

Appendix D BGS Borehole Records

SECTION OF [Murton Village - Low Farm Borehole.]

MURTON B.H.

(Murton 86 S.E. No.10.)

NZ 3295 7056

Surface Level 191.75 A.O.D.

Cores examined
Communicated 1953 by R.H.Price.

Date of boring or sinking 1953 Borer Royley Bros.

One-inch Map 15 Six-inch Map (County and Half-Quarter Sheet) Northumberland N.86 SE.

	BGS REGISTRATION NO	Thickness.			Depth from Surface.		
		Fathoms.	feet.	ins.	Fathoms.	feet.	ins.
	NZ 37 SW/36						
	PAGE NO. 1						
Open hole. Boulder clay.					1	3	6
Open hole. Broken sandstone.					6	1	0
Light grey, brown weathering fine to medium flaggy sandstone, much plant debris on partings.		25-6	2	3	6	4	1
COAL (1' 10" recovered)	METAL.	28-4		2	7	4	4
Grey fireclay, shaly, ironstone nodules, many plant remains.		31-5		3	4	5	1
Grey planty mudstone, Neuropteris, etc.		32-7		1	2	5	2
Black carbonaceous shale, much fusian.		32-11			4	5	2
Grey sandy shaly fireclay.		33-4			5	5	3
Grey earthy, rubbly, ganisteroid sandstone, ironstone nodules.		37-0		3	8	6	1
Grey banded earthy sandstone and siltstone, many plants.		38-2		1	2	6	2
Dark grey sandy mudstone, some irony nodules, few <u>Neladites</u> sp. irony at base.		49-11	1	5	9	8	1
COAL.	FQ	51-3		1	4	8	3
Grey sandy micaceous fireclay.		51-6			3	8	3
Grey early micaceous ganisteroid sandstone.		53-0		1	6	8	5
Dark grey rooty sandy mudstone passing down into mudstone with sandstone partings into grey Ganisteroid micaceous sandstone.		56-10		3	10	9	2
Dark grey siltstone with sandstone laminae, plant debris, partings of mudstone at base.		60-1		3	3	10	0
Dark grey sandstone with swirls & infillings of irony sandstone, Mussels at base, poorly preserved.					8	10	0
Black very sandy micaceous shale with thin irony sand intercalations, much plant debris, occasional fish scales, mussel fragments, and Spivorbis.				3	7	10	4
Sandstone, irony micaceous, with partings of black shale.					6	10	4

British Geological Survey	British Geological Survey	Thickness.			Depth from Surface.		
		Fathoms.	feet.	ins.	Fathoms.	feet.	ins.
Dark grey mudstone, well preserved though scarce mussels, few <u>Spivorbis</u> .			3	0	11	1	10
Grey siltstone with intercalations of sandstone.			2	5	11	4	3
Grey mudstone, few fragmentary mussels near base, mudstone, fragmentary at top.			3	0	12	1	3
Grey siltstone with sandstone intercalations. much plant debris.	1		0	3	13	1	6
Slumped grey siltstones with sandstone intercalations,			2	6	13	4	0
Light grey medium planty flaggy sandstone.			1	0	13	5	0
Grey mudstone & sandy mudstone, very occasional ironstone bands.	1		3	3	15	2	3
Grey banded very sandy mudstone.			3		15	2	6
Grey mudstone, occasional ironstone bands, very occasional mussels at 16-1-0.	1		0	6	16	3	0
Black shale.			2		16	3	2
<u>COAL.</u>			1	0	16	4	2
Dark shale (? canal - not examined)			6		16	4	8
<u>COAL.</u>			2		16	4	10
Dark shale.			1		16	4	11
<u>COAL.</u>			6		16	5	5
Black fireclay.			7		17	0	0
Black carbonaceous shale with coal streaks.			3		17	0	3
Black carbonaceous shale.			10		17	1	1
Grey mudstone, few ironstone bands, many plant remains, compression structures and pyrites at base. Thin veins ankerite.	1		2	6	18	3	7
<u>COAL.</u>			2	7	19	0	2
Brown-grey fireclay.			1	3	19	1	5
Grey very sandy rubbly fireclay.			2	4	19	3	9
Grey argillaceous sandstone, few rootlets.			1	8	19	5	5
Dark grey very sandy mudstone, thin bands of argillaceous sandstone, plant debris.			4	11	20	4	4
Grey mudstone, few plant remains.			3	3	21	1	7
Black mudstone, occasional traces of mussels.			3	5	21	5	0
Irony earthy micaceous sandstone, planty.			6		21	5	6
Grey slickensided fireclay.			2	4	22	1	10
Green-grey fireclay mudstone, ironstone nodules.			2	2	22	4	0

YARD SEAM.

BGS REGISTRATION NO.
NZ 37 SW 136
PAGE NO. 2

SECTION OF Murton Village borehole.Six-inch Map (County and Quarter Sheet) Northumberland. N.86 SE.

Brought forward	BGS REVISION NUMBER	Thickness.		Depth from Surface.		
		feet.	ins.	22	feet: 4	ins. 0
	NZ 37 SW/36					
	PAGE NO	3				
Grey argillaceous sandstone with shale bands.		3	0	23	1	0
Grey planty mudstone with coaly films.		4	3	23	5	3
Carbonaceous shale with coal streaks (Shaly coal 4")			4	23	5	7
Grey fireclay, very planty at top, shaly at base.		3	1	24	2	8
Grey very planty siltstone, & ironstone nodules, plants abundant at top.		1	3	25	5	8
Grey banded fine argillaceous wispy sandstone.		1	5	27	5	2
Grey banded argillaceous sandstone, few mussels.			5 10	28	5	0
Grey blocky sandy mudstone, few scattered mussels.		1	0	29	0	0
Grey very sandy siltstone, occasional mussels, sandstone						
● laminae, ironstone bands, also bands of mudstone.		1	1	30	1	6
Grey to dark grey mudstone, ironstone bands, thin sandy laminae, mussels throughout, scattered at top, abundant on some bedding planes at base.		1	1	31	2	10
Black planty sandy micaceous shale with mussels and <u>Spivorbis</u> , sp. ironstone nodules.			8	31	3	6
Dark grey mudstone, irony, scattered mussels and <u>Spivorbis</u> , pyritic.	190-10	1	4	31	4	10
<u>COAL</u>	193-1	2	3	32	1	1
Fireclay - black cannelly shale, pyritous at base.)	193-11		10	32	1	11
<u>COAL</u>	195-10	1	11	32	3	10
● Fireclay - grey, shaly, sandy at base.	197-10	2	0	32	5	10
Grey argillaceous sandstone, rooty.	198-6		8	33	0	6
Grey sandy mudstone, rooty, with ironstone nodules.	199-0		6	33	1	0
Grey very sandy mudstone, rooty and with sandstone laminae, debris.	200-4	1	4	33	2	4
Dark grey mudstone, rooty, ironstone nodules, much plant	202-8	2	4	33	4	8
Grey hard sandy mudstone, rooty, few ironstone nodules.	203-11	1	3	33	5	11
Alternating bands of grey shaly flaggy sandstone, much plant debris on dark micaceous partings, and thin bands of very sandy mudstone.	207-10	3	11	34	3	10
Grey to dark grey very sandy mudstone, some plant debris.	209-11	2	1	34	5	11
Grey flaggy wispy ankeritic micaceous flaggy sandstone.	210-8		9	35	0	8
Grey very sandy mudstone, plant debris and thin partings of shaly flaggy sandstone.	212-8	2	0	35	2	8
Dark grey mudstone, large ironstone nodules, occasional poorly preserved mussels.	217-4	4	8	36	1	4

British Geological Survey BGS REGISTRATION NO.

NZ 37 SW 36

PAGE NO. 4

	Thickness.		Depth from Surface.		124
	feet.	ins.	feet.	ins.	
	217-4				
<u>COAL.</u>	217-6	2	36	1	6
Band - black shale.	217-7	1	36	1	7
<u>COAL</u>	217-9	2	36	1	9
Black carbonaceous rooty shale.	218-3	6	36	2	3
<u>COAL.</u>	218-5	2	36	2	5
Black sliken-sided fireclay.	219-0	1	36	3	10
<u>COAL.</u>	221-4	1	36	5	4
Dark grey sandy fireclay, shaly towards the base.	223-10	2	37	1	10
Black carbonaceous rooty shale.	223-11	1	37	1	11
<u>COAL</u>	224-1	2	37	2	1
Band - black shale.	224-2	1	37	2	2
<u>COAL.</u>	225-1	11	37	3	1
Grey fireclay, ironstone nodules, very sandy at base.	227-5	2	37	5	5
Grey sandy mudstone, ironstone nodules, rooty.	232-11	5	38	4	11
Light grey fine wispy flaggy sandstone, Grey-sandy-mudstone, ironstone-nodules with thin bands of darker grey shaly and					
argillaceous sandstone, some plant remains.	238-6	5	39	4	6
Light grey fine to medium flaggy sandstone with a thin shaly parting.	243-0	4	40	3	0
Light grey massive current bedded medium sandstone with very occasional micaceous plant partings.	251-0	1	41	5	0
Light grey medium flaggy sandstone, much plant debris on black micaceous partings.	258-5	1	43	0	5
Grey medium flaggy sandstone much large plant debris, ankeritic cement.	259-11	1	43	1	11
Black mudstone, abundant mussels.	260-3	4	43	3	3
Grey sandy mudstone, few plant remains.	261-6	1	43	3	6
Brown-grey medium flaggy sandstone, ankeritic cement, debris.	261-8	2	43	3	8
Grey mudstone with sandy partings and plant debris.	263-0	1	43	5	0
Brown-grey ankerite cemented very flaggy sandstone.	263-7	7	43	5	7
Grey very sandy mudstone with siltstone bands and plant debris.	265-0	1	44	1	0
Brown-grey medium flaggy ankerite cemented flaggy sandstone.	265-3	3	44	1	3
Dark grey sandy mudstone, few plant remains.	265-9	6	44	1	9

Lost circulation at 39-5-6.

SECTION OF Murton Village borehole.Six-inch Map (County and Quarter Sheet) Northumberland, N 86 S.E.

	Thickness.		Depth from Surface.	
	feet.	ins.	feet.	ins.
Brought forward.	265-9		44	9
Dark grey mudstone, few bands of ironstone, pyritous in immediate roof of coal.	267-5	1 8	44	3 5
<u>COAL</u>	267-4	6	44	3 11
<u>CANNEL COAL</u>	268-1	10	44	4 9
<u>COAL</u>	269-6	9	44	5 6
Shale band	269-8	2	44	5 8
<u>COAL</u>	270-7	11	45	0 7
Dark grey to grey fireclay, slickensided, ironstone nodules, sandy towards base.		5 5	46	0 0
● Hard brown-ish -grey ankeritic mudstone with rootlets.		10	46	0 10
Greenish grey siltstone with sandy bands, few plant remains.		3 6	46	4 4
Grey to dark grey sandy siltstone occasional much plant debris, thin ankeritic bands.		1 8	47	0 0
Grey often greenish siltstone, occasional sandy bands, occasional plant debris.		4 6	47	4 6
Alternating bands of grey siltstone, plant debris, ironstone nodules, and thin slumped sandstone bands.		3 11	48	2 5
Grey fireclay with ironstone nodules, sandy at base.		2 10	48	5 3
Grey medium flaggy sandstone, micaceous, some plant debris.		5	48	5 8
● Alternations of dark grey siltstone, occasional plant remains, and thin slumped sandstone bands.		1 14	49	1 7
Greenish grey siltstone, thin sandy bands, very occasional plants, (fireclay-like texture)		3 5	49	5 0
Dark grey very sandy siltstone, much plant debris.		1 6	50	0 6
Dark grey mudstone, sandy bands towards base, few ironstone nodules, Neuropteris and well preserved plants.		3 5	50	3 11
Grey to light grey medium flaggy sandstone, some Calamites and plant debris.		2 0	50	5 10
Dark grey sandy mudstone with thin more sandy bands, well preserved plants.		1 5	51	1 4
Light grey medium sandstone, much ankeritic cement, dark occasional/micaceous planty partings.		4 0	51	5 4
Light grey medium flaggy sandstone, very micaceous partings.	1	0 8	53	0 0

BGS REGISTRATION NO.

NZ 37 SW/36

PAGE NO. 5

LOW MAIN.

HUTTON

	Thickness.		Depth from Surface.		126
	feet.	ins.	feet.	ins.	
Light grey medium massive sandstone, very flaggy locally at 54-1-0, ankeritic cemented bands, large mica flakes on partings. Coaly films at base.	2	5 3	55	5 3	BGS REGISTRATION NO. NZ 37 SW 1 36 PAGE NO. 6
<u>COAL</u>	1	3	56	0 6	
Grey fireclay.	2	0	56	2 6	
<u>COAL</u> shaly.		6	56	3 0	
Grey shaly fireclay few ironstone nodules.		4	56	3 4	
<u>COAL</u>		1	56	3 5	
Black carbonaceous shale.		3	56	3 8	
Black carbonaceous fireclay.		11	56	4 7	
Grey-green very slickensided shaly fireclay, with ironstone nodules.		1 8	57	0 3	
Green-grey mudstone, few rootlets. more sandy towards base.		3 9	57	4 0	
Grey siltstone, occasional more sandy bands and plant debris.		5 6	58	3 6	
Dark grey mudstone, well preserved plants, few ironstone bands.		2 6	59	0 0	
Grey argillaceous wispy flaggy sandstone.		11	59	0 11	
Grey siltstone with current bedded wispy fine sandstone partings, occasional slump structures, partings of mudstone. Calamites.	2	5 3	62	0 2	
Grey medium sandstone, some flaggy bands, uneven base.		9	62	0 11	
Grey blocky siltstone with wispy sandstone slumps, eroded top.		6	62	1 5	
Grey siltstone with thin wispy sandstone laminae.	2	5	62	3 10	
Light grey banded wispy flaggy sandstone with dark grey shaly partings, uneven base.		3 9	63	1 7	
Grey siltstone with slumped sandstone wisps. current bedding laminae at top, eroded top.		11	63	2 6	
Dark grey sandy mudstone with very occasional wispy sandstone laminae.	2	3	63	4 9	
Dark grey sandy mudstone with sandstone wisps.	1	0	63	5 9	

PLESSEY
HUTTON

SECTION OF Murton Village borehole.Six-inch Map (County and Quarter Sheet) Northumberland N.86 SE.

	BGS REGISTRATION		Thickness.		Depth from Surface.	
	feet.	ins.	feet.	ins.	feet.	ins.
Brought forward			63	5		9
Light greenish grey hard medium sandstone.		11	64	0		8
Dark grey siltstone with thin bands of wispy flaggy sandstone, slump structures.		5 11	65	0		7
Light grey, often greenish. medium to fine flaggy sandstone, large pellet of ironstone at 65-0-11, many shale pellets at top.		2 8	65	3		3
Grey siltstone, thin sandstone partings at base, disseminated plant fragments.		4 2	66	1		5
Grey fine argillaceous sandstone, dark micaceous partings, some coaly plant debris.		3	66	1		8
Grey very sandy siltstone with balls and slumps of sandstone, some comminuted plant debris.	1	0 7	67	2		3
Light grey fine wispy very flaggy sandstone, some iron bands.		3 9	68	0		0
Light grey fine flaggy sandstone, dark very finely micaceous partings.		2 4	68	2		4
Light grey fine sandstone, many shale pellets.		11	68	3		3
Light grey fine flaggy sandstone.		3 2	69	0		5
Grey argillaceous sandstone, ironstone nodules & plant debris. pellets at top.		10	69	1		3
Greenish grey medium sandstone shale & some ironstone		9	69	2		0
Grey siltstone with thin sandstone wisps and slumps. shale partings.		1 0	69	3		0
Light grey to grey, medium to fine flaggy sandstone with		6	69	3		6
Grey blocky siltstone with small blebs of slumped wispy sandstone, some comminuted plant debris.		5 7	70	3		1
Grey blocky siltstone with thin sandstone laminae, plant debris, thin band with slumps near base.		3 6	71	0		7
Light grey medium sandstone with shale pellets in top foot, current-bedding laminae dip steeply in this top portion. Dark micaceous partings and with ankeritic cemented bands.		2 2	71	2		9
Light grey medium flaggy sandstone, small iron pellets at base.		4 9	72	1		6
Dark grey siltstone, sandy wisps near base, plant debris.		3 11	72	5		5
Light grey fine to medium sandstone, flaggy in part, and with small shale pellets.		2 0	73	1		5
Light grey medium sandstone with abundant large shale pellets (banded siltstone) and thin bands of argillaceous sandstone.		3 1	73	4		6

	Thickness.		Depth from Surface.		128
	feet.	ins.	feet.	ins.	
Light grey greenish medium sandstone with small soft ironstone pellets.	4	6	74	3 0	
Light grey medium sandstone, many ironstone pellets.	4	9	75	1 9	
Light grey, greenish medium sandstone, few soft clay ironstone pellets.	1	11 9	76	3 6	
White medium to coarse sandstone, kaolinitic, much coalified plant debris.		5	76	3 11	
Greenish light grey medium to fine sandstone with iron bands full of plant debris.	1	4	76	5 3	
Light grey to white medium to coarse sandstone, large mica flakes, much coaly plant debris, especially in the top foot, some shale pellets at base.	1	1 3	78	0 6	BGS REGISTRATION NO. NZ 37 SW / 36 PAGE NO. 8
Dark grey sandy mudstone, more sandy towards base, with rootlets. (seat earth)		2 9	78	3 3	
Grey fine to medium ganisteroid sandstone		9	78	4 0	
Dark grey siltstone, passing down into very sandy mudstone, some plant remains.		2 6	79	0 6	
Brownish light grey medium wispy flaggy remains.		5	79	0 11	
Dark grey very sandy mudstone, few plant-		2 5	79	3 4	
Dark grey-brown-grey fireclay with thin shale parting near top, slickensided ironstone nodules at base.		4 0	80	1 4	
Greenish-grey fireclay-like mudstone with bands of sandstone, few rootlets.		8	80	2 0	
Grey sandy mudstone, fireclay-like. fireclay texture.		5 2	81	1 2	
Dark grey to black slickensided mudstone,		2 3	81	3 5	
<u>COAL</u> nodules.		4	81	3 9	
Grey very shaly fireclay, incipient ironstone	1	0	81	4 9	
Grey fine wispy flaggy sandstone.		9	81	5 6	
Grey very sandy mudstone, few rootlets.	1	2	82	0 8	
Grey mudstone.	1	9	82	2 5	
Dark grey mudstone, ironstone nodules & plants.	1	0	82	3 5	
<u>COAL.</u>		2	82	3 7	
Grey very sandy rubbly argillaceous ganisteroid sandstone.		5	82	4 0	

SECTION OF Murton Village borehole.Six-inch Map (County and Quarter Sheet) Northumberland N 86 SE

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	Thickness.		Depth from Surface.	
	feet.	ins.	feet.	ins.
Brought forward			82	4 0
Grey to light grey fine to medium wispy flaggy sandstone, occasional bands containing dark planty micaceous partings.	2	6	83	0 6
Dark grey mudstone, sandy at top, very few rootlets, few small ironstone nodules.	3	8	83	4 2
Dark grey mudstone, black at base, few small mussels at top, mussels abundant at base.	2	6	84	0 8
Black shale with ankeritic bands, also thin sandstone parting, ostracods <u>Spivorbis</u> sp. and some mussel fragments at base.		4	84	1 0
<u>COAL</u> Band - black shale		5	84	1 5
<u>COAL</u>		5	84	1 10
Grey fireclay.		7	84	2 5
Grey rooty rubbly argillaceous sandstone.		2	84	4 6
Light grey fine to medium flaggy sandstone, wispy at base, thin shale partings, some plant debris on partings.	1	2	84	5 9
Grey to dark grey sandy mudstone passing down into sandy siltstone, with plants.		2	86	1 10
Dark grey mudstone with occasional sandy bands.		2	86	3 9
<u>COAL</u> Brown-grey slickensided fireclay.		0	86	4 0
Greenish grey slickensided fireclay-mudstone.		4	86	4 4
Grey shaly flaggy sandstone, wispy, ankeritic cement at top.		2	87	0 10
Alternating bands of grey wispy flaggy sandstone and grey siltstone, sandstone predominant towards base.		3	87	4 7
Brown-grey medium sandstone, ankeritic cement.		2	88	0 11
Light grey medium massive current bedded sandstone, ankeritic cemented bands, coaly plant stems near base.		5	89	0 0
<u>COAL</u> Black fireclay with coaly partings.		11	89	0 11
Grey, very sandy shaly fireclay passing down into rooty argillaceous sandstone.		2	90	1 7
Dark grey rooty siltstone, sandy bands at base.		8	90	2 3
Rooty wispy flaggy sandstone, ankeritic bands.		2	90	4 3
		7	90	5 10
		5	91	0 3

BGS REGISTRATION NO.

NZ 37 SW/36

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BEAUMONT

SECTION OF Murton Village borehole.

Six-inch Map (County and Quarter Sheet) Northumberland N.86 SE.

	Thickness.		Depth from Surface.		
	feet.	ins.	97	feet.	ins.
Brought forward				1	2
Dark grey mudstone, planty, thin bands of siltstone and argillaceous sandstone.	3	10	97	5	0
<u>COAL</u>	2	4	98	1	4
Grey sliken-sided fireclay } TOP BUSTY. BGS REGISTRATION NO. NZ 37 SW / 36	10	10	98	2	2
<u>COAL</u> } PAGE NO. "		5	98	2	7
Brown-grey sliken-sided fireclay.	1	7	98	4	2
Grey sandy siltstone with bands of argillaceous sandstone, rooty at top, some irony nodules.	2	10	99	1	0
Alternating bands of grey to light grey wispy flaggy sandstone and grey rubbly argillaceous sandstone, ironstone nodules, and few partings of dark grey mudstone with plants.	0	10	100	1	10
Light grey medium wispy flaggy sandstone with some dark finely flaggy bands, shale pellets at base.		11	100	2	9
Light grey medium sandstone, flaggy in part, ankerite cemented bands, much plant debris in bottom 3".	3	2	100	5	11
Dark grey to black mudstone, plants abundant at base. few rootlets.	1	8	101	1	7
Dark grey very sandy mudstone with partings of siltstone,	1	11	101	3	6
Black carbonaceous shale, pyritous. fireclay-like.		1	101	3	7
Dark grey mudstone, large ironstone nodules, sliken-sided.		6	101	4	1
Light grey very wispy flaggy sandstone, rooty. pyritic at top.	1	1	101	5	2
Black carbonaceous shale, some ironstone nodules, shale very	1	2	102	0	4
Black sliken-sided fireclay.	1	11	102	2	3
Dark grey rubbly argillaceous sandstone, rooty. partings.		7	102	2	10
Light grey medium flaggy sandstone, ganisteroid with shaly	1	2	102	4	0
Light grey medium current bedded sandstone, coarse locally. at 622 ft. occasional micaceous partings.	1	4	104	2	0
Light grey medium to coarse current-bedded sandstone, locally with gritty partings, kaolinitic, coarser towards base.	3	1	107	3	0
Light grey fine to medium grit.	5	0	108	2	0
Coarse sandstone, ground away.	4	8	109	0	8
Light grey to white medium to coarse grit, kaolinitic.	5	0	109	5	8
Dark grey mudstone partings		1	109	5	9
Light grey medium to coarse grit, much plant debris and ironstone pellets.	4	9	110	4	6

British Geological Survey

BGS REGISTRATION

NZ 37 SW 13

PAGE NO. 12

	Thickness.		Depth from Surface.		132
	feet.	ins.	feet.	ins.	
Light grey medium sandstone.	665-6	1 0	110	5 6	
<u>COAL</u> THREE-QUARTER nodules.	667-6	2 0	111	1 6	
Grey fireclay, thin sandy bands and ironstone nodules.	670-0	2 6	111	4 0	British Geological Survey
Grey rooty mudstone, soft.	672-8	2 8	112	0 8	
Brown-grey fireclay sandy towards base.	673-6	10	112	1 6	
Dark grey rooty mudstone with plant remains.	675-1	1 7	112	3 1	
<u>COAL</u> ironstone nodules.	675-4	3	112	3 4	British Geological Survey
Grey fireclay.	677-2	2 4	112	5 8	
Grey rubbly rooty micaceous argillaceous sandstone.	678-1	5	113	0 1	
Grey to light grey fine, finely flaggy sandstone with shaly beds at base.	679-8	1 7	113	1 8	British Geological Survey
Grey very sandy micaceous siltstone, some ironstone nodules.	680-3	7	113	2 3	
Grey mudstone, progressively more sandy towards base, thin sandstone band at base.	682-9	3 6	113	5 9	
Grey mudstone few ironstone nodules.	686-6	2 9	114	2 6	
Black shale, micaceous at base, horny mussels.	687-0	6	114	3 0	British Geological Survey
Grey rubbly argillaceous micaceous sandstone.	687-3	3	114	3 3	
Grey rubbly ganisteroid micaceous sandstone.	689-0	1 9	114	5 0	
Alternating bands of grey rubbly argillaceous sandstone and dark grey very sandy micaceous siltstone, rootlets throughout.	694-5	5 5	115	4 5	British Geological Survey
Grey fine micaceous flaggy sandstone.	694-10	5	115	4 10	
Grey argillaceous micaceous sandstone.	695-0	2	115	5 0	
Grey finely flaggy fine sandstone.	695-11	11	115	5 11	British Geological Survey
Grey rubbly argillaceous micaceous sandstone.	696-1	2	116	0 1	
Light grey fine wispy bedded flaggy sandstone.	698-6	2 5	116	2 6	
Grey to dark grey smooth mudstone.	699-10	1 4	116	3 10	
Grey fine flaggy sandstone with shale partings.	700-2	10	116	4 8	British Geological Survey
Dark grey sandy mudstone, few plants.	701-5	9	116	5 5	
<u>COAL</u>	702-0	1 7	117	1 0	
Black slickensided shale.	702-2	2	117	1 2	
<u>COAL</u>	702-9	7	117	1 9	British Geological Survey
Carbonaceous shale and slickensided					
Fireclay with thin coal partings.	705-1	1 4	117	3 1	
Shaly <u>COAL</u> (carnel)	705-7	6	117	3 7	

BROCKWELL

SECTION OF Murton Village borehole.

Six-inch Map (County and Quarter Sheet) Northumberland N.86 SE.

	Thickness.		Depth from Surface.	
	feet.	ins.	feet.	ins.
Brought forward		11	117	3 7
Shaly grey fireclay, sandy and micaceous at base.		11	117	4 6
Grey to light grey medium ganisteroid sandstone, very micaceous and rubbly at top, massive at base.	1	2	117	5 8
Light grey medium sandstone, massive at top, flaggy and wispy at base, shale pellets at 118-2-0	4	11	118	4 7
Dark grey sandy mudstone (not all recovered)	1	5	119	0 0
Light grey to grey fine wispy flaggy sandstone.		8	119	0 8
<u>COAL</u>		2	119	0 8 ¹
Black fireclay.		12	119	0 10
● Brown fireclay with pimply bands.	2	4	119	3 2
Grey banded fine flaggy sandstone with argillaceous sandstone partings, rooty structures & small slumps.	3	7	120	0 9
Dark grey sandy rooty mudstone, thin sandstone bands at base, ironstone nodules.	1	4	120	2 1
Grey to light grey fine wispy flaggy sandstone.	4	2	121	0 3
Dark grey hard sandy micaceous rooty mudstone.		5	121	0 8
Light grey fine wispy flaggy sandstone, thin partings of dark grey mudstone. Some slump structures.	1	3 11	123	4 7
Dark grey very sandy mudstone.		4	123	4 11
● Light grey fine wispy flaggy sandstone.		4	123	5 3
Dark grey mudstone.	1	4	124	0 7
Light grey fine to medium sandstone, thin mudstone partings at top associated with slump structures in flaggy sandstone, then more massive current bedded sandstone with dark micaceous partings. Some plant debris, foot, bands with ankeritic cement, plant stems & coaly films in bottom 2	1	10	126	2 5
Black shale, fissile at top, few fish scales, slickensided at base.	1	3	126	3 8
<u>COAL</u> VICTORIA.		11	126	4 7
Brown hard sandy fireclay.	3	8	127	2 3
Light grey fine flaggy ganisteroid sandstone.	2	0	127	3 3
Light grey fine wispy flaggy sandstone.	3	2	128	0 5
Light grey medium to coarse current bedded sandstone, locally with dark micaceous partings.	2	0 9	130	1 2

BGS REGISTRATION NO.

NZ 37 SW/36

PAGE NO. 18

	Thickness.		Depth from Surface.		134
	feet.	ins.	feet.	ins.	
Light grey medium current bedded sandstone, frequent dark micaceous partings. massive.	4	5 3	135	0 5	
Light grey coarse kaolinitic sandstone,	2	2 5	138	2 10	
Black slickensided shale.		1	138	2 11	
Light grey medium massive sandstone.		5 11	139	2 10	
Grey very sandy shaly mudstone.		4	139	3 2	
Light grey medium to coarse kaolinitic, current bedded sandstone.	1	3 6	141	0 8	

BGS REGISTRATION NO.

NZ 37 SW 136

PAGE NO. 14



WINDOW SAMPLE RECORD

Status:-

FINAL

Date:-

15/12/2006

Project:		Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No	
Client:		Northumbrian Water Limited		Location:	
Method & Equipment:		Dynamic Sampling using a PC Tracker S110		Ground Level (mAOD):	
				66.325	
				Date:	
				17/10/2006	
				Sheet:	
				1 of 1	

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.40-0.60	J1		66.075		(0.25)	(1) TOPSOIL.		
0.80-1.00	J2		65.575		0.75	Firm light brown very sandy gravelly CLAY. Gravel is fine to coarse angular and consists of sandstone.		
1.20-1.65	SJ3	N17				Firm to stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone and coal.		
1.20-2.10	U4	(37)						
1.20		(44)						
1.50								
2.00		(48)			(2.35)			
2.10-2.55	SJ5	N21						
2.10-3.10	U6							
2.50		(55)						
3.00		(28)	63.225		3.10	Brown slightly clayey gravelly SAND. Gravel is fine subangular and consists of sandstone.		
3.10-3.55	SJ7	N16			(0.30)	Firm grey sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone.		
3.10-4.10	U8		62.925		3.40	Firm grey sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone.		
3.50		(97)			(0.75)			
4.00		(88)	62.175		4.15	Brown gravelly SAND. Gravel is fine angular and consists of coal and sandstone.		
4.10-4.55	SJ9	N36			(0.15)	(1) Firm stiff grey gravelly CLAY with sand bands.		
4.10-5.10	J10		62.025		4.30			
4.50		(100+)			(0.60)			
5.10-5.30	SJ11	50 for 75mm	61.425		4.90	Very weak grey MUDSTONE completely weathered. (Recovered as slightly sandy gravelly clay).		
			61.025		5.30	Window sample complete at 5.30m BGL.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth		From	To	Hours	From	To	
17/10/2006	0.00	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Blows recorded every 0.50m from 1.20m BGL. (4) Water strike at 3.00m BGL.
17/10/2006	5.30	1.10									

All dimensions in metres
Scale 1:50

For explanation of symbols and abbreviations see Key Sheets

Checked by:

SNTW

Logged by:
N. DonnisonContract No.
3454DD



WINDOW SAMPLE RECORD

 Status:-
FINAL
 Date:- 15/12/2006

Project:		Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No	
Client:		Northumbrian Water Limited		Location:	
		E.432193, 194 N:570823.037		British Geological Survey	
Method & Equipment:		Ground Level (mAOD):		Date:	
Dynamic Sampling using a PC Tracker S100		64.692		17/10/2006	
				Sheet:	
				1 of 1	

SAMPLES & TESTS			Water	STRATA			Improvement/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.40-0.60	J1		64.392		(0.30) 0.30	(1) TOPSOIL.	
0.80-1.00	J2				(0.90)	Stiff brown sandy gravelly CLAY. Gravel is fine subangular and consists of sandstone.	
1.20-1.65	SJ3	N15	63.492		1.20	Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone and coal.	
1.20-2.10	U4	(78)					
1.20		(102)					
1.50							
2.00		(38)			(1.85)		
2.10-2.55	SJ5	N20					
2.10-3.10	U6						
2.50		(75)					
3.00		(90)	61.642		3.05	Very weak/weak yellow brown medium grained SANDSTONE completely weathered.	
3.10-3.55	SJ7	N28			(0.95)	(Recovered as gravelly sand).	
3.50	U8	(100+)					
3.90-4.00	SJ9	73 for 150mm*	60.692		4.00	Window sample complete at 4.00m BGL.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth		From	To	Hours	From	To	
17/10/2006	0.00	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Blows recorded every 0.50m from 1.20m BGL.
17/10/2006	4.00	2.10									

 All dimensions in metres
 Scale 1:50

 For explanation of symbols and
 abbreviations see Key Sheets

 Checked by:

 Logged by:
 N. Donnison

 Contract No.
3454DD



WINDOW SAMPLE RECORD

 Status:-
FINAL
 Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No WS-10	
Client: Northumbrian Water Limited		Location: E:432233 999 N:570883 263	
Method & Equipment: Dynamic Sampling using a PC Tracker S100		Ground Level (m(AOD)): 62.260	Date: 17/10/2006
		Sheet: 1 of 1	

SAMPLES & TESTS			Water	STRATA			DESCRIPTION	Instrument/ Block/ID
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-0.40	J1		61.960		(0.30)	0.30	Soft dark brown sandy slightly gravelly CLAY. Gravel is fine subangular and consists of sandstone.	
0.40-1.00	B2						Soft brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone and coal.	
1.10-2.10	U3	(43)	59.860		(2.10)	2.10	Firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone and coal.	
1.20		(85)						
2.00	S34	(24)	58.310		(1.55)	1.55	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
2.10-2.55		N15						
2.10-3.10	U5	(46)	58.310		(3.95)	3.95	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
2.50		(46)						
3.00	S16	(28)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
3.10-3.55		N11						
3.10-4.10	U7	(57)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
3.50		(57)						
4.00	S18	(78)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
4.10-4.55		N36						
4.10-5.10	U9	(78)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
4.50		(78)						
5.00	C10	(70)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
5.10-5.55		N39						
5.10-6.10	U11	(34)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
5.50		(34)						
6.00	C12	(16)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
6.10-6.55		N6						
6.10-7.10	U13	(60)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
6.50		(60)						
7.00	C14	(27)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
7.10-7.55		N8						
7.10-8.00	U15	(100+)	54.260		(4.05)	4.05	Yellow brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to subrounded and consists of sandstone. (Possible Rockhead).	
7.50		(100+)						
Window sample complete at 8.00m BGL.								

Boring Progress and Water Observations					Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth	From	To	Hours	From	To	
17/10/2006										(1) Inspection pit dug prior to drilling (2) Blows recorded every 0.50m from 1.20m BGL.
17/10/2006	0.00 8.00									

 All dimensions in metres
 Scale 1:50

 For explanation of symbols and
 abbreviations see Key Sheets

Checked by:

SNT NV

Logged by:

N. Donnison

Contract No.

3454DD



WINDOW SAMPLE RECORD

Status:-

FINAL

Date:-

15/12/2006

Project:		Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No	
Client:		Northumbrian Water Limited		Location:	
		E.432284 264 N:570958.794			
Method & Equipment:		Ground Level (m(AOD)):		Date:	
Dynamic Sampling using a PC Tracker S100		61.509		17/10/2006	
				Sheet:	
				1 of 2	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.10-0.40	J1			61.109		(0.40) 0.40	Soft brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone.	
1.10-2.10	U2	(54)				(2.30)	Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone and coal.	
1.20		(60)						
2.00	SJ3	(54)						
2.10-2.55	N11							
2.10-3.10	U4							
2.50		(85)		58.809		2.70		
3.00				58.609		(0.20) 0.20	Yellow gravelly SAND. Gravel is fine to medium subangular to subrounded and consists of sandstone.	
3.10-3.55	SJ5	(39)					Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone and limestone.	
3.10-4.10	U6	N10						
3.50		(63)						
4.00								
4.10-4.55	SJ7	(24)						
4.10-5.10	U8	N19						
4.50		(26)						
5.00								
5.10-5.55	SJ9	(27)						
5.10-6.10	U10	N9				(5.00)		
5.50		(31)						
6.00								
6.10-6.55	SJ11	(28)						
6.10-7.10	U12	N12						
6.50		(47)						
7.00								
7.10-7.55	SJ13	(41)						
7.10-8.10	U14	N19						
7.50		(82)		53.609		7.90		

Boring Progress and Water Observations					Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth	From	To	Hours	From	To	
17/10/2006	0.00									(1) Inspection pit dug prior to drilling. (2) Blows recorded every 0.50m from 1.20m BGL.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>SN+M</i>	Logged by: N. Donnison	Contract No. 3454DD
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WINDOW SAMPLE RECORD

 Status:- **FINAL**
 Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No	
Client: Northumbrian Water Limited		Location: E.432284.264 N:570958.794	
Method & Equipment: Dynamic Sampling using a PC Tracker S100		Ground Level (m(AOD)): 61.509	Date: 17/10/2006
		Sheet: 2 of 2	

SAMPLES & TESTS			STRATA					Instrument Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
8.00 8.10-8.20	S15	(100+) 5 for 75mm		53.309		(0.30) 8.20	Weak grey MUDSTONE moderately to highly weathered. (Recovered as coarse subangular gravel). Window sample complete at 8.20m BGL.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth		From	To	Hours	From	To	
17/10/2006	8.20										(1) Inspection pit dug prior to drilling. (2) Blows recorded every 0.50m from 1.20m BGL.

All dimensions in metres
Scale 1:50

For explanation of symbols and abbreviations see Key Sheets

Checked by:

SMTM

Logged by:
N. DonnisonContract No.
3454DD



WINDOW SAMPLE RECORD

 Status:-
FINAL
 Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No WS-12	
Client: Northumbrian Water Limited		Location: E:432326 172 N:571021.429	
Method & Equipment: Dynamic Sampling using a PC Tracker S100		Ground Level (m(AOD)): 59.753	Date: 18/10/2006
		Sheet: 1 of 1	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.00-0.45	J1					(0.45)	Soft brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular and consists of sandstone.
			59.303			0.45	Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to angular and consists of sandstone.
1.10-2.10	U2	(26)					
1.20		(31)					
2.00		(39)					
2.10-2.55	SJ3	N16					
2.10-3.10	U4						
2.50		(104)					
3.00		(47)				(4.85)	
3.10-3.55	C5	N26					
3.10-4.10	U6						
3.50		(50)					
4.00		(14)					
4.10-4.55	SJ7	N9					
4.10-5.10	U8						
4.50		(27)					
5.00		(100+)					
5.10-5.30	SJ9	33 for 150mm	54.453			5.30	Window sample complete at 5.30m BGL.

Boring Progress and Water Observations					Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth	From	To	Hours	From	To	
18/10/2006 18/10/2006	0.00 5.30									(1) Inspection pit dug prior to drilling. (2) Blows recorded every 0.50m from 1.20m BGL.

 All dimensions in metres
 Scale 1:50

 For explanation of symbols and
 abbreviations see Key Sheets

 Checked by:

 Logged by:
 N. Donnison

 Contract No.
3454DD



BOREHOLE RECORD

Status:- **FINAL**
Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No
Client: Northumbrian Water Limited	Location: E:432272.599 N:571376.327	BH-23
Method & Equipment: Cable Percussion Rotary Coring using a Pilcon Wayfarer 1500/Atlas Copco	Ground Level (m(AOD)): 56.525	Date: 11/10/2006
		Sheet: 1 of 2

SAMPLES & TESTS			STRATA				Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	
0.10	J1			56.225		0.30	Soft brown slightly sandy CLAY with many roots and rootlets.
1.00	B2						Stiff brown slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is fine to coarse subangular and consists of sandstone and limestone. Cobbles are subrounded and consist of sandstone.
1.50-1.95	U3	(94)					
2.00	J4						
2.50-2.95	SB5	N20					
3.50	U6						
4.00-4.45	J7	(76)				(7.60)	
4.50-4.95	SB8	N15					
6.00-6.45	U9	(100)					between c.6.00 and 6.45m BGL ... very stiff.
6.50	J10			48.625		7.90 (0.10)	

Boring Progress and Water Observations					Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth	From	To	Hours	From	To	
11/10/2005	0.00	0.00			7.90	8.00	1.00	0.00	8.00	(1) Inspection pit dug prior to drilling.
11/10/2005	8.00	8.00	200mm	dry						

All dimensions in metres
Scale 1:50

For explanation of symbols and abbreviations see Key Sheets

Checked by:

SV+M

Logged by:

N. Donnison/l. Ujjan

Contract No.

3454DD



BOREHOLE RECORD

 Status:- **FINAL**

Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No BH-23
Client: Northumbrian Water Limited	Location: E:432272.599 N:571376.327	
Method & Equipment: Cable Percussion Rotary Coring using a Pilcon Wayfarer 1500/Atlas Copco		Ground Level (m(AOD)): 56.525
Date: 11/10/2006	Sheet: 2 of 2	

SAMPLES & TESTS			Water	STRATA			DESCRIPTION	Inspection/ Detail
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)		
8.00	CB11	100 for 71mm	48.525		8.00	Sandstone/siltstone BOULDER. (Recovered as subrounded cobbles) Boring complete at 8.00m BGL - continued by rotary drilling.		

Boring Progress and Water Observations					Chiselling			Water Added		GENERAL REMARKS
Date	Depth	Casing	Casing Dia	Water Depth	From	To	Hours	From	To	
										(1) Inspection pit dug prior to drilling.

 All dimensions in metres
Scale 1:50

For explanation of symbols and abbreviations see Key Sheets

Checked by:

Logged by:

N. Donnison/I. Ujjan

 Contract No.
3454DD



ROTARY CONTINUATION

Status:-

FINAL

Date:-

15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No BH-23	
Client: Northumbrian Water Limited		Location: E:432272.599 N:571376.327	
Method & Equipment: Cable Percussion Rotary Coring using a Pilcon Wayfarer 1500/Atlas Copco		Ground Level (m(AOD)): 56.525	Date: 11/10/2006
		Sheet: 1 of 5	

RUN DETAILS				STRATA				Instrument/ Facefill
Depth	TCR (SCR) RQD	(SPT) Fracture Index	Red'ed Level	Legend	Depth (Thick- ness)	DESCRIPTION		
						Discontinuities	Detail	
8.00	70 (40) 09	NR	48.525		8.00-8.35m ... possible zone of no recovery.		Boring complete at 8.00m BGL - continued by rotary drilling. (1) Dark brown BOULDER CLAY with boulders.	
		NI			8.35-8.55m ... non-intact.			
		12	47.925		8.55-8.65m ... closely spaced subhorizontal planar discontinuities.		Moderately strong very thin and thin bedded yellow brown dolomitic LIMESTONE moderately weathered.	
		NI			8.65-8.73m ... non-intact.			
		20			8.73-8.78m ... very closely spaced subhorizontal undulating rough discontinuities.			
		15			8.78-8.85m ... non-intact.			
		NI			8.85-8.92m ... closely spaced subhorizontal undulating rough discontinuities.			
9.20	100 (32) 0	NI			8.92-8.97m ... non-intact.			
					8.97-9.20m ... closely spaced subhorizontal planar and undulating rough discontinuities.			
9.70	100 (45) 20				9.20-10.20m ... non-intact.			
					10.20-10.60m ... closely spaced subhorizontal undulating rough tight and medium open discontinuities.			
		10			10.60-10.85m ... non-intact.			
		NI			10.85-10.95m ... closely spaced subhorizontal undulating rough and medium open discontinuities.			
		12			10.95-11.14m ... non-intact.			
		12			11.14-11.50m ... closely spaced subhorizontal planar to undulating rough and medium open discontinuities.			
		NI			11.50-11.60m ... non-intact.			
11.60	96 (65) 46	NR			11.60-11.70m ... possible zone of no recovery.			
		NI			11.70-12.00m ... non-intact.			

Drilling Progress and Water Observations								GENERAL REMARKS	
Date	Depth	Casing	Core Dia mm	Water		Flush		Returns	
				Strike	Standing	Type			
31/10/2006	8.00	0.00			3.30				(1) Inspection pit dug prior to drilling.

All dimensions in metres
Scale 1:25

For explanation of symbols and abbreviations see Key Sheets

Checked by:

SMTW

Logged by:

N. Donnison/I. Ujjan

Contract No.

3454DD



ROTARY CONTINUATION

Status:- **FINAL**

Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No BH-23	
Client: Northumbrian Water Limited		Location: E:432272.599 N:571376.327	
Method & Equipment: Cable Percussion Rotary Coring using a Pilcon Wayfarer 1500/Atlas Copco		Ground Level (m(AOD)): 56.525	Date: 11/10/2006
		Sheet: 2 of 5	

RUN DETAILS				STRATA			Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Index	Red'd Level	Legend	Depth (Thick- ness)	DESCRIPTION		
						Discontinuities		Detail Main
		12				12.00-12.25m ... closely spaced subhorizontal to subvertical undulating rough and medium open to open infilled with fine gravel discontinuities. 12.25-12.50m ... non-intact.	(As sheet 1 of 5) Moderately strong very thin and thinly bedded yellow brown dolomitic LIMESTONE moderately weathered.	
		NI						
		5	44.025		12.50	12.50-14.00m ... medium and occasionally closely spaced subhorizontal planar rough medium open and occasionally open discontinuities infilled with fine gravel.	Moderately strong and strong thinly bedded grey calcareous SILTSTONE (calcsilite) slightly to moderately weathered.	
		NI				14.00-14.25m ... non-intact.		
		86 (72) 21				14.25-15.30m ... closely and medium spaced subhorizontal planar smooth to undulating rough medium open and open discontinuities.		
		18				15.30-16.25m ... very closely spaced subhorizontal planar and undulating rough medium open and open discontinuities occasionally infilled with fine gravel and coarse sand.		

Drilling Progress and Water Observations								GENERAL REMARKS	
Date	Depth	Casing	Core Dia mm	Water	Strike	Standing	Flush	Type	Returns

(1) Inspection pit dug prior to drilling.

All dimensions in metres
Scale 1:25For explanation of symbols and
abbreviations see Key SheetsChecked by:
SWJ/NWLogged by:
N. Donnison/I. UjjanContract No.
3454DD



ROTARY CONTINUATION

Status:- **FINAL**
Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No	
Client: Northumbrian Water Limited		Location: E:43227Z.599 N:571376.327	
Method & Equipment: Cable Percussion Rotary Coring using a Pilcon Wayfarer 1500/Atlas Copco		Ground Level (m(AOD)):	Date:
		56.525	11/10/2006
		Sheet: 3 of 5	

RUN DETAILS				STRATA				Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Index	Red'cd Level	Legend	DESCRIPTION			
					Discontinuities	Detail	Main	
16.60	53 (35) 0	NR		xxxxxx	(1.90)	16.25-16.60m ... possible zone of no recovery.		(As sheet 2 of 5) Moderately strong and strong thinly bedded grey calcareous SILTSTONE (calcsiltite) slightly to moderately weathered.
		15		xxxxxx				
		NI		xxxxxx				
		13		xxxxxx				
18.60	80 (12) 12	NI		xxxxxx		16.60-16.80m ... closely and very closely spaced subhorizontal planar and undulating rough medium open discontinuities. 16.80-16.85m ... non-intact. 16.85-17.30m ... closely and very closely spaced subhorizontal planar and undulating rough and medium open discontinuities. 17.30-17.70m ... non-intact.		
		NI		xxxxxx				
		NR		xxxxxx				
		17		xxxxxx				
19.60	100 (90) 20	10		xxxxxx		17.70-18.80m ... possible zone of no recovery.		
		NI		xxxxxx				
		NI		xxxxxx				
		10		xxxxxx				
19.60	100 (90) 20	10		xxxxxx		18.80-19.45m ... non-intact.		
		NI		xxxxxx				
		NI		xxxxxx				
		10		xxxxxx				
19.60	100 (90) 20	10		xxxxxx		19.45-20.70m ... closely spaced subhorizontal to subvertical undulating to planar rough medium open and open discontinuities.		
		NI		xxxxxx				
		NI		xxxxxx				
		10		xxxxxx				

Drilling Progress and Water Observations								GENERAL REMARKS	
Date	Depth	Casing	Core Dia mm	Water	Strike	Standing	Flush	Type	Returns

(1) Inspection pit dug prior to drilling.

All dimensions in metres
Scale 1:25

For explanation of symbols and abbreviations see Key Sheets

Checked by: *SNJ*
N. Donnison/I. Ujjan

Contract No.
3454DD



ROTARY CONTINUATION

Status:- **FINAL**

Date:- 15/12/2006

Project: Shiremoor Flood Relief Scheme, North Tyneside		Exploratory Hole No BH-23	
Client: Northumbrian Water Limited		Location: E:432272.599 N:571376.327	
Method & Equipment: Cable Percussion Rotary Coring using a Pilcon Wayfarer 1500/Atlas Copco		Ground Level (m(AOD)): 56.525	Date: 11/10/2006
		Sheet: 5 of 5	

RUN DETAILS				STRATA			Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Index	Red'd Level	Legend	Depth (Thick- ness)	DESCRIPTION		
						Discontinuities		Main
25.10		I2	31.425		(1.80)	24.10-24.30m ... closely spaced subhorizontal planar rough discontinuities. 24.30-24.48m ... non-intact. 24.48-24.70m ... closely spaced subhorizontal planar rough very tight discontinuities. 24.70-25.10m ... possible zone of no recovery.	(As sheet 4 of 5) Moderately weak thinly laminated to very thinly bedded red MUDSTONE slightly to moderately weathered.	
		NI						
		I2						
		NR						
Borehole complete at 25.10m BGL.								

Drilling Progress and Water Observations

Date	Depth	Casing	Core Dia mm	Water		Flush		GENERAL REMARKS
				Strike	Standing	Type	Returns	
31/10/2006	25.10	0.00	92mm		20.60	Air	100%	(1) Inspection pit dug prior to drilling.

All dimensions in metres
Scale 1:25For explanation of symbols and
abbreviations see Key Sheets

Checked by:

Logged by:

N. Donnison/I. Ujjan

Contract No.

3454DD

DUNELM DRILLING CO.

BOREHOLE RECORD

Contract No. C6097 Client GREENER WHITEHOUSE
 Ground Level..... Location CAULDWELL AVE - MONKSEATON
 Date SEPT. 1993 BOREHOLE No. ROTARY B.H.1

Depth	Thick-ness	Legend	Description of Strata	Type of Sample	C kN/m ²	M %	Ø	Density Kg/m ³	N
0.20	0.20		TOPSOIL						
	3.80		DARK BROWN STONY CLAY						
4.00	0.50		ORANGE/BROWN SAND						
4.50	0.60		SANDSTONE BOULDER						
5.10	5.20		DARK BROWN & GREY MOTTLED STONY CLAY						
10.30	0.80		LIGHT GREY SANDSTONE						
10.90	0.30		DARK GREY SHALE						
11.20	0.10		COAL						
11.30	4.70		HARD GREY SHALE						
16.00	0.30		GREY SANDSTONE						
16.70	2.90		HARD GREY SHALE						
19.60	0.40		HARD DARK GREY SHALE						
20.00	0.50		COAL						
20.50	0.90		HARD GREY SHALE						
21.40	0.10		COAL						
21.65			HARD GREY SHALE						
24.00			LIGHT GREY SANDSTONE						
26.00			HARD GREY SHALE						
30.50									
			NO WORKINGS NO CAVITIES CASED TO <u>10.30 M.</u>						

Water Struck at SEEPAGE FROM CLAYS Standing Water Level.....