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Department for Environment, Water and Natural Resources

NATIONAL CENTRE FOR GROUNDWATER RESEARCH AND TRAINING

WILLUNGA SUPER SCIENCE – PHASE 2 INFRASTRUCTURE DEVELOPMENT PROGRAM

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July, 2013

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INTRODUCTION

The Willunga Embayment is located within the McLaren Vale Prescribed Wells Area (PWA) and approximately 45 km south of Adelaide on the eastern margin of the St Vincent Basin (Figure.1). The McLaren Vale PWA covers approximately 320 square kilometres, with the Onkaparinga River forming part of the northern boundary, while much of the south-eastern boundary follows the ridge of the Sellicks Hill Range. The Willunga Basin extends across the McLaren Vale PWA where groundwater is essential for irrigating the area's thriving olive, almond and wine industries.

Preliminary hydrogeological assessments in the Willunga Embayment over the last two decades have identified a number of key data and knowledge gaps, including issues around groundwater recharge, the surface water/ groundwater interaction, seawater intrusion, determination of acceptable extraction limits, impacts of future land use change and irrigation with reclaimed water. In addition, the overriding impact of potential climate change on all of these processes is very poorly understood.

The Department for Water (DFW), now the Department of Environment, Water and Natural Resources (DEWNR), was engaged by the National Centre for Groundwater Research and Training (NCGRT) in 2011 to establish a dedicated groundwater infrastructure facility for Phase-2 of the Commonwealth funded Willunga Super Science project in the Willunga Embayment.

The NCGRT received $15 million funding from the Education Investment Fund through the Australian Super Science Initiative, for groundwater infrastructure. The funds are currently being invested in field infrastructure at up to 7 sites throughout Australia. The Willunga Embayment was selected as one site, and up to $3.3 million has been allocated for new infrastructure in the region. The infrastructure will facilitate long-term monitoring of the groundwater resource, and facilitate research projects through the NCGRT.

Selection of seven sites was jointly undertaken by NCGRT and DFW, with DFW responsible for negotiating ongoing access to sites, project management, and all procurement for drilling services including provision of Wellsite Hydrogeologists for supervision of the drilling operation (Figure.2)

At the completion of NCGRT research, the Agency will consider including wells drilled from this program to the existing groundwater observation network in the McLaren Vale PWA. This report details the technical specifications of the Phase-2 well drilling and construction program.

REGIONAL GEOLOGY

The Willunga Embayment is located within the McLaren Vale PWA, approximately 45 km south of Adelaide and on the eastern margin of the St Vincent Basin. The basin is a structurally controlled trough bounded in the south and east by the Willunga Fault and to the north by outcropping pre-Cambrian/ Cambrian basement. The stratigraphy and hydrostratigraphy is given in Table 1. The trough is formed by the southward tilt of a basement block below the basin, with the upper edge of the block exposed at the Onkaparinga Gorge. The depth of the basin increases to about 350 m near the Willunga Fault at Aldinga.

Table 1. Stratigraphy and Hydrostratigraphy of the Willunga Embayment

Stratigraphy							
		Cooper, 1979	May, 1992		Fairburn, 1998	Bowering, 1979	Aldam, 1990a, b
Quaternary	Holocene	(Not included as part of the investigation)	–		Modern alluvium, Semaphore Sand member and beach gravels	Confining bed over much of the basin. Thin shallow sandy and gravel unconfined and semi-confined aquifers.	Aquifers, confining beds.
			Waldeila Formation	Ngankipari Sand	(Not mapped)		
					Ngankipari Sand		
	Pleistocene	(Not included as part of the investigation)	Christies Beach Formation		Christies Beach Formation		Aquifers, confining beds.
			(Not present in coastal section)		Kurrajong Formation		
			Taringa Formation		Ngaltinga Formation		
			Ngaltinga Formation	Snapper Point Sand member			
				Neva Clay member	Pirramimma sandstone		
			Robinson Point Formation		Ochre Cove Formation		
			(Mapped as Robinson Point Formation)		Seaford Formation		
			Burnham Limestone		Burnham Limestone		
Tertiary	Pliocene	(Not included as part of the investigation)	Hallett Cove Sandstone		Hallett Cove Sandstone	?	?
	Eocene to Oligocene	Port Willunga Formation – Pirramimma Sand member	–		Port Willunga Formation	Confined aquifer in southern half of basin. Unconfined elsewhere.	(Aquifer T1) Port Willunga Formation Aquifer including Pirramimma sand, Aldinga and Ruwarung members.
		Ruwarung member					
		Aldinga member					
		Chinaman Gully Formation			Chinaman Gully Formation	Aquitard	Confining bed
		Blanche Point Formation – Gull Rock member			Undifferentiated (Blanche Point Formation and Tortachilla Limestone)	Confining bed over southern half of basin. Aquifer to aquitard elsewhere.	
		Tortachilla Limestone				Aquitard	
		Maslin Sands – South Maslin Sand member			Maslin Sands (undifferentiated South Maslin Sand and North Maslin Sand)	Confined aquifer over most of basin. Unconfined in northern most part of basin.	(Aquifer T2) Maslin Sands including South Maslin Sand and North Maslin Sand members.
		North Maslin Sand member					
Permian		Cape Jervis Formation	–		–	Varies from poor aquifer to aquitard.	?
Precambrian		Adelaide System	–		–	Almost entirely confined or semi-confined aquifer. Unconfined over a restricted area.	Basement aquifer, confining in places.

REGIONAL HYDROGEOLOGY

The Willunga Basin contains Quaternary and Tertiary sediments that reach a maximum thickness of about 350 m in the southern and south-eastern areas. The sediments finger out against basement rocks along the northern boundary of the McLaren Vale PWA and the Willunga Fault to the east. The pre-Cambrian/ Cambrian basement underlies a succession of Quaternary and Tertiary sediments and a schematic cross-section showing the extent of the four main aquifer systems along the main axis of the Willunga Embayment (north-east – south-west) is shown in Figure. 3.

Groundwater occurs in four major aquifers:

- Quaternary Aquifer
- Port Willunga Formation Aquifer
- Maslin Sands Aquifer
- Fractured Rock Aquifer

QUATERNARY AQUIFER

Sands and interbedded clays form shallow Quaternary unconfined aquifers which are generally low yielding and provide mostly stock and domestic supplies, with limited extraction for irrigation. Recharge is predominantly derived from local rainfall and runoff provided by streams.

PORT WILLUNGA FORMATION AQUIFER

The Port Willunga Formation aquifer consists of sand and limestone and generally is of high yield. It is unconfined in its northern extent near McLaren Vale and McLaren Flat, but is confined by Quaternary sediments in the south and south-western parts of the PWA. Recharge from rainfall primarily occurs where it is unconfined. Approximately 67% of groundwater extraction within the PWA is directly from this formation.

MASLIN SANDS AQUIFER

The Maslin Sands aquifer directly overlies basement rocks and comprises fine to coarse sands and clays. The aquifer is recharged by rainfall in the north-east of the PWA where it outcrops. Elsewhere, the aquifer is confined and separated from the overlying Port Willunga Formation aquifer by the Blanche Point Formation aquitard which consists of low-permeability marine mudstone and limestone. Approximately 18% of groundwater extraction within the PWA occurs from this formation.

FRACTURED ROCK AQUIFER

Fractured Rock aquifers occur in pre-Cambrian/ Cambrian basement rocks (slate, quartzite, shale) which form ranges of the Adelaide Geosyncline to the east of the Willunga Fault and also along the Onkaparinga Gorge. Infiltration of rainfall provides recharge to the aquifer where they underlie sedimentary aquifers within the Willunga Basin. Approximately 15% of groundwater extraction occurs from the fractured rock aquifers.

GROUNDWATER FLOW AND SALINITY

PORT WILLUNGA FORMATION AQUIFER

Groundwater within the Port Willunga Formation typically flows from the higher north-eastern part of the basin towards the coast in a south-westerly direction. The groundwater salinity contours show an increase toward the coast in a south-westerly direction from about 700 mg/L to over 3000 mg/L. In some parts of the basin, the lower portion of the Port Willunga Formation contains lower salinity groundwater than the upper portion.

MASLIN SANDS AQUIFER

Groundwater in the Maslin Sands aquifer flows from the recharge areas in the north-east towards the south-west. Salinity in the aquifer ranges from below 500 mg/L in the north and increases down gradient towards the coast and along the south-west margin.

FRACTURED ROCK AQUIFER

Groundwater flow within this aquifer generally follows the topography and flows from high points around the basin margin toward the low points within the basin, with some discharge to the sedimentary aquifers. Beneath the sediments, the flow direction in the Fractured Rock aquifer is south-west toward the coast. The salinity distribution in this aquifer is variable.

DRILLING PROGRAM AND WELLFIELD DESIGN

The Phase-2 drilling program was designed for construction of a new wellfield comprising 37 groundwater observation wells at seven sites on a south-west to north-east transect across the Willunga Embayment. This transect commenced in Aldinga (Site-1) and ended in Blewitt Springs (Site-7). Locations of all sites are given in Figure 2.

The wellfield was designed by the NCGRT to undertake long term research of groundwater flow interactions of the fractured rock basement and sedimentary basin, leakage of groundwater between the multi-aquifer systems, groundwater discharge into the ocean, risk of climate change induced sea water intrusion, vertical and horizontal groundwater flow characteristics, groundwater age and residence time/ flux modelling through isotope analysis and other leading edge techniques. Plans for Individual Site Locations are given in Figures 4 to 10.

Kangarilla Drilling Pty Ltd was awarded a contract for the drilling program in mid 2012. Works commenced in July 2012 and were completed in April 2013. Drilling Solutions Pty Ltd were engaged as a sub-contractor by Kangarilla Drilling to diamond-core a sequence of the Blanche Point Formation aquitard for the determination of pore water age and residence periods by the NCGRT, and this occurred at 5 sites.

WELL DRILLING AND CONSTRUCTION

Kangarilla Drilling were engaged to drill and construct 37 observation wells. The drilling rig deployed for the drilling operation was an Ingersoll Rand TH60. All drillholes were drilled by rotary mud (Polymer) at a nominal 200 mm diameter with either a pick or roller bit.

A primary drillhole was drilled to target depth (TD) and informed all remaining well completion details on a site by site basis.

Representative samples from cuttings were collected in vials and chip trays at 1m increments from surface to total depth (TD) on the primary drillhole (Well-1) at each site. Sampling at subsequent drillholes occurred at 1 m intervals starting from 20 m above TD.

A Chronology of Events related to the drilling program was recorded is displayed in Appendix A.

WELL DESIGN

Well construction incorporated in-line completions and design based upon a nominal 100 mm diameter Class 12 or 18 UPVC casing with either a 100 mm Class 12 or 18 UPVC 0.5 mm slotted casing or 100 mm wirewound stainless steel 304 grade screen. There were no sumps constructed below the production zone.

Gravel pack was nominal 7 mm rounded quartz gravel blended with 8/16 sand and grouting to surface was undertaken through tremmie line displacement and multiple polypipe strings. Development was undertaken for a minimum of three hours through a 2” drill stem and did not include jetting through the screen with air/ water. Wells were not sterilised at the request of NCGRT.

Completion at surface was with either a lockable galvanised stand pipe or a lockable concrete gattic cover set into a concrete pad.

A detailed Lithological Log of each Site is contained in Appendix B. – Lithological Log.

All final well specifications are tabulated in Appendix C - As Constructed Drilling Schedule, and illustrated in Appendix D - Well Schematic Diagrams.

DIAMOND CORING OF THE AQUITARD

Drilling Solutions were engaged as a sub-contractor by Kangarilla Drilling to diamond core a discrete sequence of the Blanche Point Formation at Sites 1, 2, 3, 4 and 7. Coring was omitted at Sites 5 and 6 toward the end of the construction program. Core intervals are given in Table 2 below.

The drilling rig deployed for the drilling operation was a MRK 5 Investigator utilising HQ rods and a core barrel capable of retrieving core of 1 metre length.

Table 2. Diamond Core Intervals

Drillhole Name	Start (mBGL)	Finish (mBGL)	Length (m)
WSS-P2 S1-1	75.3	147	71.7
WSS-P2 S2-1	66	148	82
WSS-P2 S3-1	111	179	68
WSS-P2 S4-1	50	105	55
WSS-P2 S5-1	Cancelled		
WSS-P2 S6-1	Cancelled		
WSS-P2 S7-1	0	59	59

DOWNHOLE WIRELINE LOGGING

DFW Geophysical services were deployed to survey the primary drillhole (deepest) well at each site through a mudded and open drillhole. The results from the survey coupled with the lithology/ hydrostratigraphy description obtained from strata sampling informed the aquifer boundaries and adjustment of completion depth of associated wells at each site. Results from Geophysical surveying are contained in Appendix E.

The survey suite included the following downhole instrumentation:

- Gamma (GAPI), Near/ Far Density (NEAR, FAR), Neutron (NEUT), Calliper (CALI), Spontaneous Potential (SP), Point Resistance (PR), Focussed Resistivity (Latter? Log), Electromagnetic Induction (MED, DEEP)

Figure 1. McLaren Vale Prescribed Water Allocation – Study Area

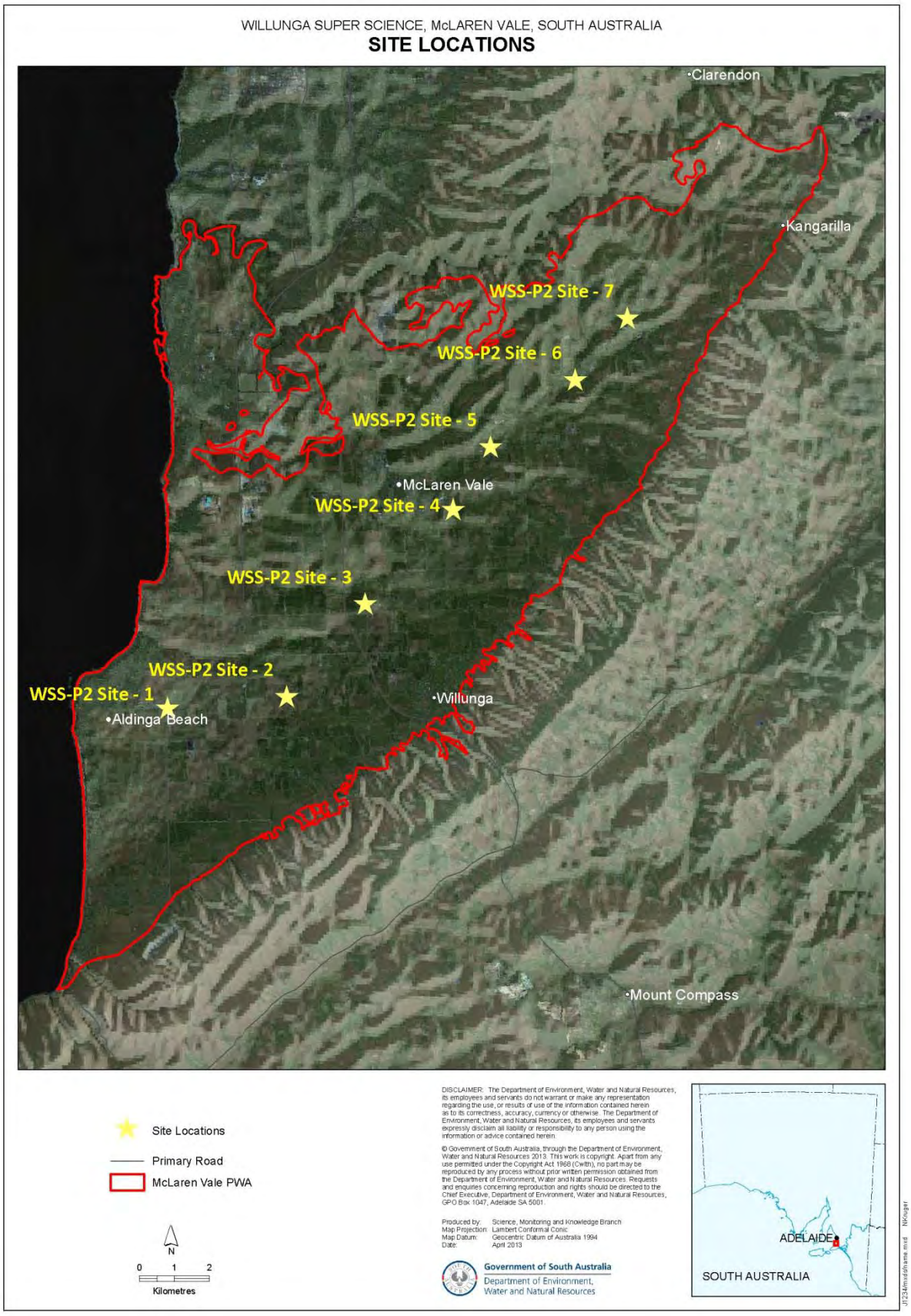


Figure 2. Site Locations

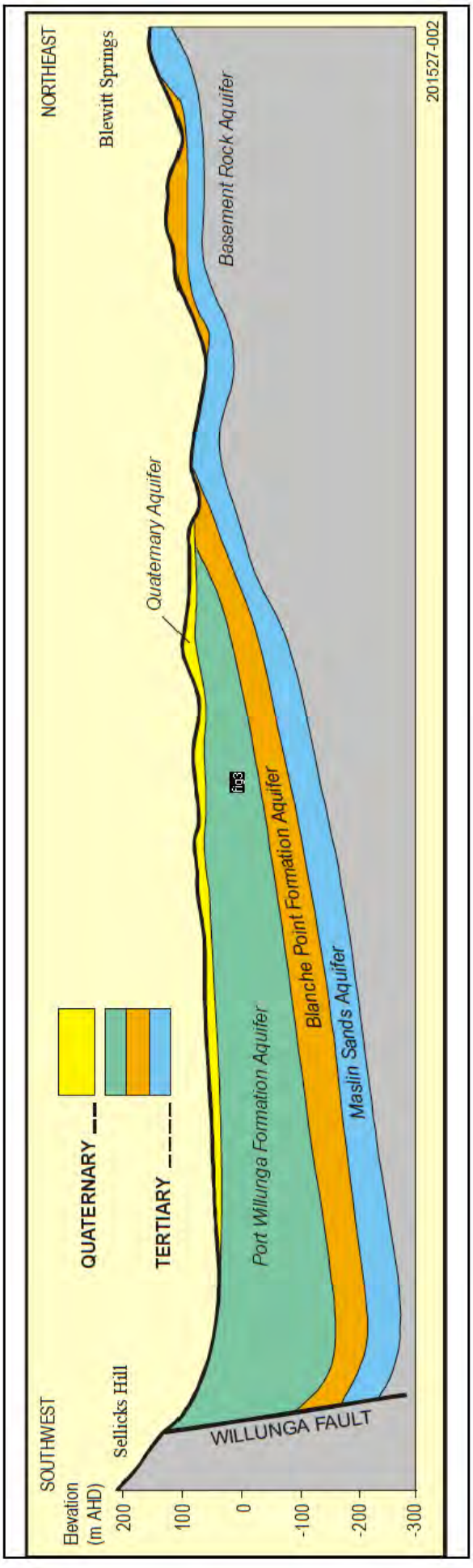


Figure 3. WSS-P2 - Geological Cross Section

Figure 4. Site-1

Figure 5. Site-2

Figure 6. Site-3

Figure 7. Site-4

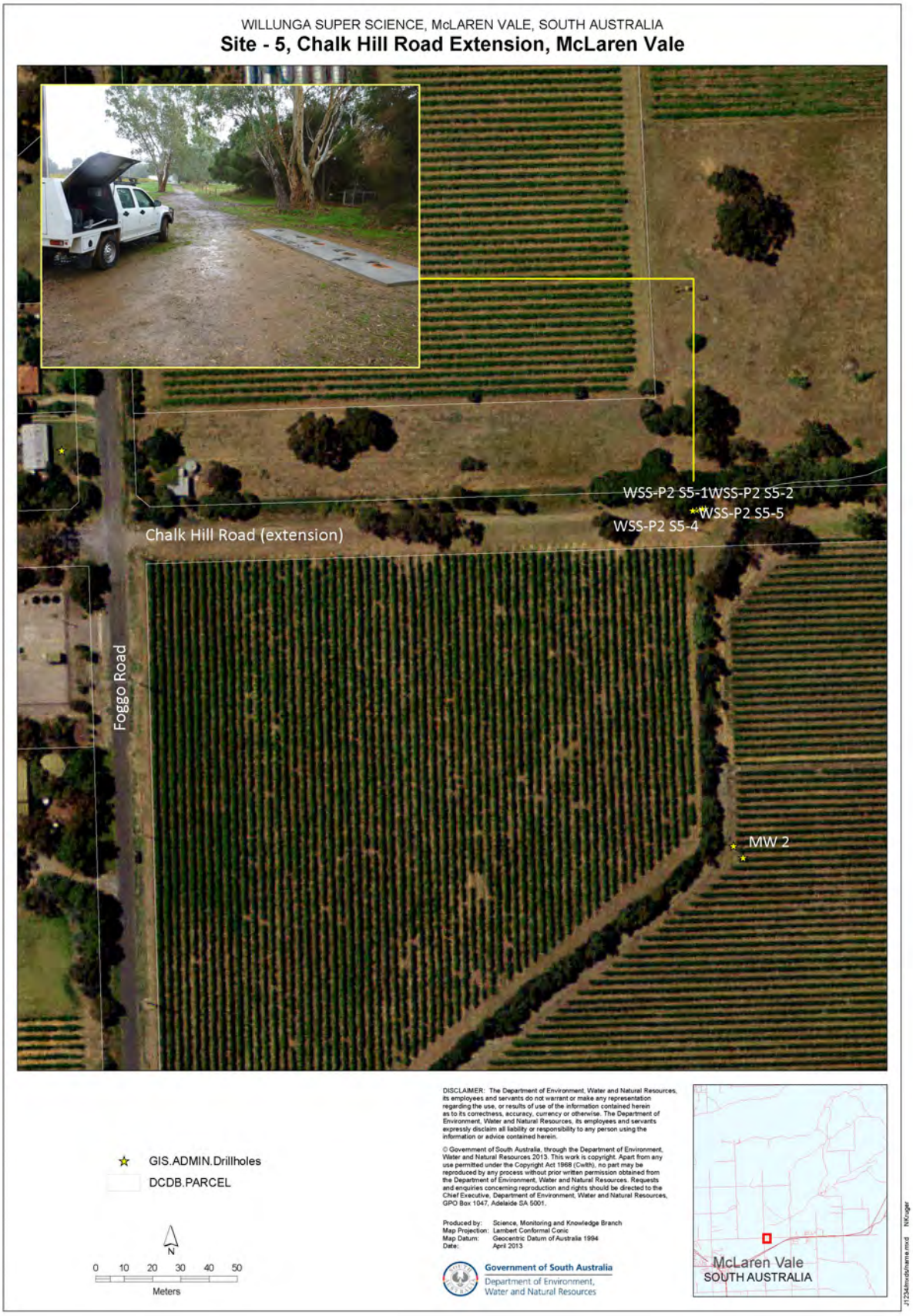


Figure 8. Site-5

Figure 9. Site-6

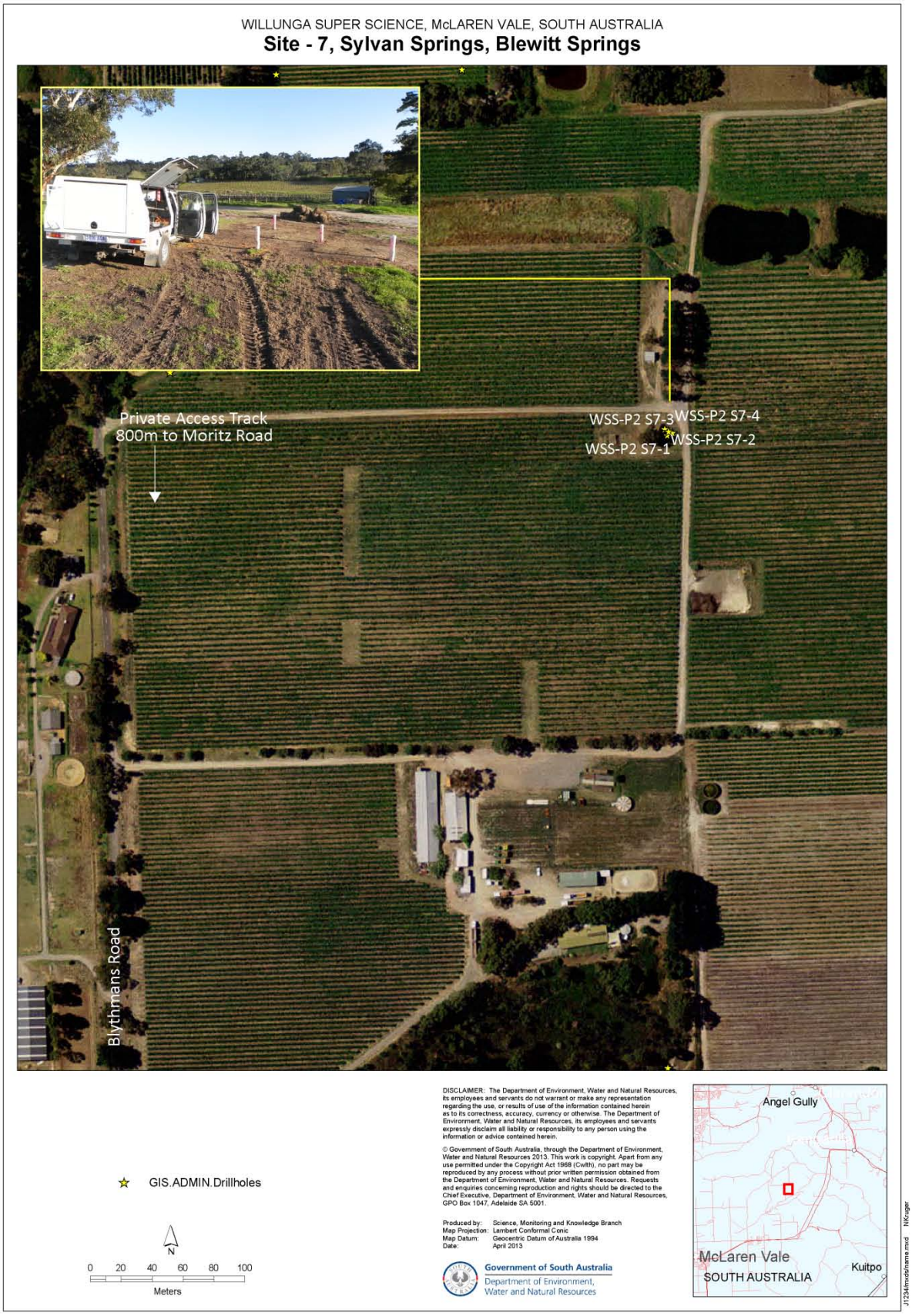


Figure 10. Site-7

APPENDICES

APPENDIX A. CHRONOLOGY OF EVENTS

Date	Week	Days	Total Work Days	Notes
Saturday, 30 June, 2012	0			Field Equipment - sorting, cleaning and packing vehicle
Sunday, 1 July, 2012	1			
Monday, 2 July, 2012	1	1	1	Kangarilla Drilling in Nangkita completing development, and sterilising equipment
Tuesday, 3 July, 2012	1	2	2	Start S4-1. Drill 0 - 62 mBGL.
Wednesday, 4 July, 2012	1	3	3	Drill 62 - 135 mBGL.
Thursday, 5 July, 2012	1	4	4	Drill 135 - 146.5 mBGL. Geophysically log S4-1
Friday, 6 July, 2012	1	5	5	Grout and run casing S4-1
Saturday, 7 July, 2012	1	6	6	Finish grouting of S4-1
Sunday, 8 July, 2012	2	7		
Monday, 9 July, 2012	2	8	7	S7-Core. S4-1 Development
Tuesday, 10 July, 2012	2	9	8	S7-Core. S4-2 commence drill 0 to 50 mBGL.
Wednesday, 11 July, 2012	2	10	9	S7-Core. S4-3 commence drill 0 to 87 mBGL
Thursday, 12 July, 2012	2	11	10	S4-3 drill 87 to 117 mBGL and commence construction.
Friday, 13 July, 2012	2	12	11	S4-2 Core. S4-3 grout and develop.
Saturday, 14 July, 2012	2	13		
Sunday, 15 July, 2012	2	14		
Monday, 16 July, 2012	3	15	12	S4-5 Drill to TD 47 mBGL. S4-2 Core from 50 to 54 mBGL. M Booth to medical.
Tuesday, 17 July, 2012	3	16	13	S4-5 Construct (Slotted) 44-47 mBGL, gravel + grout to surface. S4-2 Core from 54 to 106 mBGL. Safework SA
Wednesday, 18 July, 2012	3	17	14	S4-5 Develop. S4-2 Core 105 mBGL.
Thursday, 19 July, 2012	3	18	15	S4-6 Drill and Construct 29 - 32 mBGL.
Friday, 20 July, 2012	3	19	16	S4-6 Develop.
Saturday, 21 July, 2012	3	20		
Sunday, 22 July, 2012	3	21		
Monday, 23 July, 2012	4	22	17	S4-2 Drill 0 to 44 mBGL with 7 7/8" (previously drilled 6" to 50 mBGL, & cored 50 to 105 mBGL).
Tuesday, 24 July, 2012	4	23	18	S4-2 Drill 44 to 123 mBGL.
Wednesday, 25 July, 2012	4	24	19	S4-2 Drill 123 to 134 mBGL. Construct 0 to 129, 129 to 134 mBGL. 1st Grout plug.
Thursday, 26 July, 2012	4	25	20	S4-2 2nd Grout plug to surface. Commence development from 60 mBGL.
Friday, 27 July, 2012	4	26	21	Commence development from 119 mBGL with Poly. Unsafe. Run 2" rods to 86 mBGL and commence.
Saturday, 28 July, 2012	4	27		
Sunday, 29 July, 2012	4	28		
Monday, 30 July, 2012	5	29	22	S4-2 pull 2" galv rods from 86 m. Commence drilling of S4-4 (Tortachilla). Drill 0 to 87 mBGL metres here.
Tuesday, 31 July, 2012	5	30	23	S4-2 Drill 87 to 102. Install casing 0-97, 97 to 102 WWSS-Screen. Grout thru initial 2xtremmies.
Wednesday, 1 August, 2012	5	31	24	S4-2 Grout to surface. Commence development.
Thursday, 2 August, 2012	5	32	25	S4-2 Clean up. Sterilisation and prep. For S7.
Friday, 3 August, 2012	5	33	26	Maintenance

Date	Week	Days	Total Work Days	Notes
Saturday, 4 August, 2012	5	34		
Sunday, 5 August, 2012	5	35		
Monday, 6 August, 2012	6	36	27	Service and repair to Rig/ Equiptment etc
Tuesday, 7 August, 2012	6	37	28	Drill S7-1 7 7/8" 0 to 74 mBGL.
Wednesday, 8 August, 2012	6	38	29	Drill 74 to 123 mBGL. End of Rods at 123. Request additional rods 123 to 129 mBGL.
Thursday, 9 August, 2012	6	39	30	Geophysics 0 - 129 mBGL. 1130 on: construct S7-1. 0 to 126 Casing, 126 to 129 Slotted CL18 Casing. Grout from 120m (double tremmie) to ~50 mBGL
Friday, 10 August, 2012	6	40	31	Second grout plug, develop from 70 mBGL.
Saturday, 11 August, 2012	6	41		
Sunday, 12 August, 2012	6	42		
Monday, 13 August, 2012	7	43	32	Drill S7-2 from 0 to 38 mBGL
Tuesday, 14 August, 2012	7	44	33	Drill S7-2 from 38 to 83. Commence construction 0 to 80, 80 to 83. Grout from 70 to ~20 mBGL
Wednesday, 15 August, 2012	7	45	34	Grout S7-2 ~20 m to surface. Commence airlift development from 60m, until clear.
Thursday, 16 August, 2012	7	46	35	Install standpipes to S4 wells(?) TBC dependent on conditions. No drilling at S7.
Friday, 17 August, 2012	7	47	36	No drilling at S7. Maintenance to equipt and S4 standpipes(?) TBC
Saturday, 18 August, 2012	7	48		
Sunday, 19 August, 2012	7	49		
Monday, 20 August, 2012	8	50	37	Rig back to S7, commence S7-4. Drill S7-4 0 to 27, grout.
Tuesday, 21 August, 2012	8	51	38	Develop S7-4. Relocate to S7-3 (spud in to commence 64-67) Drill 0 - 25
Wednesday, 22 August, 2012	8	52	39	Drill S7-3 25 - 67m, construct 0-64, 64-67
Thursday, 23 August, 2012	8	53	40	Develop S7-4, de-mobilise from S7.
Friday, 24 August, 2012	8	54	41	De-mobilise and sterilisation of equiptment.
Saturday, 25 August, 2012	8	55		
Sunday, 26 August, 2012	8	56		
Monday, 27 August, 2012	9	57	42	Pending City of Onkaparinga execution upon Authorisation for Site-2, 3, 5 & 6, review set up at S2 (Ryan Road). Wellheads to S4.
Tuesday, 28 August, 2012	9	58	43	Set up on S2-1, site flooded due to perforation of an unidentified domestic water supply.
Wednesday, 29 August, 2012	9	59	44	Spud in S2-1. Circulation issues with Control Casing. Install 9m 200mm Steel and grout back annulus. Drill 0 - 14 mBGL. Allow grout to cure.
Thursday, 30 August, 2012	9	60	45	Drill S2-1 14 - 70
Friday, 31 August, 2012	9	61	46	Drill S2-1 70 - 147
Saturday, 1 September, 2012	9	62		
Sunday, 2 September, 2012	9	63		
Monday, 3 September, 2012	10	64	47	Drill S2-1 147 - 184 mBGL. Hard Drilling and incremental low sample recovery.
Tuesday, 4 September, 2012	10	65	48	Drill S2-1 184 - 194 mBGL. Hard Drilling. Drillers request refusal at 194. Successful Geophys. Logging to 194 mBGL
Wednesday, 5 September, 2012	10	66	49	Commence construction of S2-1 Casing 0 - 189 mBGL, Screen 189 - 192 mBGL. First grout
Thursday, 6 September, 2012	10	67	50	S2-1 Second grout and air-lift development from 130 mBGL for 3hr + 149.5mBGL for 1hr
Friday, 7 September, 2012	10	68	51	Drill S2-4 0 - 45 mBGL
Saturday, 8 September, 2012	10	69		
Sunday, 9 September, 2012	10	70		
Monday, 10 September, 2012	11	71	52	Drill S2-4 44 -68 mBGL, construct 0 - 66, 66 - 68

Date	Week	Days	Total Work Days	Notes
Tuesday, 11 September, 2012	11	72	53	Develop S2-4 from 45.5 mBGL for 3hr. Pack up site 2
Wednesday, 12 September, 2012	11	73	54	no site works
Thursday, 13 September, 2012	11	74	55	no site works
Friday, 14 September, 2012	11	75	56	no site works
Saturday, 15 September, 2012	11	76		
Sunday, 16 September, 2012	11	77		
Monday, 17 September, 2012	12	78	57	no site works
Tuesday, 18 September, 2012	12	79	58	no site works
Wednesday, 19 September, 2012	12	80	59	no site works
Thursday, 20 September, 2012	12	81	60	no site works
Friday, 21 September, 2012	12	82	61	no site works
Saturday, 22 September, 2012	12	83		
Sunday, 23 September, 2012	12	84		
Monday, 24 September, 2012	13	85	62	no site works
Tuesday, 25 September, 2012	13	86	63	no site works
Wednesday, 26 September, 2012	13	87	64	no site works
Thursday, 27 September, 2012	13	88	65	no site works
Friday, 28 September, 2012	13	89	66	no site works
Saturday, 29 September, 2012	13	90		
Sunday, 30 September, 2012	13	91		
Monday, 1 October, 2012	14	92	67	no site works (Public Holiday)
Tuesday, 2 October, 2012	14	93	68	Reconvene at Site-2, for S2-7 (19 to 20m)
Wednesday, 3 October, 2012	14	94	69	Develop S2-7. Very little water, surging and add water to attempt to remove mud
Thursday, 4 October, 2012	14	95	70	Drill S2-6, 0 to 34, construct 0-32, 32-34
Friday, 5 October, 2012	14	96	71	Develop S2-6. Commence drill preparation for S2-5
Saturday, 6 October, 2012	14	97		
Sunday, 7 October, 2012	14	98		
Monday, 8 October, 2012	15	99	72	Drill S2-5 0 to 50 mBGL. Construct 0-48, 48-50
Tuesday, 9 October, 2012	15	100	73	Develop S2-5
Wednesday, 10 October, 2012	15	101	74	Commence S2-3
Thursday, 11 October, 2012	15	102	75	Drill S2-3 to 68 mBGL
Friday, 12 October, 2012	15	103	76	Drill S2-3 68 - 118 mBGL
Saturday, 13 October, 2012	15	104	77	Construct S2-3
Sunday, 14 October, 2012	15	105		
Monday, 15 October, 2012	16	106	78	Develop S2-3. Prepare to drill S2-2 (pre-drill for Corer) 0 - 36 mBGL
Tuesday, 16 October, 2012	16	107	79	S2-2 pre-drilling for Corer 36 to 67 mBGL
Wednesday, 17 October, 2012	16	108	80	S2-2 Coring 67 to 68 mBGL & S1-1 Setup
Thursday, 18 October, 2012	16	109	81	S2-2 Coring (68 to 73.5 mBGL) & S1-1 Setup, Drill 0 - 14 mBGL
Friday, 19 October, 2012	16	110	82	S2-2 Coring (73.5 to 87 mBGL) & S1-1 Drill 14 to 44 mBGL. S1-1 lost circ. 34-44 mBGL
Saturday, 20 October, 2012	16	111		
Sunday, 21 October, 2012	16	112		
Monday, 22 October, 2012	17	113	83	S2-2 Coring (87 to 115.5 mBGL) & S1-1 Drill 44 to 48 mBGL - Lost Circulation
Tuesday, 23 October, 2012	17	114	84	S2-2 Coring (Stuck) & S1-1 drill 48 to 99 mBGL
Wednesday, 24 October, 2012	17	115	85	S2-2 Coring (Stuck) & S1-1 drill 99 to 149 mBGL

Date	Week	Days	Total Work Days	Notes
Thursday, 25 October, 2012	17	116	86	S2-2 Coring (Stuck) & S1-1 drill 149 to 164 (includes 3m x overshoot)
Friday, 26 October, 2012	17	117	87	S2-2 Coring (Stuck until 1200hrs, then drill 115.5 to 148 mBGL) & construct S1-1 0-158, 158-161 mBGL
Saturday, 27 October, 2012	17	118		
Sunday, 28 October, 2012	17	119		
Monday, 29 October, 2012	18	120	88	S1-1 2nd grout & air lift development (1hr)
Tuesday, 30 October, 2012	18	121	89	S1-1 air lift (2hr) & commence drilling S1-3 0 to 33 mBGL.
Wednesday, 31 October, 2012	18	122	90	S1-3 drill 33 to 74 mBGL, construct S1-3 0 to 72, 72 to 74 mBGL.
Thursday, 1 November, 2012	18	123	91	S1-3 Air lift development. Drill S1-4 0 to 31 mBGL
Friday, 2 November, 2012	18	124	92	S1-4 drill 31 to 59 mBGL, construct S1-4 0-57, 57-59 mBGL
Saturday, 3 November, 2012	18	125		
Sunday, 4 November, 2012	18	126		
Monday, 5 November, 2012	19	127	93	S1-4 second cement and development. S2-2 remove 66m of HW steel casing from 6" Drillhole.
Tuesday, 6 November, 2012	19	128	94	S1-6 drill 0 to 31 mBGL
Wednesday, 7 November, 2012	19	129	95	S1-6 develop. S1-5 Drill to 31mBGL
Thursday, 8 November, 2012	19	130	96	S1-5 Drill 31 to 44 mBGL, construct 0-42, 42-44, Gravel 41-44, Grout 0-41
Friday, 9 November, 2012	19	131	97	S1-5 Development. S1-2 (Core Sequence) drill 6" 0 to 37 mBGL.
Saturday, 10 November, 2012	19	132		
Sunday, 11 November, 2012	19	133		
Monday, 12 November, 2012	20	134	98	S1-2 (Core Sequence) drill 6" 37 to 78 mBGL
Tuesday, 13 November, 2012	20	135	99	S1 Demobilise for the corer. S2-2 re-mobilise
Wednesday, 14 November, 2012	20	136	100	S2-2 Commence drilling in cored hole, drill 0 to 30m 7 7/8". D-Solutions to S1-2, and commence set up of equiptment etc, core 76 mBGL.
Thursday, 15 November, 2012	20	137	101	S2-2 drill from 30 to 142 mBGL. S1-2 (Core) 76 to 93 mBGL.
Friday, 16 November, 2012	20	138	102	S2-2 drill from 142 to 161 mBGL. S1-2 (Core) 93 to 117 mBGL.
Saturday, 17 November, 2012	20	139		
Sunday, 18 November, 2012	20	140		
Monday, 19 November, 2012	21	141	103	S2-2 re-drill from 0-161, drillhole slumping quickly, and bailer indicates 23 m BGL to blockage. S1-2 (Core) 117 to 148 mBGL all OK.
Tuesday, 20 November, 2012	21	142	104	S2-2 run rods and re-drill/ ream to 161. After trip out, indicates drillhole open. Run casing, short of target to 0-156, 156-159. D-Solutions HW casing stuck at S1-2, but rods out OK. Discuss the adjustment of S1-2 Well specifications, deeper to 0-144, 144-147 with EB.
Wednesday, 21 November, 2012	21	143	105	S2-2 second grout and 2 hr development
Thursday, 22 November, 2012	21	144	106	S2-2 top up of cement and additional 2 hr development
Friday, 23 November, 2012	21	145	107	S2 demobilise and sterilisation. No drilling for WSS-P2
Saturday, 24 November, 2012	21	146		
Sunday, 25 November, 2012	21	147		
Monday, 26 November, 2012	22	148	108	Re-mobilise to S1-2 (Rig-1) and attempt removal of HW casing from cored drillhole S1-2 (Core)
Tuesday, 27 November, 2012	22	149	109	S1-2 remove HW Casing, commence drillin 0 to 44 mBGL
Wednesday, 28 November, 2012	22	150	110	S1-2 drilling 44 to 148 mBGL
Thursday, 29 November, 2012	22	151	111	S1-2 Construction 0-144, 144-147 and first grout
Friday, 30 November, 2012	22	152	112	S1-2 second grout and development. De-mobilise from S1 and S2.
Saturday, 1 December, 2012	22	153		
Sunday, 2 December, 2012	22	154		
Monday, 3 December, 2012	23	155	113	Demobilise from S1 and S2. Sterilisation of equiptment, commence set S3

Date	Week	Days	Total Work Days	Notes
Tuesday, 4 December, 2012	23	156	114	S3-1 Drill 0 to 74
Wednesday, 5 December, 2012	23	157	115	S3-1 Drill rig down - intermitten hydraulic engine shutdown
Thursday, 6 December, 2012	23	158	116	S3-1 Drill 74 to 118
Friday, 7 December, 2012	23	159	117	S3-1 Drill rig down - intermitten hydraulic engine shutdown. Trip out rods in afternoon.
Saturday, 8 December, 2012	23	160		
Sunday, 9 December, 2012	23	161		
Monday, 10 December, 2012	24	162	118	S3-1 Drill 118 to 140 mBGL
Tuesday, 11 December, 2012	24	163	119	S3-1 Drill 140 to 177 mBGL (condition drillhole)
Wednesday, 12 December, 2012	24	164	120	S3-1 Drill 177 to 190 mBGL (condition drillhole), ~100m of rods dropped into drillhole (afternoon)
Thursday, 13 December, 2012	24	165	121	S3-1 retrieve rods and inspect/change drill-bit. Rods stuck on trip-in at ~40 mBGL. Geophysics cancelled.
Friday, 14 December, 2012	24	166	122	S3-1 Re-drill in to 120 mBGL. Geophysics cancelled
Saturday, 15 December, 2012	24	167		
Sunday, 16 December, 2012	24	168		
Monday, 17 December, 2012	25	169	123	S3-1 Re-drill from 120 to 214 mBGL (allows for a 3m overshoot)
Tuesday, 18 December, 2012	25	170	124	S3-1 Downhole Geophysics - note that successive shallower runs were encountered due to drillhole collapse
Wednesday, 19 December, 2012	25	171	125	S3-1 Swab to 214 mBGL. Construct casing 205-208 mBGL (shallower due to drillhole collapse) + 1st cement
Thursday, 20 December, 2012	25	172	126	S3-1 2nd cement + initial development
Friday, 21 December, 2012	25	173	127	S3-1 3rd cement + additional development. Site clean-up prior to Christmas/ New Year shutdown
Saturday, 22 December, 2012	25	174		
Sunday, 23 December, 2012	25	175		
Monday, 24 December, 2012	26	176	128	Kangarilla Drilling Pty - Christmas Shutdown
Tuesday, 25 December, 2012	26	177	129	Kangarilla Drilling Pty - Christmas Shutdown
Wednesday, 26 December, 2012	26	178	130	Kangarilla Drilling Pty - Christmas Shutdown
Thursday, 27 December, 2012	26	179	131	Kangarilla Drilling Pty - Christmas Shutdown
Friday, 28 December, 2012	26	180	132	Kangarilla Drilling Pty - Christmas Shutdown
Saturday, 29 December, 2012	26	181		
Sunday, 30 December, 2012	26	182		
Monday, 31 December, 2012	27	183	133	Kangarilla Drilling Pty - Christmas Shutdown
Tuesday, 1 January, 2013	27	184	134	Kangarilla Drilling Pty - Christmas Shutdown
Wednesday, 2 January, 2013	27	185	135	Kangarilla Drilling Pty - Christmas Shutdown
Thursday, 3 January, 2013	27	186	136	Kangarilla Drilling Pty - Christmas Shutdown
Friday, 4 January, 2013	27	187	137	Kangarilla Drilling Pty - Christmas Shutdown
Saturday, 5 January, 2013	27	188		
Sunday, 6 January, 2013	27	189		
Monday, 7 January, 2013	28	190	138	Kangarilla Drilling Pty - Christmas Shutdown
Tuesday, 8 January, 2013	28	191	139	Kangarilla Drilling Pty - Christmas Shutdown
Wednesday, 9 January, 2013	28	192	140	Kangarilla Drilling Pty - Christmas Shutdown
Thursday, 10 January, 2013	28	193	141	Kangarilla Drilling Pty - Christmas Shutdown
Friday, 11 January, 2013	28	194	142	Kangarilla Drilling Pty - Christmas Shutdown
Saturday, 12 January, 2013	28	195		
Sunday, 13 January, 2013	28	196		

Date	Week	Days	Total Work Days	Notes
Monday, 14 January, 2013	29	197	143	S3-4, pre-collar and drill 0 to 17 mBGL. Lost circulation at 17 mBGL, & connection with annulus of S3-1 - additional cementing conducted.
Tuesday, 15 January, 2013	29	198	144	S3-1 & S3-4 cement and standby for curing
Wednesday, 16 January, 2013	29	199	145	S3-4 drill 17 to 80 mBGL
Thursday, 17 January, 2013	29	200	146	S3-4 drill 80 to 103 mBGL, case and cement
Friday, 18 January, 2013	29	201	147	S3-4 2nd cement and development
Saturday, 19 January, 2013	29	202		
Sunday, 20 January, 2013	29	203		
Monday, 21 January, 2013	30	204	148	S3-5 pre-collar & drill 0 to 42 mBGL.
Tuesday, 22 January, 2013	30	205	149	S3-5 drill 42 to 62 mBGL, case and cement
Wednesday, 23 January, 2013	30	206	150	S3-5 development
Thursday, 24 January, 2013	30	207	151	S3-6 pre-collar & drill 0 to 34 mBG, case and cement
Friday, 25 January, 2013	30	208	152	S3-6 develop
Saturday, 26 January, 2013	30	209		
Sunday, 27 January, 2013	30	210		
Monday, 28 January, 2013	31	211	153	no site works (Public Holiday).
Tuesday, 29 January, 2013	31	212	154	S3-2 (Core) Commence Pre-Collar, and drill 6" 0 to 42 mBGL.
Wednesday, 30 January, 2013	31	213	155	S3-2 (Core) drill 6" 42 to 111 mBGL.
Thursday, 31 January, 2013	31	214	156	Site clean up at S3, cuttings removal etc.
Friday, 1 February, 2013	31	215	157	Sterilisation and re-mobilisation/ prep for S6.
Saturday, 2 February, 2013	31	216		
Sunday, 3 February, 2013	31	217		
Monday, 4 February, 2013	32	218	158	Mobilisation to S6-1, and drill 0 to 26 mBGL. S3-2 (Core) D-Solutions run rods through to 111.4 mBGL.
Tuesday, 5 February, 2013	32	219	159	Drill S6-1, 26 to 83 mBGL. D.Solutions core S3-2 (Core) from 111.4 to 139 mBGL.
Wednesday, 6 February, 2013	32	220	160	Drill S6-1 83 to 92.2 mBGL, run Geophysics from 1300 hrs. Drill S3-2 (Core) 139 to 159 mBGL.
Thursday, 7 February, 2013	32	221	161	Construct and Develop S6-1, 0-89, 89.5 to 92.5 mBGL. Drill S3-2 (Core) 159 to 166.6 mBGL
Friday, 8 February, 2013	32	222	162	Develop S6-1. Complete drilling S3-2 (Core) 166.6 to 179 mBGL - and commence trip out/ pack up etc.
Saturday, 9 February, 2013	32	223		
Sunday, 10 February, 2013	32	224		Note: Willful damage to property at S3 & S6 [Police Report No: 13\J99423]
Monday, 11 February, 2013	33	225	163	Drill S6-2 0 to 61 mBGL. Demobilise S3-2 (Core) rig and equiptment.
Tuesday, 12 February, 2013	33	226	164	S6-2 Construct 0 to 58.5, 58.5 to 60.5 mBGL.
Wednesday, 13 February, 2013	33	227	165	S6-2 Development. Drill S6-3 from 0 to 26 mBGL
Thursday, 14 February, 2013	33	228	166	Drill S6-3 from 26 to 39 mBGL. Construct S6-3 36 to 39 mBGL.
Friday, 15 February, 2013	33	229	167	Develop S6-2. De-mobilise from Site.
Saturday, 16 February, 2013	33	230		
Sunday, 17 February, 2013	33	231		
Monday, 18 February, 2013	34	232	168	Re-mobilise to S3-2. Drill 0 to 117 mBGL (reaming out cored sequence)
Tuesday, 19 February, 2013	34	233	169	S3-2 Drill 117 to 156 mBGL (reaming out core sequence)
Wednesday, 20 February, 2013	34	234	170	S3-2 Drill 156 to 184. Construct 0 to 181, 181 to 184 mBGL (Note that above target TD of 187, due to slumping) & initial grouting
Thursday, 21 February, 2013	34	235	171	S3-2 Second grouting.
Friday, 22 February, 2013	34	236	172	S3-2 Development

Date	Week	Days	Total Work Days	Notes
Saturday, 23 February, 2013	34	237		
Sunday, 24 February, 2013	34	238		
Monday, 25 February, 2013	35	239	173	S3-3 Drill 0 to 74 mBGL
Tuesday, 26 February, 2013	35	240	174	S3-3 Drill 74 to 146 mBGL
Wednesday, 27 February, 2013	35	241	175	S3-3 Construct 0 to 142, 142 to 145 mBGL. 1st cement run.
Thursday, 28 February, 2013	35	242	176	S3-3 Second cement and development.
Friday, 1 March, 2013	35	243	177	Site-3 De-mobilisation, sterilisation and rig maintenance. Underground service clearance and location at Site-5, due to pending harvest ops.
Saturday, 2 March, 2013	35	244		
Sunday, 3 March, 2013	35	245		
Monday, 4 March, 2013	36	246	178	S5-1 Drill 0 to 74 mBGL
Tuesday, 5 March, 2013	36	247	179	S5-1 Drill 74 to 103 mBGL
Wednesday, 6 March, 2013	36	248	180	S5-1 Construct 0 to 98.7, 98.7 to 101.7 mBGL, Grout to surface
Thursday, 7 March, 2013	36	249	181	S5-1 Development
Friday, 8 March, 2013	36	250	182	S5-1 Drill and Construct
Saturday, 9 March, 2013	36	251		
Sunday, 10 March, 2013	36	252		
Monday, 11 March, 2013	37	253	183	PUBLIC HOLIDAY
Tuesday, 12 March, 2013	37	254	184	S5-2 Drill 0 to 68 mBGL
Wednesday, 13 March, 2013	37	255	185	S5-2 Drill 68 to 80 mBGL, construct 0-77, 77-80 mBGL
Thursday, 14 March, 2013	37	256	186	S5-2 Development
Friday, 15 March, 2013	37	257	187	No site works - maintenance (Joe Mason last day)
Saturday, 16 March, 2013	37	258		
Sunday, 17 March, 2013	37	259		
Monday, 18 March, 2013	38	260	188	S5-3 Drill 0 to 30 mBGL
Tuesday, 19 March, 2013	38	261	189	S5-3 Drill 30 to 56 mBGL. Construct 0 to 52, 52 to 55 mBGL
Wednesday, 20 March, 2013	38	262	190	S5-3 Development
Thursday, 21 March, 2013	38	263	191	S5-4 Drill 0 to 28 mBGL. Construct 0 to 26, 26 to 28 mBGL
Friday, 22 March, 2013	38	264	192	S5-4 Development
Saturday, 23 March, 2013	38	265		
Sunday, 24 March, 2013	38	266		
Monday, 25 March, 2013	39	267	193	S5-5 drill 0 to 18 mBGL. construct 0 to 16, 16 to 18 mBGL.
Tuesday, 26 March, 2013	39	268	194	S5-5 Development. De-mobilisation off Site-5.
Wednesday, 27 March, 2013	39	269	195	Sterilisation and preparation fro S3-1 Rectification work
Thursday, 28 March, 2013	39	270	196	NO site works
Friday, 29 March, 2013	39	271	197	NO site works - Easter Public Holiday
Saturday, 30 March, 2013	39	272		
Sunday, 31 March, 2013	39	273		
Monday, 1 April, 2013	40	274	198	NO site works - Easter Public Holiday
Tuesday, 2 April, 2013	40	275	199	Re-mobilise to S3-1 Rectification work. Drill out casing to 7 mBGL.
Wednesday, 3 April, 2013	40	276	200	S3-1 Rectification work. Drill out casing to 7 to 8 mBGL.
Thursday, 4 April, 2013	40	277	201	S3-1 Rectification work. Drill out casing to 8 to 24 mBGL. Deviation out of the casing has occurred at above 14.6 mBGL. KD Pty Ltd request lost hole.
Friday, 5 April, 2013	40	278	202	S3-1 Clean up and remove stockpile, materials etc
Saturday, 6 April, 2013	40	279		

Date	Week	Days	Total Work Days	Notes
Sunday, 7 April, 2013	40	280		
Monday, 8 April, 2013	41	281	203	S3-1b Redrill and Setup. Drill 0 to 30 mBGL.
Tuesday, 9 April, 2013	41	282	204	S3-1b Drill 30 to 64 mBGL.
Wednesday, 10 April, 2013	41	283	205	S3-1b Drill 64 to 148 mBGL.
Thursday, 11 April, 2013	41	284	206	S3-1b Drill 148 to 192 mBGL
Friday, 12 April, 2013	41	285	207	S3-1b Drill 192 to 216 mBGL. Construct Casing 0-210/ Screen 210-213/ Gravel 208-215/ Grout 0-208
Saturday, 13 April, 2013	41	286		S3-1b Second Grout
Sunday, 14 April, 2013	41	287		
Monday, 15 April, 2013	42	288	210	S3-1b Top up Grout
Tuesday, 16 April, 2013	42	289	211	S3-1b complete development from 150 mBGL.
Wednesday, 17 April, 2013	42	290	212	-
Thursday, 18 April, 2013	42	291	213	-
Friday, 19 April, 2013	42	292	214	Cancelled - Concrete contractor to S1-1
Saturday, 20 April, 2013	42	293		
Sunday, 21 April, 2013	42	294		
Monday, 22 April, 2013	43	295	215	Cancelled - Concrete contractor at S1-1
Tuesday, 23 April, 2013	43	296	216	-
Wednesday, 24 April, 2013	43	297	217	-
Thursday, 25 April, 2013	43	298	218	-
Friday, 26 April, 2013	43	299	219	-
Saturday, 27 April, 2013	43	300		
Sunday, 28 April, 2013	43	301		
Monday, 29 April, 2013	44	302	220	Concrete contractor at S1-1
Tuesday, 30 April, 2013	44	303	221	Concrete contractor at S1-2
Wednesday, 1 May, 2013	44	304	222	Concrete contractor at S1-3
Thursday, 2 May, 2013	44	305	223	Concrete contractor at S1-4
Friday, 3 May, 2013	44	306	224	Concrete contractor at S1-5
Saturday, 4 May, 2013	44	307		
Sunday, 5 May, 2013	44	308		

APPENDIX B. LITHOLOGICAL LOGS

Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Project:	**Willunga Super Science – Phase 2 Well Construction Program**		
Site:	**SITE 1, Aldinga Beach Road, Aldinga Beach (East of CFS), SA**		
Permit Number:	**216013**	Backfilled (Y/N):	**N**
Date Completed:	**30/10/2012**	Total Depth (m):	**164 mBGL**
Unit No:	**6527-2025**	Drill Method:	**Mud Rotary**
Drillhole Name:	**WSS-P2 S1-1**	Drilling Company:	**Kangarilla Drilling**
Logged By:	**Nikola Vasilic/ Nico Kruger**	Driller:	**Joe Mason (C2)**

Coordinates			
Easting:	**270071.389**	Ground Elevation (mAHD):	**24.398**
Northing:	**6093234.958**	Reference Elevation (mAHD):	**TBD**
Zone:	**54**	Reference Point Type:	**TBD**
Datum:	**GDA94**		

General Comments:

1. Wells S1-2, S1-3, S1-4, S1-5 & S1-6 based on adjacent S1-1 field litho interp. only.
2. *Depth to Water information based upon field observation on 22 February 2013.
3. *Surveying for a reference point elevation is required on all 6 wells.
4. Well yield is indicative only and due to underdevelopment (not free of solids, unclear, not jetted through the production zone) at client's request.
5. S1-2 Cored from 75.3 to 147 mBGL, prior to drilling and construction of well.

Stratigraphic Overview:

Depth (mBGL)		Formation/ Description		
From	To			
0	22	Quaternary		
22	27	Carisbrooke Sand		
27	75	Port Willunga Formation (lost circulation 34-48 mBGL)	*68-75 m*	*Aldinga member*
			75 -76 m	*(?)Chinaman Gully member*
76	80	Lignite		
80	122	Blanche Point Formation		
122	129	Tortachilla Limestone		
129	143	Lignite		
143	149	Transition Zone to Maslin Sands South		
149	164	South Maslin Sands		

Page **1** of **4**

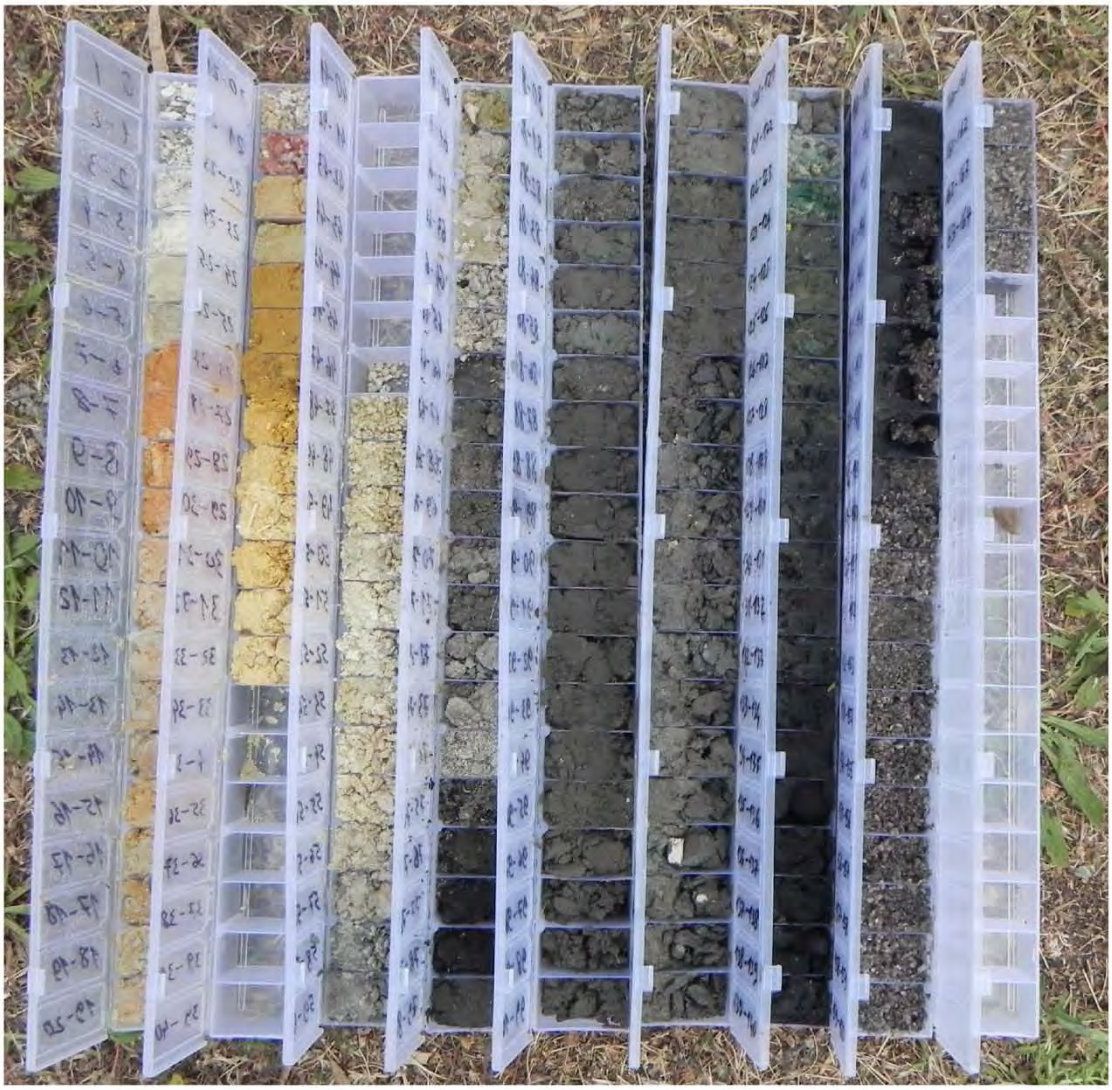
Lithological Description

Depth (mBGL)	Major Lith. Unit(s)	Lithology	Hcl Rxn
0-2	SURFACE SEDIMENTS	Top soil, white clay and calcrete	Y
2-4	CLAY	White chalk clay, very plastic	Y
4-6	CLAY	Khaki green to light grey brown clay, very plastic, rollable	N
6-16	SILTY SAND	Red and brown, fine sand, minor clay	N
16-20	SAND	Yellow to cream, coarse, fine gravel, subangular, minor silt	N
20-22	GRAVELLY SAND	White and red, coarse grained, poorly sorted, subangular to subrounded , fine gravel	N
22-24	SILTY SAND	Cream, light orange tinge, fine to medium grained	N
24-26	SILTY SAND	As above, becoming uniform in size + colour to orange brown	N
26-27	SILTY SAND	Brown to cream, as above, introduction of shells	Y
27-33	LIMESTONE	Light yellow, bioclastic shells, weakly cemented	Y
34-47	NO SAMPLE	No sample, lost circulation, (karstic conditions)(presume as above)	
47-66	LIMESTONE	Off white, bioclastic, good cemented corals and shells, minor dark stained pellets, little of fine grained quartz sand 5-10%, frequently hard drilling throughout, very reactive on HCL, (Bryozal limestone)	Y
66-76	LIMESTONE	Light grey, good cemented, with fine-grained quartz sand 30-50%, subrounded, rich with fossils	Y
76-80	LIGNITE	Lignite, carbonaceous clay	N
80-122	SILTSTONE	Grey , frequent chert bands, hard drilling	N
122-129	SILTSTONE	Grey, glauconitic 123 to 127 chert bands	N
129-135	SILT	Dark grey to black lignite, carbonaceous silt	N
135-149	LIGNITE	Dark grey to black lignite (143-148 m with coarse quartz sand)	N
149-164	SAND	White to grey coarse, quartz, dominant, well consolidated, angular, minor clay matrix	N

Well/Groundwater Information

Well ID	Unit Number	Production Zone	DTW (mBGL)	Supply			Field Observed Water Analysis		
				L/sec	Test Length	Method	Sample No	Salinity	Salinity Unit
WSS P2 S1-1	6527-2025	158 - 161	20.83	1.0	4 hrs	Air Lift	S1-1	54,600	EC
WSS P2 S1-2	6527-2026	144 –147	18.56	0.1	3 hrs	Air Lift	S1-2	3310	EC
WSS P2 S1-3	6527-2027	72 – 74	20.52	0.8	3 hrs	Air Lift	S1-3	2880	EC
WSS P2 S1-4	6527-2028	57 – 59	20.645	0.2	3 hrs	Air Lift	S1-4	2203	EC
WSS P2 S1-5	6527-2029	42 – 44	20.615	1.0	3 hrs	Air Lift	S1-5	3470	EC
WSS P2 S1-6	6527-2030	27 – 29	20.59	0.2	3 hrs	Air lift	S1-6	4590	EC

Figure 1. **Field Sample Image of WSS-P2 S1-1**



Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Project: **Willunga Super Science – Phase 2 Well Construction Program**

Site: **SITE 2, Ryan Road, Whites Valley, SA**

Permit Number: **211818**
Date Completed: **6/9/2012**
Unit No: **6627-14523**
Drillhole Name: **WSS-P2 S2-1**
Logged By: **Nico Kruger**

Backfilled (Y/N): **N**
Total Depth (m): **195.2**
Drill Method: **Mud Rotary**
Drilling Company: **Kangarilla Drilling**
Driller: **Joe Mason (C2)**

Coordinates
Easting: **273462**
Northing: **6093765**
Zone: **54**
Datum: **GDA94**

Ground Elevation (mAHD): **40.354**
Reference Elevation (mAHD): **TBD**
Reference Point Type: **TBD**

General Comments:
1. Wells S2-2, S2-3, S2-4, S2-5, S2-6 & S2-7 based on adjacent S2-1 field litho interp. only.
2. Depth to Water information based upon field observation on 22 February 2013 and may vary.*
3. Well yield is indicative only and due to underdevelopment (not free of solids, unclear, not jetted through the production zone) at client's request.
4. S2-2 cored from 66 to 148 m BGL, prior to drilling and construction of well.

Stratigraphic Overview

Depth (mBGL)		Formation/ Description
From	To	
0	14	Quaternary
14	69	Port Willunga Formation
70	(?)148	Blanche Point Formation
(?)148	195.5	(?) Blanche Point Formation/ South Maslin Sands
195.2		*End of Hole*

Lithological Description

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
0 – 4	SILTY SAND	Red brown, minor clay, recent sediments, soil horizon	N
5 -7	GRAVEL	Varicoloured, medium to coarse gravel to 50 mm, rounded to well rounded, stream bed alluvium, brown clayey matrix	N
8	CLAY	Light brown, mildly plastic and rollable, wet	N
9 -12	SAND	Cream to white with depth, quartz, medium grained, sub angular to sub rounded, well sorted, held in minor silty matrix	N
13	SANDY CLAY	As above. Mottled cream, transition to hard clay	N
14	CLAY	Grey cream/ orange, rollable, highly plastic, stiff	N
15 – 16	SAND	White to off-white, predominantly medium grained, minor fine sand to silt matrix, well sorted, angular to sub-rounded	N

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
17 – 20	SAND	Light brown to fawn, fine to medium grained, quartz dominant, well sorted, angular to sub-rounded	N
21	SAND	Brown, fine to medium grained, quartz dominant, well sorted, angular to sub-rounded, hard thin consolidated laminates of red/ brown sand	N
22 – 24.5	SAND	Varicoloured, medium to coarse grained, minor ferruginisation, hard Fe stained & cemented nodules, sub-rounded, semi-sorted	N
24.5 – 29	SAND	Orange to cream/ white, medium to coarse grained, minor cementation, sub-rounded, semi-sorted to well sorted at depth	N
30 – 34.5	SAND	Orange, fine to medium grained, well sorted, uniform, <1 % mica	N
34.5 – 41	SANDY LIMESTONE	Cream, light orange to fawn, medium grained, medium sorting and consolidation, minor goethite dark stained pellets, frequently cemented in friable (?)siliceous matrix, minor Fe stained quartz sands, minor quartz mineral alteration to 1%, Fossil remains preserved to <5%, ((?) Bryozal Limestone)	Y
42	SANDY LIMESTONE	Orange to brown, little cementation	Y
43 – 62	SANDY LIMESTONE	Cream, light orange to fawn, medium grained, medium sorting and consolidation, minor goethite dark stained pellets, frequently cemented in friable (?)siliceous and/ or calcareous matrix, minor Fe stained quartz sands, minor quartz mineral alteration to 1%, Fossil remains preserved to <5%, (?) Bryozal Limestone), minor mica <1% to base, abundant shell/ fossil fragments throughout. Note: Hard drilling from 48, revert to a roller bit throughout remaining drillhole	Y
63	SANDY LIMESTONE	Olive green, minor clay matrix, highly glauconitic,	Y
64 – 69	SANDY LIMESTONE	Cream, light orange to fawn, medium grained, medium sorting and consolidation, minor goethite dark stained pellets, frequently cemented in friable (?)siliceous matrix, minor Fe stained quartz sands, minor quartz mineral alteration to 1%, Fossil remains preserved to <5%, ((?) Bryozal Limestone), abundant shell/ fossil fragments throughout. Transition to Grey Limestone at 69 m. Note: Frequently hard drilling encountered throughout.	Y
70 - 110	SILTY SANDY LIMESTONE	Dark grey, silty in sections, well preserved gastropods/ bivalves/ fossil remains, frequent hard (?)siliceous cherty (?)laterite, fine to medium sand. Glauconitic rich section 103 – 105 m. Note: Frequently hard drilling encountered throughout.	Y
111 – 142	SILTY LIMESTONE	Light grey, oxidises rapidly, richly abundant in lightly cemented marine fossil assemblages	Y
143 – 144	SILTY LIMESTONE	As above. Light olive green to grey, major glauconitic composition, white clay matrix, fossiliferous/shells	Y
145 – 147	SILTY LIMESTONE	Light grey, oxidises rapidly, richly abundant in lightly cemented marine fossil assemblages	Y

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
148 – 151	SAND	Light brown, fine to medium grained, poor return, difficult to interpret	Y
152 – 157	SANDY SILT	Silty Limestone, grey, white clay, minor glauconitic, fine grained sands, fossils still present	Y
158	-	Poor return, no sample to interpret	-
159	SAND	Light brown, fine to medium grained, poor return, glauconitic	Y
160	SAND	Light grey, fine grained, glauconitic	Y
161	SILT	Silty Limestone, dark grey, hard	Y
162 – 166	SAND	Light grey, medium grained	Y
167 – 168	SILT	Silty Limestone, dark grey, hard	Y
169 – 195.2	SILTY SAND TO FOSSIL RICH LIMESTONE	Grey, rapidly alternating between cemented/ hard and soft layers of sand and (?)laterite, composition difficult to interpret, fine to medium grained, fossil/ shell fragments abundant, sands appear to display reasonable sorting (limited to field obs). Refer to Geophysical logging.	Y

Well/Groundwater Information

Well ID	Production Zone	Depth to Water (mBGL)	Supply			Field Observed Water Analysis		
			L/sec	Test Length	Method	Sample No	Salinity	Salinity Unit (mg/L / EC)
S2-1	189 – 192	23.905*	0.1	4hr	Air Lift	S2-1	1520	EC
S2-2	158 – 161	17.68*	1.2	3hr	Air Lift	S2-2	1613	EC
S2-3	115 – 118	17.975*	2.0	3hr	Air Lift	S2-3	1606	EC
S2-4	66 – 68	17.62*	<0.5	3hr	Air Lift	S2-4	1678	EC
S2-5	48 – 50	17.59*	1.0	3hr	Air Lift	S2-5	1910	EC
S2-6	32 - 34	17.58*	0.5	3hr	Air Lift	S2-6	1191	EC
S2-7	19 – 20	17.59*	<0.2	3hr	Air Lift	S2-7	1830	EC

Figure 1. **Field Sample Image of WSS-P2 S2-1**

Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Project:	**Willunga Super Science – Phase 2 Well Construction Program**		
Site:	**SITE 3, Pethick Road, McLaren Vale, SA**		
Permit Number:	**211794**	Backfilled (Y/N):	**N**
Date Completed:	**21/12/2012**	Total Depth (m):	**214 mBGL**
Unit No:	**6627-14616**	Drill Method:	**Mud Rotary**
Drillhole Name:	**WSS-P2 S3-1**	Drilling Company:	**Kangarilla Drilling**
Logged By:	**Nikola Vasilic/ Lyz Rysby/ Nico Kruger**	Driller:	**Joe Mason**

Coordinates

Easting:	**275554.814**	Ground Elevation (mAHD):	**60.992**
Northing:	**6096528.676**	Reference Elevation (mAHD):	**TBA**
Zone:	**54**	Reference Point Type:	**TBA**
Datum:	**GDA94**		

General Comments:

1. Wells S3-2, S3-3, S3-4, S3-5 & S3-6 based on adjacent S3-1 field litho interp. only.
2. * Depth to Water information based upon field observation on 22 Feb 2013 & 4 Mar 2013.
3. Surveying for a reference point elevation is required on all 6 wells.
4. Well yield is indicative only and due to underdevelopment (not free of solids, unclear, not jetted through the production zone) at client's request.
5. S3-2 Cored from 111 to 179 to mBGL, prior to drilling and construction of well.

Stratigraphic Overview

Depth (mBGL)		Formation/ Description
From	To	
0	33	Quaternary
33	112	Port Willunga Formation
112	116	Lignite
116	177	Blanche Point Formation
177	179	Lignite
179	214	South Maslin Sands

Lithological Description

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
0-2	SAND/ TOP SOIL	Dark grey, silty and clayey in part	N
3-4	CLAY	Green, high plasticity	N
5	CLAY	Light green, highly plastic, mottled with red silt	N
6-7	SAND	Off white, very fine, well sorted	N
8	SILTY SAND	Off white, minor orange clay	N
9	CLAY	Red clay, very plastic	N
10	SILTY SAND	Yellow to orange, very fine, well sorted, minor black pellets	N
11	SILTY SAND	Off white to yellow, very fine, well sorted	N

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
12-13	SAND	Off white, very fine, well sorted	N
14-17	SAND	Yellow, very fine, well sorted	N
18	SILTY SAND	Off white to yellow, very fine, well sorted	N
19-20	CLAY	Green plastic clay	N
21-28	SAND	Red and yellow, very fine sand, well sorted	N
29-33	GRAVEL	Gravel, subrounded to rounded, poorly sorted	N
34-35	LIMESTONE	Yellow to brown, fine grained calcareous sand, weakly cemented	Y
36-40	SAND	Orange to brown, minor silt, fine grained, well sorted	N
40-42	SAND	As above, subangular ironstone (ferruginous) bands/nodules, well sorted	N
42-52	SILTY SAND	Yellow to brown, fine grained, well sorted, frequent ferruginous bands throughout	N
53-55	SAND	Dark red to brown, silty+clayey in part, ferruginous	N
56	SANDSTONE	Orange brown, consolidated, minor silt, hard drilling	N
57-64	SAND	As above, orange brown, fine, ferruginous chips	N
65-78	SAND	Buff to green grey, fine grained, well sorted, minor clay+silt.	N
79-86	CLAYEY SAND	Cream to dark grey mottled, fine grained, angular, quartz dominant sand	N
87-94	SANDY SILT	Dark grey, shells, sandy silt to siltstone	N
95-105	SANDY SILT	As above, quartz sand, minor lignite/carbonaceous matrix (102-103 abundant coarse quartz sand)	N
106-112	CLAY	Black lignitic clay and lignite (106-111 quartz coarse sand)	N
112-115	LIGNITE	Dark grey to black lignite	N
116-118	SILTSTONE	Dark grey siltstone (easy drilling)	N
119-128	NO SAMPLE		-
129-142	SILTSTONE	Dark brown to dark grey siltstone, fine grained, shells, glauconitic	N
143-172	SILTSTONE	As above, small siltstone chips	N
173-177	SILTSTONE	As above, chips of siltstone, increased glauconite, decreasing sand content, minor lignite, quartz, minor rounded goethite pellets (177m large chips of siltstone/ lignite)	N
178-179	LIGNITE	Lignite, coarse quartz sand	N
180-186	SAND	Coarse sand	N
186-214	SAND	Medium grained quartz sand, well sorted	N

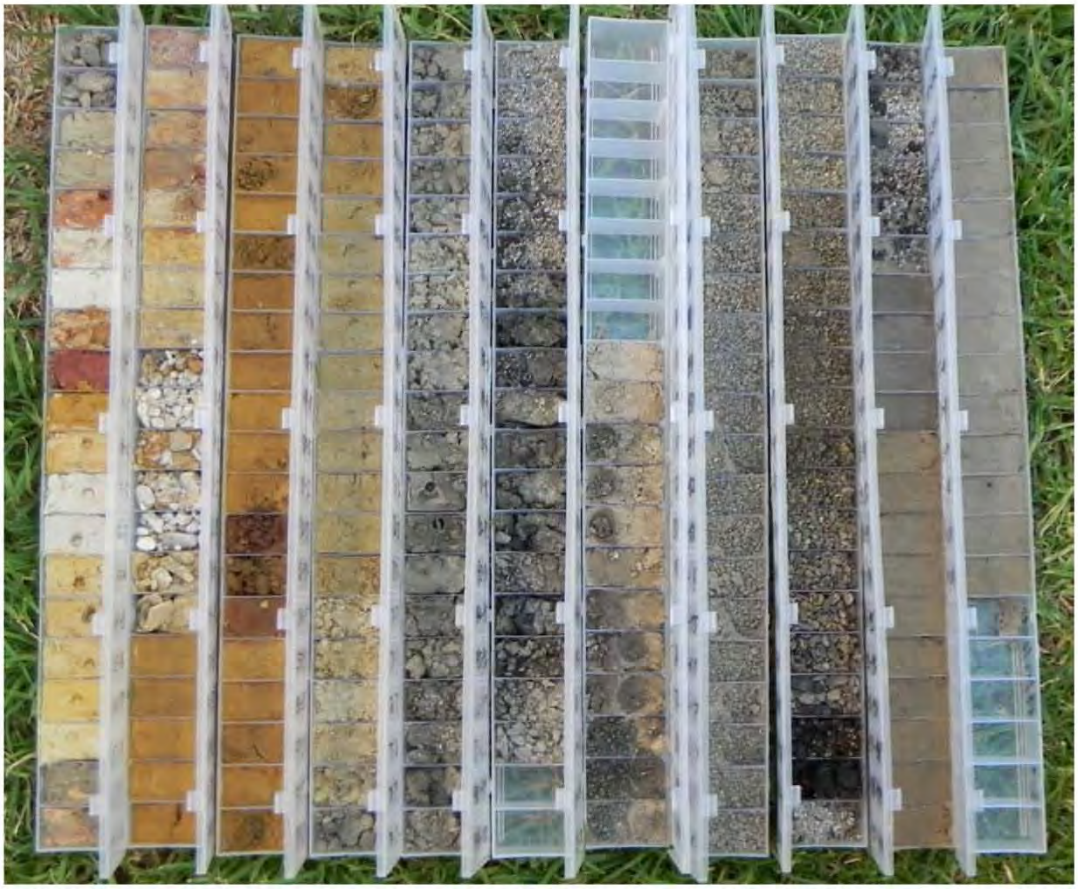
Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Well/Groundwater Information

Well ID	Production Zone	Depth to Water (mBGL)	Supply			Field Observed Water Analysis		
			L/sec	Test Length (hr)	Method	Sample No	Salinity	Salinity Unit (mg/L / EC)
S3-1 (a)	205 – 208	*23.74	0.6	3.5	Air Lift	S3-1 (a)	3370	EC
S3-1 (b)	210 – 213		1.5	3	Air Lift	S3-1 (b)	3400	EC
S3-2	184 – 187	*50.17	0.06	3	Air Lift	S3-2	2730	EC
S3-3	142 – 145	22.92	<0.01	3	Air lift	S3-3	1364	EC
S3-4	100 – 103	19.61	2	3	Air lift	S3-4	1360	EC
S3-5	59- 62	20.31	2.2	3	Air Lift	S3-5	981	EC
S3-6	32 - 34	20.38	0.8	3	Air Lift	S3-6	1940	EC

Figure 1. Field Sample Image for WSS-P2 S3-1



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Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Project: **Willunga Super Science – Phase 2 Well Construction Program**

Site: **SITE 4, Leconfield, Hut Block, McLaren Vale, SA**

Permit Number:	**211800**	Backfilled (Y/N):	**N**
Date Completed:	**29/6/2010**	Total Depth (m):	**146.5**
Unit No:	**6627-1447**	Drill Method:	**Mud Rotary**
Drillhole Name:	**WSS-P2 S4-1**	Drilling Company:	**Kangarilla Drilling**
Logged By:	**Nico Kruger/Paul Magarey**	Driller:	**Joe Mason (C2)**

Coordinates

Easting:	**277914**	Ground Elevation (mAHD):	**63.267**
Northing:	**6099383**	Reference Elevation (mAHD):	**TBD**
Zone:	**54**	Reference Point Type:	**TBD**
Datum:	**GDA94**		

General Comments:

1. Wells S4-2, S4-3, S4-4, S4-5, S4-6 based on adjacent S4-1 field litho interp. only.
2. *Depth to Water information based upon field observation on 21 February 2013.
3. *Surveying for a reference point elevation is required on all 6 wells.
4. Well yield is indicative only due to underdevelopment (not free of solids, unclear, not jetted trough the production zone) at client's request.
5. S4-2 Cored from 50 to 105 mBGL, prior to drilling and construction of well.

Stratigraphic Overview

Depth (mBGL)		Formation/ Description
From	To	
0	2	Quaternary
2	47	Port Willunga Formation
47	50.5	Lignite
50.5	96	Blanche Point Formation
96	104.5	Tortachilla Limestone
104.5	109	Lignite
109	129.5	South Maslin Sands
129.5	134.5	North Maslin Sands
134.5	146.5	Cambrian/ Pre-Cambrian Basement
146.5		End of Hole

Lithological Description

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
0 - 2	CLAYEY SAND	Brown to Dark Brown, topsoil, low plasticity, unconsolidated	N
4	CLAYEY SAND	Red brown to orange, fine grained, unconsolidated, minor mottled grey-cream nodules (calcareous and clay) to 3 cm, low plasticity	N
6	SAND	Minor clay, orange, well sorted, low plasticity, rollable, <5% Fe stained/ cemented sand lenses	N
8	CLAYEY SAND	As above. Orange, >30% Ferruginous/ cemented sand lense	N
9	SAND	Low recovery. Light orange brown, fine grained	N
10	SAND	Orange, well sorted, friable	N
11	SAND	As above.	N
12	SAND	As above. Minor grey mottled clay	N
13 – 15	SAND	As above.	N
16	SAND	As above. Minor Ferruginous/ cemented sand nodules to 5mm	N
17 – 20	CLAYEY SAND	Yellow-orange, fine grained, well sorted, minor mottled grey clay,	N
21	SAND	As above. <5% Fe Stained nodules to 3 cm.	N
22	SILTY SAND	Orange-yellow, well sorted, minor clay, low plasticity	N
23	CLAYEY SAND	Orange-yellow, minor grey mottling, low plasticity	N
24	CLAYEY SAND	As above. <25 % clay, white/ grey mottling.	N
25	CLAYEY SAND	White, fine grained, minor dark pelloids to 1 cm, minor Fe staining	N
26 – 27	SAND	Yellow-orange-brown, fine grained, unconsolidated	N
28	SILTY SAND	Brown to grey, rollable, lumpy, unconsolidated low to medium plasticity	N
29	GRAVELLY SAND	Brown to grey, fine sands, poorly sorted, white angular quartz gravels, unconsolidated to 1cm	N
30	SILTY SAND	Minor gravel. Brown to grey, fine grained, poorly sorted, angular quartz gravels to 1cm	N
31	SILTY SAND	Dark orange, medium to coarse grained, angular to sub-rounded, poorly sorted gravels, angular to sub-rounded	N
32	SILTY SAND	As above. Fine to medium grained, minor small gravel	N
33 – 34	SILTY SAND	White to light brown, fine grained, well sorted	N
35	SANDY SILT	Light brown, low plasticity, fine grained, well sorted	N
36	CLAYEY SAND	Minor fine gravel. Brown to red, coarse grained, white clay, Fe stained sand nodules	N
37	CLAYEY SAND	As above. Increasing plasticity, increasing clay lumps, mottled	N
38 – 39	SAND	Light reddish brown, medium grained, medium sorting	N
40	SILTY SAND	Mottled pink-grey-orange-red, fine to medium grained, low plasticity	N

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
41	SILTY SAND	Mottled grey-orange, fie grained, minor clay lumps	N
42	SILTY SAND	Orange to grey, 50/50 silt/sand	N
43 – 47	SILTY SAND	Minor clay. Greyish, medium to coarse grained, low plasticity, minor fine gravel. Transition zone at 47 m.	N
48 – 50.5	LIGNITE	Dark grey to black, brown streaks, carbonaceous clay	N
50.5 – 81	CLAYEY SILT LIMESTONE	Dark grey to light grey, clayey in sections, well preserved gastropods/ bivalves, fossiliferous, minor siliceous cherty layers, minor fine sands.	Y
81 – 94	CLAYEY SILT LIMESTONE	As above. Dark grey, becoming consolidated, hard drilling, increasing siliceous/ cherty bands, abundant well preserved shells/ fossils throughout. Glauconitic at 85, 86 & 94 m.	Y
95 – 97	SANDY SILTY LIMESTONE	As above. Greenish brown grey, glauconitic, abundant shell/ fossils.	Y
98 - 101	SILTY LIMESTONE	As above. Olive green becoming mottled olive green to cream at base.	Y
102 - 104	SANDY SILTY LIMESTONE	As above. Mottled green to very dark grey.	Y
105	CLAYEY SILTY LIMESTONE	As above. Rollable, plastic, abundant goethite pellets, rollable, minor ferruginous stained quartz to 3 mm. Transition to Lignite at base.	Y
106 – 109	LIGNITE	Increasing mica, mottling & sand at base, carbonaceous clay matrix	N
110 – 113	CLAYEY SAND	Mottled light grey and white, medium grained, unsorted, sub-angular, clay matrix ~20 %, increasing sand composition at 113 m	Minor
114 – 123	SAND	Grey , opaque to white, medium to coarse grained, semi to well sorted with depth, angular to sub-angular, abundantly pyritic, firm dark grey matrix, <3 % sub-angular quartz gravels to <5 mm, minor calcareous, minor clayey matrix <10 %	Minor in Matrix
124 - 127	SAND	Light grey to white. Consolidated, friable, medium to coarse grained, well sorted	N
128	CLAYEY SAND	Light brown, firm nodules, sticky, quartz gravel to <6mm, transition zone	N
129 – 134.5	SAND	Minor clay to silty sand with depth, light orange to cream/ brown, minor consolidation, abundant brown gravel sized nodules, pyritic, quartz gravels <10 mm	N
134.5 – 146.5	SILT	Siltstone, grey-blue, weathered 135 to 139 m, very hard drilling 139 to 146.5	N

Groundwater Program
Water Well Log

Well/ Groundwater Information

Well ID	Unit Number	Production Interval (mBGL)	Depth to Water (mBGL)	Supply			Field Observed Water Analysis		
				L/sec	Test Length	Method	Sample No	Salinity	Salinity Unit (mg/L / EC)
S4-1	6627-14477	143.5 to 146.5	*9.535	< 0.1	+ 3hr	Air Lift	S4-1	~2600	EC
S4-2	6627-14478	129 to 134	*9.835	< 0.2	3hr	Air Lift	S4-2	3080	EC
S4-3	6627-14476	114 to 117	*9.515	< 0.1	3hr	Air Lift	S4-3	3120	EC
S4-4	6627-14475	97 to 102	*7.83	~ 1.0	3hr	Air Lift	S4-4	3280	EC
S4-5	6627-14474	44 to 47	*7.815	~ 2.5	3hr	Air Lift	S4-5	781	EC
S4-6	6627-14473	29 to 32	*7.75	~ 2.0	3hr	Air Lift	S4-6	1025	EC

Figure 1. **Field Sample Image for WSS-P2 S4-1**

Project:	**Willunga Super Science – Phase 2 Well Construction Program**		
Site:	**SITE 5 Chalk Hill road extension, McLaren Flat, SA**		
Permit Number:	**211813**	Backfilled (Y/N):	**N**
Date Completed:	**04/03/2013**	Total Depth (m):	**103 mBGL**
Unit No:	**TBA**	Drill Method:	**Mud Rotary**
Drillhole Name:	**WSS-P2 S5-1**	Drilling Company:	**Kangarilla Drilling**
Logged By:	**Nikola Vasilic/ Nico Kruger**	Driller:	**Joe Mason (C2)**

Coordinates

Easting:	**278875**	Ground Elevation (mAHD):	**67.235**
Northing:	**6101238**	Reference Elevation (mAHD):	**TBD**
Zone:	**54**	Reference Point Type:	**TBD**
Datum:	**GDA94**		

General Comments:

1. Wells S5-2, S5-3, S5-4 & S5-5 based on adjacent S5-1 field litho interp. only.
2.* Depth to Water information based upon field observation on 26 March 2013
3. *Surveying for a reference point elevation is required on all 5 wells.
4. Well yield is indicative only and due to underdevelopment (not free of solids, unclear, not jetted through the production zone) at client's request.
5. Coring of the Aquitard (Blanche Point) cancelled.

Stratigraphic Overview

Depth (mBGL)		Formation/ Description
From	To	
0	6	Quaternary
6	28	Port Willunga Formation
28	50	Blanch Point Formation (Gull rock 35-50)
50	56	Tortachila limestone
56	75	South Maslin Sands
75	103	Weathered Pre-Cambrian/ Cambrian Basement

Lithological Description

Depth (mBGL) from	Depth (mBGL) to	*Major Litho Unit(s)*	Lithology	Hcl Rxn
0	2	SILTY CLAY	Cream	N
2	6	SILTY CLAY	Brown, plastic, rollable	N
6	13	LIMESTONE	Red to brown, minor clayey sand	N
13	15	SILTSTONE	White siltstone	N
15	18	SILTY SAND	Dark yellow, chips of siltstone, black pellets	N
18	28	SILTY SANDY LIMESTONE	White, very fine quartz sand, subangular, minor shells	Y

Depth (mBGL) from	Depth (mBGL) to	*Major Litho Unit(s)*	Lithology	Hcl Rxn
28	36	SANDY SILT	Dark grey, minor shells, unconsolidated	Y
36	42	SANDY SILT	Dark grey, siltstone, glauconite, shells, minor consolidation	Y
42	47	SANDY SILT	Dark grey, siltstone, abundant shells, abundant black pellets 0.5-1 mm to 5%, glauconite, fine to medium grained sand, angular	Y
47	49	SANDY SILT	As above, extinction of siltstone, abundant glauconite, minor shells	Y
49	55	SILTY SAND	Dark grey to dark brown, brown goethite coarse sand to fine gravel, unsorted, angular 20%,abundant glauconite, abundant shells	Y
55	58	SILTY SAND	Dark grey, weekly consolidate sandstone. 70% medium sand, angular to sub angular, goethite, coarse gravel, angular	N
58	61	SILTY SAND	As above. Extinction of gravel	N
61	62	SILTY SAND	Dark grey to black, carbonaceous clay, very fine, angular, abundant pyritic to 20%	N
62	74	LIGNITE	Lignite and carbonaceous clay	N
74	76	CARBONACEOUS CLAY	Transition zone to weathered basement. Dark grey to black lignite, carbonaceous clay, white quartz, quartz coarse sand to 5%	N
76	86	WEATHERED BASEMENT	White clay, very sticky, white quartz, coarse quartz sand	N
86	91	WEATHERED BASEMENT	Off white, clay, very sticky, grey-green slate	N
91	96	WEATHERED BASEMENT	Off white like clay, very sticky, marble, white coarse sand (quartz or marble)	N
96	103	WEATHERED BASEMENT	Off white to light grey, clay, very sticky, abundant (crushed) quartz chips 5mm, minor pirite	N

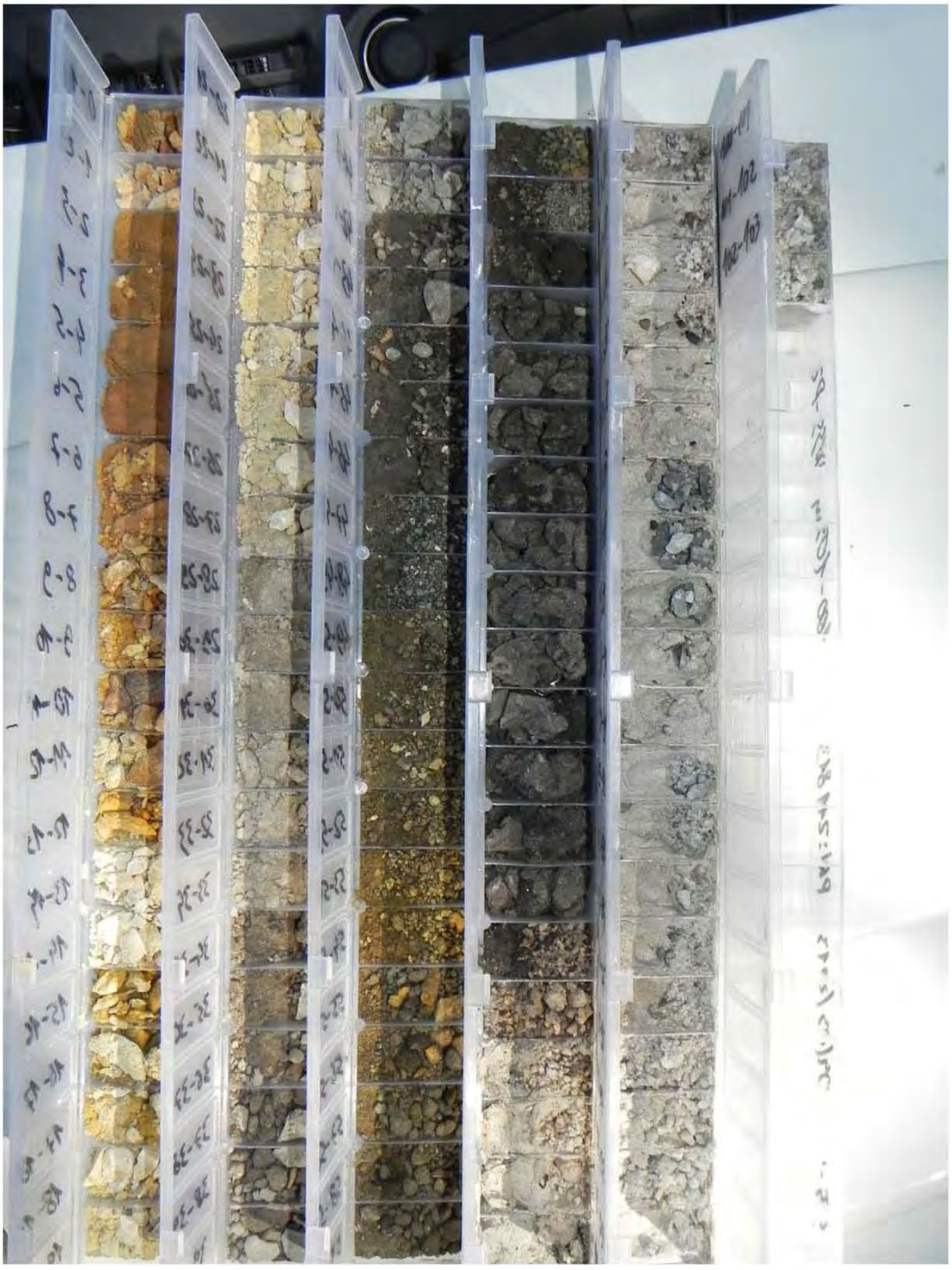
Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Well/Groundwater Information

Well ID	Unit Number	Production Zone (mBGL)	Depth to Water (mBGL)	Supply			Field Observed Water Analysis		
				L/sec	Test Length	Method	Sample No	Salinity	Salinity Unit (mg/L / EC)
S5-1		98.7-101.7	8.13	0.13	3 hr	AirLift	S5-1	2384	EC
S5-2		77-80	8.81	<0.1	3 hr	AirLift	S5-2	1640	EC
S5-3	6627-14610	53-56	4.57	<0.3	3 hr	AirLift	S5-3	1987	EC
S5-4	6627-14611	26-28	6.61	<0.01	3 hr	AirLift	S5-4	? 583	EC
S5-5	6627-14612	16-18	4.85	<0.3	3 hr	AirLift	S5-5	1997	EC

Figure 1. **Field Sample Image for WSS-P2 S5-1**



Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Project:	**Willunga Super Science – Phase 2 Well Construction Program**		
Site:	**SITE 6 Woodstock Winery, McLaren Vale, SA**		
Permit Number:	**211808**	Backfilled (Y/N):	**N**
Date Completed:	**8/2/2013**	Total Depth (m):	**92.2 mBGL**
Unit No:	**6627-14613**	Drill Method:	**Mud Rotary**
Drillhole Name:	**WSS-P2 S6-1**	Drilling Company:	**Kangarilla Drilling**
Logged By:	**Nikola Vasilic/ Nico Kruger**	Driller:	**Joe Mason (C2)**

Coordinates

Easting:	**281192.13**	Ground Elevation (mAHD):	**TBD**
Northing:	**6103279.2**	Reference Elevation (mAHD):	**TBD**
Zone:	**54**	Reference Point Type:	**TBD**
Datum:	**GDA94**		

General Comments:

1. Wells S6-2 & S6-3 based on adjacent S6-1 field litho interp. only.
2.* Depth to Water information based upon field observation on 21 February 2013
3. *Surveying for a reference point elevation is required on all 3 wells.
4. Well yield is indicative only and due to underdevelopment (not free of solids, unclear, not jetted through the production zone) at client's request.
5. Coring of the Aquitard (Blanch Point) cancelled.

Stratigraphic Overview

Depth (mBGL)		Formation/ Description
From	To	
0	17	Quaternary
17	46	Port Willunga Formation
46	57	Carbonaceous Clays/ Lignites
57	67	South Maslin Sands
67	83	Weathered Pre-Cambrian/ Cambrian Basement
83	92	Pre-Cambrian/ Cambrian Basement

Lithological Description

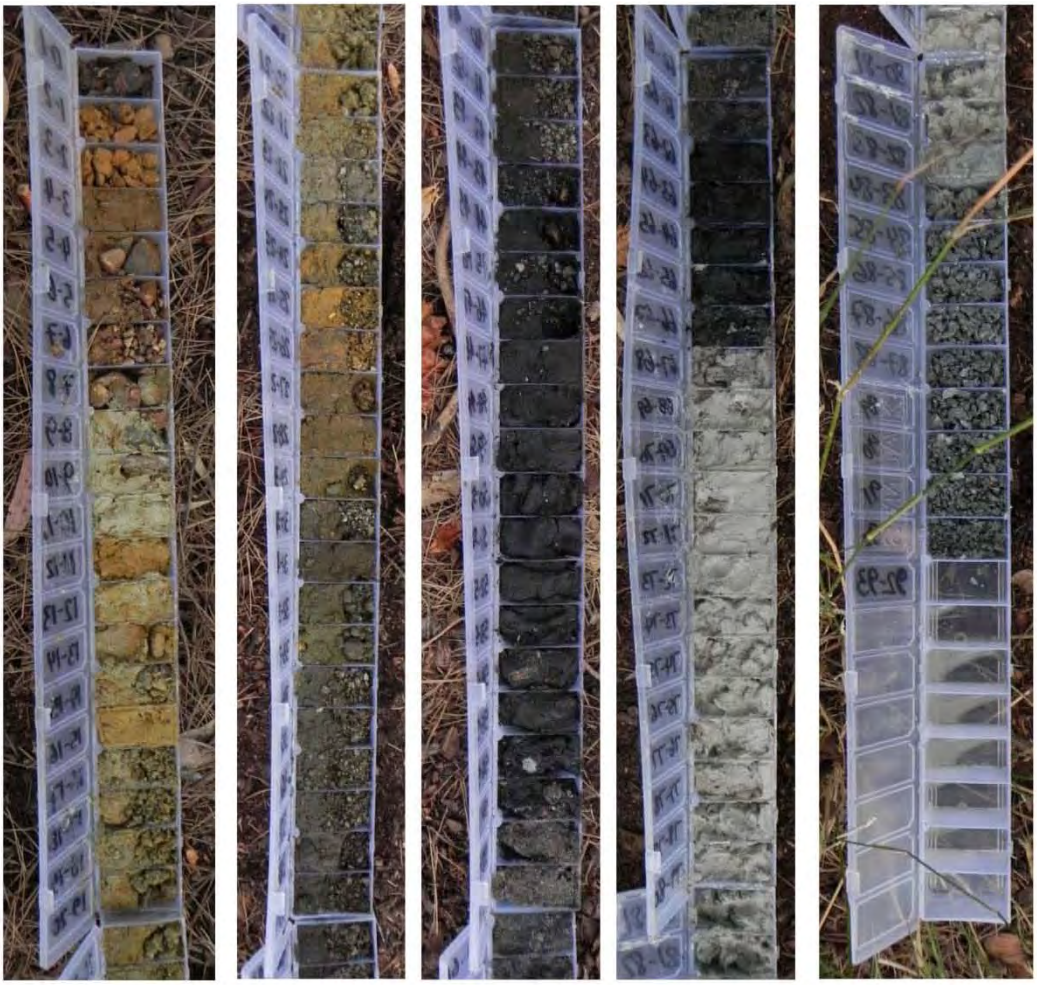
Depth (mBGL) from	Depth (mBGL) to	Major Litho Unit(s)	Lithology	Hcl Rxn
0	1	SANDY LOAM	Surface sediment, dark brown to black, abundant organic material, sandy in part	N
1	3	SILTY CLAY	Orange to brown, dry, tending toward Clayey Silt with depth, (note - sample was air drilled)	N
3	4	SANDY CLAY	Grey/ Red to Brown, plastic, moist, rollable,	N
4	5	CLAYEY GRAVEL	Varicoloured gravel with brown clay, unsorted, , angular to sub-angular	N

Depth (mBGL) from	Depth (mBGL) to	Major Litho Unit(s)	Lithology	Hcl Rxn
5	6	SANDY GRAVEL	Grey to brown, size, unconsolidated, clayey matrix, medium to coarse grained sand, quartz gravel to 20mm, multi-sphericity	N
6	7	SANDY GRAVEL	As above, increasing gravel size, unsorted, brown clay, medium grained sand, angular to sub-angular	N
7	8	SANDY GRAVEL	As above, hard drilling, unsorted, brown clay, medium grained sand, angular to sub-angular	N
8	11	CLAYEY SILT	Light cream to grey, extinguishment of gravel, abundant black marine faecal pellets	N
11	13	CLAYEY SILT	Grey to orange, abundant black pellets to 5%	N
13	14	CLAYEY SILT	As above, increasing sand content	N
14	16	SANDY SILT	As above	N
16	17	SANDY SILT	Green Grey, as above	N
17	21	SANDY SILT	Green Grey, minor consolidation, cherty bands, siliceous matrix, quartz sands, frequent hard drilling	N
21	27	SANDY SILT	Green-grey, 30% very fine sand, angular, brown to black rounded pellets 1-2mm size	N
27	30	SANDY SILT	Brown colour, fine grained, 30% sand	Y
30	39	CLAYEY SAND	Dark green to brown, fine grained, subrounded, 50% sand composition, minor 10mm brown goethite pellets	N
39	46	CLAYEY SAND	Dark grey, composed of 70% yellow , medium grained, angular, quartz sand, brown pellets (goethite)	N
46	57	CLAY LIGNITE	Black, carbonaceous clay to lignite, minor medium quartz sand	N
57	62	SAND	Clear, coarse, angular, well sorted, carbonaceous clay and lignite	N
62	67	SAND AND LIGNITE	As above but decreasing quartz sand	N
67	83	WEATHERED ROCK	White, high plasticity, sticky	N
83	92.2	SLATE	Basement. Hard rock, slate, light grey colour, very hard drilling (Precambrian/Cambrian Basement)	N

Well/Groundwater Information

Well ID	Unit Number	Production Zone (mBGL)	Depth to Water (mBGL)	Supply			Field Observed Water Analysis		
				L/sec	Test Length	Method	Sample No	Salinity	Salinity Unit (mg/L / EC)
S6-1	6627-14613	89 to 92	69.75	0.8	3 hr	AirLift	S6-1	2291	EC
S6-2	6627-14614	58.5 to 60.5	43.08	0.88	3 hr	AirLift	S6-2	1894	EC
S6-3	6627-14615	36 to 39	6.025	<0.01	3 hr	AirLift	S6-3	1984	EC

Figure 1. **Field Sample Image for WSS-P2 S6-1**



Groundwater Program
Water Well Log

Government of South Australia
Department of Environment, Water and Natural Resources

Project:	**Willunga Super Science – Phase 2 Well Construction Program**
Site:	**SITE 7, Sylvan Springs, Blewitt Springs, SA**

Permit Number:	**211809**	Backfilled (Y/N):	**N**
Date Completed:	**10/8/2012**	Total Depth (m):	**129**
Unit No:	**6627-14480**	Drill Method:	**Mud Rotary**
Drillhole Name:	**WSS-P2 S7-1**	Drilling Company:	**Kangarilla Drilling**
Logged By:	**Nico Kruger**	Driller:	**Joe Mason (C2)**

Coordinates

Easting:	**282551.221**	Ground Elevation (mAHD):	**146.424**
Northing:	**6105131.926**	Reference Elevation (mAHD):	**TBD**
Zone:	**54**	Reference Point Type:	**TBD**
Datum:	**GDA94**		

General Comments:

1. Wells S7-2, S7-3, S7-4 based on adjacent S7-1 field litho interp. only.
2. *Depth to Water information based upon field observation on 21 February 2013.
3. *Surveying for a reference point elevation is required on all 4 wells.
4. Well yield is indicative only due to underdevelopment (not free of solids, unclear, not jetted trough the production zone) at client's request.
5. S7-2 Cored from 0 to 59 mBGL, prior to drilling and construction of well.

Stratigraphic Overview

Depth (mBGL)		Formation/ Description
From	To	
0	4	Quaternary
4	27	Port Willunga Formation
27	28	Transition to Blanche Point Formation
28	45	Blanche Point Formation
46	56	Lignite
57	58	Transition to Blanche Point Formation
58	69	South Maslin Sands
69	116	(?) Cape Jervis Formation Permian Sands
116	118	Transition to basement
119	129	Pre-Cambrian/ Cambrian Basement
129		End of Hole

Lithological Description

Depth (mBGL)	Major Lith Unit(s)	Lithology	Hcl Rxn
0 -2	SAND	Orange red, medium grained, well sorted, cemented at 0.5 mBGL	N
3 – 4	SAND	Mottled dark orange/ red & white, medium grained, hard cemented, well sorted	N
5 – 6	SILTY SAND	White with minor orange/ yellow red mottling, minor clay, medium grained, dry	N
7 – 10	SAND	Mottled orange/ grey/ white, fine to medium grained, well sorted	N
11 – 17	SAND	Light cream/green to dark orange, alternating hard & friable siliceous/ cherty layers, black altered pelloids throughout, minor ferruginous, well preserved fossil remnants leached of carbonate	N
18 – 27	SILTY SAND	Mottled cream/ orange/ green to grey, medium grained, silty to clayey matrix, ferruginous layers, black preserved and altered pelloids	N
28	CLAYEY SAND	Transition to clayey sand, bryozoal limestone, minor leached fossil remains	N
29 – 45	SANDY SILTY LIMESTONE	Dark olive green to dark grey with depth, abundant leached fossil remains, increasing clays 42-45 m,	N
46	LIGNITE	Transition zone to lignite/carbonaceous clays	N
47 – 56	LIGNITE	Lignite/carbonaceous clays	N
57	SANDY LIGNITE	Transition zone to sand (refer to below)	N
58 – 60	SAND	Light brown, medium grained, well sorted, quartz dominant, sub angular	N
61 – 62	CLAYEY SAND	As above, cream.	N
63 – 68	GRAVELLY SAND	White to cream, predominantly coarse grained, 5% <5mm white quartz gravel, poorly sorted, sub-angular	N
69 – 116	CLAYEY SILTY SAND	Light brown, cream to white. Continuously alternating fine to medium sand to clayey silty sand, degree of sorting relative to composition, minor contamination from upper drillhole may lessen the medium grained sand composition	N
116 – 118	CLAYEY SILTY SAND	Transition zone. White to grey, hard drilling, weathered basement	N
119 – 129	BASEMENT	Weathered Basement presented as Grey Silty Clay/ Siltstone due to drilling method (roller bit), Washed samples include gravel sized angular quartz, grey siltstone and white/ orange detritus. Interpretation difficult.	N

Groundwater Program
Water Well Log

Well/ Groundwater Information

Well ID	Unit Number	Production Interval (mBGL)	Depth to Water (mBGL)	Supply			Field Observed Water Analysis		
				L/sec	Test Length	Method	Sample No	Salinity	Salinity Unit (mg/L / EC)
S7-1	6627-14480	126 to 129	*20.64	0.1	3hr	Air Lift	S7-1	1099	EC
S7-2	6627-14481	80 to 83	*20.095	0.5	3hr	Air Lift	S7-2	1340	EC
S7-3	6627-14482	64 to 67	*20.61	<0.5	3hr	Air Lift	S7-3	1335	EC
S7-4	6627-14483	24 to 27	*13.04	<1.0	3hr	Air Lift	S7-4	676	EC

Figure 1. **Field Sample Image for WSS-P2 S7-1**

APPENDIX C - AS CONSTRUCTED DRILLING SCHEDULE - WILLUNGA SUPER SCIENCE, PHASE 2 2012

Well Number	SITE	Unit No.	Permit Number	Permit Expiry	*Easting	*Northing	**NS Elevation	**Reference Elevation	Target Formation
	#	#	#	date			mAHD	mAHD	Type
WSS-P2 S1-1	1	6527-2025	216013	31/08/2013	270073.42	6093233.88	-	22.461	South Maslin Sands
WSS-P2 S1-2		6527-2026	216014	31/08/2013	270074.29	6093227.45	-	22.462	South Maslin Sands
WSS-P2 S1-3		6527-2027	216015	31/08/2013	270073.54	6093232.71	-	22.458	Port Willunga
WSS-P2 S1-4		6527-2028	216016	31/08/2013	270073.72	6093231.38	-	22.456	Port Willunga
WSS-P2 S1-5		6527-2029	216017	31/08/2013	270074.14	6093228.62	-	22.472	Port Willunga
WSS-P2 S1-6		6527-2030	216018	31/08/2013	270073.92	6093229.91	-	22.459	Port Willunga
WSS-P2 S2-1	2	6627-14523	211818	30/04/2013	273461.24	6093766.13	-	39.935	South Maslin Sands
WSS-P2 S2-2		6627-14524	211819	30/04/2013	273461.10	6093772.01	-	39.948	South Maslin Sands
WSS-P2 S2-3		6627-14525	211820	30/04/2013	273461.00	6093769.00	-	39.969	Blanche Point
WSS-P2 S2-4		6627-14526	211821	30/04/2013	273461.20	6093767.40	-	39.974	Port Willunga
WSS-P2 S2-5		6627-14527	211822	30/04/2013	273461.11	6093770.42	-	39.961	Port Willunga
WSS-P2 S2-6		6627-14528	211823	30/04/2013	273461.20	6093769.38	-	39.953	Port Willunga
WSS-P2 S2-7		6627-14529	211824	30/04/2013	273461.26	6093768.31	-	39.968	Port Willunga
WSS-P2 S3-1 (a)	3	6627-14616	211794 (a)	30/04/2013	275558.00	6096529.00	-	-	South Maslin Sands
WSS-P2 S3-1 (b)		6627-14674	211794 (b)	30/04/2013	275558.52	6096517.49	60.878	60.913	South Maslin Sands
WSS-P2 S3-2		6627-14617	211795	30/04/2013	275558.42	6096526.30	60.945	60.975	South Maslin Sands
WSS-P2 S3-3		6627-14618	211796	30/04/2013	275557.76	6096530.97	61.101	61.141	Blanche Point
WSS-P2 S3-4		6627-14619	211797	30/04/2013	275558.63	6096521.08	60.865	60.865	Port Willunga
WSS-P2 S3-5		6627-14620	211798	30/04/2013	275558.53	6096522.93	60.891	60.926	Port Willunga
WSS-P2 S3-6		6627-14621	211799	30/04/2013	275558.42	6096524.45	60.951	60.991	Port Willunga
WSS-P2 S4-1	4	6627-14477	211800	30/04/2013	277911.55	6099384.52	63.198	63.631	Cam/Pre-Cam Basement
WSS-P2 S4-2		6627-14478	211801	30/04/2013	277909.09	6099384.94	63.277	63.593	North Maslin Sands
WSS-P2 S4-3		6627-14476	211802	30/04/2013	277913.17	6099383.14	63.241	63.633	South Maslin Sands
WSS-P2 S4-4		6627-14475	211803	30/04/2013	277911.85	6099381.76	63.339	63.693	Tortachilla Limestone
WSS-P2 S4-5		6627-14474	211804	30/04/2013	277914.49	6099381.88	63.309	63.710	Port Willunga
WSS-P2 S4-6		6627-14473	211805	30/04/2013	277910.29	6099383.14	63.227	63.624	Port Willunga
WSS-P2 S5-1	5	6627-14622	211813	18/06/2013	278877.00	6101238.54	67.636	67.671	Cam/Pre-Cam Basement
WSS-P2 S5-2		6627-14623	211814	18/06/2013	278875.39	6101238.41	67.550	67.582	Cam/Pre-Cam Basement
WSS-P2 S5-3		6627-14610	211815	18/06/2013	278873.64	6101238.16	67.574	67.584	Tortachilla Limestone
WSS-P2 S5-4		6627-14611	211816	18/06/2013	278872.21	6101237.91	67.595	67.595	Port Willunga
WSS-P2 S5-5		6627-14612	211817	18/06/2013	278870.59	6101237.54	67.592	67.632	Port Willunga
WSS-P2 S6-1	6	6627-14613	211808	02/05/2013	281193.42	6103281.89	96.358	96.300	Cam/Pre-Cam Basement
WSS-P2 S6-2		6627-14614	211807	02/05/2013	281195.13	6103283.34	96.301	96.296	South Maslin Sands
WSS-P2 S6-3		6627-14615	211806	02/05/2013	281196.18	6103284.52	96.312	96.336	Port Willunga
WSS-P2 S7-1	7	6627-14480	211809	30/04/2013	282582.83	6105141.07	147.577	147.976	Cam/Pre-Cam Basement
WSS-P2 S7-2		6627-14481	211810	30/04/2013	282577.48	6105144.53	147.415	147.844	Cape Jervois
WSS-P2 S7-3		6627-14482	211811	30/04/2013	282578.88	6105141.40	147.699	148.119	South Maslin Sands
WSS-P2 S7-4		6627-14483	211812	30/04/2013	282579.95	6105143.05	147.500	147.917	Port Willunga

*Easting and Northing sourced from ARCGIS, GDA 1994, zone 54. Refer to Groundwater Data for latest Surveyed Results with RTK
http://www.waterconnect.sa.gov.au

**Elevation surveyed by RTK (NCGRT) April 2013

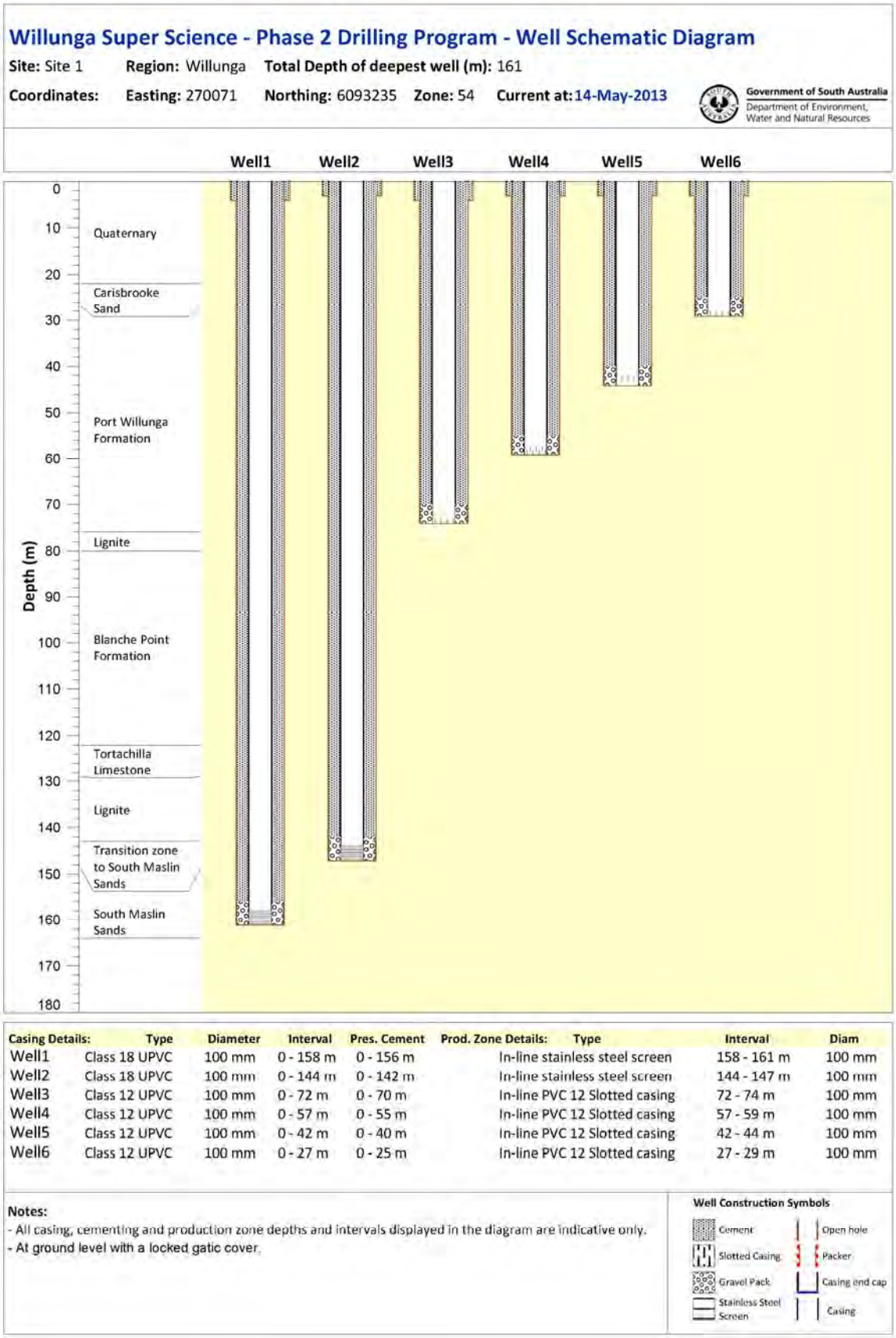
SUMMARY DETAILS OF OBSERVATION WELLS		TD	WELL CASING (WC)						PRODUCTION ZONE (PZ)						WELLHEAD	GROUNDWATER INFORMATION	
			Note: All Well Grouting/ Cementing via Tremie to Surface						Note: All screens placed in-line. Note: All Screen Aperture at 0.5mm								
Well Number	Unit No.	Total depth	Control Casing ID	Control Casing Length	Well Casing ID	Drillhole ID	Casing Type	Casing Length	Screen ID	Screen interval	Screen Length	Gravel Pack	Pack Interval	Screen Specification	Details	DTW	EC
	#	mBGL	mm	m	mm	inches	UPVC	mBGL	mm	mBGL	m		mBGL			mBGL	uS/cm
WSS-P2 S1-1	6527-2025	161	Steel 200 mm	4	100	7 7/8	Class 18	158	100	158 - 161	3	7mm / 8:16	156 - 161	Stainless Steel Screen	Concrete Gattic Cover	20.83	54,600
WSS-P2 S1-2	6527-2026	147	Steel 200 mm	3	100	7 7/8	Class 18	144	100	144 - 147	3	7mm / 8:16	142 - 147	Stainless Steel Screen		18.56	3,310
WSS-P2 S1-3	6527-2027	74	Steel 200 mm	4	100	7 7/8	Class 12	72	100	72 - 74	2	7mm / 8:16	70 - 74	UPVC 12 Slotted casing		20.52	2,880
WSS-P2 S1-4	6527-2028	59	Steel 200 mm	3	100	7 7/8	Class 12	57	100	57 - 59	2	7mm / 8:16	55 - 59	UPVC 12 Slotted casing		20.65	2,203
WSS-P2 S1-5	6527-2029	44	Steel 200 mm	3	100	7 7/8	Class 12	42	100	42 - 44	2	7mm / 8:16	40 - 44	UPVC 12 Slotted casing		20.62	3,470
WSS-P2 S1-6	6527-2030	29	Steel 200 mm	3	100	7 7/8	Class 12	27	100	27 - 29	2	7mm / 8:16	25 - 29	UPVC 12 Slotted casing		20.59	4,590
WSS-P2 S2-1	6627-14523	192	Steel 200 mm	9	100	7 7/8	Class 18	189	100	189 - 192	3	7mm / 8:16	187 - 192	Stainless Steel Screen	Concrete Gattic Cover	23.91	1,520
WSS-P2 S2-2	6627-14524	158	Steel 200 mm	3	100	7 7/8	Class 18	155	100	155 - 158	3	8:16	152 - 158	Stainless Steel Screen		17.68	1,613
WSS-P2 S2-3	6627-14525	118	Steel 200 mm	3	100	7 7/8	Class 12	115	100	115 - 118	3	7mm / 8:16	113 - 118	Stainless Steel Screen		17.98	1,606

WSS-P2 S2-4	6627-14526	68	Steel 200 mm	3	100	7 7/8	Class 12	66	100	66 - 68	2	7mm / 8:16	64 - 68	UPVC 12 Slotted casing		17.62	1,678
WSS-P2 S2-5	6627-14527	50	Steel 200 mm	3	100	7 7/8	Class 12	48	100	48 - 50	2	7mm / 8:16	47 - 50	UPVC 12 Slotted casing		17.59	1,910
WSS-P2 S2-6	6627-14528	34	Steel 200 mm	3	100	7 7/8	Class 12	32	100	32 - 34	2	7mm / 8:16	31 - 34	UPVC 12 Slotted casing		17.58	1,191
WSS-P2 S2-7	6627-14529	20	Steel 200 mm	3	100	7 7/8	Class 12	19	100	19 - 20	1	7mm / 8:16	17 - 20	UPVC 12 Slotted casing	Concrete Gattic Cover	17.59	1,830
WSS-P2 S3-1 (a)	6627-14616	208	Steel 200 mm	3	100	7 7/8	Class 18	205	100	205 - 208	3	7mm / 8:16	203 - 208	Stainless Steel Screen		23.74	3,370
WSS-P2 S3-1 (b)	6627-14674	215	Steel 200 mm	3	100	8 7/8	Class 18	210	100	210 - 213	3	7mm / 8:16	208 - 215	Stainless Steel Screen		51.07	3,400
WSS-P2 S3-2	6627-14617	185	Steel 200 mm	3	100	7 7/8	Class 18	182	100	182 - 185	3	7mm	180 - 185	Stainless Steel Screen		50.17	2,730
WSS-P2 S3-3	6627-14618	145	Steel 200 mm	3	100	7 7/8	Class 18	142	100	142 - 145	3	7mm / 8:16	140 - 145	Stainless Steel Screen		35.96	1,364
WSS-P2 S3-4	6627-14619	103	Steel 200 mm	3	100	7 7/8	Class 12	100	100	100 - 103	3	7mm	98 - 103	Stainless Steel Screen		19.61	1,360
WSS-P2 S3-5	6627-14620	62	Steel 200 mm	3	100	7 7/8	Class 12	59	100	59 - 62	3	7mm / 8:16	57 - 62	UPVC 12 Slotted casing		20.31	981

WSS-P2 S3-6	6627-14621	34	Steel 200 mm	3	100	7 7/8	Class 12	32	100	32 - 34	2	8:16	31 - 34	UPVC 12 Slotted casing		20.38	1,940
WSS-P2 S4-1	6627-14477	146.5	Steel 200 mm	6	100	7 7/8	Class 18	143.5	100	143.5 - 146.5	3	7mm / 8:16	140.5 - 146.5	Stainless Steel Screen	150 mm Galv. Steel with Lockable Lid	9.54	2,600
WSS-P2 S4-2	6627-14478	134	Steel 200 mm	3	100	7 7/8	Class 18	129	100	129 - 134	5	7mm / 8:16	125 - 134	Stainless Steel Screen		9.84	3,080
WSS-P2 S4-3	6627-14476	117	Steel 200 mm	6	100	7 7/8	Class 18	114	100	114 - 117	3	7mm / 8:16	109 - 117	Stainless Steel Screen		9.52	3,120
WSS-P2 S4-4	6627-14475	102	Steel 200 mm	3	100	7 7/8	Class 12	97	100	97 - 102	5	7mm / 8:16	95 - 102	Stainless Steel Screen		7.83	3,280
WSS-P2 S4-5	6627-14474	47	Steel 200 mm	6	100	7 7/8	Class 12	44	100	44 - 47	3	7mm / 8:16	42 - 47	UPVC 12 Slotted casing		7.82	781
WSS-P2 S4-6	6627-14473	32	Steel 200 mm	6	100	7 7/8	Class 12	29	100	29 - 32	3	7mm / 8:16	26 - 32	UPVC 12 Slotted casing		7.75	1,025
WSS-P2 S5-1	6627-14622	101.7	Steel 200 mm	3	100	7 7/8	Class 12	98.7	100	98.7 - 101.7	3	7mm / 8:16	96 - 101.7	Stainless Steel Screen	Concrete Gattic Cover	8.13	2,384
WSS-P2 S5-2	6627-14623	80	Steel 200 mm	3	100	7 7/8	Class 18	77	100	77 - 80	3	7mm / 8:16	76 - 80	Stainless Steel Screen		8.81	1,640
WSS-P2 S5-3	6627-14610	56	Steel 200 mm	3	100	7 7/8	Class 12	53	100	53 - 56	3	7mm / 8:16	52 - 56	Stainless Steel Screen		4.57	1,987

WSS-P2 S5-4	6627-14611	28	Steel 200 mm	3	100	7 7/8	Class 12	26	100	26 - 28	2	7mm / 8:16	25 - 28	UPVC 12 Slotted casing		6.61	583
WSS-P2 S5-5	6627-14612	18	Steel 200 mm	3	100	7 7/8	Class 12	16	100	16 - 18	2	7mm / 8:16	15 - 18	UPVC 12 Slotted casing		4.85	1,997
WSS-P2 S6-1	6627-14613	92	Steel 200 mm	3	100	7 7/8	Class 12	89	100	89 - 92	3	7mm / 8:16	88 - 92	Stainless Steel Screen	Concrete Gattic Cover	69.75	2,291
WSS-P2 S6-2	6627-14614	60.5	Steel 200 mm	3	100	7 7/8	Class 12	58.5	100	58.5 - 60.5	2	7mm / 8:16	57.5 - 60.5	Stainless Steel Screen		43.08	1,894
WSS-P2 S6-3	6627-14615	39	Steel 200 mm	3	100	7 7/8	Class 12	36	100	36 - 39	3	7mm / 8:16	34 - 39	UPVC 12 Slotted casing		6.03	1,984
WSS-P2 S7-1	6627-14480	129	Steel 200 mm	3	100	7 7/8	Class 18	126	100	126 - 129	3	7mm / 8:16	124 - 129	UPVC 12 Slotted casing	150 mm Galv. Steel with Lockable Lid	20.64	1,099
WSS-P2 S7-2	6627-14481	83	Steel 200 mm	3	100	7 7/8	Class 18	80	100	80 - 83	3	8:16	77 - 83	UPVC 12 Slotted casing		20.10	1,340
WSS-P2 S7-3	6627-14482	67	Steel 200 mm	3	100	7 7/8	Class 12	64	100	64 - 67	3	7mm	62 - 67	UPVC 12 Slotted casing		20.61	1,335
WSS-P2 S7-4	6627-14483	27	Steel 200 mm	3	100	7 7/8	Class 12	24	100	24 - 27	3	8:16	22 - 27	UPVC 12 Slotted casing		13.04	676

APPENDIX D. WELL SCHEMATIC DIAGRAMS

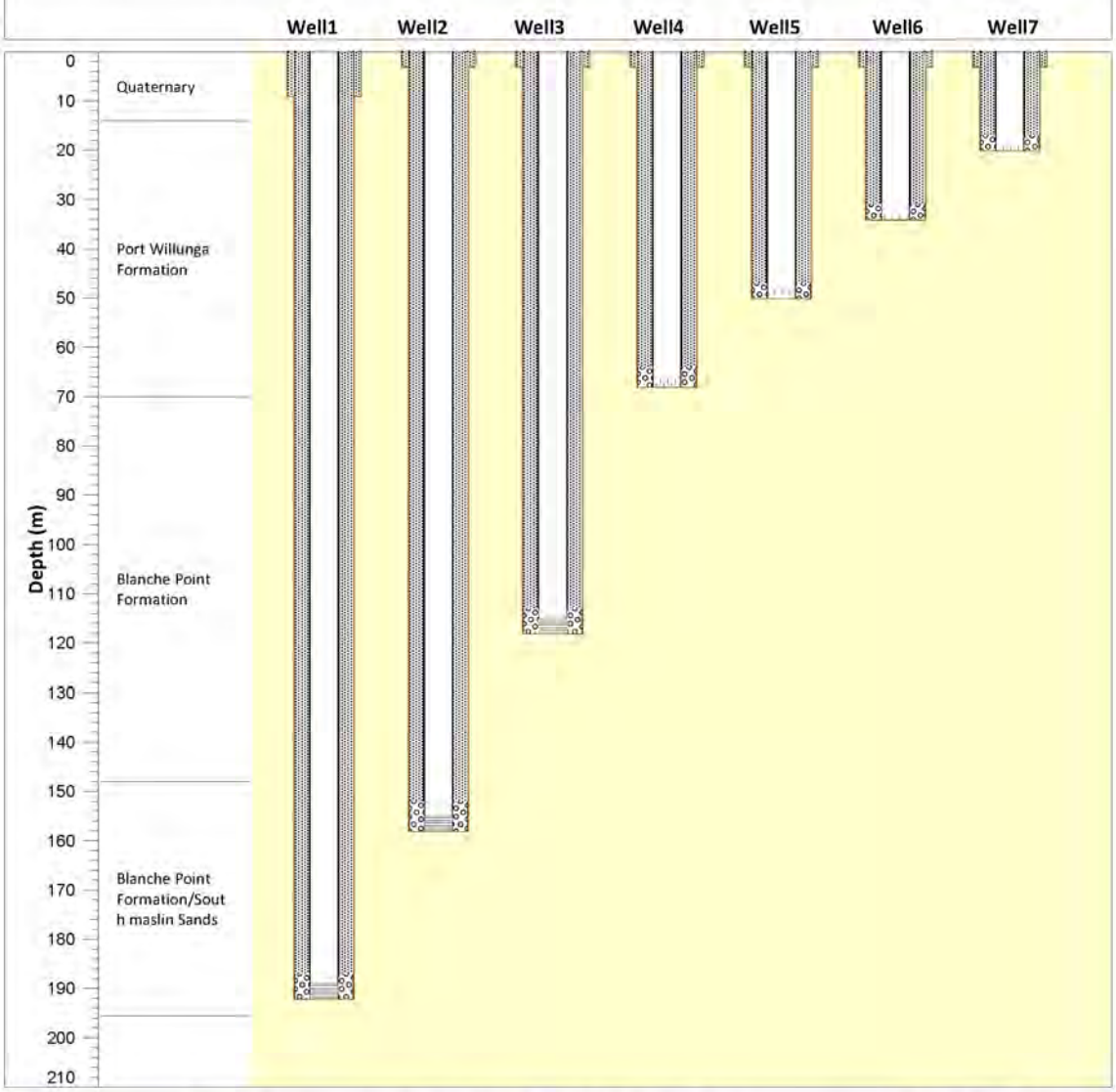


Willunga Super Science - Phase 2 Drilling Program - Well Schematic Diagram

Site: Site 2 **Region:** Willunga **Total Depth of deepest well (m):** 192

Coordinates: **Easting:** 273464 **Northing:** 6093757 **Zone:** 54 **Current at:** 14-May-2013

Government of South Australia
Department of Environment, Water and Natural Resources



Casing Details:	Type	Diameter	Interval	Pres. Cement	Prod. Zone Details:	Type	Interval	Diam
Well1	Class 18 UPVC	100 mm	0 - 189 m	0 - 187 m		In-line stainless steel screen	189 - 192 m	100 mm
Well2	Class 18 UPVC	100 mm	0 - 155 m	0 - 152 m		In-line stainless steel screen	155 - 158 m	100 mm
Well3	Class 12 UPVC	100 mm	0 - 115 m	0 - 113 m		In-line stainless steel screen	115 - 118 m	100 mm
Well4	Class 12 UPVC	100 mm	0 - 66 m	0 - 64 m		In-line PVC 12 Slotted casing	66 - 68 m	100 mm
Well5	Class 12 UPVC	100 mm	0 - 48 m	0 - 47 m		In-line PVC 12 Slotted casing	48 - 50 m	100 mm
Well6	Class 12 UPVC	100 mm	0 - 32 m	0 - 31 m		In-line PVC 12 Slotted casing	32 - 34 m	100 mm
Well7	Class 12 UPVC	100 mm	0 - 19 m	0 - 17 m		In-line PVC 12 Slotted casing	19 - 20 m	100 mm

Notes:
- All casing, cementing and production zone depths and intervals displayed in the diagram are indicative only.
- At ground level with a locked gatic cover.

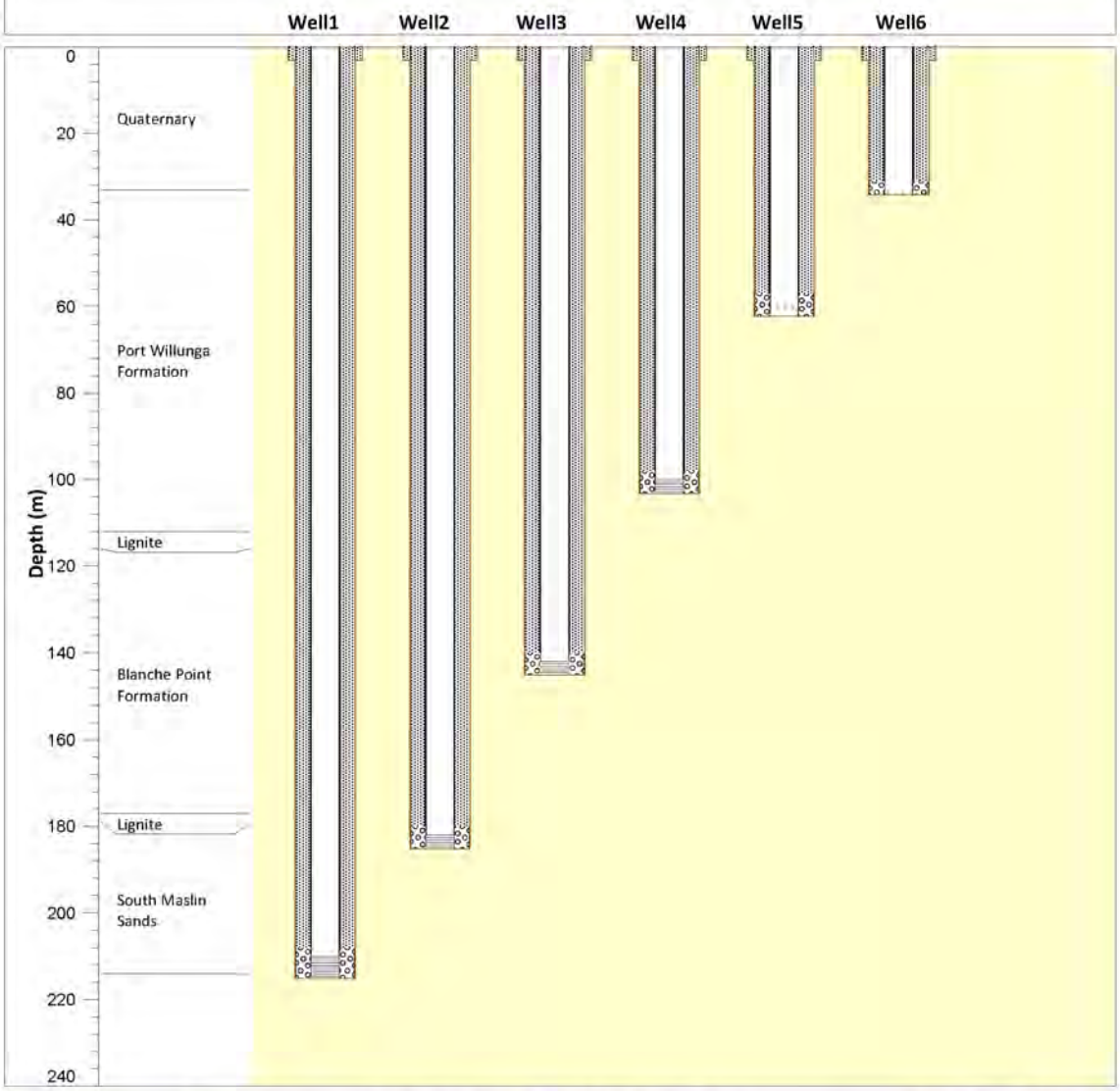
Well Construction Symbols

Willunga Super Science - Phase 2 Drilling Program - Well Schematic Diagram

Site: Site 3 **Region:** Willunga **Total Depth of deepest well (m):** 215

Coordinates: **Easting:** 275555 **Northing:** 6096529 **Zone:** 54 **Current at:** 14-May-2013

Government of South Australia
Department of Environment, Water and Natural Resources



Casing Details:	Type	Diameter	Interval	Pres. Cement	Prod. Zone Details:	Type	Interval	Diam
Well1	Class 18 UPVC	100 mm	0 - 210 m	0 - 208 m		In-line stainless steel screen	210 - 215 m	100 mm
Well2	Class 18 UPVC	100 mm	0 - 182 m	0 - 180 m		In-line stainless steel screen	182 - 185 m	100 mm
Well3	Class 18 UPVC	100 mm	0 - 142 m	0 - 140 m		In-line stainless steel screen	142 - 145 m	100 mm
Well4	Class 12 UPVC	100 mm	0 - 100 m	0 - 98 m		In-line stainless steel screen	100 - 103 m	100 mm
Well5	Class 12 UPVC	100 mm	0 - 59 m	0 - 57 m		In-line PVC 12 Slotted casing	59 - 62 m	100 mm
Well6	Class 12 UPVC	100 mm	0 - 32 m	0 - 31 m		In-line PVC 12 Slotted casing	32 - 34 m	100 mm

Notes:
- All casing, cementing and production zone depths and intervals displayed in the diagram are indicative only.
- At ground level with a locked gatic cover.

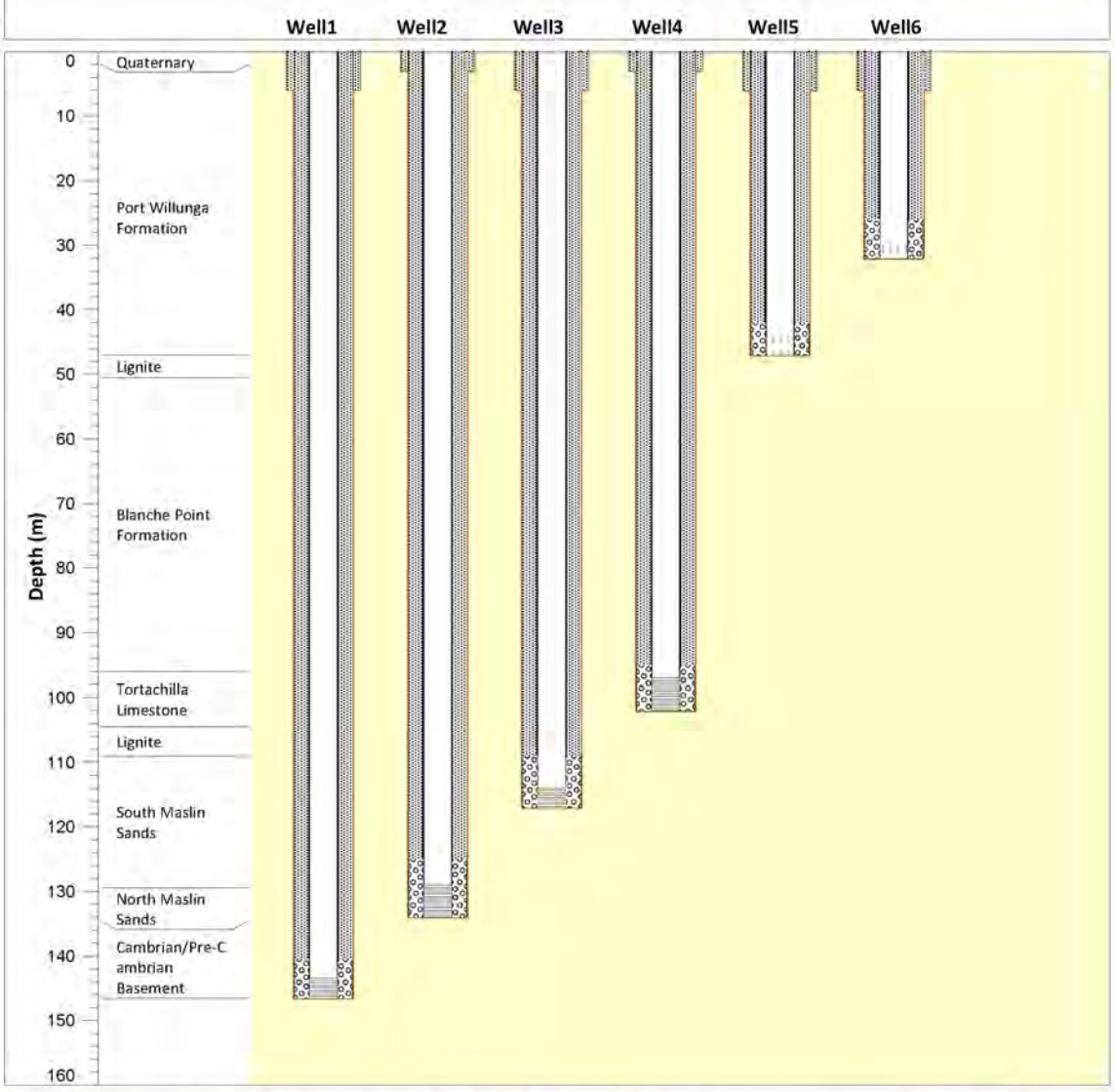
Well Construction Symbols

Willunga Super Science - Phase 2 Drilling Program - Well Schematic Diagram

Site: Site 4 **Region:** Willunga **Total Depth of deepest well (m):** 146.5

Coordinates: **Easting:** 277917 **Northing:** 6099379 **Zone:** 54 **Current at:** 14-May-2013

Government of South Australia
Department of Environment, Water and Natural Resources



Casing Details:	Type	Diameter	Interval	Pres. Cement	Prod. Zone Details:	Type	Interval	Diam
Well1	Class 18 UPVC	100 mm	0 - 143.5 m	0 - 140.5 m		In-line stainless steel screen	143.5 - 146.5 m	100 mm
Well2	Class 18 UPVC	100 mm	0 - 129 m	0 - 125 m		In-line stainless steel screen	129 - 134 m	100 mm
Well3	Class 18 UPVC	100 mm	0 - 114 m	0 - 109 m		In-line stainless steel screen	114 - 117 m	100 mm
Well4	Class 12 UPVC	100 mm	0 - 97 m	0 - 95 m		In-line stainless steel screen	97 - 102 m	100 mm
Well5	Class 12 UPVC	100 mm	0 - 44 m	0 - 42 m		In-line PVC 12 Slotted casing	44 - 47 m	100 mm
Well6	Class 12 UPVC	100 mm	0 - 29 m	0 - 26 m		In-line PVC 12 Slotted casing	29 - 32 m	100 mm

Notes:
- All casing, cementing and production zone depths and intervals displayed in the diagram are indicative only.
- Galvanised stand pipe with locked cover.

Well Construction Symbols

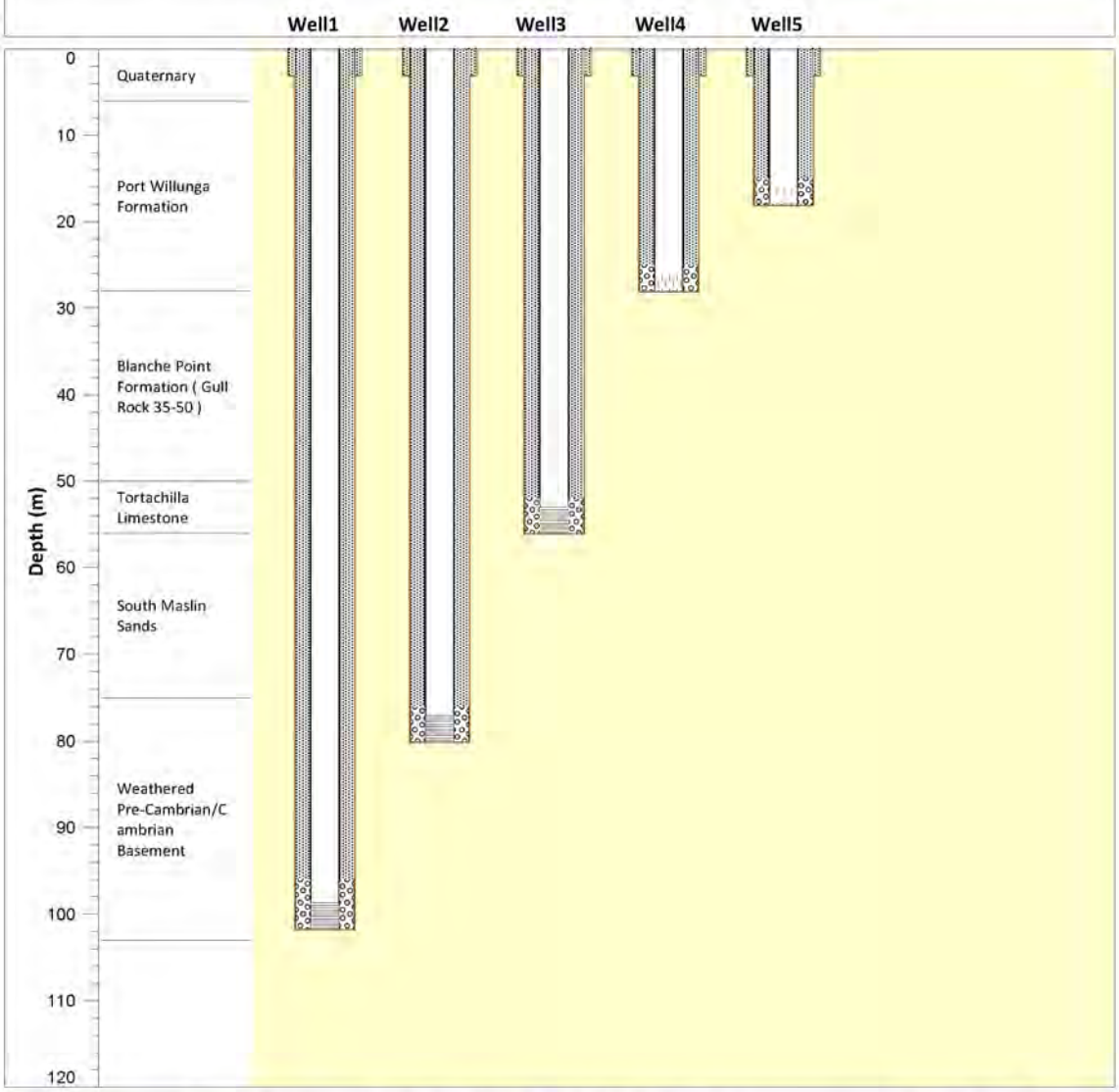
Cement | Open hole
Slotted Casing | Packer
Gravel Pack | Casing end cap
Stainless Steel Screen | Casing

Willunga Super Science - Phase 2 Drilling Program - Well Schematic Diagram

Site: Site 5 **Region:** Willunga **Total Depth of deepest well (m):** 101.7

Coordinates: **Easting:** 278811 **Northing:** 6101234 **Zone:** 54 **Current at:** 14-May-2013

Government of South Australia
Department of Environment, Water and Natural Resources



Casing Details:	Type	Diameter	Interval	Pres. Cement	Prod. Zone Details:	Type	Interval	Diam
Well1	Class 12 UPVC	100 mm	0 - 98.7 m	0 - 96 m		In-line stainless steel screen	98.7 - 101.7 m	100 mm
Well2	Class 18 UPVC	100 mm	0 - 77 m	0 - 76 m		In-line stainless steel screen	77 - 80 m	100 mm
Well3	Class 12 UPVC	100 mm	0 - 53 m	0 - 52 m		In-line stainless steel screen	53 - 56 m	100 mm
Well4	Class 12 UPVC	100 mm	0 - 26 m	0 - 25 m		In-line PVC 12 Slotted casing	26 - 28 m	100 mm
Well5	Class 12 UPVC	100 mm	0 - 16 m	0 - 15 m		In-line PVC 12 Slotted casing	16 - 18 m	100 mm

Notes:
- All casing, cementing and production zone depths and intervals displayed in the diagram are indicative only.
- At ground level with a locked gatic cover.

Well Construction Symbols

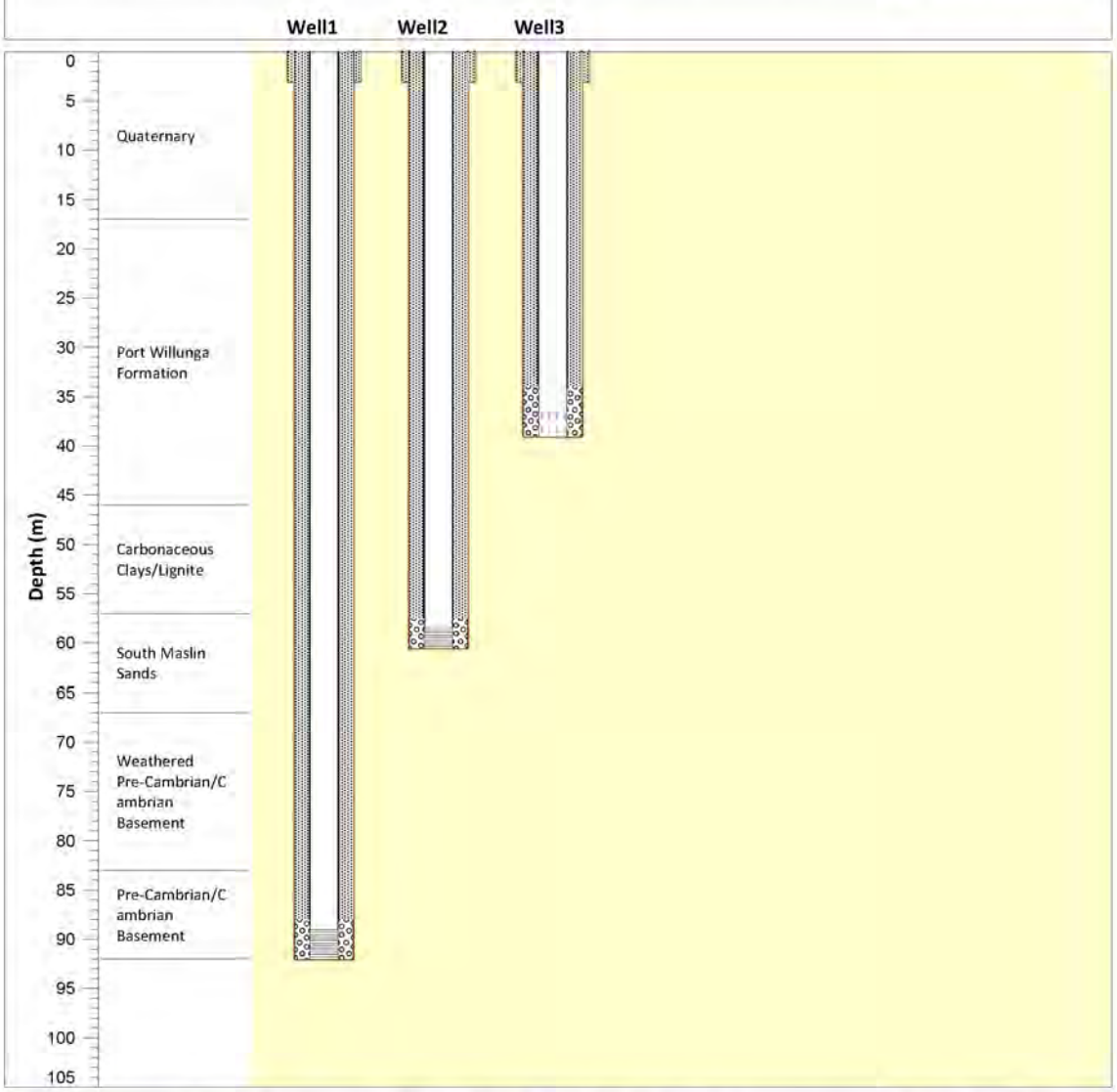
Cement
Slotted Casing
Gravel Pack
Stainless Steel Screen
Open hole
Packer
Casing end cap
Casing

Willunga Super Science - Phase 2 Drilling Program - Well Schematic Diagram

Site: Site 6 **Region:** Willunga **Total Depth of deepest well (m):** 92.5

Coordinates: **Easting:** 281192 **Northing:** 6103279 **Zone:** 54 **Current at:** 14-May-2013

Government of South Australia
Department of Environment, Water and Natural Resources



Casing Details:	Type	Diameter	Interval	Pres. Cement	Prod. Zone Details:	Type	Interval	Diam
Well1	Class 12 UPVC	100 mm	0 - 89 m	0 - 88 m		In-line stainless steel screen	89 - 92 m	100 mm
Well2	Class 12 UPVC	100 mm	0 - 58.5 m	0 - 57.5 m		In-line stainless steel screen	58.5 - 60.5 m	100 mm
Well3	Class 12 UPVC	100 mm	0 - 36 m	0 - 34 m		In-line PVC 12 Slotted casing	36 - 39 m	100 mm

Notes:
- All casing, cementing and production zone depths and intervals displayed in the diagram are indicative only.
- At ground level with a locked gatic cover.

Well Construction Symbols

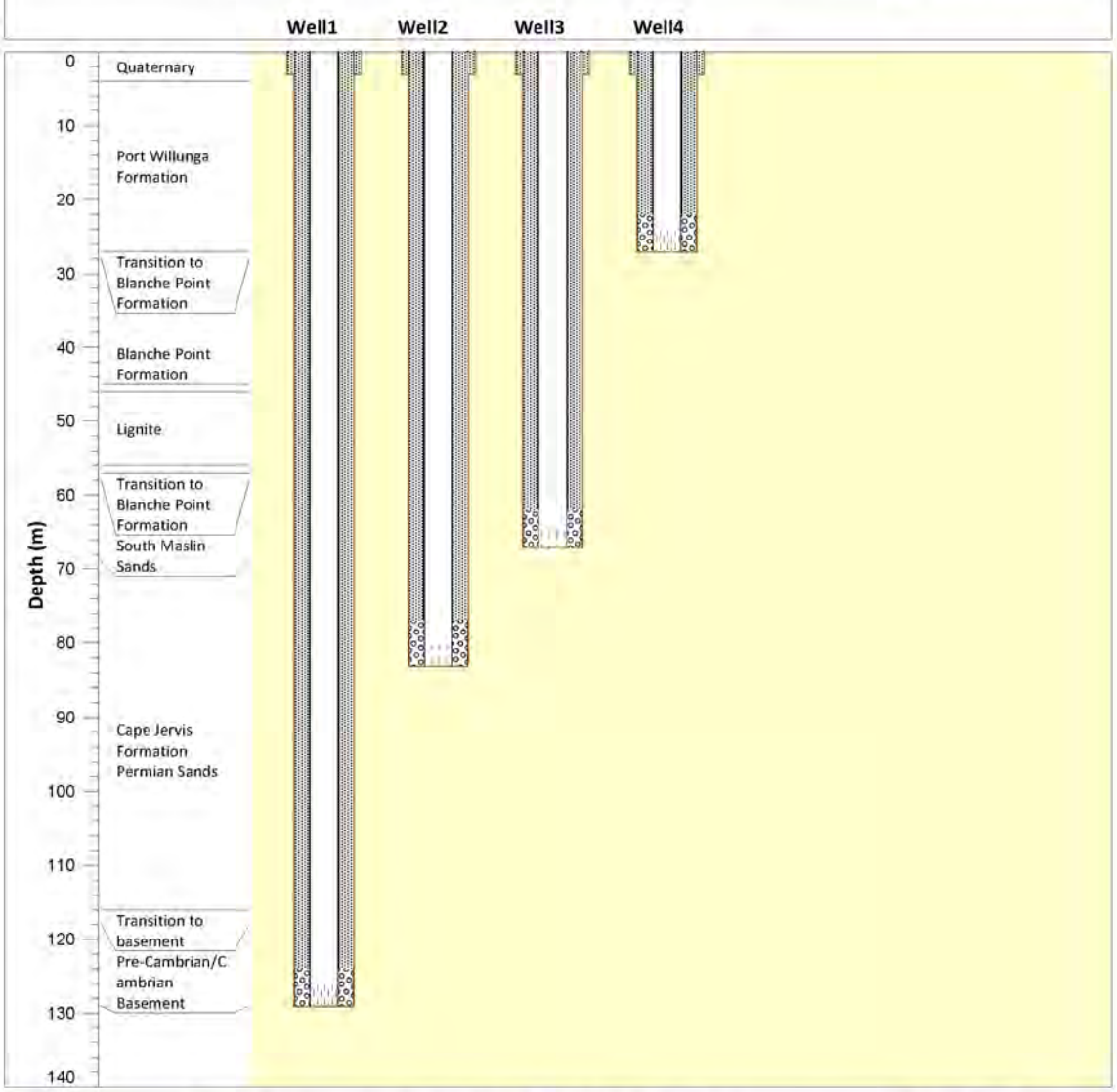
Cement
Slotted Casing
Gravel Pack
Stainless Steel Screen
Open hole
Packer
Casing end cap
Casing

Willunga Super Science - Phase 2 Drilling Program - Well Schematic Diagram

Site: Site 7 **Region:** Willunga **Total Depth of deepest well (m):** 129

Coordinates: **Easting:** 282551 **Northing:** 6105132 **Zone:** 54 **Current at:** 14-May-2013

Government of South Australia
Department of Environment, Water and Natural Resources

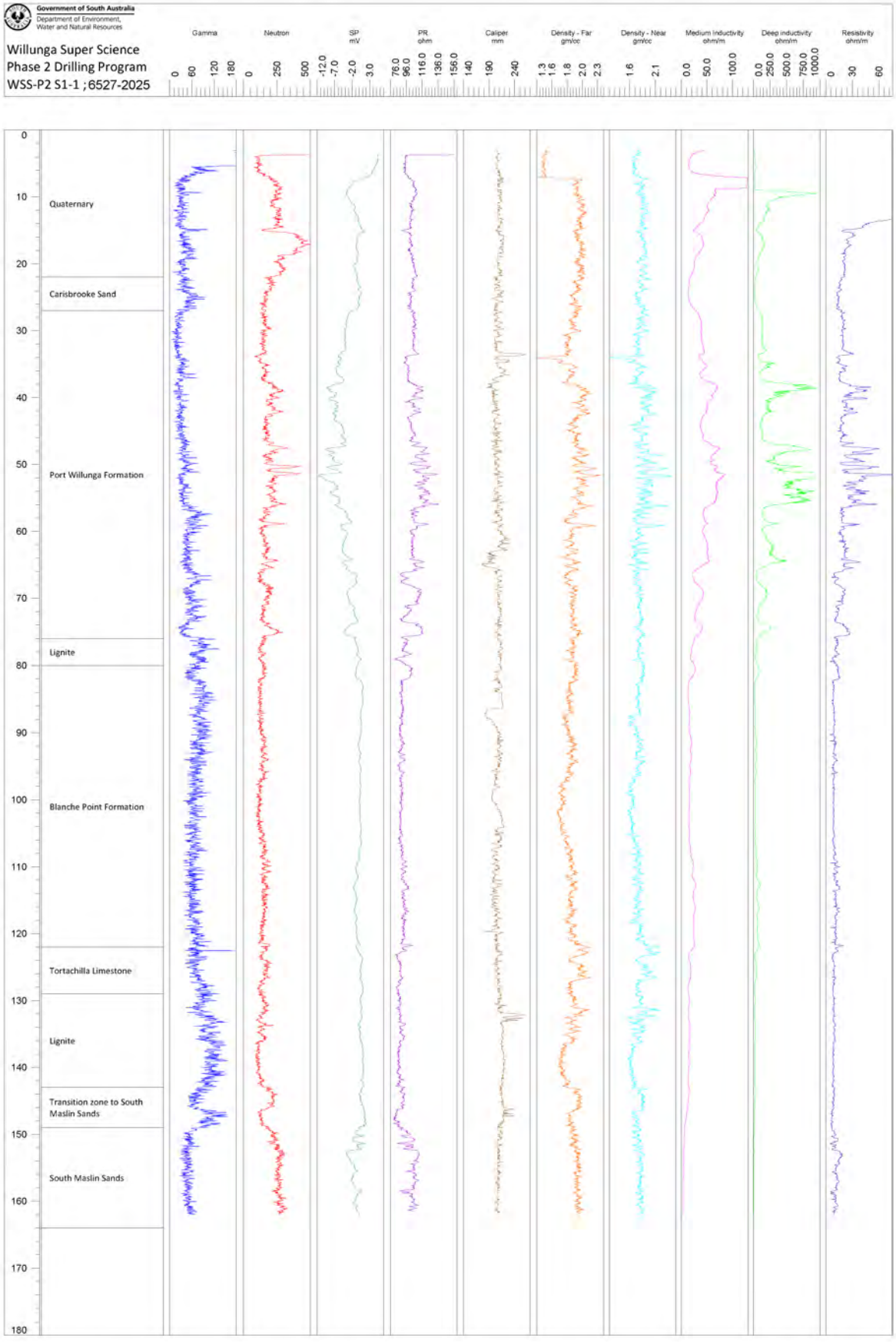


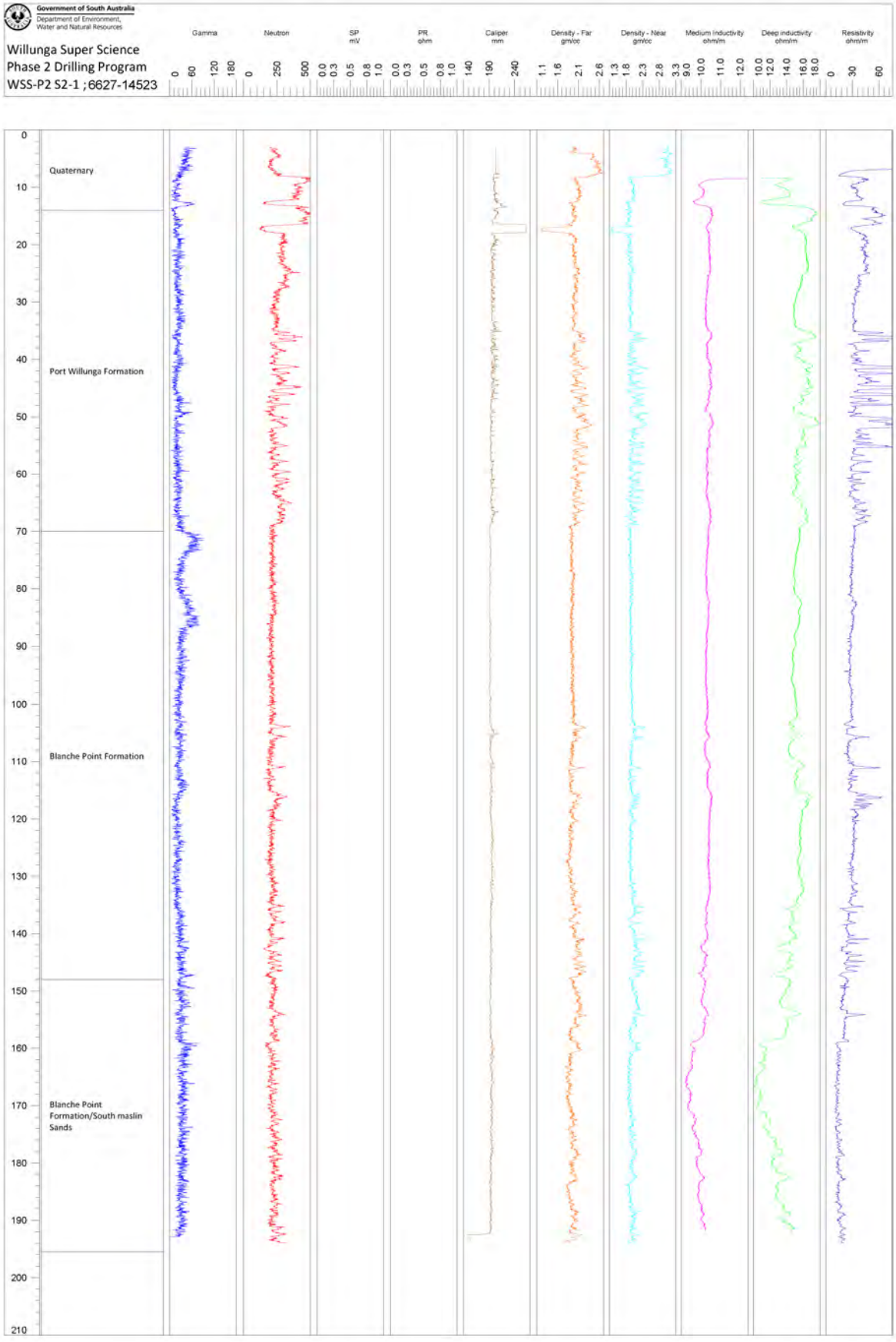
Casing Details:	Type	Diameter	Interval	Pres. Cement	Prod. Zone Details:	Type	Interval	Diam
Well1	Class 18 UPVC	100 mm	0 - 126 m	0 - 124 m		In-line PVC 12 Slotted casing	126 - 129 m	100 mm
Well2	Class 18 UPVC	100 mm	0 - 80 m	0 - 77 m		In-line PVC 12 Slotted casing	80 - 83 m	100 mm
Well3	Class 12 UPVC	100 mm	0 - 64 m	0 - 62 m		In-line PVC 12 Slotted casing	64 - 67 m	100 mm
Well4	Class 12 UPVC	100 mm	0 - 24 m	0 - 22 m		In-line PVC 12 Slotted casing	24 - 27 m	100 mm

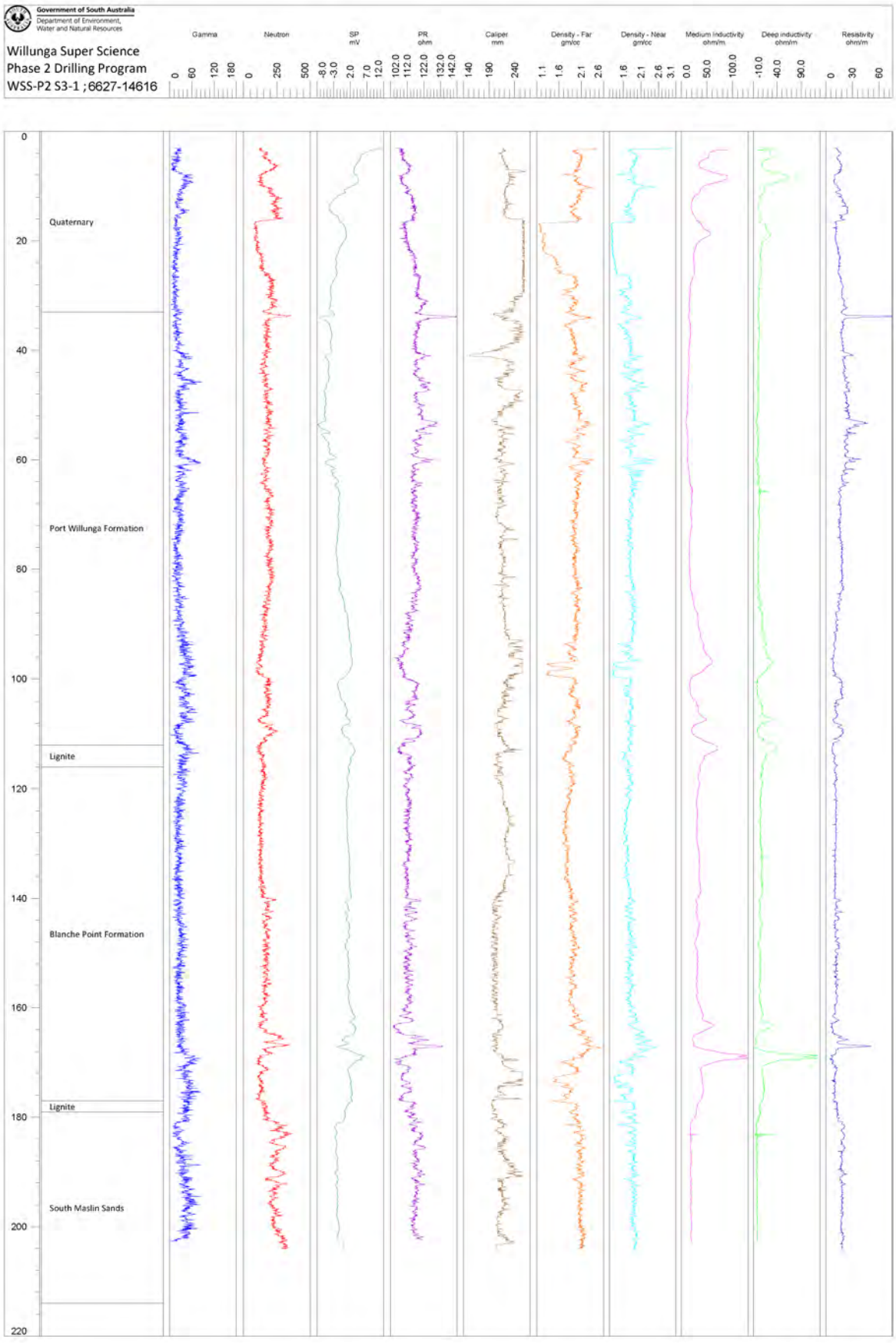
Notes:
- All casing, cementing and production zone depths and intervals displayed in the diagram are indicative only.
- Galvanised stand pipe with locked cover.

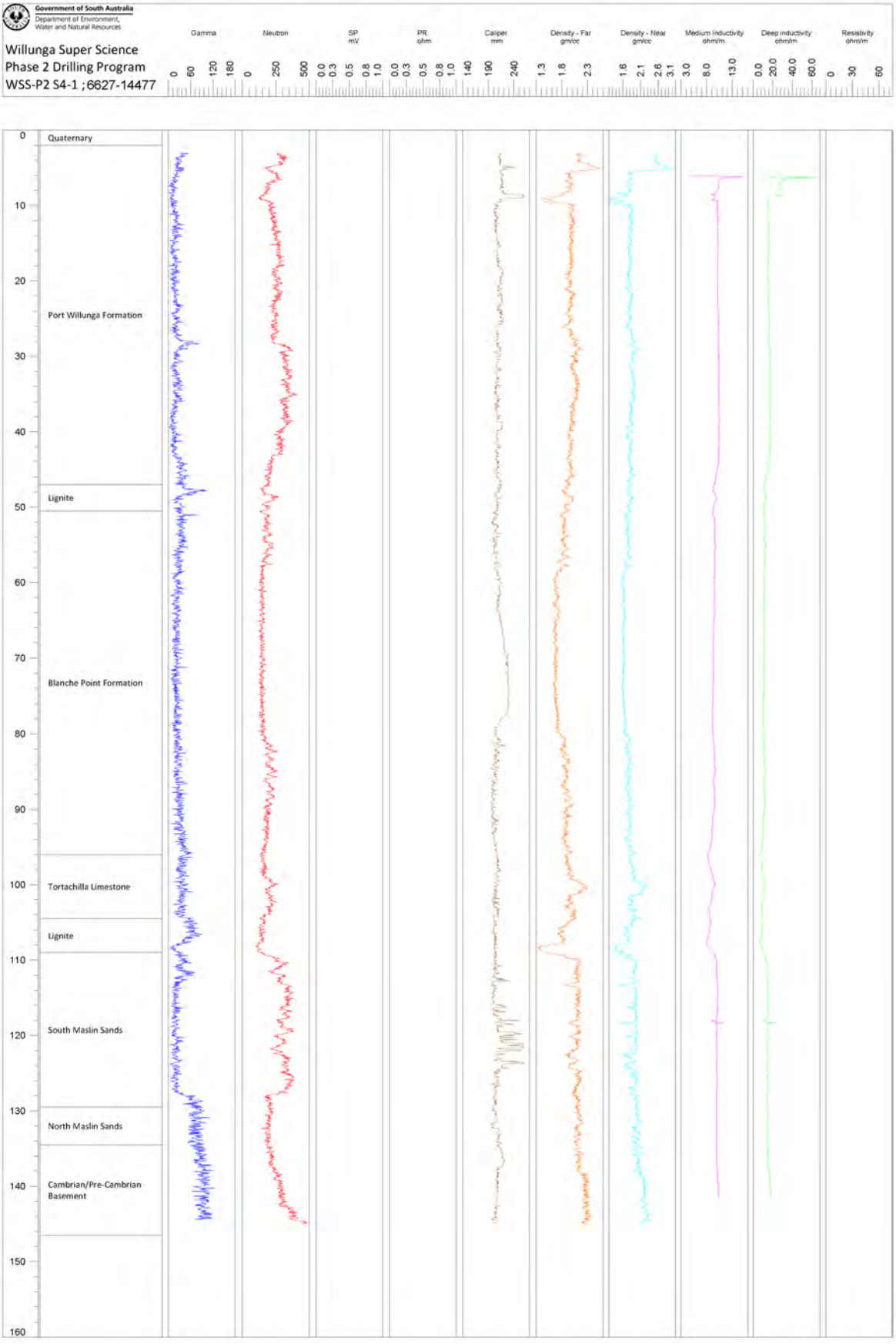
Well Construction Symbols

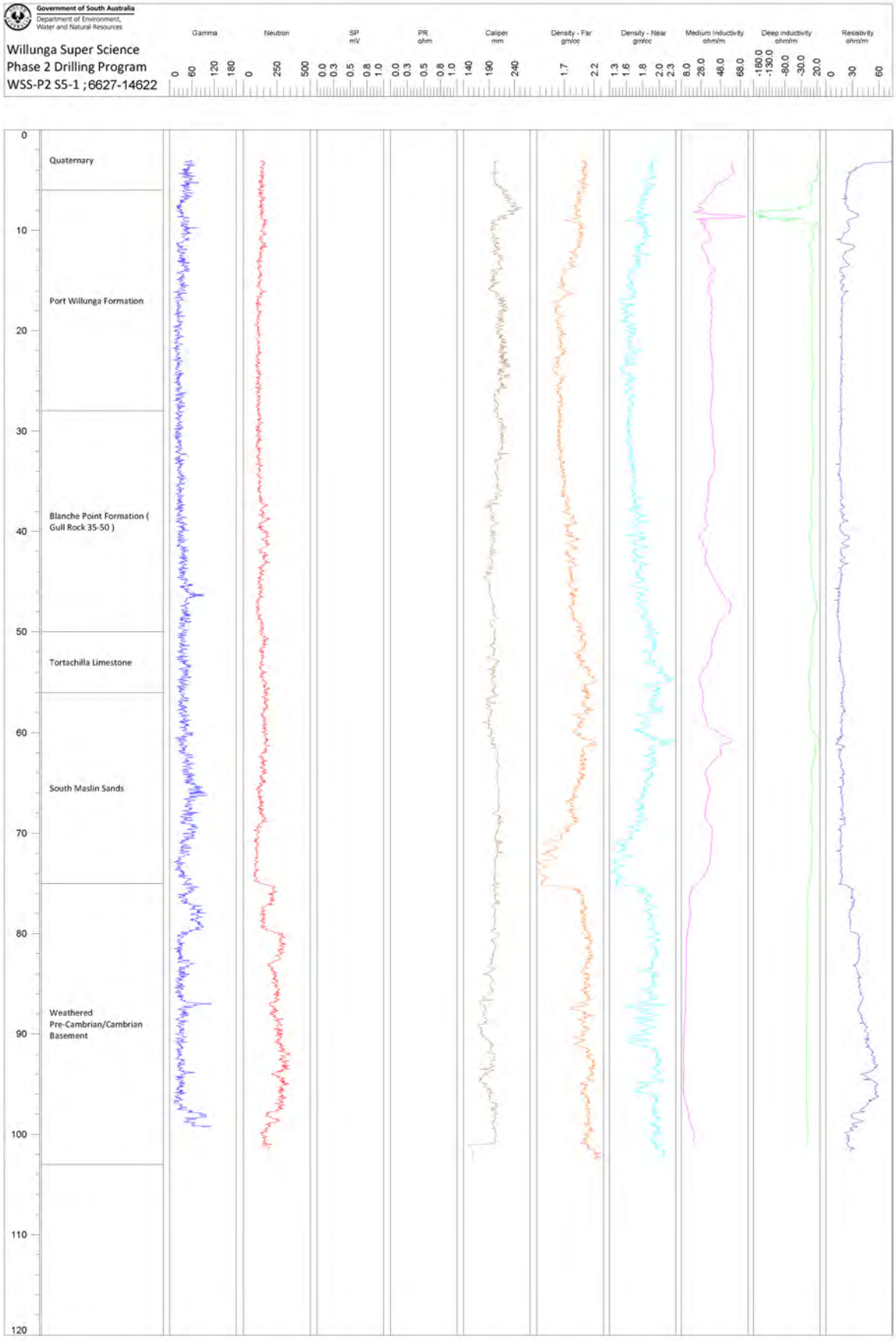
APPENDIX E. GEOPHYSICAL LOGS

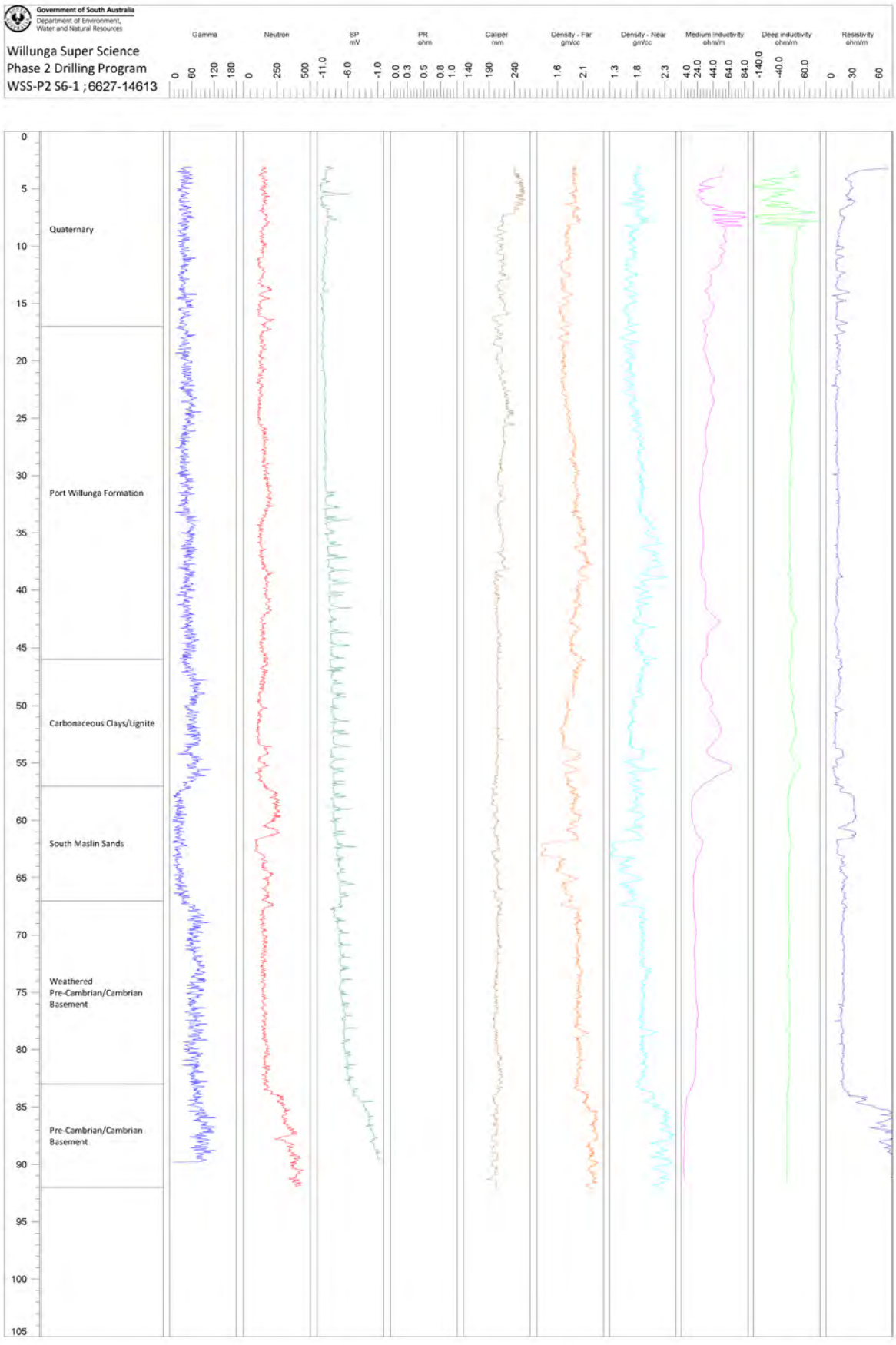

Government of South Australia
Department of Environment, Water and Natural Resources
Willunga Super Science
Phase 2 Drilling Program
WSS-P2 S1-1 ;6527-2025
Gamma
Neutron
SP mV
PR ohm
Caliper mm
Density - Far gm/cc
Density - Near gm/cc
Medium Inductivity ohm/m
Deep inductivity ohm/m
Resistivity ohm/m
Quaternary
Carisbrooke Sand
Port Willunga Formation
Lignite
Blanche Point Formation
Tortachilla Limestone
Lignite
Transition zone to South Maslin Sands
South Maslin Sands

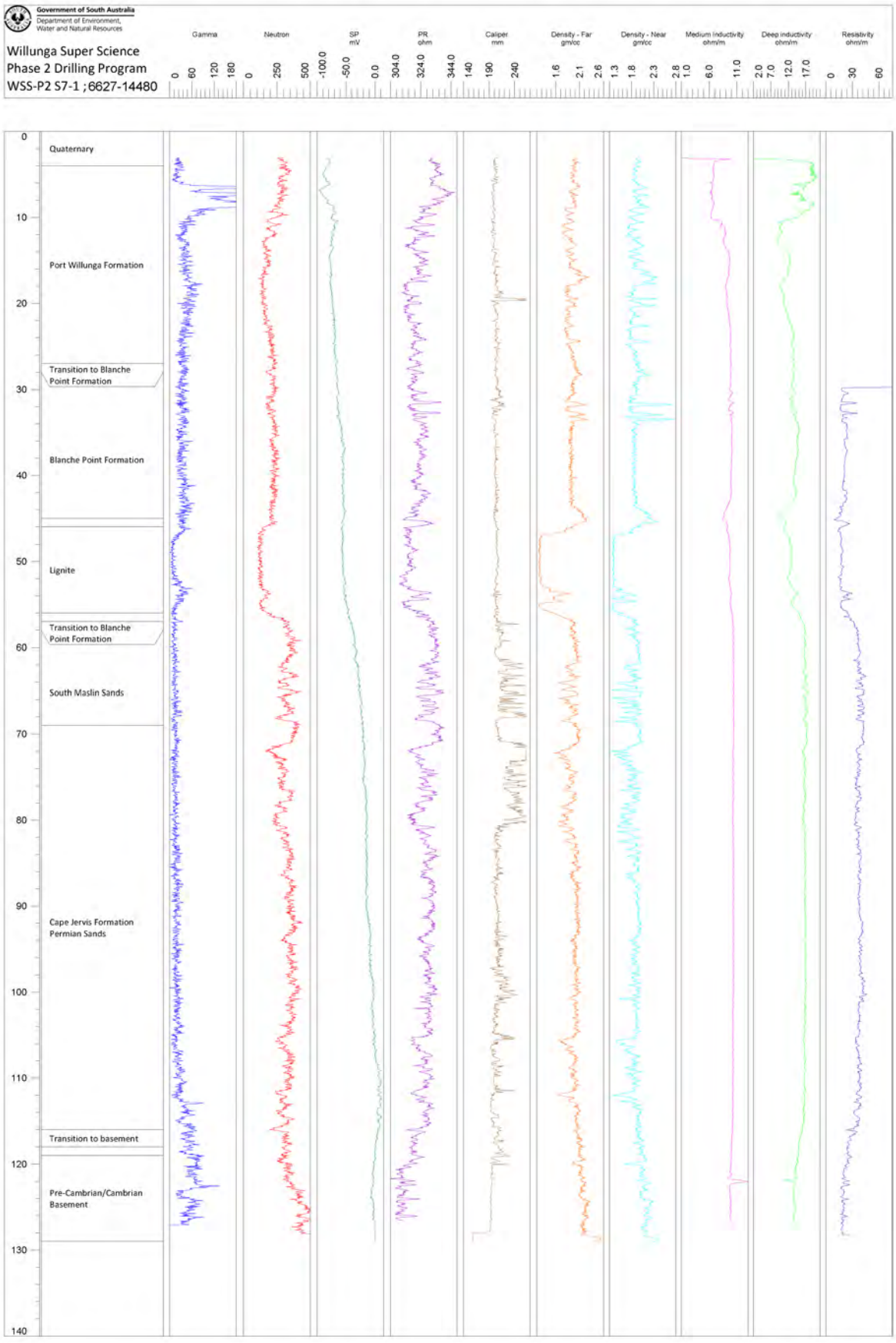

Government of South Australia
Department of Environment, Water and Natural Resources
Willunga Super Science
Phase 2 Drilling Program
WSS-P2 S2-1 ;6627-14523
Gamma
Neutron
SP mV
PR ohm
Caliper mm
Density - Far gm/cc
Density - Near gm/cc
Medium Inductivity ohm/m
Deep inductivity ohm/m
Resistivity ohm/m
Quaternary
Port Willunga Formation
Blanche Point Formation
Blanche Point Formation/South maslin Sands


Government of South Australia
Department of Environment, Water and Natural Resources
Willunga Super Science
Phase 2 Drilling Program
WSS-P2 S3-1 ;6627-14616
Gamma
Neutron
SP mV
PR ohm
Caliper mm
Density - Far gm/cc
Density - Near gm/cc
Medium Inductivity ohm/m
Deep inductivity ohm/m
Resistivity ohm/m
Quaternary
Port Willunga Formation
Lignite
Blanche Point Formation
Lignite
South Maslin Sands


Government of South Australia
Department of Environment, Water and Natural Resources
Willunga Super Science
Phase 2 Drilling Program
WSS-P2 S4-1 ;6627-14477
Gamma
Neutron
SP mV
PR ohm
Caliper mm
Density - Far gm/cc
Density - Near gm/cc
Medium Inductivity ohm/m
Deep Inductivity ohm/m
Resistivity ohm/m
Quaternary
Port Willunga Formation
Lignite
Blanche Point Formation
Tortachilla Limestone
Lignite
South Maslin Sands
North Maslin Sands
Cambrian/Pre-Cambrian Basement


Government of South Australia
Department of Environment, Water and Natural Resources
Willunga Super Science
Phase 2 Drilling Program
WSS-P2 S5-1 ;6627-14622
Gamma
Neutron
SP mV
PR ohm
Caliper mm
Density - Far gm/cc
Density - Near gm/cc
Medium Inductivity ohm/m
Deep inductivity ohm/m
Resistivity ohm/m
Quaternary
Port Willunga Formation
Blanche Point Formation (Gull Rock 35-50)
Tortachilla Limestone
South Maslin Sands
Weathered Pre-Cambrian/Cambrian Basement


Government of South Australia
Department of Environment, Water and Natural Resources
Willunga Super Science
Phase 2 Drilling Program
WSS-P2 S6-1 ;6627-14613
Gamma
Neutron
SP mV
PR ohm
Caliper mm
Density - Far gm/cc
Density - Near gm/cc
Medium Inductivity ohm/m
Deep inductivity ohm/m
Resistivity ohm/m
Quaternary
Port Willunga Formation
Carbonaceous Clays/Lignite
South Maslin Sands
Weathered Pre-Cambrian/Cambrian Basement
Pre-Cambrian/Cambrian Basement


Government of South Australia
Department of Environment, Water and Natural Resources
Willunga Super Science
Phase 2 Drilling Program
WSS-P2 S7-1 ;6627-14480
Gamma
Neutron
SP mV
PR ohm
Caliper mm
Density - Far gm/cc
Density - Near gm/cc
Medium Inductivity ohm/m
Deep inductivity ohm/m
Resistivity ohm/m
Quaternary
Port Willunga Formation
Transition to Blanche Point Formation
Blanche Point Formation
Lignite
Transition to Blanche Point Formation
South Maslin Sands
Cape Jervis Formation Permian Sands
Transition to basement
Pre-Cambrian/Cambrian Basement

APPENDIX F. DRILLERS WELL COMPLETION REPORTS

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

15 FEB 2013

1. PERMIT NO: 216013 Site

NAME OF DRILLER Joe Mason Licence No: 16778

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address P.O Box 2834

Adelaide S.A Post Code 5000

2. LOCATION OF WELL

Date of Survey 15/10/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

54h - 0270072

MTM - 6093233

☑ GDA 94/WGS84 ☐ AGD 66/84 ☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS D-2 S1-1

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5411/700 Allotment 101

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 18/10/12 Date work Completed 29/10/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO if yes please quote well number or GPS coordinates

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 164 (m) Final Depth 161 (m) Final Standing Water Level - (m) Final Yield - (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	164	200	Rotary	Mud/polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
	158	161	-	-	161	158	Air	30,000

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☐							
0	158	96	PVC Swel joint	☑	☐	0	156	100x20kg	2750	Bentonite	Tremmie	

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	158	161	0.5	96	116	Stainless steel	johnsons	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	156	161

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	
Hole developed and left at clients request		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by DEWNR Representative

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller [signature] Date 6/12/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department of Water, Land and Biodiversity Conservation

Science, Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

~~Naracoorte Regional Office, 101 Cedar~~ Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	2	Brown clays
2	7	white and grey clay (Firm)
7	17	White, orange, red clayey sands
17	18	gravel seam
18	22	White orange, red clayey sands
22	23	gravels
23	26	Orange clayey sands
27	34	White and orange limestones
34	48	Lost circulation/No samples
48	57	White and yellow limestones
57	67	Grey and green silty limestone
67	75	Brown silty limestones with sand
75	77	White coarse sands
77	81	Lignitic clays
81	112	Grey silty limestone with chert bands
112	129	glauconite and brown limestone with grey silts
129	144	Brown lignites?? with sandy
144	149	Brown lignites?? with sands
149	164	White sands

6527 2025

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 15 FEB 2013 — 2 1 6 0 1 4 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address: P.O Box 2834

Adelaide S.A Post Code 5000

2. LOCATION OF WELL

Date of Survey 27/11/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54- 0270072

UTM- 6093230

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS D2 S1-2

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5411/700 Allotment 101

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 27/11/12 Date work Completed 30/11/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 147 (m) Final Depth 147 (m) Final Standing Water Level — (m) Final Yield — (L/sec)

6. DRILLING DETAILS

If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	147	200	Rotary	Mud/polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
30/11/12	144	147	—	—	149	144	Air	—

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	200	Steel	☐	☑							
0	144	96	P.V.C Swell joint	☑	☐	0	142	100 x 20kg	2750	Bentonite	Tremmie	—

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	144	147	0.5	96	116	Stainless Steel	Johnsons	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	142	147

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air-lift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by DEWNR

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 10/12/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

~~Department of Water, Land and Biodiversity Conservation~~
~~Science Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)~~
~~Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or~~
~~Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or~~
~~Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271~~

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	2	Brown clays
2	7	White and grey clays
7	17	White, orange, red clayey sands gravels
17	18	
18	22	White, orange, red clayey sands
22	23	gravel
23	26	orange clayey sands
26	34	White + orange limestones
34	57	White + Yellow limestones
57	67	Grey/green silty limestones
67	75	Brown silty limestones with sands
75	77	White coarse sands
77	81	Lignite, clays brown
81	112	grey silts with check hard bands
112	129	glauconite and brown limestone with grey silt
129	144	Brown clays/lignite
144	147	White sands

6527 2026

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

15 FEB 2013

1. PERMIT NO: 216015 Site

NAME OF DRILLER Joe Mann Licence No: 16578

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address PO Box 2834

Adelaide SA. Post Code 5000

2. LOCATION OF WELL

Date of Survey 30/10/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 0270071

utm- 6093234

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S1-3

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5411/400 Allotment 101

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 30/10/12 Date work Completed 1/11/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 74 (m) Final Depth 74 (m) Final Standing Water Level – (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	74	200	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
1/11/12	72	74	–	–	74	72	Air	1500

7. CASING LEFT IN WELL

7.1 Dimensions

From (m)	To (m)	Internal Diam. (mm)	7.2 Type Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Casing Cemented Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☐							
0	72	100	P.V.C Swell joint	☑	☐	0	70	50x20kg	1375	Bentonite	Tremmie	

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen P.V.C	72	74	0.5	100	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	1mm	70	74

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by Nikola from DEWNR

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller [signature] Date 6/12/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department of Water, Land and Biodiversity Conservation
Science Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)
Water Laboratory, BV Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or
Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or
Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	2	Brown clays
2	7	Firm white and grey clays
7	17	orange, white, red clayey sands
17	22	coarse sands, gravels
22	27	Yellow, red, white clayey sands
27	58	White, yellow limestones
58	67	Grey, silty limestones
67	74	Grey and brown silty limestones

6527 2027

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

15 FEB 2013

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 216016 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address P.O Box 2834

Adelaide S.A Post Code 5000

2. LOCATION OF WELL

Date of Survey 1/11/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 0276071

UTM- 6093231

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S1-4

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT5411/700 Allotment 101

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 1/11/12 Date work Completed 5/11/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 59 (m) Final Depth 59 (m) Final Standing Water Level – (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details / 6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)	Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
0	3	248	Rotary	Air	5/11/12	57	59	–	–	59	57	Air	1200ppm
3	59	200	Rotary	Mud/polymer									

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☐							
0	57	100	P.V.C Swell joint	☑	☐	0	55	40x20kg	1,100	Bentonite	Tremmie	–

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	57	59	0.5	100	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	55	59

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by DEWNR

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 6/12/12

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	2	Brown clay
2	7	Firm white and grey clays
7	17	Orange, white, red clayey sands
17	22	Coarse sands and gravels
22	27	Yellow, red, and white clayey sands
27	59	White and yellow limestone

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department of Water, Land and Biodiversity Conservation

Science Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

~~Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271~~

DATE RECEIVED

6527 2028

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

15 FEB 2013

1. PERMIT NO: 216017 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address PO Box 2834

Adelaide SA Post Code 5000

2. LOCATION OF WELL

Date of Survey 7/11/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h-027 0071

UTM- 6093233

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S1-5

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5411/700 Allotment 101

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 7/11/12 Date work Completed 9/11/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 44 (m) Final Depth 44 (m) Final Standing Water Level – (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	44	200	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
9/11/12	42	44	–	–	44	42	Air	1900ppm

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☑							
0	42	100	Swell joint P.V.C	☑	☐	40	0	30x20kg	825	Bentonite	Tremmie	–

7.4 **COLLAR CASING** (must be cemented to surface) ☐ ☐

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	42	44	0.5	100	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	40	44

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

Hole developed and left as requested

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by DEWNR

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller J Mason Date 6/12/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department of Water, Land and Biodiversity Conservation

Science, Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

~~**Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271**~~

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	2	Brown clays
2	7	Firm white and grey clays
7	17	Orange white and red clayey sands
17	22	Coarse sands and gravels
22	27	Yellow, red and white clayey sands
27	44	White and yellow limestone

DATE RECEIVED

6527 2029

UNIT NUMBER

15 FEB 2013

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 216018 Site

NAME OF DRILLER Joe Mason Licence No: 16578

Contact Phone/Mobile No. Kongarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address P.O Box 2834

Adelaide S.A. Post Code 5000

2. LOCATION OF WELL

Date of Survey 6/11/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

Syh- 0270068

UTM- 6093231

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P-2 S1-6

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5411/700 Allotment 101

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 6/11/12 Date work Completed 7/11/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 29 (m) Final Depth 29 (m) Final Standing Water Level – (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	29	200	Rotary	Mud/polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
7/11/12	27	29	–	–	29	27	Air	2,300

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☑							
0	27	100	P.V.C Swell joint	☑	☐	25	20	30x20kg	405	–	Tremmie	–

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	27	29	0.5	100	116	P.V.C	TDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	25	29

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air-lift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by DEWNR

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 10/12/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department of Water, Land and Biodiversity Conservation

Science, Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	2	Brown Clays
2	7	Firm white and grey clays
7	17	Orange, white and red clayey sands
17	22	Coarse sands and gravels
22	27	Yellow, red and white clayey sands
27	29	Yellow and white limestones

6527 2030

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 05 DEC 2012 — 2 1 1 8 1 8 Site

NAME OF DRILLER J. Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier D.F.W

Postal Address P.O Box 2834 Adelaide

S.A. Post Code 5001

2. LOCATION OF WELL

Date of Survey 29/8/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 027346

WTM- 6093766

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP252-1

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5418/575 Filed plan 164027

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 29/8/12 Date work Completed 6/9/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 194 (m) Final Depth 192 (m) Final Standing Water Level - (m) Final Yield 0.1 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	194	203	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
6/9/12	189	192	-	0.1	192	189	Air lift	1600ppm

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	205	Steel	☐	☐							
0	189	95	P.V.C Swell joint	☑	☐	0	186	100x20kg	2750	Bentonite	tremmie	

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	189	192	0.5	95	117	Stainless Steel	Johnsons	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	192	186

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample Collected by Nicco Kruger

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/11/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Water, Environment and Sustainability Conservation

Science Exchange, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	8	Red, Brown sandy clay with gravels
8	17	Yellow and white sandy clays
17	20	As above with slightly coarser sands
20	35	Yellow white and orange sands, and sandy clays
35	69	Hard and soft Yellow and orange limestone
69	150	Grey silty limestone with shells
150	160	Silty grey limestone with glauconitic layers
161	168	Hard, grey limestone
168	195	Cemented and soft layers of sandstone with shells

ENTERED

6627 14523

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

05 DEC 2012

1. PERMIT NO: 21181 9 Site

NAME OF DRILLER Joe Maron Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier D. F. W

Postal Address P.O Box 2834

Adelaide S.A Post Code 5001

2. LOCATION OF WELL

Date of Survey 14/11/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h - 0273461

MTA - 6093772

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 52-2

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5416/575 Allotment 204

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 14/11/12 Date work Completed 21/11/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO if yes please quote well number or GPS coordinates

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 161 (m) Final Depth 158 (m) Final Standing Water Level – (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	161	200	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
21/11/12	155	158	–	–	158	155	Air	–

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☐							
0	155	96	P.V.C swell joint	☑	☐	0	152	220x20g	2970	–	Tremmie	–

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method: ☐ Open Hole ☐ Slotted Casing ☑ Screen(s) ☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	155	158	0.5	101	110	Stainless Steel	Johnsons	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	1mm	152	158

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by D.F.W

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/11/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Water, Water Conservation and Sustainability, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
		Hole was cored to 148m
148	161	Silty grey limestone with glauconitic layers

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

05 DEC 2012

1. PERMIT NO: 21820 Site:

NAME OF DRILLER J. Mason Licence No: 16578

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier D. F. W

Postal Address P.O Box 2834 Adelaide S.A. Post Code 5001

2. LOCATION OF WELL

Date of Survey 9/10/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 0273461
4TM- 6093769

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S-2-3

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5418/575 Filed Plan 164027

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 9/10/12 Date work Completed 15/10/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 118 (m) Final Depth 118 (m) Final Standing Water Level – (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	118	203	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
15/10/12	115	118	–	–	118	115	Airlift	–

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	205	Steel	☐	☐							
0	115	102	Swell joint P.V.C	☑	☐	0	113	75x20kg	2060	Bentonite	trommie	–

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole
☐ Slotted Casing
☑ Screen(s)
☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	115	118	0.5mm	95	112	Stainless Steel	Johnsons	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	113	118

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by Nicola from D.F.W

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller J. Mason Date 13/11/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Repa[illegible] Biodiversity Conservation

[illegible], GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED IN WELL DATABASE

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	8	Red and brown sandy clay with gravels
8	17	Yellow and white sandy clays
17	20	As above with coarser sands
20	35	Yellow, white and orange sands and sandy clays
35	69	Hard and soft yellow and orange limestone
69	118	Grey silty limestone with shells

6627 14525

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

05 DEC 2012

1. PERMIT NO: 211821 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier D.E.W

Postal Address P.O Box 2834

Adelaide S.A. Post Code 5001

2. LOCATION OF WELL

Date of Survey 7/9/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54-0273461

UTM-6093766

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S2-4

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5418/575 Allotment 204

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 7/9/12 Date work Completed 11/9/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO if yes please quote well number or GPS coordinates

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 68 (m) Final Depth 68 (m) Final Standing Water Level 19 (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	68	200	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
11/9/12	66	68	19	–	68	66	Air	950

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	205	Steel	☐	☐							
0	66	100	Swell joint P.V.C	☑	☐	64	0	50x20kg	1375	Bentonite	Tremmie	

7.4 **COLLAR CASING** (must be cemented to surface) ☐ ☐

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	66	68	0.5	100	116	IPAM & P.V.C		Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	64	68

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Samples Collected by D.E.W

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/11/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Water, Water Data Services, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED IN WDB

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	8	Red and brown Sandy clays with gravel
8	17	Yellow and white sandy clays
17	20	As above with coarser sand
20	35	Yellow, white and orange sand and sandy clays
35	68	Hard and soft Yellow and orange limestone

6627 14526

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 05 DEC 2012 — 2 1 1 8 2 2 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier D. F. W

Postal Address P.O Box 2834

Adelaide S.A. Post Code 5001

2. LOCATION OF WELL

Date of Survey 8/10/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 0273461

UTM- 6093770

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S2-5

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5418/575 Allotment 204

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 9/10/12 Date work Completed 9/10/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES (NO) if yes please quote replaced well number

Is this an Existing well? YES (NO) if yes please quote well number or GPS coordinates

Was well Abandoned? YES (NO) if so please state reason and method of backfill

Maximum Depth Drilled 50 (m) Final Depth 50 (m) Final Standing Water Level — (m) Final Yield — (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details / 6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)	Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
0	3	248	Rotary	Air	9/10	48	50	—	—	48	48	Air	—
3	50	200	Rotary	Mud-polym									

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☐							
0	48	100	Swell joint PVC	☑	☐	0	46	30x20kg	825	Bentonite	Tremmie	—

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	48	50	0.5	100	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	46	50

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample Collected by D.F.W.

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/11/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

D... Biodiversity Conservation GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED DATE ...

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	8	Red and brown Sandy clays with gravels
8	17	Yellow and white sandy clays
17	20	As above with coarser Sands
20	35	Yellow white and orange sands and sandy clays
35	50	Hard and soft yellow, orange limestone.

6627 14527

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

05 DEC 2012

1. PERMIT NO: 211823 Site

NAME OF DRILLER Joe Mason Licence No: 16578

Contact Phone/Mobile No: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier D.E.W

Postal Address P.O Box 2834

Adelaide S.A Post Code 5001

2. LOCATION OF WELL

Date of Survey 4/10/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h-0273461

UTM-6093769

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S2-6

4. LAND IDENTIFICATION

Pastoral Lease or Hundred:

Title or Plan and Parcel

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 4/10/12 Date work Completed 5/10/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 34 (m) Final Depth 34 (m) Final Standing Water Level — (m) Final Yield — (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	34	200	Rotary	Mud polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
5/10	32	34	—	—	34m	32m	Air	1200ppm

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☑							
0	34	100	Swell joint P.V.C	☑	☐	0	32	45x20kg	607	—	Tremmie	—

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	32	34	0.5	100	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	30	34

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample Collected by D.E.W.

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/11/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Biodiversity Conservation

Water Resources, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED DATE BY

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	8	Red and brown sandy clay with gravels.
8	17	Yellow and white sandy clays
17	20	As above with coarser sands
20	34	Yellow white and orange sands and sandy clays, carbonaceous.

6627 14528

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

05 DEC 2012

1. PERMIT NO: 21182 4 Site

NAME OF DRILLER Joe Mason Licence No: 16578

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision: –

PERMIT HOLDER or land occupier D.F.W

Postal Address P.O Box 2834

Adelaide S.A Post Code 5001

2. LOCATION OF WELL

Date of Survey 2/10/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h-0273461

MTM-6093766

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS D2 S2-7

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5416/575 Allotment 204

Name of Property: –

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 2/10/12 Date work Completed 3/10/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number .....

Is this an Existing well? YES/(NO) if yes please quote well number or GPS coordinates .....

Was well Abandoned? YES/(NO) if so please state reason and method of backfill .....

Maximum Depth Drilled 20 (m) Final Depth 20 (m) Final Standing Water Level – (m) Final Yield – (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	20	200	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
3/10	19	20	–	–	20	19	Air	–

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	Steel	☐	☐							
0	19	100	Swell joint P.V.C	☑	☐	0	17	25x20kg	338	–	Trommie	–

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details: .....

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	19	20	0.5	100	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	1mm	17	20

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample Collected by D.F.W

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/11/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Heritage, Water Branch, Level 1, Chesser House, 91-97 Grenfell Street, Adelaide, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	8	Red and brown sandy clay with gravels
8	17	Yellow and White sandy clays
17	20	As above with Coarse Sands

6627 14529

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 211794 Site 03

NAME OF DRILLER STEVE TUCKWELL Licence No: 33432

Contact Phone/Mobile No. 0427084227

Name of plant operator if under supervision Jason Kirk

PERMIT HOLDER or land occupier DEWNR

Postal Address L11/25 Grenfell ST GPO Box 2834 Adelaide Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

275558 E
6096529 N

☐ GDA 94/WGS84
☐ AGD 66/84
☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP2 site 3 well B

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel .....

Name of Property Pethic Road

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 8-4-13 Date work Completed 16-4-13

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number 211794 / WSSP2 S3 W1

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates** .....

Was well Abandoned? YES/NO if so please state reason and method of backfill .....

Maximum Depth Drilled 216 (m) Final Depth 213 (m) Final Standing Water Level ..... (m) Final Yield ..... (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details / 6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)	Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
0	216	200	Rotary	MUD (polymer)	16-4-13	213	210	51.8	·	213	210	Air lift	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	213	100	PVC CL 18	☑	☐	0	208	144	3960	Bentonite	Tremie (3 lines)	62+62+20

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole
☐ Slotted Casing
☑ Screen(s)
☐ Other, give details: .....

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Wedge wire	213	210	.5	100	110	Stainless Steel 304	Johnson Supersaver	Blank Plates

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity x 7m	8/16	213	210

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	0

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR Have all samples / nick kruger

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date / /

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department of Water Land and Biodiversity Conservation

Science Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)

Water Licensing Services, 23 Conyngham Street GLENSIDE SA 5065 or

Water Licensing Office, 25 Helen Street MOUNT GAMBIER SA 5290 or

Water Licensing Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED IN WELLS DATABASE

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	4	white sandy limestone
4	7	Clay
7	10	Red clay with stone
10	15	Sandy
15	20	light clays
20	25	white sandy clay/Aboriginal
25	30	sandy clays
30	35	white limestone Hard
35	38	Dark sandy clay
38	50	Sands
50	57	Red sandstone Hard drilling
69	70	Soft sands
70	84	sand with hard bits
84	95	Grey clay
95	100	Lignite clay
100	110	Dark Grey sandy clay
110	115	Grey clay with hard fractures
115	130	Siltstone
130	140	Grey limestone
142	178	Siltstone
178	180	Lignite
180	186	Sands
186	216	Medium Sand Quartz

UNIT NUMBER 6627 14674

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211795 Site 03

NAME OF DRILLER J MASON Licence No: 165178

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address GPO Box 2834

ADELAIDE Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

- ☐ GDA 94/WGS84
- ☐ AGD 66/84

275558 E
6096529 N.

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP2 SITE 3 WELL 2

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: WILLUNGA.

Parcel ID or CT number

Name of Property PETHICK ROAD.

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 29/01/2013. Date work Completed 22/02/2013.

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 187 (m) Final Depth 185 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	187	200	ROTARY	MUD (Polymer)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
20/02/13	182	185			185	182	AIR LIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203mm	STEEL	☐	☑							
0	182	100mm	PVC CL18	☑	☐	0	180	140	3300	BENTONITE	TREMIE (3 in)	60+40+40. TOP UP
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

- ☐ Open Hole
- ☐ Slotted Casing
- ☑ Screen(s)
- ☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
WEDGEWIRE	182	185	0.5	100	110mm	STAINLESS STEEL 304	JOHNSON SCREENS	BLANK PLATE SS

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
GRAVITY	8/16 + 7mm	180	185

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIR LIFT	3	–

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR HAVE ALL SAMPLES /-Nic Krieger.

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 1/4/2013

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	9	Sands & Clays
9	19	Sands & Silts
19	20	Clay
20	34	Sands & Gravels
34	35	Limestone
35	86	Sands & Sandstone Grave.
86	112	Clay dark grey Course Sand
112	115	Lignites
115	178	Siltstone Dark Brown - Gravel
178	179	Lignites.
179	214	Sand.

Driller to deliver this Copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211796 Site 03

NAME OF DRILLER J MASON Licence No: 165178

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address GPO Box 2834

ADELAIDE Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☐ GDA 94/WGS84

☐ AGD 66/84

275558 E

6096529 N

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP2 Site3 Well3

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: Willunga

Parcel ID or CT number

Name of Property Pethick Road

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 25-02-2013 Date work Completed 28-02-2013

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 145 (m) Final Depth 145 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details / 6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)	Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
0	145	200	ROTARY	MUD (Poly)	26/02/13	142	145			145	142	AIR LIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	142	100	PVC CL12	☑	☐	0	140	197	2660	—	Tremie Lines (30ft)	
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
WEDGE WIRE	142	145	0.5	100	110	STAINLESS 304	JOHNSON SUREScreen	BLANK PLATE

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
GRAVITY	8/16 + 7mm	140	145

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIRLIFT	3	—

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons: DEWNR HAVE ALL SAMPLES / -NICO KRUGER.

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 13/2/13

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	9	Sands & Clays
9	19	Sands & Silts.
19	20	Clay.
20	34	Sands & Gravels.
34	35	Limestone.
35	86	Sands & Sandstone lenses.
86	112	Clay dark grey, Coarse Sand
112	115	Lignites.
115	145	Siltstone dark brown - Glauconite

Driller to deliver this Copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211797 Site 03

NAME OF DRILLER J MASON Licence No. 165178

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address GPO Box 2834

ADELAIDE Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

- ☐ GDA 94/WGS84
- ☐ AGD 66/84

275558 E
6096529 N

☐ ZONE 52 ☐ ZONE 53 ☒ ZONE 54

3. WELL NAME WSSP2 Site3 Well 4

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: WILLUNGA

Parcel ID or CT number

Name of Property PETHICK RD

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 14-01-2013 Date work Completed 18-01-2013

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 103 (m) Final Depth 103 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	103	200	ROTARY	MUD (POLY)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
16/01/13	100	103			103	100	AIR LIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☒			~~245~~	~~3300~~	—	TREMIE	INC.
0	100	100	PVC CL18	☑	☐	0	98	245	3300	→	LINES?	LOST CLAY
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

- ☐ Open Hole
- ☐ Slotted Casing
- ☑ Screen(s)
- ☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
WEDGEWIRE	100	103	~~0.5~~ 0.5	100	110	STAINLESS STEEL 304	Johnson SureScreen	Blank Plate

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	2/16 + 7mm	98	103

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIR LIFT	3	-

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR HAS ALL SAMPLES / NICO, KRUGER

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 13/2/13

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	9	Sands & Clays
9	19	Sands & Silts
19	20	Clay
20	34	Sands & Gravels
34	35	Limestone
35	86	Sands & Sandstone layers
86	103	Clay dark grey + Coarse Sand

Driller to deliver this Copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211798 Site 03

NAME OF DRILLER J Mason Licence No: 165178

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address GPO Box 2834

ADELAIDE Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☐ GDA 94/WGS84

☐ AGD 66/84

275558 E

6096529 N

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP2 Site 3 Well 8

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: Willunga

Parcel ID or CT number

Name of Property Pethick Road

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 20/01/2013 Date work Completed 23/01/2013

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? ~~YES~~/NO if yes please quote replaced well number

Is this an Existing well? ~~YES~~/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? ~~YES~~/NO if so please state reason and method of backfill

Maximum Depth Drilled 62 (m) Final Depth 62 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	62	200	Rotary	Mud (Polymer)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
21/01/13	59	62			62	59	AIR LIFT	550

7. CASING LEFT IN WELL

7.1 Dimensions From (m)	To (m)	Internal Diam. (mm)	7.2 Type Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Casing Cemented Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑	~~0~~	~~59~~	~~70~~	~~945~~	—	Tremie	
0	59	180	PVC Cl 12	☑	☐	0	57	70	945	—	Lined 2.	
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
PVC Cl 12	59	62	0.5	100	110	PVC	Pipemaster	PVC Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm + 8/16	57	62

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIRLIFT	3	-

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR Has all Samples / Nico Kriegat

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 12/2/13

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	9	Sands & Clays
9	19	Sands & Silts
19	20	Clay
20	34	Sands & Gravels
34	35	Limestone
35	62	Sands & Sandstone lenses

Driller to deliver this Copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211799 Site 03

NAME OF DRILLER J MASON Licence No: 165178

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR.

Postal Address GPO Box 2834

ADELAIDE Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☐ GDA 94/WGS84

☐ AGD 66/84

275558 E

6096529 N

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSB2 Sch3 Well 6.

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: WILLUNGA

Parcel ID or CT number

Name of Property PETHICK ROAD

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 21-03-2013 Date work Completed 25-03-2013

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 34 (m) Final Depth 34 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	34	200	ROTARY	MUD (ROCK)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
23/03/13	32	34			34	32	AIR LIFT	

7. CASING LEFT IN WELL

7.1 Dimensions From (m)	To (m)	Internal Diam. (mm)	7.2 Type Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Casing Cemented Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	32	100	PVC. CL12	☑	☐	0	30	45	600	—	Tremie Line	
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Slotted PVC.	32	34	0.5	100	110	PVC	PipeMaster	PVC Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
GRAVITY	7 mm to 2/16.		

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIR LIFT	3	—

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR HAS ALL SAMPLES
/ — Nico Kloeze

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 12/2/13

Driller to deliver this copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	9	Sands & Clays
9	19	Sands & Silts
19	20	Clay,
20	34	Sands & Gravels

UNIT NUMBER

03 OCT 2012

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 7 1 1 8 0 0 Site

NAME OF DRILLER Joe Mason Licence No 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DFW. C/- Nicholas Kruger

Postal Address PO BOX 2834

Adelaide S.A. Post Code 5001

2. LOCATION OF WELL

Date of Survey 3/7/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54H-0277914

UTM-6099383

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME KISS P254-1

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: Willunga

Parcel ID or CT number CT 5140/750

Name of Property Allotment 1 Plan 104779

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 3rd July 2012 Date work Completed 7th July 2012

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES (NO) if yes please quote replaced well number

Is this an Existing well? YES (NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES (NO) if so please state reason and method of backfill

Maximum Depth Drilled 146.5 (m) Final Depth 146.5 (m) Final Standing Water Level 15.5 (m) Final Yield 0.1 (l/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details / 6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)	Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
0	6	248	Rotary	Air	7/7/12	143.5	146.5	15.5	0.1	146.5	143.5	Air	[redacted]
6	146.5	203	Rotary	Mud/Polymer									17600ms

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
+0.4	143.5	96	PVC/Swell joint	☑	☐	0	140	92×20kg	3100	Bentonite	tremmie	
0	6	205	Steel	☐	☐							
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen	143.5	146.5	0.5	102	114	Stainless	Johnsons	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	140	146.5

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air Lift	3	
Holes developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by Nicco Kruger.

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 7/8/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the below locations:

Department for Biodiversity Conservation, Land and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	5	brown sandy clay
5	27	brown+yellow sandy clay. with gravel
27	28.5	yellow+orange sandy clay.
28.5	37	coarse sands
37	48	white and red sandy clay with white sands.
48	81.5	black grey silty clay with shark and lignite
81.5	95	" " with shells
95	103	green+brown silty clay
103	109	brown lignitic clay
109	125	white sand+white sandy clay
125	130	white clay
130	134	white sands
134	146.5	blue weathered clay basement

6627 14477

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

03 OCT 2012

1. PERMIT NO: 7 1 1 8 0 1 Site

NAME OF DRILLER Joe Mason Licence No 16517 8

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEW. Nicolas Kruger

Postal Address PO Box 2834

Adelaide SA Post Code 5001

2. LOCATION OF WELL

Date of Survey 23/7/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54H - 0277907

UTM - 6094380

☐ ZONE 52 ☐ ZONE 53 ☐ ZONE 54

3. WELL NAME WSS A254-2

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: Willunga

Parcel ID or CT number CT 5140/750

Name of Property Allotment 1 Plan 104279

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 23rd July 2012 Date work Completed 27th July 2012

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES (NO) If yes please quote replaced well number.....

Is this an Existing well? YES (NO) **If yes please quote well number or GPS coordinates**.....

Was well Abandoned? YES (NO) If so please state reason and method of backfill.....

Maximum Depth Drilled 134 (m) Final Depth 134 (m) Final Standing Water Level 11 (m) Final Yield 0.7 (L/sec)

6. DRILLING DETAILS

If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	134	203	Rotary	Mud/Poly

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
23/7/12	129	134	11	0.7	134	129	Air	3880ms

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	7.2 Type: Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Yes	7.3 No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
+0.4	129	96	PVC/SW well	☑	☐	125	0	104×20kg	3500	Bentonite	tremmie	
0	6	205	Steel joint	☐	☐							
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:.....

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen wire wound	129	134	0.5	96	108	Stainless	Johnsons	Cap.

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	125	134

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	

Hole developed and left as requested

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Samples collected by Nicco Kruger

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 7/8/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the below locations:

Department for Water, Sustainability and Biodiversity Conservation

Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

DATE RECEIVED 15

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	106	Data not logged due to hole being core drilled.
106	175	white sand + white sandy clay.
175	179	white clay
179	134	white sands North Maslins Sands

6627 14478

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

03 OCT 2012

1. PERMIT NO: 7 1 1 8 0 7 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DFW-Nicolas Kruger

Postal Address PO Box 2834

Adelaide, SA. Post Code 5001

2. LOCATION OF WELL

Date of Survey 11/7/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ~~☐ AGD 66/84~~ ☐ ZONE 52 ☐ ZONE 53 ☐ ZONE 54

54H 277 919

~~6099~~ UTM 6099380

3. WELL NAME NSS P2 S4-3

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: Willunga

Parcel ID or CT number CT 5140/750

Name of Property Allotment/Plan 104229

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 11th July 2012 Date work Completed 14th July 2012

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) if yes please quote well number or GPS coordinates

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 117 (m) Final Depth 117 (m) Final Standing Water Level 11 (m) Final Yield 0.1 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	5	248	Rotary	Air
5	117	203	Rotary	Mud/Poly

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
14/7/12	114	117	11	0.1	117	114	Air	3180ms

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
+ 0.4	114	101	PVC swell joint	☑	☐	0	110	64x20kg	2150	Bentonite	Tremmie	
0	3	225	Steel	☐	☐							
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
wire wound	114	117	0.5	107	114	Stainless Steel	Johnsons	cap.

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	110	117

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Samples collected by Nicco Kruger

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 7/8/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the below locations:

Department for Water, Natural Resources, Biodiversity Conservation

Water Laboratory, Geological Survey & Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Murraylands Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED DATE

13. FORMATION LOG

From (m)	To (m)	Description of Material
[redacted]	[redacted]	[redacted]
0	5	brown sandy clay
5	22	brown + yellow sandy clay with gravel.
22	28.5	yellow + orange sandy clay.
28.5	37	coarse sands.
37	48	white + red sandy clay with white sands.
[redacted]		
48	81.5	black grey silty clay with Shell and lignite
81.5	95	" AS ABOVE " with shells.
95	103	green + brown silty clay
103	109	brown lignitic clay
109	117	white sands + white sandy clay. South Mashin Sands.

6627 14476

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

03 OCT 2012

1. PERMIT NO: 2 1 1 8 0 3 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEW-Nicholas Kruger

Postal Address PO BOX 7834.

Adelaide, SA. Post Code 5001

2. LOCATION OF WELL

Date of Survey 30/7 Surveyed by Method

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

S 34 - 0277986

E 138 - 6099376

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME NSS 7754-4.

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: Willunga.

Parcel ID or CT number CT 5140/750

Name of Property Allotment 1 Plan 104229.

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 30/7/12 Date work Completed 1/8/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) if yes please quote well number or GPS coordinates

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 102 (m) Final Depth 102 (m) Final Standing Water Level 11 (m) Final Yield 1 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	246	Rotary	Air
3	102	203	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
1/8	97	102	11	1	102	97	Airlift	2,200 ppm

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
+0.4	97	96	PVC Swell joint	☑	☐	0	95	70x20kg	1925	Bentonite	Tremmie	-
0	3	205	Steel	☐	☑							
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Screen Wire Wound	97	102	0.5	96	110	Stainless Steel	Johnsons	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	1mm	95	102

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	
Holes developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by Nico Kruger

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller [signature] Date 7/8/12

Driller to deliver this copy together with water samples collected and [illegible] **within 14 days of completion to any of the below locations:**

Department [illegible] Water, Land and Biodiversity Conservation

Water Laboratory and Biophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED DATE BY

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	5	Brown Sandy Clay
5	22	Brown + yellow sandy clay with gravel
22	28.5	Yellow orange Sandy clay
28.5	32	Coarse Sands
32	48	White and red sandy clay with white sands
48	81.5	black and grey silty clay with cherts and lignites
81.5	95	" as above with shells
95	102	Green and brown silty clay/limestone
		tortachilla

6627 14475

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 2/1/1804. Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEH-Nicholas Kruger

Postal Address PO BOX 1834

Adelaide, SA. Post Code 5001.

2. LOCATION OF WELL

Date of Survey 16/7/12 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

541-0277913

6143-6099374

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME NSS P2 S4-5

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: Willunga

Parcel ID or CT number CT 5140/750

Name of Property Allotment 1 Plan 104229.

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 16/7/12 Date work Completed 18/7/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES (NO) if yes please quote replaced well number

Is this an Existing well? YES (NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES (NO) if so please state reason and method of backfill

Maximum Depth Drilled 47 (m) Final Depth 47 (m) Final Standing Water Level 8 (m) Final Yield 2.5 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	47	203	Rotary	Mud/polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
18/7/12	44	47	8	2.5	47	47	Air	Tkims

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
40.4	47	105	P.V.C Swell joint	☑	☐	0	42	32x20	880	Bentonite	tremmie	-
0	3	205	Steel	☐	☑							
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Casing P.V.C	44	47	0.5	105	117	P.V.C	IDAN	Cap
Class 12								

8.3 Liner Seat (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	1mm	42	47

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air-lift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by Nico Kruger

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 7/8/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the below locations:

Department for Water, Biodiversity Conservation

Water Laboratory, Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Murraylands Regional Office, 101 Coda Avenue, NARACOORTE SA 5271

ENTERED DATE ... BY ...

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	5	Brown Sandy clay
5	22	Brow + yellow sandy clay with gravels
22	28.5	Yellow and orange sandy clay
28.5	32	Coarse sands
32	44	White and red sandy clays with small amount of white sands
44	47	White sand with white sandy clay

6627 14474

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 7 1 1 8 0 5 Site

NAME OF DRILLER Joe Mason Licence No 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DFW - Nicholas Kruger

Postal Address PO BOX 2834

Adelaide, SA Post Code 5001

2. LOCATION OF WELL

Date of Survey 19/7 Surveyed by 20/7 Method

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 0277914

UTM- 6099381

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME NWS P2 S4-6

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5140/750

Name of Property Allotment 1 Plan 104729

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 19/7/12 Date work Completed 20/7/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 32 (m) Final Depth 32 (m) Final Standing Water Level 8 (m) Final Yield 2 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	32	203	Rotary	Mud/polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
20/7/12	29	32	8	2	32	29	Air	1025mg/L

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
+0.4	32	105	P.V.C Swell joint	☑	☐	20	27	25x20	68	Bentonite	tremmie	-
0	3	205	Steel	☐	☑							

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
P.V.C Class 12	29	32	0.5	105	117	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	27	32

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample Collected by Nicco Kruger

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller Joe Mason Date 26/8/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Biodiversity Conservation

Water Monitoring and Assessment, GPO Box 2834 Adelaide SA 5001 (reports only)

SAL Laboratory, Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	5	Brown Sandy clay
5	22	Brow and yellow sandy clay with gravels
22	28.5	Yellow and orange Sandy clay
28.5	32	Coarse sands.

6627 14473

UNIT NUMBER

WSS-P2S5-1

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211813 Site 05

NAME OF DRILLER J MASON Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR.

Postal Address PO BOX 2834

ADELAIDE SA Post Code 5001

2. LOCATION OF WELL

Date of Survey 8/02/13 Surveyed by GPS Method GPS

GPS COORDINATES AND DATUM USED

☒ GDA 94/WGS84 ☐ AGD 66/84

E: 278811.270

N: 6101234.040

☐ ZONE 52 ☐ ZONE 53 ☒ ZONE 54

3. WELL NAME WSS P2 SITE5 WELL 1

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: WILLUNGA

Parcel ID or CT number CT 6083/269

Name of Property TINLAN WINES

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 4-03-2013 Date work Completed 7-03-2013

Work carried out: New Well ☒ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 103 (m) Final Depth 101.7 (m) Final Standing Water Level 8.13 (m) Final Yield 0.13 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	AIR	
3	103	200	Mud Rotary	

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
5/03/13	91	102	8.13	0.13	101.7	98.7	AIRLIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	200	Steel	☐	☒							
0	98.7	100	PVC	☒	☐	0	96	2400	Cem		Tremie Line	Ready Mix
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☒ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Wedge Wire	98.7	101.7	0.5	100	110	Stainless Steel	Johnson Screen	Blank SS Plug

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
GRAVITY	7mm + 8/16	96	101.7

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIRLIFT	3	-

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Samples Collected by DEWNR Nico Krueger

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... Date 16/4/13

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	1	Sandy Clay
1	6	Soft White Clay
6	12	Red Sandy Clay
12	14	Gravel
14	27	Yellow Sandy Clay
27	35	Marly Limestone
35	80	Grey Clay with Hard Layers
80	103	Red Shaky Clay

ENTERED DATE ... BY ...

Please give this copy together with [illegible] collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

6627 14622

UNIT NUMBER

WSS-P2 S5-2

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211814 Site 05

NAME OF DRILLER: J Mason Licence No: 165178
Contact Phone/Mobile No.: Kangarilla Drilling
Name of plant operator if under supervision:

PERMIT HOLDER or land occupier: DEWNR
Postal Address: PO Box 2834
ADELAIDE SA Post Code 5001

2. LOCATION OF WELL
Date of Survey 8/02/12 Surveyed by GPSUN Method GPS
GPS COORDINATES AND DATUM USED
☐ GDA 94/WGS84
☐ AGD 66/84
E: 278811-270
N: 6101234.040
☐ ZONE 52 ☐ ZONE 53 ☒ ZONE 54

3. WELL NAME: WSS P2 S5 W2

4. LAND IDENTIFICATION
Hundred or Pastoral Lease: WILLUNGA
Parcel ID or CT number: CT 6083/269
Name of Property: TINLIN WINES

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*
Date work Commenced: 12-03-2013 Date work Completed: 14-03-2013
Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐
Is this a Replacement well? YES/NO if yes please quote replaced well number:
Is this an Existing well? YES/NO if yes please quote well number or GPS coordinates: 8.81 <0.1
Was well Abandoned? YES/NO if so please state reason and method of backfill:
Maximum Depth Drilled: 80 (m) Final Depth: 80 (m) Final Standing Water Level: 8.81 (m) Final Yield: 0.1 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	AIR
3	80	200	Rotary	MUD

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
13/03/13	77	80	8.81	<0.1		77	AIRLIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	200	Steel	☐	☑							
0	77	100	PVC Clip.	☑	☐			2000	Litres		Tremie	
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method
☐ Open Hole
☐ Slotted Casing
☑ Screen(s)
☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Johnson Wedge Wire	77	80	0.5	100	110	Stainless Steel	SlotSaver	Blank SS Plate

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm to 2/16	75	80

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air Lift	3	-

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES
The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:
Samples Collected by DEWNR Nico Rhyne

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller [signature] *Date* 16/03/13

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	1	Sandy Clay
1	6	Stiff White Clay
6	12	Red Sandy Clay
12	14	Gravel
14	27	Yellow Sandy Clay
27	35	Marly Limestone
35	80	Grey Silt with Hard Layers

ENTERED DATE

Please forward this Copy together with any samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

6627 14623
UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 211815 Site 05

NAME OF DRILLER Steve Tuckwell Licence No: 33432

Contact Phone/Mobile No.: 0427084227

Name of plant operator if under supervision: Jason Kirk

PERMIT HOLDER or land occupier: DEWNR

Postal Address: L 11/25 Greenhill ST

GPO Box 2834 Adelaide Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

E 278812

N 6101227

☐ GDA 94/WGS84

☐ AGD 66/84

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME: W55 P2 site 5 W3

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel:

Name of Property: Challis Hill Rd

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced: 15-3-2013 Date work Completed: 20-3-2013

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number:

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled: 56.5 (m) Final Depth: 56 (m) Final Standing Water Level: (m) Final Yield: (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	56.5	200	Rotary	mud (polymer)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
19-3-13	53	56			56.5	54	Air lift	

7. CASING LEFT IN WELL

7.1 From (m)	7.1 To (m)	7.1 Internal Diam. (mm)	7.2 Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Yes	7.3 No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	56	100	PVC CL12	☑	☐	0	50	40	1100	Bentonite	Tremie (2 Line)	

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Wedgewire	53	56	0.5	100	110	STAINLESS STEEL	Johnson Screen	Blank Plate

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	8/16 +7mm	52	56

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	0

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR Have all Sample/Nicol Myer

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller: [signature] Date 20/3/13

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:
Department of Water Land and Biodiversity Conservation
Science Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)
Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or
Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or
Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	2	Clay
2	6	Hard Grey limestone
6	8	White limestone
8	9	Alluvial
9	12	Stone Bands
12	16	Sandy limestone
16	22	Sandy Clay
22	26	limestone
26	30	Sandy clay
30	33	Grey sandy mix
33	36	Grey sandy mix hard bands
36	37	Weathered Basement
37	40	Stone hard bits
40	42	Grey sand/limestone
42	45	Weathered Basement
45	56	Tortachilla limestone

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 211816 Site 05

NAME OF DRILLER Steve Tuckwell Licence No 33432

Contact Phone/Mobile No.: 0427084227

Name of plant operator if under supervision: Jason Kirk

PERMIT HOLDER or land occupier: DEWNR

Postal Address: L 11-25 Grenfell St

GPO Box 2834 Adelaide Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

E 278812

N 6101227

☐ GDA 94/WGS84

☐ AGD 66/84 ☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 35 W4

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel:

Name of Property: Chalk Hill Rd

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 21-3-13 Date work Completed 22-3-13

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? ~~YES~~/NO if yes please quote replaced well number

Is this an Existing well? ~~YES~~/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? ~~YES~~/NO if so please state reason and method of backfill

Maximum Depth Drilled 28.5 (m) Final Depth 28 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details / 6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)	Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
0	28.5	200	Rotary	MUD (polymer)	22-3-13	26	28			28.5	26	Air-lift	

7. CASING LEFT IN WELL

7.1 From (m)	7.1 To (m)	7.1 Internal Diam. (mm)	7.2 Type: Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Yes	7.3 No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	28	100	PVC cl 12	☑	☐	0	28	28	770	Bentonite	Tremies 2 lines	

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
PVC	26	28	0.5	100	110	PVC		

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	8/16 +7mm	25	28

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	2	0

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR Have all samples

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller: ..... Date 22/3/13

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:
Department of Water Land and Biodiversity Conservation
Science Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)
Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or
Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or
Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	8	River Bed
8	10	Alluvial
10	11	White clay stone
11	15	Hard stone Bands
15	17.5	Sandy limestone
17.5	19	Fractured Rock
19	26	Sandy clays

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 211817 Site 05

NAME OF DRILLER Steve Judewell Licence No 33432

Contact Phone/Mobile No. 0427054227

Name of plant operator if under supervision Jason Kral

PERMIT HOLDER or land occupier DEWNR

Postal Address 4-11-25 Grenfell St

GPO Box 2834 Adelaide Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☐ GDA 94/WGS84

☐ AGD 66/84

E 278812

N 6101227

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP235WS

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel.....

Name of Property.....

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 25-3-13 Date work Completed 26-3-13

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number.....

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**.....

Was well Abandoned? YES/NO if so please state reason and method of backfill .....

Maximum Depth Drilled 18.5 (m) Final Depth 18 (m) Final Standing Water Level.....(m) Final Yield.....(L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	18.5	200	Rotary	MUD (polymer)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
26-3-13	16	18			18.5	15	Airlift	

7. CASING LEFT IN WELL

7.1 From (m)	7.1 To (m)	7.1 Internal Diam. (mm)	7.2 Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Yes	7.3 No	7.3 From (m)	7.3 To (m)	7.3 Cement (bags)	7.3 Water (litres)	7.3 Other Additives	7.3 Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	18	160	PVC cl 12	☑	☐	0	15	12	330	Bentonite	Tremie (2 lines)	

7.4 **COLLAR CASING** (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:.....

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
PVC	16	18	0.5	160	110	PVC		

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	8/16 #700	15	18

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	0

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR have all samples

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 26/7/13

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:
Department of Water Land and Biodiversity Conservation
Science Monitoring & Information, GPO Box 2834 Adelaide SA 5001 (reports only)
Water Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or
Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or
Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	4	Clay with stone
4	11.5	White sandy clay
11.5	18	Sandy limestone with Fine Rock

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211808. Site 06

NAME OF DRILLER J MASON Licence No: 165178

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR.

Postal Address PO Box 2834

ADELAIDE SA Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

281148 E

6103236 N

☐ GDA 94/WGS84

☐ AGD 66/84 ☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP2 56 W1

4. LAND IDENTIFICATION

Hundred or Pastoral Lease:

Parcel ID or CT number

Name of Property ADJ. Woodstock Winery

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 4-02-2013 Date work Completed 8-02-2013

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 92 (m) Final Depth 92 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details / 6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)	Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
0	92	200	ROTARY	MUD (Polymer)	6-02-13	89	92			92	89	AIR LIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							3 X 20 Kgs
0	89	100	CL 12 PVC	☑	☐	0	87	63	1650	BENTONITE	TREMIE LINE 2	Cement TOP UP
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
WEDGE WIRE	89	92	0.5	100	110	STAINLESS STEEL 304	JOHNSON SURESCREEN	BLANK PLATESS

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
GRAVITY	7mm to 8/16.	87	92.

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIRLIFT	3	-

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR HAS ALL SAMPLES / - NICO KRUGER

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 14/3/13

Driller to deliver this Copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	3	Dark Brown Topsoil Silty Clay Sd
3	8.	Sandy Clay, with some gravel
8	11	Clayey Silt with black pelts
11	16	Silty Sand grey/orange.
16	30	Silty Sand Siliceous matrix
30	38.	Green Grey Silty, Sandy, Limestone
38	43	As Above. Dark brown to Grey
43	57	Sandy Clays Carbonaceous - lignite
57	62	Coarse Quartz Sand
62	67	Carbonaceous Clay / Lignite
67	82	Weathered Basement
82	92	Blue Shale, Fractured Rock

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211807 Site 06

NAME OF DRILLER J MASON Licence No 165178

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR

Postal Address PO Box 2834

ADELAIDE SA Post Code 5001

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☐ GDA 94/WGS84

☐ AGD 66/84

281148 E

6103236 N

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WS582 SITE 6 WELL 2

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: WILLUNGA.

Parcel ID or CT number

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 11-02-2013 Date work Completed 13-02-2013.

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 61 (m) Final Depth 60.5 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	61	200	ROTARY	MUD (Polymer)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
11/02/13	58	61			60.5	58.5	AIRLIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	58.5	100	PVC CL12	☑	☐	0	56	60.	810	—	TREMIE LINES 2	
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☐ Slotted Casing

☑ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
WEDGE WIRE	58.5	60.5	0.5	100	110	STAINLESS STEEL	JOHNSON SURESCREEN	BLANK PLATE SS

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
GRAVITY	7mm		
	8/16	56	61

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIR LIFT	3	-

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR HAS ALL SAMPLES.

/- NICO KROGER

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 14/3/13

Driller to deliver this copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	3	Dark Brown Topsoil Silty Clay
3	8	Sandy Clay some gravel.
8	11	Clayey Silt w black pellets.
11	16	Silty Sand grey/orange.
16	30	Silty Sand Silicious Matrix
30	38	Limestone Grey Grey, Silty Sand
38	43	AS ABOVE Dark Brown to Grey
43	57	Sandy Clay, Carbonaceous/ Ironstic
57	61	Coarse, Quartz Sand.

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

1. PERMIT NO: 211806 Site 06

NAME OF DRILLER J. MASON Licence No: 16578

Contact Phone/Mobile No.:

Name of plant operator if under supervision

PERMIT HOLDER or land occupier DEWNR.

Postal Address PO BOX 2834

ADELAIDE SA Post Code 5001.

2. LOCATION OF WELL

Date of Survey ..... Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☐ GDA 94/WGS84

☐ AGD 66/84

281148 E

6103236 N

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSSP2 SITE 6 WELL 3

4. LAND IDENTIFICATION

Hundred or Pastoral Lease: WILLUNGA

Parcel ID or CT number

Name of Property A.D.I. WOODSTOCK WINERY

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 13-02-2013 Date work Completed 15-02-2013

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO **if yes please quote well number or GPS coordinates**

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 39 (m) Final Depth 39 (m) Final Standing Water Level (m) Final Yield (L/sec)

6. DRILLING DETAILS

If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	39	200	ROTARY	MUD (Polymer)

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
14/02/13	36	39			39	36	AIR LIFT	

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	203	STEEL	☐	☑							
0	36	100.	PVC CL 12	☑	☐	0	34	40	540.	—	TREMIE LINES 2.	
				☐	☐							
				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
PVC Slotted Pipe	36	39	0.5	100	110	PVC	PipeMaster	PVC Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
GRAVITY	7mm 8/16	34	39

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
AIRLIFT	3	—

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The provision of the Water Resources Act 1997 and Regulations thereto require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

DEWNR HAS ALL SAMPLES. C/- NICO KROEGER.

As the person responsible for the work carried out on this well I advise that it has been completed as described above:

Signature of Licensed Driller ..... *Date* 14/3/13

Driller to deliver this Copy together with water samples collected and well location plan within 14 days of completion to:

Primary Industries and Resources SA
Core Library Complex
23 Conyngham Street
GLENSIDE SA 5065

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	3	Dk Brown Silty Topsoil Clayey
3	8	Sandy Clays some gravel
8	11	Clayey Silt w pellets black
11	16	Silty Sand grey/orange
16	30	Silty Sand Siliceous matrix
30	39	Limestone Brown/Grey Silty Sandy.

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 04 OCT 2012 — 2 1 1 8 0 9 Site

NAME OF DRILLER Joe Mason Licence No: 65178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier Department for Water

Postal Address: P.O Box 2834

Adelaide S.A Post Code 5001

2. LOCATION OF WELL

Date of Survey 7/8 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54J - 0282584

mTM - 6105136

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS PZ S7-1

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5982/825 Plan 72200

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 7/8/12 Date work Completed 10/8/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO if yes please quote well number or GPS coordinates

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 129 (m) Final Depth 129 (m) Final Standing Water Level 13 (m) Final Yield >0.5 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	129	203	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
10/8	126	129	13	>.5	129	126	Air	843

7. CASING LEFT IN WELL

7.1 Dimensions From (m)	To (m)	Internal Diam. (mm)	7.2 Type Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	7.3 Casing Cemented Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	205	Steel	☑	☐	0	123	50x20kg	1375	Bentonite	tremmie	
+.4	126	96	P.V.C Swell joint	☐	☐							

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
Class 18 4" P.V.C	126	129	0.5	96	116	IDAN P.V.C		Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	123	129

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by Nicco Kruger DFW.

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/9/2012

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Water, Science, Monitoring and Information, GPO Box 2834 Adelaide SA 5001 (reports only)

Core Laboratory, Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED DATE

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	4	Brown and red sandy clay
4	27	Yellow brown silty limestone with sandstone Hard bands
27	28	Green Silty limestone with glauconite's
28	45	Brown sandy clay with cherk bands and brown lignitic clays
45	56	Brown clay / lignite
56	58	Brown sandy clay with white sands
58	69	Medium / coarse white sands with small amount white sandy clay
69	109	" as above " getting finer
109	116	Fine white sands
116	118	White sandy clay with blue weathered basement
118	129	Blue basement rock with small fractures.

6627 14480 UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

04 OCT 2012

1. PERMIT NO: 21181 0 Site

NAME OF DRILLER J. Mason Licence No. 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier Department For Water

Postal Address P.O. Box 2834

Adelaide S.A Post Code 5001

2. LOCATION OF WELL

Date of Survey 13/8 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 0282573

MTM- 6105137

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S7-2

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel CT 5982/425 Plan 72200

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 13/8/12 Date work Completed 15/8/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/NO if yes please quote replaced well number

Is this an Existing well? YES/NO if yes please quote well number or GPS coordinates

Was well Abandoned? YES/NO if so please state reason and method of backfill

Maximum Depth Drilled 83 (m) Final Depth 83 (m) Final Standing Water Level ? (m) Final Yield 0.6 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air- Polymer
3	83	203	Rotary	Mud- polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
15/8	80	83						750

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	205	Steel	☑	☐	0	78	70x20kg	1925	Bentonite	tremmie	
+0.4	80	104	P.V.C Class 12	☐	☐							

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole ☑ Slotted Casing ☐ Screen(s) ☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
P.V.C Class 12 Screen	80	83	0.5	104	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	1mm	78	83

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample collected by Nicco Kruger D.E.W

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/9/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Biodiversity Conservation
Science, Monitoring and Information, GPO Box 2834 Adelaide SA 5001 (reports only)
Laboratory and Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or
Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or
Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED DATE

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	4	Brown + Red sandy clay
4	27	Yellow and brown silty limestone with Sandstone Hard bands
27	28	Green silty limestone glauconite
28	45	Brown Sandy clay with cherk bands and brown lignitic clays
45	56	Brown Clay / lignite
56	58	Brown Sandy Clay with white sands
58	69	Medium / coarse white sands with small amount of clay
69	83	"as above" with sands becoming finer

66271 44881 UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

04 OCT 2012

1. PERMIT NO: 2 1 1 8 1 1 Site

NAME OF DRILLER J. Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision:

PERMIT HOLDER or land occupier D.F.W

Postal Address: P.O Box 2834

Adelaide S.A. Post Code 5001

2. LOCATION OF WELL

Date of Survey 21/8 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

54h- 282577

mN- 6105139

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S7-3

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5982/925 Plan 72200

Name of Property:

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 21/8/12 Date work Completed 23/8/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number:

Is this an Existing well? YES/(NO) if yes please quote well number or GPS coordinates:

Was well Abandoned? YES/(NO) if so please state reason and method of backfill:

Maximum Depth Drilled 67 (m) Final Depth 67 (m) Final Standing Water Level ? (m) Final Yield 0.5 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	67	203	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
23/8	64	67	?	0.5	67	64	Air	742

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	205	Steel	☑	☐	0	62	40x 20kg	1100	Bentonite	tremmie	-
+.4	64	102	P.V.C Swell joint	☐	☐							

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
P.V.C Class 12	64	67	0.5	102	116	P.V.C	LOAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	62	67

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Air lift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample Collected by Nicco Kruger D.F.W

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller J.L.Mason Date 13/9/12

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

Department for Environment and Water, Sustainability and Climate Change, GPO Box 2834 Adelaide SA 5001 (reports only)

Laboratory of Applied Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

ENTERED DATE ... BY ...

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	4	Brown + Red Sand clays
4	27	Yellow, Brown silty limestone with sandstone bands
27	28	Green silty limestone glauconite
28	45	Brown sandy clay with cherk bands and brown lignitic clays
45	56	Brown Clays / lignite
56	58	Brown sandy clays with white sands
58	67	Medium / coarse white sands with small amount of clays

6627 14482

UNIT NUMBER

GOVERNMENT OF SOUTH AUSTRALIA

DRILLERS WELL CONSTRUCTION REPORT

Natural Resource Management Act 2004

DETAILS OF ALL WORK UNDERTAKEN MUST BE REFLECTED IN THIS REPORT

1. PERMIT NO: 04 OCT 2012 — 2 1 1 8 1 2 Site

NAME OF DRILLER Joe Mason Licence No: 165178

Contact Phone/Mobile No.: Kangarilla Drilling

Name of plant operator if under supervision

PERMIT HOLDER or land occupier D.F.W

Postal Address: P.O Box 2834

Adelaide S.A Post Code 5001

2. LOCATION OF WELL

Date of Survey 20/8 Surveyed by ..... Method .....

GPS COORDINATES AND DATUM USED

☑ GDA 94/WGS84 ☐ AGD 66/84

Sth- 211 812

UTM- 6105138

☐ ZONE 52 ☐ ZONE 53 ☑ ZONE 54

3. WELL NAME WSS P2 S7-4

4. LAND IDENTIFICATION

Pastoral Lease or Hundred: Willunga

Title or Plan and Parcel: CT 5982/925 Plan 72200

Name of Property

5. SUMMARY *(Please tick appropriate boxes and complete all relevant details)*

Date work Commenced 20/8/12 Date work Completed 21/8/12

Work carried out: New Well ☑ Deepen ☐ Enlarge ☐ Rehabilitate ☐ Backfill ☐

Is this a Replacement well? YES/(NO) if yes please quote replaced well number

Is this an Existing well? YES/(NO) if yes please quote well number or GPS coordinates

Was well Abandoned? YES/(NO) if so please state reason and method of backfill

Maximum Depth Drilled 27 (m) Final Depth 27 (m) Final Standing Water Level 14 (m) Final Yield 0.1 (L/sec)

6. DRILLING DETAILS If not a drilled well, please complete Sections: 6.2, 9, 10, 11, 12 and 13 as necessary

6.1 Construction Details

From (m)	To (m)	Diam (mm)	Drilling Method Cable Tool, Rotary Auger, Down Hole Hammer, etc.	Fluid Used (Air, Water, Mud Type)
0	3	248	Rotary	Air
3	69	203	Rotary	Mud-polymer

6.2 Water Cut Details (measurements from natural surface to nearest 0.1 m)

Date	Water Cut From (m)	Water Cut To (m)	Standing Water Level (m)	Estimated Yield (L/sec)	Hole Depth at Test (m)	Casing at Test (m)	Test Method	Salinity (mg/L) or Taste
21/8	24	27	14	0.1	27	24	Air	390

7. CASING LEFT IN WELL

7.1 Dimensions / 7.2 Type / 7.3 Casing Cemented

From (m)	To (m)	Internal Diam. (mm)	Swell Joint, Welded Collar, Steel, FRP, PVC, etc.	Yes	No	From (m)	To (m)	Cement (bags)	Water (litres)	Other Additives	Cementing Method Used	Comments
0	3	205	Steel	☑	☐	0	22	25x20	688	Bentonite	tremmie	-
3	24	102	P.V.C Swell joint	☐	☐							

7.4 COLLAR CASING (must be cemented to surface)

				☐	☐							

8. CONSTRUCTION AT PRODUCTION LEVEL

8.1 Method

☐ Open Hole

☑ Slotted Casing

☐ Screen(s)

☐ Other, give details:

8.2 Screen or Casing (*If variable aperture screen used give limits)

Type	From (m)	To (m)	Aperture* (mm)	Inner Diam (mm)	Outer Diam (mm)	Material	Trade Name	Completion of Base
P.V.C Class 12 Screen	24	27	0.5	102	116	P.V.C	IDAM	Cap

8.3 Liner Seal (Packer)

Material	Depth (m)	Internal Diam (mm)

8.4 Gravel Packing

Method of Placement	Gravel Passing Mesh Size	From (m)	To (m)
Gravity	7mm	22	27

9. IF NOT A DRILLED WELL

Method	Depth (m)	Length (m)	Width (m)	Diam (m)	Lining Material	From (m)	To (m)

10. DEVELOPMENT (State methods and time taken)

Method	Hours	Minutes
Airlift	3	
Hole developed and left as requested		

11. PUMPING TEST (measurements from natural surface to nearest 0.1m)

Interval Tested From (m)	Interval Tested To (m)	Water Level (m)	Test Method	Pump Depth (m)	Discharge Rate (L/sec)	Method of Measuring Discharge	Hours Pumped	Draw Down (m)

12. SAMPLES

The Natural Resource Management Act 2004 and Regulations require that strata and water samples must be obtained. If any samples have not been obtained state reasons:

Sample Collected by Nicco Kruger D.F.W

As the person responsible I advise that the work has been completed as described above.

Signature of Licensed Driller ..... Date 13/9/12

13. FORMATION LOG

From (m)	To (m)	Description of Material
0	4	Brown + Red Sandy Clay
4	27	Yellow, Brown silty limestone with sandstone bands

Driller to deliver this copy together with water samples collected and well location map within 14 days of completion to any of the locations below:

ENTERED DATE

Geological Survey and Resource Assessment, University Conservation

Science, Mineral House, 101 Grenfell Street, GPO Box 2834 Adelaide SA 5001 (reports only)

Core Library and Laboratory, Geophysical Services, 23 Conyngham Street GLENSIDE SA 5065 or

Mount Gambier Regional Office, 11 Helen Street MOUNT GAMBIER SA 5290 or

Naracoorte Regional Office, 101 Cedar Avenue, NARACOORTE SA 5271

6627 14483

UNIT NUMBER