



Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Borehole

Borehole
Number

BH5B

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		5.00-5.45/SPTLS/9	5.00 C	N=17 (1,2,4,4,4,5)					Firm becoming stiff below 5.0m brown and dark grey-brown sandy CLAY with occasional fine to medium subrounded to subangular gravel including sandstone and siltstone. (GLACIAL TILL)
		5.30/D/10				5.30	-		
	6								
		6.50-6.95/SPTLS/11	6.50 C	N=49 (5,5,11,12,12,14)					Hard brown and dark grey-brown silty slightly sandy CLAY with some and locally much fine to coarse subangular gravel including sandstone, coal and siltstone. Some cobbles of sandstone. (GLACIAL TILL)
	7								
		8.00-8.25/SPTLS/12	8.00 C	54/225mm (8,9,16,20,14,4)					
	8								
		8.60-8.70/SPTLS/13	8.60 C	50/3mm (12,13,50,0,0,0)		8.60	-		
						8.70	-		
	9								Orange-brown coarse subrounded BOULDER of sandstone.(GLACIAL TILL) End of Borehole at 8.70 m

Hole Started 14/04/2011

Hole Complete 14/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



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Cable-Percussion Borehole

Borehole
Number

BH6

Site **Calder Vale Business Park, Simonstone**

GRM Project ref: **P5467**

Ground Level mAOD
-

Client **The Alan Johnston Partnership**

Equipment:

Crew: DP Drilling

Logger: PW

Coordinates:
0.00E
0.00N

Scale: 1:75

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation/ Backfill	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value (Sample Blows)	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
	1	0.30/D/1 0.50-1.00/B/2				0.30	-		Brown sandy silty clay with some fine to coarse angular gravel including brick and concrete.(MADE GROUND)
	2	1.20-1.65/SPTLS/3 1.80/D/4 2.00-2.45/SPTLS/5	1.20 C 2.00 C	N=9 (2,2,3,2,2,2) N=7 (1,1,1,2,1,3)		1.50 1.80	- -		Firm brown, dark grey-brown and mottled red-brown sandy silty clay with occasional to some fine to coarse angular to subrounded gravel including brick, concrete, sandstone, siltstone and coal.(MADE GROUND)
	3	3.00-3.45/SPTLS/6	3.00 C	N=9 (1,1,2,2,2,3)					Soft to firm grey-brown mottled orange-brown sandy silty CLAY with rare fine subrounded gravel including coal and fine rootlets.(ALLUVIUM)
	4	4.00-4.45/SPTLS/7	4.00 C	N=13 (1,2,3,3,3,4)	0.00	3.70	-		Firm dark brown mottled dark grey-brown silty CLAY.(GLACIAL TILL)
	5	4.80/D/8 5.00-5.45/SPTLS/9	5.00 C	N=27 (2,2,5,7,7,8)		4.80	-		Stiff dark grey-brown and brown silty slightly sandy CLAY with occasional fine to medium subangular to subrounded gravel including sandstone, siltstone and mudstone.(GLACIAL TILL)
	6	6.00/D/10							Very stiff brown mottled dark grey-brown silty slightly sandy CLAY with some fine to coarse subangular to subrounded gravel including sandstone and mudstone.(GLACIAL TILL)
	7	6.50-6.85/SPTLS/11	6.50 C	50/235mm (6,6,11,14,19,6)		6.50	-		Hard brown, dark grey-brown and orange-brown sandy silty CLAY with some fine to coarse subangular to subrounded gravel including sandstone. (GLACIAL TILL)
	8	8.00-8.20/SPTLS/12	8.00 C	45/170mm - Abandoned					Possible rockhead (Driller's description).(COAL MEASURES)
	9	8.80-8.90/C/13	8.80 C	75/55mm - Abandoned		8.80 8.90	- -		End of Borehole at 8.90 m
	10								
	11								
	12								
	13								
	14								

Hole Started 13/04/2011

Hole Complete 13/04/2011

Remarks: Water Observations, Chiselling, Installations etc

Test Type: S = Standard Penetration Test, C = Cone Penetration Test.
N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



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Window Sample Borehole

Borehole
Number

BH6

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
	1	0.30/D/1				0.30	-		Brown sandy silty clay with some fine to coarse angular gravel including brick and concrete.(MADE GROUND)
		0.50-1.00/B/2							Firm brown, dark grey-brown and mottled red-brown sandy silty clay with occasional to some fine to coarse angular to subrounded gravel including brick, concrete, sandstone, siltstone and coal.(MADE GROUND)
		1.20-1.65/SPTLS/3	1.20 C	N=9 (2,2,3,2,2,2)		1.50	-		Soft to firm grey-brown mottled orange-brown sandy silty CLAY with rare fine subrounded gravel including coal and fine rootlets.(ALLUVIUM)
	2	1.80/D/4				1.80	-		Firm dark brown mottled dark grey-brown silty CLAY.(GLACIAL TILL)
		2.00-2.45/SPTLS/5	2.00 C	N=7 (1,1,1,2,1,3)					
	3	3.00-3.45/SPTLS/6	3.00 C	N=9 (1,1,2,2,2,3)		3.70	-		Stiff dark grey-brown and brown silty slightly sandy CLAY with occasional fine to medium subangular to subrounded gravel including sandstone, siltstone and mudstone.(GLACIAL TILL)
		4.00-4.45/SPTLS/7	4.00 C	N=13 (1,2,3,3,3,4)	0.00				
	4	4.80/D/8				4.80	-		Very stiff brown mottled dark grey-brown silty <i>Continued next sheet</i>

Hole Started 13/04/2011

Hole Complete 13/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



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Window Sample Borehole

Borehole
Number

BH6

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
	6	5.00-5.45/SPTLS/9	5.00 C	N=27 (2,2,5,7,7,8)					slightly sandy CLAY with some fine to coarse subangular to subrounded gravel including sandstone and mudstone.(GLACIAL TILL)
		6.00/D/10							
	7	6.50-6.85/SPTLS/11	6.50 C	50/235mm (6,6,11,14,19,6)		6.50	-		Hard brown, dark grey-brown and orange-brown sandy silty CLAY with some fine to coarse subangular to subrounded gravel including sandstone. (GLACIAL TILL)
	8	8.00-8.20/SPTLS/12	8.00 C	45/170mm - Abandoned					
		8.80-8.90/C/13	8.80 C	75/55mm - Abandoned		8.80	-		Possible rockhead (Driller's description).(COAL MEASURES)
	9					8.90	-		End of Borehole at 8.90 m

Hole Started 13/04/2011

Hole Complete 13/04/2011

General Remarks:

Groundwater Remarks:

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Cable-Percussion Borehole

Borehole
Number

BH7

Site **Calder Vale Business Park, Simonstone**

GRM Project ref: **P5467**

Ground Level mAOD
-

Client **The Alan Johnston Partnership**

Equipment:

Crew: DP Drilling

Logger: PW

Coordinates:
0.00E
0.00N

Scale: 1:75

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation/ Backfill	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value (Sample Blows)	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		0.30/D/1 0.50-1.00/B/2	0.00 C 0.20 C	75/81mm - Abandoned	0.00	0.30	-		Brown mottled red-brown clayey fine to coarse angular gravel including brick. (MADE GROUND)
	1	1.20-1.30/SPTLS/3				0.60	-		Brick coarse. (MADE GROUND)
		1.80/D/4 2.00-2.45/SPTLS/5	2.00 C	N=7 (1,1,1,2,2,2)		1.60	-		Very dense brown and red-brown clayey fine to coarse sand and fine to coarse angular gravel including brick. (MADE GROUND)
	2					1.90	-		Orange-brown mottled yellow-brown very sandy CLAY with some fine to coarse subrounded to subangular gravel including sandstone. (GLACIAL TILL)
	3	3.00-3.45/U/6 3.50/D/7		(42)		2.90	-		Firm brown, orange-brown and dark grey-brown very sandy CLAY with some fine to coarse subrounded to subangular gravel including sandstone, siltstone and mudstone. (GLACIAL TILL)
	4	4.00-4.45/SPTLS/8	4.00 C	N=9 (1,1,2,2,2,3)					Firm dark grey-brown silty CLAY with rare fine subrounded gravel including sandstone. (GLACIAL TILL)
	5	5.00-5.45/U/9 5.50/D/10		(62)		5.40	-		Firm dark grey-brown silty CLAY. (GLACIAL TILL)
	6	6.10/D/11 6.50-6.85/B/12	6.50 C	59/235mm (3,4,19,12,19,9)		6.10	-		Very stiff dark grey-brown silty slightly sandy CLAY with some fine to coarse subrounded gravel including sandstone and siltstone. Some cobbles of sandstone. (GLACIAL TILL)
	7								
	8	8.00-8.20/D/13 8.50-8.60/SPTLS/14	8.00 C 8.50 C	50/79mm (10,11,36,14,0,0) 250/50mm (12,13,100,75,75,0)		8.60	-		End of Borehole at 8.60 m
	9								
	10								
	11								
	12								
	13								
	14								

Hole Started **14/04/2011**

Hole Complete **14/04/2011**

Remarks: Water Observations, Chiselling, Installations etc

Test Type: S = Standard Penetration Test, C = Cone Penetration Test.
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Window Sample Borehole

Borehole
Number

BH7

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

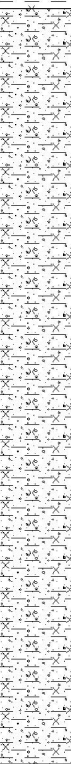
Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
	6	5.00-5.45/U/9							Firm dark grey-brown silty CLAY with rare fine subrounded gravel including sandstone.(GLACIAL TILL)
		5.50/D/10				5.40	-		Firm dark grey-brown silty CLAY.(GLACIAL TILL)
		6.10/D/11				6.10	-		Very stiff dark grey-brown silty slightly sandy CLAY with some fine to coarse subrounded gravel including sandstone and siltstone. Some cobbles of sandstone.(GLACIAL TILL)
	7	6.50-6.85/B/12	6.50 C	59/235mm (3,4,19,12,19,9)					
8		8.00-8.20/D/13	8.00 C	50/79mm (10,11,36,14,0,0)					
		8.50-8.60/SPTLS/14	8.50 C	250/50mm (12,13,100,75,75,0)		8.60	-		End of Borehole at 8.60 m
9									

Hole Started 14/04/2011

Hole Complete 14/04/2011

General Remarks:

Groundwater Remarks:

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Cable-Percussion Borehole

Borehole
Number

BH8

Site **Calder Vale Business Park, Simonstone**

GRM Project ref: **P5467**

Ground Level mAOD
-

Client **The Alan Johnston Partnership**

Equipment:

Crew: DP Drilling

Logger: PW

Coordinates:
0.00E
0.00N

Scale: 1:75

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation/ Backfill	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value (Sample Blows)	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		0.30/D/1 0.50-1.00/B/2				0.30 0.50	-		Tarmacadam.(TARMAC)
1		1.20-1.65/SPTLS/3	1.20 C	N=10 (2,2,3,2,2,3)		1.50	-		Grey-brown slightly clayey sandy fine to medium subangular gravel including limestone (sub-base).(MADE GROUND)
2		2.00-2.45/SPTLS/4	2.00 C	N=7 (1,1,1,2,2,2)					Brown and orange-brown clayey slightly sandy fine to coarse angular gravel including sandstone.(MADE GROUND)
3		2.90/D/5 3.00-3.45/SPTLS/6	3.00 C	N=19 (4,5,5,5,4,5)		2.90	-		Firm brown and dark grey-brown silty slightly sandy CLAY.(GLACIAL TILL)
4		4.00-4.45/SPTLS/7	4.00 C	N=19 (2,2,5,5,3,6)					Medium dense orange-brown sandy locally clayey fine to coarse subrounded GRAVEL including sandstone. (GLACIAL TILL)
5		4.80/D/8 5.00-5.45/SPTLS/9	5.00 C	N=25 (1,2,4,5,7,9)					Very dense boulders including sandstone.(GLACIAL TILL)
6		6.50-6.65/SPTLS/10	6.50 C	50/85mm (9,10,39,11,0,0)		6.30	-		End of Borehole at 7.10 m
7						7.10	-		
8									
9									
10									
11									
12									
13									
14									

Hole Started 16/04/2011

Hole Complete 16/04/2011

Remarks: Water Observations, Chiselling, Installations etc

Test Type: S = Standard Penetration Test, C = Cone Penetration Test.
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Window Sample Borehole

Borehole
Number

BH8

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

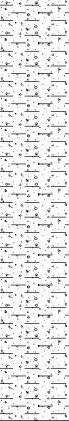
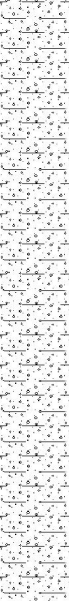
Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		0.30/D/1				0.30	-		Tarmacadam.(TARMAC)
		0.50-1.00/B/2				0.50	-		Grey-brown slightly clayey sandy fine to medium subangular gravel including limestone (sub-base).(MADE GROUND)
	1	1.20-1.65/SPTLS/3	1.20 C	N=10 (2,2,3,2,2,3)		1.50	-		Brown and orange-brown clayey slightly sandy fine to coarse angular gravel including sandstone.(MADE GROUND)
	2	2.00-2.45/SPTLS/4	2.00 C	N=7 (1,1,1,2,2,2)					Firm brown and dark grey-brown silty slightly sandy CLAY.(GLACIAL TILL)
3		2.90/D/5 3.00-3.45/SPTLS/6	3.00 C	N=19 (4,5,5,5,4,5)		2.90	-		Medium dense orange-brown sandy locally clayey fine to coarse subrounded GRAVEL including sandstone. (GLACIAL TILL)
4		4.00-4.45/SPTLS/7 4.80/D/8	4.00 C	N=19 (2,2,5,5,3,6)					

Continued next sheet

Hole Started 16/04/2011 Hole Complete 16/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



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Window Sample Borehole

Borehole
Number
BH8

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
	6	5.00-5.45/SPTLS/9	5.00 C	N=25 (1,2,4,5,7,9)		6.30	-		Medium dense orange-brown sandy locally clayey fine to coarse subrounded GRAVEL including sandstone. (GLACIAL TILL)
	7	6.50-6.65/SPTLS/10	6.50 C	50/85mm (9,10,39,11,0,0)		7.10	-		Very dense boulders including sandstone. (GLACIAL TILL)
	8								End of Borehole at 7.10 m
	9								

Hole Started 16/04/2011 Hole Complete 16/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



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Cable-Percussion Borehole

Borehole
Number

BH9

Site **Calder Vale Business Park, Simonstone**

GRM Project ref: **P5467**

Ground Level mAOD
-

Client **The Alan Johnston Partnership**

Equipment:

Crew: DP Drilling

Logger: PW

Coordinates:
0.00E
0.00N

Scale: 1:75

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation/ Backfill	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value (Sample Blows)	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		0.30/D/1 0.50-1.00/B/2	0.00 S			0.25	-		Tarmacadam.(TARMAC)
	1	1.20-1.65/SPTLS/3	1.20 S	N=6 (2,2,2,1,1,2)		1.30	-		Grey-brown sandy slightly clayey fine to medium subangular gravel including limestone (Sub-base).(MADE GROUND)
	2	2.00-2.45/SPTLS/4	2.00 S	N=7 (1,1,1,2,2,2)					Firm dark grey-brown slightly sandy clayey SILT.(ALLUVIUM)
	3	2.70/D/5 3.00-3.45/B/6	3.00 S	N=21 (3,3,3,5,6,7)		2.70	-		Medium dense brown becoming orange-brown below 3.0m slightly clayey fine to coarse SAND and fine to coarse subrounded GRAVEL including sandstone., siltstone, mudstone and coal.(GLACIAL TILL)
	4	3.80/D/7 4.00-4.45/B/8	4.00 S	N=25 (3,3,7,7,6,5)					
	5	5.00-5.45/B/9	5.00 S	N=18 (1,2,2,4,5,7)					
	6								
	7	6.50-6.95/D/10 7.10/D/11	6.50 S	N=15 (2,2,6,3,3,3)		6.80	-		Stiff dark grey-brown silty finely laminated CLAY.(GLACIAL TILL)
	8	7.50-7.95/U/12		(43)					
	9	8.00/D/13							
	10	9.00-9.45/B/14	9.00 S	N=14 (1,2,3,3,3,5)					
	11	10.50-10.65/U/15 10.70-10.80/D/16	10.70 S	(130) 75/55mm - Abandoned		10.60	-		Hard dark grey-brown silty slightly sandy CLAY with some to much fine to medium subangular gravel including sandstone and mudstone. (WEATHERED COAL MEASURES)
	12	11.20/D/17 11.20-11.70/B/18				11.20	-		
	13	12.00-12.10/D/19 12.10-12.20/D/20	12.00 S 12.10 S	75/55mm - Abandoned 75/45mm - Abandoned		12.00	-		Hard brown and dark grey-brown silty slightly sandy CLAY with some fine to medium subangular gravel including sandstone, siltstone, mudstone and coal. (WEATHERED COAL MEASURES)
	14								End of Borehole at 12.20 m

Hole Started 16/04/2011

Hole Complete 17/04/2011

Remarks: Water Observations, Chiselling, Installations etc

Test Type: S = Standard Penetration Test, C = Cone Penetration Test.
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Window Sample Borehole

Borehole
Number

BH9

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
			0.00 S						Tarmacadam.(TARMAC)
		0.30/D/1				0.25	-		Grey-brown sandy slightly clayey fine to medium subangular gravel including limestone (Sub-base).(MADE GROUND)
		0.50-1.00/B/2							
	1	1.20-1.65/SPTLS/3	1.20 S	N=6 (2,2,2,1,1,2)		1.30	-		Firm dark grey-brown slightly sandy clayey SILT.(ALLUVIUM)
	2	2.00-2.45/SPTLS/4	2.00 S	N=7 (1,1,1,2,2,2)					
		2.70/D/5				2.70	-		Medium dense brown becoming orange-brown below 3.0m slightly clayey fine to coarse SAND and fine to coarse subrounded GRAVEL including sandstone., siltstone, mudstone and coal.(GLACIAL TILL)
	3	3.00-3.45/B/6	3.00 S	N=21 (3,3,3,5,6,7)					
		3.80/D/7							
	4	4.00-4.45/B/8	4.00 S	N=25 (3,3,7,7,6,5)					

Continued next sheet

Hole Started 16/04/2011

Hole Complete 17/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Borehole

Borehole
Number

BH9

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		5.00-5.45/B/9	5.00 S	N=18 (1,2,2,4,5,7)					Medium dense brown becoming orange-brown below 3.0m slightly clayey fine to coarse SAND and fine to coarse subrounded GRAVEL including sandstone., siltstone, mudstone and coal.(GLACIAL TILL)
		6.50-6.95/D/10	6.50 S	N=15 (2,2,6,3,3,3)		6.80	-		
		7.10/D/11							Stiff dark grey-brown silty finely laminated CLAY.(GLACIAL TILL)
		7.50-7.95/U/12							
		8.00/D/13							
		9.00-9.45/B/14	9.00 S	N=14 (1,2,3,3,3,5)					

Continued next sheet

Hole Started 16/04/2011

Hole Complete 17/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Borehole

Borehole
Number

BH9

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		10.50-10.65/U/15							Stiff dark grey-brown silty finely laminated CLAY.(GLACIAL TILL)
		10.70-10.80/D/16	10.70 S	75/55mm - Abandoned		10.60	-		Hard dark grey-brown silty slightly sandy CLAY with some to much fine to medium subangular gravel including sandstone, siltstone and mudstone. (WEATHERED COAL MEASURES)
	11	11.20/D/17 11.20-11.70/B/18				11.20	-		Hard brown and dark grey-brown silty slightly sandy CLAY with some fine to medium subangular gravel including sandstone, siltstone, mudstone and coal. (WEATHERED COAL MEASURES)
	12	12.00-12.10/D/19 12.10-12.20/D/20	12.00 S 12.10 S	75/55mm - Abandoned 75/45mm - Abandoned		12.00	-		End of Borehole at 12.20 m
	13								
	14								

Hole Started 16/04/2011

Hole Complete 17/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: mail@grm-uk.com Web: www.grm-uk.com

Cable-Percussion Borehole

Borehole
Number

BH10

Site **Calder Vale Business Park, Simonstone**

GRM Project ref: **P5467**

Ground Level mAOD
-

Client **The Alan Johnston Partnership**

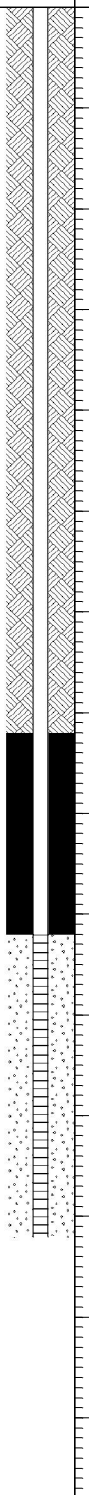
Equipment:

Crew: DP Drilling

Logger: PW

Coordinates:
0.00E
0.00N

Scale: 1:75

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation/ Backfill	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value (Sample Blows)	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
	1	0.30/D/1 0.50-1.00/B/2	0.00 S		0.00	0.20	-		Brown clayey fine to coarse sand with some fine to medium subangular gravel including brick, sandstone and siltstone. (MADE GROUND)
	2	1.20-1.65/D/3	1.20 S	N=8 (1,1,2,2,2,2)					Firm pale grey slightly clayey slightly sandy silt with occasional fine to coarse subangular to subrounded gravel including brick and sandstone. (MADE GROUND)
	3	2.00-2.45/B/4	2.00 S	N=7 (1,1,1,2,2,2)		2.40	-		Firm brown and dark grey-brown sandy silty CLAY. (ALLUVIUM)
	4	2.60/D/5 3.00-3.45/U/6		(30)		3.30	-		Firm brown, orange-brown and dark grey-brown sandy to very sandy silty CLAY with occasional fine to medium subrounded to subangular gravel including sandstone. (GLACIAL TILL)
	5	3.50/D/7 4.00-4.45/B/8	4.00 S	N=8 (1,1,2,2,1,3)					Stiff brown and orange-brown and dark grey-brown silty sandy CLAY with occasional fine to medium subangular gravel including sandstone. (GLACIAL TILL)
	6	5.00-5.45/B/9	5.00 S	N=19 (1,2,4,5,5,5)		5.10	-		Dense dark grey clayey fine to coarse angular to subangular GRAVEL including sandstone. Some cobbles of sandstone. (GLACIAL TILL)
	7	6.50-6.95/B/10	6.50 S	50/160mm (3,4,10,29,11,0)		6.40	-		Dense brown slightly sandy fine to coarse subangular GRAVEL including sandstone. (WEATHERED COAL MEASURES)
	8	7.50/D/11 8.00-8.45/B/12	8.00 S	N=37 (5,6,7,9,10,11)		8.20	-		Strong orange-brown fine to medium grained SANDSTONE. (COAL MEASURES)
	9	9.50-9.95/B/13	9.50 S	N=46 (7,7,9,10,13,14)					End of Borehole at 12.30 m
	10	10.50/D/14							
	11	11.00-11.25/B/15	11.00 S	50/170mm (9,10,16,20,14,0)	0.00				
	12	12.20-12.30/D/16	12.20 S	75/100mm - Abandoned		12.20 12.30	-		
	13								
	14								

Hole Started 15/04/2011

Hole Complete 15/04/2011

Remarks: Water Observations, Chiselling, Installations etc

Test Type: S = Standard Penetration Test, C = Cone Penetration Test.
N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Borehole

Borehole
Number

BH10

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		0.30/D/1	0.00 S		0.00	0.20	-		Brown clayey fine to coarse sand with some fine to medium subangular gravel including brick, sandstone and siltstone.(MADE GROUND)
		0.50-1.00/B/2							Firm pale grey slightly clayey slightly sandy silt with occasional fine to coarse subangular to subrounded gravel including brick and sandstone.(MADE GROUND)
		1.20-1.65/D/3	1.20 S	N=8 (1,1,2,2,2,2)					
		2.00-2.45/B/4	2.00 S	N=7 (1,1,1,2,2,2)		2.40	-		Firm brown and dark grey-brown sandy silty CLAY.(ALLUVIUM)
		2.60/D/5							
		3.00-3.45/U/6				3.30	-		Firm brown, orange-brown and dark grey-brown sandy to very sandy silty CLAY with occasional fine to medium subrounded to subangular gravel including sandstone. (GLACIAL TILL)
		3.50/D/7							
		4.00-4.45/B/8	4.00 S	N=8 (1,1,2,2,1,3)					

Continued next sheet

Hole Started 15/04/2011

Hole Complete 15/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Borehole

Borehole
Number

BH10

Site: Calder Vale Business Park, Simonstone

GRM Project ref: **P5467**

Ground Level mAOD
-

Client: The Alan Johnston Partnership

Equipment:

Coordinates:
0E
0N

Crew: DP Drilling Logger PW

Scale: 1:25

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD			
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description
		5.00-5.45/B/9	5.00 S	N=19 (1,2,4,5,5,5)		5.10	-		Firm brown, orange-brown and dark grey-brown sandy to very sandy silty CLAY with occasional fine to medium subrounded to subangular gravel including sandstone. (GLACIAL TILL)
	6					6.40	-		Stiff brown and orange-brown and dark grey-brown silty sandy CLAY with occasional fine to medium subangular gravel including sandstone. (GLACIAL TILL)
	7	6.50-6.95/B/10	6.50 S	50/160mm (3,4,10,29,11,0)					Dense dark grey clayey fine to coarse angular to subangular GRAVEL including sandstone. Some cobbles of sandstone. (GLACIAL TILL)
	8	7.50/D/11							
		8.00-8.45/B/12	8.00 S	N=37 (5,6,7,9,10,11)		8.20	-		Dense brown slightly sandy fine to coarse subangular GRAVEL including sandstone.(WEATHERED COAL MEASURES)
	9								
		9.50-9.95/B/13	9.50 S	N=46 (7,7,9,10,13,14)					

Continued next sheet

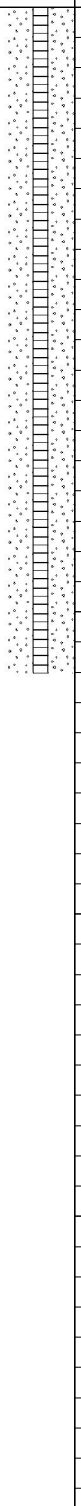
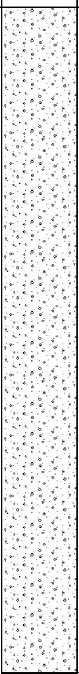
Hole Started 15/04/2011

Hole Complete 15/04/2011

General Remarks:

Groundwater Remarks:

Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.

 Burton-on-Trent (HQ) Tel: 01283 551249 Market Harborough Tel: 01858 414981 Email: mail@grm-uk.com Web: www.grm-uk.com						Window Sample Borehole				Borehole Number BH10		
Site: Calder Vale Business Park, Simonstone						GRM Project ref: P5467				Ground Level mAOD -		
Client: The Alan Johnston Partnership						Equipment:				Coordinates:		
						Crew: DP Drilling Logger PW				0E 0N		
GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD					Scale: 1:25	
Installation	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description			
		10.50/D/14							Dense brown slightly sandy fine to coarse subangular GRAVEL including sandstone.(WEATHERED COAL MEASURES)			
	11	11.00-11.25/B/15	11.00 S	50/170mm (9,10,16,20,14,0)	0.00							
12		12.20-12.30/D/16	12.20 S	75/100mm - Abandoned		12.20 12.30	- -		Strong orange-brown fine to medium grained SANDSTONE. (COAL MEASURES) <i>End of Borehole at 12.30 m</i>			
13												
14												
Hole Started 15/04/2011			Hole Complete 15/04/2011									
General Remarks:												
Groundwater Remarks:												
Test Type: S = Standard Penetration Test, C = Cone Penetration Test. N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.												

A P P E N D I X H

MONITORING OF SOIL GASES & GROUNDWATER



PROJECT NO. P5467

SITE. CALDER VALE, BURNLEY

CLIENT. The Alan Johnston Partnership

DATE. 27-Apr-11

CONDITIONS. TEMP SUNNY
ATMOSPHERIC PRESSURE: 1006

OPERATOR. STEPHEN MORRIS

EQUIPMENT. LMSxi Gas Data Recorder

GRM Development Solutions Limited
Laurus House
First Avenue
Centrum 100
Burton-upon-Trent
DE14 2WH

Telephone: (01283) 551249
Facsimile: (01283) 211968
Email: info@grm-uk.com

RESULTS

Borehole/ Well Ref. No.	Methane (CH ₄) %	Carbon Dioxide (CO ₂) %	Oxygen (O ₂) %	Flow	L.E.L	Depth to Groundwater (m)	Depth to Base of Well (m)
WS2	0.00	0.00	20.60	0.00	0.00	0.39	3
WS4	0.20	3.60	12.10	0.00	0.00	1.37	3.57
WS10	0.00	4.40	14.80	0.00	0.00	2	2.7
WS12	0.00	0.50	19.60	0.00	0.00	1.67	4.16
WS13	0.00	0.10	19.00	0.00	0.00	1.27	3.14
WS15	0.00	0.50	18.60	0.00	0.00	2.96	3.08
BH9	0.00	0.00	19.80	0.00	0.00	2.95	11.5
BH10	0.00	0.20	19.80	0.00	0.00	3.1	11.82

Notes

L.E.L. Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)
N.D. Not Detected
N.R. Not Recorded
% By Volume

Signed (Operator).....

Authorised.....

MONITORING OF SOIL GASES & GROUNDWATER



PROJECT NO. P5467
SITE. CALDER VALE, BURNLEY
CLIENT. The Alan Johnston Partnership
DATE. 10-May-11
CONDITIONS. TEMP SHOWERS
 ATMOSPHERIC PRESSURE: 1000
OPERATOR. STEPHEN MORRIS

GRM Development Solutions Limited
 Laurus House
 First Avenue
 Centrum 100
 Burton-upon-Trent
 DE14 2WH

Telephone: (01283) 551249
 Facsimile: (01283) 211968
 Email: info@grm-uk.com

EQUIPMENT.

RESULTS

Borehole/ Well Ref. No.	Methane (CH ₄) %	Carbon Dioxide (CO ₂) %	Oxygen (O ₂) %	Flow	L.E.L	Depth to Groundwater (m)	Depth to Base of Well (m)
WS2	0.0	0.0	19.0	0.0	0.0	0.37	3
WS4	1.0	5.5	3.4	0.0	22.5	1.63	3.57
WS10	0.0	0.7	17.0	0.0	0.0	1.85	2.7
WS12	0.0	2.6	17.1	0.0	0.0	1.62	4.16
WS13	6.1	0.0	15.6	0.0	>/>/>	1.55	3.14
WS15	0.0	0.6	17.3	0.0	0.0	3.02	3.08
BH9	0.0	0.0	19.7	0.0	0.0	2.9	11.5
BH10	0.0	0.4	18.7	0.0	0.0	3.1	11.82

Notes

L.E.L. Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)
 N.D. Not Detected
 N.R. Not Recorded
 % By Volume

Signed (Operator).....

Authorised.....

MONITORING OF SOIL GASES & GROUNDWATER



PROJECT NO. P5467

SITE. CALDER VALE, BURNLEY

CLIENT. The Alan Johnston Partnership

DATE. 24-May-11

CONDITIONS. TEMP 1006
ATMOSPHERIC PRESSURE:

OPERATOR. P.Wardle

EQUIPMENT. LMSxi Gas Data Recorder

GRM Development Solutions Limited
Laurus House
First Avenue
Centrum 100
Burton-upon-Trent
DE14 2WH

Telephone: (01283) 551249
Facsimile: (01283) 211968
Email: info@grm-uk.com

RESULTS

Borehole/ Well Ref. No.	Methane (CH ₄) %	Carbon Dioxide (CO ₂) %	Oxygen (O ₂) %	Flow	L.E.L	Depth to Groundwater (m)	Depth to Base of Well (m)
WS2	0.0	0.0	20.9	0.0	0.0	0.49	3
WS4	0.0	0.9	5.2	0.0	0.0	1.2	3.6
WS10	2.0	0.8	19.5	0.0	0.0	5	3
WS12	0.0	1.3	17.0	0.0	0.0	1.22	4
WS13	0.1	0.0	18.0	0.0	0.3	0.85	3.2
WS15	0.0	0.7	14.4	0.0	0.0	2.78	3.46
BH9	0.0	0.1	20.5	0.0	0.0	3.47	11.6
BH10	0.0	0.1	20.8	0.0	0.0	3.08	11.8

Notes

L.E.L. Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas
N.D. Not Detected
N.R. Not Recorded
% By Volume

Signed (Operator).....

Authorised.....

A P P E N D I X I



Nicholls Colton & Partners Limited
7-11 Harding Street, Leicester, LE1 4DH
Tel: 0116 253 6333. Fax: 0116 251 4709
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website: www.nicholls-colton.co.uk

TEST REPORT

GRM DEVELOPMENT SOLUTIONS SOIL SUITE

P5467

REPORT NO. E11/GRM/395/001		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 17/05/2011
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6388
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	42
STONE CONTENT: (%)	0.7

CLIENT SAMPLE REFERENCE:	WS1
SAMPLE LOCATION:	WS1
SAMPLE DEPTH:	0.05-0.15m
VISUAL DESCRIPTION:	Dark brown slightly gravelly sandy clay with organic matter

Acenaphthene	(mg/kg)	0.2
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	< 0.1
Benzo (a) anthracene	(mg/kg)	< 0.1
Benzo (a) pyrene	(mg/kg)	< 0.1
Benzo (b) fluoranthene	(mg/kg)	< 0.1
Benzo (g, h, i) perylene	(mg/kg)	< 0.1
Benzo (k) fluoranthene	(mg/kg)	< 0.1
Chrysene	(mg/kg)	< 0.1
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	< 0.1
Fluorene	(mg/kg)	< 0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	< 0.1
Naphthalene	(mg/kg)	< 0.1
Phenanthrene	(mg/kg)	< 0.1
Pyrene	(mg/kg)	< 0.1

Arsenic	(mg/kg)	14.7
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	2.5
Chromium (Total)	(mg/kg)	31.0
Copper	(mg/kg)	35.2
Lead	(mg/kg)	138
Mercury	(mg/kg)	< 0.7
Nickel	(mg/kg)	26.6
Selenium	(mg/kg)	< 5.0
Zinc	(mg/kg)	246

Phenols Content	(mg/kg)	< 1.4
-----------------	---------	-------

pH Value	6.0
----------	-----

SOM	(%)	9.3
-----	-----	-----

Total PAH Content	(mg/kg)	11.1
-------------------	---------	------

Cyanide (Total)	(mg/kg)	< 1.4
Sulphate (As SO ₄)	(mg/l)	23.7

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


J. Gane
Environmental Laboratory Manager
Nicholls Colton Analytical

GRM Development Solutions Ltd
Laurus House
First Avenue
Centrum 100
Burton Upon Trent
Staffordshire
DE14 2WH



Nicholls Colton & Partners Limited
7-11 Harding Street, Leicester, LE1 4DH
Tel: 0116 253 6333. Fax: 0116 251 4709

e-mail: testing@nicholls-colton.co.uk
website: www.nicholls-colton.co.uk

TEST REPORT

GRM DEVELOPMENT SOLUTIONS SOIL SUITE

P5467

REPORT NO. E11/GRM/395/002		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 17/05/2011
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6393
SAMPLE MATRIX:	Loam
MOISTURE CONTENT: (%)	6.3
STONE CONTENT: (%)	61

CLIENT SAMPLE REFERENCE:	WS8
SAMPLE LOCATION:	WS8
SAMPLE DEPTH:	0.1-0.2m
VISUAL DESCRIPTION:	Grey brown sandy gravel crushed concrete brick and organic matter (Fill)

Acenaphthene	(mg/kg)	< 0.1
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	0.2
Benzo (a) anthracene	(mg/kg)	0.6
Benzo (a) pyrene	(mg/kg)	0.5
Benzo (b) fluoranthene	(mg/kg)	0.6
Benzo (g, h, i) perylene	(mg/kg)	0.3
Benzo (k) fluoranthene	(mg/kg)	0.2
Chrysene	(mg/kg)	0.6
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	1.4
Fluorene	(mg/kg)	0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	0.3
Naphthalene	(mg/kg)	0.1
Phenanthrene	(mg/kg)	0.9
Pyrene	(mg/kg)	1.2

Arsenic	(mg/kg)	18.8
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	< 1.1
Chromium (Total)	(mg/kg)	42.3
Copper	(mg/kg)	35.3
Lead	(mg/kg)	127
Mercury	(mg/kg)	1.2
Nickel	(mg/kg)	23.0
Selenium	(mg/kg)	< 5.0
Zinc	(mg/kg)	194

Phenols Content	(mg/kg)	< 1.1
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pH Value	9.1
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SOM	(%)	1.7
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Total PAH Content	(mg/kg)	7.5
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Cyanide (Total)	(mg/kg)	< 1.1
Sulphate (As SO ₄)	(mg/l)	455

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467**

REPORT NO. E11/GRM/395/003		
ORDER REFERENCE: GRM/P5467	DATE OF ISSUE: 17/05/2011	
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6395
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	23
STONE CONTENT: (%)	0.8

CLIENT SAMPLE REFERENCE:	WS10
SAMPLE LOCATION:	WS10
SAMPLE DEPTH:	0.1-0.2m
VISUAL DESCRIPTION:	Dark brown slightly gravelly sandy silty clay with organic matter

Acenaphthene	(mg/kg)	0.1
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	0.2
Benzo (a) anthracene	(mg/kg)	0.6
Benzo (a) pyrene	(mg/kg)	0.6
Benzo (b) fluoranthene	(mg/kg)	0.8
Benzo (g, h, i) perylene	(mg/kg)	0.4
Benzo (k) fluoranthene	(mg/kg)	0.3
Chrysene	(mg/kg)	0.7
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	1.5
Fluorene	(mg/kg)	0.1
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	0.4
Naphthalene	(mg/kg)	0.3
Phenanthrene	(mg/kg)	1.1
Pyrene	(mg/kg)	1.4

Arsenic	(mg/kg)	15.2
Cadmium	(mg/kg)	2.7
Chromium (Hexavalent)	(mg/kg)	< 1.2
Chromium (Total)	(mg/kg)	29.2
Copper	(mg/kg)	42.4
Lead	(mg/kg)	108
Mercury	(mg/kg)	< 0.7
Nickel	(mg/kg)	27.1
Selenium	(mg/kg)	< 5.0
Zinc	(mg/kg)	237

Phenols Content	(mg/kg)	< 1.2
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pH Value	7.5
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SOM	(%)	6.5
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Total PAH Content	(mg/kg)	8.8
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Cyanide (Total)	(mg/kg)	< 1.2
Sulphate (As SO ₄)	(mg/l)	32.2

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.

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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467**

REPORT NO. E11/GRM/395/004		
ORDER REFERENCE: GRM/P5467	DATE OF ISSUE: 17/05/2011	
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6397
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	25
STONE CONTENT: (%)	7.6

CLIENT SAMPLE REFERENCE:	WS13
SAMPLE LOCATION:	WS13
SAMPLE DEPTH:	0.1-0.2m
VISUAL DESCRIPTION:	Brown slightly gravelly clay with crushed brick and organic matter (Fill)

Acenaphthene	(mg/kg)	< 0.1
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	0.4
Benzo (a) anthracene	(mg/kg)	0.7
Benzo (a) pyrene	(mg/kg)	0.7
Benzo (b) fluoranthene	(mg/kg)	0.8
Benzo (g, h, i) perylene	(mg/kg)	0.4
Benzo (k) fluoranthene	(mg/kg)	0.3
Chrysene	(mg/kg)	0.6
Dibenzo (a,h) anthracene	(mg/kg)	0.1
Fluoranthene	(mg/kg)	1.7
Fluorene	(mg/kg)	0.2
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	0.5
Naphthalene	(mg/kg)	0.2
Phenanthrene	(mg/kg)	1.4
Pyrene	(mg/kg)	1.5

Arsenic	(mg/kg)	18.7
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	< 1.3
Chromium (Total)	(mg/kg)	27.8
Copper	(mg/kg)	31.14
Lead	(mg/kg)	54.7
Mercury	(mg/kg)	< 0.7
Nickel	(mg/kg)	44.7
Selenium	(mg/kg)	< 5.0
Zinc	(mg/kg)	191

Phenols Content	(mg/kg)	< 1.3
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pH Value		8.1
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SOM	(%)	2.7
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Total PAH Content	(mg/kg)	9.5
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Cyanide (Total)	(mg/kg)	< 1.3
Sulphate (As SO ₄)	(mg/l)	44.0

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467**

REPORT NO. E11/GRM/395/005		
ORDER REFERENCE: GRM/P5467	DATE OF ISSUE: 17/05/2011	
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6398
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	57
STONE CONTENT: (%)	3.6

CLIENT SAMPLE REFERENCE:	WS14
SAMPLE LOCATION:	WS14
SAMPLE DEPTH:	0.05-0.15m
VISUAL DESCRIPTION:	Grey brown sandy clay with organic matter

Acenaphthene	(mg/kg)	0.3
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	< 0.1
Benzo (a) anthracene	(mg/kg)	< 0.1
Benzo (a) pyrene	(mg/kg)	< 0.1
Benzo (b) fluoranthene	(mg/kg)	< 0.1
Benzo (g, h, i) perylene	(mg/kg)	< 0.1
Benzo (k) fluoranthene	(mg/kg)	< 0.1
Chrysene	(mg/kg)	< 0.1
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	< 0.1
Fluorene	(mg/kg)	< 0.1
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	< 0.1
Naphthalene	(mg/kg)	< 0.1
Phenanthrene	(mg/kg)	< 0.1
Pyrene	(mg/kg)	< 0.1

Arsenic	(mg/kg)	154
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	< 1.6
Chromium (Total)	(mg/kg)	32.6
Copper	(mg/kg)	41.5
Lead	(mg/kg)	150
Mercury	(mg/kg)	1.2
Nickel	(mg/kg)	41.0
Selenium	(mg/kg)	< 5.0
Zinc	(mg/kg)	61.5

Phenols Content	(mg/kg)	< 1.6
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pH Value	8.2
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SOM	(%)	0.9
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Total PAH Content	(mg/kg)	16.2
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Cyanide (Total)	(mg/kg)	< 1.0
Sulphate (As SO ₄)	(mg/l)	10.3

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.

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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467**

REPORT NO. E11/GRM/395/006		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 17/05/2011
DATE & TIME OF SAMPLING: NOT PROVIDED	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 17/05/2011

NCA SAMPLE REFERENCE:	11-6399
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	42
STONE CONTENT: (%)	0.7

CLIENT SAMPLE REFERENCE:	WS15
SAMPLE LOCATION:	WS15
SAMPLE DEPTH:	0.05-0.15m
VISUAL DESCRIPTION:	Dark brown slightly gravelly sandy clay with organic matter

Acenaphthene	(mg/kg)	< 0.1
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	0.1
Benzo (a) anthracene	(mg/kg)	0.4
Benzo (a) pyrene	(mg/kg)	0.5
Benzo (b) fluoranthene	(mg/kg)	0.6
Benzo (g, h, i) perylene	(mg/kg)	0.4
Benzo (k) fluoranthene	(mg/kg)	0.2
Chrysene	(mg/kg)	0.6
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	0.9
Fluorene	(mg/kg)	< 0.1
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	0.3
Naphthalene	(mg/kg)	0.4
Phenanthrene	(mg/kg)	0.9
Pyrene	(mg/kg)	0.9

Arsenic	(mg/kg)	19.1
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	< 1.4
Chromium (Total)	(mg/kg)	30.6
Copper	(mg/kg)	46.8
Lead	(mg/kg)	109
Mercury	(mg/kg)	< 0.7
Nickel	(mg/kg)	27.7
Selenium	(mg/kg)	< 5
Zinc	(mg/kg)	139

Phenols Content	(mg/kg)	< 1.4
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pH Value		7.6
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SOM	(%)	4.2
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Total PAH Content	(mg/kg)	6.5
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Cyanide (Total)	(mg/kg)	< 1.4
Sulphate (As SO ₄)	(mg/l)	27.7

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.

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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467**

REPORT NO. E11/GRM/395/007		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 17/05/2011
DATE & TIME OF SAMPLING: NOT PROVIDED	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 17/05/2011

NCA SAMPLE REFERENCE:	11-6400
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	20
STONE CONTENT: (%)	32

CLIENT SAMPLE REFERENCE:	WS15
SAMPLE LOCATION:	WS15
SAMPLE DEPTH:	0.9-1.0m
VISUAL DESCRIPTION:	Black brown sandy gravelly clay with organic matter, brick and plastic

Acenaphthene	(mg/kg)	< 0.1
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	0.1
Benzo (a) anthracene	(mg/kg)	0.3
Benzo (a) pyrene	(mg/kg)	0.3
Benzo (b) fluoranthene	(mg/kg)	0.4
Benzo (g, h, i) perylene	(mg/kg)	0.3
Benzo (k) fluoranthene	(mg/kg)	0.1
Chrysene	(mg/kg)	0.4
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	0.8
Fluorene	(mg/kg)	< 0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	0.2
Naphthalene	(mg/kg)	0.3
Phenanthrene	(mg/kg)	0.7
Pyrene	(mg/kg)	0.7

Arsenic	(mg/kg)	16.6
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	< 1.3
Chromium (Total)	(mg/kg)	24.0
Copper	(mg/kg)	57.4
Lead	(mg/kg)	87.5
Mercury	(mg/kg)	< 0.7
Nickel	(mg/kg)	20.6
Selenium	(mg/kg)	< 5
Zinc	(mg/kg)	134

Phenols Content	(mg/kg)	< 1.3
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pH Value	8.3
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SOM	(%)	2.5
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Total PAH Content	(mg/kg)	5.0
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Cyanide (Total)	(mg/kg)	< 1.3
Sulphate (As SO ₄)	(mg/l)	169

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.

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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467 – FORT VALE**

REPORT NO. E11/GRM/406/001		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6951
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	15
STONE CONTENT: (%)	22

CLIENT SAMPLE REFERENCE:	BH2
SAMPLE LOCATION:	BH2
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Dark brown slightly gravelly slightly sandy clay with organic matter

Acenaphthene	(mg/kg)	<0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	<0.1
Benzo (a) anthracene	(mg/kg)	<0.1
Benzo (a) pyrene	(mg/kg)	<0.1
Benzo (b) fluoranthene	(mg/kg)	0.1
Benzo (g, h, i) perylene	(mg/kg)	<0.1
Benzo (k) fluoranthene	(mg/kg)	<0.1
Chrysene	(mg/kg)	0.2
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	0.2
Fluorene	(mg/kg)	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	<0.1
Naphthalene	(mg/kg)	0.1
Phenanthrene	(mg/kg)	0.3
Pyrene	(mg/kg)	0.2

Arsenic	(mg/kg)	12.5
Cadmium	(mg/kg)	<2.5
Chromium (Hexavalent)	(mg/kg)	< 1.2
Chromium (Total)	(mg/kg)	24.4
Copper	(mg/kg)	28.0
Lead	(mg/kg)	29.6
Mercury	(mg/kg)	<0.7
Nickel	(mg/kg)	29.6
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	107

Phenols Content	(mg/kg)	< 1.2
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pH Value	7.4
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SOM	(%)	0.7
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Total PAH Content	(mg/kg)	2.1
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Cyanide (Total)	(mg/kg)	< 1.2
Sulphate (As SO ₄)	(mg/l)	14.6

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.

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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467 – FORT VALE**

REPORT NO. E11/GRM/406/002		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6952
SAMPLE MATRIX:	Sand
MOISTURE CONTENT: (%)	12
STONE CONTENT: (%)	61

CLIENT SAMPLE REFERENCE:	BH3
SAMPLE LOCATION:	BH3
SAMPLE DEPTH:	0.3m
VISUAL DESCRIPTION:	Dark brown red slightly clayey sandy gravel with crushed brick (fill)

Acenaphthene	(mg/kg)	<0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	<0.1
Benzo (a) anthracene	(mg/kg)	0.2
Benzo (a) pyrene	(mg/kg)	0.1
Benzo (b) fluoranthene	(mg/kg)	0.3
Benzo (g, h, i) perylene	(mg/kg)	0.1
Benzo (k) fluoranthene	(mg/kg)	<0.1
Chrysene	(mg/kg)	0.3
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	0.5
Fluorene	(mg/kg)	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	0.1
Naphthalene	(mg/kg)	0.3
Phenanthrene	(mg/kg)	0.8
Pyrene	(mg/kg)	0.4

Arsenic	(mg/kg)	37.1
Cadmium	(mg/kg)	<2.5
Chromium (Hexavalent)	(mg/kg)	< 1.2
Chromium (Total)	(mg/kg)	72.2
Copper	(mg/kg)	168
Lead	(mg/kg)	259
Mercury	(mg/kg)	<0.7
Nickel	(mg/kg)	36.3
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	343

Phenols Content	(mg/kg)	< 1.2
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pH Value		7.1
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SOM	(%)	4.1
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Total PAH Content	(mg/kg)	3.6
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Cyanide (Total)	(mg/kg)	15.6
Sulphate (As SO ₄)	(mg/l)	26.4

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467 – FORT VALE**

REPORT NO. E11/GRM/406/003		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6953
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	18
STONE CONTENT: (%)	14

CLIENT SAMPLE REFERENCE:	BH4
SAMPLE LOCATION:	BH4
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown grey gravelly sandy clay with some organic matter

Acenaphthene	(mg/kg)	<0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	<0.1
Benzo (a) anthracene	(mg/kg)	<0.1
Benzo (a) pyrene	(mg/kg)	<0.1
Benzo (b) fluoranthene	(mg/kg)	<0.1
Benzo (g, h, i) perylene	(mg/kg)	<0.1
Benzo (k) fluoranthene	(mg/kg)	<0.1
Chrysene	(mg/kg)	<0.1
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	<0.1
Fluorene	(mg/kg)	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	<0.1
Naphthalene	(mg/kg)	<0.1
Phenanthrene	(mg/kg)	0.1
Pyrene	(mg/kg)	<0.1

Arsenic	(mg/kg)	9.9
Cadmium	(mg/kg)	<2.5
Chromium (Hexavalent)	(mg/kg)	< 1.2
Chromium (Total)	(mg/kg)	20.5
Copper	(mg/kg)	21.9
Lead	(mg/kg)	33.4
Mercury	(mg/kg)	<0.7
Nickel	(mg/kg)	20.6
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	67.8

Phenols Content	(mg/kg)	< 1.2
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pH Value		7.9
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SOM	(%)	1.5
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Total PAH Content	(mg/kg)	1.6
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Cyanide (Total)	(mg/kg)	1.4
Sulphate (As SO ₄)	(mg/l)	31.2

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


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TEST REPORT

GRM DEVELOPMENT SOLUTIONS SOIL SUITE

P5467 – FORT VALE

REPORT NO. E11/GRM/406/004		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6956
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	19
STONE CONTENT: (%)	30

CLIENT SAMPLE REFERENCE:	BH6
SAMPLE LOCATION:	BH6
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown silty sandy gravelly clay with crushed brick and organic matter (fill)

Acenaphthene	(mg/kg)	0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	0.2
Benzo (a) anthracene	(mg/kg)	0.6
Benzo (a) pyrene	(mg/kg)	0.5
Benzo (b) fluoranthene	(mg/kg)	0.7
Benzo (g, h, i) perylene	(mg/kg)	0.4
Benzo (k) fluoranthene	(mg/kg)	0.3
Chrysene	(mg/kg)	0.6
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	1.3
Fluorene	(mg/kg)	0.2
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	0.3
Naphthalene	(mg/kg)	0.7
Phenanthrene	(mg/kg)	1.3
Pyrene	(mg/kg)	1.1

Arsenic	(mg/kg)	15.5
Cadmium	(mg/kg)	3.4
Chromium (Hexavalent)	(mg/kg)	< 1.2
Chromium (Total)	(mg/kg)	31.8
Copper	(mg/kg)	65.4
Lead	(mg/kg)	156
Mercury	(mg/kg)	<0.7
Nickel	(mg/kg)	23.8
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	149

Phenols Content	(mg/kg)	< 1.2
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pH Value	7.3
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SOM	(%)	2.4
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Total PAH Content	(mg/kg)	8.4
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Cyanide (Total)	(mg/kg)	< 1.2
Sulphate (As SO ₄)	(mg/l)	178

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467 – FORT VALE**

REPORT NO. E11/GRM/406/005		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6958
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	17
STONE CONTENT: (%)	8.7

CLIENT SAMPLE REFERENCE:	BH7
SAMPLE LOCATION:	BH7
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown red gravelly sandy clay with crushed brick (fill)

Acenaphthene	(mg/kg)	0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	0.2
Benzo (a) anthracene	(mg/kg)	0.6
Benzo (a) pyrene	(mg/kg)	0.5
Benzo (b) fluoranthene	(mg/kg)	0.7
Benzo (g, h, i) perylene	(mg/kg)	0.4
Benzo (k) fluoranthene	(mg/kg)	0.2
Chrysene	(mg/kg)	0.6
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	1.5
Fluorene	(mg/kg)	0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	0.3
Naphthalene	(mg/kg)	0.2
Phenanthrene	(mg/kg)	0.2
Pyrene	(mg/kg)	1.3

Arsenic	(mg/kg)	26.6
Cadmium	(mg/kg)	<2.5
Chromium (Hexavalent)	(mg/kg)	< 1.2
Chromium (Total)	(mg/kg)	37.5
Copper	(mg/kg)	142
Lead	(mg/kg)	119
Mercury	(mg/kg)	1.0
Nickel	(mg/kg)	37.3
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	126

Phenols Content	(mg/kg)	< 1.2
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pH Value		7.9
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SOM	(%)	1.8
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Total PAH Content	(mg/kg)	8.1
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Cyanide (Total)	(mg/kg)	< 1.2
Sulphate (As SO ₄)	(mg/l)	713

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467 – FORT VALE**

REPORT NO. E11/GRM/406/006		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6960
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	6.6
STONE CONTENT: (%)	48

CLIENT SAMPLE REFERENCE:	BH8
SAMPLE LOCATION:	BH8
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown grey slightly silty gravelly sandy clay

Acenaphthene	(mg/kg)	<0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	<0.1
Benzo (a) anthracene	(mg/kg)	<0.1
Benzo (a) pyrene	(mg/kg)	<0.1
Benzo (b) fluoranthene	(mg/kg)	<0.1
Benzo (g, h, i) perylene	(mg/kg)	<0.1
Benzo (k) fluoranthene	(mg/kg)	<0.1
Chrysene	(mg/kg)	0.1
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	0.1
Fluorene	(mg/kg)	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	<0.1
Naphthalene	(mg/kg)	<0.1
Phenanthrene	(mg/kg)	0.2
Pyrene	(mg/kg)	0.1

Arsenic	(mg/kg)	8.8
Cadmium	(mg/kg)	<2.5
Chromium (Hexavalent)	(mg/kg)	1.4
Chromium (Total)	(mg/kg)	27.3
Copper	(mg/kg)	27.1
Lead	(mg/kg)	18.9
Mercury	(mg/kg)	<0.7
Nickel	(mg/kg)	25.4
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	76.8

Phenols Content	(mg/kg)	< 1.1
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pH Value		8.3
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SOM	(%)	1.0
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Total PAH Content	(mg/kg)	1.7
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Cyanide (Total)	(mg/kg)	< 1.1
Sulphate (As SO ₄)	(mg/l)	65.7

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.

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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467 – FORT VALE**

REPORT NO. E11/GRM/406/007		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6961
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	10
STONE CONTENT: (%)	30

CLIENT SAMPLE REFERENCE:	BH9
SAMPLE LOCATION:	BH9
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown grey slightly sandy gravelly clay with some organic matter

Acenaphthene	(mg/kg)	<0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	<0.1
Benzo (a) anthracene	(mg/kg)	<0.1
Benzo (a) pyrene	(mg/kg)	<0.1
Benzo (b) fluoranthene	(mg/kg)	0.1
Benzo (g, h, i) perylene	(mg/kg)	<0.1
Benzo (k) fluoranthene	(mg/kg)	<0.1
Chrysene	(mg/kg)	0.1
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	0.2
Fluorene	(mg/kg)	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	<0.1
Naphthalene	(mg/kg)	<0.1
Phenanthrene	(mg/kg)	0.3
Pyrene	(mg/kg)	0.2

Arsenic	(mg/kg)	8.1
Cadmium	(mg/kg)	<2.5
Chromium (Hexavalent)	(mg/kg)	< 1.1
Chromium (Total)	(mg/kg)	18.1
Copper	(mg/kg)	28.8
Lead	(mg/kg)	20.2
Mercury	(mg/kg)	<0.7
Nickel	(mg/kg)	21.5
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	122

Phenols Content	(mg/kg)	< 1.1
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pH Value		7.2
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SOM	(%)	1.9
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Total PAH Content	(mg/kg)	1.9
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Cyanide (Total)	(mg/kg)	< 1.1
Sulphate (As SO ₄)	(mg/l)	44.5

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


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TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5467 – FORT VALE**

REPORT NO. E11/GRM/406/008		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6962
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	31
STONE CONTENT: (%)	17

CLIENT SAMPLE REFERENCE:	BH10
SAMPLE LOCATION:	BH10
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Grey brown slightly sandy gravelly silty clay with organic matter

Acenaphthene	(mg/kg)	<0.1
Acenaphthylene	(mg/kg)	<0.1
Anthracene	(mg/kg)	<0.1
Benzo (a) anthracene	(mg/kg)	<0.1
Benzo (a) pyrene	(mg/kg)	<0.1
Benzo (b) fluoranthene	(mg/kg)	<0.1
Benzo (g, h, i) perylene	(mg/kg)	<0.1
Benzo (k) fluoranthene	(mg/kg)	<0.1
Chrysene	(mg/kg)	<0.1
Dibenzo (a,h) anthracene	(mg/kg)	<0.1
Fluoranthene	(mg/kg)	0.1
Fluorene	(mg/kg)	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	<0.1
Naphthalene	(mg/kg)	<0.1
Phenanthrene	(mg/kg)	0.1
Pyrene	(mg/kg)	0.1

Arsenic	(mg/kg)	1.6
Cadmium	(mg/kg)	<2.5
Chromium (Hexavalent)	(mg/kg)	2.4
Chromium (Total)	(mg/kg)	14.1
Copper	(mg/kg)	25.5
Lead	(mg/kg)	196
Mercury	(mg/kg)	<0.7
Nickel	(mg/kg)	11.7
Selenium	(mg/kg)	<5.0
Zinc	(mg/kg)	46.0

Phenols Content	(mg/kg)	< 1.3
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pH Value		7.8
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SOM	(%)	0.9
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Total PAH Content	(mg/kg)	1.7
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Cyanide (Total)	(mg/kg)	< 1.3
Sulphate (As SO ₄)	(mg/l)	21.5

NOTES:

1. Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
2. Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
6. Sample was supplied by customer.
7. MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.

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TEST REPORT

SPECIATED TOTAL PETROLEUM HYDROCARBON CONTENT

P5467

REPORT NO. E11/GRM/395/013

REPORT NO. E11/GRM/395/013		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 17/05/2011
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA Sample Reference:	Client Sample Reference:	Sample Location:	Sample Depth: (m)	Sample Matrix:	Visual Description:	Moisture Content: (%)	Stone Content: (%)	Aliphatics (mg/kg)							Aromatics (mg/kg)						
								>C ₅ to C ₆	>C ₆ to C ₈	>C ₈ to C ₁₀	>C ₁₀ to C ₁₂	>C ₁₂ to C ₁₆	>C ₁₆ to C ₂₁	>C ₂₁ to C ₂₅	>C ₆ to C ₇	>C ₇ to C ₈	>C ₈ to C ₁₀	>C ₁₀ to C ₁₂	>C ₁₂ to C ₁₆	>C ₁₆ to C ₂₁	>C ₂₁ to C ₂₅
11-6390	WS4	WS4	0.6-0.7	Loam	Black brown gravelly clayey silt with brick and organic matter (Fill)	26	28	0.09	< 0.04	< 0.04	< 13	16	28	49	< 0.04	< 0.04	< 0.04	< 13	< 13	31	61
11-6394	WS8	WS8	1.8-1.9	Clay	Black brown gravelly sandy clay with crushed brick (Fill)	18	41	0.09	< 0.03	< 0.03	< 12	< 12	< 12	24	< 0.03	< 0.03	< 0.03	< 12	< 12	< 12	24
11-6396	WS11	WS11	1.1-1.2	Clay	Brown grey sandy gravelly clay	7.0	37	0.05	< 0.03	< 0.03	< 11	< 11	< 11	13	< 0.03	< 0.03	< 0.03	< 11	< 11	< 11	12
11-6400	WS15	WS15	0.9-1.0	Clay	Black brown sandy gravelly clay with organic matter (Fill)	20	32	0.07	< 0.03	< 0.03	< 12	18	18	63	< 0.03	< 0.03	< 0.03	< 12	< 12	16	79

NOTES:

1. Analysis was carried out in accordance with NCA method statement: MS - CL - EPH and VPH.
2. Testing was carried out on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing a 10mm BS test sieve, this result has been corrected for moisture content but not for stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <105°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.
6. Sample was supplied by client.


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TEST REPORT

SPECIATED TOTAL PETROLEUM HYDROCARBON CONTENT

P5467 – FORT VALE

REPORT NO. E11/GRM/406/014

ORDER REFERENCE: GRM/P5467				DATE OF ISSUE: 23/05/2011			
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011			DATE OF RECEIPT: 04/05/2011			DATE OF TESTING: 05/05 TO 18/05/2011	

NCA Sample Reference:	Client Sample Reference:	Sample Location:	Sample Depth: (m)	Sample Matrix:	Visual Description:	Moisture Content: (%)	Stone Content: (%)	Aliphatics (mg/kg)							Aromatics (mg/kg)						
								>C ₅ to C ₆	>C ₆ to C ₈	>C ₈ to C ₁₀	>C ₁₀ to C ₁₂	>C ₁₂ to C ₁₆	>C ₁₆ to C ₂₁	>C ₂₁ to C ₃₅	>C ₅ to C ₇	>C ₇ to C ₉	>C ₉ to C ₁₀	>C ₁₀ to C ₁₂	>C ₁₂ to C ₁₆	>C ₁₆ to C ₂₁	>C ₂₁ to C ₃₅
11-6951	BH2	BH2	0.5-1.0	Clay	Dark brown slightly gravelly slightly sandy clay with organic matter	15	22	< 0.03	< 0.03	< 0.03	<11	<11	<11	17	<0.03	<0.03	<0.03	<5.7	<5.7	<5.7	8.9
11-6953	BH4	BH4	0.5-1.0	Clay	Brown grey gravelly sandy clay with some organic matter	18	14	< 0.02	< 0.02	< 0.02	<12	<12	<12	22	<0.02	<0.02	<0.02	<5.9	<5.9	<5.9	11
11-6954	BH4	BH4	1.2-1.65	Clay	Brown gravelly sandy clay with organic matter	21	10	< 0.02	< 0.02	< 0.02	<12	<12	<12	17	<0.02	<0.02	<0.02	<6.0	<6.0	<6.0	7.9
11-6955	BH5B	BH5B	0.5-1.0	Clay	Dark brown slightly sandy gravelly clay with some organic matter and crushed brick (fill)	22	19	< 0.02	< 0.02	< 0.02	<12	<12	<12	26	<0.02	<0.02	<0.02	<6.1	<6.1	<6.1	21.3
11-6956	BH6	BH6	0.5-1.0	Clay	Brown silty sandy gravelly clay with crushed brick and organic matter (fill)	19	30	< 0.02	< 0.02	< 0.02	<12	<12	<12	28	<0.03	<0.03	<0.03	<5.9	<5.9	<5.9	22



E11/GRM/406/014

NCA Sample Reference:	Client Sample Reference:	Sample Location:	Sample Depth: (m)	Sample Matrix:	Visual Description:	Moisture Content: (%)	Stone Content: (%)	Aliphatics (mg/kg)								Aromatics (mg/kg)							
								>C ₅ to C ₆	>C ₆ to C ₈	>C ₈ to C ₁₀	>C ₁₀ to C ₁₂	>C ₁₂ to C ₁₆	>C ₁₆ to C ₂₁	>C ₂₁ to C ₂₅	>C ₆ to C ₇	>C ₇ to C ₈	>C ₈ to C ₁₀	>C ₁₀ to C ₁₂	>C ₁₂ to C ₁₆	>C ₁₆ to C ₂₁	>C ₂₁ to C ₂₅		
11-6957	BH7	BH7	0.3	Clay	Brown red gravelly sandy clay with crushed brick (fill)	15	54	<0.02	<0.02	<0.02	<12	<12	19	72	<0.02	<0.02	<0.02	<5.7	8.9	41	98		
11-6959	BH8	BH8	0.3	Clay	Grey brown slightly silty sandy gravelly clay with organic matter	6.4	36	<0.04	<0.04	<0.04	20	32	41	145	<0.04	<0.04	<0.04	18	32	42	387		
11-6960	BH8	BH8	0.5-1.0	Clay	Brown grey slightly silty gravelly sandy clay	6.6	48	<0.02	<0.02	<0.02	17	31	39	113	<0.02	<0.02	<0.02	22	31	37	213		
11-6961	BH9	BH9	0.5-1.0	Clay	Brown grey slightly sandy gravelly clay with some organic matter	10	30	<0.02	<0.02	<0.02	19	35	41	116	<0.02	<0.02	<0.02	17	26	26	119		
11-6963	BH10	BH10	2.0-2.45	Clay	Grey brown slightly sandy clay	32	6.0	<0.02	<0.02	<0.02	<11	<11	<11	106	<0.02	<0.02	<0.02	<6.7	<6.7	6.9	76		

NOTES:

1. Analysis was carried out in accordance with NCA method statement: MS - CL – EPH and VPH.
2. Testing was carried out on an as received sample.
3. Concentrations are reported as a percentage mass of the dry soil passing a 10mm BS test sieve, this result has been corrected for moisture content but not for stone content.
4. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <105°C.
5. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.
6. Sample was supplied by client.

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TEST REPORT

Asbestos Presence

P5467

Report no. E11/GRM/395/012	
Order reference: GRM/P5467	Date of testing: 20/04 to 09/05/2011
Date of receipt: 19/04/2011	Date of issue: 17/05/2011

NCA sample reference:	Client sample reference:	Depth (m)	Sample Matrix	Asbestos Presence
11-6389	WS4	0.1-0.2	Soil	None Detected
11-6391	WS5	0.05-0.15	Soil	None Detected
11-6392	WS6	0.1-0.2	Soil	None Detected
11-6393	WS8	0.1-0.2	Soil	None Detected
11-6397	WS13	0.1-0.2	Soil	None Detected
11-6399	WS15	0.05-0.15	Soil	None Detected

NOTES:

1. Sample was supplied by customer.
2. Analysis was subcontracted to AOH.


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TEST REPORT

Asbestos Presence

P5467 – FORT VALE

Report no. E11/GRM/406/015	
Order reference: GRM-P5467	Date of testing: 05/05 to 18/05/2011
Date of receipt: 04/05/2011	Date of issue: 23/05/2011

NCA sample reference:	Client sample reference:	Depth (m)	Sample Matrix	Asbestos Presence
11-6951	BH2	0.5-1.0	Soil	None Detected
11-6952	BH3	0.3	Soil	None Detected
11-6953	BH4	0.5-1.0	Soil	None Detected
11-6955	BH5B	0.5-1.0	Soil	None Detected
11-6956	BH6	0.5-1.0	Soil	None Detected
11-6958	BH7	0.5-1.0	Soil	None Detected
11-6959	BH8	0.3	Soil	None Detected
11-6961	BH9	0.5-1.0	Soil	None Detected
11-6962	BH10	0.5-1.0	Soil	None Detected

NOTES:

1. Sample was supplied by customer.
2. Analysis was subcontracted to AOH.


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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467

REPORT NO. E11/GRM/395/008		
ORDER REFERENCE: GRM/P5467	DATE OF ISSUE: 17/05/2011	
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6388
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	42
STONE CONTENT: (%)	0.7

CLIENT SAMPLE REFERENCE:	WS1
SAMPLE LOCATION:	WS1
SAMPLE DEPTH:	0.05-0.15
VISUAL DESCRIPTION:	Dark brown gravelly sandy clay organic matter

Benzo (a) pyrene	(µg/l)	0.02
Benzo (b) fluoranthene	(µg/l)	0.04
Benzo (k) fluoranthene	(µg/l)	0.04
Benzo (g,h,i) perylene	(µg/l)	0.04
Indeno (1,2,3-c,d)pyrene	(µg/l)	0.06
Naphthalene	(µg/l)	0.38

Arsenic	(µg/l)	< 2.5
Cadmium	(µg/l)	< 2.5
Chromium (Total)	(µg/l)	< 2.5
Copper	(µg/l)	< 1.0
Lead	(µg/l)	< 1.0
Mercury	(µg/l)	< 1.0
Nickel	(µg/l)	< 2.5
Selenium	(µg/l)	17.6
Zinc	(µg/l)	< 1.0

Cyanide (Total)	(mg/l)	< 0.5
Ammonia	(mg/l)	0.5

PH VALUE	7.0
PHENOL INDEX	(µg/l) < 0.5
Sulphate	(mg/l) < 10

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to SAL.


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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467

REPORT NO. E11/GRM/395/009		
ORDER REFERENCE: GRM/P5467	DATE OF ISSUE: 17/05/2011	
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6390
SAMPLE MATRIX:	Loam
MOISTURE CONTENT: (%)	26
STONE CONTENT: (%)	28

CLIENT SAMPLE REFERENCE:	WS4
SAMPLE LOCATION:	WS4
SAMPLE DEPTH:	0.6-0.7m
VISUAL DESCRIPTION:	Black brown gravelly clayey silt with brick and organic matter (Fill)

Benzo (a) pyrene	(µg/l)	< 0.01
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	< 0.01
Benzo (g,h,i) perylene	(µg/l)	< 0.01
Indeno (1,2,3-c,d)pyrene	(µg/l)	< 0.01
Naphthalene	(µg/l)	0.23

Arsenic	(µg/l)	24.9
Cadmium	(µg/l)	< 2.5
Chromium (Total)	(µg/l)	< 2.5
Copper	(µg/l)	< 1.0
Lead	(µg/l)	< 1.0
Mercury	(µg/l)	< 1.0
Nickel	(µg/l)	< 2.5
Selenium	(µg/l)	< 1.0
Zinc	(µg/l)	< 1.0

Cyanide (Total)	(mg/l)	< 0.5
Ammonia	(mg/l)	1.3

PH VALUE	8.0
PHENOL INDEX	(µg/l) 3.0
Sulphate	(mg/l) 73

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to SAL.


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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467

REPORT NO. E11/GRM/395/010		
ORDER REFERENCE: GRM/P5467	DATE OF ISSUE: 17/05/2011	
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 16/05/2011

NCA SAMPLE REFERENCE:	11-6394
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	18
STONE CONTENT: (%)	41

CLIENT SAMPLE REFERENCE:	WS8
SAMPLE LOCATION:	WS8
SAMPLE DEPTH:	1.8-1.9m
VISUAL DESCRIPTION:	Black brown gravelly sandy clay with crushed brick (Fill)

Benzo (a) pyrene	(µg/l)	< 0.01
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	< 0.01
Benzo (g,h,i) perylene	(µg/l)	< 0.01
Indeno (1,2,3-c,d)pyrene	(µg/l)	< 0.01
Naphthalene	(µg/l)	0.02

Arsenic	(µg/l)	8.8
Cadmium	(µg/l)	< 2.5
Chromium (Total)	(µg/l)	5.3
Copper	(µg/l)	33.4
Lead	(µg/l)	< 1.0
Mercury	(µg/l)	< 1.0
Nickel	(µg/l)	< 2.5
Selenium	(µg/l)	< 1.0
Zinc	(µg/l)	< 1.0

Cyanide (Total)	(mg/l)	< 0.5
Ammonia	(mg/l)	0.2

PH VALUE	8.0
PHENOL INDEX	(µg/l) < 0.5
Sulphate	(mg/l) 892

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to SAL.



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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467

REPORT NO. E11/GRM/395/011		
ORDER REFERENCE: GRM/P5467	DATE OF ISSUE: 17/05/2011	
DATE & TIME OF SAMPLING: 12/04 TO 13/04/2011	DATE OF RECEIPT: 19/04/2011	DATE OF TESTING: 20/04 TO 09/05/2011

NCA SAMPLE REFERENCE:	11-6398
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	57
STONE CONTENT: (%)	3.6

CLIENT SAMPLE REFERENCE:	WS14
SAMPLE LOCATION:	WS14
SAMPLE DEPTH:	0.05-0.15m
VISUAL DESCRIPTION:	Grey brown sandy clay with organic matter

Benzo (a) pyrene	(µg/l)	0.03
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	0.05
Benzo (g,h,i) perylene	(µg/l)	0.03
Indeno (1,2,3-c,d)pyrene	(µg/l)	0.08
Naphthalene	(µg/l)	0.76

Arsenic	(µg/l)	8.8
Cadmium	(µg/l)	< 2.5
Chromium (Total)	(µg/l)	< 2.5
Copper	(µg/l)	< 1.0
Lead	(µg/l)	< 1.0
Mercury	(µg/l)	< 1.0
Nickel	(µg/l)	< 2.5
Selenium	(µg/l)	9.0
Zinc	(µg/l)	< 1.0

Cyanide (Total)	(mg/l)	< 0.5
Ammonia	(mg/l)	0.2

PH VALUE		8.3
PHENOL INDEX	(µg/l)	< 0.5
Sulphate	(mg/l)	< 10

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to SAL.



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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467 – FORT VALE

REPORT NO. E11/GRM/406/009		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6953
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	18
STONE CONTENT: (%)	14

CLIENT SAMPLE REFERENCE:	BH4
SAMPLE LOCATION:	BH4
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown grey gravelly sandy clay with some organic matter

Benzo (a) pyrene	(µg/l)	< 0.01
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	< 0.01
Benzo (g,h,i) perylene	(µg/l)	< 0.01
Indeno (1,2,3-c,d)pyrene	(µg/l)	< 0.01
Naphthalene	(µg/l)	0.17

Arsenic	(µg/l)	12.6
Cadmium	(µg/l)	<2.5
Chromium (Total)	(µg/l)	<2.5
Copper	(µg/l)	6.2
Lead	(µg/l)	<1.0
Mercury	(µg/l)	<1.0
Nickel	(µg/l)	<2.5
Selenium	(µg/l)	<1.0
Zinc	(µg/l)	10.6

Cyanide (Total)	(mg/l)	<0.5
Ammonia	(mg/l)	< 0.1

PH VALUE		8.1
PHENOL INDEX	(µg/l)	1.0
Sulphate	(mg/l)	< 10

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to Scientific.


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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467 – FORT VALE

REPORT NO. E11/GRM/406/010		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6955
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	0
STONE CONTENT: (%)	0

CLIENT SAMPLE REFERENCE:	BH5B
SAMPLE LOCATION:	BH5B
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Black brown sandy gravelly clay with organic matter

Benzo (a) pyrene	(µg/l)	< 0.01
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	< 0.01
Benzo (g,h,i) perylene	(µg/l)	< 0.01
Indeno (1,2,3-c,d)pyrene	(µg/l)	< 0.01
Naphthalene	(µg/l)	0.16

Arsenic	(µg/l)	8.7
Cadmium	(µg/l)	<2.5
Chromium (Total)	(µg/l)	<2.5
Copper	(µg/l)	24.1
Lead	(µg/l)	<1.0
Mercury	(µg/l)	1.9
Nickel	(µg/l)	<2.5
Selenium	(µg/l)	<1.0
Zinc	(µg/l)	<1.0

Cyanide (Total)	(mg/l)	<0.5
Ammonia	(mg/l)	< 0.1

PH VALUE	8.6
PHENOL INDEX	(µg/l) 0.9
Sulphate	(mg/l) 54.5

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to Scientific.



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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467 – FORT VALE

REPORT NO. E11/GRM/406/011		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6958
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	17
STONE CONTENT: (%)	8.7

CLIENT SAMPLE REFERENCE:	BH7
SAMPLE LOCATION:	BH7
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown red gravelly sandy clay with crushed brick (fill)

Benzo (a) pyrene	(µg/l)	< 0.01
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	< 0.01
Benzo (g,h,i) perylene	(µg/l)	< 0.01
Indeno (1,2,3-c,d)pyrene	(µg/l)	< 0.01
Naphthalene	(µg/l)	0.14

Arsenic	(µg/l)	56.4
Cadmium	(µg/l)	<2.5
Chromium (Total)	(µg/l)	<2.5
Copper	(µg/l)	33.0
Lead	(µg/l)	2.9
Mercury	(µg/l)	<1.0
Nickel	(µg/l)	<2.5
Selenium	(µg/l)	<1.0
Zinc	(µg/l)	<1.0

Cyanide (Total)	(mg/l)	<0.5
Ammonia	(mg/l)	< 0.1

PH VALUE		9.2
PHENOL INDEX	(µg/l)	1.0
Sulphate	(mg/l)	257

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to Scientific.


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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467 – FORT VALE

REPORT NO. E11/GRM/406/012		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6961
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	10
STONE CONTENT: (%)	30

CLIENT SAMPLE REFERENCE:	BH9
SAMPLE LOCATION:	BH9
SAMPLE DEPTH:	0.5-1.0m
VISUAL DESCRIPTION:	Brown grey slightly sandy gravelly clay with some organic matter

Benzo (a) pyrene	(µg/l)	< 0.01
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	< 0.01
Benzo (g,h,i) perylene	(µg/l)	< 0.01
Indeno (1,2,3-c,d)pyrene	(µg/l)	< 0.01
Naphthalene	(µg/l)	< 0.01

Arsenic	(µg/l)	< 2.5
Cadmium	(µg/l)	<2.5
Chromium (Total)	(µg/l)	<2.5
Copper	(µg/l)	17.4
Lead	(µg/l)	2.9
Mercury	(µg/l)	<1.0
Nickel	(µg/l)	<2.5
Selenium	(µg/l)	< 10
Zinc	(µg/l)	7.6

Cyanide (Total)	(mg/l)	<0.5
Ammonia	(mg/l)	< 0.1

PH VALUE		8.1
PHENOL INDEX	(µg/l)	1.0
Sulphate	(mg/l)	48.2

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to Scientific.


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TEST REPORT

GRM DEVELOPMENT SOLUTIONS LEACHATE ANALYSIS

P5467 – FORT VALE

REPORT NO. E11/GRM/406/013		
ORDER REFERENCE: GRM/P5467		DATE OF ISSUE: 23/05/2011
DATE & TIME OF SAMPLING: 11/04 TO 16/04/2011	DATE OF RECEIPT: 04/05/2011	DATE OF TESTING: 05/05 TO 23/05/2011

NCA SAMPLE REFERENCE:	11-6963
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	34
STONE CONTENT: (%)	6.0

CLIENT SAMPLE REFERENCE:	BH10
SAMPLE LOCATION:	BH10
SAMPLE DEPTH:	2.0-2.45m
VISUAL DESCRIPTION:	Grey brown slightly sandy clay

Benzo (a) pyrene	(µg/l)	< 0.01
Benzo (b) fluoranthene	(µg/l)	< 0.01
Benzo (k) fluoranthene	(µg/l)	< 0.01
Benzo (g,h,i) perylene	(µg/l)	< 0.01
Indeno (1,2,3-c,d)pyrene	(µg/l)	< 0.01
Naphthalene	(µg/l)	0.04

Arsenic	(µg/l)	17.4
Cadmium	(µg/l)	<2.5
Chromium (Total)	(µg/l)	<2.5
Copper	(µg/l)	14.0
Lead	(µg/l)	4.7
Mercury	(µg/l)	3.6
Nickel	(µg/l)	6.1
Selenium	(µg/l)	<1.0
Zinc	(µg/l)	26.5

Cyanide (Total)	(mg/l)	<0.5
Ammonia	(mg/l)	< 0.1

PH VALUE	8.0
PHENOL INDEX	(µg/l) 1.2
Sulphate	(mg/l) <10

NOTES:

1. Leaching was carried out in accordance with NRA R&D note 301 using a 10 : 1 by wet mass of sample extraction ratio.
2. Results have not been corrected for the extraction ratio with regards to the moisture content of the soil.
3. Results have not been calculated or reported as 'mg of contaminant leached per kg of soil at natural moisture content' as required by the NRA. This information is available on request.
4. Analysis was carried out in accordance with NCA method statements: MS - ICP metals water, MS - CL - Cyanide (Skalar), MS - CL - Anions and BS1377 Parts 1 and 3.
5. Testing was carried out on an as received sample.
6. Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep.
7. Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
8. Sample was supplied by client.
9. Ammonia, phenol and speciated PAH were subcontracted to Scientific.


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TEST REPORT

BS 1377 PLASTICITY INDEX AND MOISTURE CONTENT

P5467 Calder Vale

Report no. L11/GRM/164/001			
Order reference: GRM/P5467	Date of receipt: 19/04/2011	Date of testing: 29/04/2011 to 06/05/2011	Date of issue: 09/05/2011

NCA Sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Fines passing 425µm (%)	Liquid limit (%)	Plastic limit (%)	Plasticity index (%)	Moisture content (%)
11-6419	WS1 0.9-1.0	Disturbed	0.9-1.00	Brown slightly gravelly clay	97	27	16	11	12

NOTES:

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Plasticity index testing was in accordance with BS 1377 : Part 2 : 1990 Clauses 3, 4.4 (one-point) & 5.
3. Moisture content testing was in accordance with BS 1377 : Part 2 : 1990 Clause 3.2.3.1 .
4. The material was prepared from its natural state .
5. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report. The information will be provided if requested


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TEST REPORT

BS 1377 PLASTICITY INDEX AND MOISTURE CONTENT

P5467 Calder Vale

Report no. L11/GRM/164/002			
Order reference: GRM/P5467	Date of receipt: 19/04/2011	Date of testing: 26/04/2011 to 06/05/2011	Date of issue: 09/05/2011

NCA Sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Fines passing 425µm (%)	Liquid limit (%)	Plastic limit (%)	Plasticity index (%)	Moisture content (%)
11-6420	WS1 2.8-2.9	Disturbed	2.8-2.9	Brown slightly gravelly clay	96	25	13	12	5.4

NOTES:

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Plasticity index testing was in accordance with BS 1377 : Part 2 : 1990 Clauses 3, 4.4 (one-point) & 5.
3. Moisture content testing was in accordance with BS 1377 : Part 2 : 1990 Clause 3.2.3.1 .
4. The material was prepared from its natural state .
5. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report. The information will be provided if requested


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TEST REPORT

BS 1377 PLASTICITY INDEX AND MOISTURE CONTENT

P5467 Calder Vale

Report no. L11/GRM/164/003			
Order reference: GRM/P5467	Date of receipt: 19/04/2011	Date of testing: 26/04/2011 to 06/05/2011	Date of issue: 09/05/2011

NCA Sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Fines passing 425µm (%)	Liquid limit (%)	Plastic limit (%)	Plasticity index (%)	Moisture content (%)
11-6421	WS2 1.9-2.0	Disturbed	1.9-2.0	Brown slightly gravelly clay	88	16	11	5	6.4

NOTES:

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Plasticity index testing was in accordance with BS 1377 : Part 2 : 1990 Clauses 3, 4.4 (one-point) & 5.
3. Moisture content testing was in accordance with BS 1377 : Part 2 : 1990 Clause 3.2.3.1 .
4. The material was prepared from its natural state .
5. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report. The information will be provided if requested


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TEST REPORT

BS 1377 PLASTICITY INDEX AND MOISTURE CONTENT

P5467 Calder Vale

Report no. L11/GRM/164/004			
Order reference: GRM/P5467	Date of receipt: 19/04/2011	Date of testing: 26/04/2011 to 06/05/2011	Date of issue: 09/05/2011

NCA Sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Fines passing 425µm (%)	Liquid limit (%)	Plastic limit (%)	Plasticity index (%)	Moisture content (%)
11-6422	WS4 1.8-1.9	Disturbed	1.8-1.9	Brown grey slightly gravelly clay	99	36	20	16	25

NOTES:

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Plasticity index testing was in accordance with BS 1377 : Part 2 : 1990 Clauses 3, 4.4 (one-point) & 5.
3. Moisture content testing was in accordance with BS 1377 : Part 2 : 1990 Clause 3.2.3.1 .
4. The material was prepared from its natural state .
5. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report. The information will be provided if requested

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TEST REPORT

BS 1377 PLASTICITY INDEX AND MOISTURE CONTENT

P5467 Calder Vale

Report no. L11/GRM/164/005			
Order reference: GRM/P5467	Date of receipt: 19/04/2011	Date of testing: 26/04/2011 to 06/05/2011	Date of issue: 09/05/2011

NCA Sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Fines passing 425µm (%)	Liquid limit (%)	Plastic limit (%)	Plasticity index (%)	Moisture content (%)
11-6424	WS10 1.0-1.1	Disturbed	1.0-1.1	Grey brown slightly gravelly clay	98	36	18	18	20

NOTES:

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Plasticity index testing was in accordance with BS 1377 : Part 2 : 1990 Clauses 3, 4.4 (one-point) & 5.
3. Moisture content testing was in accordance with BS 1377 : Part 2 : 1990 Clause 3.2.3.1 .
4. The material was prepared from its natural state .
5. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report. The information will be provided if requested


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TEST REPORT

BS 1377 PLASTICITY INDEX AND MOISTURE CONTENT

P5467 Calder Vale

Report no. L11/GRM/164/006			
Order reference: GRM/P5467	Date of receipt: 19/04/2011	Date of testing: 26/04/2011 to 06/05/2011	Date of issue: 09/05/2011

NCA Sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Fines passing 425µm (%)	Liquid limit (%)	Plastic limit (%)	Plasticity index (%)	Moisture content (%)
11-6425	WS12 0.9-1.0	Disturbed	0.9-1.0	Grey brown slightly gravelly clay	98	40	23	17	26

NOTES:

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Plasticity index testing was in accordance with BS 1377 : Part 2 : 1990 Clauses 3, 4.4 (one-point) & 5.
3. Moisture content testing was in accordance with BS 1377 : Part 2 : 1990 Clause 3.2.3.1 .
4. The material was prepared from its natural state .
5. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report. The information will be provided if requested

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TEST REPORT

BS 1377 PLASTICITY INDEX AND MOISTURE CONTENT

P5467 Calder Vale

Report no. L11/GRM/164/007			
Order reference: GRM/P5467	Date of receipt: 19/04/2011	Date of testing: 26/04/2011 to 06/05/2011	Date of issue: 09/05/2011

NCA Sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Fines passing 425µm (%)	Liquid limit (%)	Plastic limit (%)	Plasticity index (%)	Moisture content (%)
11-6426	WS15 1.9-2.0	Disturbed	1.9-2.0	Brown clay	99	33	19	14	24

NOTES:

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Plasticity index testing was in accordance with BS 1377 : Part 2 : 1990 Clauses 3, 4.4 (one-point) & 5.
3. Moisture content testing was in accordance with BS 1377 : Part 2 : 1990 Clause 3.2.3.1 .
4. The material was prepared from its natural state .
5. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report. The information will be provided if requested

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BS 1377 WATER SOLUBLE SULFATE CONTENT AND pH OF SOIL**P5467 Calder Vale****Report no. L11/GRM/164/008**

Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6419	WS1 0.9-1.0	Disturbed	0.9 - 1.0	Brown slightly gravelly clay	100	< 0.1	< 0.1	7.2

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.


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BS 1377 WATER SOLUBLE SULFATE CONTENT AND pH OF SOIL**P5467 Calder Vale****Report no. L11/GRM/164/009**

Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6420	WS1 2.8-2.9	Disturbed	2.8 - 2.9	Brown slightly gravelly clay	100	< 0.1	< 0.1	7.1

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.


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BS 1377 WATER SOLUBLE SULFATE CONTENT AND pH OF SOIL**P5467 Calder Vale****Report no. L11/GRM/164/010**

Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6421	WS2 1.9-2.0	Disturbed	1.9 - 2.0	Brown slightly gravelly clay	96	0.2	0.2	7.2

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.


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Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6422	WS4 1.8-1.9	Disturbed	1.8 - 1.9	Brown grey slightly gravelly clay	100	0.1	0.1	6.7

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.


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BS 1377 WATER SOLUBLE SULFATE CONTENT AND pH OF SOIL**P5467 Calder Vale****Report no. L11/GRM/164/012**

Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6423	WS5 0.9-1.0	Disturbed	0.9 - 1.0	Brown slightly gravelly clay	100	0.2	0.2	6.5

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.


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BS 1377 WATER SOLUBLE SULFATE CONTENT AND pH OF SOIL**P5467 Calder Vale****Report no. L11/GRM/164/013**

Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6424	WS10 1.0-1.1	Disturbed	1.0 - 1.1	Grey brown slightly gravelly clay	100	0.6	0.7	6.5

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.


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BS 1377 WATER SOLUBLE SULFATE CONTENT AND pH OF SOIL**P5467 Calder Vale****Report no. L11/GRM/164/014**

Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6425	WS12 0.9-1.0	Disturbed	0.9 - 1.0	Grey brown slightly gravelly clay	99	0.1	0.1	6.6

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.


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Order reference: GRM/P5467

Date of receipt: 19/04/2011

Date of testing: 26/4/11 to 04/05/2011

Date of issue: 09/05/2011

NCA sample reference	Client sample reference	Sample type	Depth (m)	Sample description	Material passing a 2mm BS test sieve (% dry mass of original sample)	Sulfate content as SO ₃ of 2:1 soil/water extract (g/l):	Sulfate content as SO ₄ of 2:1 soil/water extract (g/l):	pH value
11-6426	WS15 1.9-2.0	Disturbed	1.9 - 2.0	Brown clay	100	0.1	0.1	7.1

NOTES

1. Sample preparation was in accordance with BS 1377 : Part 1 : 1990.
2. Sulphate testing was in accordance with BS 1377 : Part 3 : 1990 Clause 5.5.
3. pH testing was in accordance with BS 1377 : Part 3 : 1990 Clause 9.5.
4. Sulphate content as SO₄ has been calculated by multiplying the sulphate content as SO₃ by 1.2. BS 1377 : Part 3 : 1990 does not require SO₄ figures to be reported.

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TEST REPORT**DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION****P5467 - Fort Vale**

Report no. L11/GRM/170/002	
Order reference: GRM/P5467	Date of testing: 12/05/2011 to 13/05/2011
Date of receipt: 04/05/2011	Date of issue: 17/05/2011

NCA sample reference: 11-6973			Client reference: BH9 7.50-7.95		
Sample Description: Soft brown clay					
Preparation method:	BS 1377 : Part 1 : 1990 Clause 8.3	Orientation within original sample:	Vertical	Depth within original sample:	Taken from bottom of U100

Initial Properties	Sample height	mm	209
	Sample width	mm	103
	Moisture content	%	29
	Bulk density	Mg/m ³	1.92
	Dry density	Mg/m ³	1.49
	Rate of strain	%/min	0.7
	Type of membrane	-	Latex
	Membrane thickness	mm	0.4
Test Data	Cell pressure	kPa	140
	Maximum deviator stress	kPa	65
	Membrane correction	kPa	1.0
	Corrected maximum deviator stress	kPa	63.6
	Cumulative strain at failure	%	12.0
	Mode of failure	-	Plastic
	Shear strength (c _u)	kPa	32

NOTES

1. Testing was in accordance with BS 1377: Part 7: 1990 clause 8, single stage loading.
2. A certificate of sampling was not supplied.
3. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report.
The information will be provided if requested.

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TEST REPORT**DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION****P5467 - Fort Vale**

Report no. L11/GRM/170/001	
Order reference: GRM/P5467	Date of testing: 12/05/2011 to 13/05/2011
Date of receipt: 04/05/2011	Date of issue: 17/05/2011

NCA sample reference: 11-6972			Client reference: BH5B 4.0-4.45		
Sample Description: Soft brown gravelly clay					
Preparation method:	BS 1377 : Part 1 : 1990 Clause 8.3	Orientation within original sample:	Vertical	Depth within original sample:	Taken from bottom of U100

Initial Properties	Sample height	mm	209
	Sample width	mm	103
	Moisture content	%	17
	Bulk density	Mg/m ³	2.02
	Dry density	Mg/m ³	1.73
	Rate of strain	%/min	0.7
	Type of membrane	-	Latex
	Membrane thickness	mm	0.4
Test Data	Cell pressure	kPa	80
	Maximum deviator stress	kPa	73
	Membrane correction	kPa	1.5
	Corrected maximum deviator stress	kPa	71.5
	Cumulative strain at failure	%	16.8
	Mode of failure	-	Plastic
	Shear strength (c _u)	kPa	36

NOTES

1. Testing was in accordance with BS 1377: Part 7: 1990 clause 8, single stage loading.
2. A certificate of sampling was not supplied.
3. Some information required by BS 1377 : Part 1 : 1990 Clause 9 is not included in the report.
The information will be provided if requested.



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A P P E N D I X K

GRM TIER 1 ASSESSMENT CRITERIA									
LAND USE	Residential with Plant Uptake			Residential without Plant Uptake			Commercial & industrial		
CONTAMINANT	1%	2.50%	6%	% Soil Organic Matter			1%	2.50%	6%
				1%	2.50%	6%			
^a Arsenic	32	32	32	35	35	35	640	640	640
^a Cadmium	10	10	10	17.7	17.7	17.7	230	230	230
^b Chromium III	614	614	614	620	620	620	8,790	8,790	8,790
^b Chromium VI	4.15	4.15	4.15	4.17	4.17	4.17	34.5	34.5	34.5
^c Lead	450	450	450	450	450	450	750	750	750
^d Mercury	170	170	170	170	170	170	3600	3600	3600
^a Selenium	350	350	350	595	595	595	13,000	13, 000	13,000
^a Nickel	130	130	130	786	786	786	1800	1800	1800
^b Phenols	184	290	415	310	418	519	1,100,000	1,100,000	1,200,000
^b Copper	2330	2330	2330	6200	6200	6200	71,700	71,700	71,700
^b Zinc	3,750	3750	3750	40,500	40,500	40,500	667,000	667,000	667,000
^e Cyanide	34	34	34	34	34	34	34	34	34
^b Benzene	0.08	0.157	0.332	0.266	0.49	0.998	28	50	95
^b Toluene	119	270	611	607	1290	2710	869	1,920	4400
^b Ethylbenzene	65	154	354	167	381	843	518	1,220	2800
^b <i>o</i> - xylene	45	106	246	59.5	139	321	4,780	1,120	2600
^b <i>m</i> - xylene	44	103	240	55.4	130	302	625	1,470	3500
^b <i>p</i> - xylene	42	98.2	228	53.3	125	288	576	1,350	3200
^{b/f} Acenaphthene	210(326)	480	1000	2020(57)	3090(141)	3910(336)	85000(57)	98000(141)	100,000
^{b/f} Acenaphthylene	168	400	850	1950(86)	3020(212)	3870(506)	84,000	97000(212)	100,000
^{b/f} Anthracene	2300	4900	9200	20,100(1.84)	22,400	23,400	530,000	540,000	540,000
^b Benzo(a)anthracene	3.1	4.7	5.9	3.71	5.23	6.22	90	95	97
^b Benzo(a)pyrene	0.83	0.94	1	1	1.03	1.04	14	14	14
^b Benzo(b)fluoranthene	5.6	6.5	7	6.99	7.25	7.36	100	100	100
^b Benzo(ghi)perylene	40	46	47	43	43.6	43.8	650	660	660
^b Benzo(k)fluoranthene	8.5	9.6	10	10.1	10.3	10.4	140	140	140
^b Chrysene	6	8	9.3	8.84	9.74	10.1	140	140	140
^b Dibenzo(ah)anthracene	0.76	0.86	0.9	0.865	0.91	0.928	13	13	13
^b Fluoranthene	260	460	670	972	993	1000	23,000	23,000	23,000
^{b/f} Fluorene	160	380	780	1850(30)	2480(76)	2870(183)	64,000	69,000	71,000
^b Ideno(1,2,3-cd)pyrene	3.2	3.9	4.2	4.17	4.35	4.43	60	61	62
^b Napthalene	1.5	3.7	8.7	1.64	3.92	9.22	200(76)	480(183)	1100(432)
^{b/f} Phenanthrene	92	200	380	731(16)	872	943	22,000	22,000	23,000
^b Pyrene	560	1000	1600	2330	2380	2400	54,000	54,000	54,000
ALIPHATIC HYDROCARBONS									
^{b/f} C5-C6	30	55	110	30	55	113	3339(304)	6200(558)	13,000(1150)
^{b/f} C6-C8	73	160	370	73	162	371	8300(144)	18,000(322)	42,000(736)
^{b/f} C8-C10	19	46	110	19	46	110	2130(78)	5100(190)	12,000(451)
^{b/f} C10-C12	93(48)	230(118)	540(283)	93(48)	230(118)	540(283)	10,000(48)	24,000(118)	49,300(283)
^{b/f} C12-C16	740(24)	1700(59)	3000(142)	745(23.7)	1700(59.1)	3040(142)	61,000(24)	83,000(59)	91,000(142)
^f C16-35	45,000	64,000	76,000	89,000	89,000	89,000	1,600,000	1,800,000	1,800,000
AROMATIC HYDROCARBONS									
^{b/f} C5-7 (benzene)	65	130	280	263	483	978	28,000(1220)	49,000(2260)	90,000(4710)
^{b/f} C7-8 (toluene)	120	270	611	607	1290	2710	59,000(869)	110,000(1920)	190,000(4360)
^{b/f} C8-C10	27	65	151	33.2	80.7	189	3670(613)	8560(1500)	18,000(3580)
^{b/f} C10-C12	69	160	346	177	417	866	17,000(364)	29,000(899)	34,500(2150)
^{b/f} C12-C16	140	310	593	1250(169)	1590(419)	1710	36,000(169)	37,000	37,800
^f C16-C21	250	480	770						
^f C21-C35	890	1110	1230	1340	1340	1340	28,000	28,000	28,000

Notes

a SGV (2009)

b LQM/CIEH values or derived using CLEAv1.06 with LQM/CIEH Data.

c 2002 SGV values used until further guidance is published

d SGV for inorganic Hg used (ref.2009 SGV, Pg5, Para.4)

e Atkins ATRISKsoil Value

f Oral, dermal and inhalation exposure compared with Oral HCV

 Values in brackets present TAC exceeding solubility & vapour saturation limits

UKDWS			EQS for List 1 & 2 Dangerous Substances (µg/l)	WRAS Values (mg/kg)
Parameter	Concentration	Units		
Acrylamide	0.1	µg/l		
Aluminium	200	µgAl/l		
Ammonium	0.5	mgNH4/l	15 (NH3)	
Antimony	5	µgSb/l		10
Arsenic	10	µgAs/l		10*
Benzene	1	µg/l	30	
Benzo(a)pyrene	0.01	µg/l		
Boron	1	mgB/l	2000	
Bromate	10	µgBrO3/l		
Cadmium	5	µgCd/l	5	3
Chromium	50	µgCr/l	32.8	25/ 600 (CrVI/Total)
Chloride (i)	250	mgCl/l		
Conductivity (i)	2500	µS/cm at 20°C		
Copper(ii)	2	mg/l		
Cyanide	50	µgCN/l		25/ 250 (Free/Complex)
1, 2 dichloroethane	3	µg/l		
Epichlorohydrin	0.1	µg/l		
Fluoride	1.5	mgF/l		
Hydrogen ion	10	pH value		
Iron	200	µgFe/l	1000	
Lead (ii)	25	µgPb/l		500
Manganese	50	µgMn/l		
Mercury	1	µgHg/l	1	1
Mineral Oil (TPH)	10	µg/l		100/10/1000 (diesel/petrol/mineral)
Nickel (ii)	20	µgNi/l		
Nitrate (iii)	50	mgNO3/l		
Nitrite (iii)	0.5	mgNO2/l		
Phenol	0.5	µg/l		5
Polycyclic Aromatic Hydrocarbons	0.1	µg/l	10 (Naphtahlene)	50
Selenium	10	µgSe/l		3
Sodium	200	mgNa/l		
Sulphate (i)	250	mgSO4/l		2000
Tetrachloroethene and Trichloroethene	10	µg/l		
Tetrachloromethane	3	µg/l		
Toluene/Xylene (m, p, o)		µg/l	50/30	50
Vinyl chloride	0.5	µg/l		
Zinc	5000	µg/l		

Pesticides			
Aldrin	0.03	µg/l	0.01
Dieldrin	0.03	µg/l	0.01
Heptachlor	0.03	µg/l	
Heptachlor epoxide	0.03	µg/l	
other pesticides	0.1	µg/l	Endrin 0.005, Total'drins (0.03)
Pesticides: Total (vi)	0.5	µg/l	

Reference

UK Water Supply (Water Quality) Regulations 2000

* PAHs - sum of specified compounds:

- benzo(b)fluoranthene
- benzo(k)fluoranthene
- benzo(ghi)perylene
- indeno(1,2,3-cd)pyrene

EQS for Hardness Related List 2 Dangerous Substances							
Substance	EQS type	EQS (ug/l) for Hardness bands (mg/l CaCO3)					
		0-50	>50-100	>100-150	>150-200	>200-250	>250
Freshwaters, suitable for all fishlife							
Copper (dissolved)	Annual average	1	6	10	10	10	28
Copper (dissolved)	95th percentile	5	22	40	40	40	112
Nickel (dissolved)	Annual average	50	100	150	150	200	200
Vanadium (dissolved)	Annual average	20	20	20	20	60	60
Freshwaters, suitable for Salmonid (game) fish							
Chromium (dissolved)	Annual average	5	10	20	20	50	50
Lead (dissolved)	Annual average	4	10	10	20	20	20
Zinc (total)	Annual average	8	50	75	75	75	125
Zinc (total)	95th percentile	30	200	300	300	300	500
Freshwaters, suitable for Cyprinid (coarse) fish							
Chromium (dissolved)	Annual average	150	175	200	200	250	250
Lead (dissolved)	Annual average	20	125	125	250	250	250
Zinc (total)	Annual average	75	175	250	250	250	500
Zinc (total)	95th percentile	300	700	1000	1000	1000	2000

Contaminant Thresholds for Subsurface Water Pipes

Contaminant	Thresholds (mg/kg)
Corrosion	
Wrapped Steel	pH<7 Cond >400µS/cm
Wrapped Ductile Iron	pH<5 Cond >400µS/cm, he not neutral
Copper	pH<5 >8 and Eh +ve
Toxic Substances	
Chromium (total) (Cr)	Applies to above pipe materials
Organic Contaminants	
VOC's	0.5 PE/0.125 PVC
BTEX & MTBE	0.1 PE/0.03 PVC
SVOC	2 PE/1.4 PVC
Phenols	2 PE/0.4 PVC
Cresols & Chlorinated Phenols	2 PE/0.04 PVC
Mineral Oil C11-C20	10 PE
Mineral Oil C21 - C40	500
Ether/Ketone/Amines, Nitrobenzene/Aldehydes	0.5 PE/0.02-1 PVC

Notes.

It is not recommended that water pipes should be laid in sites where these substances are identified or suspected

Local Utility Companies should be consulted prior to pipe specifications being finalised.

Ref: Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. UKWIR Ref. No. 10/WM/03/21. 2010.



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