

MP-415 – Boxes 13 and 14



MP-415 – Boxes 15 and 16



MP-415 – Boxes 17 and 18



MP-415 – Boxes 19 and 20



MP-415 – Box 21





GEOTECHNICAL BORING LOG

Prepared By: MBL Date: 3/5/14Checked By: JCM Date: 3/5/14

SHEET 1 OF 2

BECHTEL NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN				GEOLOGIST: J. Howard			
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: A. Martin/D. Rhodes				Boring Orientation			
BORING NO.: MP-416				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (C)				Inclination: Vertical			
GROUND ELEV.: 809.6 ft (NAVD88)				NORTHING: 569,978 US ft (NAD83)				EASTING: 2,447,520 US ft (NAD83)				Azimuth: NA			
TOTAL DEPTH: 321.7 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						ROD TYPE: AWJ		HAMMER (ID): 140-lb Auto (163745)					
DATE STARTED: 6/6/13		COMPLETED: 6/23/13		HOLE DIA.: 4"		CASING DEPTH: 65.8 ft		CORE SIZE: HQ3		BITS USED: 4" Roller Cone					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL DESCRIPTION AND REMARKS			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					NO.
809.6					Ground Surface										
809.6	0.0	6	17	27						SS-1A SS-1B		FILL: LEAN CLAY (CL), brown (7.5YR 4/2), medium stiff, moist, low plasticity fines, few fine angular gravel, trace coarse sand, trace roots, strong HCl reaction			
805.9	3.7	9	14	15						SS-2		FILL: Gravelly SILT with Sand (ML), gray (7.5YR 7/1), light brown 7.5YR 6/3, and reddish brown (5YR 4/3), very stiff, dry to moist, low plasticity fines, some fine to coarse gravel, few to little fine to coarse sand, strong HCl reaction			
803.5	6.1	7	10	16						SS-3					
801.4	8.2	25	53	19						SS-4		FILL: Sandy SILT with Gravel (ML), reddish brown (5YR 4/3 to 2.5YR 4/3) and dark reddish brown (2.5YR 3/3), dry to moist, very stiff to hard, non-plastic to low plasticity fines, little coarse sand, little fine to coarse gravel, strong HCl reaction			
798.8	10.8	10	8	18						SS-5					
796.3	13.3	8	9	9						SS-6					
793.8	15.8	8	9	15						SS-7		FILL: SILTY GRAVEL with Sand (GM), reddish brown (5YR 4/3), medium dense, moist, fine to coarse gravel, little low plasticity fines, little coarse sand, strong HCl reaction			
791.4	18.2	21	30	32						SS-8		FILL: Sandy SILT with Gravel (ML), gray (5Y 5/1), hard, moist, non-plastic to low plasticity fines, little fine to coarse sand, little fine to coarse gravel, strong HCl reaction			
786.5	23.1	10	15	22						SS-9		FILL: CLAYEY SAND with gravel (SC), gray (2.5Y 6/1) to reddish brown (2.5YR 4/3), dense, moist, fine to coarse sand, little low to moderately plastic fines, little fine to coarse gravel, strong HCl reaction			
781.6	28.0	7	9	8						SS-10		FILL: Sandy SILT with Gravel (ML), reddish brown (5YR 4/3-5/3) to gray (5Y 6/1), very stiff to hard, dry to moist, low plasticity fines, little fine to coarse sand, little fine to coarse gravel, strong HCl reaction			
776.4	33.2	10	12	10						SS-11					
771.4	38.2	14	20	19						SS-12					
766.4	43.2	12	56	44/0.3						SS-13					
761.5	48.1									SS-14					

CLINCH RIVER SMR BORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



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SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: A. Martin/D. Rhodes			Boring Orientation		
BORING NO.: MP-416				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (C)			Inclination: Vertical		
GROUND ELEV.: 809.6 ft (NAVD88)				NORTHING: 569,978 US ft (NAD83)				EASTING: 2,447,520 US ft (NAD83)			Azimuth: NA		
TOTAL DEPTH: 321.7 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						ROD TYPE: AWJ		HAMMER (ID): 140-lb Auto (163745)			
DATE STARTED: 6/6/13		COMPLETED: 6/23/13		HOLE DIA.: 4"		CASING DEPTH: 65.8 ft		CORE SIZE: HQ3		BITS USED: 4" Roller Cone			
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	L	SOIL DESCRIPTION AND REMARKS	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.		O
761.0					Continued from previous page								
		9	10	13								FILL: SILTY SAND with gravel (SM), grayish brown (10YR 5/2), medium dense, moist, fine to coarse sand, some fine to coarse gravel sized limestone rock fragments, little non-plastic to low plasticity fines, strong HCl reaction (continued)	
756.5	53.1											SS-15	RESIDUAL SOIL: Sandy SILT with gravel (ML), reddish yellow (7.5YR 6/6), very stiff, moist, low plasticity fines, little fine to medium sand, little fine to coarse gravel sized limestone rock fragments, weak HCl reaction
		7	12	9									
751.4	58.2											SS-16	RESIDUAL SOIL: FAT CLAY (CH), strong brown (7.5YR 5/6), stiff, moist, high plasticity fines, trace fine sand, no HCl reaction
		4	5	7									
746.4	63.2											SS-17	RESIDUAL SOIL: Sandy LEAN CLAY (CL), reddish yellow (7.5YR 6/6), very stiff, moist, moderately plastic fines, little fine to coarse sand, few fine gravel sized limestone rock fragments, no to strong HCl reaction
		6	9	21									
744.1	65.5											SS-18	WEATHERED ROCK: LIMESTONE, sampled as SILTY SAND (SM), gray (5YR 5/1), very dense, moist, fine to coarse sand, little low plasticity fines, strong HCl reaction
		50/0.3											Soil drilling halted. Log continues on geotechnical coring log
													Observed water levels: 10.0 ft bgs, AM 6/7/13 4.6 ft bgs, AM 6/8/13 20.3 ft bgs, AM 6/9/13 Dry, AM 6/10/13 67.7 ft bgs, AM 6/11/13 67.9 ft bgs, AM 6/12/13 67.7 ft bgs, AM 6/13/13 67.9 ft bgs, AM 6/18/13 67.8 ft bgs, AM 6/19/13 67.7 ft bgs, AM 6/23/13

CLINCH RIVER SMR BORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



GEOTECHNICAL CORING LOG

Prepared By: MBL Date: 3/5/14Checked By: JCM Date: 3/5/14

SHEET 1 OF 6

BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: J. Howard			
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: A. Martin/D. Rhodes		Boring Orientation			
BORING NO.: MP-416				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (C)		Inclination: Vertical			
GROUND ELEV.: 809.6 ft		(NAVD88)		NORTHING: 569,978		US ft (NAD83)		EASTING: 2,447,520		US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 321.7 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08								HAMMER (ID): 140-lb Auto (163745)			
DATE STARTED: 6/6/13		COMPLETED: 6/23/13		CASING DEPTH: 65.8 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		RQD (ft) %	SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS				
									Begin Coring @ 65.8 ft				
743.8	65.8	0.7	4:15/0.7	(0.7)	(0.0)		Run 1		743.8	LIMESTONE (MICRITE), dark greenish gray (10Y 4/1), medium strong, very thinly to moderately bedded, moderately to slightly weathered, with trace to few laminated, wispy and diffuse Calcareous SILTSTONE interbeds, very dark gray (5Y 3/1) to black (N 2.5/) and trace very thinly bedded chert (dark gray to black); trace calcite filled pits, strong HCl reaction (Rockdell Formation-Unit D) 65.8-66.5ft: FZ, 30-90°, UR, PO, C, III 66.5-66.8ft: FZ, 25-90°, SR-PR, O, B-C, II 67.3,67.4,67.5ft: BJ, 20°, US, O, G-H, III			65.8
743.1	66.5	5.0	6:15	100%	0%	Run 2	742.0		67.6				
			5:45	(1.1)	(0.4)								
			4:15	22%	8%								
			5:30										
738.1	71.5	5.0	4:30										
			5:00	(4.4)	(3.4)	Run 3	737.5		737.5	WEATHERED ROCK: LIMESTONE-No Recovery			72.1
			3:30	88%	68%				LIMESTONE (MICRITE), dark gray (5Y 4/1-N 4/) and gray (2.5Y 5/1), strong, very thinly to moderately bedded and locally nodular, fresh, interbedded with trace to few laminated, wispy to irregular and diffuse Calcareous SILTSTONE, very dark gray (5Y 3/1) to black (N 2.5/); locally with stylolites and sparry calcite "bird eyes", locally fossiliferous, trace calcite filled pits, strong HCl reaction 76.5-77.8ft: FZ, 30-90°, SR, O, C, III, 1.0' Core loss in zone (mod. weathered) 72.4ft: J, 10°, UR, O, C, IV 73.4,73.6ft: BJ, 30°, SR-US, T-PO, F-H, III-IV, mod. weathered 73.7ft: J, 90°, SS, VT-PO, A, I-II 74.9,79.1,80.2,81.0,81.4ft: BJ, 30°, SR/US/PS, T-PO, B, II-IV 76.0ft: J, 70°, UR, VT, A, I, with calcite (intact) 76.2,76.5, 79.2ft: SH, 30°, PL, T-PO, C, III-IV 81.8,81.9,82.4,83.3,83.4,84.1,84.8,85.5ft: BJ, 20-30°, PR/US/UR, T-PO, B-C, II-III 82.1,85.3ft: SH, 30°, PL, T, C, II-III 85.5ft: J, 75°, UR, T-PO, C, IV				
			4:15										
			5:00										
733.1	76.5	5.0	4:00			Run 4							
			2:30	(4.0)	(2.9)								
			3:45	80%	58%								
			4:15										
			3:00										
728.1	81.5	5.0	3:45			Run 5							
			5:15	(5.0)	(3.5)								
			3:00	100%	70%								
			2:45										
			3:15										
			3:45										
723.1	86.5	5.0	3:15	(5.0)	(4.1)	Run 6						87.8-91.5ft: SZ/FZ, 60-90°, UL-SL-PL, VT-T, A-C, I-III, mostly intact with calcite 90.8,91.3ft: SH, 60°, PL-UL, T-PO, C, II-III, with calcite 91.1ft: SH, 30°, SL, T, C, III, with calcite 92.5ft: BJ, 40°, UR, T, B, II 93.2,94.2ft: J, 70°, US, VT, A, I, with calcite (intact) 93.6,95.0ft: J, 10°, US, T-PO, B-C, II 93.0ft: SH, 40°, PL, T, C, III, with calcite	
			3:00	100%	82%								
			3:15										
			3:30										
			3:30										
718.1	91.5	5.0	3:25	(5.0)	(4.9)	Run 7							
			3:30	100%	98%								
			3:30										
			3:30										
			3:45										
713.1	96.5	5.0	5:15	(5.0)	(3.0)	Run 8	713.1	LIMESTONE (MICRITE), gray to dark gray (2.5Y 5/1-4/1), strong, very thinly to moderately bedded, fresh, interbedded with few to little, laminated to thin, locally diffuse, Calcareous SILTSTONE, very dark gray (2.5Y 3/1), and few to little very thin to moderate chert beds, lenses, and nodules (dark gray to black, with calcite filled tensional fractures orthogonal to bedding); trace stylolites and sparry calcite "bird eyes", trace calcite filled pits, strong HCl reaction 97.3-99.2ft: SZ/FZ, 40-70°, PL, VT-T, C, II, with calcite 97.4,100.1ft: J, 30-50, SR, VT-T, A-C, I-III 100.6-101.3ft: SZ/FZ, 30-45°, PL-SL, VT-PO, C, II-III, with calcite, mostly intact 101.8ft: J, 50-90°, UR-SR, MW-T, D-C, V-III 102.9ft: SH, 40°, PL, T, C, III, with multiple calcite healed, slightly folded shears 104.7,105.2,105.6,105.9,106.2,106.3,106.4ft: SH, 35-40°, PL, T, C, II-III, with calcite			96.5		
			6:45	100%	60%								
			5:30										
			4:45										
			6:00										
708.1	101.5	5.0	4:30	(5.0)	(4.0)	Run 9							
			5:00	100%	80%								
			4:30										
			5:30										
			5:45										
703.1	106.5	5.0	8:00	(5.0)	(3.9)	Run 10		106.8ft: J, 25°, PR, O, D, IV 106.8,107.3,107.8,108.7,109.3,109.7,111.4ft: SH, 25-30°, VT, A, I, with calcite (intact) 107.3,109.0,109.5ft: SH, 20-30°, PL, T, B-C, II-III 108.5,110.6ft: BJ, 20-30°, PR-US, T-PO, B, II-III 110.6ft: J, 90°, PR, PO, C, III 110.2-110.3ft: SZ, 30-50°, PL, VT-O, C, II-III, with calcite, multiple shears 110.6ft: SH, 25°, PL, T, C, II 111.5-113.8ft: FZ, mechanically broken with 0.7' loss of core rec. (broke core bit during run) 113.1-113.2ft: SH, 40°, PL, T-O, G, V					
			8:15	100%	78%								
			8:15										
			9:15										
			7:15										
698.1	111.5	2.3	6:00	(1.6)	(0.5)	Run 11							
			6:15	70%	22%								
695.8	113.8	2.7	9:45/0.3	(2.2)	(1.4)	Run 12							

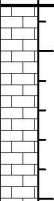
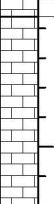
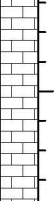
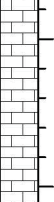
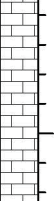
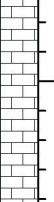
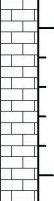

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



BECHTEL PROJECT NO.: 25847			AMEC PROJECT NO.: 6468-13-1072			COUNTY: Roane, TN		GEOLOGIST: J. Howard	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee						DRILLER: A. Martin/D. Rhodes		Boring Orientation	
BORING NO.: MP-416			DRILL METHOD: Mud Rotary/Core			DRILL MACHINE: CME-55 (C)		Inclination: Vertical	
GROUND ELEV.: 809.6 ft (NAVD88)			NORTHING: 569,978 US ft (NAD83)			EASTING: 2,447,520 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 321.7 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08					HAMMER (ID): 140-lb Auto (163745)		
DATE STARTED: 6/6/13		COMPLETED: 6/23/13		CASING DEPTH: 65.8 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits			
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		RQD (ft) %	SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS
									Continued from previous page
693.1	116.5	5.0	7:45/0.7 9:00 5:45 5:15 5:30 3:45 4:00 3:30	81% (5.0) 100%	52% (3.6) 72%	Run 13			LIMESTONE (MICRITE), gray to dark gray (2.5Y 5/1-4/1), strong, very thinly to moderately bedded, fresh, interbedded with few to little, laminated to thin, locally diffuse, Calcareous SILTSTONE, very dark gray (2.5Y 3/1), and few to little very thin to moderate chert beds, lenses, and nodules (dark gray to black, with calcite filled tensional fractures orthogonal to bedding); trace stylolites and sparry calcite "bird eyes", trace calcite filled pits, strong HCl reaction (continued) 113.8-114.3ft: FZ, 0.5' Mechanical loss of core (new core bit) 114.6ft: J, 10°, US, T-PO, C, III 114.8,115.0,115.5,115.9,116.9,117.1,117.4,117.7,118.0,118.4ft: SH, 30-40°, PL, T-PO, B-C, I-III 118.6,119.6ft: J, 60-70°, UR, T, B, II-III 119.1ft: SH, 60°, PL, T, B, II 120.5ft: BJ, 40°, PR, O, F, IV 122.7,123.5,124.1,125.6ft: SH, 20-30°, PL, T, B-C, II-III
688.1	121.5	5.0	3:30 4:00 3:45 3:30 3:45	(5.0) 100%	(5.0) 100%	Run 14			127.7,128.5,129.0ft: SH, 30°, PL, T, B, II 129.5,129.6,129.8,130.3,130.6ft: SH, 30-35°, PL, T-PO, B-D, II-III 130.8-131.3ft: FZ, 40°, PR, O, F, IV
683.1	126.5	5.0	3:15 3:15 2:45 3:00 3:15	(5.0) 100%	(3.9) 78%	Run 15			131.5-138.0ft: As above, with few thinly to moderately bedded Calcareous SILTSTONE and LIMESTONE (WACKESTONE) interbeds 131.7,132.4,132.5,132.8,134.2,134.6,134.9,135.1,135.2,135.3ft: SH, 40°, PL, T-PO, B-C, II-III 133.2ft: SH, 20°, PL, PO, C, III 135.7,136.1,136.3,136.4ft: BJ, 40°, PS/US-UR, T-PO, B-C, III-IV
678.1	131.5	5.0	4:00 4:00 4:30 7:15 8:45	(5.0) 100%	(2.5) 50%	Run 16			136.5,136.6,136.8,136.9,137.0ft: BJ, 30°, UR-PR, T-PO, B-C, II-III
673.1	136.5	5.0	7:15 6:00 4:15 4:00 4:45	(5.0) 100%	(4.6) 92%	Run 17 L3-67	671.6		CALCAREOUS SILTSTONE, greenish black (10Y 2.5/1), strong, laminated to very thinly bedded, fresh, interbedded with trace to some, laminated to very thin LIMESTONE (MICRITE), dark gray (N 4/), and trace very thin chert beds, lenses, and nodules (dark gray to black); strong HCl reaction; Limestone interbeds increase with depth (Rockdell Formation-Unit C) 138.1,138.2ft: SH, 30°, PL, T, C, II 141.6,141.7,141.9,142.0ft: J, 20-30°, UR-PR, PO-O, B-C, II 143.3,144.4ft: BJ, 20-30°, PR, T, B-C, II
668.1	141.5	5.0	9:15 6:15 5:00 5:00 4:45	(4.9) 98%	(4.3) 86%	Run 18			
663.1	146.5	5.0	4:00 4:00 4:30 4:30 4:30	(5.0) 100%	(5.0) 100%	Run 19			
658.1	151.5	5.0	5:45 5:15 6:00 5:00 4:15	(5.0) 100%	(5.0) 100%	Run 20	658.8		LIMESTONE (MICRITE), dark gray (N 4/), strong, laminated to thinly bedded, irregular to locally nodular, fresh, interbedded with some laminated to very thin, locally diffuse Calcareous SILTSTONE, greenish black (10Y 2.5/1), and trace very thin chert lenses and nodules (black); trace pyrite along laminations, strong HCl reaction 153.9ft: BJ, 30°, PR, PO, B, II
653.1	156.5	5.0	4:45 4:00 4:30 6:00 5:30	(5.0) 100%	(5.0) 100%	Run 21			161.0ft: BJ, 30°, PS, PO, B, II
648.1	161.5	5.0	4:45 4:00	(5.0) 100%	(5.0) 100%	Run 22			

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: J. Howard			
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: A. Martin/D. Rhodes		Boring Orientation Inclination: Vertical Azimuth: NA			
BORING NO.: MP-416				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (C)					
GROUND ELEV.: 809.6 ft (NAVD88)				NORTHING: 569,978 US ft (NAD83)				EASTING: 2,447,520 US ft (NAD83)					
TOTAL DEPTH: 321.7 ft				SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (163745)			
DATE STARTED: 6/6/13				COMPLETED: 6/23/13		CASING DEPTH: 65.8 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits					
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		ROD (ft) %	SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS				
									Continued from previous page				
643.1	166.5	5.0	4:00 4:00 4:00				Run 23 L3-68		LIMESTONE (MICRITE), dark gray (N 4/), strong, laminated to thinly bedded, irregular to locally nodular, fresh, interbedded with some laminated to very thin, locally diffuse Calcareous SILTSTONE, greenish black (10Y 2.5/1), and trace very thin chert lenses and nodules (black); trace pyrite along laminations, strong HCl reaction (continued)				
			4:00 3:30 3:30 2:45 3:30	(5.0) 100%	(5.0) 100%	170.4,170.5ft: SH, 30°, PL, VT-T, A-C, I-II, with calcite							
638.1	171.5								Run 24		639.4 LIMESTONE (WACKESTONE/MICRITE), gray (N 6/-N 5/), strong, very thinly to moderately bedded, locally with trace fossiliferous LIMESTONE (PACKSTONE) beds, and with little to some, laminated to moderate, wavy and irregular Calcareous SILTSTONE interbeds, greenish black (10Y 2.5/1); trace calcite filled pits, trace stylolites, strong HCl reaction		
			4:30 3:45 3:45 3:15	(5.0) 100%	(4.5) 90%	172.3,172.4,172.5,172.8,173.6,176.2ft: BJ, 30-35°, PR-UR/PS, T-PO, B-C, II							
633.1	176.5										Run 25		176.8-177.0ft: FZ, Mechanically broken, 0.1' Core loss
		5:45 4:30 3:30 3:45 3:45	(4.9) 98%	(4.2) 84%	177.0,178.9,180.6ft: BJ, 30-40°, UR/PR/PS, T-PO, B-C, II								
628.1	181.5					Run 26		178.5,178.8ft: J, 70°, VT, A, I, with calcite (intact)					
		3:45 3:15 3:00 2:45 2:45	(5.0) 100%	(4.6) 92%	181.8-182.3ft: Healed fractures, 60-70°, VT, A, I, with calcite; spaced 0.1'								
623.1	186.5							Run 27		182.2,183.3,183.7,185.3,185.7ft: BJ, 30-40°, PS/PR/UR, VT-PO, A-C, I-II			
		3:15 2:45 2:30 2:45 3:15	(5.0) 100%	(5.0) 100%	184.5ft: J, 70°, PR, T-PO, B, II								
618.1	191.5									Run 28		186.0-186.2ft: FZ, 30-40°, PR, PO, D, IV	
		3:15 3:15 3:00 3:15 3:30	(5.0) 100%	(5.0) 100%	187.7,188.1,190.7ft: BJ, 30-40°, US-UR/PR, T-PO, B-C, II								
613.1	196.5					Run 29						189.6ft: J, 50°, UR, T, C, II	
		3:30 3:00 3:00 3:00	(5.0) 100%	(5.0) 100%	193.6ft: SH, 30°, VT, A, I, with pink calcite (intact)								
608.1	201.5							Run 30				194.5ft: SH, 40°, PL, T, C, II	
		2:45 2:45 2:30 2:30 2:45	(5.0) 100%	(5.0) 100%	197.0,198.3ft: J, 55°, PR, VT-PO, C, IV, with calcite mineralization								
603.1	206.5									Run 31		198.8ft: BJ, 40°, PR, T-PO, B, II	
		1.9	4:15 4:30/0.9	(1.9) 100%	(0.7) 37%	206.6ft: J, 10°, UR, PO, B, II							
601.2	208.4					Run 32						207.0ft: SH, 35°, PL, O, C, II	
		3.1	1:45/0.1 3:15 3:00 2:30	(3.1) 100%	(2.5) 81%			207.1,207.4,208.1ft: J, 10-20°, O, B, II-III					
598.1	211.5							209.3,210.9,211.1ft: BJ, 30-35°, UR, T-PO, C, II					

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: J. Howard			
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: A. Martin/D. Rhodes		Boring Orientation			
BORING NO.: MP-416				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (C)		Inclination: Vertical			
GROUND ELEV.: 809.6 ft		(NAVD88)		NORTHING: 569,978		US ft (NAD83)		EASTING: 2,447,520		US ft (NAD83)			
TOTAL DEPTH: 321.7 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (163745)					
DATE STARTED: 6/6/13		COMPLETED: 6/23/13		CASING DEPTH: 65.8 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		ROD (ft) %	SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS				
									Continued from previous page				
593.1	216.5	5.0	4:15 3:30 3:30 3:15 3:30	(5.0) 100%	(4.9) 98%	Run 33			LIMESTONE (WACKESTONE/MICRITE), gray (N 6/-N 5/), strong, very thinly to moderately bedded, locally with trace fossiliferous LIMESTONE (PACKSTONE) beds, and with little to some, laminated to moderate, wavy and irregular Calcareous SILTSTONE interbeds, greenish black (10Y 2.5/1); trace calcite filled pits, trace stylolites, strong HCl reaction (<i>continued</i>)				
		5.0	4:00 3:00 3:00 2:45 3:15	(5.0) 100%	(5.0) 100%	Run 34			211.6ft: J, 10°, PR, PO, C, II (likely mechanical break) 215.3,216.0ft: BJ, 30°, US, T-PO, B, II 217.9ft: BJ, 30°, PR, T-PO, B, II				
		5.0	3:30 2:30 3:15 3:45 3:45	(5.0) 100%	(5.0) 100%	Run 35							
583.1	226.5												
		5.0	2:45 3:00 3:15 3:00 3:15	(5.0) 100%	(5.0) 100%	Run 36							
578.1	231.5												
		5.0	4:15 3:45 3:15 2:45 3:00	(5.0) 100%	(4.4) 88%	Run 37			LIMESTONE (MICRITE/WACKESTONE), gray to dark gray (N 5/-N 4/), strong, very thinly to thinly bedded, nodular, fresh, with few to little, laminated to thin, wavy and irregular, Calcareous SILTSTONE interbeds, black (N 2.5/) to greenish black (10Y 2.5/1); locally fossiliferous in LIMESTONE (WACKESTONE) beds, trace irregular calcite filled fractures, strong HCl reaction 233.4,234.1,235.6ft: BJ, 30-40°, UR-PS, T-O, B-F, II-IV 233.6,234.8ft: J, 40°, PR-PS, T-PO, B-C, II-III 235.9-236.2ft: FZ, 15-30°, SR, MO, K, IV 240.6ft: BJ, 35°, PS, T-PO, B, II				
573.1	236.5												
		5.0	3:30 3:00 3:15 3:15 3:30	(5.0) 100%	(5.0) 100%	Run 38							
568.1	241.5												
		5.2	3:00 3:45 3:00 3:00 3:00/1.2	(5.2) 100%	(4.7) 90%	Run 39			242.3-242.8ft: FZ, 30-50°, SR, PO-O, K, IV 245.2ft: SH, 40°, PL, T, C, II				
562.9	246.7												
		5.0	3:00 2:00 2:00 2:00 2:00	(4.8) 96%	(4.8) 96%	Run 40			CALCAREOUS SILTSTONE, greenish black (10Y 2.5/1) to dark gray and very dark gray (N 4/-N 3/), weak to strong, laminated to very thinly bedded, fresh, with little to some, laminated to thin LIMESTONE (MICRITE) interbeds, gray (N 5/); strong HCl reaction (Lincolnshire Formation-Fleanor Member-Unit B) 247.2-247.4ft: J, 10°, PR, PO, K, III, 0.2' Core loss (mechanical break/blocked off)				
557.9	251.7												
557.1	252.5	0.8	4:30/0.8	(0.6) 75%	(0.0) 0%	Run 41			251.7-252.8ft: FZ, 10-20°, PR-SR, PO-O, B-C, III (Mostly mechanical breaks)				
		4.2	1:00/0.2 5:30 2:45 2:00 3:00	(4.2) 100%	(3.8) 90%	Run 42			253.3ft: 30°, PS, T, B, II 254.1ft: J, 50°, PR, PO, B, II, with calcite mineralization				
552.9	256.7												
552.1	257.5	0.8	2:30/0.8	(0.7) 88%	(0.4) 50%	Run 43			CALCAREOUS SILTSTONE, dusky red (2.5YR 3/2) and very dusky red (2.5YR 2.5/2) to reddish black (2.5YR 2.5/1) and locally dark greenish gray (5GY 4/1) to greenish black (5GY 2.5/1-10Y 2.5/1), weak to medium strong and strong, laminated to very thinly bedded, locally with thickly bedded appearance, fresh, with few to little laminated to thin LIMESTONE (MICRITE) interbeds, dark gray (N 4/) to dark greenish gray (10Y 4/1); slightly to strongly bioturbated with vertical and horizontal burrows, trace calcite filled pits and burrows, strong HCl reaction				
		4.2	1:15/0.2 3:45 2:45 2:30	(4.2) 100%	(4.2) 100%	Run 44			257.0ft: J, 20°, SR, PO, B, II, 0.1' Core loss; likely mechanical break				

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: J. Howard	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: A. Martin/D. Rhodes			Boring Orientation
BORING NO.: MP-416				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (C)			Inclination: Vertical
GROUND ELEV.: 809.6 ft (NAVD88)				NORTHING: 569,978 US ft (NAD83)				EASTING: 2,447,520 US ft (NAD83)			Azimuth: NA
TOTAL DEPTH: 321.7 ft			SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (163745)		
DATE STARTED: 6/6/13			COMPLETED: 6/23/13		CASING DEPTH: 65.8 ft			CORE BARREL TYPE: HQ3/Diamond Impregnated core bits			
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %RQD (ft) %		SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS			
								Continued from previous page			
547.9	261.7	5.0	3:00 2:15 2:45 2:30 2:45 3:00	(5.0) 100%	(5.0) 100%	Run 45		254.7,257.3ft: BJ, 30-40°, PS/PR, T, B, II 256.6ft: SH, 40°, PL, VT, C, II CALCAREOUS SILTSTONE, dusky red (2.5YR 3/2) and very dusky red (2.5YR 2.5/2) to reddish black (2.5YR 2.5/1) and locally dark greenish gray (5GY 4/1) to greenish black (5GY 2.5/1-10Y 2.5/1), weak to medium strong and strong, laminated to very thinly bedded, locally with thickly bedded appearance, fresh, with few to little laminated to thin LIMESTONE (MICRITE) interbeds, dark gray (N 4/) to dark greenish gray (10Y 4/1); slightly to strongly bioturbated with vertical and horizontal burrows, trace calcite filled pits and burrows, strong HCl reaction (continued)			
542.9	266.7	5.0	2:15 2:15 2:30 2:30 3:00	(5.0) 100%	(5.0) 100%	Run 46					
537.9	271.7	5.0	3:00 2:45 3:00 3:15 3:45	(5.0) 100%	(5.0) 100%	Run 47		274.8ft: J, 60°, PS, T, B, II 276.4ft: BJ, 30°, PS, T, B, II			
532.9	276.7	0.7	2:15/0.7	(0.7)	(0.0)	Run 48		276.9ft: BJ, 30°, PS, PO, C, II			
532.2	277.4	4.3	1:15/0.3 3:45 3:15 3:00 3:15	100% (4.3) 100%	0% (3.7) 86%	Run 49		277.1-277.4ft: FZ, 30°, PS, PO, C, III 277.4-277.5ft: FZ, 30°, PR, PO, C, III (mechanical break) 279.1,280.3ft: BJ, 30°, PR/PS, T, B, II 280.6-280.7,281.3-281.4ft: FZ, 30°, PS/PR, PO-O, K, II			
527.9	281.7	5.0	5:15 4:00 3:45 3:15 4:00	(5.0) 100%	(5.0) 100%	Run 50		282.0,282.8ft: SH, 30°, PL, T, C, II			
522.9	286.7	5.0	4:15 2:30 2:15 2:30 3:15	(5.0) 100%	(5.0) 100%	Run 51					
517.9	291.7	5.0	3:15 2:15 2:15 2:30 2:45	(5.0) 100%	(5.0) 100%	Run 52					
512.9	296.7	5.0	3:30 2:45 2:45 2:30 3:00	(5.0) 100%	(4.9) 98%	Run 53		298.1,299.6,299.7ft: BJ, 30°, PS, T, B, II			
507.9	301.7	5.0	3:00 2:30 2:30 2:45 3:00	(5.0) 100%	(5.0) 100%	Run 54					
502.9	306.7	5.0	3:15 3:15	(5.0) 100%	(4.8) 96%	Run 55		307.9ft: J, 50°, PR, VT, A, I 308.3,310.1,311.0,311.3ft: BJ, 30°, PS, T, B, II			

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



BECHTEL PROJECT NO.: 25847	AMEC PROJECT NO.: 6468-13-1072	COUNTY: Roane, TN	GEOLOGIST: J. Howard
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee		DRILLER: A. Martin/D. Rhodes	Boring Orientation
BORING NO.: MP-416	DRILL METHOD: Mud Rotary/Core	DRILL MACHINE: CME-55 (C)	Inclination: Vertical
GROUND ELEV.: 809.6 ft (NAVD88)	NORTHING: 569,978 US ft (NAD83)	EASTING: 2,447,520 US ft (NAD83)	Azimuth: NA
TOTAL DEPTH: 321.7 ft	SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08		HAMMER (ID): 140-lb Auto (163745)
DATE STARTED: 6/6/13	COMPLETED: 6/23/13	CASING DEPTH: 65.8 ft	CORE BARREL TYPE: HQ3/Diamond Impregnated core bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS
								Continued from previous page
497.9	311.7	5.0	3:00 3:15 4:00	(5.0) 100%	(4.8) 96%	Run 56		CALCAREOUS SILTSTONE, dusky red (2.5YR 3/2) and very dusky red (2.5YR 2.5/2) to reddish black (2.5YR 2.5/1) and locally dark greenish gray (5GY 4/1) to greenish black (5GY 2.5/1-10Y 2.5/1), weak to medium strong and strong, laminated to very thinly bedded, locally with thickly bedded appearance, fresh, with few to little laminated to thin LIMESTONE (MICRITE) interbeds, dark gray (N 4/) to dark greenish gray (10Y 4/1); slightly to strongly bioturbated with vertical and horizontal burrows, trace calcite filled pits and burrows, strong HCl reaction (<i>continued</i>) 312.3ft: J, 50°, PR, T-PO, C, III, with calcite mineralization 312.3,312.4,312.5ft: BJ, 30°, T, C, II
492.9	316.7	5.0	3:45 2:30 3:00 3:00 3:30	(4.6) 92%	(4.1) 82%	Run 57		316.8-317.0ft: FZ, 10°, PR, PO, K, II (mechanical break) 317.0ft: J, 60°, PR, VT-PO, A, I 319.8,320.4ft: J, 45-50°, PR, T-PO, B, II 319.8,320.4,320.5ft: BJ, 30°, PR, T, B, II 321.1ft: SH, 30°, PL, T, C, II
487.9	321.7		2:45				487.9	321.7 Boring and coring terminated at 321.7 feet.

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14