

## Appendix B

# Sediment Core Logs

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ENSR Australia Pty Ltd. (trading as AECOM)  
Level 5, 828 Pacific Highway  
Gordon, NSW, 2072

# BOREHOLE LOG

PC01

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183409.5549  
COMMENTS Depth to sea bed = 7.8 m EASTING 308260.9888

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
10.5		PC1_0.0-0.3	*			CL-ML	Silty CLAY. Dark grey/brown, very soft hydrous layer. No odour or staining noted.	0.25
12.4		PC1_0.3-0.6	*			CL-ML	Gravelly Silty CLAY. Dark brown/black, soft. Gravels up to 2 cm. No odour or staining noted.	0.60
							Piston core refusal on bedrock at 0.6 m. Total Depth: 0.60 m	



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# BOREHOLE LOG

PC02

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183459.209  
COMMENTS Depth to sea bed = 8.0 m EASTING 308255.1175

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
12.2		PC2_0.0-0.3	*			CL-ML	Sandy Silty CLAY. Brown very soft, hydrous layer. No odour or staining noted.	
						CL-ML	Sandy Silty CLAY. Dark brown, very soft. No odour or staining noted.	0.30
5.8		PC2_0.3-0.85	*				Shell fragment inclusions.	0.85
							Piston core refusal on Sandy Silty Clay at 0.85 m. Total Depth: 0.85 m	



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# BOREHOLE LOG

PC03

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183508.863  
COMMENTS Depth to sea bed = 9.3 m EASTING 308249.2462

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
11.6		PC3_0.0-0.3	*			CL-ML	Silty CLAY. Brown, very soft hydrous layer. No odour or staining noted.	0.30
18.5		PC3_0.3-0.75 DUP05	*			CL-ML	Gravelly Silty CLAY. Dark brown, soft. Small gravels to 1 cm and less than 5% shell material. No odour or staining noted.	0.75
							Piston core refusal on Gravel at 0.75 m. Total Depth: 0.75 m	



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# BOREHOLE LOG

PC04

**PROJECT NUMBER** S3017805 **DATE** 07 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183558.5171  
**COMMENTS** Depth to sea bed = 8.8 m **EASTING** 308243.3749

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
6.7		PC4_0.0-0.33	*			CL-ML	Silty CLAY. Brown, very soft hydrous layer. No odour or staining noted.	0.15
						CL-ML	Sandy Silty CLAY. Dark brown, very soft. Minor fine grained sand inclusions. No odour or staining noted.	0.33
							Sandstone gravel inclusions up to 25 mm.	
							Piston core refusal on Bedrock at 0.33 m.	
							Total Depth: 0.33 m	



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## BOREHOLE LOG

PC05

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183608.1712  
**COMMENTS** Depth to sea bed = 7.4 m **EASTING** 308237.5036

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		PC5_0.0-0.02				CL	<p>Silty Sandy CLAY; Brown, soft, saturated, low plasticity. Contains fine to medium grained sand, crushed shells, seaweed, pipi shells and evidence of bioturbation (worm burrows). Minor seaweed odour noted. No staining noted.</p> <p>End of Sediment Grab at 0.02 m; previous refusal of piston core on Bedrock. Total Depth: 0.02 m</p>	0.02




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# BOREHOLE LOG

PC06

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183657.8253  
COMMENTS Depth to sea bed = 8.4 m EASTING 308231.6323

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
7		PC6_0.0-0.27	*			CL-ML CL-ML	<p>Sandy Silty CLAY. Brown, very soft, hydrous layer. &gt; 50% sand. No staining or odour noted.</p> <p>Sandy Silty CLAY. Dark grey, very soft. 5% fine grained sand inclusions. Shell fragments up to 5 cm and evidence of bioturbation (burrow hole approximately 3 cm wide).</p> <p>Piston core refusal on Bedrock at 0.27 m. Total Depth: 0.27 m</p>	0.10 0.27






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# BOREHOLE LOG

PC07

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183707.4794  
COMMENTS Depth to sea bed = 10.2 m EASTING 308225.761

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
7.2		PC7_0.0-0.2 DUP07	* *			CL-ML CL-ML	<p>Sandy Silty CLAY. Brown, very soft, hydrous layer. Minor shell fragment inclusions. No odour or staining noted.</p> <p>Silty CLAY. Black becomes darker at depth, very soft. &lt; 10% gravel and shell fragments. No odour or staining noted.</p> <p>Piston core refusal on Bedrock at 0.2 m. Total Depth: 0.15 m</p>	0.03 0.20



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# BOREHOLE LOG

PC08

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183757.1335  
COMMENTS Depth to sea bed = 10.9 m EASTING 308219.8897

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
3.5		PC8_0.0-0.35	*			CL-ML	Silty CLAY. Brown, soft. Contains minor fine grained sand. No odour or staining noted.	
4.9		PC8_0.35-0.7	*				Becomes dark grey/brown. Contains minor medium grained sand. Evidence of bioturbation (worm burrows). No odour or staining noted.	
5.1		PC8_0.7-1.2	*	1			Becomes black, dense. Contains minor fine grained sand. No odour or staining noted.	
						GPS	Sandy GRAVEL. Black, dense. Angular gravels (possible sandstone) up to 1 cm. No odour or staining noted.	1.10
							Piston core refusal on Sandy Gravel at 1.2 m. Total Depth: 1.20 m	1.20



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# BOREHOLE LOG

PC09

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183806.7875  
COMMENTS Depth to sea bed = 11.6 m EASTING 308214.0184

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
9.7		PC9_0.0-0.4	*			CL-ML	Silty CLAY. Brown, very soft. Contains minor fine grained sand. No odour or staining noted.	
6		PC9_0.4-0.8	*				Becomes dark brown/grey, soft. Contains minor fine grained sand. No odour or staining noted.	
11.5		PC9_0.8-1.12 E2	*	1		GPS	Sandy GRAVEL. Angular gravels to 1 cm. Contains minor fine and medium grained sand. No odour or staining noted.	0.90
							Piston core refusal on Sandy Gravel at 1.12 m. Total Depth: 1.12 m	1.12



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# BOREHOLE LOG

PC10

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183856.4416  
COMMENTS Depth to sea bed = 13.4 m EASTING 308208.1472

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
11.9		PC10_0.0-0.25	*			CL-ML	<p>Silty CLAY. Dark brown, soft. Contains minor medium grained sand. No odour or staining noted.</p> <p>Becomes dark brown/grey. Contains minor fine grained sand. No odour or staining observed.</p> <p>Piston core refusal on rock at 0.25 m.</p> <p>Total Depth: 0.25 m</p>	0.25




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# BOREHOLE LOG

PC11

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183906.0957  
COMMENTS Depth to sea bed = 17 m EASTING 308202.2759

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC11_0.0-0.2	*			CL-ML	Silty CLAY. Light grey/brown, soft, hydrous layer. No odour or staining noted. Contains minor medium grained sand. No odour or staining noted. Piston core refusal on rock at 0.2 m. Total Depth: 0.20 m	0.20



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# BOREHOLE LOG

# PC12

**PROJECT NUMBER** S3017805 **DATE** 09 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183900.2244  
**COMMENTS** Depth to sea bed = 16.9 m **EASTING** 308152.6218

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC12_0.0-0.4	*			CL-ML	Silty CLAY. Dark brown, soft hydrous layer. Contains minor fine grained sand. No odour or staining noted.	
		PC12_0.4-0.76	*				Becomes dark brown/grey. No odour or staining noted.	
		DUP09	*					
		TRIP06	*					
							Piston core terminated at 0.76 m, water too deep to obtain piston core sample. Total Depth: 0.76 m	0.76



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# BOREHOLE LOG

PC13

PROJECT NUMBER S3017805 DATE 13 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Sediment Grab  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183850.5703  
COMMENTS Depth to sea bed = 16.6 m EASTING 308158.4931

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2	✖	PC13_0.0-0.06	✱			CL-ML	<p>Silty CLAY. Grey/brown to dark grey/brown, soft, saturated, low plasticity. Contains trace (&lt;5%) fine grained sand and minor organic matter. No odour or staining noted.</p> <p>End of Sediment Grab at 0.07 m; previous refusal of piston core on unknown matrix (possible bedrock or river gravels). Total Depth: 0.07 m</p>	0.07





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# BOREHOLE LOG

## PC14

**PROJECT NUMBER** S3017805 **DATE** 08 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183800.9162  
**COMMENTS** Depth to sea bed = 14.0 m **EASTING** 308164.3644

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
7.1		PC14_0.0-0.36	*			CL-ML	Silty CLAY. Brown, soft, hydrous layer. Contains minor fine grained sand. No odour or staining noted. Becomes dark grey/black.	0.31
						GP	Sandy GRAVEL. Dark grey/brown, dense. Frequent gravels less than 1cm. No odour or staining noted.  Piston core refusal on Sandy Gravel at 0.36 m. Total Depth: 0.36 m	0.36





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## BOREHOLE LOG

## PC15

**PROJECT NUMBER** S3017805 **DATE** 08 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183751.2622  
**COMMENTS** Depth to sea bed = 12.5 m **EASTING** 308170.2357

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
13		PC15_0.0-0.5	*			CL-ML	Silty CLAY. Dark brown, soft, hydrous layer. No odour or staining noted.	0.15
15.5		PC15_0.5-1.0	*			CL-ML	Silty CLAY. Dark brown/grey. Contains minor medium grained sand. No odour or staining noted.  Becomes dark grey/black.	1.00
				1			Piston core refusal on Clay at 1.0 m. Total Depth: 1.00 m	



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# BOREHOLE LOG

## PC16

**PROJECT NUMBER** S3017805 **DATE** 07 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183552.6458  
**COMMENTS** Depth to sea bed = 11.5 m **EASTING** 308193.7208

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
7.6		PC16_0.0-0.3				CL-ML	Sandy Silty CLAY. Dark grey/brown, very soft. Fine grained sand inclusions. No odour or staining noted.	
8.5		PC16_0.3-0.76					Becomes dark grey and dark brown at depth.	
							Less than 10% shells and gravels 1-3 cm.	0.76
							Piston core refusal on Shells and Gravel at 0.76 m. Total Depth: 0.76 m	






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# BOREHOLE LOG

PC17

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183651.954  
COMMENTS Depth to sea bed = 11.0 m EASTING 308181.9782

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
6.4		PC17_0.0-0.7	*			CL-ML	Sandy Silty CLAY. Brown, very soft. No odour or staining noted.  Becomes dark brown. No odour or staining noted.	
9.1		PC17_0.7-1.0	*				Becomes dark black/brown, very soft. Less than 10% crushed shells. Rounded river gravels up to 5 cm. No odour or staining noted.	
				1			Piston core refusal on Shells and Gravel at 1.0 m. Total Depth: 1.00 m	1.00



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# BOREHOLE LOG

PC18

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183602.2999  
COMMENTS Depth to sea bed = 10.6 m EASTING 308187.8495

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
8.1		PC18_0.0-0.26	*			CL-ML	Sandy Silty CLAY. Brown, very soft, hydrous layer. Small shell fragment inclusions. No odour or staining noted.	0.26
9.4		PC18_0.26-0.52	*			CL-ML	Silty CLAY. Dark brown, very soft. Small shell fragment inclusions. No odour or staining noted.	0.52
							Piston core refusal on Bedrock at 0.52 m. Total Depth: 0.52 m	



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# BOREHOLE LOG

# PC19

**PROJECT NUMBER** S3017805 **DATE** 08 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183701.6081  
**COMMENTS** Depth to sea bed = 12.2 m **EASTING** 308176.107

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
14.2		PC19_0.0-0.53	*			CL-ML	Silty CLAY. Brown, soft, hydrous layer (saturated). No odour or staining noted.  Becomes dark grey/brown. Evidence of bioturbation(worm burrows). No odour or staining noted.	0.53
10.9		PC19_0.53-1.03	*			CL-ML	Silty CLAY. Dark grey/brown. Contains minor medium grained sand. No odour or staining observed.  Becomes darker in colour. Contains minor medium grained sand.	0.85
				1		CL-ML	Gravelly Silty CLAY. Black with numerous small gravels 1-3 mm and minor large angular gravels up to 5cm. No odour or staining noted.  Piston core refusal on Gravel at 0.94 m. Total Depth: 1.03 m	0.94



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# BOREHOLE LOG

PC20

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183502.9917  
COMMENTS Depth to sea bed = 10.0 m EASTING 308199.5921

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
8.2		PC20_0.0-0.17	*			CL-ML	Gravelly Silty CLAY. Dark grey/brown, soft. Frequent gravels up to 1 cm and large mussel shells. Large charcoal pieces up to 5 cm. Charcoal-like odour noted. Black staining observed.  Piston core refusal on Gravel at 0.17 m. Total Depth: 0.17 m	0.17



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# BOREHOLE LOG

PC21

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183453.3377  
COMMENTS Depth to sea bed = 8.2 m EASTING 308205.4634

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
9		PC21_0.0-0.35	*			CL-ML	Sandy Gravelly Silty CLAY. Brown, very soft. Big mussel shells and wood fragments (broken off from pier). Sulphuric odour noted. No staining observed.	0.35
							Piston core refusal on Gravel at 0.35 m. Total Depth: 0.35 m	



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## BOREHOLE LOG

PC22

**PROJECT NUMBER** S3017805 **DATE** 06 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183403.6836  
**COMMENTS** Depth to sea bed = 10.0 m **EASTING** 308211.3347

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
15.8		PC22_0.0-0.2	*			CL-ML	Silty CLAY. Dark black, soft hydrous layer. No odour or staining noted.	
17		PC22_0.3-0.5 DUP04	*				Contains gravels, large mussel shells, pieces of wood from pier pylons and aluminium fragments. No odour or staining noted. Large coal gravels at base of sample. Sulphurous odour noted. Sheen observed. Piston core refusal on Gravel at 0.55 m. Total Depth: 0.55 m	0.55





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## BOREHOLE LOG

PC23

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183894.3531  
**COMMENTS** Depth to sea bed = 16.7 m **EASTING** 308102.9677

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	✱	PC23_0.0-0.06	✱		SP-SC		<p>Silty Sandy CLAY. Grey/brown, soft, saturated, low plasticity. Contains (40%) medium grained sand and moderate organic matter. Slight hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab at 0.06 m; previous refusal of piston core on weathered Bedrock .</p> <p>Total Depth: 0.06 m</p>	0.06



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# BOREHOLE LOG

# PC24

**PROJECT NUMBER** S3017805 **DATE** 09 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183844.699  
**COMMENTS** Depth to sea bed = 16.7 m **EASTING** 308108.839

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC24_0.0-0.23	*			CL-ML CL-ML	Silty CLAY. Brown, soft hydrous layer. No odour or staining noted. Silty CLAY. Dark grey/brown. Contains minor fine grained sand. No odour or staining noted. Contains minor medium grained sand. No odour or staining noted. Piston core refusal on Shale at 0.23 m. Total Depth: 0.23 m	0.10 0.23



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# BOREHOLE LOG

PC25

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183795.0449  
COMMENTS Depth to sea bed = 10.9 m EASTING 308114.7103

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC25_0.0-0.35	*			CL-ML	Silty CLAY. Brown, soft hydrous layer. No odour or staining noted.	0.10
		DUP08	*			CL-ML	Silty CLAY. Dark grey/brown. Contains minor fine to medium grained sand. No odour or staining noted.	0.35
		TRIP05	*				Piston core refusal on Bedrock at 0.35 m. Total Depth: 0.35 m	





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## BOREHOLE LOG

PC26

**PROJECT NUMBER** S3017805 **DATE** 08 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183745.3909  
**COMMENTS** Depth to sea bed = 12.0 m **EASTING** 308120.5816

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
15.1		PC26_0.0-0.5	*			CL-ML CL-ML	Silty CLAY. Light brown, very soft, hydrous layer. No odour or staining noted. Sandy Silty CLAY. Brown, soft. Fine to medium grained sand inclusions. No odour or staining noted.	0.05
12.2		PC26_0.5-0.87	*				Becomes dark grey, dense. No odour or staining noted. Becomes black. Angular gravels 1-2 cm including flat shale gravels. Medium grained sand inclusions. No odour or staining noted. Piston core refusal on Bedrock at 0.9 m. Total Depth: 0.87 m	0.90



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## BOREHOLE LOG

## PC27

**PROJECT NUMBER** S3017805 **DATE** 08 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183695.7368  
**COMMENTS** Depth to sea bed = 13.3 m **EASTING** 308126.4529

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
4.9		PC27_0.0-0.5 TRIP03	*			CL-ML	Sandy Silty CLAY. Dark brown, dense. Fine and medium grained sand inclusions. No odour or staining noted. Saltwater yabby burrow observed in core sample Becomes darker brown and grey.	0.50
9.8		PC27_0.5-0.9	*			CL-ML	Silty CLAY. Dark grey, dense. No odour or staining noted. Contains minor gravel inclusions at 0.55 m.  Contains minor gravel inclusions at 0.8 m.	0.90
							Piston core refusal on Gravel at 0.9 m. Total Depth: 0.90 m	



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# BOREHOLE LOG

PC28

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183646.0827  
COMMENTS Depth to sea bed = 13.0 m EASTING 308132.3242

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
15.6		PC28_0.0-0.4	*			CL-ML	Sandy Silty CLAY. Brown, very soft. Fine grained sand inclusions. Evidence of bioturbation(worm burrows). No odour or staining noted.	
11.2		PC28_0.4-0.9	*				Becomes dark grey/black. Medium grained sand inclusions. No odour or staining noted.	
53.1		PC28_0.9-1.4	*	1			Band of shell fragments from 1.3 to 1.35 m. Becomes dark black, dense. Fine grained sand inclusions. River gravel inclusions up to 8 cm. Frequent rounded river gravels 5 cm in diameter. No odour or staining noted. Piston core refusal on Gravel at 1.4 m. Total Depth: 1.40 m	1.40



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# BOREHOLE LOG

PC29

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183596.4286  
COMMENTS Depth to sea bed = 12.8 m EASTING 308138.1955

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
18.8		PC29_0.0-0.45	*			CL-ML	Sandy Silty CLAY. Brown, very soft. Coal-like odour noted. No staining observed.	
17.5		PC29_0.45-0.83	*			CL-ML	Sandy Silty CLAY. Black/dark grey, dense. Small gravels less than 2 mm. Fine grained sand inclusions. Slight sulphuric odour noted. No staining observed.	0.45
							Piston core refusal on Clay at 0.83 m. Total Depth: 0.83 m	0.83



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# BOREHOLE LOG

PC30

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183546.7745  
COMMENTS Depth to sea bed = 12.0 m EASTING 308144.0668

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
6.9		PC30_0.0-0.3	*			CL-ML	Sandy Silty CLAY. Brown, very soft, hydrous layer. Fine grain sand inclusions. No odour or staining noted.	0.30
6.8		PC30_0.3-0.68 E1	*			CL-ML	Shell and gravel material. Sulphurous odour noted from 0.1 m onwards. No staining observed.	
			*				Sandy Gravelly Silty CLAY. Dark grey, very soft. Oily residue on piston core barrel observed. Sulphurous odour noted.	0.68
			*				Large rounded river gravel.	
							Sub rounded sandstone inclusion.	
							Piston core refusal on Gravel at 0.68 m.	
							Total Depth: 0.68 m	





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# BOREHOLE LOG

PC31

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183497.1205  
COMMENTS Depth to sea bed = 11.7 m EASTING 308149.938

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
8.1		PC31_0.0-0.26	*			CL-ML	Sandy Silty CLAY. Light grey/brown, very soft. Evidence of bioturbation(worm burrows). Fine grained sand inclusions. No odour or staining noted.	
5.2		PC31_0.26-0.52	*			CL-ML	Dark grey/brown, very soft. Shell fragments and river gravel inclusions.	0.40
							Gravelly Sand Silty CLAY. Dark grey/brown, very soft. Gravel and medium grained sand inclusions. No odour or staining noted.	0.52
							Piston core refusal on Gravel at 0.52 m. Total Depth: 0.52 m	



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# BOREHOLE LOG

PC32

PROJECT NUMBER S3017805 DATE 07 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183447.4664  
COMMENTS Depth to sea bed = 11.3 m EASTING 308155.8093

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
7.2		PC32_0.0-0.23	*			CL-ML CL-ML	<p>Sandy Silty CLAY. Brown, very soft, hydrous layer. Fine sand grain inclusions. No odour or staining noted.</p> <p>Sandy Silty CLAY. Dark brown, very soft. Contains large angular gravels. No odour or staining noted.</p> <p>Piston core refusal Gravel at 0.23 m. Total Depth: 0.23 m</p>	0.09 0.23



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# BOREHOLE LOG

PC33

PROJECT NUMBER S3017805 DATE 06 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183397.8123  
COMMENTS Depth to sea bed = 10.0 m EASTING 308161.6806

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
18		PC33_0.0-0.2	*			CL-ML	Silty CLAY. Light brown, soft hydrous layer. No odour or staining noted.	0.25
15.2		PC33_0.3-0.5	*			CL-ML	Silty CLAY. Black with minor medium grained sand inclusions. No odour or staining noted. Nylon fishing line. Coal gravels up to 20 cm. No odour or staining noted. Piston core refusal on Clay at 0.5 m. Total Depth: 0.50 m	0.50



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## BOREHOLE LOG

## PC34

**PROJECT NUMBER** S3017805 **DATE** 08 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183264.2814  
**COMMENTS** Depth to sea bed = 8.1 m **EASTING** 307882.4346

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC34_0.0-0.27	*				<p>Silty CLAY. Grey/brown, hydrous layer. Contains minor medium grained sand. No odour or staining noted.</p> <p>Becomes black. Contains minor fine grained sand and trace yellow/light green clay materials. Fibrous vegetation observed. No odour or staining noted.</p> <p>Road base material (blue metals) at base of core. No odour or staining noted.</p> <p>Piston core refusal Road base Gravel at 0.27 m. Total Depth: 0.27 m</p>	0.27



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# BOREHOLE LOG

PC35

PROJECT NUMBER S3017805 DATE 08 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183313.9355  
COMMENTS Depth to sea bed = 9.3 m EASTING 307876.5633

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC35_0.0-0.35	*			CL-ML	Silty CLAY. Grey/white, soft. Contains minor medium grained sand and shell fragments. No odour or staining noted.	
		PC35_0.35-0.59	*			CL	Becomes black/dark grey. Contains minor fine grained sand. No odour or staining noted.	0.50
							CLAY. Black/dark grey, dense. No odour or staining noted.	0.59
							Piston core refusal on Bedrock at 0.59 m. Total Depth: 0.59 m	



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## BOREHOLE LOG

## PC36

**PROJECT NUMBER** S3017805 **DATE** 09 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183363.5896  
**COMMENTS** Depth to sea bed = 10.3 m **EASTING** 307870.692

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
20.2		PC36_0.0-0.16	*			CL-ML	Silty CLAY. Brown, soft hydrous layer. Contains minor fine to medium grained sand. No odour or staining noted.	
15.1		PC36_0.16-0.5	*				Remains brown with minor to medium grained sand. No odour or staining noted.  Becomes black/dark grey. Small crushed road base gravels and crushed shells less than 1cm.  Piston core refusal on Road base Gravel at 0.5 m. Total Depth: 0.50 m	0.50



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# BOREHOLE LOG

PC37

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183413.2436  
COMMENTS Depth to sea bed = 10.5 m EASTING 307864.8207

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
6.7		PC37_0.0-0.37	*			CL-ML CL-ML	Silty CLAY. Light brown, soft hydrous layer. No odour or staining noted. Silty CLAY. Brown, very soft. Contains minor medium grained sand. No odour or staining noted. Contains gravels and shell material. Piston core refusal on Shells and Gravel at 0.37 m. Total Depth: 0.37 m	0.10 0.37



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# BOREHOLE LOG

PC38

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183462.8977  
COMMENTS Depth to sea bed = 10.3 m EASTING 307858.9494

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
15.2		PC38_0.0-0.4	*			CL-ML	Silty CLAY. Lighter brown/grey, soft hydrous layer. No odour or staining noted.	
7.9		PC38_0.4-0.8 DUP16	*				Becomes dark brown/grey. No odour or staining noted.	
10.5		PC38_0.8-1.23	*	1		SP	Becomes black. No odour or staining noted.	1.00
							Sand. White/grey, poorly graded medium to coarse grained sand with small shell fragments. No odour or staining noted.	1.23
							Piston core refusal on Clay at 1.23 m. Total Depth: 1.23 m	





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# BOREHOLE LOG

PC39

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183512.5518  
COMMENTS Depth to sea bed = 10.8 m EASTING 307853.0781

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
15.1		PC39_0.0-0.4	*			CL-ML CL-ML	Silty CLAY. Brown, soft hydrous layer. No odour or staining noted.	0.10
13.2		PC39_0.4-0.87	*				Silty CLAY. Dark brown/grey. Contains minor fine grained sands. No odour or staining noted.  Becomes black. Minor angular gravels at base of sample. No odour or staining noted.	0.83
							Piston core refusal on Gravel at 0.83 m. Total Depth: 0.83 m	



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## BOREHOLE LOG

PC40

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183562.2059  
COMMENTS Depth to sea bed = 11.3 m EASTING 307847.2068

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC40_0.0-0.5	*			CL-ML	Silty CLAY. Brown, soft hydrous layer. Contains minor fine grained sand. No odour or staining noted.	
		PC40_0.5-1.0	*			CL-ML	Silty CLAY. Dark grey/black, dense. No odour or staining noted.	0.50
		PC40_1.0-1.47	*	1		CL-ML	Silty CLAY. Dark grey/black, very dense. Bands of minor medium grained sand. No odour or staining noted. Minor small gravel inclusions.	1.00
							Piston core refusal on Gravel at 1.47 m. Total Depth: 1.47 m	1.47



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# BOREHOLE LOG

PC41

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183611.86  
COMMENTS Depth to sea bed = 11.9 m EASTING 307841.3355

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC41_0.0-0.5 DUP17 TRIP10	*			CL-ML	Silty CLAY. Light grey/black, soft hydrous layer. No odour or staining noted.	0.10
			*			CL-ML	Silty CLAY. Black. Contains minor fine grained sand. No odour or staining noted.	
		PC41_0.5-1.0	*					
			*	1				
		PC41_1.0-1.55	*				Becomes light grey/white/black and contains medium grained sand. No odour or staining noted.	
							Becomes black and contains minor fine grained sand. No odour or staining noted.	1.55
							Piston core refusal on Bedrock at 1.55 m. Total Depth: 1.55 m	



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# BOREHOLE LOG

PC42

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183661.5141  
COMMENTS Depth to sea bed = 13.2 m EASTING 307835.4642

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC42_0.0-0.5 DUP13	*			CL-ML CL-ML	Silty CLAY. Dark brown, soft hydrous layer. No odour or staining noted.	0.08
			*				Silty CLAY. Dark grey/brown. Contains minor fine grained sand and evidence of bioturbation(worms burrows) observed. No odour or staining noted.	
		PC42_0.5-0.88	*			CL-ML	Silty CLAY. Black/dark grey. No odour or staining noted.	0.50
							Becomes very dense and contains small hard gravels (up to 2 mm) and shell fragments. No odour or staining noted.	0.88
							Piston core refusal on Shells and Gravel at 0.88 m. Total Depth: 0.88 m	



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## BOREHOLE LOG

PC43

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183711.1681  
COMMENTS Depth to sea bed = 15.4 m EASTING 307829.5929

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC43_0.0-0.35	*			CL-ML	Silty CLAY. Dark brown, soft hydrous layer. No odour or staining noted.	0.10
		PC43_0.35-0.70	*			CL-ML	Silty CLAY. Dark grey/brown. Contains minor fine grained sand. No odour or staining noted. Evidence of bioturbation(worms burrows) observed. No odour or staining noted.	
		PC43_0.7-1.05	*			CL-ML	Silty CLAY. Black, soft. No odour or staining noted.	0.70
				1			Piston core refusal on Bedrock at 1.05 m. Total Depth: 1.05 m	1.05



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## BOREHOLE LOG

PC44

PROJECT NUMBER S3017805 DATE 13 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Sediment Grab  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183705.2968  
COMMENTS Depth to sea bed = 13.6 m EASTING 307779.9388

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	✖	PC44_0.0-0.06	✖			CL-ML	<p>Silty CLAY. Brown, soft, saturated, low plasticity. Contains minor (10%) fine to medium grained sand, crushed shells. Minor seaweed odour noted. No staining noted.</p> <p>End of Sediment Grab at 0.06 m, previous refusal of sediment core on Bedrock. Total Depth: 0.06 m</p>	0.06



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# BOREHOLE LOG

PC45

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183655.6428  
COMMENTS Depth to sea bed = 11.3 m EASTING 307785.8101

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC45_0.0-0.5	*			CL-ML	Silty CLAY. Dark grey/brown, soft hydrous layer. Contains minor medium grained sand. No odour or staining noted.	
							Becomes dark grey/dark brown. Contains minor fine grained sand and minor shell fragments. No odour or staining noted.	0.50
		PC45_0.5-1.03	*			CL-ML	Silty CLAY. Dark grey/black, soft. No odour or staining noted.	
				1		CL-ML	Silty CLAY. Dark grey/black. Contains minor medium grained sand, minor gravels and minor crushed shell pieces. No odour or staining noted.	0.98
							Piston core refusal on Shells and Gravel 1.03 m. Total Depth: 1.03 m	1.03



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## BOREHOLE LOG

PC46

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183605.9887  
**COMMENTS** Depth to sea bed = 6.7 m **EASTING** 307791.6814

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered bedrock. No piston core sample could be taken. Total Depth: 0.00 m	





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## BOREHOLE LOG

PC47

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183582.4056  
**COMMENTS** Depth to sea bed = 4.2 m **EASTING** 307803.3274

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered bedrock. No piston core sample could be taken. Total Depth: 0.00 m	



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# BOREHOLE LOG

## PC48

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183556.3346  
**COMMENTS** Depth to sea bed = 5.1 m **EASTING** 307797.5527

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC48_0.0-0.1				SC	Clayey SAND. Grey/orange/brown, medium dense medium grained sand. No odour or staining noted.  Piston core refusal on Bedrock at 0.1 m. Total Depth: 0.10 m	0.10



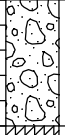
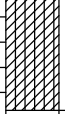
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# BOREHOLE LOG

PC49

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183506.6805  
COMMENTS Depth to sea bed = 10.2 m EASTING 307803.424

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC49_0.0-0.5	*			GPS	Sandy GRAVEL. Black and contains angular gravels of varying size and shell fragments up to 5 cm. Minor silty clay component. No odour or staining noted. Thin band of silty CLAY which contains minor fine grained sand.	0.50
		PC49_0.5-0.97	*			CL-ML	Silty CLAY. Dark grey/black and contains minor fine grained sand. No odour or staining noted.	0.97
							Piston core refusal on Clay at 0.97 m. Total Depth: 0.97 m	



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# BOREHOLE LOG

PC50

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183457.0264  
COMMENTS Depth to sea bed = 9.7 m EASTING 307809.2953

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC50_0.0-0.4	*			CL	Sandy Silty CLAY. Dark grey/dark brown, stiff. No odour or staining noted.	
		PC50_0.4-0.84	*			CL-ML	Silty CLAY. Dark grey/black. No odour or staining noted.  Contains minor medium grained sand from 0.6 m.	0.40  0.84
							Piston core refusal on Clay at 0.84 m. Total Depth: 0.84 m	



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# BOREHOLE LOG

PC51

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183407.3724  
COMMENTS Depth to sea bed = 9.2 m EASTING 307815.1666

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						CL-ML	Silty CLAY. Light grey/black, soft hydrous layer. No odour or staining noted.	0.10
		PC51_0.0-0.4 E2	*			CL-ML	Silty CLAY. Dark grey/black which contains minor medium grained sand. No odour or staining noted.	
		PC51_0.4-0.53	*				Becomes black and contains crushed shells. No odour or staining noted.	0.53
							Piston core refusal on Bedrock at 0.53 m. Total Depth: 0.53 m	




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## BOREHOLE LOG

PC52

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183357.7183  
COMMENTS Depth to sea bed = 8.8 m EASTING 307821.0379

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC52_0.0-0.19	*	-		CH	CLAY. Dark brown, stiff, medium to high plasticity. No odour or staining noted.	0.15
						CL-MI	Silty CLAY. Dark brown with angular gravels 1-2 cm. No odour or staining noted.	0.19
							Piston core refusal on Gravel at 0.19 m. Total Depth: 0.19 m	






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# BOREHOLE LOG

PC53

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183308.0642  
COMMENTS Depth to sea bed = 6.4 m EASTING 307826.9092

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC53_0.0-0.42	*			SP	SAND. Dark grey, loose, medium grained. Contains minor large angular gravels up to 5 cm and anthropogenic material (nail). No odour or staining noted.	0.15
		DUP11	*			CL-ML	Silty CLAY. Dark brown. Organic odour noted. No staining observed.	0.30
		TRIP08	*			CL	CLAY. Mottled grey and orange, very stiff, medium plasticity. No odour or staining noted.	0.42
							Piston core refusal on Clay at 0.42 m. Total Depth: 0.42 m	



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## BOREHOLE LOG

## PC54

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183258.4101  
**COMMENTS** Depth to sea bed = 7.8 m **EASTING** 307832.7805

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC54_0.0-0.3	*			CL-ML	Silty CLAY. Light brown, soft hydrous layer (saturated). No odour or staining noted. Becomes dark brown/black. No odour or staining noted. Becomes black. No odour or staining noted.	
		PC54_0.3-0.86	*			CL	CLAY. Black, stiff clay, medium plasticity. No odour or staining noted. Piston core refusal Clay at 0.86 m. Total Depth: 0.86 m	0.80 0.86







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# BOREHOLE LOG

PC55

PROJECT NUMBER S3017805 DATE 09 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183202.8847  
COMMENTS Depth to sea bed = 2.6 m EASTING 307788.9977

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC55_0.0-0.3	*			SP	SAND. Brown/orange, medium dense. Contains minor small gravels and shell fragments. Sewage-like odour noted. No staining observed.	0.30
		PC55_0.3-0.63	*			CL-ML	Silty CLAY. Brown and becomes black at depth with medium grained sand. Slight tar-like odour noted. Slight sheen observed.	0.63
							Piston core refusal on Clay at 0.63 m. Total Depth: 0.63 m	




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# BOREHOLE LOG

PC56

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183252.5388  
COMMENTS Depth to sea bed = 7.7 m EASTING 307783.1264

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC56_0.0-0.42	*			CL-ML CL-ML	<p>Silty CLAY. Dark brown, soft hydrous layer. Contains minor fine grained sand. Hydrocarbon and tar-like odour noted. No staining observed.</p> <p>Silty CLAY. Black with large gravels up to 5 cm. Hydrocarbon and tar-like odour noted. No staining observed.</p> <p>Crushed rock fragments (possible sandstone) and green rock fragments amongst black sediment. Hydrocarbon and tar-like odour noted. No staining observed.</p> <p>Piston core refusal on crushed Sandstone at 0.42 m. Total Depth: 0.42 m</p>	0.10 0.35 0.42





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# BOREHOLE LOG

# PC57

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183302.1929  
**COMMENTS** Depth to sea bed = 4.8 m **EASTING** 307777.2551

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC57_0.0-0.24	*			CL	CLAY. Brown. Contains trace small gravels up to 10 cm. No odour or staining noted.	0.20
						CH	CLAY. Brown, stiff, medium to high plasticity. No odour or staining noted.	0.57
							Piston core refusal on Clay at 0.57 m. Total Depth: 0.24 m	




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# BOREHOLE LOG

PC58

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183401.5011  
COMMENTS Depth to sea bed = 7.9 m EASTING 307765.5125

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC58_0.0-0.28	*			CL-ML SPG	<p>Silty CLAY. Light brown, soft hydrous layer. Contains minor fine grained sand. No odour or staining noted.</p> <p>Gravelly SAND. Large angular rock fragments up to 5cm and trace stiff clays. No odour or staining noted.</p> <p>Piston core refusal on Bedrock at 0.28 m. Total Depth: 0.28 m</p>	0.07 0.28



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## BOREHOLE LOG

PC59

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183446.2242  
**COMMENTS** Depth to sea bed = 8.7 m **EASTING** 307771.5535

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered bedrock. No piston core sample could be taken. Total Depth: 0.00 m	



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## BOREHOLE LOG

PC60

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183488.7327  
**COMMENTS** Depth to sea bed = 6.3 m **EASTING** 307782.6731

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered bedrock. No piston core sample could be taken. Total Depth: 0.00 m	



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## BOREHOLE LOG

PC61

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183649.7715  
**COMMENTS** Depth to sea bed = 9.3 m **EASTING** 307736.1561

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered bedrock; four attempts 5 m in all directions. No piston core sample could be taken. Total Depth: 0.00 m	



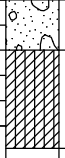
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# BOREHOLE LOG

PC62

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183680.5284  
COMMENTS Depth to sea bed = 8.7 m EASTING 307709.6719

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC62_0.0-0.59 DUP12 TRIP09	* * *			SPG CL-ML	Gravelly SAND. Dark brown medium grained sand with minor gravels up to 2 cm. No odour or staining noted. Silty CLAY. Dark brown/dark grey, soft. No odour or staining noted.	0.20 0.59
							Piston core refusal on Clay at 0.59 m. Total Depth: 0.59 m	






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# BOREHOLE LOG

PC63

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183699.4256  
COMMENTS Depth to sea bed = 10.7 m EASTING 307730.2848

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC63_0.0-0.5	*			CL-ML CL-ML	Silty CLAY. Dark brown, soft hydrous layer. No odour or staining noted. Silty CLAY. Dark brown/dark grey and contains minor fine grained sand. Bioturbation (worm burrows) observed. No odour or staining noted.  Becomes black. No odour or staining noted.	0.05
		PC63_0.5-0.95 DUP15 TRIP12 PC63_0.95-1.05	* * * *	1			Piston core refusal on dense Sand at 1.05 m. Total Depth: 1.05 m	1.05





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# BOREHOLE LOG

PC64

PROJECT NUMBER S3017805 DATE 10 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Piston Core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183246.6675  
COMMENTS Depth to sea bed = 6.2 m EASTING 307733.4723

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC64_0.0-0.25	*			GPS	Sandy GRAVEL. Dark brown/dark grey. Slight tar-like odour noted. No staining observed.	0.25
		PC64_0.25-0.65	*			SPG	Gravelly SAND. Black and contains crushed shells. Slight tar-like odour noted. No staining observed.	0.65
							Piston core refusal on Shell and Gravel at 0.65 m. Total Depth: 0.65 m	



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# BOREHOLE LOG

# PC65

**PROJECT NUMBER** S3017805 **DATE** 10 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Piston Core  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183296.3216  
**COMMENTS** Depth to sea bed = 5.3 m **EASTING** 307727.601

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		PC65_0.0-0.25	*			SP	SAND. Mottled dark brown/brown/dark grey becoming darker at depth. Medium grained with shell fragments. No odour or staining noted.  Piston core refusal on Bedrock at 0.25 m. Total Depth: 0.25 m	0.25



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# BOREHOLE LOG

PC66

PROJECT NUMBER S3017805 DATE 13 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Sediment Grab  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183347.2624  
COMMENTS Depth to sea bed = 2.5 m EASTING 307741.6652

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	1	PC66_0.0-0.02	*			SL-MK	<p>Sandy Silty CLAY. Grey/brown, soft, saturated, low plasticity. Contains very fine minor crushed shells, barnacles and seaweed. Seaweed odour noted. No staining or fibre cement material noted.</p> <p>End of Sediment Grab at 0.02 m; previous refusal of piston core on Bedrock. Total Depth: 0.02 m</p>	0.02



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# BOREHOLE LOG

SG01

PROJECT NUMBER S3017805 DATE 06 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183530.7544  
COMMENTS Depth to sea bed = 11.0 m EASTING 308221.4835

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
2.1	✱	SG1_0.0-0.05	✱			CL-MI	<p>Silty CLAY. Light brown/grey, soft hydrous layer. Contains trace fine grained sand. Evidence of bioturbation(tube worms). No odour or staining noted. Becomes dark brown/dark grey and highly bioturbated. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.05 m. Total Depth: 0.05 m</p>	0.05



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## BOREHOLE LOG

## SG02

**PROJECT NUMBER** S3017805 **DATE** 06 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183630.0626  
**COMMENTS** Depth to sea bed = 10.8 m **EASTING** 308209.7409

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
3.7	3.7	SG2_0.0-0.04	*	0.00	ZZZZZ	CL-MI	<p>Silty CLAY. Light brown/grey, soft hydrous layer. Contains trace fine grained sand. No odour or staining noted.</p> <p>Becomes dark brown/dark grey with frequent shell fragments. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.04 m. Total Depth: 0.04 m</p>	0.04



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## BOREHOLE LOG

## SG03

**PROJECT NUMBER** S3017805 **DATE** 06 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183729.3708  
**COMMENTS** Depth to sea bed = 12.0 m **EASTING** 308197.9983

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
2.5	SG3 0.0-0.05 DUP01 TRIP01	*** *** ***	////	CL-ML			Silty CLAY. Brown/grey. Contains trace fine grained sand. Evidence of bioturbation(worm burrows). No odour or staining noted.  End of Sediment Grab. Recovery to 0.05 m. Total Depth: 0.05 m	0.05



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# BOREHOLE LOG

## SG04

**PROJECT NUMBER** S3017805 **DATE** 06 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183828.6789  
**COMMENTS** Depth to sea bed = 12.0 m **EASTING** 308186.2558

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
5.8	✖	SG4_0.0-0.06	✱			CL-ML	<p>Sandy Silty CLAY. Light brown/grey with approximately 40% sand and minor shell/gravel fragments. No odour or staining noted.</p> <p>Becomes dark brown/dark grey with lower sand fraction approximately 10%.</p> <p>End of Sediment Grab. Recovery to 0.06 m.</p> <p>Total Depth: 0.06 m</p>	0.06





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# BOREHOLE LOG

## SG05

**PROJECT NUMBER** S3017805 **DATE** 06 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183773.1536  
**COMMENTS** Depth to sea bed = 11.5 m **EASTING** 308142.473

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
4.7	✖	SG5_0.0-0.07	✖			CL-ML	<p>Silty CLAY. Light brown/grey, soft hydrous layer. Contains trace fine grained sand. Evidence of bioturbation(worm burrows and gastropods). No odour or staining noted.</p> <p>Becomes dark brown/dark grey and highly bioturbated. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.07 m. Total Depth: 0.07 m</p>	0.07




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## BOREHOLE LOG

## SG06

**PROJECT NUMBER** S3017805 **DATE** 06 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183673.8454  
**COMMENTS** Depth to sea bed = 12.0 m **EASTING** 308154.2156

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
6	✓	SG6_0.0-0.08	*			CL-ML	Silty CLAY. Brown with approximately 25% sand. No odour or staining noted. Becomes dark brown/dark grey with trace sand (approximately 2%). End of Sediment Grab. Recovery to 0.08 m. Total Depth: 0.08 m	0.08



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# BOREHOLE LOG

SG07

**PROJECT NUMBER** S3017805 **DATE** 06 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Direct-Push  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** H. Cross/R. Cole **NORTHING** 6183574.5372  
**COMMENTS** Depth to sea bed = 12.5 m **EASTING** 308165.9581

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
7.9	✱	SG7_0.0-0.06	✱			CL-ML	<p>Silty CLAY. Brown, soft hydrous layer. Contains gravel size shells up to 1 cm. Evidence of bioturbation(worm burrows). No odour or staining noted. Becomes dark brown/dark grey with minor fine grained sand and highly bioturbated. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.06 m. Total Depth: 0.06 m</p>	0.06



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# BOREHOLE LOG

SG08

PROJECT NUMBER S3017805 DATE 06 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Direct-Push  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY H. Cross/R. Cole NORTHING 6183475.2291  
COMMENTS Depth to sea bed = 11.5 m EASTING 308177.7007

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
6.9	✓	SG8_0.0-0.08	*			CL-ML	<p>Silty CLAY. Brown, soft hydrous layer. Contains gravel size shells up to 1 cm. Evidence of bioturbation(worm burrows). No odour or staining noted. Becomes dark brown/dark grey. Contains minor fine grained sand and evidence of bioturbation(worm burrows). No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.08 m. Total Depth: 0.08 m</p>	0.08



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## BOREHOLE LOG

## SG09

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183206.6736  
**COMMENTS** Depth to sea bed = 5.6 m **EASTING** 307915.2347

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	✖	SG9_0.0-0.07	✱			CL-ML	<p>Silty CLAY. Grey/brown, soft, hydrous layer, low to medium plasticity. Contains minor (5-10%) fine to medium grained sand and evidence of bioturbation(worm burrows). Seaweed odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.07 m. Total Depth: 0.07 m</p>	0.07



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# BOREHOLE LOG SG10

PROJECT NUMBER S3017805 DATE 13 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Sediment Grab  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD  
LOGGED BY K. Pigram NORTHING 6183231.7164  
COMMENTS Depth to sea bed = 5.7 m EASTING 307923.1574

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	✖	SG10_0.0-0.07	*			CL-ML	<p>Silty CLAY. Dark grey brown, soft, hydrous layer, low to medium plasticity. Contains minor (&lt;10%) fine to medium grained sand and evidence of bioturbation(worm burrows). Seaweed odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.07 m. Total Depth: 0.07 m</p>	0.07



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## BOREHOLE LOG

## SG11

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183633.7514  
**COMMENTS** Depth to sea bed = 12.1 m **EASTING** 307813.5728

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	0.3	SG11_0.0-0.07	*			CL-ML	<p>Silty CLAY. Dark grey/brown, soft to medium stiff, hydrous layer, low plasticity. Contains minor (&lt;10%) fine to medium grained sand, contains minor shells, minor organic matter and seaweed. Slight seaweed odour. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.07 m. Total Depth: 0.07 m</p>	0.07



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## BOREHOLE LOG

## SG12

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183534.4432  
**COMMENTS** Depth to sea bed = 11.3 m **EASTING** 307825.3154

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	0.04	SG12_0.0-0.04	*	0.04	ZZZZZ	CL-MI	<p>Silty CLAY. Dark grey/brown, soft to medium stiff, hydrous layer, low to medium plasticity. Contain very minor (&lt;5%) fine to medium grained sand. Contains very minor organic matter. Very slight hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.04 m. Total Depth: 0.04 m</p>	0.04





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# BOREHOLE LOG

# SG13

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183435.135  
**COMMENTS** Depth to sea bed = 10.2 m **EASTING** 307837.058

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2	0.05	SG13_0.0-0.05	*			CL-MI	<p>Silty CLAY. Dark grey/brown, soft, hydrous layer, low plasticity. Contains minor sand, crushed gravel and minor organic matter. Slight hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.05 m. Total Depth: 0.05 m</p>	0.05



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# BOREHOLE LOG

# SG14

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183335.8269  
**COMMENTS** Depth to sea bed = 8.0 m **EASTING** 307848.8006

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	1	SG14_0.0-0.03	*		///	CL	<p>Sandy CLAY. Dark grey/brown, soft to medium stiff, hydrous layer, low plasticity. Contains (40%) medium to coarse grained sand, crushed shell pieces and minor organics. Very slightly hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.03 m. Total Depth: 0.03 m</p>	0.03





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## BOREHOLE LOG

## SG15

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183250.4564  
**COMMENTS** Depth to sea bed = 7.3 m **EASTING** 307859.7093

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SG15_0.0-0.11	*			CL-ML	<p>Silty CLAY. Dark grey/brown, soft, hydrous layer, low plasticity. Contains minor organic matter. Slight hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.11 m. Total Depth: 0.11 m</p>	0.11



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## BOREHOLE LOG

## SG16

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183225.4136  
**COMMENTS** Depth to sea bed = 5.6 m **EASTING** 307851.7866

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	✖	SG16_0.0-0.05	✖			CL-ML	<p>Silty CLAY. Dark grey/brown, soft to medium stiff, hydrous layer, low plasticity. Contains minor (&lt;10%) fine to medium grained sand and organic matter (leaves and sticks). Slight hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.05 m. Total Depth: 0.05 m</p>	0.05



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## BOREHOLE LOG

## SG17

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183241.321  
**COMMENTS** Depth to sea bed = 7.6 m **EASTING** 307797.929

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2	✱	SG17_0.0-0.06	✱			CL-ML	<p>Silty CLAY. Dark grey/brown, soft, hydrous layer, low plasticity. Contains minor (5-10%) surficial fine to medium grained sand and very minor organic matter. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.06 m. Total Depth: 0.06 m</p>	0.06



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# BOREHOLE LOG SG18

PROJECT NUMBER S3017805 DATE 13 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Sediment Grab  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD  
LOGGED BY K. Pigram NORTHING 6183266.3638  
COMMENTS Depth to sea bed = 8.5 m EASTING 307805.8517

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	0.04	SG18_0.0-0.04	*	0.04	ZZZZZ	CL-MI	<p>Silty CLAY. Dark grey/brown, soft, hydrous layer, low plasticity. Contains very minor (&lt;5%) surficial fine grained sand and very minor organic matter. Very slight hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.04 m. Total Depth: 0.04 m</p>	0.04



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## BOREHOLE LOG

## SG19

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183329.9556  
**COMMENTS** Depth to sea bed = 5.1 m **EASTING** 307799.1465

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2		SG19_0.0-0.01	*			CL	<p>Sandy CLAY. Dark grey/brown, soft to medium stiff, hydrous layer, low plasticity. Contains (50%) medium to coarse grained sand and minor fine to medium grained crushed shell pieces. Very slight hydrogen sulfide odour noted. No staining or fibre cement material noted.</p> <p>End of Sediment Grab. Recovery to 0.01 m. Total Depth: 0.01 m</p>	0.01



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# BOREHOLE LOG

## SG20

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183429.2637  
**COMMENTS** Depth to sea bed = 9.3 m **EASTING** 307787.4039

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2	0.04	SG20 0.0-0.04 DUP02	* *		////	CLS	<p>Sandy CLAY. Dark grey/brown, soft to medium stiff, hydrous layer, low plasticity. Contains (50%) medium to coarse grained sand and minor fine to medium grained crushed shell pieces. Very slight hydrogen sulfide odour noted. No staining or fibre cement material noted.</p> <p>End of Sediment Grab. Recovery to 0.04 m. Total Depth: 0.04 m</p>	0.04





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# BOREHOLE LOG SG21

PROJECT NUMBER S3017805 DATE 13 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Sediment Grab  
SAMPLING METHOD Grab  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183520.8569  
COMMENTS Depth to sea bed = 9.3 m EASTING 307791.5867

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SG21_0.0-0.02 DUP03	* *			CL	<p>Sandy CLAY. Dark grey/brown, soft to medium stiff, hydrous layer, low plasticity. Contains (30%) fine to medium grained sand and minor organic matter. Slight hydrogen sulfide odour noted. No staining noted.</p> <p>End of Sediment Grab. Recovery to 0.02 m. Total Depth: 0.02 m</p>	0.02



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## BOREHOLE LOG

## SG22

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183627.8801  
**COMMENTS** Depth to sea bed = 6.3 m **EASTING** 307763.9187

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered boulders and cobbles of gravel on first, second (10 m south) and third (15 m west) attempt. No additional sediment grabs attempted due to lack of recovery on shallow Bedrock. Total Depth: 0.00 m	



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## BOREHOLE LOG

## SG23

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183324.0843  
**COMMENTS** Depth to sea bed = 5.4 m **EASTING** 307749.4924

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	1	SG23_0.0-0.03	*			SC-SM	<p>Silty Clayey SAND. Brown, fine to medium grained, loose to medium dense, saturated. Contains (30%) soft, low plasticity clay. Contains minor organic matter. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.03 m. Total Depth: 0.03 m</p>	0.03



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## BOREHOLE LOG

## SG24

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183372.6436  
**COMMENTS** Depth to sea bed = 3.7 m **EASTING** 307524.0131

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2		SG24_0.0-0.01	*			SP	<p>SAND. Brown, medium grained, loose to medium dense, saturated. Contains very small (&lt;3 mm) medium to coarse grained coal fragments, contains fine to medium grained ironstone gravels (&lt;4 mm) and medium grained crushed shell fragments. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.01 m. Total Depth: 0.01 m</p>	0.01



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## BOREHOLE LOG

## SG25

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183412.5631  
**COMMENTS** Depth to sea bed = 3.6 m **EASTING** 307538.0195

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered boulder and cobbles of gravel on first and second attempt. No additional sediment grab samples attempted due to lack of recovery on shallow Bedrock. Total Depth: 0.00 m	



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## BOREHOLE LOG

## SG26

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183407.6613  
**COMMENTS** Depth to sea bed = 3.4 m **EASTING** 307488.3233

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	0.02	SG26_0.0-0.02	*			SPG	Gravelly SAND. Brown, medium grained, loose to medium dense, saturated. Contains medium grained minerals. No odour or staining noted.  End of Sediment Grab. Recovery to 0.02 m. Total Depth: 0.02 m	0.02



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## BOREHOLE LOG

## SG27

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183447.5808  
**COMMENTS** Depth to sea bed = 3.5 m **EASTING** 307502.3296

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered boulder and cobbles of gravel on first and second (5-6 m south) attempt. No additional sediment grab samples attempted due to lack of recovery on Gravel. Total Depth: 0.00 m	



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## BOREHOLE LOG

## SG28

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183442.6789  
**COMMENTS** Depth to sea bed = 3.8 m **EASTING** 307452.6334

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	0.04	SG28_0.0-0.04	*			SP	<p>SAND. Brown, medium to coarse grained, loose to medium dense, saturated. Contains coarse crushed shell pieces and (10%) minerals. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.04 m. Total Depth: 0.04 m</p>	0.04





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## BOREHOLE LOG

## SG29

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183482.5984  
**COMMENTS** Depth to sea bed = 4.0 m **EASTING** 307466.6398

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Encountered boulder and cobbles of gravel and seaweed on first and second (1-2 m south) attempt. Unsuccessful after 10 grab attempts. No additional sediment grab samples attempted due to lack of recovery on Gravel. Total Depth: 0.00 m	



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## BOREHOLE LOG

## SG30

**PROJECT NUMBER** S3017805 **DATE** 13 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Sediment Grab  
**SAMPLING METHOD** Grab  
**SURFACE ELEVATION** 0.000 m AHD

**LOGGED BY** K. Pigram **NORTHING** 6183477.6965  
**COMMENTS** Depth to sea bed = 3.7 m **EASTING** 307416.9436

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1		SG30_0.0-0.01	*		///	SC	<p>Clayey SAND. Light brown, medium to coarse grained, medium dense, saturated. Contains trace (&lt;5%) small (&lt;10mm) gravels and medium to coarse grained crushed shell pieces. No odour or staining noted.</p> <p>End of Sediment Grab. Recovery to 0.04 m. Total Depth: 0.01 m</p>	0.04



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# BOREHOLE LOG

VC01

PROJECT NUMBER S3017805 DATE 14 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocoreing  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183454.65  
COMMENTS Depth to sea bed = 4.8 m EASTING 307630.85

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1		VC1_0.0-0.2	*			GP-GC	Gravelly CLAY. Dark grey/brown, soft, hydrous layer, low plasticity. Contains (30%) coarse gravels (10-40 mm). No odour or staining noted.	0.40
0.2		VC1_0.5-0.6	*			CL-CH	CLAY. Grey/brown with yellow mottling, stiff to very stiff, hydrous layer, low to medium plasticity. No odour or staining noted.	1.30
0.3		VC1_1.3-1.4	*			GP-GC	Gravelly CLAY. Grey/brown to dark grey, stiff, saturated, low to medium plasticity. Contains (20%) gravels (10-40 mm). Possible hydrocarbon/chemical and hydrogen sulfide odour noted. No staining or fibre cement material noted.	2.40
0.4		VC1_2.4-2.5	*			CL-CH	CLAY. Light grey/brown, stiff to very stiff, hydrous layer, medium to high plasticity. No odour or staining noted. Becoming bright yellow/grey from 2.6 m bbl.	2.80
							Vibro-core terminated on Clay at 2.8 m bbl. Total Depth: 2.80 m	















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# BOREHOLE LOG

VC02

PROJECT NUMBER S3017805 DATE 15 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocore  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183564.01  
COMMENTS Depth to sea bed = 5.8 m EASTING 307674.6

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3		VC2_0.3-0.4	*			SPG	Clayey Gravelly SAND. Dark grey/brown, medium to coarse grained, medium dense to dense, saturated. Contains (30%) gravels (10-40 mm). No odour or staining noted.	0.10
						CLS		0.30
0.1		VC2_0.7-0.8 DUP21	*			SP	Sandy CLAY. Dark grey/brown, very soft to soft, saturated, low plasticity. Contains minor (10%) gravels (10-20 mm). No odour or staining noted.	
						CLS	SAND. Dark grey, medium grained, medium dense, saturated. Contains trace (<5%) yellow /brown sandstone fragments (10-15 mm). Contains minor silty clay (10%) pockets. No odour or staining noted.	0.60
						SP	Sandy CLAY. Dark grey, soft, saturated, low plasticity. Contains trace (<5%) sand and minor (10%) gravels (10-40 mm). Slight hydrogen sulfide and slight hydrocarbon odour noted. No odour or staining noted.	0.90
				1		CLS	SAND. Dark grey, medium grained, medium dense, saturated. Contains trace (<5%) yellow /brown sandstone fragments (10-15 mm). Contains minor silty clay (10%) pockets. No odour or staining noted.	1.30
0.4		VC2_2.7-2.8	*			CLS	Sandy CLAY. Dark grey/brown, soft to medium stiff, saturated, low plasticity. Contains minor (5-10%) gravels (10-40 mm). Slight hydrogen sulfide odour noted. No staining noted.	
						CL-CH	CLAY. Grey with brown mottling, medium stiff to stiff, saturated, low to medium plasticity. Contains very minor fine to medium grained sand. Slight hydrogen sulfide and possible slight hydrocarbon odour noted. No staining noted.	2.50
				3		CLS	Sandy CLAY. Dark grey to black, medium stiff to stiff, saturated, low plasticity. Contains minor (50-10%) gravels (10-20 mm). Moderate hydrocarbon odour noted. No fibre cement material noted.	3.35
0.2		VC2_3.7-3.8	*			CL	CLAY. Light grey, very stiff to hard, saturated, low plasticity. Contains minor fine to medium grained sand - becoming finer with depth. No odour or staining noted.	3.60
				4		CLG	Sandy Gravelly CLAY. Grey with orange and yellow/brown mottling, medium stiff, saturated, low plasticity. Contains (20%) coarse gravels (<20 mm) and (40%) medium grained sand. No odour or staining noted.	4.00
							Vibro-core terminated on Gravelly Clay at 4.33 m bbl. Total Depth: 4.33 m	4.33

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# BOREHOLE LOG

VC03

PROJECT NUMBER S3017805 DATE 14 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocoreing  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183382.3888  
COMMENTS Depth to sea bed = 9.5 m EASTING 307788.6351

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3		VC3_0.0-0.2	*			CL-ML	Silty CLAY. Dark grey/brown, very soft, hydrous layer, low plasticity. Contains minor organic matter. No odour or staining noted.	0.20
						SC	Gravelly Clayey SAND. Very dark grey/brown, medium to coarse grained, medium dense to dense. Contains (20%) gravels (10-40 mm). No odour or staining noted.	0.30
0.4		VC3_0.5-0.6	*			CL-ML	Silty CLAY. Very dark grey/brown, soft, saturated, low plasticity. No odour or staining noted.	
				1				
0.1		VC3_1.2-1.3	*			SC	Becoming medium stiff to stiff with low to medium plasticity at 1.1 m below bed level (bbl).	1.20
						CL-ML	Gravelly Clayey SAND. Very dark grey/brown, medium to coarse grained, medium dense to dense. Contains (20%) gravels (10-40 mm). No odour or staining noted.	1.40
						CL-CH	Silty CLAY. Very dark grey/brown, soft, saturated, low plasticity. No odour or staining noted.	1.60
0.2		VC3_1.8-1.9	*				CLAY. Grey/yellow/brown, very stiff to hard, hydrous layer, medium plasticity. No odour or staining noted.	1.93
							Vibro-core terminated on Clay at 1.93 m bbl. Total Depth: 1.93 m	



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# BOREHOLE LOG

VC04

PROJECT NUMBER S3017805 DATE 16 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocore  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183504.6472  
COMMENTS Depth to sea bed = 10.5 m EASTING 307819.0581

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	■	VC4_0.2-0.3	*			CL-ML	Silty CLAY. Dark grey, soft, saturated, low plasticity. Contains minor (10%) gravels (<10 mm) at surface. Hydrogen sulfide odour noted. No staining noted.	
0.2	■	VC4_0.7-0.8	*			SC	Clayey SAND. Grey/brown, fine to medium grained, medium dense, saturated. No odour or staining noted. Clay content decreasing with depth; sand content increasing with depth and becoming coarser.	0.70
0.2	■	VC4_1.2-1.3	*	1		SP	SAND. Light grey and white, medium to coarse grained, medium dense, saturated. Contains fine to medium grained quartz and crushed shell fragments. Very slight hydrogen sulfide odour noted. No staining noted.	1.20
0.3	■	VC4_1.7-1.8	*	2		CL	CLAY. Light brown, medium stiff to stiff, saturated, low plasticity. Contains minor (10%) coarse grained sand. Slight hydrogen sulfide odour noted. No staining noted.	1.70
							Increasing coarse grained coagulated sand particles from 2.5 m bbl.	2.60
							Vibro-core terminated on Sandy Clay at 2.6 m bbl. Total Depth: 2.60 m	



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# BOREHOLE LOG

VC05

PROJECT NUMBER S3017805 DATE 14 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocore  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183350.2431  
COMMENTS Depth to sea bed = 6.0 m EASTING 307679.3122

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2		VC5_0.0-0.2	*			CL-ML	Silty CLAY. Grey/brown, very soft, saturated, low plasticity. Contains black possible medium grained coal fragments. No odour or staining noted.	
0.1		VC5_0.5-0.6 DUP25 TRIP17	*			GC	Silty Sandy Clayey Gravel. Grey/brown, medium to coarse grained, loose to medium dense, saturated. Contains (50%) gravels (10-40 mm). Contains minor clear/blue liquid crystals (possible cyanide). No odour or staining noted.	0.50
0.3		VC5_1.6-1.7	*			CL-CH	CLAY. Dark grey/brown, stiff to very stiff, saturated, low to medium plasticity. No odour or staining noted.	1.60
0.1		VC5_2.5-2.6	*			SANDSTONE	SANDSTONE. Brown/yellow/grey, weathered bedrock, very hard, saturated. No odour or staining noted.  Vibro-core terminated on Sandstone at 2.6 m bbl. Total Depth: 2.60 m	2.50 2.60



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# BOREHOLE LOG

VC06

PROJECT NUMBER S3017805 DATE 16 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocoreing  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183459.4303  
COMMENTS Depth to sea bed = 5.1 m EASTING 307723.5921

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	■	VC6_0.0-0.1	*			GPS	Sandy GRAVEL. Light grey and black, coarse grained, loose, saturated. Contains small gravels (<10 mm), minor (10%) clay pockets and minor silt. No odour or staining noted.	0.10
0.3	■	VC6_0.2-0.3	*			GC	Clayey GRAVEL. Light grey and black, coarse grained, loose, saturated. Contains cobbles of gravel (10-40 mm). Slight hydrogen sulfide odour noted. No staining noted.	0.40
0.4	■	VC6_0.5-0.6	*			CLG	Gravelly CLAY. Light grey/green and black, medium stiff to stiff, low plasticity. Contains (40%) gravels (10-50 mm) and minor (10%) silt. Slight hydrogen sulfide odour noted. No staining noted.	0.70
0.2	■	VC6_0.7-0.8	*			GC	Clayey GRAVEL. Light grey and black, coarse grained, medium dense to dense, saturated. Contains minor (10%) silt and large gravels (20-60 mm). Slight hydrogen sulfide odour noted. No staining noted.	1.30
				1			Vibro-core terminated at 1.3 m bbl; refusal on dense large gravel boulders. Total Depth: 1.30 m	





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## BOREHOLE LOG

VC07

PROJECT NUMBER S3017805 DATE 16 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocoreing  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183572.5503  
COMMENTS Depth to sea bed = 2.6 m EASTING 307753.8936

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2		VC7_0.1-0.2	*			SP	Minimal recovery.	0.10
0.2		VC7_0.2-0.3	*			GC	SAND. Dark grey, medium to coarse grained, medium dense, saturated. Contains (20%) silt and medium to coarse crushed shell pieces. No odour or staining noted.	0.20
0.7		VC7_0.3-0.4	*				Clayey GRAVEL. Dark grey and black, coarse grained, loose, saturated. Contains gravels (10-50 mm) and (10-20%) silt. Slight hydrogen sulfide odour noted. No staining noted.	0.62
0.3		VC7_0.7-0.8 DUP27	*			SC	Clayey SAND. Dark grey/brown, fine to medium grained, medium dense to dense, saturated. Contains minor (10%) silt. Slight hydrogen sulfide odour noted. No staining noted.	0.90
0.2		VC7_0.9-1.0	*	1		CLS	Sandy CLAY. Grey/brown, medium stiff, saturated, low plasticity. Contains (50%) fine to medium grained sand and (10-20%) silt. No odour or staining noted.	1.30
							Vibro-core terminated on Sandy Clay at 1.3 m bbl. Total Depth: 1.30 m	



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# BOREHOLE LOG

VC08

PROJECT NUMBER S3017805 DATE 16 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocoreing  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183622.9123  
COMMENTS Depth to sea bed = 5.8 m EASTING 307687.8591

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	■	VC8_0.2-0.3	*			CL-ML	Gravelly Silty CLAY. Brown/green/grey with orange mottling, soft, saturated, low plasticity. Contains minor (10%) gravels (10-20 mm). Slight hydrogen sulfide odour noted. No staining noted.	
0.2	■	VC8_0.5-0.6 DUP28 TRIP15	*			CLG	Gravelly CLAY. Grey/brown, medium stiff to stiff, saturated, low to medium plasticity. Contains (40%) gravels (10-20 mm). Slight hydrogen sulfide odour noted. No staining noted.	0.50
				1				
				2			Contains large piece of gravel (60 mm) at 2.1 m bbl.	
0.1	■	VC8_2.3-2.4	*			CL-CH	CLAY. Dark grey, stiff to very stiff, saturated, low to medium plasticity. Contains trace (<5%) small gravels (<10 mm). Slight hydrogen sulfide odour noted. No staining noted.	2.25
0.3	■	VC8_2.7-2.8	*				Becoming dark grey/black, contains small crushed shells and tar-like odour noted from 2.7 m bbl.	2.70
				3			Vibro-core terminated on Clay at 3.1 m bbl. Total Depth: 3.10 m	3.10

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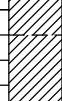

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# BOREHOLE LOG

VC09

PROJECT NUMBER S3017805 DATE 15 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocore  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183499.4222  
COMMENTS Depth to sea bed = 4.1 m EASTING 307658.2651

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							No recovery.	
0.1	■	VC9_0.3-0.4	*			GC	Sandy Clayey GRAVEL. Dark grey, coarse grained, loose to medium dense, saturated. Contains (70%) gravels (<20 mm) and minor (10%) sand. Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	0.20
0	■	VC9_0.7-0.8 DUP29 TRIP16	*			CLG	Gravelly CLAY. Dark grey to black, soft to medium stiff, saturated, low plasticity. Contains (50%) gravel and (50%) clay. Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	0.60
			*	1			Contains large gravels (10-50 mm) from 1.2 m bbl.	
			*	2		CL	CLAY. Dark grey, soft, saturated, low plasticity. Contains minor (10%) gravels (<10 mm). Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	2.10
			*			CLG	Gravelly CLAY. Dark grey to black, soft to medium stiff, saturated, low plasticity. Contains (50%) gravel and (50%) clay. Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	2.40
0.2	■	VC9_2.8-2.9	*			CL	CLAY. Dark grey, soft, saturated, low plasticity. Contains minor (10%) gravels (<10 mm). Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	2.70
			*	3		CL	CLAY. Dark grey with light grey mottling, medium to coarse grained, soft, saturated, low plasticity. Contains minor (10%) medium to coarse grained sand. Contains small orange and brown ironstone gravels. Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	3.10
0.2	■	VC9_3.5-3.6	*			CL-CH	CLAY. Dark grey, stiff, saturated, low to medium plasticity. Contains whole and crushed small shells (<10 mm). Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	3.50
			*	4			Becoming very stiff from 4.6m bbl.	
							Vibro-core terminated on Clay at 4.8 m bbl. Total Depth: 4.80 m	4.80

S3017805\_PKPC\_SEDIMENT INVESTIGATION\_BORELOGS\_6AUG09.GPJ 06/08/09



ENSR Australia Pty Ltd. (trading as AECOM)  
Level 5, 828 Pacific Highway  
Gordon, NSW, 2072

## BOREHOLE LOG

VC10

**PROJECT NUMBER** S3017805 **DATE** 15 Jul 09  
**PROJECT NAME** Port Kembla Outer Harbour Sediment Investigation  
**LOCATION** Port Kembla Outer Harbour NSW  
**DRILLING METHOD** Vibrocoreing  
**SAMPLING METHOD** Vibro-core  
**SURFACE ELEVATION** 0.000 m AHD  
**LOGGED BY** K. Pigram **NORTHING** 6183411.8632  
**COMMENTS** Depth to sea bed = 4.4 m **EASTING** 307596.3339

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Refusal on unknown solid first attempt. Vibro-core abandoned after seven unsuccessful attempts to penetrate. Total Depth: 0.00 m	



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Gordon, NSW, 2072

# BOREHOLE LOG

VC11

PROJECT NUMBER S3017805 DATE 15 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocore  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183492.5424  
COMMENTS Depth to sea bed = unknown EASTING 307517.5328

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	■	VC11_0.2-0.3	*			CLS	Silty Sandy CLAY. Grey/brown, soft, saturated, low plasticity. Contains fine grained sand - increasing with depth and becoming denser with depth. High water content. Slight hydrogen sulfide odour noted. No staining noted.	0.40
0.1	■	VC11_0.5-0.6	*			SPG	Clayey Gravelly SAND. Grey/brown, medium to coarse grained, medium dense, saturated. Contains (30%) large gravels (10-60 mm). Increasing clay content with depth. Slight hydrogen sulfide and possible hydrocarbon odour noted. No staining noted.	1.00
0	■	VC11_1.1-1.2	*	1		SC	Gravelly Clayey SAND. Grey/brown, coarse grained, medium dense to dense, saturated. Contains (20%) gravels (10-20 mm). Slight swampy odour noted. No staining noted.	2.45
0.1	■	VC11_2.5-2.6	*	2		SP	SAND. Grey/brown, medium to coarse grained, medium dense to dense, saturated. Contains very minor (<5%) clay component. Contains coarse crushed shells. Slight hydrogen sulfide odour noted. No staining noted. Becoming light grey/brown at 2.7 m bbl.	3.10
				3			Vibro-core terminated at 3.1 m bbl on Bedrock; steel core bent at base. Total Depth: 3.10 m	



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Gordon, NSW, 2072

# BOREHOLE LOG

# VC12

PROJECT NUMBER S3017805 DATE 15 Jul 09  
PROJECT NAME Port Kembla Outer Harbour Sediment Investigation  
LOCATION Port Kembla Outer Harbour NSW  
DRILLING METHOD Vibrocore  
SAMPLING METHOD Vibro-core  
SURFACE ELEVATION 0.000 m AHD

LOGGED BY K. Pigram NORTHING 6183552.1777  
COMMENTS Depth to sea bed = 4.0 m EASTING 307596.0735

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	■	VC12_0.2-0.3	*			SP	SAND. Dark brown, fine to medium grained, medium dense to dense, saturated. Contains trace (<5%) silt and fine grained crushed shell pieces. Slight hydrogen sulfide odour noted. No staining noted.  Becoming dense to very dense and dark brown from 0.4 to 0.9 m bbl.	
0.2	■	VC12_1.0-1.1	*	1		SP	SAND. Light grey/brown, medium grained, medium dense to dense, saturated. Contains trace (<5%) silt and fine to medium grained crushed shell pieces. Contains minor (10%) very small black gravels (<5mm). Slight hydrogen sulfide odour noted. No staining noted.	0.90
0.1	■	VC12_2.1-2.2	*	2		SP	SAND. Light grey, fine to medium grained, dense, saturated. Contains (20%) silt and very fine grained crushed shell pieces. Very slight hydrogen sulfide odour noted. No staining noted.  Becoming grey/brown, denser with depth and contains trace (<5%) clay content from 2.9 m bbl.	2.00
0.1	■	VC12_3.2-3.3	*	3		SP	SAND. Light grey with black, white and dark grey inclusions, coarse grained, medium dense, saturated. Contains minor (10%) silt, medium to coarse grained crushed shells and white, yellow and brown sandstone pebbles (<10 mm) and dark grey gravels (10-50 mm). No odour or staining noted.	3.10
							Vibro-core terminated on Sandstone at 3.5 m bbl. Total Depth: 3.50 m	3.50

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## Appendix C

# PID Calibration Certificates

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# ENVIROEQUIP RENTALS

*Your Friend in the Field*

## Equipment Report - MINIRAE 2000 PID

This PID has been performance checked / calibrated\* as follows:

Calibration	Actual Value	Reading	Pass?		
Zero – fresh air	0.0 ppm	0.0 ppm	<input checked="" type="checkbox"/>		
Span – Isobutylene	103 ppm	103 ppm	<input checked="" type="checkbox"/>		
<b>Operations Check</b>					
<input checked="" type="checkbox"/> Performance Check (pump, lamp, sensor & battery voltage check)					
<input checked="" type="checkbox"/> Battery Charged	<input checked="" type="checkbox"/> Filters Check	<input checked="" type="checkbox"/> Spare battery Voltage (5.5v minimum) 6 v			

\* Calibration gas traceability information is available upon request.

Date: 02/07/2009 Checked by: MILENKO

Signed: \_\_\_\_\_

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MiniRae 2000 PID / Operational Check, plus Battery Voltage @ 5.2V
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lamp Voltage: 10.6 C/factor: 1
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Compound Set to: ISOBUTYLENE
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Protective yellow rubber boot
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inlet probe (attached to PID)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spare water trap filter(s) Qty 1
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Charger 240V to 12V 500mA
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Instruction Manual behind foam on the lid of case "
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Quick Guide Sheet behind foam on the lid of case "
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spare Alkaline Battery Compartment with batteries
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inline Moisture trap Filter Guide Laminated
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Calibration regulator & tubing (optional)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Carry Case
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Processors Signature/ Initials

MS

EE Quote Reference	15321	Condition on return
Customer Ref		
Equipment ID	PIDMINSAH	
Equipment serial no.	110901695	
Return Date	/ /	
Return Time		

Melbourne	Sydney	Brisbane	Perth	Auckland	Kuala Lumpur
Sydney – Level 1, 4 Talavera Road, North Ryde NSW 2113 Australia					
Telephone: +61 2 8817 4244		Free Call (interstate): 1-800-675-756			
Fax: +61 2 9889 4622		Head Office Fax: +61 3 9646 4195			
Email: rentals.sydney@enviroequip.com			Internet: www.rentals.enviroequip.com		

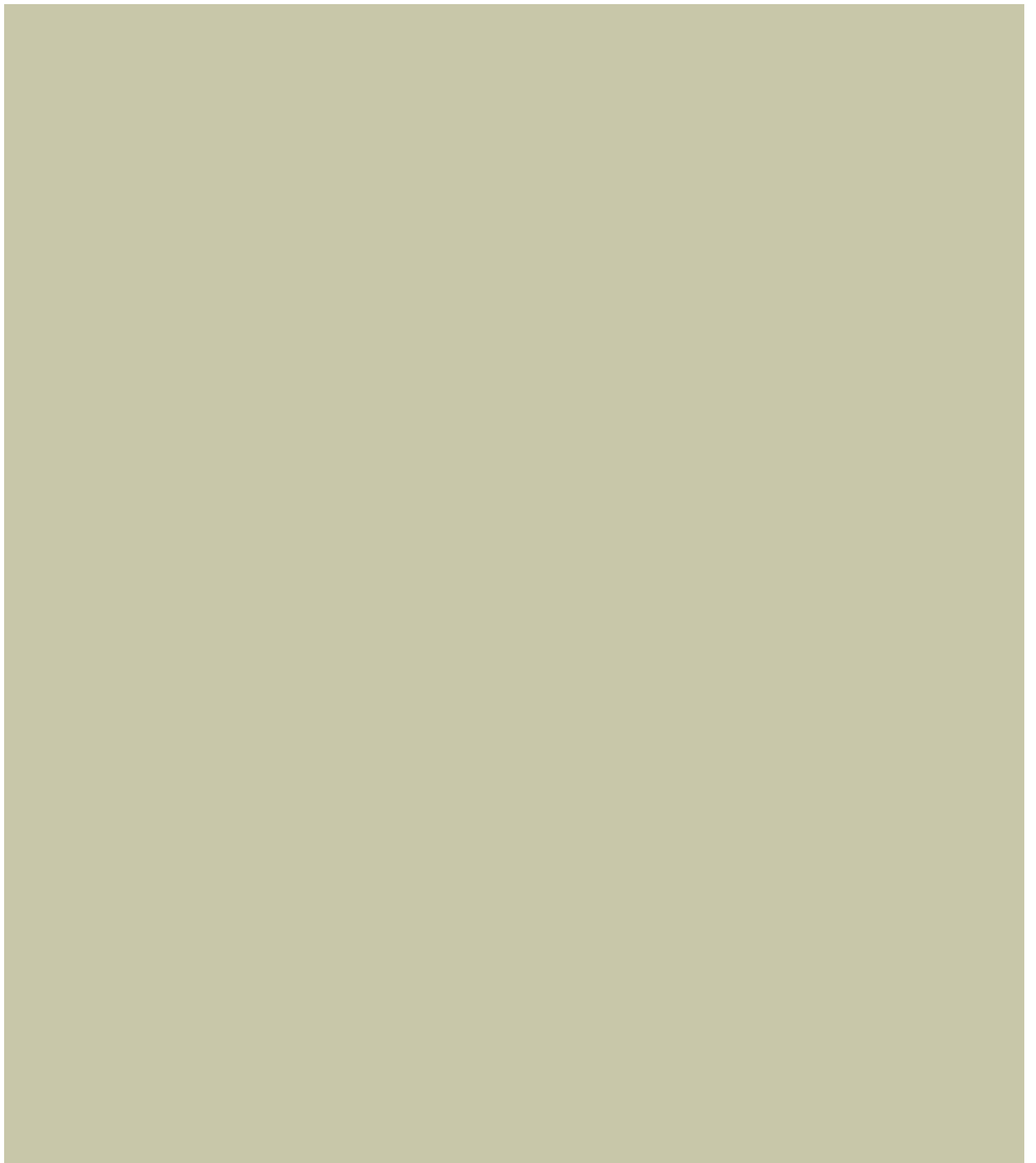
Frequency: Daily on Use or Twice Daily

Printed copies of this document are uncontrolled

## Photoionization Detector – Calibration Record

Job Number//Name: .....  
Frequency: Daily on Use or Twice Daily

[illegible]







**PORT KEMBLA OUTER HARBOUR DEVELOPMENT**

*Environmental Assessment Volumes*

**Volume 1**

Main Environmental Assessment Document  
Appendix A: Consultation Supplementary Documentation

**Volume 2**

Appendix B: Contamination: Sediment Quality - Main Document

**Volume 3**

Appendix B: Contamination: Sediment Quality - Laboratory Results

**Volume 4**

Appendix C: Contamination: Soils and Groundwater Quality  
Appendix D: Qualitative Human Health and Ecological Risk Assessment: InSitu Sediment and Groundwater Contamination

**Volume 5**

Appendix E: Preliminary Hazard Analysis  
Appendix F: Coastal Hydrodynamic Processes  
Appendix G: Aquatic Ecology

**Volume 6**

Appendix H: Terrestrial Ecology Supplementary Documentation  
Appendix I: Traffic and Transport  
Appendix J: Noise and Vibration  
Appendix K: Air Quality

**Volume 7**

Appendix L: Landscape and Visual Amenity  
Appendix M: Heritage  
Appendix N: Climate Change