



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG03

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 16/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 1.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly, sandy silt, dark brown, moist, soft, with ballast, bricks, rail line, scrap metal, pipes, sandstone blocks	MG03/0.1		38	
1		End of Borehole				Shallow GW at 0.7 m BGS; trench collapse Dewatering has no effect on groundwater level Trench collapse
2						

Contractor: [Online](#)
Project Manager: [Matt Bennett](#)
Equipment/Drill Method: 20 t Excavator
Easting (AMG): [317104.94](#)
Northing (AMG): [1247704.93](#)
Ground Elevation (m AHD): [18.75](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG04

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 16/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 1.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				Visual contamination, no odours
		FILL gravelly Sand, black/brown				
			MG04/0.5		16	
		FILL brick fill, no soil material, fibro sheeting, pipes and building rubble.				Water intrusion (high flow) Dewatering has no effect on groundwater level
1						
			MG04/1.5			
		End of Borehole				Trench collapse
2						

Contractor: [Online](#)
Project Manager: [Matt Bennett](#)
Equipment/Drill Method: [20 t Excavator](#)
Easting (AMG): [317116.70](#)
Northing (AMG): [1247711.17](#)
Ground Elevation (m AHD): [18.72](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG05

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 16/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 1.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		BITUMEN				
		FILL				
		gravel subgrade, ash gravels and crushed rock				
		Brick foundation of second gas holder, move 1 m north				
		FILL	MG05/0.5		20	
		silty Clay, brown, soft, very moist, fine gravels ,low plasticity	QC02			
1		CLAY - Natural				
		red and grey mottles, stiff, high plasticity	not sampled			Clay pipe at 1.2 m BGS surrounded by ashy backfill
2			MG05/1.8		850	Oil seepage from side wall at 1.6 m BGS Very high HC odours
3			MG05/3.4		1700	
4						
5			BG05/5.0		450	HC odours
		End of Borehole				Wall collapse, stop excavating due to heritage sign of brickwork in gas holder

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317110.82
Northing (AMG): 1247719.75
Ground Elevation (m AHD): 18.72



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG06

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 16/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 5.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				Visual contamination Pipe and footing at 1 m along trench from north end
		FILL gravelly Sand, and Clay, brown-black, moist, ballast, bricks, pipework, coke/ash gravels				
1		FILL silty Clay (original surface?), low plasticity, brown, wet	MG06/1.0		80	High HC odour, visible tar and oil
						Tar pipe at 3 m along trench from north end
2		CLAY - Natural red and green mottles, low plasticity, moist	MG06/2.0		450	High HC odour, visible tar in pores
3			MG06/3.5		50	
4			MG06/4.7		70	
5						Trench collapse

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 0
Northing (AMG): 0
Ground Elevation (m AHD): 0



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG07

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 16/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 4.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface	MG07/1.0		10	No odour
		FILL gravelly ash and ballast, black				
		FILL clay, medium plasticity, red and grey mottles, moist, brick chunks				
1		sandy CLAY - Natural low plasticity, red and yellow mottles, moist	MG07/4.0		14	No odour
2						
3						
4		End of Borehole				Limited excavation area
5						

Contractor: [Online](#)
Project Manager: [Matt Bennett](#)
Equipment/Drill Method: [20 t Excavator](#)
Easting (AMG): [317103.96](#)
Northing (AMG): [1247696.52](#)
Ground Elevation (m AHD): [18.74](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG08

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 17/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 4.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		SAND				
		FILL				
		sandy ash and ballast, coarse gravel, dry to moist, loose	MG08/0.3		24.1	HC odours
		FILL				
		thin concrete slab				Pipe at 0.3 m BGS and 1 m from north end of trench
		brick work - layered				Tar seepage from n/s walls; high odour
		gravelly clay, red/grey, medium plasticity, moist	MG08/1.0		16.4	
1						
		FILL	MG08/1.5		95.6	Concrete footing 1.5 m BGS and 3.5 m from north end of trench
		silty Clay (original surface?), brown/green, high plasticity, moist to we				Visible tar in soil pores, high odour
2			MG08/2.1		78.0	
		CLAY - Natural				
		high plasticity, red and grey mottles, moist				Visible tar in soil pores
3			MG08/3.1		42.0	
		shale CLAY	MG08/4.0		32.5	No tar in soil pores; faint HC odour
4		weathered, medium plasticity, grey to white, moist				Side wall collapse at tar seepage layer
		End of Borehole				
5						

Contractor: Online

Project Manager: Matt Bennett

Equipment/Drill Method: 20 t Excavator

Easting (AMG): 317142.77

Northing (AMG): 1247736.07

Ground Elevation (m AHD): 18.73 (south end of trench)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG09A1

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp
















Date: 17/10/06

Logged By: Adam Sullivan

Final Depth (m bgs): 5.5

Bore Diameter (mm): 100

Weather: overcast with showers

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL Brickwork layer				
		FILL Gravelly Sand				
		FILL fine sandy Clay, orange/brown, with red mottles, soft, low to medium plasticity, Tar seem @ 0.7 m BGS	MG09A1/0.7		261	Metal pipe Slight HC odour, oily sheen
1		FILL silty Clay (original surface?), yellow and orange, soft, low plasticity, moist, getting very dark grey to black with depth				
2		CLAY - Natural grey to yellow, very soft, low plasticity, moist, with grey, red sandy clay inclusions, becoming much more plastic and stiff				Strong HC odour, oily sheen
3						
						
4		CLAY heavy clay, grey, dark red, stiff, highly plastic, with silty clay inclusions and fracture.	MG09A1/3.6		0.0	
			DUP21			
						
						
5		heavy clay, weathered, red, silty clay inclusions light grey	MG09A1/4.8		1.5	
						
			MG09A1/5.5		2.0	
						
6		End of Borehole				Refusal in extremely to moderately weathered shale

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317134.074
Northing (AMG): 1247734.848
Ground Elevation (m AHD): 18.44



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG09B

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 17/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 2.5

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				9 inch pipe, full of tar at 0.3 m BGS and 8 m along trench from north end 12 inch pipe, full of water at 0.5 m BGS and 11 m along trench from north end*
		FILL sandy gravel				
		CONCRETE				
		FILL Ash and clay, gravelly clay	MG09B/0.3		506	
			MG09B/PIPE		257	
			MG09B/0.6		242	Water seepage, high flow High water flow through pores in gravel
1						
		CLAY - Natural medium plasticity, red and grey mottles, moist				Trench collapse
2			MG09B/2.5		35.2	
		End of Borehole				* Sample taken from pipe, free product, highly viscous, very damp
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317141.13
Northing (AMG): 1247722.61
Ground Elevation (m AHD): 18.86 (south end of trench)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG09C

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 17/8/06

Logged By: Adam Sullivan

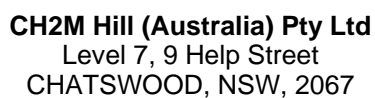
Final Depth (m bgs): 3.8

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL soil and ballast				
		CONCRETE				
		FILL ash gravels and sand	MG09C/0.3		230	
		FILL gravelly Clay, medium plasticity, moist, red/grey				
1			MG09C/1.5		32	visible pockets of tar
		FILL silty Clay (original surface?), low plasticity, brown green, moist, firm	MG09C/1.9		190	high HC odour
2						
3						
		weathered shale CLAY - Natural medium plasticity, moist	MG09C/3.8		29.3	
		End of Borehole				
4						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317134.48
Northing (AMG): 1247721.27
Ground Elevation (m AHD): 18.7 (west end of trench)



Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 0.7
Bore Diameter (mm): N/A
Weather: sunny

Contractor: [Online](#)
Project Manager: [Matt Bennett](#)
Equipment/Drill Method: [20 t Excavator](#)
Easting (AMG): [0](#)
Northing (AMG): [0](#)
Ground Elevation (m AHD): [0](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG10A

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 17/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 4.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL sandy gravel, ballast				
		FILL black ash, and coke gravel				
			MG10A/0.7		92.3	
1		FILL gravelly clay, medium plasticity, red/grey, moist				Water and tar seepage at 1.1 m BGS
						Brick footing from 0.7 to 1.6 m BGS
		FILL silty Clay (original surface?) high plasticity, brown/green, moist				
2						
		CLAY - Natural high plasticity, red and grey mottles, moist, stiff				
			MG10A/2.8		101	
3						
		shale CLAY weathered				
			MG10A/4.0		155	
4		End of Borehole				Trench collapse

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317150.44
Northing (AMG): 1247736.72
Ground Elevation (m AHD): 18.85



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG10B

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 18/10/2006

Logged By: Adam Sullivan

Final Depth (m bgs): 3.5

Bore Diameter (mm): 100

Weather: overcast

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL clay, very stiff, dry				
		FILL gravelly sand, light brown, loose, dry, with ballast, roots,				
		FILL silty sand, dry, loose, dark brown to black, with ash, wood, clinker				slight HC odour
1		FILL reworked clay, grey, with red/brown mottles, stiff, moist, with gravel component. Getting less stiff and light brown with depth				no odour, no visible contamination
2		CLAY - Natural with some silt, high plasticity, moist, spongy	MG10B/1.8		2.0	strong HC odour
		CLAY low to medium plasticity, stiff, grey with red and yellow mottles, weathered zone @ 2.6 m BGS.				moderate HC odour
3		CLAY low to medium plasticity, stiff, grey with red and yellow mottles, weathered zone @ 2.6 m BGS.	MG10B/3.0		2.0	
		SHALE weathered, friable, grey with red mottles				no odour
		End of Borehole				
4						

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317157.472
Northing (AMG): 1247740.001
Ground Elevation (m AHD): 18.82



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG11

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 17/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 4.0

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments	
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)		
0		Ground Surface				broken water pipe at 1.5 m BGS and eastern end of trench, high odours	
		FILL very gravelly Sand,dry, grey/black, gravel is fine to coarse grain, angular, ash, coke, ballast	MG11/0.2		11.2		
		FILL gravelly Clay, dry, very firm, grey/red/orange, low plasticity, black compact coke					
		FILL Clay, dry, firm, orange and red, possibly reworked material					
1							
			MG11/1.5		8.2		
2			FILL Sand, medium grain, yellow/orange, wet, compact, thick black staining from 1.9 m BGS, sand containing free tar		MG11/2.0		5.3
3							
		CLAY - Natural very firm, dry, grey and red mottles, red portion is silty/sandy					
			BG11/4.0	6.9			
4		End of Borehole					

Contractor: [Online](#)

Project Manager: [Matt Bennett](#)

Equipment/Drill Method: [20 t Excavator](#)

Easting (AMG): [317138.23](#)

Northing (AMG): [1247707.26](#)

Ground Elevation (m AHD): [18.6](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: RP

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/08/06
Logged By: Adam Sullivan

Final Depth (m bgs): 2.0
Bore Diameter (mm): N/A
Weather: fine/overcast

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				No odours, some minor ash
		FILL gravelly Clay, firm, low plasticity, minor ashy gravels, ballast gravel up to cobbles				
		FILL reworked clay, low to medium plasticity, rootlets, red with orange hues, moist, firm				
1		FILL sandy Clay, low plasticity, red/brown Fill becoming more sand content with depth				Clay pipe at 1.8 m BGS with high water flow from pipe
2		End of Borehole				Water intrusion too high

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: 20t Excavator
Easting (AMG): 0
Northing (AMG): 0
Ground Elevation (m AHD): 0



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP01

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 3.5

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, subangular to subround, light brown, dry, crushed sandstone and concrete	TP01/0.0/0.25		4.3	
		FILL gravelly Sand, gravel subround to subangular, brown, grey, red, dry, with fragments of sandstone, shale, concrete, sand contains grey ash				Ash present
1			TP01/1.0		349	
		FILL gravelly Sand, gravelly sands, little or no fines, medium grained, yellow, dry	TP01/1.5		37.4	No visual contamination
2						
			TP01/2.0		52.1	
		FILL clayey Sand, gravel-sand-clay mixtures, gravel fine grained, subangular to subround, brown, dry, with sandstone and shale				No visual contamination
3			TP01/3.0		114	
		End of Borehole				
4						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317112.54
Northing (AMG): 1247638.33
Ground Elevation (m AHD): 18.04



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP02

Project No.: 347496

Project: MacDonaltdown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 5.1

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL sandy Gravel, medium to coarse grained, sandstone, white or light grey, dry	TP02/0.0-0.25		361	
		FILL gravelly Sand, medium to coarse grain, subangular to subround, dark grey/black, dry, clinker, coke and ash	TP02/0.5		12.2	
1			TP02/1.0		2.4	old metal pipe at 0.8 m BGS
		FILL gravelly, clayey Sand, brown/orange, dry, dead rootlets, patches of red sandy clay at 1.4 - 1.5 m BGS	TP02/1.5		2.8	
2		FILL gravelly Sand, brown/dark brown, dry, cobbles and small boulders of sandstone, bricks. Layer of clinker gravel and cobbles at 2.4 m BGS	TP02/2.0		N/A	
						Top of brick wall (foundation) present at 2.7 m BGS; tracked back away from residential properties; steel bar at 2.7 m BGS
3		FILL sandy, gravelly Clay, low to medium plasticity, dark grey, fine to medium grained, subangular to subround, coke, rootlets	TP02/3.0		12.2	200 mm clay pipe (sewerage), possibly connecting gas holder buildings to sewer main.
4		CLAY - Natural Light grey, red mottled, iron staining around mottles.	TP02/4.0		5.5	Possibly layer of VENM from gas holder excavation
		CLAY High plasticity, stiff, red and grey mottles, ironstone gravels, coarse grained, moist	TP02/4.5		52.3	Strong HC like odour
5						
		End of Borehole				Trench collapse

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317109.67
Northing (AMG): 1247657.65
Ground Elevation (m AHD): 19.07



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP03

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 4.0

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		Fill gravelly Sand, brown, dark brown, dark grey, ash and crushed sandstone, ballast, clinker, ash	TP03/0.0-0.25		85.3	Slight odour
		Fill gravelly Clay, firm, medium plasticity, dry, orange and grey, fine to coarse gravel, subround to subangular, ballast, coke	TP03/0.5		81.5	Water ingres at 0.6 m BGS, fast ingres
1			TP03/1.0		64.0	
		Fill clayey Silt (original surface?), low plasticity, dark grey, wet	TP03/1.5		64.4	Strong HC odour
2			TP03/2.0		81.2	
		Silty CLAY - Natural firm, medium plasticity, red-brown and grey, mottled	TP03/3.0		41.1	Strong HC like odour
3						
			TP03/4.0		98.2	
4		End of Borehole				
5						

Contractor: [Online](#)
Project Manager: [Matt Bennett](#)
Equipment/Drill Method: [Back Hoe](#)
Easting (AMG): [317139.83](#)
Northing (AMG): [1247679.08](#)
Ground Elevation (m AHD): [18.02](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP04

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 3.1

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, brown, grey, dark grey, gravel, fine to coarse, subangular to subround of coke, clinker, sandstone	TP04/0.0-0.25		5.1	Ash sand
		FILL gravelly Clay, orange, light brown, grey, dry, mottled, firm, low plasticity, gravel medium to coarse grained, shale, weathered sandstone, black, odorous staining in clay at 0.7 m BGS Grey with red mottles, orange iron staining below 0.8 m BGS	TP04/0.5		4.8	Black odour staining at 0.7 m BGS
			TP04/0.7		3.1	
1						
2		clayey SILT - Natural (original surface?) wet, soft	TP04/2.0		3.5	Slight odour
3		sandy CLAY Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays (CL), red/brown, grey, firm, mottled, wet End of Borehole	TP04/3.0		4.1	slight odour
4						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317155.8
Northing (AMG): 1247705.63
Ground Elevation (m AHD): 18.5



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP05

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 2.3

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL Sandy Clay, dark brown, grey, black very gravelly sand of ash, clinker and coke, dry, gravel angular to subround, ash, coke, clinker	TP05/0.0-0.25		4.8	Black material with odour
		FILL dry, light brown, low plasticity				
		FILL yellow, medium grained	TP05/0.5		1.4	strong water ingress at 0.5 m BGS
1		clayey SILT - Natural (original surface?), dark brown, soft				
			TP05/1.0		2.8	
		CLAY red/brown, firm				
2			TP05/2.0		2.7	
		End of Borehole				
3						

Contractor: [Online](#)
Project Manager: [Matt Bennett](#)
Equipment/Drill Method: [Back Hoe](#)
Easting (AMG): [317185.53](#)
Northing (AMG): [1247738.73](#)
Ground Elevation (m AHD): [18.44](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP06

Project No.: 347496

Project: MacDonaltdown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 2.7

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, ash, clinker and coke, gravel subround to angular, fine to coarse grained	TP06/0.0-0.25		10.7	Dark staining, smelly
		FILL sandy Clay, light brown to orange, firm, low plasticity, some clinker				
		FILL (original surface?) clayey gravel, orange/brown, medium to coarse grained, sandstone, grey-black subangular clinker	TP06/0.5		2.5	Groundwater ingress at 0.6 m BGS Black stains in places
1			TP06/1.0		7.1	
		FILL clayey Silt (original surface?) dark grey/brown, wet	TP06/1.5		2.7	Black stain in top 0.2 m of stratum
2						
		CLAY - Natural red/brown, with grey mottles, firm, high plasticity	TP06/2.5		3.4	
		End of Borehole				
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317189.09
Northing (AMG): 1247749.95
Ground Elevation (m AHD): 18.53



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP07

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 2.2

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				poorly reinforced, broke through with clay spade
		CONCRETE				
		FILL gravelly Sand, black to dark grey, dry, ash and coke, gravel fine to medium grained, of ash, coke, clinker	TP07/0.0-0.25		5.6	iron pipe at 0.3 m BGS running east-west
						water ingress at 0.4 m BGS
		FILL clayey Sand, brown, slightly gravelly, wet, half bricks, gravel fine to coarse grained, subround to subangular, sandstone, shale	TP07/0.5		3.8	
1		FILL gravelly Clay, grey and red mottles, very firm, subangular to subround sandstone and shale	TP07/1.0		3.0	possibly reworked natural material
		FILL clayey Silt (original surface?), soft				
			TP07/1.5		2.3	
		CLAY - Natural firm to very firm, grey and redbrown mottles	TP07/2.0		4.0	
2						
		End of Borehole				
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317201.10
Northing (AMG): 1247755.82
Ground Elevation (m AHD): 18.89



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP08

Project No.: 347496

Project: MacDonalddtown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 2.6

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, dark brown, dark grey, dry, well graded sand of ash, clinker, coke, gravel well graded of same matter	TP08/0.0-0.25		15.5	visual contamination, odour
		FILL gravel, light brown, dry, gravel of sandstone	TP08/0.5		10.8	slight odour, no visual contamination
		FILL gravelly Clay, light brown with orange mottles, firm, dry, sand medium to coarse grained of sandstone, gravel subangular medium to coarse grained sandstone and shale				no odour or visual contamination
1		FILL gravelly Clay, grey with red mottles, dry, gravel well graded, subangular to subround of sandstone	TP08/1.0		13.1	no odour or visual contamination
		FILL clayey Silt (original surface?), soft	TP08/1.5		16.4	possibly reworked natural material
		gravelly CLAY - Natural brown, very firm, gravel medium to coarse grained subangular shale	TP08/2.0		14.8	no odour or visual contamination
2		CLAY grey with red mottles, very firm				no odour or visual contamination
		End of Borehole				
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317202.32
Northing (AMG): 1247766.15
Ground Elevation (m AHD): 19.15



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP09

Project No.: 347496

Project: MacDonaltdown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 2.6

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL Sand, dark grey, dry, ash, clinker, coke, gravel well graded, angular to subangular, of ash, clinker, coke, ballast gravel present	TP09/0.0-0.25		12.9	visual contamination, odour
		FILL gravelly Sand,, light brown, dry, sand of crushed sandstone, gravel medium to coarse grained, subangular, of sandstone, with cobbles of sandstone	TP09/0.5		10.6	Black staining in top 0.1 m of stratum
		FILL sandy Clay, possibly reworked natural material, grey with orange mottles, very firm, dry, gravel medium to coarse grained, angular shade				no odour or visual contamination
1			TP09/1.0		10.4	no odour or visual contamination
			TP09/1.5		10.7	
2		FILL clayey Silt (original surface?), soft				
			TP09/2.0		12.8	no odour or visual contamination
			TP09/2.5		8.1	
		CLAY - Natural (CL), grey with red mottles, very firm				no odour or visual contamination
		End of Borehole				
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317218.1
Northing (AMG): 1247779.27
Ground Elevation (m AHD): 19.47



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP10

Project No.: 347496

Project: MacDonaltdown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 4.1

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, dark brown, dark grey or black, of ash, coke, coal, gravel medium to coarse grained, angular to subangular of same material, presence of bricks, round cobbles	TP010/0.0-0.25		3.5	complete rail sleeper present; rusted rail rivets
			TP10/0.5		10.1	
1		FILL single layer of red brick				
		FILL Sand, dry medium grained, yellow sand, massive concrete boulder at 1.1 m BGS	TP10/1.0		5.3	No odour, some mild grey staining
		FILL gravelly Clay, orange with grey mottles, dry, medium to coarse grained, subangular to subround, of shale	TP10/1.5		8.6	no odour or visual contamination
2		FILL sandy Gravel, grey, wet, of shale				water ingress at 1.7 m BGS
			TP10/2.0		8.6	
		gravelly CLAY - Natural possibly reworked natural material, orange with grey mottles, very firm, gravel medium to coarse grained, angular shale				no odour or visual contamination
3			TP10/3.0		8.5	
		CLAY grey with red mottles, very firm; medium grained, angular shale gravel in top 0.1 m of stratum				
			TP10/4.0		12.4	
4		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317184.32
Northing (AMG): 1247770.00
Ground Elevation (m AHD): 20.10



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP11

Project No.: 347496

Project: MacDonaltdown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 3.2

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, brown, black, dry, ash and coke, rootlets in top 0.1 m	TP11/0.2		54.1	
		FILL clayey Sand, yellow, orange, wet				layer of dense coke gravel at 0.2 - 0.3 m BGS high water flow ingress at 0.5 m BGS
1		FILL clayey Sand, interbedded with grey and red mottles, firm clay at 0.8 - 0.9 mBGS and 1.2 - 1.3 m BGS, reworked natural material	TP11/1.0		38.0	
2						
3						
		CLAY - Natural very firm, grey with red mottles	TP11/3.5		36.7	
4		End of Borehole				Trench collapse
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317158.91
Northing (AMG): 1247723.56
Ground Elevation (m AHD): 18.59



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP12

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 16/08/06

Logged By: Chris Newland

Final Depth (m bgs): 1.8

Bore Diameter (mm): N/A

Weather: overcast

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, brown, dry, gravel of ash, concrete, sandstone, brick fragments brick wall and concrete boulders at 0.6 m BGS Copper pipe segments at 1.1 m BGS	TP12/0.0-0.25		2.2	Topsoil of dark grey colour
			TP12/0.5		2.0	
		Brick wall and concrete boulders				
1			TP12/1.0		2.4	Fibro sheeting fragment found at 1.0 m BGS
		Copper pipe segment				
						No visual contamination, no odour
		FILL building rubble, concrete, bricks, ceramics, fibro sheeting fragments are abundant				
		End of Borehole				Refusal on concrete/brick
2						
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317123.57
Northing (AMG): 1247736.37
Ground Elevation (m AHD): 20.13



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP13

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 1.7

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand., dry, compact, sand of ash, clinker, shale, coke, coal, gravel same material, angular to subangular	TP13/0.0-0.25		27.8	
		FILL sandy Gravel, brown, orange, dry, gravel, cobbles of sandstone, broken ceramic tiles and pipes present				
		FILL silty Clay (original surface?), brown, firm, dry, low plasticity, with some angular shale coarse gravel	TP13/0.5		13.2	
		silty CLAY - Natural orange/yellow, firm, dry, with red mottles, low plasticity				
1			TP13/1.0		9.1	
		CLAY very firm, dry, red and grey mottles	TP13/1.5		11.8	
		End of Borehole				
2						

Contractor: [Online](#)
Project Manager: [Matt Bennett](#)
Equipment/Drill Method: [Back Hoe](#)
Easting (AMG): [317084.37](#)
Northing (AMG): [1247717.07](#)
Ground Elevation (m AHD): [18.7](#)



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP14

Project No.: 347496

Project: MacDonaltdown Gasworks

Site/Client: RailCorp

Date: 15/08/06

Logged By: Chris Newland

Final Depth (m bgs): 1.8

Bore Diameter (mm): N/A

Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, dark brown, dry, ash	TP14/0.0-0.25		19.1	Visual black staining (ash), no odour
		FILL silty Clay (original surface?), brown to orange, dry, low plasticity, gravel fine grained, angular, shale				
			TP14/0.5		22.2	
		silty CLAY - Natural orange to brown, with red mottles, dry				
1			TP14/1.0		16.4	
		silty CLAY grey with red mottles, dry				
			TP14/1.5		23.0	
		End of Borehole				
2						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317067.72
Northing (AMG): 1247713.76
Ground Elevation (m AHD): 18.7



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP15

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 17/8/06

Logged By: Adam Sullivan

Final Depth (m bgs): 4.1

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		FILL gravelly Sand, loose				
		FILL Ash and gravel	TP15/0.3		34.6	
1			TP15/1.0		311	water and free tar in brickwork footing at 1.1 m BGS
2		FILL sandy Clay (original surface?), brown to green, high plasticity				high HC odour
3		CLAY - Natural medium plasticity, red and grey mottles, moist	TP15/2.8		351	visible tar in pores
4		shale CLAY weathered	TP15/4.1		235	tar in pores minor tar visible
		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317145.97
Northing (AMG): 1247729.63
Ground Elevation (m AHD): 18.78



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP15A

Project No.: 347496

Project: Macdonaldtown Gasworks

Site/Client: Railcorp

Date: 17/10/06

Logged By: Adam Sullivan

Final Depth (m bgs): 8.0

Bore Diameter (mm): N/A

Weather: overcast with showers

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				
		Disturbed from previous testpit TP15				
1						
2						
3						
4						Photo taken of fracture
5		SHALE weathered shale, friable, dry				Refusal, change to solid stem auger at 4.8 m BGS
6			TP15A/6.0		16.0	Visible tar in pores, minor odours at 5.5 m BGS sample with geoprobe
7			TP15A/7.2		1.0	sample with geoprobe, no odour
8						
		End of Borehole				
Contractor: Macquarie Drilling Project Manager: Matt Bennett Equipment/Drill Method: Geoprobe PT Easting (AMG): 317146.377 Northing (AMG): 1247729.433 Ground Elevation (m AHD): 18.80						



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP16

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 17/08/06

Logged By: Chris Newland

Final Depth (m bgs): 3.8

Bore Diameter (mm): N/A

Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				Groundwater ingress Black staining and free tar at 0.6 m BGS
		FILL gravelly Sand, dark grey, black, dry, ash and coke				
		FILL gravelly Sand, orange and light brown, dry, with cobbles, sandstone	TP16/0.3		49.2	
1			TP16/1.0		2.1	
2		CLAY - Natural grey and red mottles, very firm				
3						
			TP16/3.5		43.9	
4		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20t Excavator
Easting (AMG): 317172.67
Northing (AMG): 1247743.89
Ground Elevation (m AHD): 18.6



CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP18

Project No.: 347496

Project: MacDonalddown Gasworks

Site/Client: RailCorp

Date: 17/08/06

Logged By: Chris Newland

Final Depth (m bgs): 4.4

Bore Diameter (mm): N/A

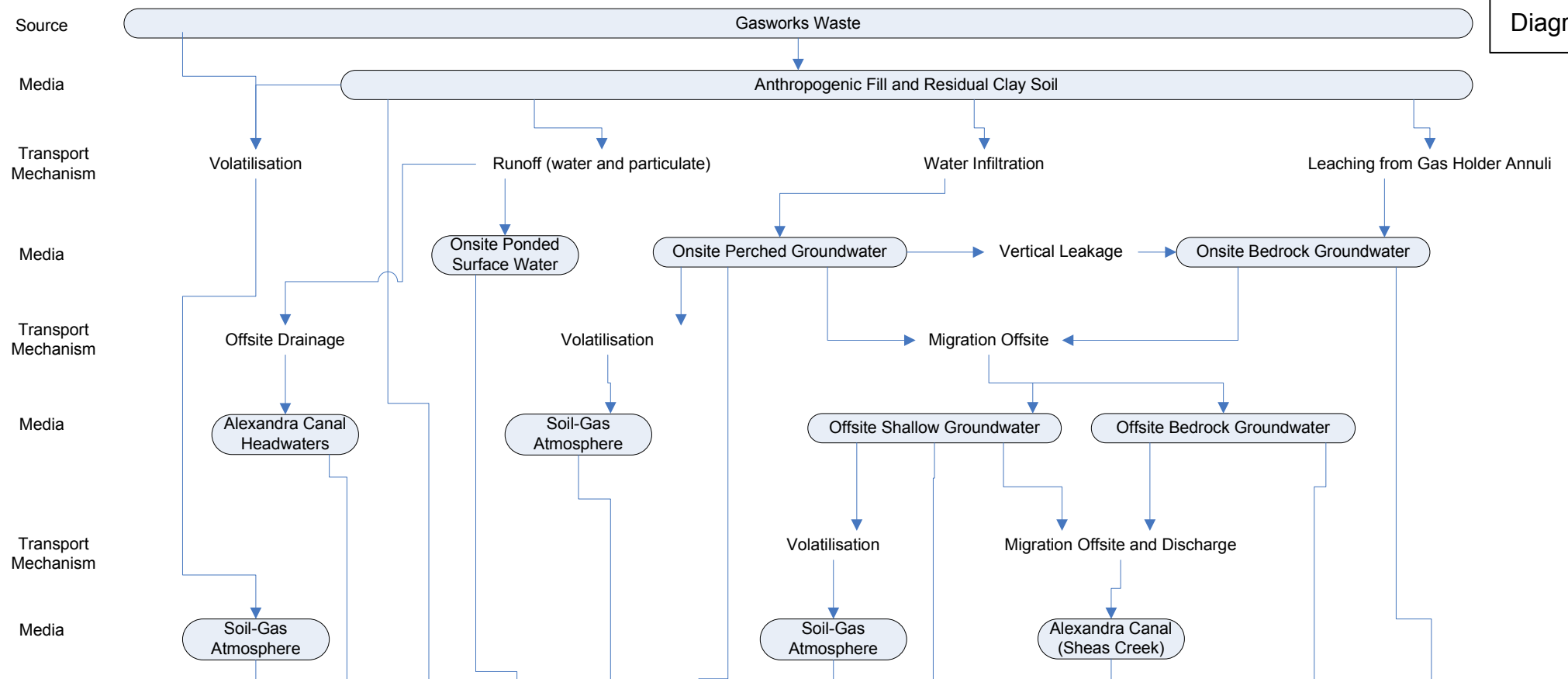
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			Comments
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	
0		Ground Surface				Fibro sheeting fragments
		FILL brown, dry, gravel of ash, concrete, sandstone, brick fragments brick wall and concrete boulders, corrugated iron, leather straps				
1		FILL sandy Clay, orange with red mottles, dry, firm	TP18/1.2		4.9	
		FILL sandy Clay, firm, damp, brown				
2			TP18/1.9		1.9	
3		CLAY - Natural red and grey mottles, stiff, red is friable, grey is firm	TP18/3.2		85.9	
4			TP18/4.4		17.9	
		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20t Excavator
Easting (AMG): 317109.12
Northing (AMG): 1247729.32
Ground Elevation (m AHD): 19.84

Appendix D
Conceptual Site Model

Diagram A

[illegible]

Appendix E
Calibration Certificate and Records

FORM FWSL-02 CH2M HILL Equipment Calibration Daily Log Sheet - Soils

PID CALIBRATION (onsite only)			
Calibration gas ppm?	100	150	DATE: 17/10/06
START OF DAY			
PID reading after calibration	102		MIDDAY CHECK
			PID reading with Cal gas
END OF DAY			
PID reading after calibration			PID Correction Factor Used
BACKGROUND READING:	0.0		
Calibration gas ppm?	100	150	DATE: 18/10/06
START OF DAY			
PID reading after calibration	107		MIDDAY CHECK
			PID reading with Cal gas
END OF DAY			
PID reading after calibration			PID Correction Factor Used
BACKGROUND READING:	0.0		
Calibration gas ppm?	100	150	DATE: 19/10/06
START OF DAY			
PID reading after calibration	99.7		MIDDAY CHECK
			PID reading with Cal gas
END OF DAY			
PID reading after calibration			PID Correction Factor Used
BACKGROUND READING:	0.0		
Calibration gas ppm?	100	150	DATE: 20/10/06
START OF DAY			
PID reading after calibration	96.0		MIDDAY CHECK
			PID reading with Cal gas
END OF DAY			
PID reading after calibration			PID Correction Factor Used
BACKGROUND READING:	0.0		
Calibration gas ppm?			DATE:
START OF DAY			
PID reading after calibration			MIDDAY CHECK
			PID reading with Cal gas
END OF DAY			
PID reading after calibration			PID Correction Factor Used
BACKGROUND READING:			

FORM FWSL-02 CH2M HILL Equipment Calibration Daily Log Sheet - Soils

PID CALIBRATION (onsite only)			
Calibration gas ppm?	100ppm	DATE:	15/8/06
START OF DAY			
PID reading after calibration	See calibration certificate from Enviroquip	MIDDAY CHECK	
		PID reading with Cal gas	100ppm
END OF DAY			
PID reading after calibration	100ppm	PID Correction Factor Used	n/a
BACKGROUND READING:		Chris Newland	
Calibration gas ppm?	100ppm	DATE:	16/8/06
START OF DAY			
PID reading after calibration	100ppm	MIDDAY CHECK	
		PID reading with Cal gas	99.9ppm
END OF DAY			
PID reading after calibration	100ppm	PID Correction Factor Used	1/9
BACKGROUND READING:	0.0ppm	Chris Newland	
Calibration gas ppm?	100ppm	DATE:	17/8/06
START OF DAY			
PID reading after calibration	100ppm	MIDDAY CHECK	
		PID reading with Cal gas	101ppm
END OF DAY			
PID reading after calibration	99.9ppm	PID Correction Factor Used	n/a
BACKGROUND READING:	0.0ppm	Chris Newland	
Calibration gas ppm?		DATE:	
START OF DAY			
PID reading after calibration	100ppm	MIDDAY CHECK	
		PID reading with Cal gas	
END OF DAY			
PID reading after calibration		PID Correction Factor Used	
BACKGROUND READING:			
Calibration gas ppm?		DATE:	
START OF DAY			
PID reading after calibration		MIDDAY CHECK	
		PID reading with Cal gas	
END OF DAY			
PID reading after calibration		PID Correction Factor Used	
BACKGROUND READING:			