sample (50 irbed Sample (75 hear; peak/remou	i) st taken) usal mm dia) mm dia)	SO B: Class MOISTU D Dr M Ma W W PL Plis	IL DES ased c ssificat RE Y pist	SCRIP on Unifi tion Sy	ed	CONSISTE RELATIVE VS S F St VSt H Fb VL L MD D VD	
detai	ils of a	abbrev descr	/iatior	IS						SMEC /	AUSTR	ALIA						SME

CLIEI	٨T	: 1	iahts	ource Bl	Þ		Ν		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	IG L	00	G HOLE NO : BH26 PROJECT NUMBER : 30041768 SHEET : 1 OF 2	8
LOCA	TIO)N : \	Nyalo	ng West	t	58081	0 (M		Zone 55) SURFACE ELEVATION : 233.00 (AHD)			FINAL DEPTH : 5.95 m ELINATION° / ORIENTATION° : 90° /	N/A
RIG T					N. UZ				3011 ACE ELEVATION - 233.00 (AID)		INC	HOLE DIA : 100 mm	
DATE	ST	ARTE	D: 2	26/07/20	18 D.	ATE C	OMP	LETE	D : 26/07/2018 DATE LOGGED : 26/07/2018 LOGGED	BY : .	AS	CHECKED BY : SC	
		D	RILLI	NG					MATERIAL				
PROGF S CASING &		PENETRATIC	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	288.6VATION	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations	
		VE F	0	υщ	5	0.0			Sandy SILT low plasticity, pale brown, fine grain sand, with rootlets	D	0	TOPSOIL	
				0.50m	232.5	0.5			0.20m Sandy SILT low plasticity, brown, mottled black, fine to medium grain sand	м	St - VSt	0.10: disturbed natural topsoil to 0.2 m ALLUVIUM 0.30: trace rootlets to 0.5 m	
				SPT 1 6,12,9 N=21 CBR-1 0.5m-0.6m 0.95m	232.0	0.5		ML		D to M			
				1.00m SPT 2 11,12,12 N=24		1.0 -			1.00m Sandy CLAY high plasticity, grey-brown, fine to medium grain sand				-
			pe	1.45m 1.50m SPT 3 11,13,13 N=26	231.5	1.5			1.50m: becoming mottled pale grey, trace fine to medium grained sand				-
ADV	No Fluid		Not Encountered	1.95m	231.0	- 2.0 — - -		СН			VSt		-
				2.50m SPT 4 8,8,10 N=18	230.5	- - 2.5			2.70m	D			
				2.95m	230.0	- - 3.0			CLAY: high plasticity, grey-brown mottled red				
					229.5	- - 3.5		СН					
				4.00m	229.0	-			4.00m				
MET HA AS ADV ADT HF WB RR SD NDD PT HAN	Har Aug Aug Hol Wa Roo Sor Nor Cor	nd auge ger scre ger drill	ewing ing with ht auge e drilling ng uctive d s push	n V bit n TC bit er g Irilling	1.2			Id/mm/	SAMPLES & FIELD TESTS B CLASS Bulk Disturbed Sample D CLASS S No Resistance Undisturbed Sample D S Very Hard / Refusal Water Sample HP Class Hand Penetronnetral Sample S Class Class Class Class Class S Very Hard / Refusal Water Sample HP Moist Fisher Result of SPT ("sample taken) N MOIST Result of SPT ("sample taken) N yy R Hammer Bouncing (Refusal Moist SPT Class N M yz R Hammer Bouncing (Refusal Moist SPT Class N M yz R Hammer Bouncing (Refusal Moist SPT Class N M yz P Hammer Bouncing (Refusal Moist N M yz P P P	DIL DE Based o assifica	SCRIP on Unif tion Sy	fied VS - Very Soft	ense
See E details & bas	s of a	abbre	/iation	s					SMEC AUSTRALIA			SN	

	ENT			source BF			N			RILL HOLE	E - ENGINE	EERIN	G L	.00	PF	OLE NO : ROJECT NUME HEET : 2 OF	BER : 30041768
				ong West 0111.0, N		58981	1.0 (N	IGA94	Zone 55)	SURFACE ELEVA	TION : 233.00	(AHD)		INCI	FI	NAL DEPTH :	
		PE: H			(0 D				G: 4WD		CTOR : APEX D				HOLE DI	A : 100 mm	
DA	IES	IARII	=D : 2	26/07/20	18 D.	AIEC	COMF	LEIE	D : 26/07/2018	8 DATE LOGGED	: 26/07/2018 L	LOGGED E	3Y : /	AS		CHECKE	DBY:SC
			RILL		1			7			MATE	ERIAL					
DRILLING &		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2229.00VATION	(m) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NA ROCK fe	MATERIAL DES(AME : plasticity or partic secondary and mino NAME : grain size, col patures, inclusion and m	ele characteristic, colo components our, texture and fabric		MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obse	
				SPT 5 13,16,16 N=32		4.0				plasticity, mottled red-bro	own, trace fine grain sa	and			ALLUVIUM 4.05: bands	of sandy silt to 5	i.5m
- ADV	- No Fluid -		Not Encountered	N=32 4.45m 5.50m SPT 6 14.16,18 N=34	227.5 [228.0			СН	5.50m: bec	oming mottled pale grey,	trace fine grained sand	4	D	Н	4.00. Danus -	o sanoj sin lo c	
	┥┥			5.95m	227.0	_			5.95m								
						6.0			Hole Termir Target Depl	nated at 5.95 m th							-
					226.5	- 6.5											
						_											
. OMEC					226.0	7.0-											
					225.5	- - 7.5											
LAK FARM UZUDZU IU					225.0	-											
	S A DV A DT A = H B W R R D S DD N F C AND H	and aug uger scr uger dril ollow flig /ash-boo ock rolle onic dril on destr ontinuo and me	ewing ling wit ling wit ght aug re drillin er ling ructive of us push thods	h TC bit er Ig drilling tub			×uu ATER	dd/mm/	• No Resistance Very Hard / Refusal ⁽ yy n Date shown water level nflow	R Hammer Bound U50 Undisturbed Sa U75 Undisturbed Sa	Sample ole mple Sample teter (kPa) ration Test =sample taken) ing / Refusal mple (50mm dia) mple (75mm dia) ak/remouded(kPa)	MOISTL D D M M W W PL P	Based of the second sec	SCRIP on Unifi tion Sy	ed	CONSISTE RELATIVE VS S F St VSt H Fb VL L MD D VD	
deta	ails of	anator abbre of desc	viatior	าร						SMEC AUS	STRALIA						SMEC

	Lightsour		N			RILL HOLE - El along Solar Farm	NGINE	ERINO	GL	.00	D PI	OLE NO : ROJECT NUMI HEET : 1 OF	BER : 30041768
LOCATION : POSITION :			58829.0 (N	1GA94	Zone 55)	SURFACE ELEVATION :	231.00 (A	(HD)		INCI		NAL DEPTH :	<u>5.95 m</u> TION°: 90° / N/A
RIG TYPE :					: 4WD	CONTRACTOR :						IA:100 mn	
DATE START	ED: 24/0)7/2018 DA	ATE COMP	PLETE	D : 24/07/2018	B DATE LOGGED : 24/0	7/2018 LC	GGED B	Y : A	٩S		CHECKE	DBY:SC
	DRILLING	;					MATEF	RIAL					
R CASING & CASING & CASING B CASING CASINA	0H GROUND WATER LEVELS		DEPTH (m) GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	MATERIAL DESCRIPTION ME : plasticity or particle charac secondary and minor compon- NAME : grain size, colour, textu atures, inclusion and minor com	teristic, colour ents re and fabric,	r,	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCT & Other Obse	
	> -		0.0		Sandy CLA	Y high plasticity, grey-brown, with	ootlets		D	0	TOPSOIL		
ADV No Flud	0.55 0.55 4.6, 1.0 1	1 8 8 0.002 14 0.002 14 0.002 15 1.002 15 1.002 15 1.002 15 1.002 15 1.002 15 1.002 15 1.002 15 1.002 15 1.002 16 1.002 17 1.002 17 1.002 17 1.002 17 1.002 17 1.002 17 1.002 17 1.002 17 1.002 17 1.002 18 1.002 19 1.002 10 1.002 10 1.002 11 1.002 12 1.002 13 1.002 14 1.002 14 1.002 15 1.002 14 1.002 15 1.002 14 1.002 15 1.002 16 1.002 17 1.002 18 1.002 19 1.002		СН	2.50m CLAY: high grain sand	plasticity, pale brown, mottled red- ine grain sub-rounded to sub-angu	black, trace m		м	St VSt St	ALLUVIUM 0.30: trace ro	potiets to 1.5 m	-
METHOD HA Hand au AS Auger at ADT Auger d ADT Auger d HF Hollow f WB Wash-br RR Rock rol SD Sonic dr NDD Non des PT Continu HAND Hand m See Explanatc details of abbr		27.0		СН						VSt			-
METHOD HA Hand au AS Augers ADV Auger d ADT Auger d HF Hollow f WB Wash-b RR Rock rol SD Sonic dr NDD Non des PT Continuu HAND Hand m See Explanatc	rewing illing with V I illing with TC ight auger ore drilling ler tructive drillin bus push tub ethods	bit bit	₹	dd/mm/y	n Date shown water level flow	SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample W Water Sample HP Hand Penetrometer (kPa) SPT Standard Penetrometer (kPa) SPT Standard Penetrometer (kPa) SPT Standard Penetrometer (kPa) US0 Undisturbed Sample (75m V5 Uandisturbed Sample (75m V5 Vane Shear, peak/remoud PT Push Tube MC Moisturbe Content	aken) al m dia) m dia)	SOII Ba Class MOISTUF D Dry M Mo W We PL Pla	L DES ased o sificat RE y bist	n Unif ion Sy	ied	CONSISTE RELATIVE VS F St VSt H Fb VL L MD D VD	
details of abbr & basis of des	eviations					SMEC AUSTRA	LIA						SMEC

CLIENT : Lightsource BP		ORE DRILL HOLE - ENGINEE		OLE NO : BH27 ROJECT NUMBER : 30041768 HEET : 2 OF 2
LOCATION : Wyalong West POSITION : E: 530108.0, N: 6	258829 0 (MGA94 7o	ne 55) SURFACE ELEVATION : 231.00 (AH		NAL DEPTH : 5.95 m / ORIENTATION° : 90° / N/A
RIG TYPE : HYNDAGH	MOUNTING :		,	IA : 100 mm
DATE STARTED : 24/07/2018	DATE COMPLETED	24/07/2018 DATE LOGGED : 24/07/2018 LOG	GED BY : AS	CHECKED BY : SC
DRILLING		MATERIA	AL	
DRILLING & CASING & CASING & CASING BELLING BELLIND FLUID SCONDWATER CHARTION VH GROUND WATER CARDIN CHARTER SAMPLES & FIELD TESTS	DEPTH (m) GRAPHIC LOG CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components	MOISTURE CONDITION CONSISTENCY FELATIVE DENSITY	STRUCTURE & Other Observations
		ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components CLAY: high plasticity, pale brown, mottled red-brown, with fine g	arain ALLUVIUM	
NGP	4.5 - - - 4.5 - - - - - - - - - - - - -	CLAY: high plasticity, pale brown, mottled red-brown, with fine g sand, trace fine grain sub-rounded to sub-angular gravel (contin	1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4	ased moisture content
		Hole Terminated at 5.95 m Target Depth		-
METHOD HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with C bit HF Hollow flight auger WB Wash-bore drilling RR Rock roller SD Sonic drilling PT Continuous push tub HAND Hand methods		SAMPLES & FIELD TESTS B Bulk Disturbed Sample D Disturbed Sample U Undisturbed Sample ES Environmental Sample y Hard / W watar HP Hand Penetrometral Sample Es SPT Standard Penetration Test N Result of SPT ("=sample taken) R Hammer Bouncing / Refusal UT5 Undisturbed Sample (Somm dia) r Ivest Utres Sample Taken) R Hammer Bouncing / Refusal UT5 Undisturbed Sample (Somm dia) r Ivest Utres VS Vane Shear; peak/remouded(kPa) PT Purch Tuke; Tuke	CLASSIFICATION SYMBOLS & SOIL DESCRIPTION Based on Unified Classification System MOISTURE D Dry M Moist W Wet PL Plastic limit LL Liquid limit	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
See Explanatory Notes for details of abbreviations & basis of descriptions.		SMEC AUSTRALIA		SMEC

CLIE				ource BF ng West				N		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	IG L	-00	PRO SHE	DLE NO : BH28 DJECT NUMBER : 30041768 EET : 1 OF 1 AL DEPTH : 3.6 m
	SITION TYPE				N: 62					Zone 55) SURFACE ELEVATION : 235.00 (AHD) G : 4WD CONTRACTOR : APEX DRILLING		INC	_INATION° /	ORIENTATION°: 90°/N// .: 100 mm
					18 D		-	-		D : 26/07/2018 DATE LOGGED : 26/07/2018 LOGGED	BY :	AS		CHECKED BY : SC
		D	RILLI	NG			1			MATERIAL				
& CASING &	DRILLING FLUID VE	ve F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	285.8VATION	O DEPTH (m)	GRAPHIC	LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
						0.0			СН	Silty CLAY. high plasticity, grey-brown, with rootlets	D		TOPSOIL	natural topsoil to 0.2 m
						-				0.20m Sandy CLAY high plasticity, dark brown to brown mottled grey, with	-	St - VSt	ALLUVIUM	
					234.5	-				fine to medium grain quartz sand	D	vsi	0.30: trace roo	tlets to 0.5 m
				0.50m SPT 7,10,10	0	0.5 —								
				N=20 DS-1 0.5m-0.7m		-					D			
					0	-								
				0.95m 1.00m SPT	234.	1.0				1.00m: becoming mottled black, trace medium grained sand		VSt		
				9,7,8 N=15		-			СН	Loon. Decoming mouled black, bace medium grained said				
						-								
				1.45m 1.50m	233.5	-					D to M	1		
	000000		pə	SPT 5,8,5 N=13	Ť	1.5								
	id		Encountered			-								
	- No Fluid		Not En		0.	-				1.90m				
				1.95m	233.0	2.0 —				CLAY: high plasticity, grey-brown mottled brown, trace fine to medium grain sand		St		
						-								
						-								
				2.50m	232.5	-								
				SPT 6,8,12 N=20	Ť	2.5				2.50m: becoming pale grey-brown, mottled red-brown, trace fine grained sub-angular gravel				
						-	$\left \right \right $		СН		м			
					0	-								
				2.95m	1232.	3.0 —						VSt		
						-								
						-								
				3.50m	231.5	-								
,	V			SPT 5/50mm N=R	Ī	3.5	Ш			3.50m: fine to coarse grain granitic sand, with silt	D	D	3.50: auger gri	inding on inferred residual granite
	i			3.55m	1	-				Hole Terminated at 3.60 m Material refusal on inferred granite rock / boulder (HW-MW)				
	i	 			231.0	-	-							
ME					23	4.0 P							MBOLS &	CONSISTENCY/
HA AS AD	Hanc Auge V Auge	d auge er scre er drilli	wing ng with	V bit				11.1		No Resistance U Undisturbed Sample Si U Undisturbed Sample C	DIL DE Based o assifica	on Unif	ied	RELATIVE DENSITY VS - Very Soft S - Soft
AD HF WE	T Auge Hollo 8 Wast	er drilli ow fligl h-bore	ng with nt auge drilling	r TC bit						ES Environmental Sample Very Hard / W Water Sample Refusal HP Hand Penetrometer (kPa) MOIST				F - Firm St - Stiff VSt - Very Stiff
RR SD ND	Rock Sonic D Non	k roller ic drillii destru	ng ctive d	rilling		"	VATE - -	- d		n Date shown U50 Undisturbed Sample (50mm dia) M	Dry Noist			H - Hard Fb - Friable VL - Very Loose
PT HA		tinuou	s push				₽		Drilling /ater i	water level U75 Undisturbed Sample (75mm dia) W V fflow VS Vane Shear, peak/remouded(kPa) PL P P Push Tube	Vet Plastic li .iquid lii			L - Loose MD - Medium Dense D - Dense
deta	Explan ils of ab	bbrev	iation	s			<u> </u>	⊿ ^	a.ci (SMEC AUSTRALIA	yuru III			VD - Very Dense
& ba	sis of d	lescri	ptions	S.										

1	NON-CORE DRILL HOLE - ENGINEERIN	GLOG HOLE NO : BH29 PROJECT NUMBER : 30041768
CLIENT : Lightsource BP LOCATION : Wyalong West	PROJECT: Wyalong Solar Farm	SHEET : 1 OF 2 FINAL DEPTH : 5.95 m
POSITION : E: 530883.0, N: 6258830.0 () RIG TYPE : HYNDAGH MOU	MGA94 Zone 55) SURFACE ELEVATION : 231.00 (AHD) INTING : 4WD CONTRACTOR : APEX DRILLING	INCLINATION° / ORIENTATION° : 90° / N/A HOLE DIA : 100 mm
	PLETED : 27/07/2018 DATE LOGGED : 27/07/2018 LOGGED E	
DRILLING	MATERIAL	
PRILLING & CASING PRILLING FLUID FLU	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	WINDERSON OF STRUCTURE STRUCTURE STRUCTURE STRUCTURE & Other Observations
	CH Silty CLAY high plasticity, grey-brown, with rootlets	D TOPSOIL 0.10: disturbed natural topsoil to 0.2 m
	0.20m CLAY: high plasticity, dark grey to grey-brown, trace fine grain sub-rounded gravel 0.20m	ALLUVIUM 0.30: trace rootlets to 0.5 m
U 0.50m N 0.5 -	0.30m: trace fine grain sand to 0.5 m	
0.50m C 0.5 - SPT 0.5 - 2.3.4 N=7 - -		F 0.55: trace calcareous content recovered as gravel
0.95m 0.	1.00m: becoming mottled pale grey, trace fine grained sand	
N=8 - DS-1 -		
1.45m 0; - 1.5m 0; - 1.5 -		
SPT 1.0 3,5,6 N=11 -	1.50m: becoming pale brown	
→ → → → → → → → → → → → → → → → → → →		
- NO E INO 	СН	
		· · ·
2.50m N 2.5	2.50m: becoming grey-brown, mottled red-brown	St –
4,7,7 N=14		
<u>2.95m</u>		· · ·
0 4.00m 2. 4.0		
HA Hand auger AS Auger screwing ADV Auger drilling with V bit	KATION SAMPLES & FIELD TESTS SC L±±5 B Bulk Disturbed Sample SC → No Resistance D Disturbed Sample E U U undisturbed Sample Classical Sample Classical Sample	FICATION SYMBOLS & CONSISTENCY/ DIL DESCRIPTION RELATIVE DENSITY Based on Unified VS - Very Soft assification System S - Soft
ADT Auger drilling with TC bit HF Hollow flight auger WB Wash-bore drilling WATER	ES Environmental Sample W Water Sample Refusal HP Hand Penetrometer (kPa) MOISTL	F - FITM St - Stiff JRE VSt - Very Stiff
RR Rock roller WATEF SD Sonic drilling NDD Non destructive drilling	Idd/mm/yy R Result of SPT (*=sample taken) D D M R Hammer Bouncing / Refusal M M M U50 Undisturbed Sample (50mm dia) M	ry H - Hard Ioist Fb - Friable VL - Very Loose
PT Continuous push tub HAND Hand methods	Drilling water level U75 Undisturbed Sample (75mm dia) W W water inflow VS Vane Shear, peak/remouded(kPa) PL Pl Push Tube	Vet L - Loose lastic limit MD - Medium Dense iauid limit D - Dense
See Explanatory Notes for details of abbreviations & basis of descriptions.	SMEC AUSTRALIA	VD - Very Dense

CL	IEN	IT	: L	.ights	ource Bl	Þ		Ν		CORE DRILL HOLE - ENGINE	ERING	GL	.00	PI PI	OLE NO : BH29 ROJECT NUMBER : 30041768 HEET : 2 OF 2
LO	CA	TIO	N : \	Vyalc	ng West)883.0, N	t	258830).0 (N			(HD)		INCL	FI	NAL DEPTH : 5.95 m ? / ORIENTATION° : 90° / N/A
RIC	ΞT	YPE	E : H	YND	AGH			MOÙ	NTING	: 4WD CONTRACTOR : APEX DRI	ILLING				IA: 100 mm
DA	TE	ST	ARTE	D:2	27/07/20	18 D	ATE (COMI	PLETE	: 27/07/2018 DATE LOGGED : 27/07/2018 LO	OGGED B	Y : A	AS		CHECKED BY : SC
		1	D	RILL		1			7	MATER	RIAL				
PRILLING BRILLING	_		VE F PENETRATION VH	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	222.0VATION	(m) DEPTH (m)	GRAPHIC	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components		MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY		STRUCTURE & Other Observations
					SPT 5,8,10 N=18		-			CLAY : high plasticity, dark grey to grey-brown, trace fine grain sub-rounded gravel (<i>continued</i>)	n			ALLUVIUM	
					4.45m	1 226.5	- - 4.5			4.50m: becoming mottled yellow					- - - -
		No Fluid		Not Encountered		226.0			сн			М	VSt		- - - -
					5.50m SPT 16,19,24 N=43	225.5	- - 5.5			5.50m: becoming mottled red-brown, trace fine grained sand				5.50: bands	of sandy silt recovered to 5.95m
		v			5.95m	225.0				95m Hole Terminated at 5.95 m			н		-
							- 0.0 			Target Depth					
						224.5	- 6.5								-
1.06.0						224.0									-
vic 1.06.5 lib Prj: SMEC							-								
8 - SK_NR.GPJ LID: SE						223.5	7.5								- - -
SOLAR FARM 0208201						223.0	- - 8.0			TTTT		10.1-	010		-
30REHOLE 30041768-WYALOI	A S DV F B R DD T	Aug Aug Holl Was Roc Son Nor Cor	jer drill low flig sh-bore k rolle nic drilli n destru	ewing ing with ing with ht auge e drillin ng uctive o s push	n TC bit er g trilling		100000000		dd/mm/	Date shown U50 Undisturbed Sample (50mm dia) ater level U75 Undisturbed Sample (75mm dia) w VS Vane Shear; peak/remouded(kPa)	SOI Ba Clas MOISTUI D Dry M Mo W We PL Pla	L DES ased o sificat RE y bist	SCRIP n Unifi ion Sy	ed	CONSISTENCY/ RELATIVE DENSITY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
See det & b															

CLU	ENT	· .	Light	source B			Ν		-CORE DRILL HOLE - ENGINEERIN PROJECT: Wyalong Solar Farm	G L	00	
LOC	CATI	ION :	Wyalo	ong Wes	t	50040	0 (14					SHEET : 1 OF 2 FINAL DEPTH : 5.95 m
-		DN : PE : I			N: 62				Zone 55) SURFACE ELEVATION : 234.00 (AHD) S : 4WD CONTRACTOR : APEX DRILLING		INCI	LINATION° / ORIENTATION° : 90° / N/A HOLE DIA : 100 mm
DAT	TE S	TART	ED :	25/07/20	18 D <i>i</i>	ATE C	OMP	LETE	D : 25/07/2018 DATE LOGGED : 25/07/2018 LOGGED B	3Y : /	AS	CHECKED BY : SC
		[ORILL						MATERIAL			
DRILLING A		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2B4.0VATION	O DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL NAME : plasticity or particle characteristic, colour, secondary and minor components ROCK NAME : grain size, colour, texture and fabric, features, inclusion and minor components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	
								СН	Sandy CLAY high plasticity, grey-brown, fine grain sand, with rootlets	D		TOPSOIL 0.10: disturbed natural topsoil to 0.2 m
						+			0.20m CLAY: high plasticity, dark grey-brown to brown, mottled orange	-		ALLUVIUM
					5					D to M		0.30: trace rootlets to 1 m
				0.50m SPT 1	233.5	0.5						
				5,6,6 N=12		-						
						-					St	
					o.							
				0.95m 1.00m SPT 2	233.0	1.0 —			1.00m: becoming mottled red-brown			
				5,6,7 N=13		-						
				1.45m	2.5	_						
				1.50m SPT 3 5,7,8	232.	1.5 —			1.50m: becoming pale grey-brown, mottled red, trace fine grained			1.50: bands of sandy silt to 5.95m
				N=15		-			sand			
			þ									
			Not Encountered	1.95m	232.0	-						
- ADV	- No Fluid		Not End		123	2.0 —						
								СН				
						_				м		
				0.50	231.5	-						
				2.50m SPT 4 8,13,16		2.5 —						
				N=29							VSt	
						-						
0.0				2.95m	231.0	-						
MEC 1.0						3.0-						
5 lib Prj: {						-						
-MC 1.06.						-						
1 LID: SE					230.5	- 3.5						
K NR.GP						-						
52018 - S				2 00		-						
ARM 0208				3.80m SPT 5 16,25,29		╢					н	-
SOLAR F/				N=54	230.0	4.0						
BOREHOLE 30041768 - WYALOI LA TA S MH TA BOUNDALOI LA TA S MH TA BOUNDALOI	S A DV A DT A E F V R S D D N C	land aug Auger sc Auger dri	rewing Iling wit ght aug re drillir er ling ructive us pust	th TC bit ler ng drilling		wA		Id/mm/ evel o Drilling vater ir	SAMPLES & FIELD TESTS Sold B Bulk Disturbed Sample B D Disturbed Sample B U Undisturbed Sample Cla Very Hard / W Water Sample Refusal HP Hand Penetrometral Sample MOISTI SPT Standard Penetration Test yy Result of SPT (*=sample taken) D n Date shown U50 Undisturbed Sample (Somm dia) water level U75 Undisturbed Sample (Cform dia) water level VY Svane Shear; peak/remouded(kPa) PL	DIL DES Based c assificat URE Dry Moist Vet Plastic li	SCRIP on Unif tion Sy	fied VS - Very Soft
See deta	Water outflow Mo Meisture Content								SMEC AUSTRALIA			

CLIE				ource Bl			N			RILL HOLE	- ENGI	NEERIN	GL	.00	Pi	OLE NO : ROJECT NUMB HEET : 2 OF :	ER : 30041768
				ong West 9338.0, N		58643	.0 (N	1GA94	Zone 55)	SURFACE ELEVA	TION : 234.0	00 (AHD)		INCI		NAL DEPTH: / ORIENTAT	<u>5.95 m</u> ION°: 90° / N/A
		E : ⊦			10.5				G: 4WD		TOR : APE				HOLE D	IA : 100 mm	
DAT	ESI	ARTE	:D : 2	25/07/20	18 D <i>i</i>	AIEC	OMF	LEIE	D : 25/07/201	8 DATE LOGGED	: 25/07/2018	B LOGGED I	3Y :	AS		CHECKEL	BY : SC
			RILL		1			7			М	IATERIAL					
PRILLING & OO		- 2	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	2B0.BVATION	OEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	ROCK	MATERIAL DESC AME : plasticity or partic secondary and minor : NAME : grain size, colo patures, inclusion and m	le characteristic, components our. texture and f	fabric.	MOISTURE	CONSISTENCY RELATIVE DENSITY		STRUCTL & Other Obser	
				SPT 5 16,25,29 N=54		4.0 -			CLAY: high (continued)	plasticity, dark grey-brow	n to brown, mottle	ed orange			ALLUVIUM		
				4.25m		_											-
					5	_											-
					229.5	4.5											-
						-											-
			p			-								н			-
			Encountered		0.	-											-
- ADV -	No Fluid		Not End		229.0	5.0 —		СН					м				-
						-											-
						_											-
					228.5	_											-
				5.50m SPT 6 4,10,19	52	5.5 —											-
				N=29		-											-
						_								VSt			-
				5.95m	228.0	_			5.95m								-
					5	6.0 —			Hole Termir Target Dep	nated at 5.95 m th							-
						_											-
						-											-
					227.5	-											-
						6.5											-
						-											-
						-											-
0.90					227.0	-											-
SMEC 1.						7.0											-
(pri all e.c						-											-
EMC 1.06					Ŀ,	-											-
2 LID: S					226	7.5											_
K_NR.G						-											-
- 81028r						-											-
FARM UZI					3.0	-											-
SOLAR					226.0	9.0				0.000		CLASS		ION SY	/MBOLS &	CONSISTEN	
HA AS AD	i Au IV Au IT Au I Ho B Wa R Ro So So	and aug iger scru iger drill iger drill ollow flig ash-bor ock rolle onic drill	ewing ing witi ing witi ht aug ht aug ht aug n e drillin r ing	h TC bit er g				dd/mm/	No Resistance Very Hard / Refusal yy	SAMPLES & FIELI B Bulk Disturbed 3 D Disturbed Samp U Undisturbed Samp U Undisturbed Sa ES Environmental 3 W Water Sample HP Hand Penetrom SPT Standard Penet N Result of SPT (R Hammer Bounc	Sample le mple Sample eter (kPa) ration Test ≔sample taken)	E Cla MOIST)ry	on Unifi	ed	RELATIVE I VS S F St VSt H Fb	- Very Soft - Soft - Firm - Stiff - Very Stiff - Hard - Friable
ND PT HA	Co	on destr ontinuou and met	is push	tub			-⊈-		n Date shown water level iflow	U50 Undisturbed Sa U75 Undisturbed Sa VS Vane Shear; pe	mple (50mm dia) mple (75mm dia) ak/remouded(kPa)	w v	1oist Vet Plastic li	mit		VL L MD	- Very Loose - Loose - Medium Dense
ON-CORE								water n water o		PT Push Tube MC Moisture Conter			iquid li			D VD	- Dense - Very Dense
See deta & ba	e Explanatory Notes for ails of abbreviations vasis of descriptions. SMEC AUSTRALIA																

Appendix D Laboratory Results



Dandenong South ACN 143 009 330 25 Metcalf Street DANDENONG SOUTH, VIC 3175

Report eens Road //C 3004 farm CG Request No.: Lot No.: Wyalong 1, 0.5 - 1.0m 7/2018 fu brading nitted by client DS-08702	Method AS 1289.2.1.1 AS 1289.3.8.1	The results of the tests, calibrations and/or measurements included in this occument are included in this Australiannational standards. 12712	Accredited for compliance - Testing Approved Signatory: J. La Melbourne Lab Supervis Date of Issue: 9/08/2 L NOT BE REPRODUCED E RESULT 11.9 2	amont or)
eens Road /IC 3004 farm CG Request No.: Lot No.: Wyalong 1, 0.5 - 1.0m 7/2018 fu	AS 1289.2.1.1	The results of the tests, calibrations and/or measurements included in this document area testels to Australiantiational tandards. (I 12772 D	- Testing Approved Signatory: J. La Melbourne Lab Supervis Jate of Issue: 9/08/2 L NOT BE REPRODUCED E	amont or) 2018 EXCEPT IN FULL
Lot No.: Wyalong I, 0.5 - 1.0m 7/2018 tu trading nitted by client	AS 1289.2.1.1	and/or measurements included in this document are traceable to Australian/national standards. 12712 D	Melbourne Lab Supervis Jate of Issue: 9/08/2 L NOT BE REPRODUCED E Result 11.9 2	or) 2018 EXCEPT IN FULL
I, 0.5 - 1.0m 7/2018 ru irading nitted by client	AS 1289.2.1.1		11.9 2	Limits
I, 0.5 - 1.0m 7/2018 ru irading nitted by client	AS 1289.2.1.1		11.9 2	Limits
	AS 1289.2.1.1		11.9 2	Limits
	AS 1289.2.1.1		11.9 2	Limits
			2	
			CLAY Distilled 18.0	



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			Ph: +61 3 8796 7900 Fax: +61 3 9706 9431
Material Te	est Report		Report No: MAT:S18DS-08704/1 Issue No: 1
Client: SMEC Address: Level 10, MELBOU Project: Wyalong Project No.: 100794 Order No.: TRN:	71 Queens Road JRNE VIC 3004 Solar Farm		Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this Approved Signatory: J. Lamont (Melbourne Lab Supervisor) 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH03, 0.5 - 0.6m 3 26/07/2018 In-Situ Clay AS Grading Submitted by client S18DS-08704		
Test Results			
Description		Method	Result Limits
Moisture Content (%) Emerson Class Numb		AS 1289.2.1.1 AS 1289.3.8.1	23.9
Soil Description Type of Water Temperature of Water	- (°C)		CLAY Distilled 18.0
Comments			

Comments



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Material Te	st Report		Report No: MAT:S18DS-08705/1 Issue No: 1
Client: SMEC Address: Level 10, MELBOUI	71 Queens Road RNE VIC 3004 Solar Farm		Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests. calibrations and/or measurements included in this document are traceable to Australian/national standards. 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH05, 0.5 - 1.0m 4 25/07/2018 In-Situ Clay AS Grading Submitted by client S18DS-08705		
Test Results Description Moisture Content (%)		Method AS 1289.2.1.1	Result Limits 17.0
Emerson Class Number Soil Description Type of Water Temperature of Water		AS 1289.3.8.1	2 CLAY Distilled 18.0
Comments			

Comments N/A



			Ph: + 61 3 8796 7900 Fax: +61 3 9706 9431
Material Te	st Report		Report No: MAT:S18DS-08707/1 Issue No: 1
Client: SMEC Address: Level 10, MELBOU	71 Queens Road RNE VIC 3004 Solar Farm		Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australiannational standards. 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH08, 0.5 - 1.0m 6 26/07/2018 In-Situ Clay AS Grading Submitted by client S18DS-08707		
Test Results			
Description Moisture Content (%)		Method AS 1289.2.1.1	Result Limits
Emerson Class Number Soil Description Type of Water Temperature of Water		AS 1289.3.8.1	CLAY Distilled 18.0
Comments			

Comments



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Material Te	st Report		Report No: MAT:S18DS-08708/1 Issue No: 1
MELBOU	71 Queens Road RNE VIC 3004 Solar Farm 9 CG Request No.: Lot No.:		Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests calibrations and/or measurements included in this Australian/autoralianaliandards. 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH10, 0.4 - 0.6m 7 26/07/2018 In-Situ Clay AS Grading Submitted by client S18DS-08708		
Test Results Description		Method	Result Limits
Moisture Content (%) Emerson Class Number Soil Description Type of Water Temperature of Water		AS 1289.2.1.1 AS 1289.3.8.1	164 3 CLAY Distilled 18.0

Comments



Dandenong South ACN 143 009 330 25 Metcalf Street DANDENONG SOUTH, VIC 3175

			Ph: +61387967900 Fax: +61397069431
Material Te	st Report		Report No: MAT:S18DS-08709/1 Issue No: 1
Client: SMEC Address: Level 10, MELBOU	71 Queens Road RNE VIC 3004 Solar Farm		Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this dustralian/ational standards. 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH12, 0.5 - 0.6m 8 26/07/2018 In-Situ Clay AS Grading Submitted by client S18DS-08709		
Test Results Description Maintum Content (%)		Method	Result Limits
Moisture Content (%) Emerson Class Number Soil Description Type of Water Temperature of Water		AS 1289.2.1.1 AS 1289.3.8.1	24.5 2 CLAY Distilled 18.0
Comments			

Comments N/A



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Material Tes	st Report		Report No: MAT:S18DS-08710/1 Issue No: 1
Client: SMEC Address: Level 10, 7	1 Queens Road RNE VIC 3004 Solar Farm		Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/ational standards. 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH16, 0.5 - 1.0m 9 26/07/2018 In-Situ Clay AS Grading Submitted by client S18DS-08710		
Test Results Description Moisture Content (%)		Method AS 1289.2.1.1	Result Limits
Emerson Class Numbe Soil Description Type of Water Temperature of Water (AS 1289.3.8.1	2 CLAY Distilled 18.0
Comments			

Comments



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GEOTECHNICS			Ph: +61 3 8796 7900 Fax: +61 3 9706 9431
Material Te	est Report		Report No: MAT:S18DS-08713/1 Issue No: 1
MELBOU	71 Queens Road IRNE VIC 3004 Solar Farm 9 CG Request No .:		Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this document are traceable to (Melbourne L ab Supervisor)
TRN:	Lot No.:		document are traceable to Australiannational stradards. (Melbourne Lab Supervisor) 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details			
Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH26, 0.5 - 0.6m 12 26/07/2018 In-Situ Sand AS Grading Submitted by client S18DS-08713		
Test Results Description		Method	Result Limits
Moisture Content (%)		AS 1289.2.1.1	7.6
Emerson Class Numb Soil Description Type of Water Temperature of Water		AS 1289.3.8.1	Sand Distilled 18.0
Comments			

Comments



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	Fax: +61 3 9706 9431
Report	Report No: MAT:S18DS-087 Issue This report replaces all previous issues of report no 'MAT:S18DS-08
Queens Road	Accredited for compliance with ISO/IE - Testing
CG Request No.: Lot No.:	The results of the tests. calibrations and/or measurements included in this document are traceable to Australianinational standards. 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN F
BH26, 1.0m 2 6/07/2018 In-Situ Sandy CLAY AS Grading Submitted by client S18DS-08727	
Method	Result Limits
oution	AS 1289.3.6.1
oution	AS 1289.3.6.1 Drying by: Oven Date Tested: Note: Sample Washed
	Lot No.: West Wyalong BH26, 1.0m 2 6/07/2018 In-Situ Sandy CLAY AS Grading Submitted by client S18DS-08727



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laterial Te	est Report	Report No: MAT:S18DS-0873 Issue N
MELBOU	71 Queens Road JRNE VIC 3004 Solar Farm	Accredited for compliance with ISO/IEC – Testing
-		The results of the tests, calibrations and/or measurements included in this Approved Signatory: J. Lamont
Order No.: 'RN:	CG Request No.: Lot No.:	document are traceable to Australian/attoinal standards. (Melbourne Lab Supervisor) 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FU
ample Details	West Wyalong	
ample Location eld Sample ID ate Sampled ource aterial oecification ampling Method ample ID	BH17, 0.5m 5 27/07/2018 In-Situ Clay with Sand AS Grading Submitted by client S18DS-08730	
		Result Limits
Other Test Resu escription loisture Content (%)	Ilts Method AS 1289.2.1.1	Result Limits 15.7
escription oisture Content (%)	Method AS 1289.2.1.1	15.7 AS 1289.3.6.1
escription oisture Content (%) article Size Dis % Passing	Method AS 1289.2.1.1	15.7 AS 1289.3.6.1 Drying by: Oven
escription oisture Content (%) article Size Dis	Method AS 1289.2.1.1	15.7 AS 1289.3.6.1



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Material Test	Report	Report No: MAT:S18DS-08726 Issue No This report replaces all previous issues of report no 'MAT:S18DS-08726
Client: SMEC Address: Level 10, 71 (MELBOURNE Project: Wyalong Sola Project No.: 1007949 Order No.: TRN:	E VIC 3004	Accredited for compliance with ISO/IEC 17 - Testing The results of the tests, calibrations and/or measurements included in this document are traceable Australian/hational standards. 12712 Date of Issue: 22/08/2018
Sample Details		THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULI
Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH26, 0.5m 1 26/07/2018 In-Situ Sandy SILT AS Grading Submitted by client S18DS-08726	
Other Test Results Description Moisture Content (%)	Method AS 1289.2.1.1	Result Limits
Particle Size Distril	oution	AS 1289.3.6.1 Drying by: Oven
100 [Date Tested:
90 80 70 60 40 40 40 40 40 40 40 40 40 40 40 40 40	sieve	Note: Sample Washed Limits Sieve Size % Passing Limits 19.0mm 100 13.2mm 100 13.2mm 100 6.7mm 100 6.7mm 100 2.36mm 100 1.18mm 99 600µm 96 425µm 90 300µm 82 150µm 66 75µm 58
Comments		

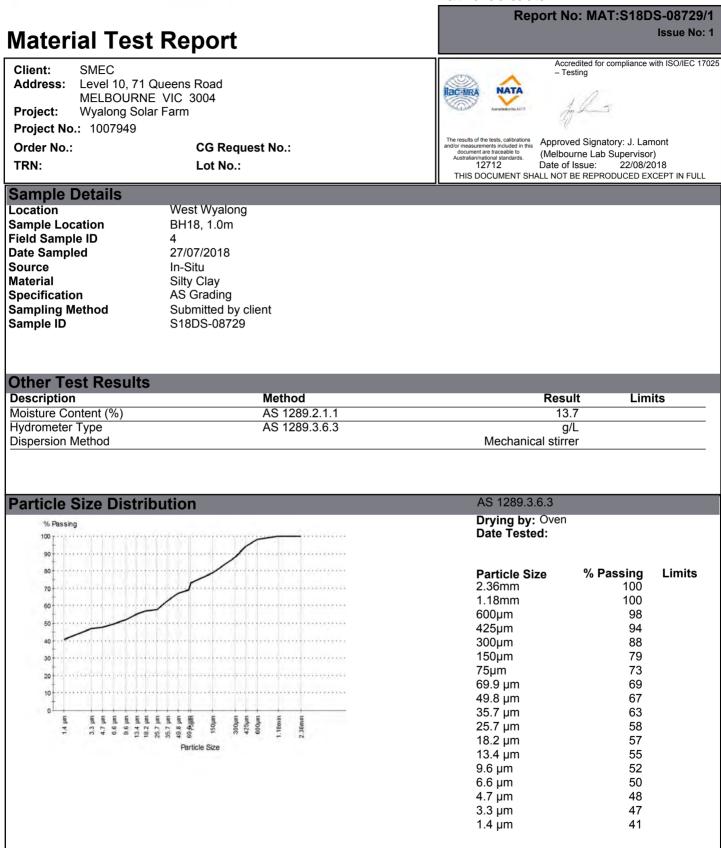


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		Fax: +61 3 9706 9431
laterial Te	st Report	Report No: MAT:S18DS-08728 Issue No
MELBOU	71 Queens Road RNE VIC 3004 Solar Farm	Accredited for compliance with ISO/IEC - Testing
Order No.: TRN:	CG Request No.: Lot No.:	The results of the tests, calibrations and/or measurements included in this document are traceable Australian/national standards. 12712 Australian/national standards.
ample Details ocation ample Location ield Sample ID vate Sampled ource laterial pecification ampling Method ample ID	West Wyalong BH28, 0.5m 3 26/07/2018 In-Situ Sandy CLAY AS Grading Submitted by client S18DS-08728	
Other Test Resu Description Moisture Content (%)	Its Method AS 1289.2.1.1	Result Limits 10.5
Other Test Resu	Method AS 1289.2.1.1	



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Comments



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Material Te	est Report	Report No: MAT:S18DS-08736/1 Issue No: 1
MELBOU	, 71 Queens Road JRNE VIC 3004 I Solar Farm 49	Accredited for compliance with ISO/IEC 1702 – Testing
Order No.: TRN:	CG Request No.: Lot No.:	The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/aductand standards. Approved Signatory: J. Lamont (Melbourne Lab Supervisor) 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details		
Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH03, 0.5m 11 26/07/2018 In-Situ CLAY AS Grading Submitted by client S18DS-08736	

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	18.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		Yes	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.2	65	
Plastic Limit (%)	AS 1289.3.2.1	22	
Plasticity Index (%)	AS 1289.3.3.1	43	

Comments

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Material Te	est Report	Report No: MAT:S18DS-08737/1 Issue No: 1
MELBO	, 71 Queens Road JRNE VIC 3004 9 Solar Farm 49 CG Request No.: Lot No.:	Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/mational standards. 12712 Date of Issue: 9/08/2018
Sample Details		THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH05, 0.5m 12 25/07/2018 In-Situ CLAY AS Grading Submitted by client S18DS-08737	

Test Results Description Method Result Limits Sample History AS 1289.1.1 Oven-dried Preparation AS 1289.1.1 Dry Sieved Linear Shrinkage (%) AS 1289.3.4.1 20.0 Mould Length (mm) 250 Crumbling No Curling Yes Cracking No Liquid Limit (%) AS 1289.3.1.2 67 Plastic Limit (%) AS 1289.3.2.1 18 Plasticity Index (%) AS 1289.3.3.1 49

Comments



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Material Te	est Report	Report No: MAT:S18DS-08738/1 Issue No: 1
MELBOU	, 71 Queens Road JRNE VIC 3004 J Solar Farm 49 CG Request No.: Lot No.:	Accredited for compliance with ISO/IEC 1702 – Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. 127212 Accredited for compliance with ISO/IEC 1702 – Testing Approved Signatory: J. Lamont (Melbourne Lab Supervisor) Date of Issue: 9/08/2018
Sample Details		THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH10, 0.5m 13 26/07/2018 In-Situ CLAY AS Grading Submitted by client S18DS-08738	

Test Results			
Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	22.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		Yes	
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	78	
Plastic Limit (%)	AS 1289.3.2.1	19	
Plasticity Index (%)	AS 1289.3.3.1	59	

Comments



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Material Te	est Report	Report No: MAT:S18DS-08739/1 Issue No: 1
MELBOU	, 71 Queens Road JRNE VIC 3004 9 Solar Farm 49 CG Request No.: Lot No.:	Accredited for compliance with ISO/IEC 1702 – Testing The results of the tests, calibrations and/or measurements included in this Australiannational standards. 12712 Date of Issue: 9/08/2018
	Lot No	THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details		
Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH12, 0.5m 14 26/07/2018 In-Situ CLAY AS Grading Submitted by client S18DS-08739	

lest Results			
Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	20.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		Yes	
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	78	
Plastic Limit (%)	AS 1289.3.2.1	21	
Plasticity Index (%)	AS 1289.3.3.1	57	

Comments

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Material Te	est Report	Report No: MAT:S18DS-08740/1 Issue No: 1
MELBO Project: Wyalong Project No.: 10079		Accredited for compliance with ISO/IEC 1702 – Testing
Order No.: TRN:	CG Request No.: Lot No.:	The results of the tests, calibrations document are traceable to Australian/antional standards. 12712 Date of Issue: 9/08/2018 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL
Sample Details		
Location Sample Location Field Sample ID Date Sampled Source Material Specification Sampling Method Sample ID	West Wyalong BH16, 0.5m 15 26/07/2018 In-Situ CLAY AS Grading Submitted by client S18DS-08740	

Test Results			
Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	20.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		Yes	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.2	58	
Plastic Limit (%)	AS 1289.3.2.1	19	
Plasticity Index (%)	AS 1289.3.3.1	39	

Comments

Head Office 25 Metcalf Drive DANDENONG SOUTH VIC 3175

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MOISTURE CONTENT REPORT

Customer: SMEC

Customer Address: Level 10, 71 Queens Road, MELBOURNE, VIC

Project: Wyalong Solar Farm

Location: West Wyalong

Customer Order No.: 30041768

Report Number: W18DS02263

Report Date: 09/08/18

CG Job No: 1007949

Test Method: AS 1289 2.1.1

Page: 1 of 1

Testing performed and reported at our Dandenong South Laboratory 12712

Moisture Content (%):	21.9	23.5	18.9	21.5	24.3		 	
Sampling Procedure:	Client Sampled		 	 				
Test Depth (mm):		-	-	-	-			
Layer Depth (mm):	-	-	-	-	-		 	
Sample Location :	1.0m	4.0m	4.0m	2.5m	4.0m			
Comple Location :	BH16	BH26	BH18	BH04	BH12			
To Be Used As:	Material Analysis			 				
Material Description:	CLAY	CLAY	CLAY	CLAY	CLAY			
Material Source:	In-situ	In-situ	In-situ	In-situ	In-situ			
Date Tested:	2/08/2018	2/08/2018	2/08/2018	2/08/2018	2/08/2018			
Time Sampled:	am/pm	am/pm	am/pm	am/pm	am/pm			
Date Sampled:	28/07/2018	28/07/2018	28/07/2018	28/07/2018	28/07/2018			
Lot No.:	-	-	-	-	-		 	
ID No.:	1	2	3	4	5		 	
Sample No.:	S18DS-08731	S18DS-08732	S18DS-08733	S18DS-08734	S18DS-08735			

Remarks:



Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

APPROVED SIGNATORY

J Lamont

Ja hans

Form No.: CG.319.003

Issue Date: 16/06/2018





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Comments





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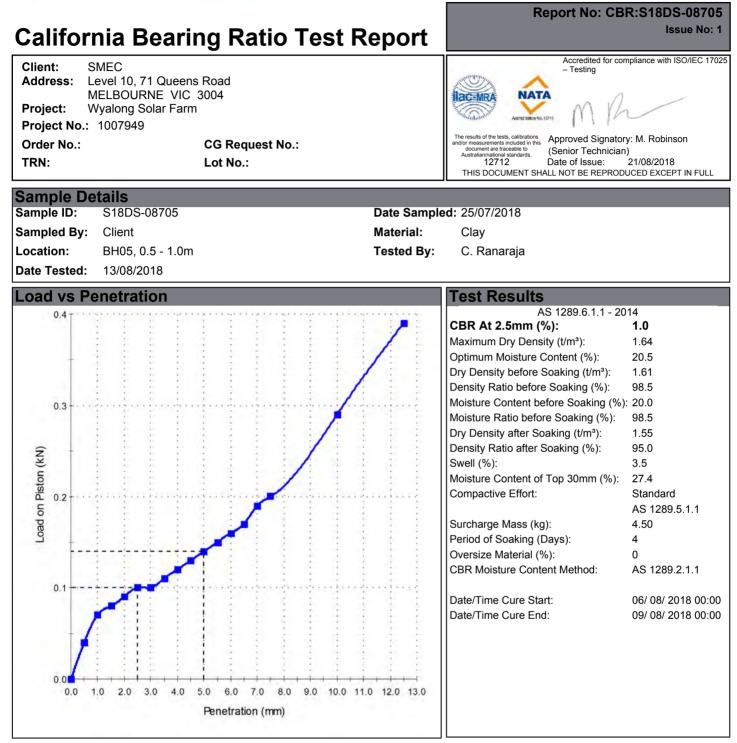


Comments





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Comments





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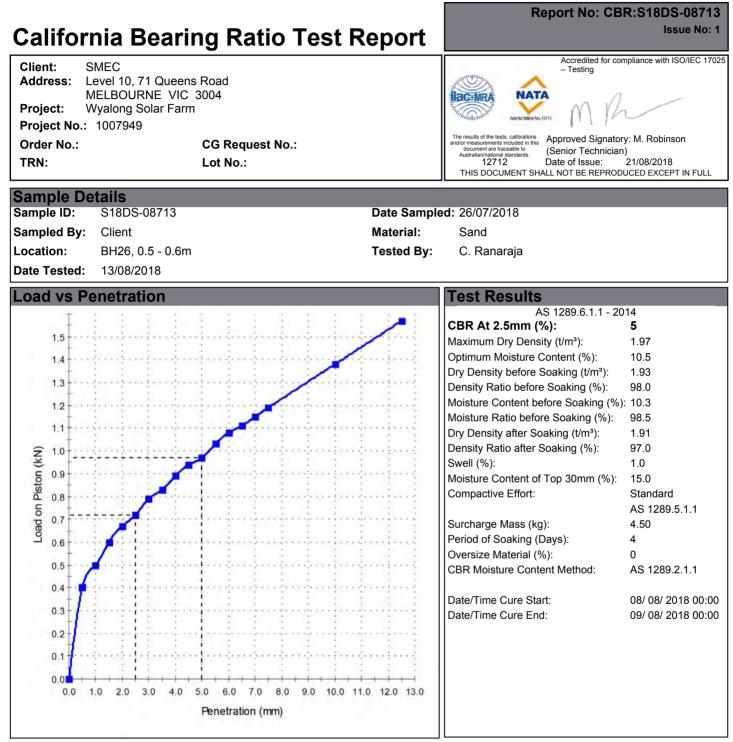


Comments





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Comments

Head Office:

25 Metcalf Street Dandenong South VIC 3175 Ph: +61 8796 7900



Thermal Resistivity Dryout Curve Report

Customer: SMEC Customer Address: Level 10, 71 Queens Rd Melbourne VIC 3004 Project: Wyalong Solar Farm Project Location: Wyalong Customer Request No.: 30041768

Report No: W18DS02259 CG Project No: 1007949 Report Date: 21/08/18 Test Method: TR LAB.2013 (In-House) Page: 1 of 3

Testing performed and reported at our Dandenong South Laboratory

Sample No: S18DS-08703

Client Sample ID: 2 Sample Location: BH01 @ 1.0-1.5m Date Sampled: 26/07/2018

Maximum Dry Density (t/m³): 1.81 Optimum Moisture Content(%): 14.8 Moulded Moisture Content (%): 14.7 Date Moulded: 13/08/2018

Sampling Procedure: As Received Sample Description: CLAY Sample History: Remoulded

Achieved Density Ratio (%): 95.5 Achieved Moisture Ratio (%): 99.0

Moisture Content (%)	Compacted Dry Density t/m ³	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
0.0		0.32	3.13
4.6		0.58	1.72
9.0		1.05	0.95
14.7	1.72	1.74	0.57



Head Office:

25 Metcalf Street Dandenong South VIC 3175 Ph: +61 8796 7900



Thermal Resistivity Dryout Curve Report

Customer: SMEC Customer Address: Level 10, 71 Queens Rd Melbourne VIC 3004 Project: Wyalong Solar Farm Project Location: Wyalong Customer Request No.: 30041768

 Report No:
 W18DS02259

 CG Project No:
 1007949

 Report Date:
 21/08/18

 Test Method:
 TR LAB.2013 (In-House)

 Page:
 2 of 3

Testing performed and reported at our Dandenong South Laboratory

Sample No: S18DS-08706

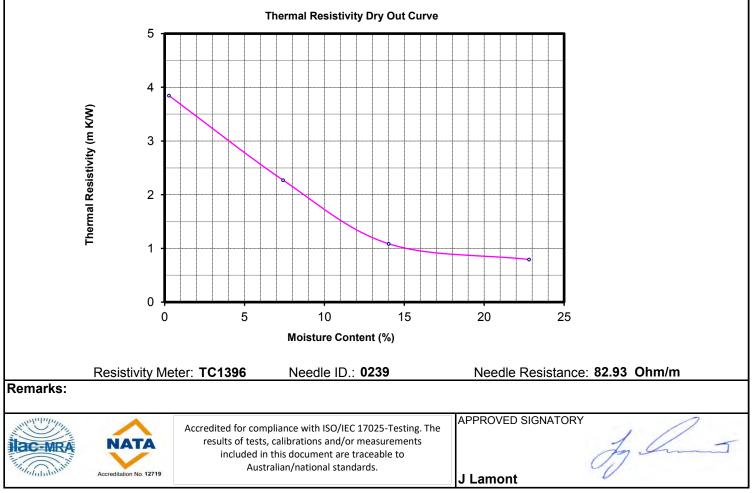
Client Sample ID: 5 Sample Location: BH05 @ 1.0-1.5m Date Sampled: 25/07/2018

Maximum Dry Density (t/m³): 1.58 Optimum Moisture Content(%): 23.1 Moulded Moisture Content (%): 22.8 Date Moulded: 14/08/2018

Sampling Procedure: As Received Sample Description: CLAY Sample History: Remoulded

Achieved Density Ratio (%): 95.5 Achieved Moisture Ratio (%): 98.5

Moisture Content (%)	Compacted Dry Density t/m ³	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
0.3		0.26	3.85
7.4		0.44	2.27
14.0		0.92	1.09
22.8	1.51	1.26	0.79



Head Office:

25 Metcalf Street Dandenong South VIC 3175 Ph: +61 8796 7900



Thermal Resistivity Dryout Curve Report

Customer: SMEC Customer Address: Level 10, 71 Queens Rd Melbourne VIC 3004 Project: Wyalong Solar Farm Project Location: Wyalong Customer Request No.: 30041768

 Report No:
 W18DS02259

 CG Project No:
 1007949

 Report Date:
 21/08/18

 Test Method:
 TR LAB.2013 (In-House)

 Page:
 3 of 3

Testing performed and reported at our Dandenong South Laboratory

Sample No: S18DS-08711

Client Sample ID: 10 Sample Location: BH16 @ 1.0-1.5m Date Sampled: 26/07/2018

Maximum Dry Density (t/m³): 1.70 Optimum Moisture Content(%): 19.7 Moulded Moisture Content (%): 19.3 Date Moulded: 8/08/2018

Sampling Procedure: As Received Sample Description: CLAY Sample History: Remoulded

Achieved Density Ratio (%): 95.5 Achieved Moisture Ratio (%): 98.0

Moisture Content (%)	Compacted Dry Density t/m ³	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
0.0		0.36	2.78
6.6		0.50	2.00
11.9		0.90	1.11
19.3	1.63	1.46	0.68







Certificate of Analysis

SMEC Australia Pty Ltd Level 10, 71 Queens Road Melbourne VIC 3004



NATA Accredited Accreditation Number 1261 Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention:

Nihad Rajabdeen

Report
Project name
Project ID
Received Date

610075-S WYALONG WEST SOLAR FARM 30041768 Jul 31, 2018

Client Sample ID Sample Matrix			BH04 Soil	BH06 Soil	BH07 Soil	BH16 Soil
Eurofins I mgt Sample No.			M18-JI35695	M18-JI35696	M18-JI35697	M18-JI35698
Date Sampled			Jul 24, 2018	Jul 25, 2018	Jul 25, 2018	Jul 26, 2018
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	700	380	6.9	590
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	380	380	48	370
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.0	7.9	7.4	7.4
Sulphate (as SO4)	30	mg/kg	210	120	< 30	180
% Moisture	1	%	21	12	3.5	17

Client Sample ID Sample Matrix Eurofins I mgt Sample No. Date Sampled			BH17 Soil M18-JI35699 Jul 27, 2018	BH23 Soil M18-JI35700 Jul 25, 2018	BH27 Soil M18-JI35701 Jul 24, 2018	BH28 Soil M18-JI35702 Jul 26, 2018
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	42	630	38	330
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	190	430	110	290
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.4	4.8	6.3	8.4
Sulphate (as SO4)	30	mg/kg	< 30	120	< 30	72
% Moisture	1	%	4.5	16	3.7	15



Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	Aug 01, 2018	28 Day
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Aug 01, 2018	7 Day
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Aug 01, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO4)	Melbourne	Aug 01, 2018	28 Day
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
% Moisture	Melbourne	Jul 31, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

	🔅 eur	ofins	mgt		ABN– 50 005 e.mail : Enviro web : www.eur	Sales@	eurofins	.com	2- 0 Pl N	akleigh hone : + ATA # ^	ston Town Close VIC 3166 ⊦61 3 8564 5000	Sydney Unit F3, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 9900 8400 NATA # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 2075	
A Pi	ompany Name: Idress: oject Name: oject ID:	Level 10, 71 Melbourne VIC 3004	alia Pty Ltd (V Queens Road WEST SOLAF	Ŀ			Re	der N port # one: k:		0	10075 3 9514 1500 3 9514 1502		Received: Due: Priority: Contact Name:	Jul 31, 2018 1:15 PM Aug 7, 2018 5 Day Nihad Rajabdeen Services Manager : Cindi Guo
		Sa	mple Detail			Chloride	Conductivity (1:5 aqueous extract at 25°C as rec.)	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Moisture Set				
Mel	bourne Laborate	ory - NATA Site	# 1254 & 142	271		х	х	х	х	х				
	ney Laboratory]			
Bris	bane Laborator	y - NATA Site #	20794											
Per	th Laboratory - I	NATA Site # 237	736								ļ			
Ext	ernal Laboratory	1									ļ			
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
1	BH04	Jul 24, 2018		Soil	M18-JI35695	х	х	х	х	х	1			
2	BH06	Jul 25, 2018		Soil	M18-JI35696	х	х	Х	Х	х]			
3	BH07	Jul 25, 2018		Soil	M18-JI35697	х	х	Х	х	х]			
4	BH16	Jul 26, 2018		Soil	M18-JI35698	х	х	Х	х	х]			
5	BH17	Jul 27, 2018		Soil	M18-JI35699	х	х	Х	х	х	ļ			
6	BH23	Jul 25, 2018		Soil	M18-JI35700	х	х	Х	х	х	ļ			
7	BH27	Jul 24, 2018		Soil	M18-JI35701	х	х	Х	х	х	ļ			
8	BH28	Jul 26, 2018		Soil	M18-JI35702	х	х	Х	х	х	ļ			
Tes	t Counts					8	8	8	8	8				



mgt

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.

- 2. All soil results are reported on a dry basis, unless otherwise stated.
- 3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- 4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- 5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- 6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 7. Samples were analysed on an 'as received' basis.
- 8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days. **NOTE: pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ug/L: micrograms per litre
ppm: Parts per million	ppb: Parts per billion	%: Percentage
org/100mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Terma	
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. Organochlorine Pesticide analysis where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- 4. Organochlorine Pesticide analysis where reporting Spike data, Toxaphene is not added to the Spike.
- 5. Total Recoverable Hydrocarbons where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- 6. pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- 7. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- 8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- 9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
- 10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.



Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Chloride			mg/kg	< 5			5	Pass	
Conductivity (1:5 aqueous extract at	25°C as rec.)		uS/cm	< 10			10	Pass	
Sulphate (as SO4)			mg/kg	< 30			30	Pass	
LCS - % Recovery									
Chloride			%	111			70-130	Pass	
Sulphate (as SO4)			%	103			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Sulphate (as SO4)	M18-JI35646	NCP	%	93			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chloride	M18-JI35698	CP	%	80			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
pH (1:5 Aqueous extract at 25°C as rec.)	M18-JI35658	NCP	pH Units	5.9	6.0	pass	30%	Pass	
Sulphate (as SO4)	M18-Au00058	NCP	mg/kg	< 30	< 30	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-JI35699	CP	%	4.5	4.0	12	30%	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

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Authorised By

Cindi Guo Alex Petridis Michael Brancati Analytical Services Manager Senior Analyst-Metal (VIC) Senior Analyst-Inorganic (VIC)

Glenn Jackson National Operations Manager Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Appendix E Electrical Resistivity Testing Results



Wyalong Solar Farm Soil Resistivity Report

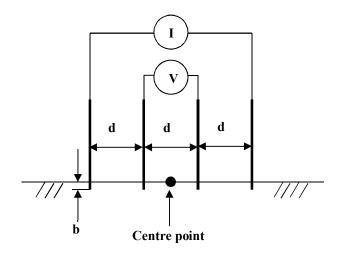
Client	Lightsource BP
Site Location:	Wyalong Solar Farm
Document Number:	SMEC-WYG-REP-002





Test Methodology: 4 Pole Wenner Method

The Wenner Method was used to perform the soil resistivity tests, with the probe spacing and configuration indicated below:



The following steps are required for the Wenner method:

- 1. A centre point needs to be selected on the middle of the ground, which shall be marked, as this will be the reference point.
- 2. Four equally spaced earth electrodes to be inserted into the ground.
- 3. Ensure that the test electrodes are in a straight line and the inserted depth is no more than 1/20th of the electrode spacing. (b = d / 20)
- 4. Using appropriate testing equipment, current is injected into the earth via the two outer rods and the voltage between the two inner rods is measured.
- The apparent soil resistivity shall be calculated. (ρ = R_{mes} x 2π x d) and recorded in the tables provided in section.



Soil Resistivity Test Results

Client: Lightsource BP					
Location of Test:					
Wyalong Solar Farm					
Date of Tests:					
21/08/18 & 22/08/18	21/08/18 & 22/08/18				
Test Conditions					
Weather: Cold and drizzle of rain. Constan	t soil moisture content at all diff	erent site locations.			
All traverses completed in dry wheat fields					
Test Procedure: Four Pole Wenner Meth	od				
Equipment Used During Testing:	Serial Number:	Next Calibration Date:			
AEMC 6472	193373QKDV	30 November 2018			

Summary of Results:

• Substation measurements: Traverses 1 & 2 were completed (locations indicated Page 4) and using algorithm converted into a two (2) layer soil model as below:

Layer	Depth	Resistivity
1	0 – 0.431 m	28.91
2	0.431 m to infinite	6.86

• Field measurements: Traverses 3,4 & 5 were completed (locations indicated Page 4) using algorithm converted into a two (2) layer soil model as below:

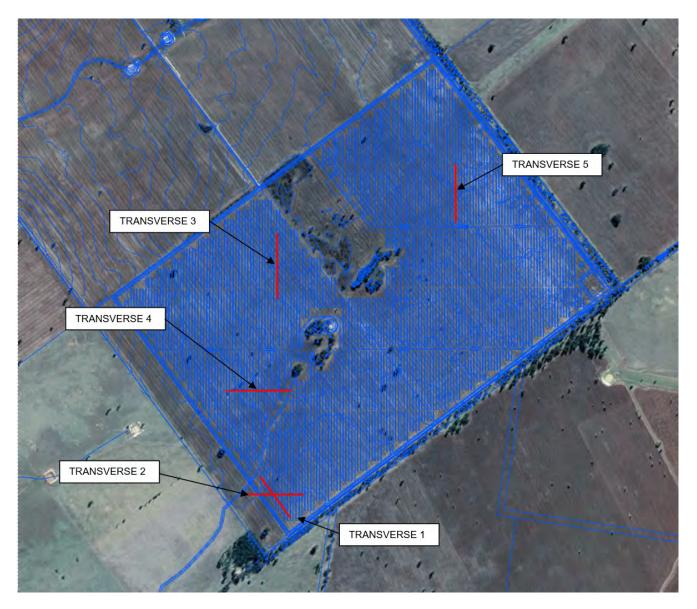
Layer	Depth	Resistivity
1	0 – 0.276 m	68.35
2	0.276 m to infinite	5.34

Test Sheet Acceptance Sign Off:

5	SMEC Report Written by:			SMEC Report Approved by:		
Name:	Jess Ramakrishnan	/ David Townley	Name:	Malcolm Davies		
Signature:	Rmi	terry	Signature:			
Date:	24/08/2018		Date:	24/08/2018		



Test Location



Wyalong Solar Farm



Test Sheet (Traverse #1)

Test	Details

Test Details				
Location:	N/W Cor	Substation Centrepoint: WGS 84 529681E 6257971N N/W Corner End Point 1: WGS 84 529604E 6258059N N/W Corner End Point 2: WGS 84 529749E 6257876N		
Traverse / Direction No:	Traverse	e 1, (at substation location)		
Date:	21/08/17	,		
Time (start):	1430H			
Time (finish):	1630H			
Test Conditions:	Dry whe	at fields		
Method:	Four Pol	e Wenner Method		
Test Setup	I			
Instrument:	AEMC 6	472		
Calibration Data (last test, n	ext test): New ma	chine – next calibration due	: 28 October 2018	
Max. voltage:	42V Pea	ık		
Max. current:	10mA			
Frequency:	128Hz s	128Hz square wave		
Measured Data				
		V	$ \rho_a \approx 2\pi a R $	
C1 a	P1	P2 a a a		
a [m]	b [m]		ρ _a [Ω.m]	
0.5	0.1	9.42	29.59	
1	0.1	2.24	14.07	
2	0.1	0.63	7.92	
4	0.1	0.23	5.78	
8	0.1	0.13	6.53	
16	0.1	0.06	6.03 10.05	
32	0.1	0.05	25.13	
50	0.1	0.08	50.27	
80	0.1	0.10	50.27	



Test Sheet (Traverse #2)

Test [Details
--------	---------

Test Details				
Location:	N/E Corner End Poir	Substation Centrepoint - WGS 84 529681E 6257971N N/E Corner End Point 1: WGS 84 529561E 6257968N N/E Corner End Point 2: WGS 84 529797E 6257963N		
Traverse / Direction No:	Traverse 2 (at substa	ation location)		
Date:	21/08/18			
Time (start):	1630H			
Time (finish):	1730H			
Test Conditions:	Dry wheat fields			
Method:	Four Pole Wenner M	lethod		
Test Setup	I			
Instrument:	AEMC 6472			
Calibration Data (last test, next t	est): New machine – next	calibration due : 28 Oct	ober 2018	
Max. voltage:	42V Peak			
Max. current:	10mA			
Frequency:	128Hz square wave			
Measured Data	I			
			$R = \frac{V}{I}$ $\rho_a \approx 2\pi aR$ $\downarrow b$	
C1 P	1 P2	C2	<u>^</u>	
a [m]	b [m]	Ω	ρ _a [Ω.m]	
0.5	0.1	5.49	17.25	
1	0.1	1.72	10.81	
2	0.1	0.57	7.16	
4	0.1	0.23	5.78	
8	0.1	0.13	6.53	
16 32	0.1	0.08	10.05	
50	0.1	0.05	15.71	
80	0.1	0.07	35.19	
	0.1	5.67	30.10	



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Test Sheet (Traverse #3)

Test Details				
Location:	Centrepoint: WGS N-S Direction	Centrepoint: WGS 84 529651E 6259018N N-S Direction		
Traverse / Direction No:	Traverse 3			
Date:	22/08/18			
Time (start):	0800H			
Time (finish):	1000H			
Test Conditions:	Dry wheat fields			
Method:	Four Pole Wenner	Method		
Test Setup				
Instrument:	AEMC 6472			
Calibration Data (last test, next test	t): New machine – ne	ext calibration due : 28 Oc	tober 2018	
Max. voltage:	42V Peak			
Max. current:	10mA			
Frequency:	128Hz square wav	'e		
Measured Data				
			ρ _a ≈ 2πaR ↓b	
C1 P1	P a ◀ ◀	2 C2	 ↑	
a [m]	b [m]	Ω	ρ _a [Ω.m]	
0.5	0.1	7.89	24.79	
1	0.1	1.79	11.25	
2	0.1	0.44	5.53	
4	0.1	0.18	4.52	
8	0.1	0.10	5.03	
16 0.1		0.04	4.02	
32	0.1	0.03	6.03	
50 80	0.1	0.02	6.28 10.05	
ou	U. I	0.02	10.00	



Test Sheet (Traverse #4)

Test Details				
		Centrepoint: WGS 84 529586E 6258460N E-W Direction		
Traverse / Direction No:		Traverse 4		
Date:		22/08/18		
Time (start):		1200H		
Time (finish):		1330H		
Test Conditions:		Dry wheat fields		
Method:		Four Pole Wenner M	ethod	
Test Setup		·		
Instrument:		AEMC 6472		
Calibration Data (last	test, next test):	New machine – next	calibration due : 28 Oc	tober 2018
Max. voltage:		42V Peak		
Max. current:		10mA		
Frequency:		128Hz square wave		
Measured Data				
	ſ			$ ho_a \approx 2\pi a R$ b
C1	P1	P2	C2	↓ ³
I ∢		ا ٭ــــــــــــــــــــــــــــــــــــ	ا جــــــــــــــــــــــــــــــــــــ	+
	а	а	а	
a [m]		b [m]	Ω	ρ _a [Ω.m]
0.5		0.1	1.39	4.37
1		0.1	0.72	4.52
2		0.1	0.3	3.77
4		0.1	0.18	4.52
8		0.1	0.08	5.03
16		0.1	0.06	12.06
32 50		0.1	0.00	6.28
80		0.1	0.02	15.08
00		0.1		



Test Sheet (Traverse #5)

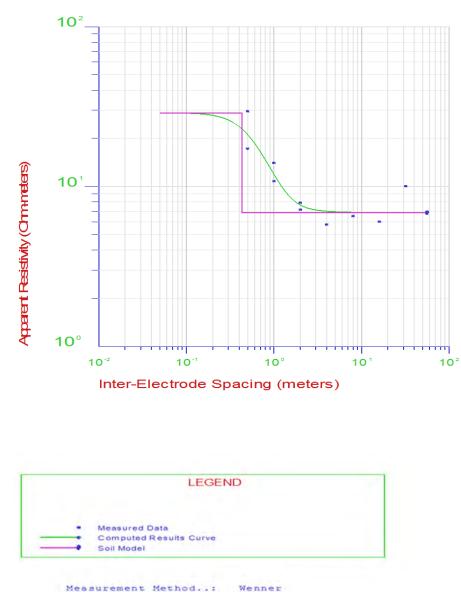
Test Details					
Location:		Centrepoint: WGS 84 530467E 6259335N N-S Direction			
Traverse / Direction No:		Traverse 5			
Date:		22/08/18			
Time (start):		1330H			
Time (finish):		1530H			
Test Conditions:		Dry wheat fields			
Method:		Four Pole Wenner Meth	bc		
Test Setup					
Instrument:		AEMC 6472			
Calibration Data (last	test, next test):	New machine – next cal	bration due : 28 Oc	ctober 2018	
Max. voltage:		42V Peak			
Max. current:		10mA			
Frequency:		128Hz square wave			
Measured Data					
				ρ _a ≈ 2πaR ↓ b	
C1	P1	P2	C2		
- -	a	← → ←	a	Ť	
a [m]		b [m]	Ω	ρ _a [Ω.m]	
0.5		0.1	8.13	25.54	
1		0.1	1.60	10.05	
2		0.1	0.58	7.29	
4		0.1	0.20	5.03	
8		0.1	0.08	4.02	
16		0.1	0.05	5.03	
32		0.1	0.03	6.03	
50		0.1	0.02	6.28	
80		0.1	0.02	10.05	



Soil Model

The following model was calculated using CDEGS software: Figure 1:Wyalong Solar Farm – 2 Layer Soil Model for Substation Traverses

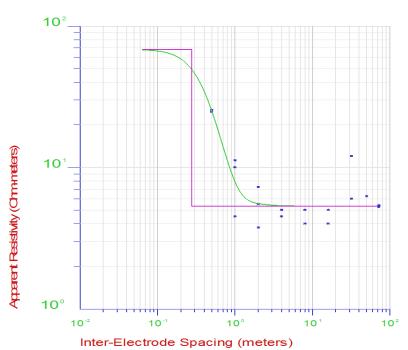
Metric/Logarithmic X and Y



RMS err	or	19.04%
Layer	Resistivity	Thickness
Number	(Ohm-m)	(Meters)
Air	Infinite	Infinite
2	28.91051	0.4314606
3	6.853844	Infinite



Figure 2 : Wyalong Solar Farm – 2 Layer Soil Model for Field Traverses



Metric/Logarithmic X and Y

		LEGEN	ID
	Com	sured Data puted Results Curve Model	
		ment Method:	
RM	IS erro	or:	27.95%
I	ayer	Resistivity	Thickness
Nu	mber	(Ohm-m)	(Meters)
==			
	Air	Infinite	Infinite
	2	68.34624	0.2756365
	3	5.337744	Infinite



Appendix B: Testing Process

Figure 3: Testing process- AEMC 6472 Ground Tester



Figure 4: Testing process - indicating probe layout and using AEMC 6472 Ground Tester



local people global experience

SMEC is recognised for providing technical excellence and consultancy expertise in urban, infrastructure and management advisory. From concept to completion, our core service offering covers the life-cycle of a project and maximises value to our clients and communities. We align global expertise with local knowledge and state-of-the-art processes and systems to deliver innovative solutions to a range of industry sectors.

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