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APPENDICES - LITTLE FOREST BURIAL GROUND - GEOLOGY, GEOPHYSICS AND WELL INSTALLATION 2009-2010

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APPENDIX A –DETAILS OF OPERATIONAL WELLS INSTALLED FROM 1961 TO 2010

Well ID	Install Date	Easting	Northing	XY Source	Ground Elevation	Measure Point (TOC) Elevation	Z Source	Measure Point Description	Drilled Depth (below ground)	Casing type	Screen Top Elevation	Screen Base Elevation
W2s	2010	313168.91	6231833.54	CMS, 2010	132.09	132.79	CMS, 2010	High point on PVC	5.00	50mm PVC	130.09	128.09
W2m	2010	313169.88	6231832.59	CMS, 2010	132.09	132.78	CMS, 2010	High point on PVC	14.00	50mm PVC	121.59	119.59
W2d	2010	313169.90	6231833.70	CMS, 2010	132.09	132.88	CMS, 2010	High point on PVC	20.50	50mm PVC	114.59	112.59
W3	2010	313206.10	6232057.74	CMS, 2010	132.36	133.03	CMS, 2010	High point on PVC	7.00	50mm PVC	129.36	127.03
W4	2010	313257.64	6232029.41	CMS, 2010	132.57	133.18	CMS, 2010	High point on PVC	5.50	50mm PVC	130.07	128.07
W5	2010	313301.26	6232067.78	CMS, 2010	130.78	131.51	CMS, 2010	High point on PVC	5.70	50mm PVC	128.78	126.78
W6	2010	313306.70	6232023.61	CMS, 2010	132.08	132.79	CMS, 2010	High point on PVC	7.00	50mm PVC	129.08	127.08
W7	2010	313300.85	6231986.19	CMS, 2010	132.12	132.75	CMS, 2010	High point on PVC	6.00	50mm PVC	129.62	127.12
W9	2010	313269.05	6231988.69	CMS, 2010	132.66	133.38	CMS, 2010	High point on PVC	5.00	50mm PVC	132.16	130.16
W10	2010	313268.79	6231987.91	CMS, 2010	132.66	133.38	CMS, 2010	High point on PVC	5.70	50mm PVC	130.66	128.66
W12	2010	313277.04	6231947.83	CMS, 2010	131.67	132.32	CMS, 2010	High point on PVC	8.00	50mm PVC	129.67	127.67
W13	2010	313250.91	6231952.05	CMS, 2010	132.04	132.58	CMS, 2010	High point on PVC	5.50	50mm PVC	129.54	127.54
W15	2010	313234.52	6231992.50	CMS, 2010	132.92	133.66	CMS, 2010	High point on PVC	7.00	50mm PVC	130.92	128.92
CH17	2009	313374.54	6232182.92	Cooper & Richards, 2009	126.19	126.19	Cooper & Richards, 2009	High point on PVC	5.00	50mm PVC	122.99	122.09
CH18	2009	313306.44	6232107.32	Cooper & Richards, 2009	129.33	130.10	Cooper & Richards, 2009	High point on PVC	5.00	50mm PVC	127.05	126.15
CH21	2009	313298.90	6232067.97	Cooper & Richards, 2009	130.53	131.59	Cooper & Richards, 2009	High point on PVC	5.00	50mm PVC	128.17	127.27
CH30	2009	313265.64	6231966.79	Cooper & Richards, 2009	132.26	132.26	Cooper & Richards, 2009	High point on PVC	5.00	50mm PVC	129.36	128.46
CH31	2009	313248.93	6231948.81	Cooper & Richards, 2009	131.94	131.94	Cooper & Richards, 2009	High point on PVC	7 (10 longhole)	50mm PVC	126.29	125.23
P1d	2002	313270.87	6231839.44	SKM, 2003	128.92	129.68	SKM, 2003	High point on PVC (hinge side)	21.77	50mm PVC	113.91	107.91
P1s	2002	313270.40	6231834.32	SKM, 2003	128.94	129.74	SKM, 2003	High point on PVC (hinge side)	5.88	50mm PVC	126.76	123.86
P2d	2002	313232.20	6232162.12	SKM, 2003	127.84	128.72	SKM, 2003	High point on PVC?	36.44	50mm PVC	98.28	92.28
CW	2000	313213.05	6232125.59	SKM, 2003	129.51	130.14	SKM, 2003	High point on PVC	12.52	50mm PVC	123.62	117.62
MB11	1987	313172.91	6231816.38	SKM, 2003	132.33	132.66	SKM, 2003	Black mark on PVC	8.37	50mm PVC	132.33	124.29
MB12	1987	313268.10	6231802.42	SKM, 2003	129.05	129.44	SKM, 2003	High point on PVC	4.79	50mm PVC	129.05	124.65
MB13	1987	313279.77	6231879.94	SKM, 2003	129.50	129.93	SKM, 2003	High point on PVC	7.10	50mm PVC	129.50	122.83
MB14	1987	313188.62	6231915.99	SKM, 2003	132.54	132.90	SKM, 2003	Black mark on PVC	6.90	50mm PVC	132.54	126.00
MB15	1987	313202.69	6232014.25	SKM, 2003	133.37	133.85	SKM, 2003	Point where PVC touches metal	7.30	50mm PVC	133.37	126.55
MB16	1987	313271.65	6232004.06	SKM, 2003	132.79	133.23	SKM, 2003	Side closest to star picket	6.05	50mm PVC	132.79	127.18
MB17	1987	313312.21	6232098.69	SKM, 2003	129.55	129.97	SKM, 2003	Mark on PVC	5.86	50mm PVC	129.55	124.11
MB18	1987	313216.86	6232112.77	SKM, 2003	129.99	130.45	SKM, 2003	High point on PVC?	7.05	50mm PVC	129.99	123.40
MB19	1987	313370.21	6232112.55	SKM, 2003	128.87	128.93	SKM, 2003	High point on PVC?	7.37	50mm PVC	128.87	121.56
MB20	1987	313361.99	6231989.92	SKM, 2003	131.52	131.68	SKM, 2003	High point on PVC?	6.05	50mm PVC	131.52	125.63
MB21	1987	313351.32	6231910.01	SKM, 2003	129.95	130.15	SKM, 2003	High point on PVC?	5.80	50mm PVC	129.95	124.35
MB22	1987	313317.34	6231792.60	SKM, 2003	127.71	127.85	SKM, 2003	High point on casing?	4.05	50mm PVC	127.71	123.80
BH1	1961	313214.41	6232130.36	SKM, 2003	129.24	129.48	SKM, 2003	High point on casing	2.85	152mm Asbestos cement	128.04	126.42
BH2	1961	313207.35	6232067.32	SKM, 2003	131.99	132.19	SKM, 2003	High point on casing	7.47	152mm Asbestos cement	130.80	124.55
BH3	1961	313185.87	6231949.73	SKM, 2003	133.18	133.23	SKM, 2003	High point on casing	3.40	152mm Asbestos cement	131.98	129.79
BH4	1961	313172.38	6231854.97	SKM, 2003	131.65	131.82	SKM, 2003	High point on casing (uncracked part)	6.10	152mm Asbestos cement	130.46	125.58
BH5	1961	313161.23	6231792.26	SKM, 2003	132.92	133.11	SKM, 2003	High point on casing	3.66	152mm Asbestos cement	131.74	129.30
BH6	1961	313249.92	6231777.78	SKM, 2003	129.66	129.95	SKM, 2003	High point on casing	1.98	152mm Asbestos cement	128.49	127.73
BH10	1961	313300.13	6232117.55	SKM, 2003	128.89	129.15	SKM, 2003	High point on casing	5.18	152mm Asbestos cement	127.68	123.72
BHA	1970	313269.45	6232155.35	SKM, 2003	127.56	0.00	SKM, 2003	High point on casing	0.00	Asbestos/steel lined	0.00	0.00
BHB	1970	313329.74	6232147.28	SKM, 2003	127.60	127.76	SKM, 2003	High point on casing	0.00	Asbestos/steel lined	0.00	0.00
BHE	1970	313238.92	6232160.08	SKM, 2003	127.86	127.99	SKM, 2003	High point on casing	0.00	Asbestos/steel lined	0.00	0.00
BHF	1984	313324.40	6231996.01	SKM, 2003	131.79	132.32	SKM, 2003	Side of pipe with slot	0.00	PVC	0.00	11.60
OS1	1969	313280.89	6231834.84	SKM, 2003	128.71	128.87	SKM, 2003	High point on casing?	0.00	Asbestos lined	0.00	0.00
OS2	1969	313296.29	6231933.85	SKM, 2003	131.05	131.26	SKM, 2003	High point on casing?	0.00	Asbestos lined	0.00	128.64
OS3	1969	313313.92	6232055.50	SKM, 2003	131.08	131.28	SKM, 2003	High point on casing?	0.00	Asbestos lined	0.00	127.38
OS2W	1969	313275.84	6231938.46	Scaled from Ellis, 1977	133.20	n.d.	n.a.	High point on casing	0.00	Ceramic lined	0.00	0.00
BH2/3	1961	313218.94	6232019.54	Scaled from Ellis, 1977	131.40	n.d.	n.a.	High point on casing	0.00	Asbestos lined	0.00	0.00
D14	1975	313234.54	6231988.13	Scaled from Ellis, 1977	n.d.	n.d.	n.a.	High point on casing	3.00	40mm PVC	0.00	0.00
D18	1975	313265.11	6232029.18	Scaled from Ellis, 1977	n.d.	n.d.	n.a.	High point on casing	3.00	40mm PVC	0.00	0.00

APPENDIX B – WELL CONSTRUCTION DIAGRAMS AND GEOLOGICAL LOGS

coffey environments

Environmental Log - Piezometer

Client: *ANSTO*

Principal:

Project: *Little Forest Burial Ground, Groundwater Assessment*

Borehole Location: *Little Forest Burial Ground, Lucas Hts.*

Borehole No. *W1*

Sheet 1 of 1

Office Job No.: *ENAURHOD04037AA*

Date started: *21.9.2010*

Date completed: *21.9.2010*

Logged by: *NC*

Checked by: *EW*

drill model & mounting: Edson MRA260 Ute | Easting: 313226.76 | slope: -90° | R.L. Surface: 130.20

hole diameter: 150 | Northing: 6231782.32 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
CB						130	0		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey.	<Wp	F	
						129	1		CH	**Silty CLAY:** Medium plasticity, grey mottled red brown, some ironstone staining (red brown)	<Wp	F	
						128	2			**SHALE:** Extremely weathered, very low strength, grey to brown.	<Wp		
							3			Stiffness increasing			
ADT						127				**Sandy SANDSTONE:** Very low strength, orange to pale brown. Sandy bands, very fine grained some quartz.	D		
							4			Moisture increasing.	W		
						126				Saturated			
							5			Dry	D		
						125				**Sandy SILTSTONE:** Very low strength, grey. Sandy bands, very fine grained, some quartz.			
						124	6			Borehole abandoned, backfilled to surface with bentonite cement grout Borehole terminated at 6.5m			
							7						
						123							
							8						
						122							
							9						
						121							
							10						

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev 0

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support

C casing N nil

penetration 1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Environmental Log - Piezometer

Borehole No. **W2s**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **21.9.2010**

Principal:

Date completed: **21.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313168.91 | slope: -90° | R.L. Surface: 132.79

hole diameter: 150 | Northing: 6231833.54 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT						132	1		SM	**Topsoil;** Silty SAND; fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red brown.	<Wp	F	
						131	2		CH	**CLAY:** Low to medium plasticity, red brown with grey (extremely weathered shale)	<Wp	F-St	
						130	3			**SHALE:** Extremely weathered, very low strength, grey to pale brown. Some clay banding.	D		
						129	4			**Sandy SILTSTONE:** Extremely weathered, very low strength, grey to pale brown. Clay bandings, red brown ironstone staining.	D		
						128	5			**CLAY;** low to medium plasticity, brown to pale brown with red brown. Shale banding, grey, indistinct. Traces of silt.	<Wp	F-St	
						127	6			Borehole terminated at 5m			
						126	7						
						125	8						
						124	9						
						123	10						

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev.0

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support

C casing N nil

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Environmental Log - Piezometer

Borehole No. **W2m**

Sheet 1 of 2

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **23.9.2010**

Principal:

Date completed: **23.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313169.98 | slope: -90° | R.L. Surface: 132.78

hole diameter: 100/95 | Northing: 6231832.59 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT						132	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red brown.	<Wp	F	
						131	2		CH	**CLAY;** low to medium plasticity, red brown with grey (extremely weathered shale)	<Wp	F-St	
AH						130	3			**SHALE;** extremely weathered, very low strength, grey to pale brown. Some clay banding.	D		
						129	4			**SHALE;** extremely weathered, very low strength, grey to pale brown. Clay bandings, red brown ironstone staining.	D		
						128	5		CH	**CLAY;** low to medium plasticity, brown to pale brown with red brown. Shale banding, grey, indistinct. Traces of silt.	<Wp	F-St	
						127	6			**SHALE;** extremely weathered, low strength, grey to dark grey, minor pale brown. Some clay banding.	M		
						126	7			**Sandy SILTSTONE;** very low strength, grey. Sandy bands, very fine grained, some quartz.	D		
						125	8			**SHALE;** moderate strength, dark grey. Distinct. Some brown colour banding. Becoming moist.	M		
						124	9						
						123	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W2m**

Sheet 2 of 2

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **23.9.2010**

Principal:

Date completed: **23.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313169.98 | slope: -90° | R.L. Surface: 132.78

hole diameter: 100/95 | Northing: 6231832.59 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
AH						122	11			**SHALE**; moderate strength, dark grey. Distinct. Some brown colour banding. *(continued)*	M		
						121	12			Saturated	W		
						120	13				M		
						119	14						
						118	15			Borehole terminated at 14m			
						117	16						
						116	17						
						115	18						
						114	19						
						113	20						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev.0

coffey environments

Environmental Log - Piezometer

Borehole No. **W2d**

Sheet 1 of 3

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **20.9.2010**

Principal:

Date completed: **23.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313169.9 | slope: -90° | R.L. Surface: 132.88

hole diameter: 150/95 | Northing: 6231833.7 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT (150mm)		C		outer PVC casing		132	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red brown.	<Wp	F	
						131	2		CH	**CLAY:** Low to medium plasticity, red brown with grey (extremely weathered shale)	<Wp	F-St	
										SHALE: Extremely weathered, very low strength, grey to pale brown. Some clay banding.	D		
						130	3						MilliQ water supplied by ANSTO was used down hole (<2L) to enable drill cutting recovery.
							4			**SHALE:** Extremely weathered, very low strength, grey to pale brown. Clay bandings, red brown ironstone staining.	D		
						129				**CLAY:** Low to medium plasticity, brown to pale brown with red brown. Shale banding, grey, indistinct. Traces of silt.	<Wp	F-St	
							5			**SHALE:** Extremely weathered, low strength, grey to dark grey, minor pale brown. Some clay banding.	M		
AB (95mm)						128				**Sandy SILTSTONE:** Very low strength. grey. Sandy bands, very fine grained, some quartz.	D		
						127	6						
						126	7						
AH (95mm)						125	8			**SHALE:** Moderate strength, dark grey. Distinct. Some brown colour banding. Becoming moist.	M		
						124	9						
						123	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	distube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support

C casing N nil

penetration 1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev 0

coffey environments

Environmental Log - Piezometer

Borehole No. **W2d**

Sheet 2 of 3

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **20.9.2010**

Principal:

Date completed: **23.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313169.9 | slope: -90° | R.L. Surface: 132.88

hole diameter: 150/95 | Northing: 6231833.7 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
AH (95mm)			▼			122	11			**SHALE:** Moderate strength, dark grey. Distinct. Some brown colour banding. *(continued)*	M		
										Saturated	W		
						121	12						Rapid Groundwater inflow into open borehole.
						120	13				M		
						119	14						
						118	15						
						117	16			**SANDSTONE:** Medium grained, grey to orange.			Hawkesbury Sandstone. Difficult to establish moisture due to upper aquifer.
						116	17						
										Orange colouring decreasing, predominantly grey.			
						115	18						
						114	19						
						113	20						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing; N nil

penetration: 1 2 3 4 – no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev.0

coffey environments

Environmental Log - Piezometer

Borehole No. **W2d**

Sheet 3 of 3

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **20.9.2010**

Principal:

Date completed: **23.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313169.9 | slope: -90° | R.L. Surface: 132.88

hole diameter: 150/95 | Northing: 6231833.7 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
										SANDSTONE: Medium grained, grey to orange. *(continued)*	M		
						112	21			Permanent PVC casing of 100mm diameter installed between 0m and 5.5m Borehole terminated at 20.5m			
						111	22						
						110	23						
						109	24						
						108	25						
						107	26						
						106	27						
						105	28						
						104	29						
						103	30						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing; N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W3**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **16.9.2010**

Principal:

Date completed: **17.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313206.1 | slope: -90° | R.L. Surface: 133.03

hole diameter: 150 | Northing: 6232057.74 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT			17/9/10			132	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	M	F	
						131	2			**SHALE:** Extremely weathered, very low strength, pale brown to grey. Some clay banding.	D		
						130	3			**SHALE:** Extremely weathered, very low strength, grey with minor pale brown. Some clay banding.	D		
						129	4			**SHALE:** Extremely weathered, low strength, grey to dark grey.			
						128	5						
						127	6			Stifness increasing			Standing water level recorded 17/09/2010 after open borehole left overnight. Poor ADT drill cutting recovery due to dryness of material.
						126	7			Borehole terminated at 7m			
						125	8						
						124	9						
							10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W4**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **16.9.2010**

Principal:

Date completed: **16.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313257.64 | slope: -90° | R.L. Surface: 133.18

hole diameter: 150 | Northing: 6232029.41 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT						133	0		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
							1		CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey.	<Wp	F	
						132				**SHALE:** Extremely weathered, very low strength, pale brown to grey. Some clay banding.	D		
						131	2			Becoming moist	W		
						130	3			Saturated			
						129	4			Dry	M		
						128	5			**SHALE:** Highly weathered, low strength, dark grey to black. Increasing shale strength banding.	M		
										Borehole terminated at 5.5m			
						127	6						
						126	7						
						125	8						
						124	9						
							10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W5**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **15.9.2010**

Principal:

Date completed: **15.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313301.26 | slope: -90° | R.L. Surface: 131.51

hole diameter: 150 | Northing: 6232067.78 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	structure and additional observations
ADT						131	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey.	<Wp	F	
						130	2			**SHALE:** Extremely weathered, very low strength, grey with minor pale brown. Some clay banding.	<Wp		
										Saturated	W		
						129	3			Dry	D		
						128	4			**SHALE:** Extremely weathered, very low to low strength, grey to dark grey.			
						127	5						During groundwater monitoring well installation, well caved in to 4.5m bgl. Location was overdrilled to 5.7m bgl.
						126	6			Borehole terminated at 5.7m			
						125	7						
						124	8						
						123	9						
						122	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing; N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W6**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **14.9.2010**

Principal:

Date completed: **14.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313306.7 | slope: -90° | R.L. Surface: 132.79

hole diameter: 150 | Northing: 6232023.61 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT						132	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, brown to orange with slight mottled pale brown.	<Wp	F	
						131	2						
										SHALE: Extremely weathered, very low strength, pale brown to grey. Some clay banding.	M		
						130	3						
			▶							Saturated	W		
						129	4			**SHALE:** Extremely weathered, very low to low strength, grey to dark grey. Dry	D		
										Clay banding increasing			
						128	5			Clay banding decreasing, becoming distinct Shale			
										Stiffness increasing.			
						127	6						
						126	7						
										Borehole terminated at 7m			
						125	8						
						124	9						
						123	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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coffey environments

Environmental Log - Piezometer

Borehole No. **W7**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **14.9.2010**

Principal:

Date completed: **14.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313300.85 | slope: -90° | R.L. Surface: 132.75

hole diameter: 150 | Northing: 6231986.19 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	structure and additional observations
ADT						132	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity,pale brown orange and grey.	<Wp	F	
						131	2			**SHALE:** Extremely weathered, very low strength, pale brown to grey. Some clay banding.	M		
						130	3			**SHALE:** Extremely weathered, very low strength, grey to dark grey with trace pale brown. Some clay banding. Saturated	W		
						129	4			Dry	D		
						128	5			**SHALE:** Extremely weathered, low strength, grey to dark grey.			
						127	6			**SHALE:** Highly weathered, low strength, dark grey to black. Increasing shale strength banding.			
						126	7			Borehole terminated at 6m			
						125	8						
						124	9						
						123	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support

C casing N nil

penetration 1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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coffey environments

Environmental Log - Piezometer

Borehole No. **W7a**
Sheet 1 of 1
Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**
Date started: **13.9.2010**
Principal:
Date completed: **13.9.2010**
Project: **Little Forest Burial Ground, Groundwater Assessment**
Logged by: **NC**
Borehole Location: **Little Forest Burial Ground, Lucas Hts.**
Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313300.23 | slope: -90° | R.L. Surface: 131.99
hole diameter: 150 | Northing: 6231982.28 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	structure and additional observations
ADT						131	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity,pale brown orange and grey.	<Wp	F	
						130	2			**SHALE:** Extremely weathered, very low strength, pale brown to grey. Some clay banding.	M		
			▶			129	3			**SHALE:** Extremely weathered, very low strength, grey to dark grey with trace pale brown. Some clay banding. Saturated	W		
						128	4			Dry	D-M		
						127	5			**SHALE:** Extremely weathered, low strength, grey to dark grey.			
						126	6			**SHALE:** Highly weathered, low strength, dark grey to black. Clay banding. Increasing shale strength banding.			
						125	7						
						124	8			During 150mm auger removal, auger was lost down hole (lodged at ~4.5m bgl). Attempts were made to recover the auger, however were unsuccessful. The auger remains present at ~4.5m bgl. Borehole was backfilled to surface with bentonite pellets. Borehole terminated at 8m			
						123	9						
						122	10						

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support
C casing N nil

penetration
1 2 3 4 no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Environmental Log - Piezometer

Borehole No. **W8**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **21.9.2010**

Principal:

Date completed: **21.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313269.23 | slope: -90° | R.L. Surface: 132.73

hole diameter: 150 | Northing: 6231989.49 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT						132	1		SM	**Topsoil;** Silty SAND; fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY;** low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	<Wp	F	
						131	2			**CLAY;<BB> low - medium plasticity, brown to grey, some pale grey. Extremely weathered shale.**	<Wp	F	
										SHALE; extremely weathered, very low strength, grey to dark grey with some pale brown. Some clay banding. Indistinct	D		
						130	3			Becoming moist - wet	W		
										Dry	D-M		
						129	4				D		
										SHALE; extremely weathered, very low to low strength, grey to dark grey.			
						128	5						
						127	6			Becoming dark grey. Becoming distinct			
						126	7						
						125	8			Borehole abandoned. Refer to the report for abandonment details. Borehole terminated at 7m			
						124	9						
						123	10						

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev.0

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Environmental Log - Piezometer

Borehole No. **W9**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **21.9.2010**

Principal:

Date completed: **21.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313269.05 | slope: -90° | R.L. Surface: 133.38

hole diameter: 150 | Northing: 6231988.69 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	structure and additional observations
ADT						133	0		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	<Wp	F	
						132	1			**CLAY:** Low to medium plasticity, brown to grey, some pale grey. Extremely weathered shale.	<Wp	F	
							2			**SHALE:** Extremely weathered, very low strength, grey to dark grey with some pale brown. Some clay banding. Indistinct	D		
			▶			131				Becoming moist to wet	W		
							3			Dry	D-M		
						130					D		
							4			**SHALE:** Extremely weathered, very low to low strength, grey to dark grey.			
						129	5						
						128	6			Borehole terminated at 5m			
						127	7						
						126	8						
						125	9						
						124	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing; N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev.0

coffey environments

Environmental Log - Piezometer

Borehole No. **W10**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **22.9.2010**

Principal:

Date completed: **22.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313268.79 | slope: -90° | R.L. Surface: 133.38

hole diameter: 150 | Northing: 6231987.91 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	structure and additional observations
ADT						133	0		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	M	F	
						132	1			**CLAY:** Low to medium plasticity, brown to grey, some pale grey. Extremely weathered shale.	D	St	
										SHALE: Extremely weathered, very low strength, grey to dark grey with some pale brown. Some clay banding, indistinct.	D		
						131	2			Becoming moist to wet	W		
							3			Dry	D		
						130							
							4			**SHALE:** Extremely weathered, very low to low strength, grey to dark grey.			
						129							
							5			Becoming dark grey. Clay banding increasing. Slightly moist			
						128							
							6			Borehole terminated at 5.7m			
						127							
							7						
						126							
							8						
						125							
							9						
						124							
							10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 29.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W11d**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **20.9.2010**

Principal:

Date completed: **21.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313269.58 | slope: -90° | R.L. Surface: 132.61

hole diameter: 150 | Northing: 6231990.48 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT			▼			132	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	<Wp	F	
						131	2			**CLAY:** Low to medium plasticity, brown to grey, some pale grey. Extremely weathered shale.	<Wp	F	
										SHALE: Extremely weathered, very low strength, grey to dark grey with some pale brown. Some clay banding. Indistinct	D		
						130	3			Becoming moist - wet	W		
										Dry	D-M		
						129	4				D		
										SHALE: Extremely weathered, very low to low strength, grey to dark grey.			
						128	5						
										SHALE: Highly weathered, low strength, dark grey to black. Increasing shale strength banding.			
						127	6						
						126	7			Strength increasing. Distinct			
										SHALE: Moderately weathered, low to medium strength, dark grey to black. Distinct			
						125	8			Stiffness and strength increasing.			
						124	9						
						123	10						
						122	11			Borehole abandoned. Refer to the report for abandonment details. Borehole terminated at 10m			

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing; N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W12**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **17.9.2010**

Principal:

Date completed: **17.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313277.04 | slope: -90° | R.L. Surface: 132.32

hole diameter: 150 | Northing: 6231947.83 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	structure and additional observations
ADT						132	0		SM	**TOPSOIL:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	<Wp	F	
						131	1		CH	**CLAY:** Medium plasticity, brown to grey, extremely weathered.	<Wp	St	
						130	2			**SHALE:** Extremely weathered, very low strength, pale brown to grey. Some clay banding.	D		
										Becoming moist	M-W		
						129	3			**SHALE:** Extremely weathered, very low strength, grey with minor dark grey with red brown. Ironstone banding. Dry	M		
						128	4			**SHALE:** Extremely weathered, very low to low strength, grey to dark grey.	D		Some water ponding in base of borehole when left open for ~5minutes during drilling
						127	5			**SHALE:** Highly weathered, low strength, dark grey to black. Increasing shale strength banding.			
						126	6						
						125	7			**CLAYSTONE:** Low strength, pale brown to orange. Some grey to dark grey banding.			Possible sandstone interface
							8			Borehole terminated at 8m			
						124	9						
						123	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing; N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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coffey environments

Environmental Log - Piezometer

Borehole No. **W13**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **21.9.2010**

Principal:

Date completed: **21.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313250.91 | slope: -90° | R.L. Surface: 132.58

hole diameter: 150 | Northing: 6231952.05 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT			▼			132	1		SM	**Topsoil:** Silty SAND: Fine grained, brown to dark brown. Traces of rootlets, ironstone gravels, red brown.	M	L	Grass on surface.
									CH	**Silty CLAY:** Low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	<Wp	F	
						131				**CLAY:** Low plasticity, brown to grey. Extemely weathered shale.	<Wp	St	
							2			**SHALE:** Extremely weathered, very low strength, grey with minor pale brown. Some clay banding.	M		
						130				Becoming moist to wet	M-W		Open hole was left to sit for ~5 minutes at 2.5m bgl during drilling. Some water seepage occured.
							3			Dry	D-M		
						129				**SHALE:** Extremely weathered, very low to low strength, grey to dark grey. Some red brown ironstone banding. Some grey clay banding			
							4			**SHALE:** Extremely weathered, very low to low strength, grey to dark grey. Minor clay banding.			
						128							
							5			**SHALE:** Highly weathered, low strength, dark grey to black. Increasing shale strength banding.	D		
						127	6			Borehole terminated at 5.5m			
							7						
						126							
							8						
						125							
							9						
						124							
							10						
						123							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
DT diatube
B blank bit
V V bit
T TC bit
TBX Tubex
*bit shown by suffix
e.g. ADT

support
C casing N nil

penetration
1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
P pressure meter
Bs bulk sample
R refusal
E environmental sample
PID PID measurement
WS water sample
PZ piezometer
ALT air lift test

moisture
D dry
M moist
W wet
Wp plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 Issue 3 Rev.0

coffey environments

Environmental Log - Piezometer

Borehole No. **W14d**
Sheet 1 of 1
Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**
Date started: **17.9.2010**
Principal:
Date completed: **17.9.2010**
Project: **Little Forest Burial Ground, Groundwater Assessment**
Logged by: **NC**
Borehole Location: **Little Forest Burial Ground, Lucas Hts.**
Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313251.98 | slope: -90° | R.L. Surface: 131.58
hole diameter: 150 | Northing: 6231951.98 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
ADT						131	1		SM	**Topsoil;** Silty SAND; fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface
									CH	**Silty CLAY;** low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	<Wp	F	
						130				**CLAY;** low plasticity, brown to grey. Extremely weathered shale.	<Wp	St	
							2			**SHALE;** extremely weathered, very low strength, grey with minor pale brown. Some clay banding.	D		
						129				Becoming moist	M-W		
							3			Dry	D-M		
						128				**SHALE;** extremely weathered, very low to low strength, grey to dark grey.			
						127	4						
							5						
						126							
							6			**SHALE;** highly weathered, low strength, dark grey to black. Increasing shale strength banding. Distinct	D		
						125							
							7						
						124				Becoming very stiff.			
							8						
						123							
							9						
						122				Borehole abandoned. Refer to the report for abandonment details Borehole terminated at 9m			
							10						

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

Form GEO 5.10 issue 3 Rev.0

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support
C casing N nil

penetration
1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Environmental Log - Piezometer

Borehole No. **W15**

Sheet 1 of 1

Office Job No.: **ENAURHOD04037AA**

Client: **ANSTO**

Date started: **16.9.2010**

Principal:

Date completed: **16.9.2010**

Project: **Little Forest Burial Ground, Groundwater Assessment**

Logged by: **NC**

Borehole Location: **Little Forest Burial Ground, Lucas Hts.**

Checked by: **EW**

drill model & mounting: Edson MRA260 Ute | Easting: 313234.52 | slope: -90° | R.L. Surface: 133.66

hole diameter: 150 | Northing: 6231992.5 | bearing: | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	structure and additional observations
ADT						133	1		SM	**Topsoil;** Silty SAND; fine grained, brown to dark brown. Traces of rootlets. Traces of fine ironstone gravels, red brown.	M	L	Grass on surface.
									CH	**Silty CLAY;** low to medium plasticity, red to pale brown to grey. Traces of fine ironstone gravels.	<Wp	F	
						132	2			**SHALE;** extremely weathered, very low strength, pale brown to grey. Some clay banding.	D		
						131	3			**SHALE;** extremely weathered, very low strength, grey with minor pale brown. Some clay banding.	D		
						130	4			**SHALE;** extremely weathered, very low to low strength, grey to dark grey. Becoming moist to saturated	D W		
						129	5			Dry Becoming more distinct, becoming dark grey.	D		
						128	6			**SHALE;** highly weathered, low strength, dark grey to black. Increasing shale strength banding.	D		
						127	7			Stiffness increasing.			
						126	8			Borehole terminated at 7m			
						125	9						
						124	10						

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
DT	diatube
B	blank bit
V	V bit
T	TC bit
TBX	Tubex

*bit shown by suffix e.g. ADT

support: C casing, N nil

penetration 1 2 3 4: no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
P	pressure meter
Bs	bulk sample
R	refusal
E	environmental sample
PID	PID measurement
WS	water sample
PZ	piezometer
ALT	air lift test

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

PIEZOMETER ENAURHOD04037AA-LOGS.GPJ COFFEY.GDT 28.10.10

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Project ID:	CES090517-ANS	**Easting:**	6231951.139
Project:	Drilling Investigation	**Northing:**	313253.421
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH1**

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PH: (02) 8569 2200 FAX: (02) 9552 4399

DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Brown, moist. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, medium to high plasticity, moist, no odour. Ironstone gravels, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown with ironstone gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Light brown and dry. Due to rock formation, sample tube missing from 2 m to 3 m. Push tube refusal @ 3.00 m.				
3				**End of corehole. Corehole terminated at 3.00 m (practical refusal).**				
4								
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313253.958
Project:	Drilling Investigation	**Northing:**	6231951.311
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH1A**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Brown, moist. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, medium to high plasticity, moist, no odour. Ironstone gravels, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown with ironstone gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Light brown becoming brown with depth. Dry. Push tube refusal @ 4.00m.				
3								
4				**End of corehole. Corehole terminated at 4.00 m (practical refusal).**				
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313254.106
Project:	Drilling Investigation	**Northing:**	6231950.156
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH2**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				0
				SILTY CLAY: Brown, moist. Black charcoal inclusion. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, medium to high plasticity, wet, no odour. Ironstone gravels @ 1.10 m, trace fine to medium gravels, possible water bearing zone.				1
				SHALEY CLAY: Orange/brown with ironstone gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Light brown and dry. Push tube refusal @ 2.80 m.				2
3				**End of corehole. Corehole terminated at 2.80 m (practical refusal).**				3
4								4
5								5

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313254.119
Project:	Drilling Investigation	**Northing:**	6231948.217
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH3**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
1				SILTY CLAY: Brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
2				SHALEY CLAY: Orange/brown with grey colourations, ironstone gravels, trace fine to medium gravels. Dry.				
				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, trace fine to coarse gravels. Iron staining from 3.70 m. Light brown/grey becoming grey with depth and dry. Push tube refusal @ 4.00 m.				
3								
4				**End of corehole. Corehole terminated at 4.00 m (practical refusal).**				
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	03/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	03/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313254.340
Project:	Drilling Investigation	**Northing:**	6231946.200
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH4**

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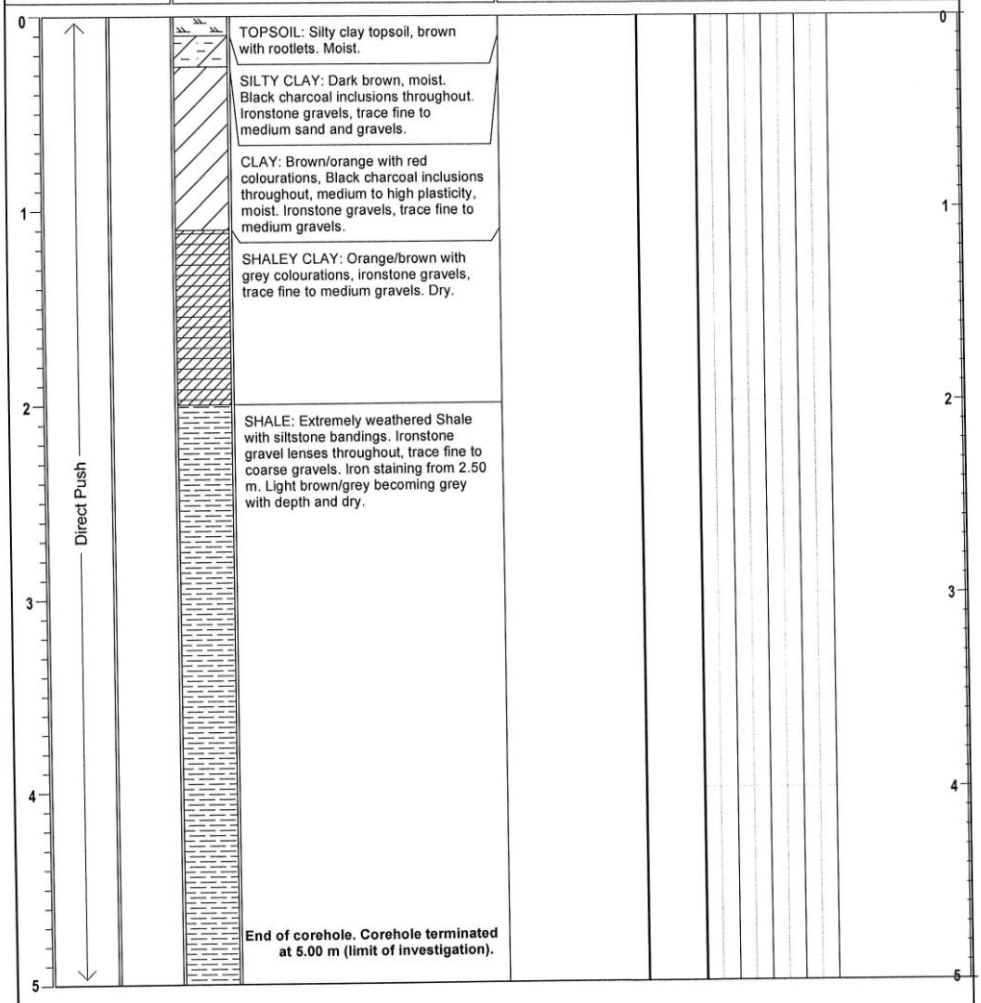

Drill Company:	Macquarie Drilling	**Date Commenced:**	03/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	03/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313255.055
Project:	Drilling Investigation	**Northing:**	6231942.058
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH5**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown with grey colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, trace fine to coarse gravels. Iron staining from 2.50 m. Light brown/grey becoming grey with depth and dry.				
3								
4								
5				**End of corehole. Corehole terminated at 5.00 m (limit of investigation).**				

Drill Company:	Macquarie Drilling	**Date Commenced:**	03/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	03/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313255.606
Project:	Drilling Investigation	**Northing:**	6231938.273
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH6**

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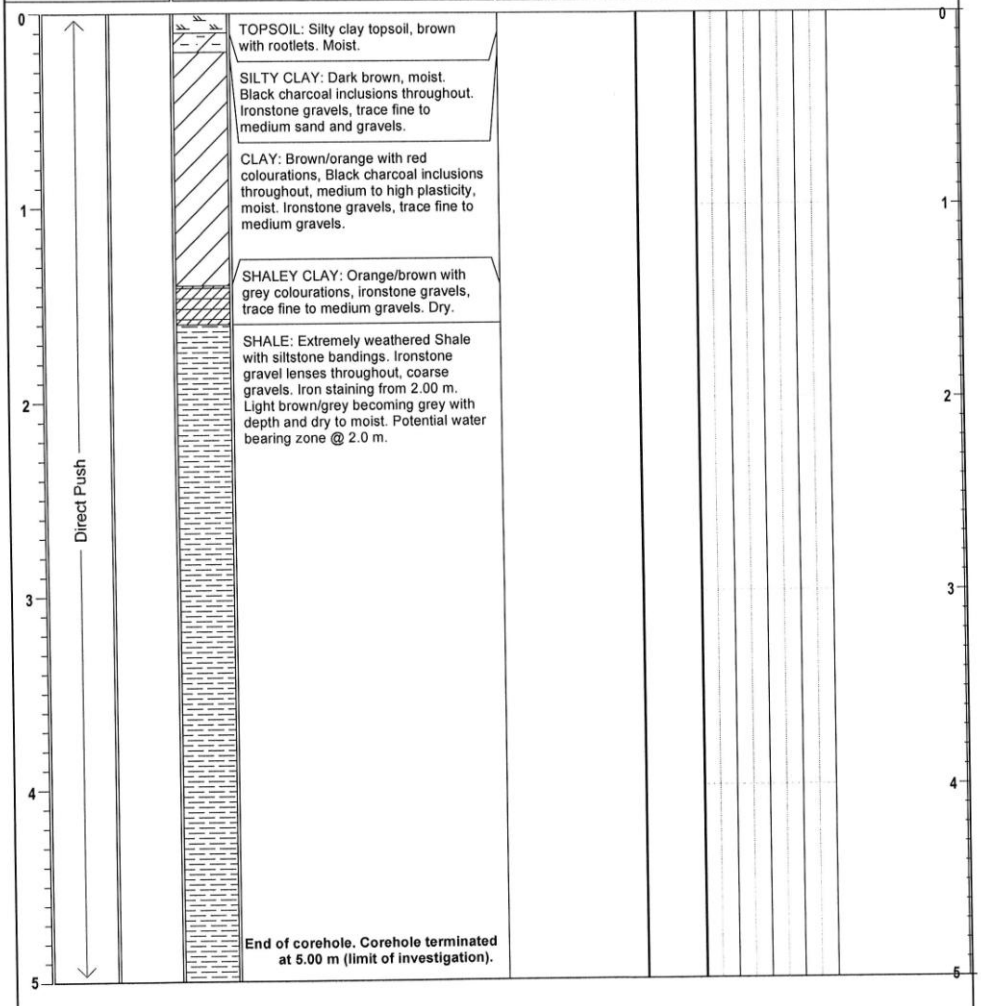

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313255.606
Project:	Drilling Investigation	**Northing:**	6231938.273
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH6**

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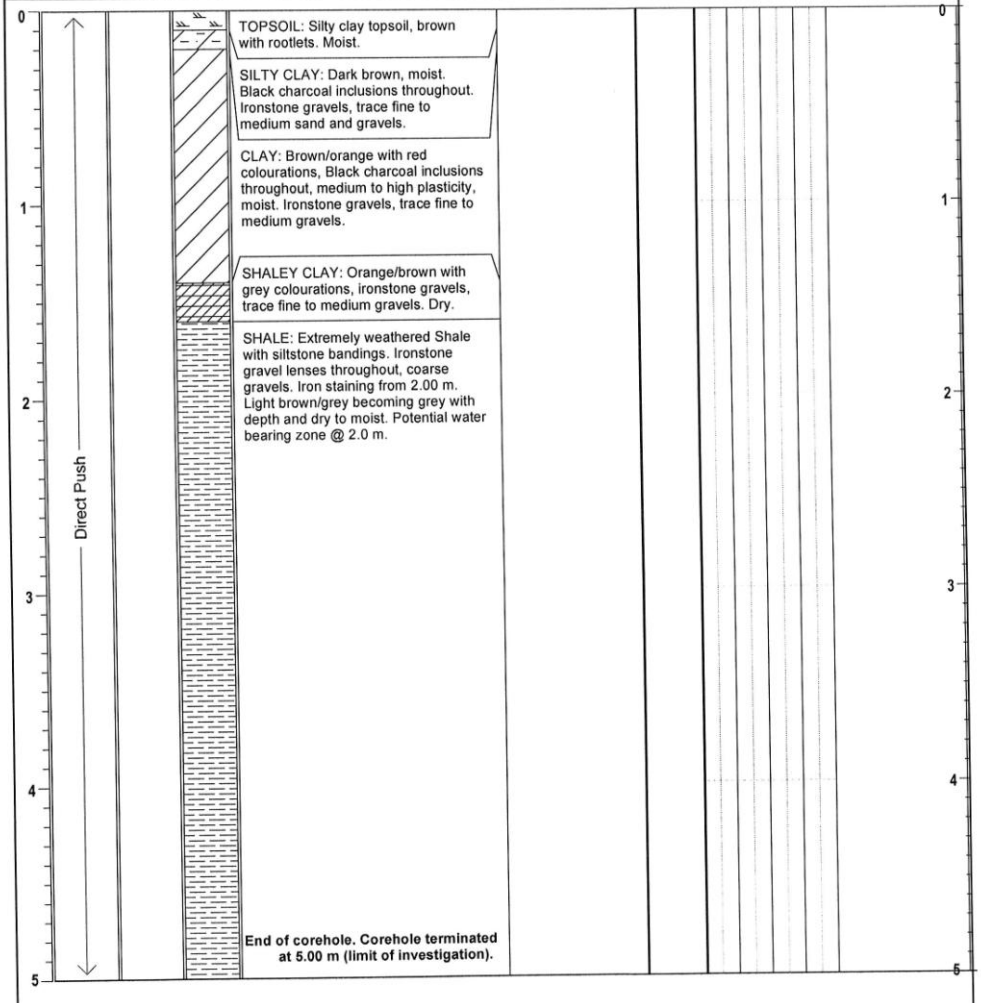

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313262.959
Project:	Drilling Investigation	**Northing:**	6231951.712
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH7**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Brown, moist. Black charcoal inclusions. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
2				SHALEY CLAY: Orange/brown with ironstone gravels. Dry.				
				SHALE: Extremely weathered Shale with siltstone bandings. Brown and dry. Push tube refusal @ 2.50 m.				
3				**End of corehole. Corehole terminated at 2.50 m (practical refusal).**				
4								
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313265.113
Project:	Drilling Investigation	**Northing:**	6232027.950
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH8**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				0
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				1
				SHALEY CLAY: Orange/brown with grey colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Iron staining from 2.00 m. Light brown/grey becoming grey with depth and dry to moist. Potential water bearing zone @ 2.0 m.				2
3								3
4								4
5				**End of corehole. Corehole terminated at 5.00 m (limit of investigation).**				5

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313230.827
Project:	Drilling Investigation	**Northing:**	6231970.868
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH9**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: ilty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Brown, moist. Black charcoal inclusion. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels throughout, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered shale with siltstone bandings. Light brown/grey becoming brown with depth. Dry. Push tube refusal @ 3.40 m.				
3								
				End of corehole. Corehole terminated at 3.40 m (practical refusal).				
4								
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313237.431
Project:	Drilling Investigation	**Northing:**	6232013.151
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH10**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			FILL: Silty clay, brown with rootlets. Black charcoal inclusions throughout. Ironstone gravels, medium to coarse gravels. Moist.				
1				CLAY: Brown/orange with red colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels throughout, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered shale with siltstone bandings. Brown, becoming light brown/grey with depth. Dry. Push tube refusal @ 3.60 m.				
3								
4				**End of corehole. Corehole terminated at 3.60 m (practical refusal).**				
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313312.592
Project:	Drilling Investigation	**Northing:**	6232045.266
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH11**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			FILL: Silty clay, brown with rootlets. Ironstone gravels, medium to coarse gravels. Moist.				
1				CLAY: Brown/orange with red colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Cemented ironstone layers from 0.5m, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Becoming brown/grey with depth and dry. Push tube refusal @ 4.00 m.				
3								
4				**End of corehole. Corehole terminated at 4.00 m (practical refusal).**				
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313307.224
Project:	Drilling Investigation	**Northing:**	6232011.709
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH12**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				0
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, becoming grey with depth, Black charcoal inclusions throughout, medium to high plasticity, moist to wet. Cemented ironstone layers from 0.5m, trace fine to medium gravels.				1
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Becoming brown/grey with depth and dry. Push tube refusal @ 4.00 m.				2
3								3
4				**End of corehole. Corehole terminated at 4.00 m (practical refusal).**				4
5								5

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313297.263
Project:	Drilling Investigation	**Northing:**	6231954.086
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH13**

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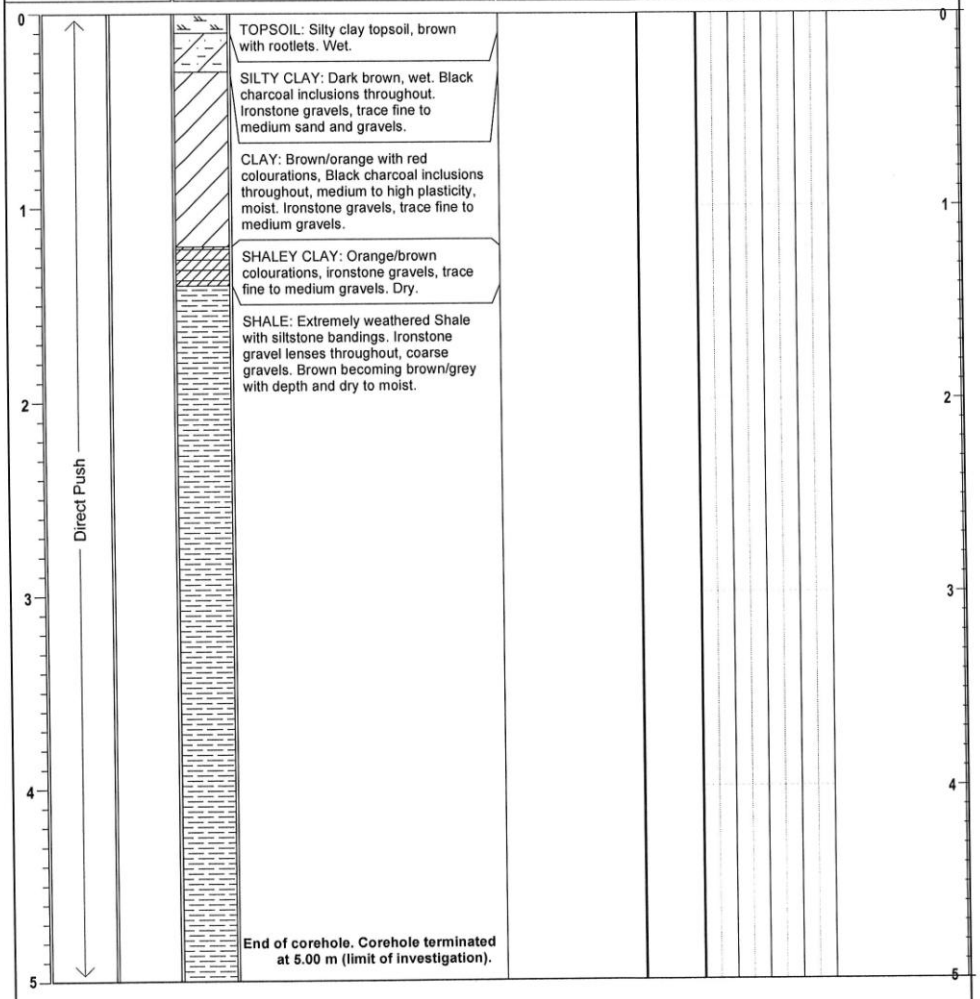

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313276.208
Project:	Drilling Investigation	**Northing:**	6231947.132
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH14**

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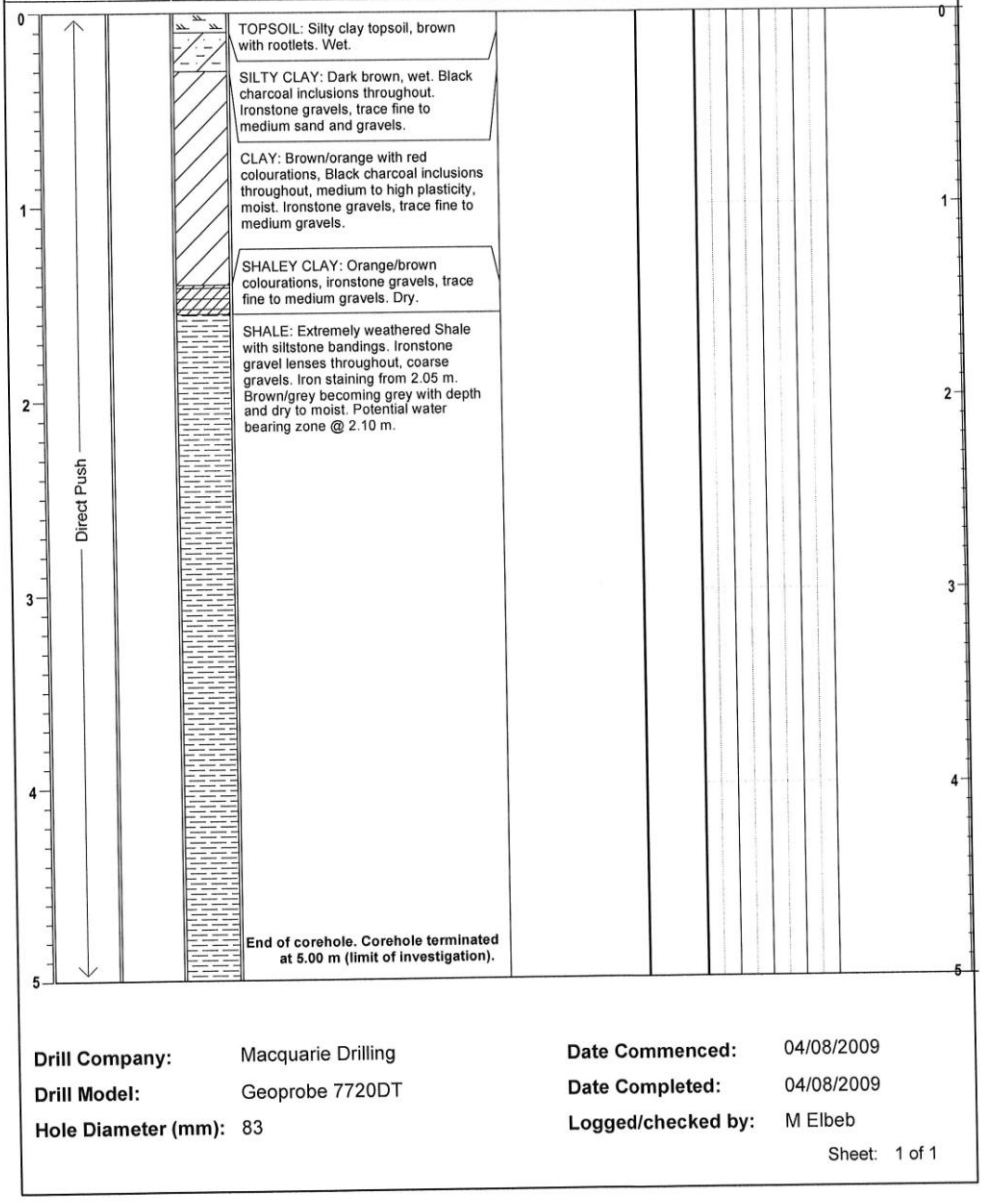

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313215.124
Project:	Drilling Investigation	**Northing:**	6232103.617
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH15**

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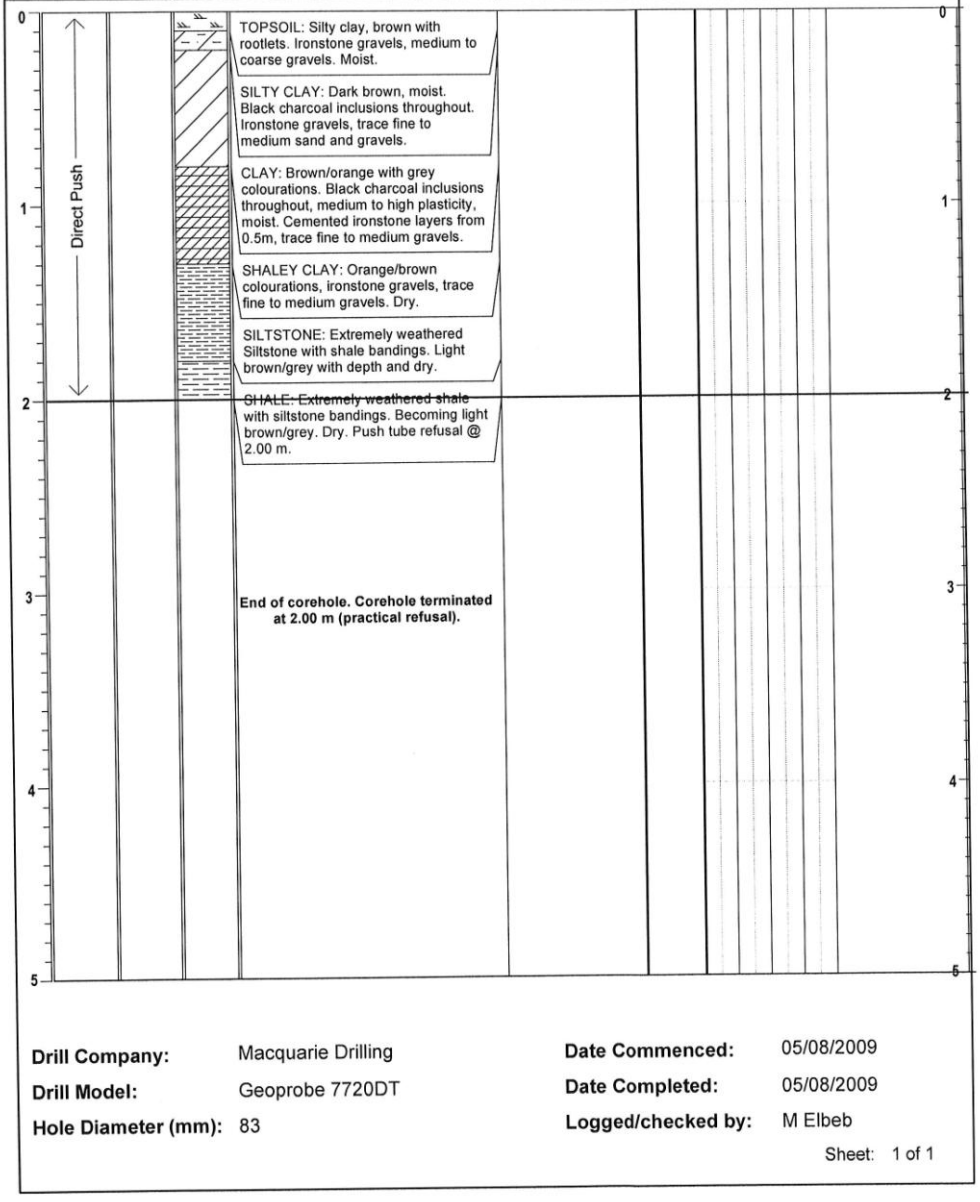

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313270.970
Project:	Drilling Investigation	**Northing:**	6231998.436
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH16**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			FILL: Brown, moist. Black charcoal inclusion. Ironstone gravels, trace fine to medium sand and gravels.				0
1				CLAY: Brown/orange with red colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels throughout, trace fine to medium gravels.				1
2				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				2
3				SHALE: Extremely weathered shale with siltstone bandings. Light brown/grey becoming brown with depth. Dry. Push tube refusal @ 4.00 m.				3
4				**End of corehole. Corehole terminated at 4.00 m (practical refusal).**				4
5								5

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

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Project ID:	CES090517-ANS	**Easting:**	313374.485
Project:	Drilling Investigation	**Northing:**	6232183.621
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH17**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay, brown with rootlets. Ironstone gravels, medium to coarse gravels. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with grey colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Cemented ironstone layers from 0.5m, trace fine to medium gravels.				
				SILTSTONE: Extremely weathered Siltstone with shale bandings. Becoming light brown/grey with depth and dry. Push tube refusal @ 1.3 m.				
2								
3	SFA							
4		▼		SHALE: Extremely weathered Shale with siltstone bandings. Light brown/grey with depth and Wet from 4.4 m.. SFA refusal @ 5.00 m.				
5				**End of corehole. Corehole terminated at 5.00 m (practical refusal).**				

Drill Company:	Macquarie Drilling	**Date Commenced:**	06/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	06/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313306.392
Project:	Drilling Investigation	**Northing:**	6232107.609
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH18**

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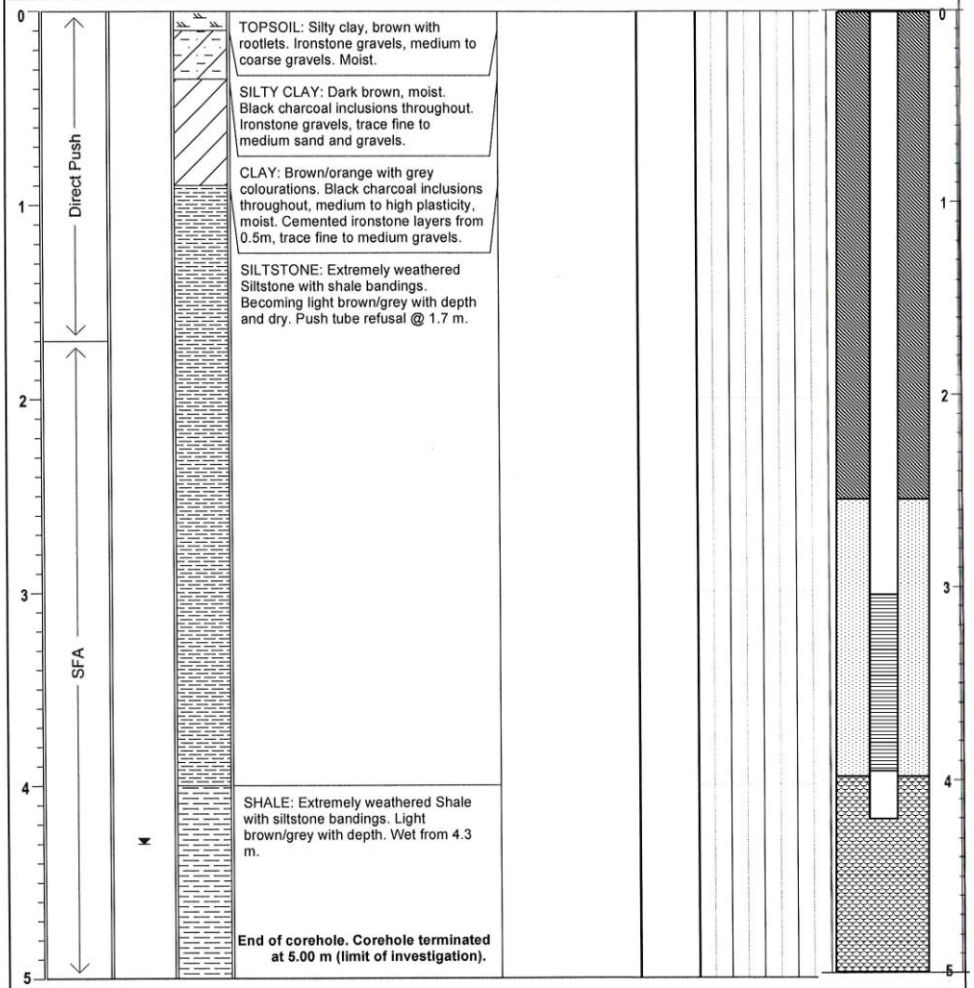

Drill Company:	Macquarie Drilling	**Date Commenced:**	06/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	06/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313269.320
Project:	Drilling Investigation	**Northing:**	6231878.273
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH19**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, dark brown with rootlets. Moist to wet.				0
				CLAY: Brown/orange with red colourations, medium to high plasticity, moist to wet, no odour. Cemented Ironstone gravel layers from 0.48m, trace fine to medium gravels.				
1				UNKNOWN: Due to the sample tube getting stuck inside the drilling rod, no core sample was taken. However, grey Shale was observced at the end of the sample tube. Push tube refusal @ 1.90 m.				1
2				**End of corehole. Corehole terminated at 1.90 m (practical refusal).**				2
3								3
4								4
5								5

Drill Company:	Macquarie Drilling	**Date Commenced:**	03/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	03/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313242.021
Project:	Drilling Investigation	**Northing:**	6231781.337
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH20**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
				SHALE: Extremely weathered Shale with siltstone bandings. Light brown/grey becoming grey with depth and dry to moist. Push tube refusal @ 1.50 m.				
2				**End of corehole. Corehole terminated at 1.50 m (practical refusal).**				
3								
4								
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313298.959
Project:	Drilling Investigation	**Northing:**	623067.798
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH21**

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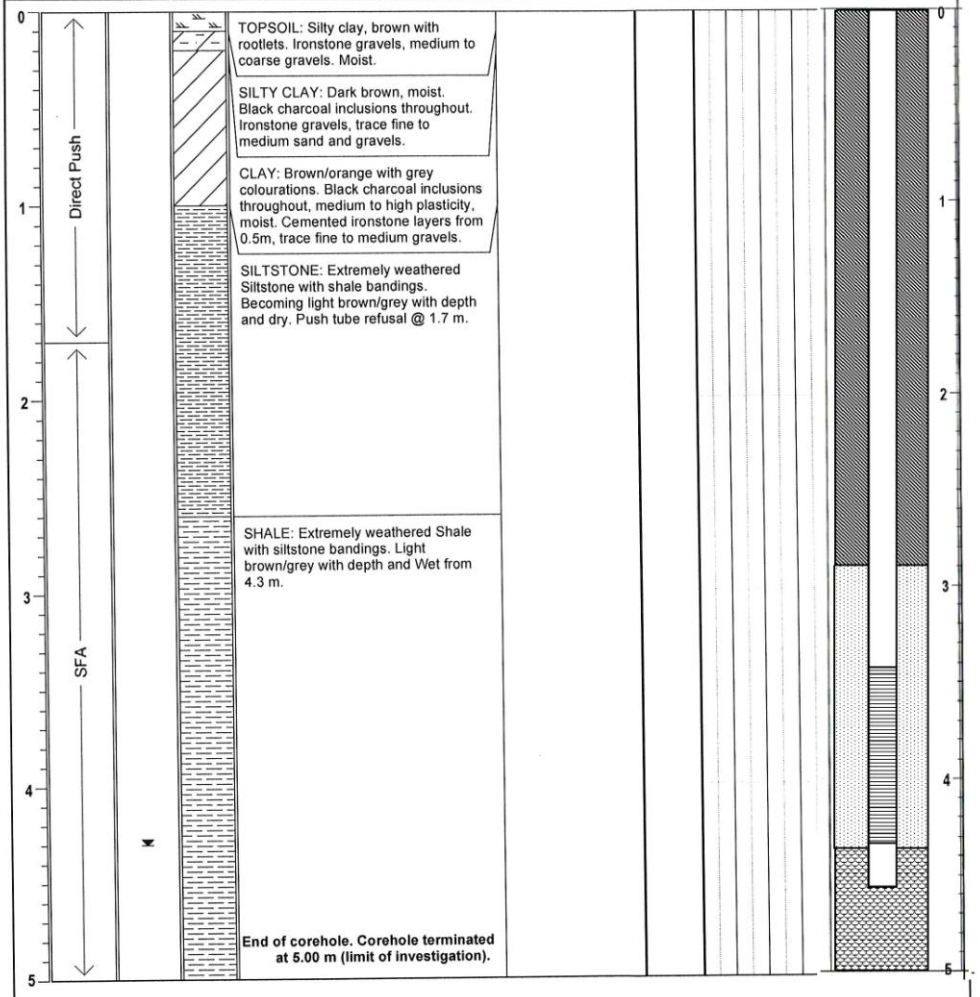

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID: CES090517-ANS **Easting:** 313302.779

Project: Drilling Investigation **Northing:** 623087.693

Client: ANSTO **Elevation:**

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Location: ANSTO - Little Forest Burial Ground **Environmental Log:** **CH22**

DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay, brown with rootlets. Ironstone gravels, medium to coarse gravels. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with grey colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Cemented ironstone layers from 0.5m, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
				SILTSTONE: Extremely weathered Siltstone with shale bandings. Becoming light brown/grey with depth and dry. Push tube refusal @ 2.00 m.				
2				**End of corehole. Corehole terminated at 2.00 m (practical refusal).**				
3								
4								
5								

Drill Company: Macquarie Drilling **Date Commenced:** 05/08/2009

Drill Model: Geoprobe 7720DT **Date Completed:** 05/08/2009

Hole Diameter (mm): 83 **Logged/checked by:** M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313307.201
Project:	Drilling Investigation	**Northing:**	6231965.142
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH23**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Becoming brown/grey with depth and dry. Push tube refusal @ 3.60 m.				
3								
4				**End of corehole. Corehole terminated at 3.60 m (practical refusal).**				
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313242.411
Project:	Drilling Investigation	**Northing:**	6231944.922
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH24**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown with grey colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Iron staining from 2.05 m. Brown/grey becoming grey with depth and dry to moist. Potential water bearing zone @ 2.10 m.				
3								
4								
5				**End of corehole. Corehole terminated at 5.00 m (limit of investigation).**				

Drill Company:	Macquarie Drilling	**Date Commenced:**	03/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	03/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313269.282
Project:	Drilling Investigation	**Northing:**	6231939.971
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH25**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Wet.				
				SILTY CLAY: Dark brown, wet. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist to wet. Cemented ironstone layers from 0.7m, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Becoming brown/grey with depth and dry. Push tube refusal @ 4.80 m.				
3								
4								
5				**End of corehole. Corehole terminated at 4.80 m (practical refusal).**				

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313282.891
Project:	Drilling Investigation	**Northing:**	6231937.687
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH26**

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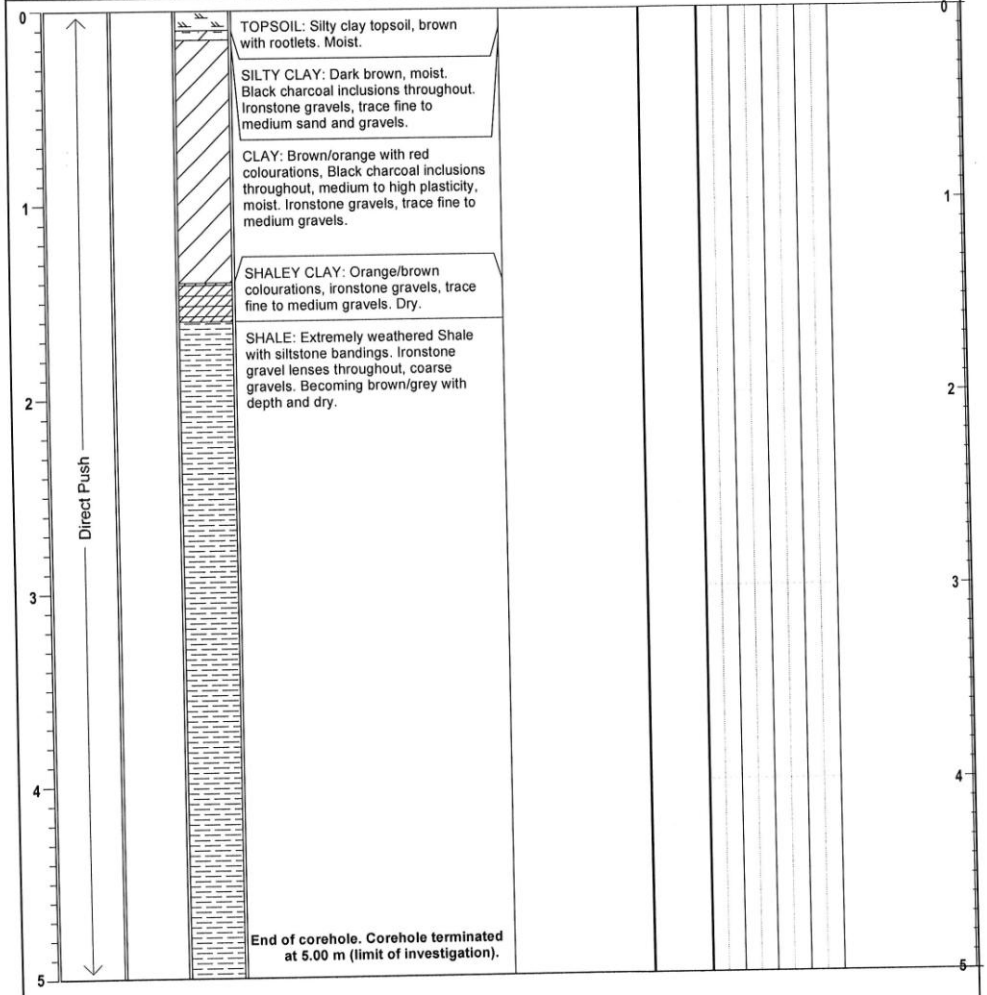

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313297.474
Project:	Drilling Investigation	**Northing:**	6231937.971
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH27**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
2				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Brown becoming brown/grey with depth and dry.				
3								
4								
5				**End of corehole. Corehole terminated at 5.00 m (limit of investigation).**				

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313304.551
Project:	Drilling Investigation	**Northing:**	6231950.664
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH28**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			TOPSOIL: Silty clay topsoil, brown with rootlets. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SHALE: Extremely weathered Shale with siltstone bandings. Ironstone gravel lenses throughout, coarse gravels. Brown becoming brown/grey with depth and dry to moist.				
3								
4								
5				**End of corehole. Corehole terminated at 5.00 m (limit of investigation).**				

Drill Company:	Macquarie Drilling	**Date Commenced:**	04/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	04/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313209.596
Project:	Drilling Investigation	**Northing:**	6232014.015
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH29**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0				TOPSOIL: Silty clay topsoil, dark brown with rootlets. Moist.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusions throughout. Ironstone gravels, trace fine to medium sand and gravels.				
1	Direct Push			CLAY: Brown/orange with red colourations, Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown with grey colourations, ironstone gravels, trace fine to medium gravels. Dry.				
				SHALE: Extremely weathered Shale with siltstone bandings. Light brown/grey becoming grey with depth and dry to moist. Push tube refusal @ 2.00 m.				
2				**End of corehole. Corehole terminated at 2.00 m (practical refusal).**				
3								
4								
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313265.553
Project:	Drilling Investigation	**Northing:**	6231967.183
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH30**

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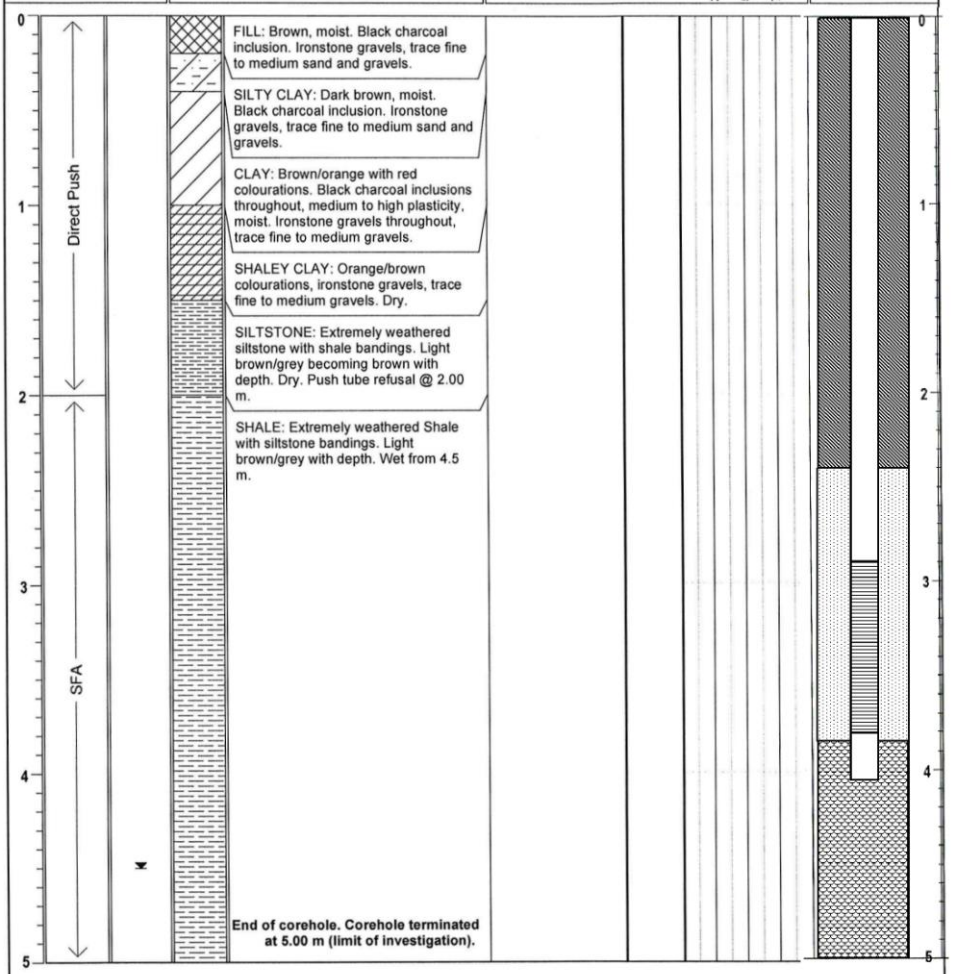

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313265.915
Project:	Drilling Investigation	**Northing:**	6231967.811
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH30A**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			FILL: Brown, moist. Black charcoal inclusion. Ironstone gravels, trace fine to medium sand and gravels.				
				SILTY CLAY: Dark brown, moist. Black charcoal inclusion. Ironstone gravels, trace fine to medium sand and gravels.				
1				CLAY: Brown/orange with red colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels throughout, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SILTSTONE: Extremely weathered siltstone with shale bandings. Light brown/grey becoming brown with depth. Dry. Push tube refusal @ 2.00 m.				
				End of corehole. Corehole terminated at 2.00 m (practical refusal).				
3								
4								
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID:	CES090517-ANS	**Easting:**	313265.380
Project:	Drilling Investigation	**Northing:**	6231964.326
Client:	ANSTO	**Elevation:**	
Location:	ANSTO - Little Forest Burial Ground	**Environmental Log:**	**CH30B**

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DRILLING INFO.			LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0	Direct Push			FILL: Brown, moist. Black charcoal inclusion. Ironstone gravels, trace fine to medium sand and gravels.				
1				SILTY CLAY: Dark brown, moist. Black charcoal inclusion. Ironstone gravels, trace fine to medium sand and gravels.				
				CLAY: Brown/orange with red colourations. Black charcoal inclusions throughout, medium to high plasticity, moist. Ironstone gravels throughout, trace fine to medium gravels.				
				SHALEY CLAY: Orange/brown colourations, ironstone gravels, trace fine to medium gravels. Dry.				
2				SILTSTONE: Extremely weathered siltstone with shale bandings. Light brown/grey becoming brown with depth. Dry. Push tube refusal @ 1.7 m.				
3				**End of corehole. Corehole terminated at 1.70 m (practical refusal).**				
4								
5								

Drill Company:	Macquarie Drilling	**Date Commenced:**	05/08/2009
Drill Model:	Geoprobe 7720DT	**Date Completed:**	05/08/2009
Hole Diameter (mm):	83	**Logged/checked by:**	M Elbeb

Sheet: 1 of 1

Project ID: CES090517-ANS **Easting:** 313248.705

Project: ANSTO - Little Forest Burial Ground **Northing:** 6231948.671

Client: ANSTO **Elevation:** 131.858

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Location: ANSTO - Little Forest Burial Ground **Environmental Log:** **CH31**

DRILLING INFO.				LITHOLOGY		SAMPLING INFORMATION			WELL DETAIL
DHD	TVD	Method	Water	Symbol	Description	Sample ID	Type	FID/PID (ppm) 0 250 500 750	
0–1	0–1	Direct Push			TOPSOIL: Silty clay topsoil, brown, moist				
					SILTY CLAY: Brown, moist, ironstone gravels turn to medium gravels				
1–2	1–2				CLAY: Brown/orange with grey colourations, medium to high plasticity, moist, ironstone gravels, medium to coarse gravels				
2					SHALE: Extremely weathered shale with siltstone banding.				
2–3	2–3				UNKNOWN: Core loss				
3–4	3–4				SHALE: Extremely weathered shale with ironstone gravels, medium to coarse gravels, Siltstone bandings.				
5	4				UNKNOWN: Core loss				
5–6	4–5				SHALE: Extremely weathered shale with siltstone bandings, ironstone gravel lenses throughout, medium to coarse gravel. Highly fractured rock				
7	5				SHALE: Black/ dark grey shale				
8–9	6				UNKNOWN: Core loss				
10	7				SILTSTONE: Light grey with grey shale lenses				

Drill Company: Macquarie Drilling **Date Commenced:** 04/08/2009

Drill Model: Geoprobe 7720DT **Date Completed:** 08/08/2009

Hole Diameter (mm): 83 **Logged/checked by:** M Elbeb

Sheet: 1 of 1

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LOG OF BORING P1s

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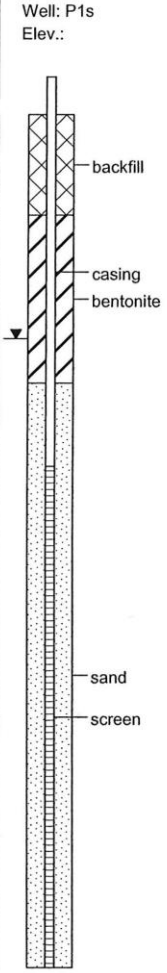
2114073A
Shallow piezometer on Line 3 at 110m

Drilling Company	: Macquarie Drilling	Supervising Geologist	: A Averkiou
Driller	: F Chittleburgh, E McClelland	Drilling Completed	: 14 June 2002
Rig Type	: P160		
Method	: Air Hammer		
Hole Diameter	: 120mm		

Depth in	USCS	GRAPHIC	DESCRIPTION
0	TS		TOPSOIL - clay-rich topsoil, medium to dark brown.
1	CL		CLAY - red/brown clay.
2	WS		SHALE - extremely weathered shale, light to medium grey, clayey.
3			Wet at 3.3m.
4	SH		SHALE - medium to dark brown/grey shale. Appears as fragments and fine silt-like grains.
5			
6			



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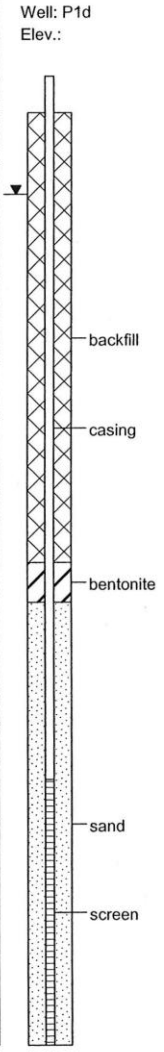
LOG OF BORING P1d

(Page 1 of 1)

2114073A
Deep piezometer on Line 3 at 114.5m

Drilling Company	: Macquarie Drilling	Supervising Geologist	: A Averkiou
Driller	: F Chittleburgh, E McClelland	Drilling Completed	: 14 June 2002
Rig Type	: P160		
Method	: Air Hammer with Water Injection		
Hole Diameter	: 120mm		

Depth in	USCS	GRAPHIC	DESCRIPTION
0	TS		TOPSOIL - clay-rich topsoil, medium brown. Moist.
	CL		CLAY - red/brown with some medium grey coloured clay.
2	WS		SHALE - extremely weathered, light grey, clayey, dry. Wet at 2.8m.
4	SH		Water injected at 2.9m. SHALE - medium to dark grey shale. Appears as fragments (from about 6m) and fine silt-like grains amongst the water. Water becomes oily and as the water pools, a black/brown outer rim forms.
6			
8	SS SH		SANDSTONE AND SHALE - light to medium grey, clayey.
10			
12			
14	SS		SANDSTONE - light grey, clayey. Appears as sand grains and rock fragments. These fragments are up to 6mm, composed of sand grains, and are white with a shiny lustre. Fracture? at ~14.5 - 15.5m.
16			
18			Fracture at ~17.5 - 18.5m. Larger rock fragments up to 9mm and individual grains up to 5mm. Pale grey to white.
20			
22			



07-16-2002 o:\A356-Water\Nov01-Oct02\Projects\2114073a ANSTO Little Forest Burial Ground\Logs\P1d.BOR

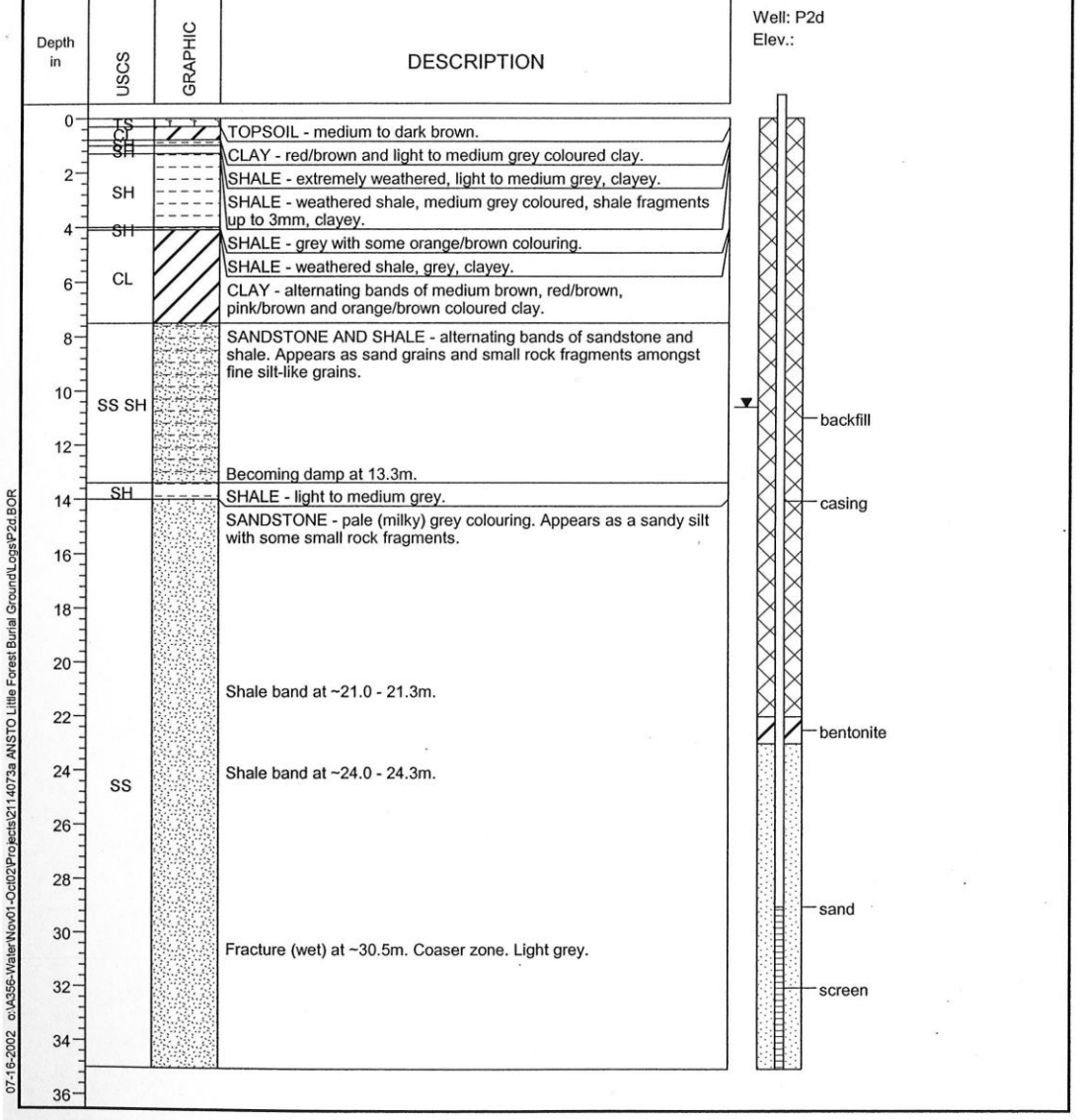
PPK Environment & Infrastructure

LOG OF BORING P2d

(Page 1 of 1)

2114073A
Deep piezometer on Line 1 at 430m

Drilling Company	: Macquarie Drilling	Supervising Geologist	: A Averkiou
Driller	: F Chittleburgh, E McClelland	Drilling Completed	: 14 June 2002
Rig Type	: P160		
Method	: Air Hammer		
Hole Diameter	: 120mm		



07-16-2002 c:\A356-Water\Wow01-Oct02\Projects\2114073a ANSTO Little Forest Burial Ground\Logs\P2d.BOR

DASCEM Holding Pty Ltd
Suite 1D, 9 Burwood Rd
BURWOOD, NSW, 2134
Ph: 9715 6699 Fax: 9715 6811
dascem@iprimus.com.au

BOREHOLE No.:

CW

BOREHOLE - ENGINEERING LOG

sheet 1 of 3

Client :	Property Group	**Hole Commenced:**	20-Jun-00
Project :	Off Site Investigation	**Hole Completed:**	20-Jun-00
Bore Location :	ANSTO Little Forest Burial Ground (NW Corner)	**supervised by:**	KK
Job Number:	CL 426	**log checked by:**	SM
Surface R.L.:		**Drill Model :**	Fox B 40
Casing R.L.:		**Drilling Company:**	Drill test
Datum: AHD		**Hole Diameter:**	100mm

drilling information					sampling data					profile description				
Method	Support	Water	R.L.	depth metres	Type	Depth taken	PID (ppm)	Graphic log	material SOIL TYPE: size/plasticity, colour, structure, (origin)	consistency/ rel. density (Fb VS S F St VSt H / VL L M D VD)	moisture (Dry Moist Wet Sat.)	structure and additional observations
TC - BIT	NONE			1	D	1.0m			Silty Clay, low-medium plasticity, orange-brown			
				2	D	2.0m			SHALE, extremely weathered, very low strength, blue-grey			
				3					TC Bit refusal @ 2.4m. Start coring			
				4								
				5								

Key

Method

V	auger with V-bit
TC	auger with TC-bit
R	roller/tricone
W	washbore
M	mud drilling

Water

- Depth Water Encountered
- Depth Water Stabilised
- Time to stabilise : . . . . .

NFGWO No free groundwater observed

Sampling Data

U50	undisturbed sample 50mm diameter
D	disturbed sample
SPT	standard penetration test
NC	cone penetrometer
pp	pocket penetrometer

Moisture

D	dry
M	moist
W	wet
S	saturated
MC	moisture content
PL	plastic limit
LL	liquid limit

Support

C	casing
M	mud

Consistency/Relative Density

V	very soft
S	soft
F	firm
St	stiff
V	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
M	medium dense
D	dense
V	very dense

geoZ.syd

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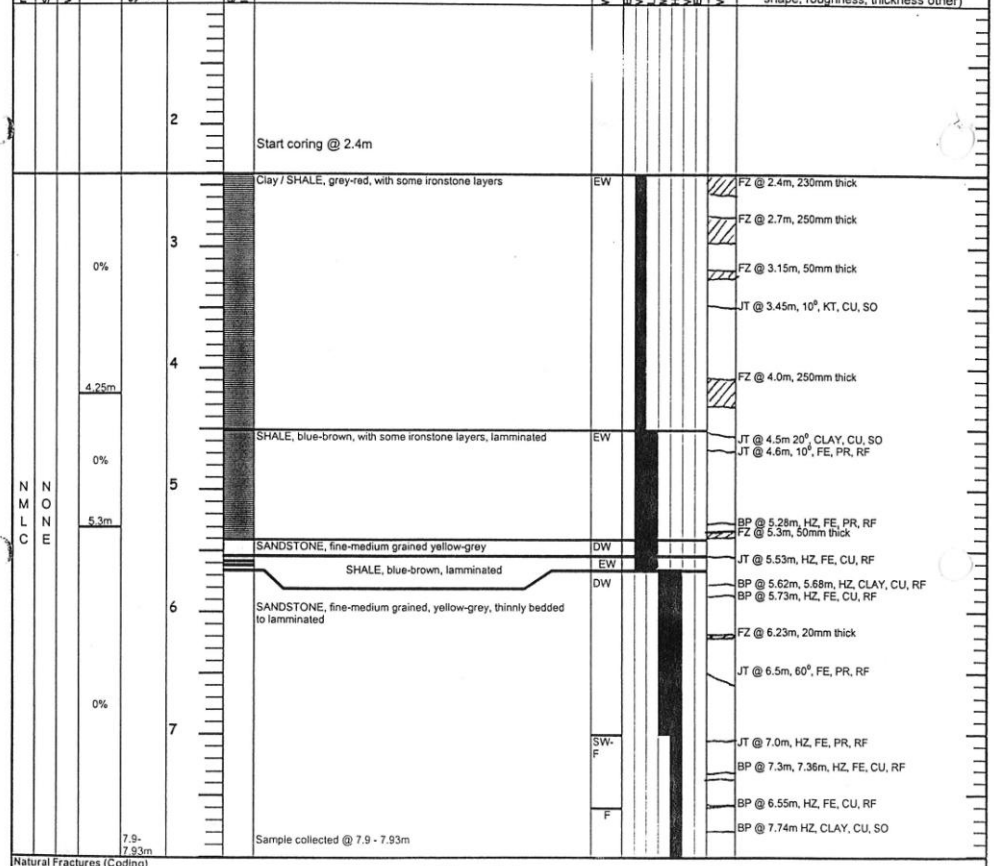
Email: dascem@iprimus.com.au

BOREHOLE No.:

CW

COREHOLE - ENGINEERING LOG sheet 2 of 3

Client :	Property Group	**Hole Commenced:**	20-Jun-00
Project :	Off Site Investigation	**Hole Completed:**	20-Jun-00
Bore Location :	ANSTO Little Forest Burial Ground (NW Corner)	**supervised by:**	KK
Job Number:	CL 426	**log checked by:**	SM
Surface R.L.:		**Drill Model :**	Fox B40
Casing R.L.:		**Drilling Company:**	Drilltest
Datum:	AHD	**Hole Diameter:**	100mm



Natural Fractures (Coding)

Fracture Type	Orientation	Infilling or Coating	Shape	Roughness
JT Joint	VT Vertical	CN Clean	PR Planar	POL Polished
BP Bedding Plane Parting	HZ Horizontal	X Carbonaceous	CU Curved	SL Slickensided
SM Seam	XX Degrees	CLAY Clay	UN Undulose	SO Smooth
FZ Fragmented Zone		CH Chlorite	ST Stepped	RF Rough
SZ Shear Zone		CA Calcite	IR Irregular	VR Very Rough
VN Vein		FE Iron		
		MI Micaceous		Others
		QZ Quartz		DIS Discontinuous
				TI Tight

CORELOG MW21-27

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Email: dascem@iprimus.com.au

BOREHOLE No.:

CW

COREHOLE - ENGINEERING LOG

sheet 3 of 3

Client : Property Group
Project : Off Site Investigation
Bore Location : ANSTO Little Forest Burial Ground (NW Corner)
Job Number: CL 426
Surface R.L.:
Casing R.L.:
Datum: AHD

Hole Commenced: 20-Jun-00
Hole Completed: 20-Jun-00
supervised by: KK
log checked by:
Drill Model : Fox B40
Drilling Company: Drilltest
Hole Diameter: 100mm

drilling information						Profile Description			Natural Fractures
Progress						material			Additional Data
method	support	water	Core loss / run %	Samples & field tests	depth (R.L.) metres	graphic log	ROCK TYPE: grain size, colour, structure, minor constituents	Weathering / Est. Strength $I_s(50)$ MPa	Visual (joints, partings, seams, zones, etc. description, orientation, infilling or coating, shape, roughness, thickness other)
			8.3m		9				BP @ 8.15m, 25°, CLAY, PR, SO BP @ 8.15m, 10°, CN, PR, SO SM @ 8.2m, 10mm thick BP @ 8.5m, 08°, CN, PR, SO JT @ 8.62m, 78°, CN, PR, RF BP @ 8.7m, 8.78m, HZ, PR, RF, CN, BP @ 9.1m, 9.35m, HZ, PR, RF, CN,
N M L C	N O N E		0%	9.45-9.48m	10		Sample collected @ 9.45-9.48m		JT @ 9.90m, 75°, FE, PR, RF BP @ 10.02m 10°, CN, PR, SO BP @ 10.48m, 15°, CLAY, PR, SO
			11.3m 0%		11				JT @ 11.15m, 40°, CN, CU, RF
					12		Coring terminated @ 11.9m. Monitoring well installed		

Natural Fractures (Coding)

Fracture Type
JT Joint
BP Bedding Plane Parting
SM Seam
FZ Fragmented Zone
SZ Shear Zone
VN Vein

Orientation
VT Vertical
HZ Horizontal
Xo Degrees

Infilling or Coating
CN Clean
X Carbonaceous
CLAY Clay
KT Chlorite
CA Calcite
FE Iron
MI Micaceous
QZ Quartz

Shape
PR Planar
CU Curved
UN Undulose
ST Stepped
IR Irregular

Roughness
POL Polished
SL Slickensided
SO Smooth
RF Rough
VR Very Rough

Others
DIS Discontinuous
TI Tight

CORELOG MW21-27

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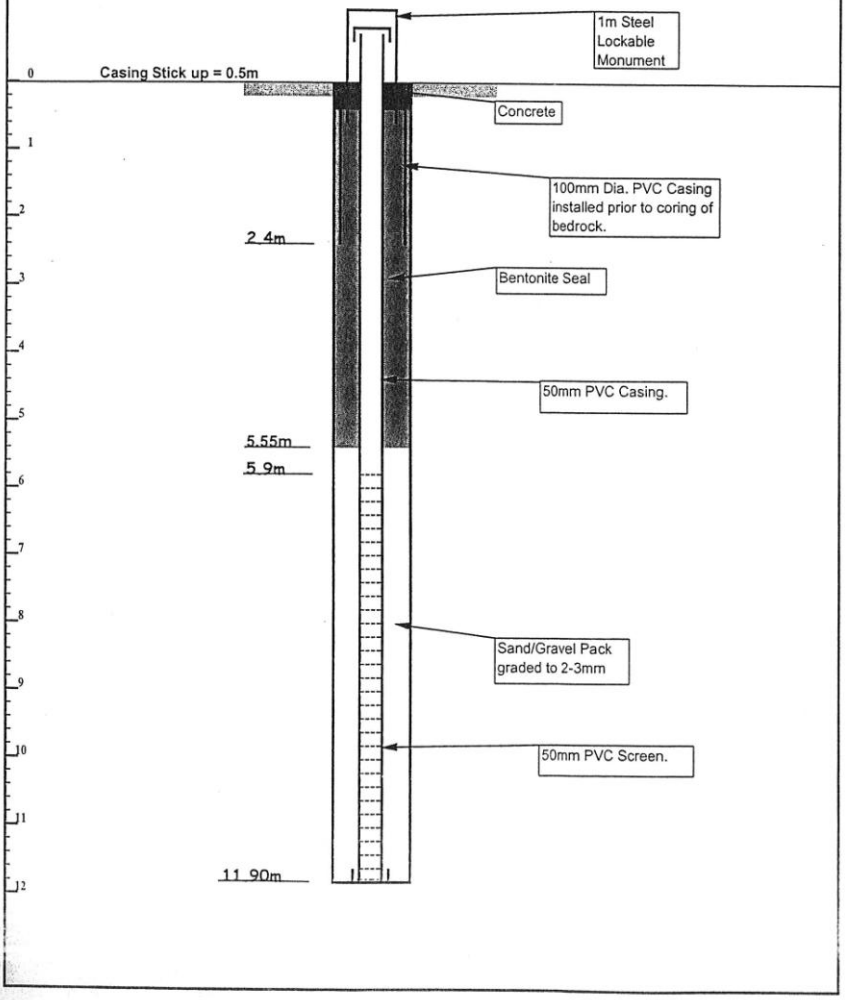
BURWOOD, NSW, 2134
Ph: 9715 6699 Fax: 9715 6811
dascem@bigpond.com.au

BOREHOLE No.:

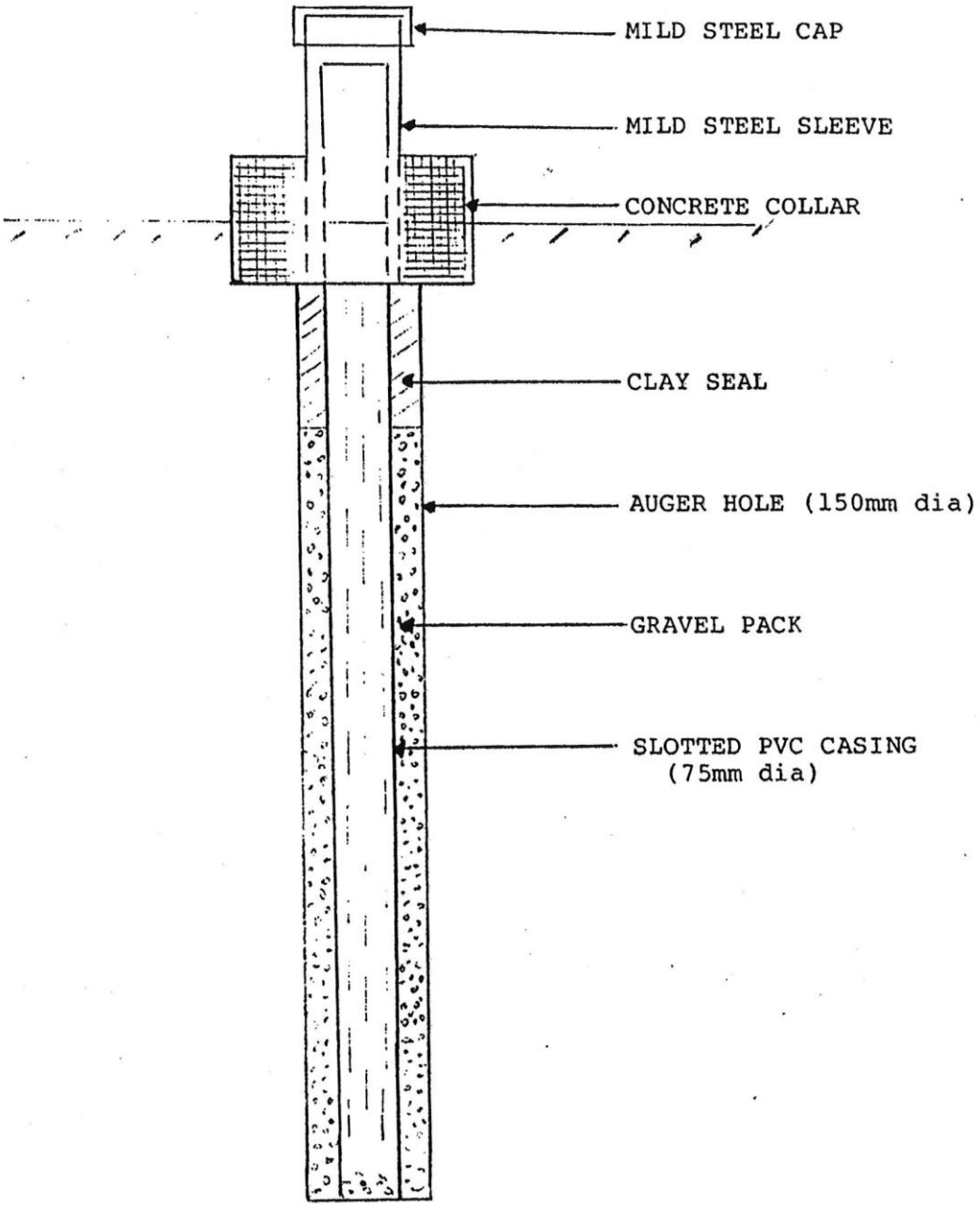
CW

Monitoring Well Installation

Client :	Property Group	**Hole Commenced:**	20-Jun-00
Project :	Off Site Investigation	**Hole Completed:**	20-Jun-00
Bore Location :	ANSTO Little Forrest Burial Ground (NW Corner)	**supervised by:**	KK
Job Number:	CL426	**log checked by:**	SMc
Surface R.L.:		**Drill Model :**	Fox B40
Casing R.L:		**Drilling Company:**	Drilltest Pty Ltd
Datum:		**Hole Diameter:**	100mm



DESIGN OF MB SERIES MONITORING BORES



LFBG GEOLOGICAL LOG

BORE HOLE MB-11

0 - 1.7m	•	light brown clayey soil (completely weathered shale)
	•	red-brown and greyish clay; laminations present (completely weathered shale)
1.7 - 3.2m	•	mottled zone, mainly grey and reddish clay - some hard reddish shale fragments
	•	light grey silty-shale fragments (leached layer)
3.2 - 4.7m	•	fresher greyish shale fragments (sample damp)
	•	dark grey-blackish shale and iron-stained black shale fragments
4.7 - 6.2m	•	yellowish-brown clay some sandy siltstone fragments (iron-stained) and grey silty-shale; start of interbedded shale and siltstone/sandstone in this interval
6.2 - 7.7m	•	iron-stained/carbonaceous siltstone fine sandstone (probably interbedded black shale and iron-stained course siltstone/fine sandstone
7.7 - 8.35m	•	as above

LFBG GEOLOGICAL LOG

BORE HOLE MB-12

0 - 1.7m	• tan-brown clayey soil (completely weathered shale)
	• red-brown grey mottled clay some laminations (completely weathered shale)
1.7 - 3.2m	• mottled grey-red-brown clay with few black shale fragments
	• light grey silty shale fragments
3.2 - 4.7m	• light grey siltstone and shale fragments and iron-stained shale/siltstone fragments and fine sandstone
	• shale/sandstone boundary in this interval
4.7 - 5.39m	• mainly coarse grey siltstone/fine sandstone with iron-staining on some fragments
	• change to brownish colour sandy clay, iron-stained fine sandstone interval
	• grey fine sandstone and iron-stained sandstone fragment

LFBG GEOLOGICAL LOG

BORE HOLE MB-13

0 - 1.7m	•	tan-brown clay soil (lamination present) (completely weathered shale)
1.7 - 3.2m	•	greyish-reddish mottled clay iron-stained silty-shale
3.2 - 4.7m	•	light grey siliceous shaley/siltstone fragments more iron-stained towards bottom
4.7 - 6.2m	•	mainly iron-stained siltstone/shale fragments
6.2 - 7.10m	•	change to dark fragments - fresher black shale fragments and iron-stained shale fragments

LFBG GEOLOGICAL LOG

BORE HOLE MB-14

0 - 1.7m	•	tan-brown clay soil grading into red-brown clay (completely weathered shale)
1.7 - 3.2m	•	red-brown iron-stained silty shale fragments and light grey leached shale
3.2 - 4.7m	•	as above
4.7 - 6.2m	•	red-orange iron-stained silty shale grading down into soft black shale
6.5m	•	(hit hard shale according to driller)
6.2 - 7.0m	•	mainly black shale
	•	hole dry at time of drilling

LFBG GEOLOGICAL LOG

BORE HOLE MB-15

0 - 1.7m	•	tan-brown clay grading into mottled grey, red-brown colour towards 1.7m (completely weathered shale)
1.7 - 3.2m	•	abundant grey and red-brown iron-stained shale fragments (leached shale)
3.2 - 4.7m	•	darker grey and iron-stained shale
4.7 - 6.2m	•	as above
6.2 - 7.35m	•	soft black shale predominant, some brown iron-stained shale. (Hole dry at time of drilling)

LFBG GEOLOGICAL LOG

BORE HOLE MB-16

(collar located 55.8m north of reference line and 35.8m from eastern boundary fence)

0 - 1.7m	•	red-brown clay (completely weathered shale)
1.7 - 3.2m	•	grey and iron-stained shale fragments (leached shale)
3.2 - 4.7m	•	black and iron-stained shale
4.7 - 6.1m	•	black shale with iron-stained shale

(no radioactive contamination indicated on cuttings by mini geiger monitor)

LFBG GEOLOGICAL LOG

BORE HOLE MB-17

0 - 1.7m	•	tan-brown, reddish-grey clay (completely weathered clay)
1.7 - 3.2m	•	mainly light grey and brown iron-stained silty shale (leached shale)
3.2 - 4.7m	•	light grey shale grading to black soft shale fragments
4.7 - 6.0m	•	mainly soft black shale sample, damp from around 5.0m

LFBG GEOLOGICAL LOG

BORE HOLE MB-18

0 - 1.7m	•	red-brown clay soil, completely weathered shale
1.7 - 3.2m	•	light grey and red-brown iron-stained shale
3.2 - 4.7m	•	red-brown iron-stained shale grading into predominantly soft black shale
4.7 - 6.0m	•	predominantly black shale, some iron-stained fragments (damp near bottom of hole)
	•	hole dry at time of drilling

LFBG GEOLOGICAL LOG

BORE HOLE MB-19

0 - 1.7m	•	tan-brown clay completely weathered shale
	•	light grey and red-brown shale fragments
1.7 - 3.2m	•	predominantly light grey and iron-stained shale fragments
3.2 - 4.7m	•	predominantly soft black shale fragments
4.7 - 6.2m	•	as above
6.2 - 7.4m	•	as above
	•	hole dry to around 6.0m
	•	water in bottom of hole when hole cleaned

LFBG GEOLOGICAL LOG

BORE HOLE MB-20

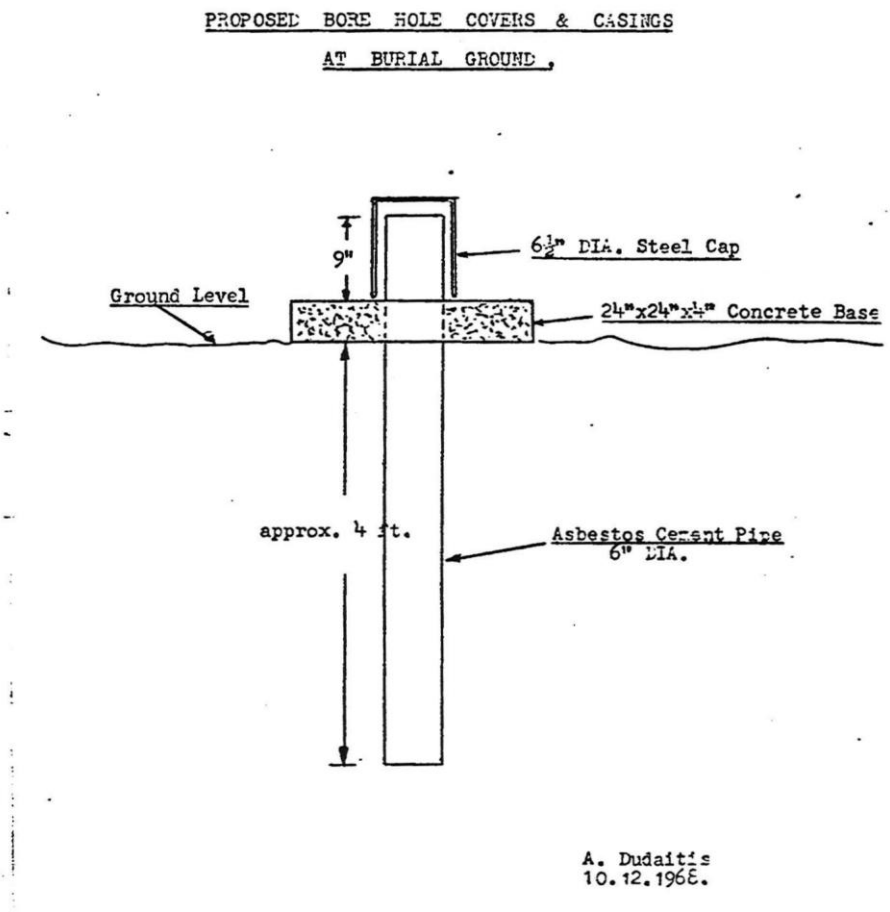
0 - 1.7m	•	red-brown clay, completely weathered shale
1.7 - 3.2m	•	light grey leached weathered shale (siliceous)
3.2 - 4.7m	•	light grey shale grading to soft black shale
4.7 - 6.10m	•	mainly soft black shale fragments
	•	hole made water when cleaned

LFBG GEOLOGICAL LOG

BORE HOLE MB-21

0 - 1.7m	•	red-brown clay
	•	mottled grey-brown-red clay completely weathered shale
1.7 - 3.2m	•	light grey siliceous shale fragments and red-brown shale fragments
3.2 - 4.7m	•	as above
4.7 - 5.8m	•	soft black shale fragments mainly
	•	cuttings all dry

BH Series Well Construction



SURVEY OF EXISTING BORE HOLES
AT BURIAL GROUND.

Bore Hole	Depth	Lining	Remarks
BH 1	9' 4"	No lining	
BH 2	24' 6"	A. C.	A. C. = Asbestos Cement
C 1	20' 6"	A. C.	
NW 2 (SH 1)	21' 0"	A. C.	
(SH 2)	23' 0"	A. C.	
N 2	22' 0"	STEEL	
NE 2	22' 0"	A. C.	
NW 1	21' 6"	STEEL	
N 1	21' 6"	STEEL	
E 2	22' 0"	A. C.	
E 1	20' 6"	STEEL	
INJ	21' 6"	"	
W 1	21' 6"	"	
S 1	22' 6"	"	
S 2	23' 6"	A. C.	
SE 2	22' 0"	A. C.	
C 2	25' 0"	A. C.	
BH 3	11' 2"	No lining	
BH 4	20' 0"	" "	
BH 5	12' 0"	" "	
BH 6	6' 6"	" "	
BH 7	12' 3"	" "	
BH 8 and BH 9	UNABLE TO LOCATE		
BH 10	17' 0"	No lining	

APPENDIX C – HISTORICAL AERIAL PHOTOGRAPHY


N
500
Metres
Little Forest Area, 1955


N
500
Metres
Little Forest Area, 1961


N
500
Metres
Little Forest Area, 1970


N
500
Metres
Little Forest Area, 1978


N
500
Metres
Little Forest Area, 1984
500 m
LITTLE FOREST ROAD

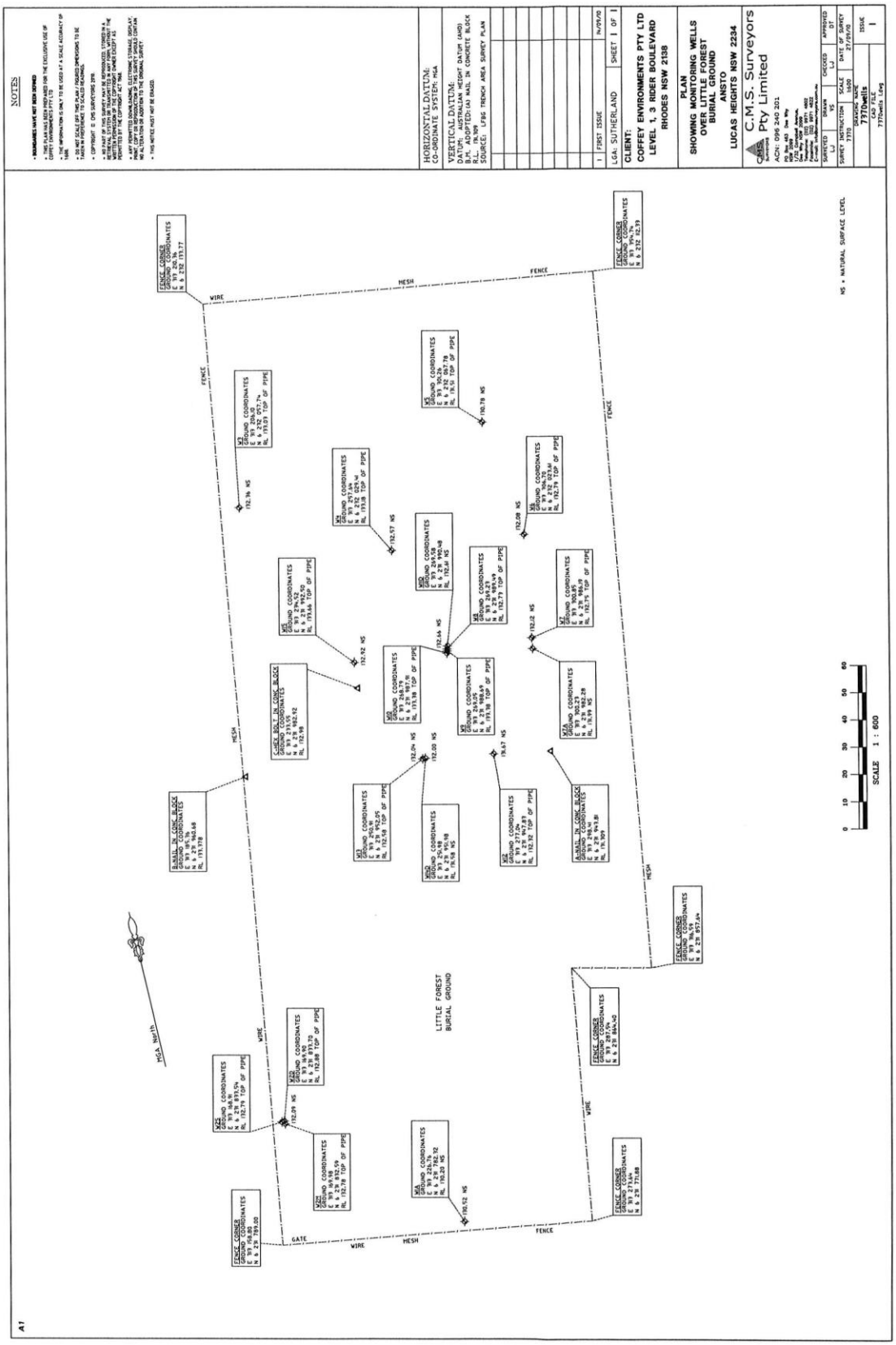

N
500
Metres
Little Forest Area, 1994
500 m
LITTLE FOREST ROAD


N
500
Metres
Little Forest Area, 2001
500 m
LITTLE FOREST ROAD


N
500
Metres
Little Forest Area, 2006
500 m
LITTLE FOREST ROAD


N
500
Metres
Little Forest Area, 2010
500 m

APPENDIX D – COORDINATE SURVEY REPORTS


NOTES
HORIZONTAL DATUM:
CO-ORDINATE SYSTEM: MGA
VERTICAL DATUM:
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
B.M. ADOPTED: (A) NAIL IN CONCRETE BLOCK
R.L. 76.789
SOURCE: LTAS TRENCH AREA SURVEY PLAN
1 FIRST ISSUE 24/09/09
LGA: SUTHERLAND SHEET 1 OF 1
CLIENT:
COFFEY ENVIRONMENTS PTY LTD
LEVEL 1, 3 RIDER BOULEVARD
RHODES NSW 2138
PLAN
SHOWING MONITORING WELLS
OVER LITTLE FOREST
BURIAL GROUND
ANSTO
LUCAS HEIGHTS NSW 2234
C.M.S. Surveyors
Pty Limited
ACN: 096 240 201
SURVEYED LJ
DRAWN VS
CHECKED LJ
APPROVED DT
SURVEY INSTRUCTION 27705
SCALE 1:600
DATE OF SURVEY 27/09/09
DRAWING NAME 7970wells
JOB No. 7970
ISSUE 1
SCALE 1 : 600
LITTLE FOREST
BURIAL GROUND
MGA North
A1

Bores- top of PVC

MARK	DESCRIPTION	EASTING	NORTHING	HEIGHT (A.H.D)
CH17	Offsite, gattock cover, top of PVC	313374.54	6232182.92	126.187
CH18	New square monument, top of PVC	313306.44	6232107.32	130.095
CH21	New square monument, top of PVC	313298.90	6232067.97	131.593
CH22	Exposed PVC	313302.69	6232087.91	130.866
CH30	Between trenches, gattock cover, top of PVC	313265.64	6231966.79	132.260
CH31	Gattock cover, PVC lower lip at mark	313248.93	6231948.81	131.943
MB13	Old yellow round monument, top of PVC	313279.91	6231879.92	129.846
P1D	Existing bore hole, top of PVC	313270.77	6231839.22	129.664
P1S	Existing bore hole, top of PVC	313270.18	6231834.34	129.745
CW	Existing bore hole, top of PVC	313212.87	6232125.85	130.128

Reference points.

MARK	DESCRIPTION	EASTING	NORTHING	HEIGHT (A.H.D)
A	Nail in concrete block	313298.41	6231943.81	131.309
B	Nail in concrete block	313185.36	6231960.68	133.378
C	Hex bolt in concrete block	313233.55	6231982.92	132.980

Trench Markers

MARK	DESCRIPTION	EASTING	NORTHING
TM1	Centre of red marker	313229.87	6231956.60
TM2	Centre of red marker	313241.78	6232027.17
TM3	Centre of red marker	313257.44	6232027.52
TM4	Centre of red marker	313274.11	6232023.77
TM5	Centre of red marker	313282.71	6232067.96
TM6	Centre of red marker	313312.51	6232062.31
TM7	Centre of red marker	313292.50	6231947.03
TM8	Centre of red marker	313264.18	6231951.22
TM9	Centre of red marker	313259.03	6231952.04

Datum:

Azimuth- PM 53871
E- 313494.594
N- 6232397.026

PM 54371
E- 313712.146
N- 6232479.153

Origin of levels- PM 53871, RL 118.658 (A.H.D)

Note:

Methods of survey:
Coordinates: Theodolite traverse
Level: PM 53871 to CH17- Theodolite trig traverse.
CH17 relative to other marks: Automatic level.

* CH bores surveyed by Cooper & Richards Surveyors Pty Ltd under contract to Consulting Earth Scientists

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SKM

John Bradd
ANSTO
PMB 1
MENAI
NSW 2234

10 March 2003

Little Forest Burial Ground-Boreholes

Dear John

Little Forest Burial Ground Boreholes

Attached is a spreadsheet containing the x, y and z coordinates for Boreholes around the Little Forest Burial Ground surveyed on the 7th March 03. In conjunction with this we have surveyed a grid over the site and created contours at a major interval of 1 meter and a minor interval of 0.5 meters.

The vertical datum is Australian Height Datum (AHD) and the horizontal datum is Map Grid of Australia(MGA).

I will send you a hardcopy of all data surveyed and will also email you the digital files for your records.

If you have any questions don't hesitate to call.

Yours sincerely

Michael Hayden
Survey Project Manager
Phone: 99282220
Fax: 99282224
E-mail: MHayden@skm.com.au

POINT NAME	EASTING	NORTHING	ELEVATION	CODE	DESCRIPTION
A	313158.926	6231788.897	133.119	664	FENCE
B	313210.461	6232133.826	129.287	664	FENCE
BH1	313214.407	6232130.356	129.240	310	BOREHOLE
BH2	313207.354	6232067.318	131.986	310	BOREHOLE
BH3	313185.870	6231949.726	133.181	310	BOREHOLE
BH4	313172.375	6231854.974	131.649	310	BOREHOLE
BH5	313161.230	6231792.260	132.917	310	BOREHOLE
BH6	313249.921	6231777.775	129.659	310	BOREHOLE
BH10	313300.130	6232117.547	128.894	310	BOREHOLE
BHA	313269.448	6232155.348	127.564	310	BOREHOLE
BHB	313329.738	6232147.281	127.597	310	BOREHOLE
BHC	DESTROYED			310	BOREHOLE
BHD	313365.729	6232141.515	127.873	310	BOREHOLE
BHE	313238.922	6232160.084	127.861	310	BOREHOLE
BHF	313324.396	6231996.013	131.793	310	BOREHOLE
C	313354.720	6232112.213	128.785	664	FENCE
CM	313298.423	6231943.768	131.289	692	CONCRETE MARKER
CW	313213.046	6232125.586	129.505	310	BOREHOLE
D	313316.639	6231857.752	128.503	664	FENCE
E	313287.488	6231864.353	128.986	664	FENCE
F	313273.605	6231771.835	129.101	664	FENCE
MB11	313172.913	6231816.378	132.331	310	BOREHOLE
MB12	313268.101	6231802.419	129.047	310	BOREHOLE
MB13	313279.765	6231879.938	129.499	310	BOREHOLE
MB14	313188.619	6231915.987	132.540	310	BOREHOLE
MB15	313202.692	6232014.249	133.369	310	BOREHOLE
MB16	313271.653	6232004.060	132.793	310	BOREHOLE
MB17	313312.213	6232098.692	129.551	310	BOREHOLE
MB18	313216.857	6232112.771	129.988	310	BOREHOLE
MB19	313370.205	6232112.546	128.869	310	BOREHOLE
MB20	313361.987	6231989.923	131.519	310	BOREHOLE
MB21	313351.324	6231910.011	129.952	310	BOREHOLE
MB22	313317.341	6231792.600	127.707	310	BOREHOLE
OS1	313280.887	6231834.839	128.714	310	BOREHOLE
OS2	313296.289	6231933.848	131.052	310	BOREHOLE
OS3	313313.915	6232055.496	131.080	310	BOREHOLE
P1D	313270.870	6231839.443	128.919	310	BOREHOLE
P1S	313270.403	6231834.321	128.943	310	BOREHOLE
P2D	313232.203	6232162.120	127.841	310	BOREHOLE
S1	313282.238	6231887.451	129.778	500	TRENCH
S1	313255.829	6231891.506	130.062	500	TRENCH
S2	313268.610	6231896.774	130.230	500	TRENCH
S2	313272.027	6231896.493	130.237	500	TRENCH