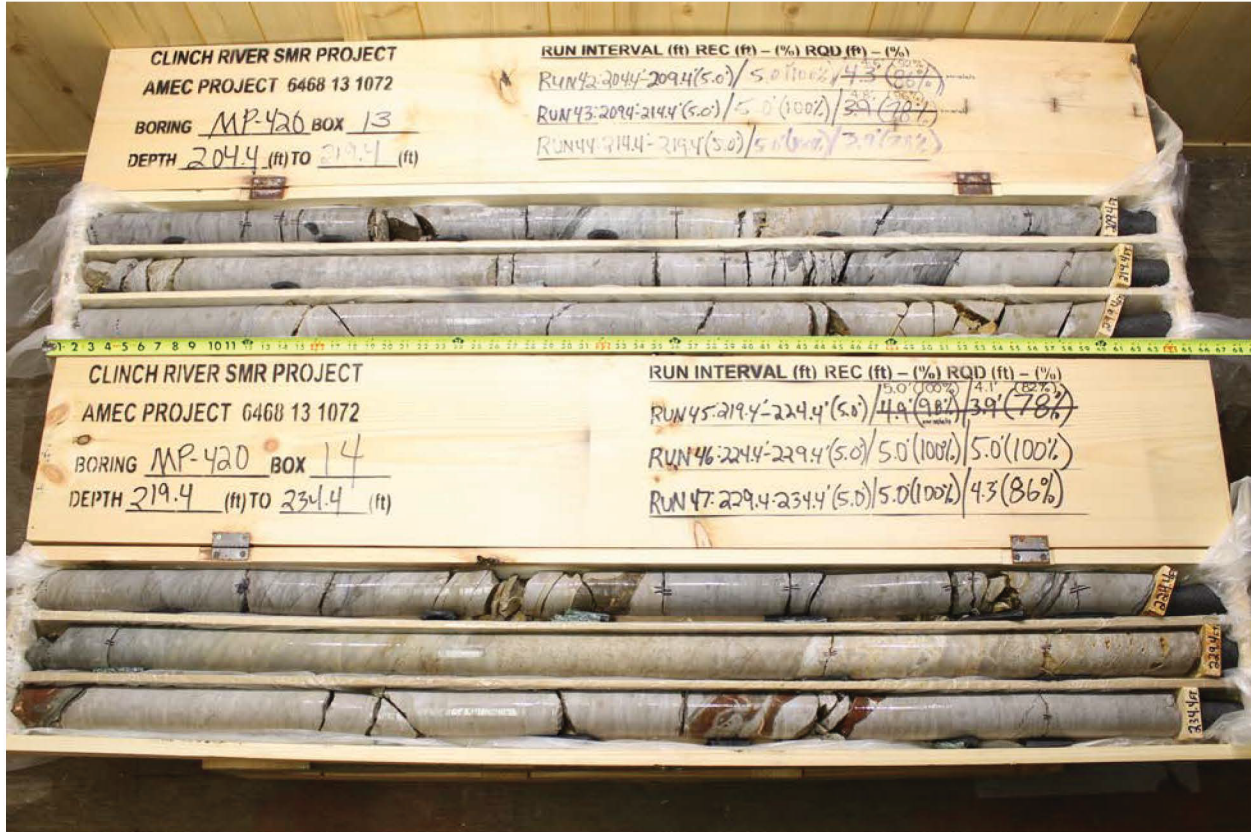


MP-420 – Boxes 13 and 14



MP-420 – Boxes 15 and 16



MP-420 – Boxes 17 and 18



MP-420 – Boxes 19 and 20





GEOTECHNICAL BORING LOG

Prepared By: MBL Date: 3/5/14

Checked By: JCM Date: 3/5/14

SHEET 1 OF 2

BECHTEL NO.: 25847		AMEC PROJECT NO.: 6468-13-1072			COUNTY: Roane, TN		GEOLOGIST: R. Clark					
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee					DRILLER: S. Snow/D. King			Boring Orientation				
BORING NO.: MP-421			DRILL METHOD: Mud Rotary/Core			DRILL MACHINE: CME-55 (TSD)			Inclination: Vertical			
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532		US ft (NAD83)		EASTING: 2,446,440		US ft (NAD83)		Azimuth: NA		
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08				ROD TYPE: AWJ		HAMMER (ID): 140-lb Auto (373705)				
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		HOLE DIA.: 4"		CASING DEPTH: 49.0 ft		CORE SIZE: HQ3		BITS USED: 4" Roller Cone		
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL DESCRIPTION AND REMARKS
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
803.6					Ground Surface							803.6 0.0
803.6	0.0	3	4	4							SS-1	
801.0	2.6	11	8	7							SS-2	
798.6	5.0	32	50/0.3								SS-3	
796.1	7.5	4	6	3							SS-4	
793.6	10.0	5	7	7							SS-5	
791.0	12.6	2	3	3							SS-6	
788.6	15.0	4	4	4							SS-7	
784.4	19.2	3	5	8							SS-8	
779.5	24.1	6	5	6							SS-9	
774.4	29.2	6	6	15							SS-10	
769.3	34.3	2	4	4							SS-11	
764.3	39.3	6	5	10							SS-12	
759.5	44.1	11	48	15							SS-13	
												801.6 2.0 799.1 4.5 796.6 7.0 794.1 9.5 791.6 12.0 789.1 14.5 785.6 18.0 781.6 22.0 771.6 32.0 761.6 42.0 Bit Refusal/SPT refusal at 48.9' with no penetration begin rock coring

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



BECHTEL NO.: 25847		AMEC PROJECT NO.: 6468-13-1072			COUNTY: Roane, TN		GEOLOGIST: R. Clark												
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee					DRILLER: S. Snow/D. King			Boring Orientation											
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core			DRILL MACHINE: CME-55 (TSD)			Inclination: Vertical											
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532		US ft (NAD83)		EASTING: 2,446,440		US ft (NAD83)											
Azimuth: NA		TOTAL DEPTH: 320.3 ft			SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08			ROD TYPE: AWJ											
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		HOLE DIA.: 4"		CASING DEPTH: 49.0 ft		CORE SIZE: HQ3											
BITS USED: 4" Roller Cone		ELEV. (ft)		DEPTH (ft)		BLOW COUNT			BLOWS PER FOOT		SAMP. NO.		LOG		SOIL DESCRIPTION AND REMARKS				
		0.5ft		0.5ft		0.5ft		0		20		40		60		80		100	
755.0																			
754.7		49.9		50/0.0														SS-14	
																		Soil drilling halted. Log continues on geotechnical coring log	
																		Observed water levels:	
																		3.6 ft bgs AM 7/6/13	
																		41.8 ft bgs, AM 7/7/13	
																		42.9 ft bgs, AM 7/8/13	
																		41.2 ft bgs, AM 7/9/13	
																		44.5 ft bgs, AM 7/10/13	
																		45.9 ft bgs, AM 7/11/13	
																		48.2 ft bgs, AM 7/16/13	
																		47.9 ft bgs, AM 7/17/13	

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



GEOTECHNICAL CORING LOG

Prepared By: MBL Date: 3/5/14

Checked By: JCM Date: 3/5/14

SHEET 1 OF 6

BECHTEL PROJECT NO.: 25847		AMEC PROJECT NO.: 6468-13-1072		COUNTY: Roane, TN		GEOLOGIST: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: S. Snow/D. King		Boring Orientation	
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: CME-55 (TSD)		Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532 US ft (NAD83)		EASTING: 2,446,440 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb Auto (373705)	
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %			
								Begin Coring @ 48.9 ft
754.7	48.9	1.3	5:55	(0.8)	(0.0)	Run 1		WEATHERED ROCK: LIMESTONE (MICRITE), light gray (5Y 7/1) and weak red (10R 5/2), weak to strong, highly weathered, with interbedded chert; weak to strong HCl reaction
753.4	50.2	5.0	2:08/0.3	(4.7)	(2.0)	Run 2		LIMESTONE (MICRITE), light gray (5Y 7/1), weak to medium strong and strong, laminated to very thin bedded, moderately to slightly weathered, slightly argillaceous, interbedded with few to little, very thin to thin chert beds, lenses, and nodules (jasperoidal, weak red, dark reddish brown to reddish gray with olive brown, few with red specks, calcite filled tensional fractures orthogonal to bedding through-out); trace calcite filled pits, strong HCl reaction (Lower Blackford Formation-Unit A)
748.4	55.2	5.0	5:35 5:00 6:37 5:18 2:45	(4.7) 94%	(2.0) 40%			
743.4	60.2	5.0	4:00 5:29 5:02 5:40 9:16	(5.0) 100%	(2.9) 58%	Run 3		50.2-51.5ft: FZ/J, 30°/60-70°, PR-SR, T-O, B-D, II-III, 0.3' core loss 51.9,52.8ft: BJ, 30°, PS, T, B, II-III 52.5ft: J, 0°, PR, PO, B, II 53.0-53.8ft: BJ/FZ, 30°/55-70°, PS, T, B, II 54.1,54.3,54.5,54.6ft: BJ, 30-35°, PS, T, B, II 56.1ft: J, 10°, PS, T-PO, B, III 56.4,56.8,57.0,57.2,57.4,58.1,58.3,58.4,59.2ft: BJ, 30-35°, PS, T-PO, B, II 57.7ft: J, 45°, PS, VT, A, II 60.4,60.7,61.1,61.2,61.8,63.4,63.1ft: BJ, 30-35°, PS, T, B, II 63.2,63.6,63.9,64.2,64.4,64.6,64.8,65.0ft: BJ, 30-35°, PS, T, B, II 60.8ft: J, 60°, PS, T, B, III 62.7ft: J, 35°, UR, PO, B, III
738.4	65.2	5.0	5:27 5:18 5:26 5:37 6:55	(5.0) 100%	(2.2) 44%	Run 4		
733.4	70.2	5.0	3:00 5:40 4:32 4:59 5:34	(4.6) 92%	(3.3) 66%	Run 5		LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), gray (5Y 6/1) to bluish gray (5PB 6/1), weak to medium strong, laminated and thin bedded into moderately to thickly bedded repeating fining upward sequences, slightly weathered to fresh, argillaceous, interbedded with trace to few laminated to very thin clayey Calcareous SILTSTONE, dark gray (N 4/) to black (N 2.5/), wispy to diffuse bedding, and with scattered medium to coarse sand sized, angular chert clasts/fragments (reddish brown); slight bioturbation with disturbed bedding and slightly nodular appearance, few stylolites, fenestral with sparry calcite "bird eyes" through-out, strong HCl reaction
728.4	75.2	5.0	3:45 3:08 2:53 2:45 2:59	(5.0) 100%	(5.0) 100%	Run 6		65.5,66.0,66.2,66.6,67.2,67.4,67.6,68.9,69.0,69.6ft: BJ, 30-35°, PS, T, B, II 65.8ft: J, 60°, PS, VT, A, II 66.2,66.6ft: FZ, core loss, moderately weathered 66.9ft: J, 20°, PR, T, B, II 71.5,72.2,72.9,74.7ft: BJ, 25-30°, PS, T, B, II
723.4	80.2	5.0	3:40 3:03 3:22 3:31 3:42	(5.0) 100%	(5.0) 100%	Run 7		78.0ft: BJ, 30°, PS, T, B, II 78.4ft: J, 50°, PS, T, B, II
718.4	85.2	5.0	3:33 2:54 3:21 2:15 3:00	(5.0) 100%	(5.0) 100%	Run 8		83.7ft: BJ, 30°, US, T, B, II, stylolites
713.4	90.2	5.0	3:08 2:41 2:48 2:38 2:41	(5.0) 100%	(4.4) 88%	Run 9 L7-25		86.3ft: J, 80°, PR, PO, B, III 86.7ft: J, 60°, PR, PO, B, III 86.1,86.3,87.5ft: BJ, 20-35°, PR, T, B, II
708.4	95.2	5.0	2:45 2:00 1:53 2:04 2:13 2:30 2:21	(5.0) 100%	(5.0) 100%	Run 10 Run 11		LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), bluish gray (5PB 5/1), gray (N 6/-N 5/) to dark gray and very dark gray (N 4/-N 3/), grading to black (N 2.5/) and reddish black (10R 2.5/1), with little greenish gray (10Y 5/1), weak to medium strong, laminated to moderately bedded, locally thickly bedded, fresh, argillaceous, interbedded with little to some, laminated to moderately bedded, clayey Calcareous SILTSTONE, weak red (7.5R 4/2; 5R 4/1) to dark greenish gray (10Y 4/1) and very dark gray (2.5Y 3/1), wispy/wavy to mostly diffuse bedding, and with trace scattered, subangular coarse sand to fine gravel sized clasts of chert, limestone, and dolomite; slight to moderate bioturbation, fenestral with sparry calcite "bird eyes", strong HCl reaction 88.6,89.7,89.8ft: BJ, 20-35°, PR, T, B, II 92.9,93.5ft: BJ, 20°, PR, PO, B, III 94.2ft: BJ, 35°, PS, PO, B, III

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: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: S. Snow/D. King		Boring Orientation	
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: CME-55 (TSD)		Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532 US ft (NAD83)		EASTING: 2,446,440 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb Auto (373705)	
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %			
								Continued from previous page
703.4	100.2	5.0	2:08 2:05 2:43			Run 12		LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), bluish gray (5PB 5/1), gray (N 6/-N 5/) to dark gray and very dark gray (N 4/-N 3/), grading to black (N 2.5/) and reddish black (10R 2.5/1), with little greenish gray (10Y 5/1), weak to medium strong, laminated to moderately bedded, locally thickly bedded, fresh, argillaceous, interbedded with little to some, laminated to moderately bedded, clayey Calcareous SILTSTONE, weak red (7.5R 4/2; 5R 4/1) to dark greenish gray (10Y 4/1) and very dark gray (2.5Y 3/1), wispy/wavy to mostly diffuse bedding, and with trace scattered, subangular coarse sand to fine gravel sized clasts of chert, limestone, and dolomite; slight to moderate bioturbation, fenestral with sparry calcite "bird eyes", strong HCl reaction (continued)
698.4	105.2	5.0	1:55 1:48 2:08 2:39	(4.8) 96%	(4.6) 92%	Run 12		101.6-102.0ft: Mechanically reduced to rubble 102.0ft: BJ, 35°, PS, T, C, III 103.6ft: J, 65°, PS, T, B, II 110.0ft: BJ, 30°, PR, PO-O, B, III
693.4	110.2	5.0	2:06 1:55 1:38 1:54 2:38	(5.0) 100%	(5.0) 100%	Run 13		693.6
688.4	115.2	5.0	2:39 2:06 2:05 3:19 3:29	(4.9) 98%	(4.7) 94%	Run 14		DOLOMITIC LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), greenish gray (10Y 5/1; 5GY 6/1), dark gray to very dark gray (N 4/-N 3/), dark bluish gray (5PB 4/1), weak to strong, thinly to thickly bedded, fresh, interbedded with trace to few, clayey Calcareous SILTSTONE, weak red (5R 4/1) to dark reddish gray (10R 3/1), locally planar to diffuse bedding, and with trace to little, coarse sand to fine gravel sized, angular to subangular clasts of chert and dolomite (reddish brown to gray and dark gray); trace bioturbation, trace calcite filled pits, trace stylolites, weak HCl reaction
683.4	120.2	5.0	2:22 2:45 2:59 3:08 3:01	(5.0) 100%	(4.6) 92%	Run 15		111.5, 113.4ft: BJ, 35°, US, T, B, II 111.7, 112.3, 113.7ft: J, 80°, VT, A, I, with calcite 112.6, 113.2ft: BJ, 35°, PS, T, B, III 115.4ft: BJ, 40°, SR, T-PO, C, II, stylolite 116.4ft: J, 50°, PS, T, B, III 117.7, 117.9ft: BJ, 30°, UR-PR, PO, C, II-III 118.5ft: J, 75°, PS, T, B, III
678.4	125.2	5.0	2:51 3:09 5:36 3:25 4:31	(4.9) 98%	(3.6) 72%	Run 16		CRYSTALLINE DOLOMITE, fine grained, dark gray to very dark gray (2.5Y 4/1-3/1), with light gray (2.5Y 7/1), and trace weak red (7.5R 4/2) and grayish green (5GY 5/2), weak to strong, very thinly to moderately bedded, fresh; healed fractures with dolomite and calcite through-out, trace stylolites (typically with greenish gray indurated clay mineralization), locally with calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction (Knox Group-Newala Formation)
673.4	130.2	5.0	3:45 5:29 3:45 3:31 2:59	(5.0) 100%	(4.8) 96%	Run 17		119.6-125.2ft: FZ, 60-75°, VT, A, I, with calcite and spaced at about 0.2' 120.3, 120.8, 121.1, 121.9, 122.6, 122.9, 123.3ft: BJ, 25-35°, US-PS, T, B, II 123.1-123.3ft: Mechanically reduced to rubble 123.5ft: J, 40°, PR-UR, T-PO, C, II 125.0-126.6ft: FZ, 50-60°, VT, A, I, with calcite and spaced at about 0.4' 126.3, 126.7, 127.7ft: BJ, 30°, PR-SR, PO, B, II 127.0ft: J, 45°, PR, PO, B, II
668.4	135.2	5.0	2:27 2:05 2:39 2:47 2:00	(5.0) 100%	(5.0) 100%	Run 18		133.2ft: J, 70°, PR, T, B, II
663.4	140.2	5.0	2:53 2:37 2:22 2:38 3:09	(5.0) 100%	(5.0) 100%	Run 19		670.2
658.4	145.2	5.0	2:42 2:06 2:08 2:31 2:36 1:57	(5.0) 100%	(5.0) 100%	Run 20 Run 21		CRYSTALLINE DOLOMITE, fine to locally coarse grained, mostly gray (2.5Y 6/1-5/1, N 5/) to dark gray (2.5Y 4/1) and very dark gray (2.5Y 3/1), with trace to little dark reddish gray (2.5YR 4/1) and weak red (2.5YR 4/2), locally mottled along pre-dolomitization fractures and bedding, strong, very thinly to moderately bedded, locally thickly bedded, fresh, trace chert nodules (dark gray); trace to few stylolites (most with black to grayish brown to greenish gray clay mineralization), trace to few calcite and dolomite filled pits and vugs (separate/non-touching), locally with trace open pits and vugs (separate/non-touching), weak/delayed to no HCl reaction
								133.6, 134.5ft: J, 50°, PS, T, B, II 134.7ft: J, 70°, VT, A, I, with dolomite 139.4ft: BJ, 25°, PS, T, B, II 140.3-142.4ft: FZ, 40-70°, VT, A, I, with calcite and spaced at about 0.3' 140.4ft: BJ, 30°, PR, T, B, II 142.0ft: J, 40°, PS, T, B, II 143.6-144.7ft: FZ, 50-70°, VT, A, I, with calcite and spaced at about 0.1' 144.0ft: J, 30°, US, O, C, III

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: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: S. Snow/D. King		Boring Orientation	
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: CME-55 (TSD)		Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532 US ft (NAD83)		EASTING: 2,446,440 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb Auto (373705)	
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %			
								Continued from previous page
653.4	150.2	5.0	2:38 3:39 3:08 2:35	100%	100%	Run 22		CRYSTALLINE DOLOMITE, fine to locally coarse grained, mostly gray (2.5Y 6/1-5/1, N 5/) to dark gray (2.5Y 4/1) and very dark gray (2.5Y 3/1), with trace to little dark reddish gray (2.5YR 4/1) and weak red (2.5YR 4/2), locally mottled along pre-dolomitization fractures and bedding, strong, very thinly to moderately bedded, locally thickly bedded, fresh, trace chert nodules (dark gray); trace to few stylolites (most with black to grayish brown to greenish gray clay mineralization), trace to few calcite and dolomite filled pits and vugs (separate/non-touching), locally with trace open pits and vugs (separate/non-touching), weak/delayed to no HCl reaction (continued) 147.0ft: J, 65°, UR, T, B, II 148.3ft: BJ, 30°, PS, T, B, II 150.2, 151.5, 151.9, 152.9, 154.0ft: BJ, 30°, US, T, C, II, stylolites 152.3ft: J, 65-75°, PR, T, B, II 153.2-154.7ft: FZ, 60-65°, VT, A, I, with dolomite and spaced at about 0.2' 153.4ft: BJ, 20°, US, T, B, II 155.3, 156.0, 156.2, 156.9, 159.5ft: BJ, 30-35°, US, T, C, II, stylolites 156.6-157.6ft: J, 70-90°, VT, A, I 159.0-159.7ft: FZ, 90° and 55°, VT, A, I, with dolomite
648.4	155.2	5.0	2:50 2:57 2:40 2:05 2:43	(5.0) 100%	(5.0) 100%	Run 23		164.7ft: J, 65°, PR, O-VW, B, II, with mechanical abrasion
643.4	160.2	5.0	2:21 2:13 1:57 2:08 2:15	(5.0) 100%	(4.7) 94%	Run 24		165.3-167.5ft: FZ, 60-90°, VT, A, I, with dolomite and spaced at about 0.1' 165.9-166.2ft: J, 70°, PS, VT, A, I 166.5ft: J, 40°, PR, T, B, II 166.6-167.1, 169.6-169.8, 171.4-171.9ft: J, 80-90°, VT, A, I, with greenish gray clay mineralization 169.4ft: BJ, 30°, PS, T, B, III 171.4ft: BJ, 45°, PS, T, B, II 170.2-170.4ft: As above with red (5R 4/4), thin, indurated clayey siltstone/mineralization filling fracture
638.4	165.2	5.0	2:40 2:18 3:08 2:47 2:34	(5.0) 100%	(4.9) 98%	Run 25		172.8-173.5ft: FZ, 80°, VT, A, I, with calcite and spaced at about 0.1' 174.2ft: BJ, 30°, PS, T, B, II 174.3ft: J, 20°, PS, PO, B, III
633.4	170.2	5.1	3:56 2:29 2:33 1:40 3:03	(5.0) 100%	(5.0) 100%	Run 26		CRYSTALLINE DOLOMITE, coarse to fine grained, dark reddish gray (5R 4/1) to weak red (7.5R 4/2) with gray (5Y 6/1; N 5/) and gray to dark gray (2.5Y 5/1-4/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to moderately bedded, fresh; trace stylolites, trace dolomite filled and partially filled pits, weak HCl reaction
628.3	175.3	5.0	3:49 3:28 3:05 5:11 4:43/1.1	(4.9) 96%	(4.6) 90%	Run 27 L7-26		CRYSTALLINE DOLOMITE, fine grained, reddish gray (5R 5/1) to weak red (7.5R 4/2) and pale red (5R 6/2), with gray (5Y 6/1; N 5/) to light gray (2.5Y 7/1, 7.5YR 7/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to thin bedded, locally to moderately bedded, fresh, and trace to few thin to very thin and laminated, chert beds (black) and chert/dolomite cemented, subrounded to rounded, fine to medium grained quartz sand lenses (gray to greenish gray); calcite and dolomite healed fractures through-out, trace stylolites, trace calcite and dolomite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 175.3ft: Dark reddish brown (2.5YR 2.5/3), very thin, indurated clayey siltstone/mineralization filling fracture 175.5ft: J, 50°, PS, T, B, II 176.8ft: J, 10°, PR, PO, B, II 177.2ft: BJ, 40°, PS, T, B, II 178.0-178.3ft: FZ, 30°, PS, T, B, II-III 178.7ft: J, 25°, UR, T-PO, C, II 179.5ft: J, 50°, VT, A, I 179.8ft: J, 45°, PS, T, B, III 180.0ft: J, 25°, UR-SR, O, C, II, stylolite 181.8, 182.8, 183.6, 184.5ft: BJ, 20-35°, US, T, B, II, stylolites 186.2, 186.5ft: BJ, 30°, PR/PS, T, B, II 186.7ft: J, 60°, PS, T, B, II 188.9, 189.4ft: J, 70-45°, US, PO, C, II, stylolites 190.9, 191.4, 193.6, 193.7ft: BJ, 20-30°, PS, T, B, II
623.3	180.3	5.0	4:40 3:01 3:05 3:23 3:41	(4.9) 98%	(4.1) 82%	Run 28		
618.3	185.3	5.0	5:11 3:08 3:45 4:18 4:10	(5.0) 100%	(4.1) 82%	Run 29		
613.3	190.3	4.9	5:00 3:51 4:37 5:45 5:48	(5.0) 100%	(4.3) 86%	Run 30		
			4:06 3:35 4:25 3:39	(4.9) 100%	(4.9) 100%	Run 30		

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: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: S. Snow/D. King		Boring Orientation	
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: CME-55 (TSD)		Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532 US ft (NAD83)		EASTING: 2,446,440 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb Auto (373705)	
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %			
Continued from previous page								
608.4	195.2	5.1	4:09/0.9 4:37 2:57 4:23 3:29 3:18/1.1	(5.0) 98%	(5.0) 98%	Run 31		CRYSTALLINE DOLOMITE, fine grained, reddish gray (5R 5/1) to weak red (7.5R 4/2) and pale red (5R 6/2), with gray (5Y 6/1; N 5/) to light gray (2.5Y 7/1, 7.5YR 7/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to thinly bedded, locally to moderately bedded, fresh, and trace to few thin to very thin and laminated, chert beds (black) and chert/dolomite cemented, subrounded to rounded, fine to medium grained quartz sand lenses (gray to greenish gray); calcite and dolomite healed fractures through-out, trace stylolites, trace calcite and dolomite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction (continued) 197.3ft: BJ, 45°, US, PO, B, II, stylolite 197.9,199.7,201.0,202.0,203.5,204.3ft: BJ, 35°, PS, T, B, II 200.9ft: J, 10°, PS, B, T, II 201.5ft: J, 45°, SS, T, B, II 203.7ft: SH, 60°, VT, A, I, with dolomite 205.6,208.0ft: BJ, 30°, US, T, C, II, stylolites 206.9ft: BJ, 35°, PS, O, B, II 207.9-209.2ft: FZ, 40-60°, VT, A, I, with dolomite and spaced at about 0.1' 208.6ft: BJ, 25°, PS, T, B, II 206.9-210.1ft: As above, very dark gray (2.5Y 3/1) to dark reddish gray (2.5YR 3/1) 210-214.4ft: FZ, 50-60°, VT, A, I, with dolomite and spaced at about 0.3' 212.1ft: BJ, 35°, UR, O, C, II, stylolites 215.2ft: As above, becomes pinkish gray (5YR 7/1) with reddish gray (5R 5/1) 215.5,216.2,216.4ft: J, 60-70°, VT, A, I, with dolomite 217.2ft: BJ, 30°, UR, PO, C, IV, stylolite 218.3ft: J, 40°, PS, T, B, II 216.7ft: Dark reddish gray (2.5YR 3/1), very thin, with indurated clayey siltstone/mineralization filling irregular fracture
603.3	200.3	4.9	3:41 4:08 4:34 4:25 4:52/0.9	(4.9) 100%	(4.9) 100%	Run 32		
598.4	205.2	5.0	3:39 4:50 6:50 4:15 5:41	(5.0) 100%	(5.0) 100%	Run 33		
593.4	210.2	5.0	4:24 4:19 3:30 3:14 3:21	(5.0) 100%	(5.0) 100%	Run 34		
588.4	215.2	5.0	3:47 4:01 4:29 3:30 4:07	(5.0) 100%	(5.0) 100%	Run 35		
583.4	220.2	5.0	3:30 3:08 4:44 2:55 4:05	(5.0) 100%	(4.8) 96%	Run 36		
578.4	225.2	5.0	3:42 3:10 2:35 3:35 4:44	(5.0) 100%	(4.8) 96%	Run 37 L7-27		
573.4	230.2	5.0	4:49 2:33 4:36 3:09 4:12	(5.0) 100%	(4.8) 96%	Run 38		
568.4	235.2	5.0	3:42 3:00 3:48 4:09 4:15	(5.0) 100%	(5.0) 100%	Run 39		
563.4	240.2	5.0	4:48 3:15 3:25	(5.0) 100%	(5.0) 100%	Run 40		

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



BECHTEL PROJECT NO.: 25847		AMEC PROJECT NO.: 6468-13-1072		COUNTY: Roane, TN		GEOLOGIST: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: S. Snow/D. King		Boring Orientation	
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: CME-55 (TSD)		Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532 US ft (NAD83)		EASTING: 2,446,440 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb Auto (373705)	
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %			
			3:53 4:13					Continued from previous page
558.4	245.2	5.0	3:57 3:36 3:37 2:18 3:12	(5.0) 100%	(4.9) 98%	Run 41	557.1	245.2-246.5ft: As above, with little to some, scattered to laminated and very thin lenses of well rounded, medium grained quartz sand 245.6,246.5ft: BJ, 30°, PS, VT, B, II
553.4	250.2	5.0	3:21 5:42 4:31 4:08 5:23	(5.0) 100%	(4.5) 90%	Run 42	555.1	LIMESTONE (MICRITE), gray (N 6/-N 5/) to pinkish gray (7.5R 7/1), medium strong, very thinly bedded, fresh, interbedded with little, laminated to very thin Calcareous SILTSTONE, reddish gray (2.5YR 4/1) to greenish gray (10Y 5/1); strong HCl reaction 247.7,248.4ft: BJ, 30-35°, PS, T, B, II
548.4	255.2	5.0	3:21 5:42 4:31 4:08 5:23	(5.0) 100%	(4.5) 90%	Run 42	548.0	CRYSTALLINE DOLOMITE, fine to coarse grained, greenish gray (10GY 6/1) to gray (N 6/), dark gray (N 4/), and pinkish gray (5R 7/1), with some weak red (5R 4/3), strong, very thinly to moderately bedded, fresh, with trace to few jasperoid chert nodules, red (7.5R 5/6), and locally with some, well rounded, medium quartz sand lenses and scattered grains; healed fractures through-out, trace to few calcite and dolomite filled pits and irregular vugs (separate/non-touching), weak/delayed to no HCl reaction 248.5,249.7ft: BJ, 30-35°, PS, T, B, II 250.4,250.6ft: J, 70°, VT, A, I, with dolomite 251.4-251.7ft: J, 70°, PS, PO, B, III 251.7-252.5ft: FZ, J, 50-60° and 20-30°, PS PO, B, III, spaced at about 0.2-0.4' 253.9ft: J, 60°, PS, T, B, III 255.5ft: J, 30°, US, T-PO, B, II
543.4	260.2	4.9	3:50 3:40 3:25 3:33 3:19/0.9	(4.9) 100%	(4.8) 98%	Run 44	543.4	CRYSTALLINE DOLOMITE, fine grained, weak red (2.5YR 5/2) to dark reddish brown (5YR 3/2), with some gray (5Y 6/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to thinly bedded, locally to moderately bedded, fresh, with trace angular chert nodules (dark gray), and trace to few scattered, subrounded, medium grained quartz sand; trace stylolites, weak/delayed to no HCl reaction 262.0ft: BJ, 20°, PS, T-PO, B, II
538.5	265.1	5.0	5:00 3:39 3:54 3:33 3:29	(5.0) 100%	(4.6) 92%	Run 45	535.6	266.7ft: J, 50°, PS, T, B, II 267.1ft: BJ, 0-45°, SR, T, C, II, stylolite
533.5	270.1	5.0	5:55 4:30 3:35 3:47 3:14	(4.9) 98%	(4.4) 88%	Run 46	533.5	CRYSTALLINE DOLOMITE, fine to coarse grained, gray (2.5Y 6/1-5/1) with dark reddish gray (10R 4/1), to gray and very dark gray (2.5Y 5/1-3/1) and pale red (5R 6/2) with some gray (10YR 5/1), mottled, strong, very thin to moderately bedded, fresh, with trace chert nodules (dark gray and white) and few scattered rounded to subrounded medium grained quartz sand grains; healed fractures through-out, trace stylolites, trace dolomite and calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 268.0ft: BJ, 30°, UR-SR, T-PO, C, II, stylolite 268.6-269.0ft: FZ, 60°, VT, A, I, with dolomite 270.5-270.8ft: FZ, BJ, 35°, PS, T, B, II 272.8,273.2ft: BJ, 35°, UR, T, C, II, stylolites 237.5-274.9ft: FZ, 65-85°, VT, A, I, with folomite and spaced at about 0.1' 270.5-270.8ft: As above, with dark reddish brown (2.5YR 3/3), indurated clay/siltstone mineralization filled fracture 276.4ft: BJ, 35°, PS, T, B, II 276.6ft: BJ, 35°, PS, T, B, II 276.6-277.7ft: J, 80°, PS, VT, A-B, III 279.5ft: BJ, 25°, PS, T, C, III 276.4-276.6ft: As above, with SILTSTONE, dusky red (2.5YR 3/2), laminated, with some lenses of medium grained quartz sandstone, dark gray (N 4/)
528.5	275.1	5.0	4:53 2:53 3:41 2:49 3:54	(5.0) 100%	(4.8) 96%	Run 47	528.5	280.4,281.4,281.7ft: J, 60-70°, PR, T, C, III 282.3ft: BJ, 35°, SR, T, C, II, stylolite 283.4-283.5ft: As above, greenish gray (5G 5/1), silicified, with coarse dolomite crystals
523.5	280.1	5.0	3:11 3:39 3:20 4:11 4:58	(5.0) 100%	(4.5) 90%	Run 48	520.1	LIMESTONE (MICRITE), gray (2.5Y 6/1-5/1), strong, very thinly to thinly bedded, fresh, with few stylolites, and scattered dolomite crystals through-out, strong HCl reaction; becomes mostly DOLOMITIC LIMESTONE at 289.4' to 289.9': CRYSTALLINE DOLOMITE, fine grained, dark reddish gray (2.5YR 3/1), strong, very thinly bedded, fresh, weak/delayed to HCl reaction to 290.9': LIMESTONE (MICRITE), as above to 292.5': Jasperoidal chert to 292.7' 287.0ft: BJ, 30°, SR, T-PO, C, II, stylolite
518.5	285.1	5.0	4:56 5:18 5:28 4:57 4:48	(5.0) 100%	(5.0) 100%	Run 49	518.5	292.5,292.7ft: BJ, 30°, PS, T-PO, B, II
513.5	290.1	5.0	3:51 3:39	(5.0) 100%	(4.8) 96%	Run 50	513.5	

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



BECHTEL PROJECT NO.: 25847		AMEC PROJECT NO.: 6468-13-1072		COUNTY: Roane, TN		GEOLOGIST: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: S. Snow/D. King		Boring Orientation	
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: CME-55 (TSD)		Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532 US ft (NAD83)		EASTING: 2,446,440 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb Auto (373705)	
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
				REC. (%)	RQD (%)			
								Continued from previous page
508.5	295.1	5.1	2:43 2:44 2:42			Run 51		510.9 CRYSTALLINE DOLOMITE, fine grained, weak red (5R 4/2), with gray (N 6/) mottling through-out that mimics bedding and pre-dolomitization healed fractures, strong, thinly bedded, fresh; trace stylolites, weak/delayed to no HCl reaction 294.1ft: J, 75°, PS, VT, B, II 298.3ft: BJ, 35°, UR, T, C, II, stylolite
503.4	300.2	5.0	2:31 2:18 1:58 2:15 2:52/1.1	(5.1) 100%	(5.1) 100%	Run 52		301.4ft: BJ, 45°, PS, T, C, II 304.4ft: BJ, 30°, SR, T, C, II, stylolite 304.8ft: BJ, 30°, PS, T, B, II
498.4	305.2	5.0	3:56 3:30 3:05 3:30 3:19	(5.0) 100%	(5.0) 100%	Run 53 L7-28		497.8 LIMESTONE (MICRITE), gray (2.5Y 6/1-5/1), strong, very thinly to thinly bedded, fresh, with few stylolites, and scattered dolomite crystals through-out, strong HCl reaction; becomes nodular with dolomite matrix at 308.0' to 308.3': CRYSTALLINE DOLOMITE, fine grained, dark reddish gray (2.5YR 3/1), strong, thinly to moderately bedded, fresh, with trace thin jasperoidal chert lenses, and some medium grained, subrounded to rounded quartz sand, weak/delayed to no HCl reaction; silicified from 309.4' to 309.6': LIMESTONE (MICRITE), as above to 311.8' 306.0-307.0ft: FZ/SZ, 70-80°, VT, A, I, spaced at 0.1-0.3' 309.6ft: BJ, 20°, PS, T, B, II 308.3-309.6ft: FZ, 80-90°, VT, A, I, spaced at about 0.1'
493.4	310.2	5.0	3:36 4:40 5:44 3:42 5:43	(5.0) 100%	(4.9) 98%	Run 54		491.8 CRYSTALLINE DOLOMITE, fine grained, dark reddish gray (5R 4/1), with gray (5Y 6/1) mottling through-out that mimics bedding and pre-dolomitization fractures, strong, laminated to thinly bedded, fresh, with trace very thin, chert and dolomite cemented, medium grained, subrounded to rounded quartz sand lenses; healed fractures through-out, trace dolomite and calcite filled pits and irregular vugs (separate/non-touching), weak/delayed to no HCl reaction 313.2ft: BJ, 35°, PS, T, B, II 313.3-314.3ft: FZ, 50-55°, VT, A, I, with dolomite; spaced about 0.1' 315.7ft: BJ, 40°, PS, T, C, II, stylolite 319.0ft: BJ, 25°, PS, T-PO, B, II
488.4	315.2	5.1	4:40 2:59 3:04 3:55 3:30/1.1	(5.0) 98%	(5.0) 98%	Run 55		311.8 Boring and coring terminated at 320.3 feet.
483.3	320.3							483.3

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