



Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No B-1001	
		 William Lettis & Associates, Inc.	
Drilling Method Rotary Wash / HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1533081.9 N; 628359.4 E	Total Depth 176.5 feet	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750	Elevation (Datum NAVD 88) 611.3 feet	Ground Water Depth See Note A	Date Started 7/11/06
Casing Size and Depth HW: 4.5 inch O.D. / 16.4 feet	Borehole Inclination -60	Logged by J. Hoefl	Date Completed 7/18/06

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology		Remarks	Elevation (feet)
											Lithology			
15	1	<u>2.6</u> 3.6	67	SW to F	R3						LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); slightly weathered to fresh; medium strong; several voids and clay filled voids - 15.6-15.9 feet: void - 17.8-18.6 feet: clay filled void, yellowish brown (10YR 5/6), wet, very stiff, medium plasticity, contains limestone clasts of sand-gravel size -20.5-22 feet: clay filled void, yellowish brown (10YR 5/6), wet, very stiff, medium plasticity, contains limestone clasts of sand and gravel - 22.9-23.7 feet: clay-filled void, dark yellowish brown (10YR 4/4), wet, stiff, medium plasticity - 23.8-24.3 feet: clay material, dark yellowish brown (10YR 4/4), wet, stiff, medium plasticity, contains limestone clasts of sand and gravel - 28 feet: rock becomes fresh	Boring is inclined 60° from horizontal. Depths indicated are measurements along drilling axis. Elevations may be used to determine vertical distances. Discontinuity angle measurements are relative to borehole axis. 17.5-21 feet: Good water return Rod dropped from 20.5 to 21.6 feet 21 feet: Lost water return and did not recover. Rod dropped ~0.5' at 23.8 feet, clay filled void, no water return	595	
20	2	<u>3.7</u> 5.0	62	SW to F	R3								590	
25	3	<u>4.6</u> 5.0	73	SW to F	R3								585	
30	4	<u>5.0</u> 5.0	100	F	R3	BHTV NG					LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong; strong HCl reaction	BHTV and NG analysis were conducted over the length of cored section	580	
35	5	<u>4.8</u> 5.0	96	F	R3					D	- bedding has an apparent dip of ~40° to 50°; shale is 0.01-0.6- feet thick with spacing of 0.05-0.6 feet - 36.2-36.8 feet: rip up clasts and bioturbation		575	
40	6	<u>5.0</u> 5.0	100	F	R3						- shale becomes wavy, thickness < 0.03 feet, spacing is 0.05-0.3 feet		570	
45	7	<u>4.3</u> 5.0	86	F	R3								565	
50	8	<u>5.3</u> 4.4	100	F	R3						LIMESTONE (micrite) with interbeds of shale; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong; occasional vugs and calcite spars - shale is wavy <0.02 feet thick, spacing varies between 0.02 and 0.3 feet		560	

Reviewed by / Date DSC 5-9-07 Rev. 1

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1001

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	9	$\frac{5.1}{5.2}$	99									55.5 feet: Unconfined Compression Test	
60	10	$\frac{5.2}{5.2}$	99									58.8 feet: Unconfined Compression Test	560
65	11	$\frac{5.1}{5.2}$	98	F	R3							- shale is <0.02 feet thick with spacings of 0.02-0.3 feet, wavy	555
70	12	$\frac{5.2}{5.0}$	100	F	R3								550
75	13	$\frac{3.9}{5.0}$	84							D			545
80	14	$\frac{5.3}{4.4}$	100									- shale is <0.02 feet thick with spacings <0.1 feet, very wavy, spars in rock fabric	540
85	15	$\frac{0.8}{0.6}$	100	F	R3								535
90	16	$\frac{5.1}{5.0}$	100										530
	17	$\frac{5.0}{5.0}$	100	F	R3								

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ROCK LOG - Boring No. B-1001

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)	
95	18	4.9 5.0	98								LIMESTONE (micrite) with calcareous shale interbeds; micrite ranges from light gray (N7) to medium gray (N5) and shale is dark gray (N3); fresh; medium strong; prominent stylolites (pressure solution features); strong HCl reaction		525	
100	19	5.1 5.0	100											520
105	20	5.0 5.0	99	F	R3									515
110	21	4.8 5.0	96	F	R3				Jo, 75, Wa, SI, Ti		D	LIMESTONE (micrite) interbedded with calcareous shale; micrite is medium gray (N5); shale is dark gray (N3); fresh; medium strong; strong HCl reaction		510
115	22	5.1 5.0	100									- shale is <0.02 feet thick with spacings of 0.05-0.2 feet, wavy		505
120	23	4.9 5.0	97	F	R3						- 122-128 feet: reduction in shale bed content and frequency		500	
125	24	5.2 5.0	100								- shale is <0.1 feet thick with spacings of 0.03-0.7 feet, wavy and planar beds		495	
130	25	4.9 5.0	97	F	R3			Jo, 10, St, SI, Ti, Slicken sides, Rake = 135					490	

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Depth (feet)	Run No.	Recovery / C t	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135	26	5.0 / 5.0	100										
140	27	4.9 / 5.0	97					Bj, 45, Pl, Sm, Ti, Slicks, Rake = 90		D	- shale is on average 0.02 feet thick with spacings of 0.01-0.5 feet, planar and wavy beds LIMESTONE (micrite) with calcareous shale; micrite is medium light gray (N6) and shale is dark gray (N3); fresh; medium strong; shale is very thin laminae; micrite contains spars		490
145	28	4.9 / 5.0	97	F	R3								485
150	29	5.2 / 5.0	100								LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong; occasional shale rich sections 0.2-2 feet thick		480
155	30	4.8 / 5.0	96					Bj, 45, Wa, Sm, Ti, Slicks, Rake = 90			LIMESTONE (micrite) with calcareous shale interbeds, and calcareous shale rich sections; shale is dark gray (N3); micrite is medium gray (N5); fresh; medium strong; strong HCl reaction - 155-172 feet: shale is 0.01-0.1 feet thick with spacings of 0.03-1 feet, mainly planar shale beds		475
160	31	4.9 / 5.0	98	F	R3					E			470
165	32	5.1 / 5.0	100										465
170	33	5.0 / 5.0	100	F	R3						- 172-176.5 feet: shale is 0.01-0.2 feet thick with spacings of 0.05-0.8 feet		

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ROCK LOG - Boring No. B-1001

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
175	34	3.5 3.5	98							E		PVC: 4 inch O. D. installed after drilling for BHTV test	460
180											Boring terminated at 176.5 feet NOTE A: Water level data Date - Depth (below ground surface) 7/17 - 14.8 feet 7/18 - 14.5 feet 7/20 - 14.5 feet		455
185													450
190													445
195													440
200													435
205													430
210													

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



SOIL LOG - Boring No. B-1002

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532906.7 N; 628471.5 E		Total Depth 120.5 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750		Elevation (Datum NAVD 88) 613.3 feet	Ground Water Depth See Note A	Date Started 5/30/06
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Logged by A. Tillery / K. Krug	Date Completed 5/30/06

W. Adams 374-07

Reviewed by / Date *DSC 3-13-07*

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CH	613.3	Lithology 0.0
3	SPT 1		3	18					CH	609.8	CLAY, strong brown (7.5YR 5/8) with orange yellow mottling, moist, stiff, trace sand, few black manganese nodules
4			4						CH	609.8	
5			6						CH	609.8	CLAY, strong brown (7.5YR 4/6) to brown (7.5YR 4/4), moist, medium stiff, few gravel, sand and black manganese nodules
6	SPT 2		3	20	25.5	66/34	GSZ		CH	606.8	
7			3						CH	606.8	CLAY, reddish brown (5YR 4/4), moist, medium stiff
8			4						CH	606.8	
9			4						CH	606.8	
10	SPT 3		3	16	22.9	51/26	GSZ H		CH	604.5	
11			4						CH	604.5	CLAY, strong brown (7.5YR 5/8), dry to moist, hard, trace black manganese nodules
12	SPT 4		20	13	21.5	50/27			GW	603.9	
13			26						CH	602.3	GRAVEL, light gray, moist to dry, very stiff to hard, gravel is angular limestone fragments <1 in diameter, reacts with acid
14			9						CH	601.7	
15			17						SW-GC	599.1	CLAY, dark brown (7.5YR 3/4) to olive yellow (5Y 6/6), dry to moist, very stiff
16	SPT 5		9	24	25.9	68/45	GSZ		CH	599.1	clayey GRAVEL, gravel is pale yellow (2.5Y 7/4) and clay is light gray (2.5Y 7/2), dry to moist, gravel is limestone fragments
17			17						GW	598.8	
18			52						CH	598.8	CLAY, strong brown (7.5YR 4/6), dry to moist, hard
19	SPT 6		35	16					GW	596.8	
20			30/1						CH	596.8	GRAVEL with clay
21											SPT refusal at 16 feet 20 blows/0". Auger down to 17 feet. Continuation of borehole description in rock log.
22											
23											
24											
25											
26											
27											
28											
29											
30											

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ROCK LOG - Boring No. B-1002

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532906.7 N; 628471.5 E		120.5 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750	Elevation (Datum NAVD 88) 613.3 feet	Ground Water Depth See Note A	Date Started 5/30/06
Casing Size and Depth PVC: 4.5 inch O.D / 16.5 feet	Borehole Inclination Vertical	Logged by A. Tillery / K. Krug	Date Completed 5/30/06

W. J. Tillery 3-14-07
Reviewed by / Date *DSC 3-13-07*

Depth (feet)	Run No.	Recovery / Cut	% RCP	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Remarks	Elevation (feet)
17-20	1	3.2 / 3.5	86	SV to I	R3		SHALE with interbedded micrite; shale is dark gray (N3) and micrite is medium gray (N5); slightly weathered to fresh; medium strong; 50-60% shale	Bj, 15, Wa, Pl, Si, Ro Bj, 10, Wa, Pl, Si, Ro		17-51 feet: fluid return is good	595
20-25	2	5.1 / 5.1	10				- 24.3-25.4 feet: interbedded packstone, micrite, and shale	Bj, 20, Pl, Wa, Si, Ro, TI			590
25-30	3	4.8 / 5.0	94	F	R3		SHALE with irregular beds of micrite; shale is dark gray (N3) and micrite is medium gray (N5); fresh; medium strong; 60% shale	Bj, 15, Pl, Si, Ro, TI Bj, 10, Ro, TI			585
30-35	4	4.8 / 5.0	84				calcareous SHALE with interbedded micrite; shale is grayish black (N2) and micrite is medium gray (N5); fresh; medium strong; 55% shale	Bj, 0, Pl, Wa, poor fit, Op Bj, 10, Pl, Wa, Si, Ro, Op, poor fit Bj, 15, Wa, poor fit			580
35-40	5	5.2 / 5.0	97				- 38 feet: decreasing shale with depth	Bj, 10, no fit Bj, 15, Pl, Si, Ro, Op Bj, 15, Pl, Wa, Si, Ro, poor fit			575
40-45	6	5.1 / 5.0	00								570
45-50	7	1.9 / 3.0	38	F	R3		LIMESTONE (micrite) interbedded with thin shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; shale reacts with acid; some rip- up clasts in shale: 25% shale				565
50-55	8	5.0	00	F	R3					51-120.5 feet: poor to moderate fluid returns. Water loss ranges from 50-100 gal per run. 54.3 feet: strong hydrocarbon odor. No visible evidence.	560

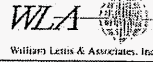
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1002

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
60	9	4.9 5.0	98									56.38 feet: Unconfined Compression Test	555
65	10	5.2 5.0	100								- 60 feet: 30% shale		550
70	11	5.1 5.1	100	F	R3						- 65.5-75 feet: 40% shale		545
75	12	5.0 5.0	90									73.7-74.7 feet: sub-vertical incipient fracture	540
80	13	5.0 5.0	100	F	R3					C			535
85	14	4.9 5.0	98										530
90	15	5.1 5.0	100	F	R3								525
95	16	5.0 5.0	3										520

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1002

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
100	17	4.8 5.0	93										515
											LIMESTONE (wackestone with minor micrite); fresh; medium strong; shale beds few and very thin (<0.05 ")		
	18	5. 5.	100										510
											LIMESTONE (micrite) interbedded with thin shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; 25% shale		
105				F	R3								
	19	5.1 5.1	94										505
											LIMESTONE (micrite and wackestone) interbedded with thin shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; shale beds are very thin, wavy, and react with acid - 106.5-113 feet: bioturbated zone		
110										D			
	20	5.0 5.0	100										500
115				F	R3								
												- 114.5-116.8 feet: bioturbated zone	
	21	5.0 5.0	100										495
120													
											Boring terminated at 120.5 feet		
											NOTE A: Water level data		
											Date - Depth (below ground surface)		
											6/5 - 15.8 feet		490
											8/6 - 12.8 feet		
125													
													485
130													
													480
135													

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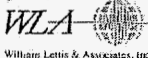


SOIL LOG - Boring No. B-1003

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532838.5 N; 628359.6 E	Total Depth 120.4 feet
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550	Elevation (Datum NAVD 88) 613.6 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by J. Howard
		Date Started 5/30/06
		Date Completed 6/5/06

W. J. Howard 3-14-07
Reviewed by / Date **DSC 3-13-07**

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								613.6 613.4	ML	0.0 0.2	TOPSOIL
1	SPT 1		4 6 4	18							SILT with sand, yellowish red (5YR 4/6), stiff, dry to moist (Fill)
3	SPT 2		2 2 3	18	16.4	26/ 10	GSZ		CL	3.5	CLAY with sand, gray with blue tint (Gley 2 10BG5/1), moist, medium stiff (Residual)
4	SPT 3		2 2 3	18							
8	SPT 4		5 9 15	18	22.3	44/ 23	GSZ		CL	9.2	gravelly CLAY with sand, dark grayish brown (10YR 4/2), medium dense, dry to moist (Residual)
11	SPT 5		8 9 16	18	16	44/ 23	GSZ/H				
14	SPT 6		31 50/1"	7						13.0	highly weathered LIMESTONE, light brownish gray (10YR 6/2), moist, dense to very dense, soil consistency
15	SPT 7		50/1"	0						14.8	Auger and SPT refusal at 14.8 feet. Continuation of borehole description in rock log.

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  William Lettis & Associates, Inc.			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532838.5 N; 628359.6 E	Total Depth 120.4 feet
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 613.6 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 15.2 feet		Borehole Inclination Vertical	Logged by J. Howard
			Date Started 5/30/06
			Date Completed 6/5/06

W. Johnson 3-14-07

Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	1.2 / 1.5	0	SW	R2					C	LIMESTONE (micrite) with interbedded calcareous shale; dark gray (N3) to medium light gray (N6); slightly weathered to fresh; weak; high proportion shale interbeds (~40%)	14.8-86.4 feet: fluid return is good	595
20	2	4.9 / 5.0	86	SW	R3			Bj, 5, Wa, St Bj, 10, Pl, Sl, Ti Bj, 10, Pl, Sl, Ti		C	- 21.3 feet: color changes to medium light gray (N6)		590
25	3	5.0 / 5.0	84	SW	R3			Bj, 10, Wa, Sl, Op Bj, 10, Pl, Sl, Op		C	- 26.3-31.3 feet: shale beds appear moderately thin to thin with spacings of 0.1-0.3 feet		585
30	4	5.0 / 5.0	100	F	R3			Bj, 5, Pl, Sl, Op		D	LIMESTONE (micrite) with calcareous shale interbeds; medium light gray (N6) and dark gray (N3); slightly weathered to fresh; medium strong - 30 feet: chert and calcite crystals - 31.5-46 feet: chert and small shell fragments found		580
35	5	5.0 / 5.0	86	SW to F	R3	BHTV				D		BHTV analysis was conducted over the length of cored section	575
40	6	4.8 / 5.0	90	SW to F	R3			Bj, 5-15, Wa, Ro, Op		D		38.6 feet: Unconfined Compression Test	570
45	7	5.0 / 5.0	100	F	R4			Bj, 20, Pl, Sl, Op					565
50	8	5.0 / 5.0	100	SW to F	R4								560
	9	5.0 / 5.0	86	SW to F	R4								

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1003



Depth (feet)	Run No.	Recovery / Cut	% ROD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55													
60	10	5.1 / 5.1	100	F	R4							58.0 feet: Unconfined Compression Test	555
65	11	5.1 / 5.1	100	SW to F	R4								550
70	12	5.1 / 5.1	100	SW to F	R3			Bj. 10, Pl. Sl. Op					545
75	13	5.1 / 5.1	86	SW to F	R3			Bj. 10, Pl. Sl. Op Bj. 5, Pl. Sl. Ti Bj. 10, Pl. Sl. Op		D	- 71.3-75 feet: shale bedding becomes thick - 73-74 feet: calcite interbeds and slicken sided surface - 75-82 feet: shale beds are moderately thin to thick with spacings of 0.1-0.3 feet - 75-105 feet: small amounts of shell fragments and calcite crystals		540
80	14	3.2 / 3.2	00	SW to F	R3			Ve, 80, Ma, Ro, Ti, Slicken sides Bj. 15, Pl. Sl. Ti Bj. 5-15, Ma, Sl, T Slicken sides			- 80.3 feet: calcite interbeds and slicken sided surface - 82-92 feet: shale beds very thin and sparse - 83 feet: large calcite crystals		535
85	15	4.9 / 4.9	00	SW to F	R3							86.4 feet: lost ~90% of fluid return	530
90	16	5.0 / 5.0	00	SW to F	R3			Bj. 10, Pl. Ro, Op			- 90-97 feet: shale is thin to moderately thin with spacings of 0.3-0.5 feet	90-91 feet: lost fluid return 91-101 feet: some fluid return	525
	17	5.0 / 5.0	00	SW to F	R3			Bj. 5, Pl. Sl. Op Bj. 10			- 94 feet: bioturbation with calcite filled / healed fractures		520

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ROCK LOG - Boring No. B-1003

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95													
97	18	5.0 / 5.0	100	SW to F	R3						- 97-115 feet: shale is moderately thick to moderately thin with spacings of 0.1-0.3 feet		515
101												101-120.4 feet: no fluid return	
105	19	5.0 / 5.0	100	SW to F	R3								510
110	20	5.0 / 5.0	100	SW to F	R3								505
115	21	5.0 / 5.0	100	SW to F	R3						- 115-117.4 feet: shale beds become diffuse		500
120	22	4.0 / 4.0	100	F	R3						LIMESTONE (wackestone); light medium gray (N6); fresh; medium strong; occasional shale laminae: thin to very thin with spacings of 0.2-0.4 feet	PVC: 4 inch O. D. installed after drilling for BHTV test	495
120.4											Boring terminated at 120.4 feet		
125											NOTE A: Water level data Date - Depth (below ground surface) 5/30 - 12.3 feet 7/5 - 14.3 feet		490
130													485
													480

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1004	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532950 N; 628276.6 E	
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 611.1 feet	Ground Water Depth See Note A
Sampling Method CME		Borehole Inclination Vertical	Logged by D. Stepanof
			Date Started 5/1/06
			Date Completed

D. Stepanof 3-14-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0										611.1	
0 - 4.0		CME 1	38.4	3.8	24/9	GSZ		sandy CLAY, dark yellowish brown (10YR 4/4), moist, very stiff, trace manganese nodules (Fill)	CL	610	
4.0 - 8.2		CME 2	58.8	15.2	48/23	GSZ		CLAY with sand, yellowish brown (10YR 5/6), moist, hard, trace manganese nodules, trace siltstone fragments (Residual)	CL	605	
8.2 - 13.1		CME 3	58.8	22	74/45	GSZ		CLAY, yellowish brown (10YR 5/6), moist, hard, trace limestone fragments medium gray (N5) (Residual)	CH	600	
13.1 - 13.1	SPT 4	50/1	0							598.0	CME and SPT refusal at 13.1 feet. Continuation of borehole description in rock log. 13-13.1 feet: Enercon Hydrogeologist collected 1 soil sample at 13-13.1 feet for special testing
13.1 - 13.1										13.1	
15											
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299 	ROCK LOG - Boring No. B-1004
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Casing Size and Depth HW: 4.5 inch O.D. / 13.6 feet	Borehole Inclination Vertical	Logged by D. Stepanof	Date Completed
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D. Stepanof 3-14-07
 Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	3.1 / 3.1	91	F	R			Bj, 10, Pl, Sl			LIMESTONE (micrite) with interbedded shale; medium light gray (N6) to medium gray (N5) and pale yellowish brown (10YR 6/2); fresh; medium strong; contains uniformly spaced thin shale beds of 0.1 feet thickness and occasional vertical stylolitic features and relic burrows	13.1- 150.2 feet: Good milky fluid return	595
20	2	5.0 / 5.0	100					Bj, 85, Pl, He, Calcite Filled					590
25	3	5.0 / 5.0	100					Bj, 80, Pl, He, Calcite Filled					585
30	4	4.8 / 5.0	96					Bj, 70, Pl, He, Calcite Filled			- 25.8 feet: color changes to medium dark gray (N4) and dark gray (N3) - 27 feet: color shift to grayish blue (5PB 5/2) with interbeds of light olive gray (5Y 5/2)		580
35	5	5.0 / 5.0	100					Bj, 5, Pl, Sl, Ti		D	- 30 feet: color changes to medium light gray (N6) to medium gray (N5)	30.8 feet: Unconfined Compression Test increased rotation speed and down pressure	575
40	6	4.9 / 4.9	100					Bj, 18, Wva, Sl, Ti					570
45	7	5.0 / 5.0	100					Bj, 10, Pl, Sl, Ti			- 43.3 feet: interbeds become laminated and irregular in shape - 44 feet: calcite filled vugs		565
50	8	4.9 / 4.9	96					Bj, 16, Pl to Sl, Sl, Op					560
				F	R3						- 51-52.3 feet: crystalline zone	50 feet: hydrocarbon odor 51.6 feet: Unconfined Compression Test	

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1004

Depth (feet)	Run No.	Recovery / C.t	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	9	5.0 5.0	100						Pa. 30, Slickensides, - 1" long				555
60	10	5.1 5.1	100	F	R3								550
65	11	5.1 5.1	100	F	R3								545
70	12	5.1 5.1	100										540
75	13	5.1 5.1	100	F	R3	PA				D			535
80	14	5.0 5.0	100								LIMESTONE (wackestone); light bluish gray (5B 7/1) to medium bluish gray (5B 5/1); fresh; medium strong; generally sporadic laminated shale beds with abundant horizontal stylolitic features, relic fossils and burrows		530
85	15	5.0 5.0	00	F	R3				.5, cken ies bvertic al. 80, Ht				525
90	16	1.0 1.0	00									. 90-120.5 feet: rock is medium strong to weak	520

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1004

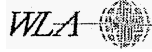
Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95	17	5.0 / 5.0	100	F	R2 to R3							- 96 feet: development of crystalline limestone interbeds and filled vugs	515
100	18	5.0 / 5.0	100					Fa, 40, Spar, Slicken sides					510
105	19	5.0 / 5.0	100	F	R2 to R3					D	LIMESTONE (micrite); medium dark gray (N4) to dark gray (N3); fresh; medium strong to weak; thinly bedded shale irregularly spaced, some spar structures		505
110	20	5.0 / 5.0	100								LIMESTONE (wackestone) medium dark gray (N4) to dark gray (N3); fresh; medium strong to weak		500
115	21	5.0 / 5.0	100	F	R2 to R3			Bj, 12, He, 0.02-foot seam Bj, 5, Wa, St, Op Fa, 15, Slicken sides		PA			495
120	22	5.0 / 5.0	100					Bj, 30, St, Ro, Ti			- 118.5-122 feet: increase in fracture zones; healed		490
125	23	5.0 / 5.0	82		R2					PA	LIMESTONE (micrite); medium dark gray (N4) to dark gray (N3); fresh; weak; thin interbedded shale and burrows		485
130	24	5.0 / 5.0	00	T	R2 to R3			Fa, 16, Slicken sides		E	LIMESTONE (wackestone) medium dark gray (N4) to dark gray (N3); fresh; weak to medium strong; generally contains irregularly defined shale interbeds (laminated to thin); also contains vertical stylolitic features and relic fossils		480

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1004

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135	25	5.0 5.0	100	F	R2 to R3					E	LIMESTONE (micrite); medium gray (N5) to medium dark gray (N4); fresh; medium strong to weak; contains thin to laminated shaley interbeds; occasional sparry structures and vertical stylolitic features		475
140	26	5.1 5.1	100								- 140-143.8 feet: very thin regularly spaced shale interbeds		470
145	27	5.1 5.1	100	F				Bl, 10, Pl, Sm, No fit		F	- 143.8-150.2 feet: beds bioturbated		465
150	28	4.0 4.0	100								Boring terminated at 150.2 feet NOTE A: Water level data Date - Depth (below ground surface) 5/22 - 10.8 feet 7/19 - 14.5 feet		460
155													455
160													450
165													445
170													440




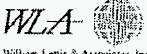
SOIL LOG - Boring No. B-1005

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532943.5 N; 628407.1 E		Total Depth 251 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750	Elevation (Datum NAVD 88) 608.9 feet	Ground Water Depth See Note A	Date Started 6/7/06
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by A. Tillery	Date Completed 6/10/06

A. Tillery 3-14-07

Reviewed by / Date DSC 3-13-07

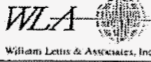
Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									ML	608.9	
1	SPT 1	1	1	18					CL	607.8	Sample recovery was not noted for SPT 1-5 at time of drilling; values for recovery were obtained from photographs taken at the time of sampling.
2											
3	SPT 2	1	1	18							
4											
5	SPT 3	3	7	18					ML	602.5	
6											
7	SPT 4	3	5	18					GW	600.2	
8									CH	599.9	
9	SPT 5	5	18	8						597.9	10.9 feet: auger grinding. Auger refusal at 11 feet. Continuation of borehole description on rock log. Casing set at 11.5 feet.
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
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Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1005	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532943.5 N; 628407.1 E	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750		Elevation (Datum NAVD 88) 608.9 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 4.5 inch O.D. / 11.5 feet		Borehole Inclination Vertical	Logged by A. Tillery
			Date Started 6/7/06
			Date Completed 6/10/06

W. Adams 5-14-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% ROD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology		Remarks	Elevation (feet)
15	1	4.0 4.5	80	SW	R3							LIMESTONE (micrite) interbedded with shale; micrite is medium gray (N5) and shale is grayish black (N2); slightly weathered to fresh; medium strong - 12.7-13.2 feet: 0.5 foot void - 11.5-19.4 feet: shale beds are very thin (<1 mm thick) and wavy	13.7 feet: milky gray fluid return 5 feet away from drill rig.	595
20	2	5.2 5.0	100	F	R3							- 19.4-24.1; shale beds are ~ 1 cm thick and planar	Losing fluid at 12.5 feet, approximately several hundred gal/run	590
25	3	5.0 5.0	100	F	R3							- 24.1- 26.4 feet: shale beds are wavy		585
30	4	5.0 5.0	99	F	R3					D		LIMESTONE (micrite); medium gray (N5); fresh; medium strong; wavy and planar beds; some stylolites	Stop to re-grout P-S casing due to slippage in hole. Also drive steel conductor casing to 14 feet to avoid water loss. Subsequent fluid return is good throughout drilling	580
35	5	4.9 5.0	98	F	R3									575
40	6	5.0	100	F	R3							LIMESTONE (micrite) interbedded with shale; micrite is medium gray (N5) and shale is dark gray to grayish black (N3 to N2); fresh; medium strong - 36-41 feet: shale beds are wavy - 41-61 feet: shale beds are planar, 40% shale	36.2 feet: Petrographic Analysis (sample PET-1005E)	570
45	7	5.1 5.0	100	F	R3								44.2 feet: Unconfined Compression Test	565
50	8	5.0 5.0	99	F	R3								49.1 feet: Unconfined Compression Test	560

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1005

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	9	5.1 / 5.1	99	F	R3				coating, rake=65			down hole pressure 450 psi	555
60	10	4.1 / 5.1	98	F	R3				Fa, 10, Pl, Sm, Op, slickensides		- 61-67.7 feet: shale beds are thinner, 20% shale, some lenses of wackestone		550
65	11	5.3 / 5.0	100	F	R3				Bj, 25, Wa, Sl-R, Op				545
70	12	4.9 / 5.1	97	F	R3				Bj/Fa, 15, Pl, Sl-R, Ti, calcite coating	D	LIMESTONE (micrite) interbedded with shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; heavily bioturbated; fossiliferous; sparry calcite vugs; burrows frequently filled in with wackestone; shale beds are thinner	69.0 feet: Unconfined Compression Test	540
75	13	4.9 / 5.0	99	F	R3				Fa, 30, Pl, Sl-R, slickensides, rake=55, hydrocarbon odor		- 71-81 feet: less shale (10-15%)		535
80	14	5.1 / 5.0	00	F	R3				Bj, 5, Wa, Sl-R, Op			77.8 feet: Unconfined Compression Test	530
85	15	5.2 / 5.0	00	F	R3				Fa, 30, Pl, Sl-R, slickensides				525
90	16	5.0 / 5.0	00	F	R3				Bj, 20, Pl-Wa, Sl-R, Op		- 88-90.3 feet: zone with almost no shale		520
											- 90.3-101.5 feet: more shale (20-25%)		

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1005

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95	17	4.9 5.0	100	F	R3			Bj, 10, Pl, SI-Ro, Ti Bj, 10, Wa, SI-Ro, Ti					515
100	18	5.1 5.0	95	F	R3							down hole pressure is 450 psi	510
105	19	5.0 5.0	100	F	R3			Bj, 10, Pl, Sm, Op Bj, 10, Pl, SI-Ro, Op		D	LIMESTONE (micrite) with interbedded shale, light gray (N7); fresh; medium strong; no shale		505
110	20	4.9 5.0	100	F	R3							- 108.9-115 feet: shale beds are planar	500
115	21	4.8 5.0	98	F	R3			Fa, 0, Pl, Sm, Ti, stickensides, rake=0				- 115-125.2 feet: shale beds become wavy and discontinuous, bioturbation	495
120	22	5.1 5.0	100	F	R3								490
125	23	5.2 5.0	100	F	R3							- 125.2-126 feet: zone with no shale	485
130	24	5.0 5.0	98	F	R3			Bj, 10, Pl, Sm, Op				- 128-130.3 feet: bioturbated, fossils, shale-rich section	480

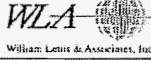
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1005

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135	25	5.0 5.0	100	F	R3				Fa. 5, Pl, Sm, slickensides, rake=90				475
140	26	4.8 5.0	96	F	R3				Fa, Pl, Sm, rake=40	C	LIMESTONE (micrite); medium gray (N5); fresh; medium strong; little shale, medium light gray (N6); 2% shale	136 to 251 feet: Rig geologist changes to K. Krug	470
145	27	5.0 5.0	99	F	R3						LIMESTONE (micrite) interbedded with calcareous shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; shale laminae every 0.01-0.1 feet; bioturbation at 148.2 feet - 143.8 feet: fossils		465
150	28	5.0 5.0	100	F	R3							146.2 feet: Unconfined Compression Test - 149.2-150 feet: shale increases and limestone is coarser, limestone color changes to medium dark gray (N4) to dark gray (N3)	460
155	29	5.0 5.0	100	F	R3					III		- 153.6-181 feet: shale increases and limestone is coarser, limestone color change to medium dark gray (N4) to dark gray (N3)	455
160	30	4.8 5.0	97	F	R3							- 160.6-160.9 feet: healed fractures - 161-165 feet: vugs filled with calcite	450
165	31	5.0 5.0	100	F	R3				Ja, 65, Wa, Sl, Ti			- 165-181 feet: shale becomes interwoven with limestone, no distinct bedding	445
170	32	4.9 5.0	8	F	R3					F			440

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299

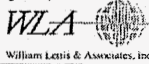


William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1005

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
175	33	5.0 / 5.0	99	F	R3								435
											- 174.5-176 feet: heavily disturbed calcareous shale bed		
180	34	5.1 / 5.0	100	F	R3								430
185	35	5.0 / 5.0	100	F	R3								425
											- 182.7-189 feet: shale beds become laminated and interwoven		
190	36	5.0 / 5.0	99	F	R3								420
										F	- 189-197.2 feet: shale beds thin, limestone is dominant		
195	37	5.0 / 5.0	100	F	R3								415
200	38	5.1 / 5.0	100	F	R3								410
											- 197.2-198.3 feet: calcareous shale bedding is discernible -198.3-210.6 feet: shale bedding is interwoven		
205	39	5.0 / 5.0	99	F	R3								405
											- 203-205 feet: calcite veins or fracture infill present throughout, parallel to and cross cuts bedding		
210	40	5.1 / 5.0	100	F	R3								400
												205.3 feet: Unconfined Compression with Stress/Strain Test	

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1005

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
215	41	5.1 5.0	100	F	R3					F	- 210.6-211.2 feet: calcareous shale bed with deformed bedding, fossils		395
											SHALE (calcareous); grayish black (N2); fresh; medium strong		
220	42	5.0 5.0	92	F	R3						LIMESTONE (micrite) with interbedded calcareous shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong		390
225	43	5.0	100	F	R3								385
230	44	4.7 5.0	94	F	R3								380
235	45	5.3 5.0	100	F	R3					ISF			375
240	46	4.8 5.0	97	F	R3								370
245	47	5.0	100	F	R3							241.3 feet: Petrographic Analysis (sample PET-1005A)	365
250	48	5.0 5.0	100	F	R3						LIMESTONE (micrite) with minor shale interbeds; medium gray (N5); fresh; medium strong SHALE (calcareous); grayish black (N2); fresh; medium strong LIMESTONE (micrite) with minor shale interbeds; medium gray (N5); fresh; medium strong; 5% shale SHALE with interbedded limestone; shale is		360

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1005

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
255											grayish black (N2) and limestone is medium gray (N5); fresh; medium strong limestone beds very thin with 0.1 feet spacing		355
											Boring terminated at 251.0 feet		
											NOTE A: Water level data		
											Date - Depth (below ground surface)		
											6/10 - 13.0 feet		
											6/11 - 13.2 feet		
											8/4 - 11.2 feet		
260													350
265													345
270													340
275													335
280													330
285													325
290													320

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299	SOIL LOG - Boring No. B-1007

Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550	Elevation (Datum NAVD 88) 608.4 feet	Ground Water Depth See Note A	120 feet Date Started 6/10/06
Logged by		Date Completed	

W. Johnson 3-13-07
 Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	
0								608.4	Lithology	0.0	Remarks
3	SPT 1		3 5 6	16.2					CH	608.4	CLAY, brownish yellow (10YR 6/6), dry to moist, stiff to very stiff, few manganese nodules, few organics
5	SPT 2		8 9 9	18					CH	605	- 3.5 feet: becomes yellowish brown (10YR 5/6)
7	SPT 3		6 9 14	18					CH	603	- 7.0 feet: few weathered angular limestone gravel and roots
8.1	SPT 4	50/1"	1					600.3	CH	8.1	SPT and auger refusal at 8.1 feet. Continuation of borehole description in rock log.
10										600	
15										595	
20										590	
25										585	
30										580	

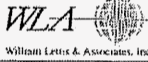
Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		MACTEC		<i>WLA</i>	ROCK LOG - Boring No. B-1007	
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1533041.2 N; 628430.9 E		Total Depth 120 feet		
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 608.4 feet	Ground Water Depth See Note A	Date Started 6/10/06		
Casing Size and Depth HW: 4.5 inch O.D. / 8.65 feet		Borehole Inclination Vertical	Logged by J. Hoeft	Date Completed 6/12/06		

W. Hoeft 3-14-07

Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RON	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
10	1	3.2 / 3.2	89	SV	01						LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); fresh to slightly weathered; medium strong; strong HCl reaction - 8.1-15 feet: occasional chert pods of varying size from < 0.05 feet diameter to >0.15 feet thick - 12-20 feet: shale is banded, rip up clasts	Fluid return good from 9 feet to bottom of boring	600
15	2	5.1 / 5.1	99										595
20	3	5.0 / 4.9	100	F	R3						- 20-27 feet: shale beds are <0.05 feet thick with spacings of 0.05-0.2 feet, shale is weak		590
25	4	4.9 / 5.0	97										585
30	5	5.1 / 5.0	100	F	R3					D	- 27-45.5 feet: shale is <0.05-0.3 feet thick with spacings of 0.05-0.3 feet		580
35	6	5.0 / 5.0	99										575
40	7	4.9 / 5.0	60	F	R3						- 39.5-41 feet: vertical joints, wavy, tight		570
45	8	5.1 / 5.0	83								- 44.5-45.2 feet: vertical joint, wavy, tight - 45.5-53 feet: shale is <0.05 feet thick with spacings of 0.1-0.2 feet		565
												47.0 feet: Unconfined Compression Test	

Project Name and No.: NuStart - Bellefonte COL. Project: 6468061299



ROCK LOG - Boring No. B-1007

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
50	9	5.1 / 5.0	94	F	R3							50-51 feet: core damaged during retrieval	560
55	10	5.0 / 5.0	100								LIMESTONE (micrite) with thin calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong; strong HCl reaction - 52-59 feet: micrite is locally crystalline		555
60	11	4.5 / 5.0	90	F	R3							58.8 feet: Unconfined Compression Test	550
65	12	5.6 / 5.0	100									- 59.3-87.3 feet: shale is < 0.02 feet thick with spacings of 0.03-0.2 feet	545
70	13	4.8 / 5.0	96	F	R3					D			540
75	14	5.0 / 5.0	100										535
80	15	5.0	100	F	R3								530
85	16	1.0 / 1.0	8.7										525
												- 87.3-89.6 feet: color of micrite changes to light	

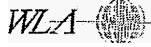
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1007

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
90	17	6.0 6.0	100								gray to medium light gray (N7/N6), shale is <0.02 feet with spacings of 0.2-0.8 feet		520
				F	R3						- 89.6-100 feet: shale is < 0.01 feet thick with spacings of < 0.01-0.9 feet		
95	18	5.0 5.0	99										515
100	19	5.0 5.0	100								- 100-114.3 feet: shale is <0.01 feet thick with spacings of 0.02-0.3 feet, wavy		510
				F	R3								
105	20	5.0 5.0	100							D			505
110	21	5.1 5.0	100										500
				F	R3								
115	22	4.8 5.0	95								- 114.3-116.6 feet: shale is 0.02-0.2 feet thick, wavy		495
											- 116.3-120 feet: shale becomes discrete beds of 0.01 feet thick with spacings of 0.02-0.15 feet		
120	23	3.7 3.5	100	F	R3								490
125											Boring terminated at 120 feet.		485
											NOTE A: Water level data Date - Depth (below ground surface) 6/12 - 10.5 feet		

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299


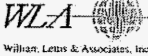


SOIL LOG - Boring No. B-1011

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532610.4 N; 628132.4 E		Total Depth 75.5 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 75	Elevation (Datum NAVD 88) 615.6 feet	Ground Water Depth See Note A	Date Started 5/30/06
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by D. Stepanof/K. Krug	Date Completed 6/6/06

D. Stepanof 3-14-07
Reviewed by / Date *DSC* 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CL	615.6	Lithology
0	SPT 1		4 5 7	15.6					CL	615.6	CLAY, dark reddish brown (5YR 3/3), dry to wet, stiff, trace gravel, (Fill)
5	SPT 2		31 3 5	16.8					CL	612.6	- color changes to yellowish red (5YR 4/6), and becomes wet at 4.5 feet (Residual)
5											possible water table at 4.5 feet
6	SPT 3	WOR 4 6		16.8	24.0	77/ 53	GSZ		CH	609.6	CLAY, yellowish brown (10YR 5/4), moist, stiff, few dark brown silt pockets
10	SPT 4		5 9 12	16.8	17.9	34/ 16	GSZ		CL	607.1	CLAY, pale yellow (2.5Y 7/4), dry to moist, very stiff to hard, effervesces strongly in HCl acid
15	SPT 5		26 30 33	10.8							- 12 feet: few weathered limestone fragments
15	SPT 6		19 26 24	14.4							
16.5	SPT 7		14	4.8					GW	599.6 599.1	GRAVEL, medium gray (N5), dry, dense, gravel is limestone rock fragments
16.5											Auger and SPT refusal at 16.5 feet. Continuation of borehole description in rock log.

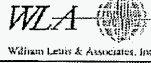
Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1011	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532610.4 N; 628132.4 E	Total Depth 75.5 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 75		Elevation (Datum NAVD 88) 615.6 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 6.63 inch O.D. / 16.5 feet		Borehole Inclination Vertical	Logged by D. Stepanof/K. Krug
			Date Started 5/30/06
			Date Completed 6/6/06

W. Stepanof 3-14-07

Reviewed by / Date *DSC* 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
20	1	3.0 / 3.0	100	F	R3					C	LIMESTONE (micrite) with interbeds of calcareous shale; micrite is medium gray (N5) and shale is medium dark gray (N4); fresh; medium strong; prominent shale-rich zone (~40%) - 16.5-22.7 feet: shale beds are 0.5-0.02 feet with spacings of 0.1-0.2 feet	No fluid recovery along boring Down pressure 600 psi	595
25	2	4.8 / 5.0	96	F	R3					C	- 22.7-30.7 feet: reduced shale content, shale is thin (<0.1 feet) and spaced 0.2-0.4 feet apart, chert nodules present		590
30	3	4.9 / 5.0	98										585
35	4	5.1 / 5.0	99				BHTV				- 30.7-35.2 feet: shale is 0.2-0.3 feet thick with spacings 0.2-0.5 feet	BHTV analysis was conducted over the length of cored section	580
40	5	5.1 / 5.0	100	F	R3					D	- 33 feet: calcite coating of crack, pyrite - 33.2 feet: slickensides and calcite crystals - 34.7 feet: chert nodule - 35.2-45.7 feet: limestone becomes more crystalline, shale changes color to medium gray (N3) - 37.5 feet: chert nodule 0.1x0.2 feet		575
45	6	4.9 / 5.0	98	F	R3					D	- 40.5 feet: stylolites - 42.5-47 feet: high angle joints with clay and calcite coatings		570
50	7	4.9 / 5.0	98	R2 / R3						D	- 45.7-49.0 feet: shale color changes to medium dark gray (N4), thickness and spacing are maintained		565
55	8	5.1 / 5.0	100	F	R3					D	49-69.8 feet: limestone becomes more crystalline, shale changes color medium gray (N3)		560

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1011

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
60	9	5.1 5.1	100										555
65	10	4.1 5.1	98	F	R3					D	- 64 feet: calcite filled vugs, maximum size 0.1x0.1 feet		550
70	11	5.1 5.1	100										545
75	12	4.9 5.0	98	F	R3						- 69.5 feet: calcite filled vug on fracture - 69.8-75.5 feet: shale returns to original banding, beds are 0.5-0.02 feet with spacings of 0.1-0.2 feet, fossil rich zone at 69.8-70 feet - 72.4-72.6 feet: slicken-sides on bedding surface		540
80	13	0.8 1.0	80								Boring terminated at 75.5 feet		535
85											NOTE A: Water level data Date - Depth (below ground surface) 8/6 - 13.2 feet		530
90													525
95													520

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



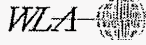
SOIL LOG - Boring No. B-1013

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532758.8 N; 628315.6 E	Total Depth 50 feet
Drilling Contractor (Driller) and Rig MACTEC (Warren) / CME 45	Elevation (Datum NAVD 88) 614.8 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by J. Hoeft
		Date Completed 6/7/06

Reviewed by / Date *J. Hoeft 3-18-07*
DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Aterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									ML	614.8	Lithology
									CH	613.8	TOPSOIL, clayey silt with organics, dark yellowish brown (10YR 4/4), very stiff, dry to moist
	SPT 1		4 5 7	10.	27.0	78/ 45	GSZ		CH	613.8	CLAY, light yellowish brown (2.5Y 6/4), dry to moist, stiff
									CL	611.1	CLAY, pale olive (5Y 6/3), wet, soft
5		SP 2	2 2 2	9.6	18.0	28/ 12	GSZ		CL	609.3	CLAY, yellowish brown (10YR 5/4) moist, stiff, trace manganese nodules
									CH	609.3	
		SP 3	2 3 5	12					CH		
									CH		
									CH		
	SPT 4		3 4 5	9					CH		
10									GW	604.3	GRAVEL with clay, dry, dense to very dense, weathered limestone
									GW	603.2	
	SPT 5		37 50/1	7					GW	603.2	SPT refusal at 11.6 feet. Auger refusal at 12.5 feet. Continuation of borehole description in rock log
15											
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1013

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532758.8 N; 628315.6 E		Total Depth 50 feet
Drilling Contractor (Driller) and Rig MACTEC (Warren) / CME 45		Elevation (Datum NAVD 88) 614.8 feet	Ground Water Depth See Note A	Date Started 5/31/06

Reviewed by / Date W. J. Adams - 3-14-07
DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	1.9 / 3.5	11	MV to SV	NR						GRAVEL with clay, dry, dense to very dense, weathered limestone	Begin rock coring after auger refusal at 12.5 feet.	600
20	2	5.1 / 5.0	87	SV to	R2 to R3			i, 20, /a, Sm, p		C	SHALE (calcareous) with micrite interbeds and occasional sections of packstone; shale is dark gray (N3), micrite is medium dark gray (N4) and packstone is medium bluish gray (5B 5/1); fresh to slightly weathered -15-26 feet: micrite layers are 0.05-0.2 feet with spacings <0.4 feet		595
25	3	5.1 / 5.0	100	F	R2 to R3			Jo/Bb, Wa, Ro, Ti, Sw		C	-22.4-23.4 feet: packstone with visible rip up clasts	BHTV analysis was conducted over the length of cored section	590
30	4	5.0 / 5.0	100	F	R2 to R3			Jo, 70, Wa, Ro, Ti		C	- 26-27.7 feet: predominatly micrite - 27.3-27.7 feet: high angle fracture 27.7-31.2 feet: micrite layers are 0.05-0.2 feet with spacings <0.4 feet		585
35	5	5.1 / 5.0	100	F	R3			i, 25, a, Sl, Ti		D	LIMESTONE (micrite) with interbedded calcareous shale, micrite is medium gray (N5), and shale is dark gray (N3) to grayish black (N2); fresh; medium strong; occasional chert pods and vugs -31.3-41 feet: shale layers are < 0.05 feet thick with spacings <0.2 feet, very crystalline - 36-41 feet: many chert pods in Run 6, maximum size 0.2x0.1 feet		580
40	6	5.0 / 5.0	99	F	R3			Bb, 10, Wa, Ro, Ti		D	- 41-50 feet: shale bed thicknesses are < 0.7 feet with spacings <0.6 feet, micrite is very crystalline	42 feet: slower drilling	575
45	7	1.9 / 3.0	97	F	R3			Bb, 20, Wa, Sl, Ti					570
50	8	3.5 / 1.0	36	F	R3			Bb, 10, Wa, Sl, Ti				PVC: 4 inch O. D. installed after drilling for BHTV test	565
Boring terminated at 50.0 feet													

NOTE A: Water level data


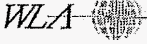
Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



William Lettis & Associates, Inc.



ROCK LOG - Boring No. B-1013

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55											Date - Depth (below ground surface) 6/5 - 9.2 feet 6/7 - 9.1 feet 8/6 - 9.1 feet		560
60													555
65													550
70													545
75													540
80													535
85													530
90													525

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1014	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532984.8 N; 628354.3 E		Total Depth 121.2 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750	Elevation (Datum NAVD 88) 609.1 feet	Ground Water Depth See Note A	Date Started 6/13/06
Sampling Method	Borehole Inclination	Logged by	Date Completed

W. Johnson 3-14-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								CLAY with sand, yellowish brown (10YR 5/8), dry to moist, stiff, trace clasts of manganese oxide nodule	CH	609.1	
	SPT 1		3 5 5	16.				- slight color change to yellowish brown (10YR 5/6)			
5			3 5 9	17.4				CLAY with sand, brownish yellow (10YR 6/8), dry to moist, stiff to very stiff, few clasts	CH	604.6	SPT and auger refusal at 5 feet. Casing set to a depth of 6 feet. Continuation of borehole description in rock log.
	SPT 2									4.5	
	SPT 3	20/0'		7.2						6.0	

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1014	
		 William Lettis & Associates, Inc.	
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532984.8 N; 628354.3 E	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750		Elevation (Datum NAVD 88) 609.1 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 5.5 feet		Borehole Inclination Vertical	Logged by K. KRUG
			Date Started 6/13/06
			Date Completed 6/14/06

Reviewed by / Date *W. Adams 3-14-07*
DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
10	1	5.0 5.5	92	SW	R2 to R3						LIMESTONE (micrite) interbedded with calcareous shale; micrite is medium bluish gray (Gley 2, 5/1) and shale is reddish brown (5YR 4/4) alternating to very dark greenish gray (Gley 2 3/1); slightly weathered to fresh; weak to medium strong - 7.6-7.8 feet: possible void - 8.2-10.8 feet: shale beds 0.05 - 0.1 feet thick and spaced 0.5 - 0.7 feet apart, non-planar, limestone is calcite rich, bioturbated zone at 8-9 feet	7.1 feet: Unconfined Compression Test	600
15	2	5.0 5.0	100	F	R3								595
20	3	4.9 5.0	98								- 17.2-18 feet: mostly medium gray (N5) limestone, fossiliferous, burrows - 18-21.4 feet: shale beds are 0.1 - 0.2 feet thick with spacings of 0.01 - 0.1 feet		590
25	4	5.0 5.0	100	F	R3						- 21.4-37 feet: shale beds indefinite and interweaving with (more dominant) limestone, 30% shale		585
30	5	5.3 5.0	100										580
35	6	4.8 5.0	96	F	R3						- 35-35.1 feet: burrows - 35.8-37 feet: healed fracture, calcite	32.2 feet: Unconfined Compression Test	575
40	7	5.3 5.0	100								- 37-46 feet: interwoven shale bands become more solid and group as inbeds in thicknesses of 0.1 - 0.2 feet with spacings 0.01 - 0.5 feet		570
45	8	4.8 5.0	96								- 42-48 feet: bioturbation - 43.4-45.6 feet: crystalized fracture plane		565

Mb. 75, Wa. Ro. Ti, incipient

Jo. 75, Wa. Ro. Ti, incipient 36.3-37.3'

Jo. 75, Wa. Ro. Ti, incipient, 44-45.6'

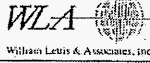
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1014



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
50	9	4.4 / 5.0	89	F	R2 to R3		Jo, 65, Wa, Ro, T1, 47.4-47.9'				- 46-50.9 feet: less shale beds, shale beds are defined with thicknesses of 0.1 - 0.2 feet and spacings of 0.1 - 0.5 feet, 15% shale	46 - 51 feet: calcite-filled vugs present throughout run	560
55	10	5.3 / 5.0	100								- 50.9-57.7 feet: shale beds become very thin and discontinuous, calcite filled vugs, 5% shale - 51-86 feet: calcite-filled vugs 0.2 - 0.01 feet diameter, common		555
60	11	5.3 / 5.0	100	F	R3		Mb, slickensides				- 57.7-73.3 feet: shale beds are 0.01 - 0.1 feet thick with spacings < 0.2 feet, 20% shale	55.8 feet: Unconfined Compression Test	550
65	12	5.2 / 5.0	100							D			545
70	13	4.6 / 5.0	91	F	R3								540
75	14	5.2 / 5.0	100								- 73.3-76 feet: calcite-rich limestone with no shale		535
80	15	5.0 / 5.0	100	F	R3						- 76-86.1 feet: shale is 0.001 - 0.1 feet thick with spacings 0.2 - 0.1 feet, planar, interwoven		530
85	16	4.8 / 5.0	95								- 85 feet: fossil-rich limestone layer		525

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1014

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
86.1-87.4	17	5.0 / 5.0	99								- 86.1-87.4 feet: very little shale (2%), limestone is medium gray (N5) - 87.4-92 feet: shale is very thin		520
92.0-98.1	18	5.2 / 5.0	100	F	R3			Jo, 70, Wa, Ro, Ti Ja, 65, Wa, Ro, Ti			- 92.0-98.1 feet: micrite interbedded with shale, micrite is medium gray (N5), 10% shale		515
98.1-105.7	19	5.2 / 5.0	100								- 98.1-105.7 feet: micrite with interbedded shale, 15% shale		510
105.7-111.9	20	4.9 / 5.0	97	F	R3					D	- 105.7-111.9 feet: shale is < 0.01 feet thick with spacings of 0.001 - 0.2 feet, beds become irregular at 111 feet, 10% shale - 106-115 feet: calcite infilled vugs common among bands of limestone		505
111.9-115.2	21	5.2 / 5.0	100								- 105.7-111.9 feet: shale is < 0.01 feet thick with spacings of 0.001 - 0.2 feet, beds become irregular at 111 feet, 10% shale - 106-115 feet: calcite infilled vugs common among bands of limestone		500
115.2-117.6	22	4.7 / 5.0	93	F	R3			Jo, 70, Wa, Ro, Ti			LIMESTONE (micrite) with calcareous shale; medium gray (N5); fresh; medium strong; shale is irregular; 25% shale - 115.2-117.6 feet: shale becomes planar, calcite-healed fractures		495
117.6-119.7	23	5.1 / 5.2	100	F	R3						- 117.6-117.9 feet: packstone or wackestone 0.3 feet thick - 117.9-120.4 feet: shale beds are irregular		490
119.7-121.2								Mb: slickensided, calcite-coated			LIMESTONE (micrite); medium gray (N5); fresh; medium strong; shale laminae with spacings of 0.2 feet - 119.7 feet: slickensided calcite joint plane		485
121.2-122.2											Boring terminated at 121.2 feet NOTE A: Water level data Date - Depth (below ground surface) 8/6 - 12.2 feet		485

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1034	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532442.6 N; 629037 E	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750/CME 85		Elevation (Datum NAVD 88) 622 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Date Started 6/22/06
		Logged by K. KRUG	Date Completed 6/26/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)		Remarks
										622	0.0	
0									CH	622	0.0	
1	SPT 1		7 6 5	18					CH			CLAY with sand, brown (7.5 YR 4/4) to dark yellowish brown (10YR 4/6), dry to moist, stiff, few clast and organics
2												
3	SPT 2		2 5 5	18								- 4.5 feet: sand content decreases (some), color is yellowish brown (10YR 5/6), few manganese oxide
4												
5	SPT 3		7 13 15	18					CH	615.6	6.4	CLAY, dark yellowish brown (10YR 4/6), dry, very stiff to stiff, trace manganese oxide
6												
7	SPT 4		7 3 5	18					CH	613.0	9.0	- 8.5-9 feet: no clasts, some organics
8												CLAY, yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/6), moist to dry, medium stiff, trace manganese oxide, trace organics
9	SPT 5		7 3 5	15.6					CH	609.9	12.1	- presence of organics
10												sandy CLAY, yellowish brown (10YR 5/5), moist, medium stiff, rich in manganese oxide
11	SPT 6		25/1"	1					CH	608.0	14.0	Auger and SPT refusal at 14 feet. Continuation of borehole description on rock log.
12												
13												
14												
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Reviewed by / Date DSC 5-9-07 Rev. 1

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299 		ROCK LOG - Boring No. B-1034	
Drilling Method		Boring Location Coordinates: AL State Grid (ft) 1532442.6 N; 629037 E	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750/CME 85		Elevation (Datum NAVD 88) 622 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 14 feet		Borehole Inclination Vertical	Logged by K. KRUG
		Total Depth 249.5 feet	Date Started 6/22/06
			Date Completed 6/26/06

W. Johnson 3-19-07
 Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% ROD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)	
15	1	1.8 2.0	20	SW	R2					Bj, 10, Wa, Ro, Op	LIMESTONE (wackestone); medium dark gray (N4); slightly weathered; weak LIMESTONE (micrite) with interbedded calcareous shale and occasional wackestone beds; micrite is medium gray (N5) and shale is black (Gley 1, 2.5/0); slightly weathered to fresh; weak to medium strong; shale is laminated, nonplanar and indistinct, spaced 0.001 feet apart; ~20% shale - 15.6-28.6 feet: shale beds are non-planar - 16.8-17 feet: wackestone layer - 19.3-19.5 feet: wackestone layer	15-26 feet: poor to little fluid return	605	
20	2	5.0 5.0	92	SW	R2 to R3							- 23.2-28.6: rip-up clasts		600
25	3	5.2 5.0	100											595
30	4	4.7 5.0	94	F	R3					A	LIMESTONE (wackestone) with interbedded shale; fresh; medium strong; shale wispy, undulatory .< 0.001 feet thick, spaced 0.001 feet apart; calcite-rich		590	
35	5	5.0 5.0	100									LIMESTONE (micrite) with interbedded calcareous shale; fresh; medium strong; shale is planar, globular shaped, < 0.01 feet thick spaced < 0.2 feet apart - 35.3-35.7 feet: wackestone bed - 35.7-39.1 feet: shale is globular shaped - 39.1-43 feet: shale beds become more planar	33.2 feet: Unconfined Compression with Stress/Strain Test	585
40	6	5.3 5.0	100							Jo, 65, Wa, Ro, 1 Jo, 65, Wa, Ro, 1			580	
45	7	5.3 5.0	100	F	R3							LIMESTONE (micrite) with interbedded shale; fresh; medium strong; 10% shale - 45.5-46.2 feet: shale is calcareous - 43-45.5 feet: shale becomes wispy, interwoven with limestone - 46.2-53.3 feet: shale is wispy, non-planar and < 0.01 feet thick, spaced < 0.3 feet apart	45.8 feet: Petrographic Analysis (sample PET-1034F)	575
50	8	5.0 5.0	100							B			570	
	9	5.2	100									- 53.3 -54.4 feet: shale becomes < 0.01 feet thick		

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1034

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55		5.0									with rip-up clasts - 54.4-60.7 feet: shale beds become undulatory and interwoven/globular and faint with < 0.1 feet thickness spaced < 0.1 feet apart	54.58 feet: Unconfined Compression with Stress/Strain Test 56-249.5 feet: no fluid return	565
60	10	4.9 / 5.0	98	F	R3						- 60.7- 66.6 feet: shale becomes more planar	60.3 feet: Unconfined Compression Test	560
65	11	5.0 / 5.0	100										
70	12	5.0 / 5.0	100	F	R3						LIMESTONE (wackestone) with interbedded calcareous shale; fresh; medium strong; shale beds are non-planar, very thin with spacing < 0.01 feet; calcite coating of wackestone; ~35% shale LIMESTONE (micrite) with interbedded shale; fresh; medium strong; 10% shale		555
75	13	5.2 / 5.0	100							B	LIMESTONE (micrite) with interbedded calcareous shale; fresh; medium strong; shale beds are non-planar; 35 % shale		550
80	14	4.9 / 5.0	98	F	R3						- 73 feet: decrease to 10% shale, shale becomes wispy, thin and spaced < 0.2 feet apart - 79-80 feet: shale becomes more bedding defined, rip-up clasts of limestone common, fossil rich - 80-82.4 feet: shale becomes wavy, wispy - 81 feet: Increase in shale content to 40%		545
85	15	4.9 / 5.0	96								- 82.4-82.6 feet: calcite rich in-fill - 82.6-86.4 feet: heavily deformed bedding, shale thickens to < 0.2 feet bands, wavy, non-planar	83.2 feet: Unconfined Compression Test	540
90	16	4.9 / 5.0	97	F	R3						LIMESTONE (micrite and wackestone) with interbedded calcareous shale; fresh; medium strong; 10% shale - 86.4-95.2 feet: shale is calcite-rich, wavy and wispy, and spaced < 0.2 feet apart - 88.5 feet: calcite-filled vug, 0.2 x 0.25 feet		535
	17	5.1	100										530

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1034

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95		5.0									LIMESTONE (wackestone) with interbedded calcareous shale; fresh; medium strong; thickness < 0.2 feet, spaced < 0.3 feet; 30% shale		525
	18	5.0 / 5.0	100	F	R3						- 95.2-98.9 feet: shale beds thicken and are globular		
100											101.6 feet: fossiliferous		520
	19	4.7 / 5.0	94										
105				F	R3								515
	20	5.3 / 5.0	100								LIMESTONE (micrite and wackestone) with interbedded shale; fresh; medium strong; 40% shale		
110											- 107.5-113.3 feet: shale density increases as non-distinct interwoven bands; 0.01 - 0.2 feet thick, space up to 0.2 feet		510
	21	5.0 / 5.0	100							B	SHALE with interbedded limestone; fresh; medium strong; approximately 30% micrite		
115				F	R3						LIMESTONE (wackestone) with interbedded calcareous shale; fresh; medium strong; shale is non-planar and undulatory; 35% shale	114.4 feet: Unconfined compression with Stress/Strain Test	505
	22	4.8 / 5.0	97								- 114.6-126 feet: shale is globular with < 0.01 feet thickness and spaced < 0.1 feet apart, rip-up clasts common		
120													500
	23	5.3 / 5.0	100										
125				F	R3						- 126-132 feet: shale beds become wispy and less globular		495
	24	5.2 / 5.0	100										
130												130 feet: changed drilling rig to CME 85	
	25	3.1 / 3.5	87	F	R3						LIMESTONE (wackestone) with interbedded calcareous shale; fresh; medium strong; ~25% shale; occasional rip-up clasts		490

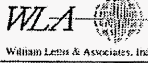
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1034

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135	26	5.5 / 5.0	91	F	R3						LIMESTONE (micrite), Grey (5YR 5/1), fossil-rich, interbedded with wispy calcareous shale spaced ~0.01 feet apart - 137.5-143.5 feet: calcite vugs common (0.01 x 0.01 feet)		485
140	27	5.0 / 5.0	100										480
145	28	4.4 / 5.0	88	F	R3						LIMESTONE (packstone and wackestone); fresh; medium strong; with minor interbedded shale; calcite-rich; 10% shale - 144.2-144.9: calcite-rich - 144.9-145.4 feet: shale beds wispy and undulating - 145.4-147.2 feet: 3 shale beds spaced ~0.4 feet apart - 147.2-149.5 feet: shale beds occur in groupings every 0.5-0.7 feet with wispy < 0.002 thick layers associated with rip-up clasts	146.9 feet: Unconfined compression with Stress/Strain Test	475
150	29	5.0 / 5.0	100							B	LIMESTONE (wackestone) with interbedded calcareous shale; fresh; medium strong; 25% shale - 149.5-154.5 feet: shale density increases		470
155	30	5.2 / 5.0	100	F	R3			Jo. 65, Wa. Ro. Ti			- 154.4-154.7 feet: shale bed - 154.5 feet: decrease to 10% shale		465
160	31	4.8 / 5.0	95					Jo. 75, Wa. Ro. Ti			- 154.7-168.5 feet: shale occurs in groupings spaced 1-2 feet apart with beds < 0.01 feet thick, wavy to wispy and undulating, size of calcite in-filled vugs increases to 0.01-0.1 feet		460
165	32	5.1 / 5.0	100	F	R3			Jo. 70, Wa. Ro. Ti Jo. 55, Wa. Ro. Ti			- 167-168.6 feet: shale beds become more planar and start to thicken to 0.01-0.2 feet, fewer rip-up clasts		455
170	33	5.0 / 5.0	99							C	Interbedded LIMESTONE (packstone) and calcareous shale; fresh; medium strong; 45% shale - 168.5-174.5 feet: shale beds thicken to 0.2-0.4 feet, more planar, limestone is calcite-rich, shale color changes to very dark gray (10YR 3/1)		450

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1034



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
175	34	5.3 5.0	100	F	R3			Jo, 70, Wa, Sm			-174 feet: decrease in shale density (15%) and thickness (0.1 feet thick) - 174-176.2 feet: healed joint structures present - 174.5-175 feet: shale bed		445
180	35	5.1 5.0	100								LIMESTONE (micrite) interbedded with calcareous shale; micrite gray (5YR 5/1); fresh; medium strong; shale becomes groupings of thin, planar, 0.01-0.1 foot thick beds spaced 0.02-0.1 feet apart; 45% shale		440
185	36	5.0 5.0	100	F	R3			Jo, 60, Wa, Ro, Ti			LIMESTONE (alternating micrite and wackstone) with interbedded calcareous shale; fresh; medium strong; 40% shale		435
190	37	5.3 5.0	100							C	SHALE with interbedded limestone (micrite) beds; shale color returns to black (Gley 1, 2.5/0); fresh; medium strong; micrite beds are planar 0.01-0.1 feet thick with spacings < 0.01 feet; 80% shale		430
195	38	4.7 5.0	92	F	R3						SHALE with interbedded limestone (micrite and wackstone); fresh; medium strong; 55% shale		425
200	39	5.3 5.0	100	F	R3						SHALE (calcareous) with interbedded limestone (micrite); fresh; medium strong; beds massive and disturbed at edges; 60% shale		420
205	40	4.9 5.0	98	F	R2							205.5 feet: Petrographic Analysis (sample PET-1034C)	415
210	41	4.2 5.0	82								LIMESTONE (micrite and wackstone) with interbedded shale; fresh; medium strong; fossil rich: 20% shale - 207.9-211.1 feet: alternating micrite and wackstone, shale beds are wavy, non-continuous, and heavily disturbed; - 211.1-212.1 feet: prominent shaly zone, 70% shale - 212.1-224.3 feet: micrite with interbedded shale.		410

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1034

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
215	42	5.3 / 5.0	100	T	R3						some packstone and wackestone interbeds; shale is thin and globular; occasional fossil-rich units		405
											- 217.5-218 feet: packstone interbed		
220	43	4.9 / 5.0	94										400
225	44	3.8 / 5.0	68	F	R3					C	SHALE with interbedded limestone (micrite); fresh; medium strong; limestone is interwoven in non-planar layers with thicknesses 0.1-0.3 feet and spacings 0.01-0.2 feet; 55% shale		395
230	45	5.2 / 5.0	100		R3						- 230.1-231.9 feet: wackestone with thin shale interbeds		390
235	46	5.0 / 5.0	48	F	R2 to R3						- 236.3-236.8 feet: Pyrite nodules		385
240	47	5.0	100		R3					D	LIMESTONE (micrite) with interbedded shale; fresh; medium strong; shale is wispy to thick; calcite infill; 15% shale; minor wackestone	238.2-239.6 feet: pieces, possibly induced by drilling	380
245	48	4.7 / 5.0	93	F	R2						- 242.2-247.8 feet: shale beds are thin to wispy, discontinuous and undulatory, spaced 0.01-0.3 feet apart, calcite infilling more common		375
											- 247 feet: calcite vugs 0.1 x 0.01 feet common		
											- 247.8-249.6 feet: shale beds become thicker (0.01-0.1 feet) with spacings of 0.2-0.3 feet, less calcite	247.4 feet: Unconfined Compression with Stress/Strain Test	
250											Boring terminated at 249.5 feet NOTE A: Water level data Date - Depth (below ground surface) 6/25 - 14.8 feet 6/26 - 14.7 feet 6/29 - 14.9 feet 8/18 - 12.6 feet		370

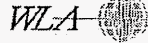
Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1035	
 			
Hollow stem auger (8" OD)/ HQ core (3.8")		1532549.5 N; 629112.9 E	
Drilling Contractor (Driller) and Rig MILLER (Upchurch) / CME 85		Elevation (Datum NAVD 88) 616.1 feet	Ground Water Depth See Note A
		Borehole Inclination Vertical	Date Started 8/2/06
		Logged by J. Hoefft	Date Completed 8/5/06

W. H. Hoefft 3-14-07

Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type	Elevation (feet)	Remarks
0									CH	616.1	Lithology
	SPT 1	10 14 16	8.4					CLAY, reddish brown (5YR 4/4), dry, very stiff, few limestone gravel and organic matter (Fill)	CH	614.0	
	SPT 2	7 10 14	14.4	21.3	50/26	GSZ		CLAY with sand, yellowish brown (10YR 5/6), moist, very stiff, few manganese nodules	CH	611.9	
5	SPT 3	2 3 6	7.2	23.4	58/35	GSZ		CLAY, yellowish brown (10YR 5/6), moist, stiff	CH	607.6	
	SPT 4	8 12 9	15.6						CH	605	
10	SPT 5	25 45 30/2	12					moist, very stiff, gravel is weathered limestone	GC	601.8	
	SPT 6	35/3"	2.4								SPT refusal at 12.6 feet. Auger refusal at 14.0 feet. Continuation of borehole description in rock log. Advance boring by washing to 14.3 feet and set PVC casing before HQ coring.
15											
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1035

Drilling Contractor (Driller) and Rig MILLER (Upchurch) / CME 85		Elevation (Datum NAVD 88) 616.1 feet	Ground Water Depth See Note A	Date Started 8/2/06
Casing Size and Depth PVC: 4.5 inch O.D / 14.3 feet		Borehole Inclination Vertical	Logged by J. Hoeft	Date Completed 8/5/06

M. J. Hoeft 3-13-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	We then g	Element	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	1.4 / 1.7	84	SW to F	R					A	LIMESTONE (micrite) with calcareous shale interbeds and occasional packstone beds; micrite is medium gray (N5), packstone is medium blueish gray (5B 5/1) and shale is dark gray (N3); fresh to slightly weathered; medium strong	Advance boring by washing to 14.3 feet and set PVC casing before HQ coring. 14.3-37 feet: Fluid return good	600
20	2	5.1 / 5.0	100	F	R					A	- 14-30.7 feet: shale is 0.01-0.15 feet thick, wavy and planar beds, visible rip ups		595
25	3	5.1 / 5.0	100							A		26.48 feet: Unconfined Compression Test	590
30	4	4.6 / 5.0	91	F	R					A			585
35	5	5.1 / 4.9	100							A	LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5), and shale is dark gray (N3); fresh; medium strong; strong HCl reaction		580
40	6	5.2 / 5.0	100							n		37 feet: fluid return reduced significantly	575
45	7	5.1 / 5.2	98	F	R					B		40.27 feet: Unconfined Compression Test 42 feet: No fluid return to bottom of boring	570
50	8	5.2 / 5.0	100	F	R								565
55	9	5.0	99									- 52.8-60 feet: shale is hairline to 0.03 feet thick with spacings of 0.05-0.5 feet wavy rip ups visible	

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1035

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55		5.0											560
60	10	5.0 / 5.0	100	F	R3						- 60-75 feet: shale is 0.01-0.1 feet thick with spacings of <0.5 feet, wavy		555
65	11	4.9 / 5.0	97										550
70	12	5.1 / 5.0	100	F	R3								545
75	13	4.8 / 5.0	96							B	- 75-87.3 feet: shale is <0.1 feet thick (average is 0.01 feet) with spacings of 0.05-0.4 feet, wavy	72.28 feet: Unconfined Compression Test	540
80	14	4.3 / 5.0	86	F	R3						- 81-85 feet: general absence of (<5%) calcareous shale interbeds		535
85	15	5.3 / 4.3	100										530
90	16	5.2 / 5.3	98	F	R3			Jo. 80, Wa, Si, Ti			LIMESTONE (micrite) with calcareous shale interbeds and occasional packstone interbeds; micrite is medium gray (N5), packstone is medium bluish gray (5B 5/1) and shale is dark gray (N3); fresh; medium strong; average packstone interbed thickness is 0.1 feet; rip up clasts and visible fossils		525
	17	5.3 / 5.2	100					Jo. 70, Wa, Si, Ti			- 88.2-90.2 feet: packstone interbed - 90.2-101 feet: shale is < 0.1 feet thick with spacings 0.03-0.3 feet, wavy		

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1035

Depth (feet)	Run No.	Recovery / Corrosion	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95													520
100	18	5.0 / 5.1	99	F	R3							- 101-105 feet: shale rich section, shale is 0.05-1.0 feet thick with spacings of <0.05 feet interbedded with packstone, prominent rip up clasts	515
105	19	5.1 / 5.1	100									- 105-111 feet: packstone with shale, shale is 0.05-0.1 feet thick with spacings of <0.3 feet, rip up clasts	510
110	20	5.1 / 5.1	99	F	R3							- 108 feet: visible fossils and rip up clasts	505
115	21	4.8 / 5.0	96					Jo, 65, Wa, Sl, 1 Mineraliz		B		- 113 feet: becomes more micritic; packstone still present	500
120	22	5.2 / 5.0	100	F	R3			Jo, 90, Wa, Sl, 1					495
125	23	5.1 / 5.0	00									- 122.2-124.4 feet: packstone with shale, fossils, and rip up clasts	490
130	24	5.0 / 5.0	00	F	R3							- 124.4-132 feet: shale beds are <0.01 feet thick, wavy and irregular with rip up clasts	485
	25	5.1	100									LIMESTONE (packstone) with calcareous shale interbeds; packstone is medium bluish gray (5B 5/1) and shale is dark gray (N3); fresh: medium	

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299 	ROCK LOG - Boring No. B-1035
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Depth (feet)	Run No.	Recovery / Cut	% ROD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135		5.0									strong; pressure solution features		480
140	26	5.1	98	F	R3					B	LIMESTONE (micrite) and calcareous shale interbeds with packstone beds; micrite is medium gray (N5), packstone is medium bluish gray (5B 5/1) and shale is dark gray (N3); fresh; medium strong; shale is < 0.03 feet thick with spacings of <0.05 feet		475
145	27	5.0	100							B	LIMESTONE (packstone); packstone is medium bluish gray (5B 5/1) and shale is dark gray (N3); fresh; medium strong; pressure solution features; sections of calcareous shale are 0.3-1.5 feet thick - 142.2- 150 feet: no shale, all stylonitic pressure solution features		470
150	28	5.0	100	F	R3					B	- 150-160 feet: packstone with shale interbeds, spacing varies from 0.05-0.5 feet		465
155	29	4.8	96							B	LIMESTONE (micrite) with calcareous shale interbeds; shale is dark gray (N3), micrite is medium gray (N5); fresh; medium strong		460
160	30	4.8	96	F	R3					B	- 154-165 feet: calcareous shale ~30% of rock mass		455
165	31	4.9	100							C	SHALE (calcareous) with interbedded micrite; shale is dark gray (N3), micrite is medium gray (N5); fresh; medium strong; planar bedding; micrite beds are thinly bedded (<0.1 feet thick); 35% micrite		450
170	32	4.6	91	F	R3								445
											Boring terminated at 171.1 feet NOTE A: Water level data Date - Depth (below ground surface) 8/3 - 9.4 feet		

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1035


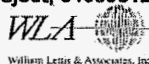
Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
175											8/4 - 11.6 feet 8/5 - 11.5 feet		440
180													435
185													430
190													425
195													420
200													415
205													410
210													405

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299 	SOIL LOG - Boring No. B-1037
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Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532329 N; 628980.8 E	Total Depth 149.7 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750	Elevation (Datum NAVD 88) 621.4 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by A. Tillery
		Date Started 6/19/06
		Date Completed 6/21/06

W. J. Adams 3-13-07
 Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PL)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CH	621.4	
		SPT 1	WOI 17	19					CH	618.4	
5		SPT 2	335	7	16.8	38/19	GSZ		CL	613.4	
		SPT 3	WOI 56	17.5					CH	613.4	
10		SPT 4	357	15	24.8	73/43	GSZ		CH	608.9	
		SPT 5	WOI 2512	9					GP	607.4	
15		SPT 6	1520/0'	6					GP	607.4	

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1037	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532329 N; 628980.8 E	
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750		Elevation (Datum NAVD 88) 621.4 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 4.5 inch O.D / 13.5 feet		Borehole Inclination Vertical	Logged by A. Tillery
			Date Started 6/19/06
			Date Completed 6/21/06

Reviewed by / Date *A. Tillery* 3-13-07
DTC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology		Remarks	Elevation (feet)	
15	1	1.1 1.3	61	HW	R3							LIMESTONE (wackestone) interbedded with micrite and shale beds; micrite is medium gray (N5) and shale is grayish black (N2); fresh to highly weathered; medium strong; micrite is very fine grained	14-93.5 feet: fluid return good, milky white	605	
	2	5.3 5.0	100	F	R3			Bj, 10, Wa, Si - Ro				- 13.5-14 feet: weathered and fractured rock zone			
20	3	4.9 5.0	94					Bj, 10, Pl, Sm, Ti				- 13.5-22.8 feet: micrite beds are 0.1-0.2 feet thick and shale beds are wavy and laminated to 15.6 feet and less wavy and thicker (up to 8cm) from 15.8 feet to 22.8 feet		600	
	4	5.1 5.0	96	F	R3			Bj, 15, Si, Si - Ro				- 22.8-25 feet: discontinuous and wavy, shale beds are thinner	25-40 feet: generally fossiliferous few slight bioturbated lenses	595	
	5	5.0 5.0	96					Bj, 15, Pl, Sm, poor fit		A		- 25-31 feet: shale beds very thin, wavy, with random stylolites and rip up clasts		590	
	6	5.1 5.0	93	F	R3			Bj, 10, Wa, Sm, Ti				- 37 feet: sparry calcite vug 0.2 feet		585	
40	7	4.9 5.0	98					Bj, 10, Wa, Ro, Ti						580	
	8	5.0 5.0	96	F	R3			Bj, 20, Pl, Sm, rake = 90						575	
								Bj, 10, Pl, Sm, Ti							
								Bj, 25, Pl, Ro, Ti							
50	9	5.2 5.0	100					Bj, 15, Wa, Si-Ro, Op				- 50-54.6 feet: bioturbated zone of micrite		570	
								Bj, 10, Pl, Mo-Ro, Ti		B					



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	10	4.9 / 5.0	92	F	R3			Bj, 15, Pl, Mo-Ro, Ti			LIMESTONE (micrite) interbedded with calcareous shale; micrite is medium gray (N5) and shale is grayish black to dark gray (N2-N3); fresh; medium strong; micrite is fine to very fine grained with 0.05-0.4 feet beds; shale is very thin, wavy and discontinuous		565
60	11	5.2 / 5.0	100					Bj, 10, no Bj, 10, no			- 55-62 feet: less shale, wavy irregular beds	59.1 feet: Unconfined Compression Test	560
65	12	4.9 / 5.0	100	F	R3			Jo, 60, Sl, Op, Mo-Ho			- 65 feet: shale beds highly irregular, bioturbated, and discontinuous, chert nodule - 67.2-74.6 feet: shale beds are thicker with an average of 0.2 feet		555
70	13	5.2 / 5.0	100								- 70-85 feet: sparry, calcite-filled burrows	68.95: Unconfined Compression Test	550
75	14	5.0 / 5.0	100	F	R3					E1	- 75-76.8 feet: bioturbation - 79-79.4 feet: bioturbation		545
80	15	4.8 / 5.0	100					Bj, 15, Pl, Ro, poor fit					540
85	16	4.9 / 5.0	100	F	R3						- 84.8-89.5 feet: less shale		535
90	17	5.4 / 5.0	100					Fa, 25, Pl, Sm, Ti			89.7-94.0 feet: limestone is medium to coarse grained 92 feet: sparry calcite vug		530

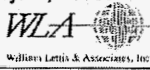
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1037



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95	18	5.1 / 5.0	100	F	R3						- 94.0-94.8 feet: shale rich zone	93.5 feet: lost fluid return momentarily	525
100	19	5.0 / 5.0	99								LIMESTONE (micrite): micrite is medium light gray to light gray (N6-N7); fresh; medium strong; micrite is fine grained with some sparry calcite filled cracks; scattered shale laminae (1%)		520
105	20	2.0 / 2.0	3	F	R3						- 107.6-109.1 feet: micrite with wackestone; small, sparry, calcite-filled bioturbation		515
110	21	5.0 / 5.0	100					Bj, 10, F, SI-Ro, T			- 110.0-111.1 feet: fossiliferous	110 feet to bottom of boring: lost fluid return	510
115	22	1.0 / 1.0	0	F	R3			Bj, 10, P, SI-Ro, T			LIMESTONE (micrite) interbedded with shale beds; micrite is medium gray (N5) and shale is grayish black (N2); micrite is very fine grained, slightly fossiliferous, with beds 0.1-0.5 feet (avg=0.2 feet); micrite to shale ratio is 70:30		505
120	23	5.0 / 5.0	100					Bj, 10, Pl, SI-Ro, Op			- 117.5-118.2 feet: shale rich zone - 118.2-124.6 feet: shale content increases with depth, beds are 0.1-0.4 feet thick, wavy, bioturbated, with rip up clasts		500
125	24	1.0 / 1.0	99	F	R3			Bj, 2, Pl, Mo-Ro, Op, poor fit			127.4-128.8 feet: packstone, fossiliferous		495
130	25	1.0 / 1.0	36					Bj, 18, Pl, Sm, TI			LIMESTONE (wackestone and micrite) interbedded with shale layers; wackestone and micrite are medium gray (N5) and shale is grayish black (N2); fresh; medium strong; wackestone and micrite are very fine to medium grained; shale beds are wavy, thin		490
								Bj, 5, Wa					

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1037



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135	26	5.0 / 5.0	100	F	R3			SI-Ro, Ti					485
140	27	5.1 / 5.0	100					Bj, O, Pl, Sm, Ti		B	- 140-145 feet: shale beds are thinner - 142.1-144.2 feet: bioturbation		480
145	28	5.0 / 4.9	98	F	R3			Bj, 10, Wa, SI-Ro			LIMESTONE (wackestone) interbedded with shale and micrite beds; wackestone is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; wackestone is medium grained with heavily bioturbated beds; shale is fine grained and thin with wavy beds		475
150											Boring terminated at 149.7 feet		470
155											NOTE A: Water level data Date - Depth (below ground surface) 5/20 - 9.2 feet 5/21 - 14.3 feet 8/17 - 13.4 feet		465
160													460
165													455
170													450

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1040	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532554 N; 629061 E	
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 616.9 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Logged by J. Hoeft
			Date Started 6/26/06
			Date Completed 6/28/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CL	616.9	CLAY, reddish brown (5YR 4/4), dry to moist, stiff to very stiff, trace manganese nodules (~0.01 inch in diameter)
1	SPT 1		9 7 7	16.2					CL		- 1.7 feet: becomes yellowish brown (10YR 5/4)
2	SPT 2		7 7 8	16.8					CL		- 6.5 feet: becomes moist in third SPT sample
3	SPT 3		5 6 9	18					CL		
4	SPT 4		7 22 50/6"	16.8					CL	607.4	CLAY with limestone gravel, yellowish brown (10YR 5/4), dry to moist, hard
5	SPT 5		50/0"	0					CL	603.7	- 9.5-13 feet: limestone gravel is slightly weathered with white powder coating and has sharp angular edges
6											SPT at 11.2 feet did not advance. Driller broke through with auger.
7											SPT refusal at 13.2 feet. Continuation of borehole description in rock log.

WLA 5-10-07

Reviewed by / Date DSC 5-9-07 Rev. 1

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1040	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532554 N; 629061 E	
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 616.9 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 13.6 feet		Borehole Inclination Vertical	Logged by J. Hoeft
			Date Started 6/26/06
			Date Completed 6/28/06

Reviewed by / Date MJH 5-10-07
DSC 5-9-07 Rev. 1

Depth (feet)	Run No.	Recovery / Cut	% ROD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	2.9 2.9	77	F	R3				Bi, 10, Wa, Sl, Ti	A	LIMESTONE (micrite) with calcareous shale interbeds; medium gray (N5) and dark gray (N3); ash; medium strong		600
15-21									Jo, 70, Wa, Sl, Ti		14.8-15.6 feet: high angle fracture (70°) with slight staining		
15-21									Bi, 10, Wa, Sm, Ti		15-21 feet: shale is wavy, range of thickness is .01-0.1 feet with spacing < 0.01-0.2 feet		
20	2	5.0 5.0	99	F	R3				Jo, 70, Wa, Sl-Sm, Ti		18.9-19.5 feet: high angle fracture (70°) with slight staining		595
20-21											21-31 feet: shale is <0.01 feet thick with spacing 0.01-1.0 (average is 0.8)		
25	3	5.1 5.0	100	F	R3				Jo, 90, Wa, Sl, Ti		21.4-24.2 feet: high angle fracture: 90°		590
25-29.1									21.4-24.2 feet Bi, 25, Wa, Sl, Ti				
30	4	4.8 5.0	90	F	R3							29.1 feet: Unconfined Compression Test	585
30-43											- 31- 45 feet: shale bed spacing 0.03-0.3 feet, wavy		
35	5	5.1 5.0	100	F	R3				Jo, 75, Wa, incipient	B		- 33.5 feet: shale bed 0.08 feet thick with light olive gray (5Y 5/2) color	580
40	6	4.9 5.0	9	F	R3								575
45	7	3.6 5.0	72	F	R3							- 43 feet: rip-up clasts	570
45-50.4											- 45-56.5 feet: shale is 0.02-0.2 feet thick with spacing 0.05-0.3 feet		
50	8	6.6 5.0	100	F	R3							- 50.4 feet: shale layer 0.2 feet thick	565
50-55.3												50.3 feet: Unconfined Compression Test	

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1040



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)	
55	9	5.0 / 4.9	100	F	R3		[Brick pattern]			B			560	
60	10	5.0 / 5.0	100	F	R3							- 56.5-65 feet: shale is 0.01-0.4 feet thick with spacing 0.02-0.3 feet		555
65	11	4.9 / 5.0	98	F	R3								63.2 feet: Unconfined Compression Test	550
70	12	5.0 / 5.0	99	F	R3							- 65-75 feet: shale is 0.01-0.1 feet thick with spacing 0.1-0.6 feet, rip-up clasts		545
75	13	4.9 / 5.0	97	F	R3							- 69 feet: stylolites observed		540
80	14	4.2 / 4.1	100	F	R3							- 75-90 feet: shale is 0.01-0.1 feet thick with spacing 0.05-0.5 feet, rip-up clasts		535
85	15	6.0 / 6.1	97.7	F	R3									530
90	16	5.2 / 5.0	100	F	R3							- 90-110.4 feet: shale is 0.01-0.2 feet thick with spacing 0.05-0.3 feet - 91-93 feet: calcareous shale-rich section, micrite is 0.1-0.2 feet thick		525

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1040

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)		
95	17	4.6 4.9	98	F	R3		[Brick pattern]			B	- 96 feet: rip-up clasts		520		
100	18	5.1 5.0	100	F	R3										515
105	19	4.8 5.0	95.6	F	R3										510
110	20	5.2 5.0	100	F	R3										505
115	21	4.8 5.0	96	F	R3										500
120	22	3.9 3.9	98.7	F	R3										495
125											Boring terminated at 120 feet NOTE A: Water level data Date - Depth (below ground surface) 5/12 - 13.7 feet 5/14 - 11.2 feet 6/28 - 9.0 feet 6/30 - 14.4 feet 7/5 - 9.0 feet 7/14 - 7.2 feet 7/20 - 16.0 feet		490		
130													485		

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1042	
 			
Drilling Method Rotary Wash/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532375 N; 628931.2 E	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750		Elevation (Datum NAVD 88) 622 feet	Ground Water Depth See Note A
Casing Size and Depth HWT / 20.6 feet		Borehole Inclination -60	Logged by K. KRUG
			Total Depth 124.3 feet
			Date Started 7/8/06
			Date Completed 7/10/06

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
25	1	1.5 1.5	0	CW to SW	R1 to R3						LIMESTONE (micrite) with interbedded calcareous shale; micrite is dark gray (4/0) and shale is very dark gray (7.5YR 3/1); completely to slightly weathered; weak to medium strong; predominately soil and wackestone fragments	Boring is angled at 60° from horizontal. Depths shown are distances along the axis of drilling. Elevations may be used to determine vertical distances. Discontinuity angle measurements are relative to borehole axis.	600
	2	3.5 5.0	58	SW	R2 to R3						LIMESTONE (wackestone) with interbedded calcareous shale; wackestone is bluish gray (5/1) and shale is dark gray (7.5YR 3/1); slightly weathered; weak to medium strong	22.5-27 feet: good fluid return 27-49 feet: poor fluid return 29-40.5 feet: calcite infills present	595
30	3	4.7 5.0	94							A	LIMESTONE (micrite) with interbedded calcareous shale; micrite is dark gray (4/0) and shale is very dark gray (7.5YR 3/1); fresh; medium strong; shale is 0.01-0.3 feet thick in irregular layers with beddings spaced 0.1 feet apart		590
	4	5.2 5.0	100	F	R3						- 32.8-33.1 feet: shale bed - 33.1-34.0 feet: packstone bed		590
40	5	5.1 5.0	100								LIMESTONE (micrite and wackestone) with interbedded calcareous shale; micrite and wackestone are dark gray (4/0) and shale is very dark gray (7.5YR 3/1); fresh; medium strong		585
	6	5.0 5.0	100	F	R3						- 40.5-42.5 feet: bioturbation in shale, calcite very common		580
50	7	5.1 5.0	100							B	- 50-90 feet: consistently spaced shale interbeds, irregular shaped, some diffuse boundaries, moderate amount of rip up clasts	49 feet to bottom of boring: No fluid return 49.4 feet: Unconfined Compression Test	575
	8	5.0 5.0	100	F	R3							56.1 feet: Unconfined Compression with Stress/Strain Test	570
60	9	5.1 5.0	100										

Reviewed by / Date WLA 5-10-07 DSC 5-9-07 REV. 1

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1042

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
65	10	5.0 / 5.0	100	F	R3							65.1 feet: Unconfined Compression Test	565
70	11	5.0 / 5.0	100										560
75	12	5.0 / 5.0	100	F	R3								555
80	13	4.9 / 5.0	98								B	- 80 feet: rock becoming strong	550
85	14	5.2 / 5.0	100	F	R4								545
90	15	5.0 / 5.0	100									- 91.2-91.8 feet: shale is massive and interwoven with limestone present only as rip up clasts	540
95	16	5.0 / 5.0	100	F	R4							LIMESTONE (micrite and wackestone) interbedded with calcareous shale; limestone is bluish gray (5/1) and shale is dark gray (7.5YR 3/1); fresh; medium strong - 92.7-94.3 feet: packstone with shale interwoven as thin wisps; calcite infill and replacement common, vug infill	535
100	17	5.0 / 5.0	100										535

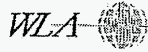
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1042

Depth (fee.)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
105	18	5.0 5.0	100	F	R4								530
110	19	5.0 5.0	100					Jo, 70, Wa, Ro, Ti		B	- 112.5-113.4 feet: packstone with wispy shale layers		525
115	20	5.0 5.0	100	F	R4								520
120	21	5.0 5.3	100	F	R4								515
125											Boring terminated at 124.3 feet. NOTE A: Water level data Date - Depth (below ground surface) 7/9 - 15.8 feet 7/11 - 15.1 feet 7/20 - 13.2 feet		510
130													505
135													500
140													500

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299





SOIL LOG - Boring No. B-1043

Drilling Method Hollow stem auger (8" OD)	Boring Location Coordinates: AL State Grid (ft) 1532423.8 N; 628741.9 E	Total Depth 2 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 75	Elevation (Datum NAVD 88) 622.7 feet	Ground Water Depth See Note A
Sampling Method Split Spoon	Borehole Inclination Vertical	Date Started 6/6/06
	Logged by K. KRUG	Date Completed 6/7/06

W. Johnson 3-14-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/Pl)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								GRAVEL (FILL)		622.7	
	SPT 1	*	2.4							620.7	Drilled to test for concrete. * SPT 1 blow counts not recorded due to rig geologist omission
	SPT 2	10/0	1.2					CEMENT/CONCRETE		620.6	Rocks encountered. 10 blows at zero advancement
5											
10											
15											
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1043A	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532424.3 N; 628756.8 E	Total Depth 75.6 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 75		Elevation (Datum NAVD 88) 622.2 feet	Ground Water Depth See Note A
Sampling Method SPT		Borehole Inclination Vertical	Logged by K. KRUG
			Date Started 6/6/06
			Date Completed 6/8/06

W. Pollock 3-13-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CH	622.2	
1.3	SPT 1		8 4 3	12				CLAY with sand, dark reddish brown (2.5YR 3/4), dry to moist, hard, few organics	CL	620.9	
5	SPT 2		4 6 5	18	17.4	36/ 19	GSZ				
6.0	SPT 3		8 7 9	18.5				CLAY with sand, strong brown (7.5YR 4/6) to yellowish brown (10YR 5/6), moist, medium stiff to very stiff - 6 feet: becomes yellowish brown (10YR 5/6) - 8.5 feet: becomes yellowish brown (10YR 5/8) with few manganese nodules - 11 feet: becomes yellowish brown (10YR 5/6)	CH	616.2	
10	SPT 4		4 6 7	18.5	30	73/ 47	GSZ H				
11	SPT 5		4 9 11	24							
12.5											water level measured at 12.5 feet (6/8/06)
14.5	SPT 6		4 10	12						607.7	SPT refusal at 14.5 feet. Advance auger to 15.6 feet. Continuation of borehole description on rock log.
15.6			10/0"					ROCK FRAGMENTS, limestone slightly weathered		606.6	

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1043A

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532424.3 N; 628756.8 E		Total Depth 75.6 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 75	Elevation (Datum NAVD 88) 622.2 feet	Ground Water Depth See Note A	Date Started 6/6/06
Casing Size and Depth PVC: 6.63 inch O.D / 15.6 feet	Borehole Inclination Vertical	Logged by K. KRUG	Date Completed 6/8/06

W. Adams 3-14-07
DSC 3-13-07

Reviewed by / Date

Depth (feet)	Run No.	Recovery / Cut	% ROD	We theing	Strength	In-Situ Testing	Li logy	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
20	1	4.5	83	F	R3						LIMESTONE (micrite) interbedded with calcareous shale; micrite is light gray (N7) and shale is dark gray (N3); fresh; medium strong; shale is 0.1-0.2 feet thick, spaced 0.05-0.3 feet apart; calcite vugs present	good fluid return	605
25	2	5.0	100	F	R3						- 22.6-29.0: shale is 0.01-0.09 feet thick with spacings of 0.01-0.1 feet		600
30	3	5.2 5.0	01	F	R3						- 29-39.4 feet: shale beds increase in frequency, 0.1-0.2 feet thick with spacings of 0.05-0.1 feet - 30 feet: fossiliferous zone		595
35	4	4.1 3.1	38	F	R3							34-75.6 feet: good fluid return	590
40	5	5.2 5.0	38	F	R3						- 39.4-50 feet: shale beds increase in frequency, 0.1-0.2 feet thick with spacings of 0.05-0.1 feet		585
45	6	5.0 5.0	100	F	R3						- Spar-filled vugs		580
50	7	1.0 1.0	100	F	R3								575
55	8	1.7 1.0	94	F	R3						- 50-60 feet: limestone changes to wackestone, very fossil rich		570

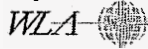
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1043A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)	
60	9	3.1 5.1	100	F	R3			Bb, 10, Wa, Sm, Ti		B	- 60-75.6 feet: shale increases in frequency, 0.01-0.2 feet thick with spacings of 0.05-0.02 feet - 60-75 feet: fossil-rich bands become common		565	
65	10	2.5 5.1	100	F	R3									560
7	11	4.8 5.0	96	F	R3			Bb, 20, Wa, Sl, Ti				- 67.8 and 68.6 feet: fossils present in bands 1-2 feet thick		555
75	12	5.5 5.1	100	F	R3			Bb, 5, Wa, Sm, Ti				- clay-filled fracture		550
80											Boring terminated at 75.6 feet NOTE A: Water level data Date - Depth (below ground surface) 6/6 - 14.0 feet 6/7 - 12.6 feet		545	
85													540	
90													535	
95													530	

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



SOIL LOG - Boring No. B-1044

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532399.8 N; 629086.6 E		Total Depth 76 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750	Elevation (Datum NAVD 88) 618.7 feet	Ground Water Depth See Note A	Date Started 6/6/06
Split Spoon/ HQ core		Vertical	Logged by A. Tillery Date Completed

W. Godwin 3-14-07
Reviewed by / Date: *DSC 3-13-07*

Depth (feet)	Sample	Sample Tv & N	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg L _p (PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									OH	618.7	organic CLAY, reddish brown (2.5YR 4/4), dry to moist, stiff
3	SPT 1	7	3	18					CH	616.7	CLAY with sand, strong brown (7.5YR 5/6) to yellowish brown (10YR 5/8), moist, stiff to medium stiff
5	SPT 2	5	1	18	19.8	5.2 2.2	GSZ		CL	613.2	CLAY, dark brown (7.5YR 3/4), moist to dry, medium stiff, few fine sand
8	SPT 3	8	2	18					CH	611.9	CLAY, yellowish brown (10YR 5/6), moist, medium stiff, black manganese nodules
8.0	SPT 4	40/1"	40/1"	0						610.7	Auger refusal at 8.0 feet. SPT refusal at 8 feet with blow counts of 40/1". Continuation of borehole description in rock log.



Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		MACTEC		WLA William Lettis & Associates, Inc.		ROCK LOG - Boring No. B-1044	
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")			Boring Location Coordinates: AL State Grid (ft) 1532399.8 N; 629086.6 E			Total Depth 76 feet	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750			Elevation (Datum NAVD 88) 618.7 feet		Ground Water Depth See Note A	Date Started 6/6/06	
Casing Size and Depth PVC: 4.5 inch O.D / 8 feet			Borehole Inclination Vertical		Logged by A. Tillery	Date Completed 6/7/06	

Reviewed by / Date *A. Tillery 3-13-07*
DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
10	1	2.7 / 2.8	82	SW	R3			Bj, 5, Wa, Ro			LIMESTONE (wackestone) with interbedded shale wackestone is medium gray (N5) and shale is grayish black (N2); slightly weathered; medium strong; shale beds are very thin (1 mm-3 cm)	Driller using recirculating tank. Series 2 drill bit 550 psi down-hole pressure. Fluid return is good from 8-61 feet.	610
15	2	5.0 / 5.0	84	SW	R3			Bj, 10, Wa, Ro Bj, 20, St, Ro Bj, 10, Pl, Si-Ro Bj, 10, Pl, Si-Ro Bj, 15, Pl, Ro Bj, 10, Pl, Si-Ro, no fit			- 16 feet: weathering decreases to fresh - 16.4-18.1 feet: beds are planar and not wavy - 18.5-18.9 feet: fossiliferous	Rod drop of <=1 foot at 15.2 feet	605
20	3	5.0 / 5.0	100	F	R3			Bj, 0, Pl, Sm Bj, 0, Wa, Ro, Op Bj, 0, ground down, no fit					600
25	4	5.1 / 5.0	100					Bj, 15, Pl, Sm, Op, stained Bj, 5, Wa, Si-Ro Bj, 5, Pl, Sm Bj, 10, Pl, Ro, Ti			LIMESTONE (micrite) with interbedded shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; laminated shale; bioturbated	BHTV analysis was conducted over the length of cored section	595
30	5	5.0 / 5.0	100					Bj, 10, Wa, Ro, Ti		A	LIMESTONE (wackestone) with interbedded shale; wackestone is medium light gray (N6) and shale is grayish black (N2); fresh; medium strong; shale interbeds generally wavy and laminated		590
35	6	4.8 / 5.0	93					Bj, 15, Pl-Wa, Si-Ro Bj, 10, Sm, Pl					585
40	7	5.0 / 5.0	100					Bj, 10, Sm, Pl, Op					580
45	8	5.0 / 5.0	100					Bj, 20, Pl, Si-Ro, Ti Bj, 15, Pl, Si-Ro, Op Bj, 10, Pl, Ro, Op Bj, 10, Pl, Si-Ro, Op Bj, 15, Pl, Si-Ro, Op			- 43-46 feet: very fossiliferous		575
											LIMESTONE (micrite) interbedded with thin shale layers; micrite is medium light gray (N6) and shale is grayish black (N2); fresh; medium strong;		


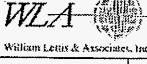


Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
50	9	5.1 5.0	100					Bj, 10, Pl, SI-Ro		A	occasional shale beds, wavy, laminated and bioturbated - 48.8-49.8 feet: fossiliferous packstone		570
55	10	5.2 5.0	97					Bj, 10, Wa, SI-Ro, fossils		A	- frequent bioturbation throughout		565
60	11	5.0 5.0	100	F	R3			Bj, 10, Pl, SI-Ro, Bj, 10, Wa, Ro, no fit		A	- 56.8-60.2 feet: shale decreasing		560
65	12	5.0 5.0	89	F	R3			Bj, 10, Pl, Sm, Op, poor fit		B		61-66 feet: lost 25 gallons of fluid return	555
70	13	5.1 5.0	101					Bj, 20, Wa, no fit, Bj, 15, Wa, no fit, Bj, 10, Pl, Sm, Op, Bj, 10, Pl, St, Ro, Ti		B	- 67.3 and 69.1 feet: abundant chert - 68 feet: recovered core (68 feet) slightly exceeds cored section (67.8 feet)		550
75	14	5.0 5.0	100	F	R3					B	LIMESTONE (wackestones) interbedded with thin shale layers; medium light gray (N6) and grayish black (N2); fresh; medium strong; some stylolite features	PVC: 4 inch O. D. installed after drilling for BHTV test	545
80											Boring terminated at 76.0 feet		540
85											NOTE A: Water level data Date - Depth (below ground surface) 3/18 - 9.5 feet		535

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1045	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532482.4 N; 628986.7 E	
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 622.4 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Logged by J. Howard
		Total Depth 75.1 feet	
		Date Started 6/6/06	
		Date Completed 6/7/06	

W. Howard 3-14-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CH	622.4	
		SP 1	2 3 2	18	22.0	58 32	GSZ				
		SPT 2	2 5 7	18							
5											
		SPT 3	9 19 20	18	10.7	41 21	GSZ		CL	616.4	
		SP 4	9 4 8	18					CL	613.9	
10											
		SP 5	9 10 11	18					CH	611.4	
		SPT 6	6 8 14	18	23.4	71 40	GSZ				
15											
		SP 7	7 6 7	18							
		SPT 8	50/1"	0						603.9	
20											
											Auger SPT refusal at 18.5 feet. Continuation of boring description in rock log.
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1045	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532482.4 N; 628986.7 E	Total Depth 75.1 feet
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 622.4 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 4.5 inch O.D / 18.5 feet		Borehole Inclination Vertical	Logged by J. Howard
			Date Started 6/6/06
			Date Completed 6/7/06

W. Howard 3-13-07
Reviewed by / Date DSC 3-13-07



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Level (feet)
20	1	2.7 / 2.7	62	MW to SW	R3					A	LIMESTONE (micrite) with shale beds; medium light gray (N6), slight to moderate weathering, moderate strength; shale beds are thin to moderately thin		600
25	2	4.4 / 4.4	43	HW	R3					A	-18.5-26.1 feet: shale beds are 0.1 feet apart		600
				MW							- 26.1 feet: shale beds 0.1-0.4 feet apart		595
30	3	5.5 / 5.5	100	F	R4					BHTV	- 26-30 feet: small calcite crystals observed	BHTV analysis was conducted over the length of cored section	595
35	4	4.9 / 4.9	79	SW to F	R4							32.7 feet: Unconfined Compression Test	590
40	5	5.1 / 5.1	100	F	R4								585
45	6	5.1 / 5.1	100	SW to F	R4					B	- 41-46 feet: shale beds are irregular with small amounts of bioturbation and relic shell fragments		580
											- 46 feet: rock becoming fresh; strong		575
50	7	5.0 / 5.0	100	F	R4						- 46-58 feet: shale beds are moderately thick to moderately thin 0.1-0.3 feet apart and irregularly shaped		570
55	8	5.1 / 5.1	100	F	R4								570
													565
													565

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299





ROCK LOG - Boring No. B-1045

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)	
60	9	5.0	90	F	R4		[Lithology Pattern: Shale]			E	- 58-61 feet: shale beds thin to very thin with spacings 0.2-0.4 feet 59 feet: small calcite crystals visible	58.6 feet: Unconfined Compression with Stress/Strain Test	560	
65	10	5.5	100	SW to F	R4	- 61-64 feet: shale beds moderately thin to very thin with spacing 0.2-0.4 feet apart					- 64-75.1 feet: shale beds moderately thick			555
70	11	5.5	100	F	R4	- 66.8-68.5 feet: fossiliferous layer								550
75	12	4.4	100	F	R4									545
80											Boring terminated at 75.1 feet	PVC: 4 inch O. D. installed after drilling for BHTV test	540	
85											NOTE A: Water level data Date - Depth (below ground surface) 6/6 - 16.3 feet 7/20 - 16.0 feet		535	
90													530	
95													525	

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1047	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532622.2 N; 628995.6 E		Total Depth 120 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750	Elevation (Datum NAVD 88) 619.2 feet	Ground Water Depth See Note A	Date Started 6/25/06
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by A. Tillery	Date Completed 6/26/06

W. Johnson 3/13/07
Reviewed by / Date DSC 3-13-07


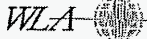
Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Liquidity Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								CH	619.2	619.2	Lithology
1	SPT 1	WOR 3/4	7								CLAY, yellowish brown (10YR 5/6) to brown (7.5YR 5/4), moist, medium stiff, very stiff, and stiff, trace gravel and manganese nodules (Residual)
3.5	SPT 2	4/8/12	13	23.1	55/31	GSZ				615	- 3.5 feet: color changes to brown (7.5YR 5/4)
6.5	SPT 3	4/6/9	13	25.6	66/31	GSZ				610	- 6.5 feet: slight color change to strong brown (7.5YR 5/8)
10	SPT 4	3/4/8	9.5								- soil contains gravel and becomes greenish/grayish brown (10YR 5/2)
11.8	SPT 5	11 1/2" / 2						GW	608.2 / 607.7	11.0 / 11.5	GRAVEL with clay, yellow, very dense, possible weathered bedrock
15											SPT refusal: advanced 2 inches with one blow followed by zero advancement after 10 blows Augered to 11.8 feet and washed hole to 12 feet. Continuation of borehole description in rock log.
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299		ROCK LOG - Boring No. B-1047	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532622.2 N; 628995.6 E	
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750		Elevation (Datum NAVD 88) 619.2 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 4.5 inch O.D / 11.6 feet		Borehole Inclination Vertical	Logged by A. Tillery
			Total Depth 120 feet
			Date Started 6/25/06
			Date Completed 6/26/06

W. J. Adams 3-13-07
DSC 3-13-07

Reviewed by / Date



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	3.0 / 3.0	100	SW to F	R3			Bj, 15, Wa, Ro, poor fit			LIMESTONE (micrite) interbedded with thin shale beds; micrite is medium gray (N5) and shale is grayish black (N2); fresh to slightly weathered; medium strong; shale interbeds are wavy, irregular and occasionally grade into thin wackestone intervals - 15 feet: rock becomes fresh	Fluid return good throughout drilling of boring	605
20	2	5.0 / 5.0	100	F	R3			Bj, 15, S, Ro					600
25	3	5.0 / 5.0	100	F	R3								595
30	4	5.0 / 5.0	99					Bj, 10, Pl, Sm, Ti		B	- 30-42 feet: increasing shale content		590
35	5	5.0 / 5.0	100	F	R3								585
40	6	5.0 / 5.0	100					Bj, 10, Pl, Si-Ro, Op					580
45	7	4.9 / 5.0	99	F	R3			L, 15, Pl, m, Ti			- 42-50 feet: generally very little shale interbeds		575
50	8	5.0 / 5.0	100										570

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1047	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532622.2 N; 628995.6 E	
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750		Elevation (Datum NAVD 88) 619.2 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 4.5 inch O.D / 11.6 feet		Borehole Inclination Vertical	Logged by A. Tillery
			Date Started 6/25/06
			Date Completed 6/26/06

W. Rodini 3-14-07
DSC 3-13-07

Reviewed by / Date

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	3.0 3.0	10	SW to F	R						LIMESTONE (micrite) interbedded with thin shale beds; micrite is medium gray (N5) and shale is grayish black (N2); fresh to slightly weathered; medium strong; shale interbeds are wavy, irregular and occasionally grade into thin wackestone intervals - 15 feet: rock becomes fresh	Fluid return good throughout drilling of boring	605
20	2	5.0 5.0	10	F	R3								600
25	3	5.0 5.0	10	F	R3								595
30	4	5.0 5.0	99										590
35	5	5.0 5.0	00							B	- 30-42 feet: increasing shale content		585
40	6	5.0 5.0	00										580
45	7	5.0 5.0	99										575
50	8	5.0 5.0	00										570

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1047	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532622.2 N; 628995.6 E	Total Depth 120 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750		Elevation (Datum NAVD 88) 619.2 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Logged by A. Tillery
			Date Started 6/25/06
			Date Completed 6/26/06

Reviewed by / Date W. Johnson 3/13/07
DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								CH	619.2	0.0	
1	SPT 1	WOR 3/4	7					CLAY, yellowish brown (10YR 5/6) to brown (7.5YR 5/4), moist, medium stiff, very stiff, and stiff, trace gravel and manganese nodules (Residual)			
5	SPT 2	4/8/12	13	23.1	59/33	GSZ		- 3.5 feet: color changes to brown (7.5YR 5/4)			
6.5	SPT 3	4/6/9	13	25.6	66/38	GSZ		- 6.5 feet: slight color change to strong brown (7.5YR 5/8)			
10	SPT 4	3/4/8	9.5					- soil contains gravel and becomes greenish/grayish brown (10YR 5/2)		610	
11.1	SPT 5	11/2	2					GW	608.2	11.1	
11.2								GRAVEL with clay, yellow, very dense, possible weathered bedrock	607.7	11.2	SPT refusal: advanced 2 inches with one blow followed by zero advancement after 10 blows Augered to 11.8 feet and washed hole to 12 feet. Continuation of borehole description in rock log.
15											
20										600	
25										595	
30										590	

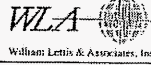
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1047


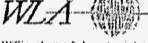
Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	9	5.0 / 5.0	100	F	R3								565
60	10	5.0 / 5.0	100								LIMESTONE (wackestone) interbedded with shale; wackestone is medium gray to light gray (N5-N6) and shale is grayish black (N2); fresh; moderately strong; thin to laminated wavy shale beds	milky gray drilling return	560
65	11	5.0 / 5.0	100	F	R3								555
70	12	5.1 / 5.0	100					Bj, 15, Pl. Sm. Op. poor fit					550
75	13	2.6 / 2.0	100		R2 to R3					B	calcareous SHALE; grayish black (N2); fresh; weak to medium strong; beds dipping 10-15°; interbedded with micrite		545
80	14	3.3 / 3.0	100	F	R3								540
85	15	5.0 / 5.0	100								- 79.8 feet: grading to limestone (micrite) with interbedded shale, approximate contact at 79.8 feet		535
90	16	5.1 / 5.0	100	F	R3							down hole pressure = 500 psi	530
	17	4.8 / 5.0	96								LIMESTONE (wackestone) interbedded with shale; medium gray (N5) to dark gray (N3); fresh; medium strong; regular intervals of wavy laminations of shale		

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1047

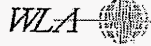
Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Lithology	Remarks	Elevation (feet)
95	18	5.2 / 5.0	100	f	R3						- 93-95 feet: bioturbated	525
100	19	4.9 / 5.0	9									520
105	20	5.3 / 5.0	100	F	R3							515
110	21	4.8 / 5.0	96					Bj, 25, F, S, Ro, T, W, Ti		E	LIMESTONE interbedded with thin shale; from 106 to 120 feet, alternating 1 to 4 feet intervals of micritic limestone and wackestone; micrite and wackestone are medium gray (N5) and shale is grayish black (N2); fresh; moderately strong - 108 1 feet: recovered core slightly exceeds the cored length of 108 feet - 106-109 feet: micrite - 109-112 feet: wackestone - 112-113 feet: micrite - 113-120 feet: wackestone	510
115	22	1.1 / 1.0	100									505
120	23	.0 / .0	100	F	R3			Bj, 0, Pl, Ro, Ti				500
125											Boring terminated at 120 feet	495
130											NOTE A: Water level data Date - Depth (below ground surface) 6/27 - 5.2 feet	490

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1048	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532210.9 N; 628709.9 E	Total Depth 76.3 feet
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 550		Elevation (Datum NAVD 88) 627.8 feet	Ground Water Depth See Note-A
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Logged by D. Stepanof
			Date Started 7/6/06
			Date Completed 7/7/06

D. Stepanof 3-13-07
Reviewed by / Date 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/Pl)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CL	627.8	Lithology 0.0
1.5	SPT 1		5 7 9	18					CH	626.3	CLAY with sand, yellowish brown (10YR 5/6), very stiff (Fill)
5	SPT 2		5 6 9	18	22	54/ 26	GSZ		CH		sandy CLAY, brown (7.5YR 4/4) with reddish yellow mottling (7.5YR 6/8), dry, very stiff (Fill)
8	SPT 3		5 7 8	18					CH		- 5.0 feet: color changes to yellowish red (5YR 4/6)
10	SPT 4		4 6 8	18	20.7	51/ 24	GSZ		CH	619.8	sandy CLAY, strong brown (7.5YR 5/8), moist, stiff, few manganese nodules (Residual)
13.8	SPT 5		4 6 7	15	18.8		CHE		CL	614.0	sandy CLAY with gravel, strong brown (7.5YR 5/8), moist, very stiff, gravel is angular and effervesces violently with HCl
15	SPT 6		9 10 10	18					CL	611.8	CLAY, strong brown (7.5YR 5/6) to yellowish red (5YR 5/8), moist, very stiff to hard, few manganese nodules, slight efferecense with HCl
16	SPT 7		7 8 10	18	29.4	38/ 16	GSZ		CL	607.2	
19.5	SPT 8		5 7	13						20.6	SPT refusal at 19.5 feet. Auger refusal at 20.8 feet. Boring began at 20.6 feet. Continuation of borehole description in rock log.
20.6			50/1"								

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1048

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532210.9 N; 628709.9 E	Total Depth 76.3 feet
Casing Size and Depth		Borehole Inclination	Logged by Date Completed
		See Note A	7/6/06
			7/7/06

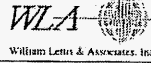
Reviewed by / Date *W. Adams 3-14-07*
DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Unit	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
25	1	5.5 / 5.5	7	SV	R3					A	LIMESTONE (micrite) interbedded with calcareous shale; medium gray (N5) and shale is dark gray (N3); slightly weathered to fresh; medium strong; effervesces strongly with HCl; bedding is medium thin to thin - 21.4-22 feet: packstone bed, incipient fractures - 21.6-22 feet: clay filled fractures, clay is reddish brown - 24.6-25 feet: clay lined fractures, clay is olive brown - 26.1-26.5 feet: bioturbated - 26.7-28 feet: packstone bed	23.8 feet: lost water return and did not recover	605
30	2	4.7 / 5.3	83	F	R3								600
35	3	5 / 4.1	100										595
40	4	3 / 3	100	F	R3							BHTV and NG analysis were conducted over the length of cored section	590
45	5	5 / 5	100							B		43.5 feet: slight hydrocarbon odor along mechanical breaks	585
50	6	4.9 / 5.0	97	F	R3							- 46-51 feet: thin beds of calcareous shale present, medium dark gray (N4), rip-up clasts, thin to medium spaced horizontal stylolites	580
55	7	5.5 / 5.3	100									54.1-54.4 feet: rip-up clasts present	575
60	8	4.9 / 5.0	18	F	3								570

Bj, 20, Wa, Ro, Tr
Bj, 10, Wa, Ro, Op

LIMESTONE (micrite and wackestone) with thin

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1048

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
65	9	5.1 / 5.0	100								beds of packstone and thinly laminated calcareous shale; micrite and packstone are medium gray (N5); fresh; medium strong; <10% shale - 62.3 feet: calcite filled vug <0.1 feet in diameter		565
70	10	4.9 / 5.0	98	F	R3			Bj, 15. Wa, Ro, Ti		B	- 66-71 feet: increase of calcareous shale beds with abundant rip-up clasts - 65.8 -66.8 feet: incipient fractures		560
75	11	5.0 / 5.0	100	F	R3			Bb, 10. Wa, Sl, Ti			LIMESTONE (packstone) with micrite and shale interbeds; packstone and micrite are medium gray (N5) and shale is medium dark gray (N4); fresh; medium strong; shale is medium to thin spaced	PVC: 4 inch O. D. installed after drilling for BHTV test	555
80											Boring terminated at 76.3 feet		550
85											NOTE A: Water level data Date - Depth (below ground surface) 7/17 - 20.7 feet 8/18 - 14.2 feet		545
90													540
95													535
100													530




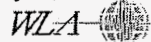
SOIL LOG - Boring No. B-1049

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532539.2 N; 628917.1 E	Total Depth 128 feet
Drilling Contractor (Driller) and Rig MILLER (Upchurch) / CME 85	Elevation (Datum NAVD 88) 617.3 feet	Ground Water Depth See Note A
Sampling Method SPT / Shelby Tube	Borehole Inclination Vertical	Logged by J. Hoeff
		Date Started 8/15/06
		Date Completed 8/16/06

M. J. Adams 3/14/07
DSC 3-13-07

Reviewed by / Date

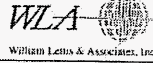
Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Aterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CH	617.3	Lithology
0									CH	617.3	CLAY, dark yellowish brown (10YR 4/4), moist, very stiff, few manganese nodules and organics
1	SPT 1		5	12					CH	617.3	
2	SPT 2		8	15.6					CH	614.1	CLAY, olive brown (2.5Y 5/3), wet to moist, stiff, trace manganese nodules and organics
3	SPT 3		6						CH	614.1	
4	UD 3		7	15					CH	614.1	
5	SPT 4		2	18					CH	614.1	
6	SPT 5		3						CH	614.1	
7	SPT 5		6	10.8					CH	614.1	
8			16						CH	607.8	- 8.5 feet: becomes olive brown (2.5Y 4/3) with few limestone gravel
9			13						CH	607.8	7.5 feet: attempted to obtain a shelly tube sample without success. A hard substance was encountered that bent the tube. SPT refusal at 9.4 feet. Auger refusal at 9.5 feet. Continuation of borehole description on rock log.
10			13/5						CH	607.8	
10									CH	9.5	

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1049	
		 William Lewis & Associates, Inc.	
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532539.2 N; 628917.1 E		Total Depth 128 feet
Drilling Contractor (Driller) and Rig MILLER (Upchurch) / CME 85	Elevation (Datum NAVD 88) 617.3 feet	Ground Water Depth See Note A	Date Started 8/15/06
Casing Size and Depth PVC: 4.5 inch O.D / 9.9 feet	Borehole Inclination Vertical	Logged by J. Hoeft	Date Completed 8/16/06

Reviewed by / Date *M. J. Hoeft 3-13-07*
DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQN	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
10	1	2.9 / 3.0	97								weathered LIMESTONE and clay LIMESTONE (packstone) with calcareous shale interbeds; medium gray (N5) to medium bluish gray (5B 5/1); slightly weathered; medium strong; strong HCl reaction	Fluid return good throughout boring	605
15	2	4.9 / 5.0	7	SW	R3						- 9.9-32.8 feet: shale is hairline to 0.1 feet thick with spacings of <0.05-0.4 feet, wavy		600
20	3	5 / 5.1	9	SV	R3						- 20.5 feet: rip up features		595
25	4	5.1 / 5.0	10								- 26 feet: rip up features		590
30	5	5.0 / 5.0	100	F	R3					B	- 32.8-45 feet: large rip up clasts (up to 0.05 inch diameter) and stylonitic features present	Add conductor casing, reseat at 9.9 feet	585
35	6	5.0 / 5.0	98								LIMESTONE (packstone) with calcareous shale interbeds; packstone is medium bluish gray (5B 5/1) and shale is dark gray (N3); fresh; medium strong		580
40	7	5.0 / 5.0	8	F	R3						- 32.8-45 feet: shale is 0.01-0.1 feet thick with varied spacing between 0.01-0.3 feet, wavy with rip ups		575
45	8	5.0 / 5.0	10								- 45-60 feet: shale is 0.01-0.15 feet thick with spacings of 0.01-0.5 feet, prominent rip up features		570

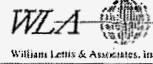
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1049

Depth (feet)	Run No.	Recovery / Cut	% RQN	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
50	9	5.0 5.0	99	F									565
					R3								
55	10	5.1 5.0	100										560
60	11	4.1 5.1	99	F									555
					R3						- 60-75 feet: shale is 0.05-0.2 feet thick with spacings < 0.15 feet, shale constitutes ~25-30% of the rock, rip up features <0.03 feet diameter		
65	12	5.0 5.0	99										550
											- 66-85 feet: intervals of micrite and lesser shale interbeds		
70	13	.C .C	100	F						B			545
					R3								
75	14	1 .0	100										540
											- 75-90 feet: shale is 0.01-0.1 feet thick with spacings of < 0.2 feet, wavy with rip up features		
80	15	1 0	100	F									535
					R3								
85	16	4.9 5.0	98										530
				F									

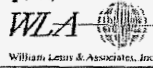
Project Name and No.: NuStart - Bellefonte COL. Project: 6468061299



ROCK LOG - Boring No. B-1049



Depth (feet)	Run No.	Recovery	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
90	17	4.8 5.0	96								- 90-97.6 feet: shale is on average 0.01 feet thick with spacings of < 0.2 feet, wavy with rip up features		525
95	18	5.3 4.8	100	SW to F	R3						- 97.6-105 feet: area of less shale with pressure solution features		520
100	19	5.2 5.3	98	SW to F	R3			Bj, 70, Wa, Sl, Op/TI					515
105	20	5.0 5.0	99	F						B	- 105-109.8 feet: shale is hairline to 0.1 feet thick with spacings of <0.3 feet		510
110	21	5.1 5.0	100		R3						109.8-121.5 feet: zone with less shale, shale is hairline to 0.01 feet thick with pressure solution features		505
115	22	4.9 5.0	98	F									500
120	23	4.9 5.0	98		R2						SHALE (calcareous) with packstone interbeds; dark gray (N3) and packstone is medium bluish gray (5B 5/1); fresh; weak; strong HCl reaction; shale can be scratched by thumb nail; shale constitutes ~50% of the rock; spacing of shale beds is < 0.3 feet - shaley zone		495
125	24	7.0	15	F						C			490
											Boring terminated at 128 feet		

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1049

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
130													485
												NOTE A: Water level data Date - Depth (below ground surface) 8/17 - 9.5 feet	480
135													475
140													470
145													465
150													460
155													455
160													450
165													



Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1053	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532489.4 N; 628910.4 E	
Drilling Contractor (Driller) and Rig MACTEC (Warren) / CME 45		Elevation (Datum NAVD 88) 620.2 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Logged by J. Howard
			Date Started 6/28/06
			Date Completed 7/5/06

W. Howard 3-14-07
DSC 3-13-07

Reviewed by / Date



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type	Elevation (feet)
0									CL	620.2
1	SP 1		6 4 5	6	15	44 24	GSZ			620
4	SPT 2		4 1 4	14	10.2		CHE			615
6	SPT 3		3 3 4	14	23	47 27	GSZ	- 6-7.5 feet: color is red (2.5YR 4/6)		615
8	SP 4		2 4 5	8				- 8.5-10.5 feet: color is brown (7.5 YR 4/4)		610
10	SP 5		7 50/5	8					CL	609.7
10.5									CL	10.5
11										608.3
11.9										11.9
12.3										
15										605
20										600
25										595
30										

SPT refusal at 11.9 feet.
Auger refusal at 12.3 feet.
Continuation of borehole description on rock log.

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1053	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532489.4 N; 628910.4 E	
Drilling Contractor (Driller) and Rig MACTEC (Warren) / CME 45		Elevation (Datum NAVD 88) 620.2 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 12.3 feet		Borehole Inclination Vertical	Logged by J. Howard
			Date Started 6/28/06
			Date Completed 7/5/06


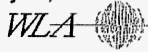
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 DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	3.1 / 3.4	41	MW	R3			Bj, 17, Pl, Ro, Op Bj, 15, Pl, Ro, So		B	LIMESTONE (micrite and minor wackestone) with interbedded shale; limestone is medium light gray (N6), moderately weathered; medium strong; trace bioturbation		605
20	2	5.1 / 5.1	98	SV to	R3			Bj, 20, Pl, Ro, Op Bj, 15, Pl, Ro, Op Bj, 10, Pl, Ro, Op		B	- 15-35 feet: shell fragments and shale layers present 12.3-35 feet: shale beds are thin to moderately thin with spacings of 0.1-0.3 feet; wavy and irregular due to bioturbation		600
25	3	5.0 / 5.0	100	F	R3					B			595
30	4	5.0 / 5.0	10	F	R3			Bj, 10, Wa, Sl, Ti Bj, 5, Pl, Sl, Ti		B			590
35	5	3	86	F	R4			Bj, 10, Pl, Sl, Ti Bj, 15, Pl, Sl, Op		B			585
40											Boring terminated at 35.0 feet	34.4 feet: the last 0.6 feet of rock is left in the hole. Driller could not extract it.	580
45											NOTE A: Water level data Date - Depth (below ground surface) 7/5 - 14.7 feet		575
50													570

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1059	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532712.7 N; 628706.2 E	Total Depth 250 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750		Elevation (Datum NAVD 88) 619 feet	Ground Water Depth See Note A
Sampling Method CME/SPT		Borehole Inclination Vertical	Logged by J. Hoefft
			Date Started 5/12/06
			Date Completed 5/17/06

W. Johnson 3-13-07
 Reviewed by / Date DSC 3-13-07

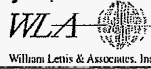
Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								619		619	
								618.6	SP-GM	618.6	ASPHALT
										618.2	Gravelly FILL
								617.5	CL	617.5	CLAY, reddish brown (2.5YR 4/4), moist, stiff to hard, few limestone clasts
5		CME 1		24							
		SPT 2	4 3 6	18							- 6.7 feet: small pockets of sand and weathered limestone clasts, becomes more moist
		SPT 3	3 5 3	12							- 9.5-10 feet: angular gravel
		SPT 4	9 14 16	9.6							- 11 feet: color changes to brown (7.5YR 4/4)
15		SPT 5	50/5"	1.1				605.5		605.5	SPT refusal at 14 feet in limestone bedrock. Rock core casing placed at 13.5 feet. Continuation of borehole description on rock log.
								605.0		605.0	LIMESTONE (micrite)

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1059	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532712.7 N; 628706.2 E	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750		Elevation (Datum NAVD 88) 619 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 14 feet		Borehole Inclination Vertical	Logged by J. Hoeft
			Total Depth 250 feet
			Date Started 5/12/06
			Date Completed 5/17/06

Reviewed by / Date *M/J 5-10-07*
DSC 5-9-07 *Rev. 1*

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Sire gth	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	1.9 2.0	95	SV to F	R2 to R3			Bj, 10, Wa, Si, Ti Bj, 5, Wa, Si, Ti			LIMESTONE (micrite) with minor shale; micrite is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh to slightly weathered; weak to medium strong; interbedded wackestone is grayish blue (5PB 5/2) to medium gray (N5) in color; strong HCL reaction	Casing set at 13.5 feet (start of core Run#1)	605
20	2	4.9 5.0	72	SW to F	R2 to R3			Bj, 10, Wa, Si, Ti Bj, 0-5, Wa, Si, Op Bj, 15, Wa, Sm-Si, Ti			- 17.5-20.5 feet: zone of fracturing, clay lined surfaces - 20 feet: clay filled joint	Good fluid return throughout boring	600
25	3	5.0 5.0	100	SW to F	R2 to R3			Bj, 15, Wa, Si, Ti-Op Bj, 15, Wa, Si, Ti Bj, 10, Wa, Si, Op Bj, 5, Wa, Si, Op					595
30	4	5.0 5.0	100	F	R2 to R3			Bj, 10, Wa, Si, Ti Bj, 10, Wa, Si, Ti		B	LIMESTONE (wackestone) interbedded with shale; wackestone is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; weak to medium strong		590
35	5	5.0 5.0	100	F	R2 to R3			Bj, 15, Wa, Si/Ro, Ti Bj, 10, Wa, Si, Ti		B	- 31.7 feet: small (0.05 feet) spar filled void, angular crystal faces	30.7 feet: Petrographic Analysis (sample PET-1059F)	585
40	6	5.0 5.0	100	F	R2 to R3			Bj, 10, Wa, Ro, Ti			- 36.1-37.2 feet: zone of larger grain size, many fossils, bioturbation		580
45	7	5.0 5.0	100	F	R2 to R3			Bj, 20, St, Si, Ti, slickensides: Rake=45°, calcite cement			- 40-40.7 feet: wackestone and packstone bed, abundant fossils, bioturbated - 41.8 feet: slickensided joint (calcite cement)		575
50	8	5.0 5.0	100	F	R2 to R3			Bj, 10, Wa, Ro/Si, Ti			- 45.4 feet: poorly developed stylolites		570
55	9	5.0 5.0	100	F	R1 to R2			Bj, 5, Wa, Si, Ti		C	LIMESTONE (micrite and packstone) with interbedded shale; micrite is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; weak to very weak; occasional sections of wackestone interbeds of medium bluish gray (5PB 5/1) to medium gray (N5) in color; 30% shale		565

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1059

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Eleva (feet)
55				F									565
56	10	5.0 / 5.0	100		R3			Jo, 40, Pl, Sm, Ti			- 56-57 feet: prominent shale bed, shale bed thicknesses are 0.05 - 0.5 feet, shale is softer (scratched by fingernail) and reacts with HCL (weak)		560
60								Bj, 15, Wa, Sl, Ti			- 57-60.2 feet: zone of interbedded packstone, wackestone and micrite		
61	11	5.0 / 5.0	100		R3			Bj, 10, Pl, Sm, Ti			SHALE (calcareous) interbedded with limestone (micrite and wackestone); dark gray (N3); fresh; medium strong; limestone is very thinly bedded with spacings of 0.75-1.5 inches (average is 1 inch)		
63											- 61.1 feet: healed calcite fracture		
64											- 63-64.5 feet: fossiliferous		555
66				F				Bj, 5, Wa, Sl, Ti			- 65.6 to 80.2 feet: zone of higher percentage of shale (70%)		
67	12	5.0 / 5.0	100		R1 to R2			Bj, 10, Wa, Sl, Ti			SHALE (calcareous) with interbedded limestone (micrite); dark gray (N3); fresh; weak to very weak; micrite is very thinly bedded; shale is very weak		
70													550
71	13	5.0 / 5.0	100		R2			Bj, 0, Pl, Sl, Ti			SHALE (calcareous) with interbedded packstone; shale is dark gray (N3) to grayish black (N2) and packstone is medium gray (N5); fresh; weak; packstone is very thinly bedded; occasional sections of wackestone interbeds; visible fractures of hairline size in shale sections		
72								Bj, 10, Wa, Sl, Ti			- 71.8-72.8 feet: packstone bed		
73				F							- 72.9-78.4 feet: very thinly bedded		545
75								Bj, 5, Wa, Sm, Ti					
78	14	5.0 / 5.0	100		R1 to R2						- 78.4-80.2 feet: shale bed, bedding becomes irregular and disrupted, 0.5-3 inches of micrite fragments in shale matrix, fresh, weak to very weak		
79											- 79 feet: vertical fractures, trilobite cephalon at fracture		
80								Bj, 10, Wa, Sm, Ti					540
81	15	5.0 / 5.0	100		R1 to R2						SHALE (calcareous) with interbedded micrite; shale is dark gray (N3) to grayish black (N2) and micrite is medium gray (N5); weak to very weak; fresh; incipient fractures in shale; occasional wackestone interbeds; 70% shale	81.6 feet: Petrographic Analysis (sample PET-1059E)	
82													535
85				F				Bj, 10, Wa, Sm, Ti			- 85.6 feet: shale has visible incipient fractures		
86	16	5.0 / 5.0	100		R1 to R2			Bj, 5, Pl, Sm, Ti					
87													
88								Bj, 0-5, Pl, Sm, Op			- 88.6 feet: pyrite along slickensided surface		530
89													
90	17	5.0 / 5.0	100		R2 to R3			Bj, 10, Wa, Sl, Ti			LIMESTONE (packstone) with interbedded shale; packstone is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; weak to very weak; rock is rich in calcareous shale		
91											SHALE (calcareous) with interbedded micrite; shale is dark gray (N3) to grayish black (N2) and		525

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299	ROCK LOG - Boring No. B-1059
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Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95	18	5.0 / 5.0	100	F				Bj, 5, Pl, Sm, Ti Bj, 5, Wa, Sl, Ti Bj, 5, Wa, Sl, Ti		C	micrite is medium gray (N5); weak to very weak; fresh; incipient fractures in shale; occasional wackestone interbeds; 70% shale LIMESTONE (micrite) with interbedded shale; micrite is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; weak to medium strong; shale content increases with depth from 15-20% at the top to 30-40% at the bottom; irregular and discontinuous bedding; bioturbated/burrows; rock appears to be fragments of limestone with shale filling; soft sediment deformation		525
100	19	5.0 / 5.0	100		R1 to R2			Bj, 10, Wa, Sm, Ti					520
105	20	5.0 / 5.0	100	F	R2 to R3			Bj, 15, Pl, Sm, Ti Bj, 5, Wa, Sm, Ti			- 107.5 feet: dark limestone and shale show small fractures, both vertical and horizontal (may indicate some level of permeability)		515
110	21	5.0 / 5.0	100		R1 to R2			Bj, 5, Wa, Sm, Ti			SHALE interbedded with micrite; shale is dark gray (N3) to grayish black (N2) and micrite is medium gray (N5); fresh; weak to medium strong; 20% micrite LIMESTONE (wackestone and packstone) interbedded with shale; limestone is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; weak to very weak; 15% shale		510
115	22	5.0 / 5.0	100	F	R1 to R2			Bj, 5, Wa, Sm, Ti			SHALE with limestone fragments; shale is dark gray (N3) to grayish black (N2) and limestone is medium gray (N5); fresh; weak to medium strong; fragments comprise 20-25%		505
120	23	5.0 / 5.0	100		R2 to R3			Bj, 5, Wa, Sl, Ti Bj, 10, Wa, Sl, Ti			LIMESTONE (micrite) interbedded with shale; micrite is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; weak to medium strong; shale is thinly bedded	120.8 feet: Petrographic Analysis (sample PET-1059D)	500
125	24	5.0 / 5.0	100	F	R2 to R3			Bj, 10, Wa, Ro, Ti		D	- 123.5 feet: chert pod, little to no HCl reaction - 127 feet: chert pod - little to no HCL reaction - 129 feet: chert pod - little to no HCL reaction		495
130	25	5.0 / 5.0	100		R2			Bj, 15, Wa, Sl, Ti Bj, 0, Wa, Sm, Ti			- 130.8 feet: 0.05 feet thick black shale bed with white calcite cement, fractured - 131.2 feet: vertical fractures with strong hydrocarbon odor and unknown green substance with a vaseline-like consistency		490
													485

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1059

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135	26	5.0 / 5.0	99	F	R3			Bj, 15, Wa, Si, Ti		D	- 134.8 feet: chert - 135.9 feet: small chert layer ~0.1-0.7 feet thick, black (N1), medium strong - 135.2 feet: 0.5 inch thick bed with coal-like fragments, little to no HCl reaction, harder than limestone - 136 feet: small chert layer ~0.1 - 0.7 feet thick; medium strong, black (N1) LIMESTONE (micrite); medium gray (N5); fresh; medium strong; little to no shale layers	134.7 feet: Petrographic Analysis (sample PET-1059C)	485
140	27	5.0 / 5.0	100		R3			Bj, 10, Wa, Ro, Ti Bj, Wa, Ro, Ti			- 141.8 feet: small chert pod ~0.05 feet thick		480
145	28	5.0 / 5.0	100	F	R3			Bj, 5, Wa, Si, Ti			LIMESTONE (micrite) interbedded with shale; micrite is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; medium strong; shale beds are <0.1-0.2 inches thick with spacings of 2-3 inches; 20% shale		475
150	29	5.0 / 5.0	100		R3			Bj, 15, Wa, Si, Ti Bj, 15, Wa, Ro, Ti			LIMESTONE (micrite); medium gray (N5); fresh; medium strong; minor interbedded shale: dark gray (N3) to grayish black (N2); 5% shale		470
155	30	5.0 / 5.0	100	F	R3			Bj, 0, Wa, Sm/Si, Ti					465
160	31	5.0 / 5.0	100		R3			Bj, 10, Wa, Si, Ti Bj, 5, Wa, Si, Ti Bj, 10, Pl, Si, Ti					460
165	32	5.0 / 5.0	100	F	R3			Bj, 10, Wa, Si, Ti Bj, 10, Wa, Sm/Si, Ti Bj, 10, Wa, Si, Ti			LIMESTONE (micrite with minor thinly bedded wackestone) interbedded with shale; micrite is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; medium strong; locally bioturbated; 15% shale - 165.1-165.8 feet: vertical fractures - 166 to 166.8 feet: vertical fractures - 167.5 feet: calcite cement-filled fracture - 169.5 feet: poorly developed slickensides - 171 feet: vertical fractures - 171.6 feet: calcite cement lining joint		455
170	33	5.0 / 5.0	100		R3			Bj, 10, Wa, Si, Ti Bj, 15, Pl, Sm, Ti Bj, 15, Wa, Si, Ti					450
													445



Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
34	5.0 / 5.0	100	F	R3			Bj, 10, Wa, Si, Ti	Bj, 10, Wa, Si, Ti, calcite lined fracture	D		- 176.5 feet: calcite-lined fracture	445
35	5.0 / 5.0	100	F	R3			Bj, 5, Wa, Si, Ti	Bj, 5, Pl, Si, Ti	D		- 184 feet: calcite cement-lined fracture	440
36	5.0	98	F	R3			Bj, 15, Wa, Si, Ti	Bj, 10, Wa, Sm, Ti	D			435
37	5.0 / 5.0	100	F	R3			Bj, 15, Wa, Si, Ti	Bj, 10, Wa, Ro, Ti	D			430
38	5.0	100	F	R3			Bj, 15, Wa, Si, Ti	Bj, 10, Wa, Ro, Ti	D			425
39	5.0 / 5.0	100	F	R3			Bj, 10, Wa, Si	Bj, 15, Wa, Ro, Ti	D		- 204.2 feet: calcite-lined fracture	420
40	5.0 / 5.0	100	F	R3			Bj, 0, Wa, Si, Ti	Bj, 15, Wa, Ro, Ti	D			415
41	5.0	100	F	R3			Bj, 30, Wa, Si, Ti/Op		D		LIMESTONE (micrite); medium gray (N5); fresh; medium strong; very few shale beds of color dark	410
												405

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1059

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
215											gray (N3) to grayish black (N2); 5% shale - 214.6 feet: light-colored limestone in fracture ~0.05 feet		405
	42	5.0 5.0	100	T	R3			Bj, 5, Wa, Si, Ti					
											- 218.4 feet: calcite cement lining fracture		400
220													
	43	5.0 5.0	100		R3			Bj, 20, Wa, Si, Ti					
225				F				Fa, 30, Pl, Si, Ti Jo, 25, Wa, Si, Ti			- 224.9 feet: small reverse fault, slickensides LIMESTONE (micrite with minor thinly bedded wackestone) interbedded with shale; micrite is medium gray (N5) and shale is dark gray (N3) to grayish black (N2); fresh; medium strong; 15% shale		395
	44	5.0 5.0	100		R3								390
230											- 229.9 feet: several small (<0.02 feet) calcite vugs		
	45	5.0 5.0	100		R3			Bj, 20, Wa, Si, Ti		D	- 232.4 feet: vertical fractures		385
235				F				Bj, 5, Wa, Si, Ti Bj, 10, Wa, Si, Ti					
	46	5.0 5.0	100		R3								380
240								Bj, 10, Wa, Sm, Ti			- 239.4-240.4 feet: big vertical fracture has slight hydrocarbon odor		
	47	5.0 5.0	100		R3			Bj, 10, Wa, Sm, Si/Ti			- 244.2 feet: strong hydrocarbon odor		375
245				F				Bj, 10, Wa, Si, Ti Bj, 30, Pl, Sm, Si, Ti					
	48	5.0 4.5	99		R3						LIMESTONE (micrite); light olive gray (5Y 5/2); fresh; medium strong; 100% micrite - 248 feet: stylolites		370
250								Bj, 15, Wa, Ro					
											Boring terminated at 250.0 feet NOTE A: Water level data Date - Depth (below ground surface) 5/16 - 4.0 feet 5/17 - 7.6 feet 8/17 - 9.8 feet		365

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



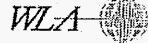
SOIL LOG - Boring No. B-1061

Drilling Method Hollow stem auger (8" OD) / HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532124.2 N; 629092.1 E		Total Depth 75.2 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 75		Elevation (Datum NAVD 88) 630.2 feet	Ground Water Depth See Note A	Date Started 6/8/06
Sampling Method Split Spoon / HQ core		Borehole Inclination Vertical	Logged by K. KRUG	Date Completed 6/9/06

Reviewed by / Date W. J. Johnson 3-14-07
DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery	Water Content (%)	Atterberg Limit (LL/Pl)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CH	630.2	Lithology 0.0
1	SP 1		3 5 7	18					CH	627.7	CLAY, dark yellowish brown (10YR 4/6), dry, stiff, contains clasts of limestone
2									CH	627.7	CLAY, yellowish brown (10YR 5/8), moist, stiff, trace manganese clasts and organics
3	SP 2		3 4 5	24					CL	626.5	CLAY, brownish yellow (10YR 6/6) to dark yellowish brown (10YR 4/4), moist, stiff, few rock clasts, trace manganese clasts
4									GC	623.2	clayey GRAVEL, dark yellowish brown (10YR 4/4), moist, hard
5	SP 3		3 7 50/7"	13					GC	622.6	
7.6											SPT refusal at 7.6 feet. Continuation of borehole description in rock log.

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1061

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532124.2 N; 629092.1 E		Total Depth 75.2 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 75	Elevation (Datum NAVD 88) 630.2 feet	Ground Water Depth See Note A	Date Started 6/8/06
Casing Size and Depth PVC: 6.63 inch O.D. / 7.6 feet	Borehole Inclination Vertical	Logged by K. KRUG	Date Completed 6/9/06

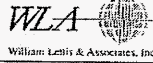
M. J. Adams 3-14-07

Reviewed by / Date

DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
10	1	1.6 / 2.0	0	CW to HW	R1 to R3					Jo. 19, Wa, Ro, Ti	LIMESTONE (micrite) with pockets of completely weathered rock (soil consistency) interbedded with calcareous shale; micrite is bluish gray (Gley 2 5/1) and shale is dark greenish gray (Gley 2 4/1); shales are spaced 0.6-0.1 feet apart in bands 0.2-0.01 feet thick; weathering ranges from moderately weathered rock fragments to completely weathered; very weak rock to moderately weathered; potential soil-filled pockets between 7.6 and 14.6 feet	Possible soil filled void at depths 7.6-8.0 feet and 9.0-9.6 feet fluid recovery good, brown	620
15	2	1.2 / 5.0	0	F	R3								615
20	3	5.0 / 5.0	83	F	R3						LIMESTONE (micrite) with interbeds of shale; medium gray (N5) to grayish black (N2); fresh; moderately strong; shale beds are irregularly spaced, wavy and irregular in structure		610
25	4	4.9 / 5.0	93	F	R3	BHTV				Jo. 15, Wa, Sm, Ti-Op		BHTV and NG analysis were conducted over the length of cored section	605
30	5	5.0 / 5.0	94	F	R3	NG				USI	- 26.1 feet: slickensides		600
35	6	4.9 / 5.0	98	F	R3						- 33.4 feet: calcite filled vugs - 34-51 feet: calcareous shale beds becoming thin to medium bedded	fluid recovery good	595
40	7	5.0 / 5.0	100	F	R3							34.5-40.5 feet: abundant drilling-induced discontinuities	590
45	8	5.0 / 5.0	97	F	R3								585
45	9	5.0	100	F	R3						- 45-48.5 feet: calcareous shale layers spacing increases with large limestone bands		585

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1061

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
50	10	4.9 5.0	94	F	R3					IS		- 51.4-56 feet: fossils or rip up structures increase; shale beds decrease in thickness and occurrence	580
55	11	5.0 5.0	100										575
60	12	4.9 5.0	97	F	R3							- 63.6-75.2 feet: shale bands become more discernable	570
65	13	5.0 5.0	100							A		- 66.6 feet: calcite filled vug	565
70	14	5.0 5.0	100	F	R3								560
75	15	0.6 0.6	100									Boring terminated at 75.2 feet PVC: 4 inch O. D. installed after drilling for BHTV test	555
80												NOTE A: Water level data Date - Depth (below ground surface) 3/7 - 12.6 feet 3/12 - 22.6 feet	550
85													545





SOIL LOG - Boring No. B-1067

Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532868.7 N; 628839.9 E		Total Depth 174.5 feet
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750	Elevation (Datum NAVD 88) 614.4 feet	Ground Water Depth See Note A	Date Started 6/27/06
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by A. Tillery	Date Completed 7/6/06

Reviewed by / Date *W. Tillery 3-14-07*
DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CL	614.4	
	SPT 1		5 5 7	6				CLAY with sand, dark yellowish brown (10YR 4/4), dry to moist, stiff, trace roots and micaceous flecks	CL	0.0	
	SPT 2		6 8 5	11				CLAY, yellowish brown (10YR 5/8), dry to moist, stiff, trace sand, trace manganese nodules, occasional lenses of coarse grained material (Residual)	CL	610.9	Driller notes: auger chatter
	SPT 3		3 7 12	14				- 4.4-4.6 feet: sand lens CLAY, yellowish brown (10YR 5/4), moist, stiff, trace sand, trace manganese nodules, occasional lenses of coarse grained material (Residual)	CH	609.8	
	SPT 4		7/4" 20/0	4						605.4	SPT refusal at 8.8 feet. Auger refusal at 9.0 feet. Continuation of borehole description on rock log.
10											
15											
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299  		ROCK LOG - Boring No. B-1067	
Drilling Method Hollow stem auger (8" OD) / HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532868.7 N; 628839.9 E	
Drilling Contractor (Driller) and Rig MILLER (Ray) / CME 750		Elevation (Datum NAVD 88) 614.4 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 4.5 inch O.D. / 9 feet		Borehole Inclination Vertical	Logged by A. Tillery
		Total Depth 174.5 feet	Date Started 6/27/06
			Date Completed 7/6/06

Reviewed by / Date W. Arthur 3-14-07
DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Cementitious Unit	Lithology	Remarks	Elevation (feet)
10	1	4.9 / 5.0	92	F	R3			Bj, 15, Pl, Ro, Op, clay coating			LIMESTONE (micrite) interbedded with shale; micrite is medium gray (N5) and shale is grayish black (N2); slightly weathered to fresh; medium strong - 9.4-9.9 feet: fracture zone, poor recovery, thin yellow clay coatings along fractures - 8.8- 17.4 feet: shale beds are <0.05-0.3 inches thick with spacings of 0.5-2 inches, wavy, discontinuous, very fine- grained beds, bioturbation - 14.4-14.8 feet: wackestone bed, fossiliferous	9.4-50 feet: Fluid return good to fair throughout boring	605
15	2	5.0 / 5.0	100					Bj, 15, Pl, Wa, Sm, Ti			LIMESTONE (wackestone with interbedded packstone) interbedded with shale; micrite is medium gray (N5) and shale is grayish black (N2); fresh; medium strong		600
20	3	5.0 / 5.0	100	F	R3			Fa, 20, Pl, Sm, Ti, slickensided			- 22.4-25.5 feet: wavy, discontinuous, spotty shale - 24 feet: bioturbation		595
25	4	5.0 / 5.0	100					Bj, 20, Pl, Sm, Ti, calcite coating		B	- 25.5-29.5 feet: packstone interbed with very little shale, medium gray (N5) to medium light gray (N6), many broken fossil fragments, stylolites every 0.1-0.3 feet		590
30	5	5.1 / 5.0	98	F	R3			Bj, 10, St, Sl, Ro, poor fit			- 30.5-35 feet: packstone interbed with very little shale, medium gray (N5), medium coarse grained, fossiliferous, stylolites		585
35	6	5.2 / 5.0	100					Bj, 10, Wa, Sl-Ro, Ti			36-37 feet: fossiliferous zone 38-40.4 feet: beds more planar with very little shale		580
40	7	5.0 / 5.0	100	F	R3			Bj, 10, Wa, Ro, Ti			SHALE (calcareous) with interbedded limestone (packstone); shale is grayish black and limestone is medium gray (N9); fresh; medium strong; 60% shale		575
45	8	4.9 / 5.0	100					Bj, 10, Pl, Sl-Ro, Op, Jo, 80, He, Ti, incipient, 43.3-43.7'		C	interbedded LIMESTONE (micrite and wackestone) and SHALE; limestone is medium gray (N5) and shale is grayish black (N2); shale content increases with depth; beds are planar; 30% shale - 46-46.6 feet: prominent shale bed		570

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299	ROCK LOG - Boring No. B-1067
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Depth (feet)	Run No.	Recovery / Cut	% RQD	We i g	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
50	9	5.0 / 5.0	100	F	R3				Bj, 15, Pl, Ro, Op		SHALE interbedded with micrite and wackestone; shale is grayish black (N2) and limestone is medium gray (N5); planar beds; fresh; medium strong; 80% shale		565
55	10	4.5 / 5.1	96						Jo, 70, Pl, Sl-Op, He		LIMESTONE (wackestone and packstone) with interbedded shale; limestone is medium gray (N5) and shale is grayish black (N2); fresh; medium strong; 35% shale - 54-54.8 feet: prominent shale bed - 56.8-57.6 feet: prominent shale bed, 95% shale - 58.6-59.3 feet: prominent shale bed		560
60	11	4.8 / 5.0	100	F	R3						- 60.7-62.2 feet: shale and limestone, shale beds 0.1-2 inches thick, 45% shale		555
65	12	5.3 / 5.0	100								SHALE with interbedded micrite; shale is grayish black (N2) and micrite is medium gray (N5); fresh; medium strong; 70% shale - 63.9-80.8 feet: planar interbeds with striped appearance, micrite beds are 0.1-0.2 feet		550
70	13	5.3 / 5.0	100	F	R3				Fa, 40, Wa, Sm, Ti	C			545
75	14	0 / 0	0	F	R3				Fa, 80-20°, Sl, Ti, slickensides				540
80	15	1 / 0	00						Fa, 10, Pl, Sm Ti, rake=80, Bj, 10, Pl, Sm, Op		LIMESTONE (micrite and packstone) interbedded with calcareous shale; micrite is medium gray (N5), packstone is medium bluish gray (5B 5/1) and shale is dark gray (N3); fresh; weak to medium strong; limestone beds are 0.05-0.2 feet thick with spacings of 0.05-0.4 feet; 35% shale		535
85	16	4.9 / 5.0	18.6	F	R3						LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); fresh; weak to medium strong; shale beds are <0.01-0.05 feet thick with spacings of 0.05-0.2 feet; 25% shale		530

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1067

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
90	17	4.9 5.0	97.6										525
95	18	5.2 5.0	100	F	R2 to R3					C	SHALE (calcareous) with interbedded limestone (micrite and packstone); shale is dark gray (N3), micrite is medium gray (N5) and packstone is medium bluish gray (5B 5/1); fresh; weak to medium strong; micrite is globular; bioturbation; 60% shale		520
100	19	4.9 5.0	98.6										515
105	20	5.0 5.0	99	F	R2 to R3								510
110	21	5.0 5.0	100										505
115	22	5.1 5.0	100	F	R3					D	LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong; 20% shale - 109.1-121 feet: shale beds are <0.02 feet thick with spacings of 0.02 feet, occasional chert which varies in size from 0.03-0.05 feet, vugs and spar in rock fabric - 115-125 feet: chert intervals		500
120	23	4.8 5.0	96										495
125	24	5.1 5.0	100	F	R3								490

Jo. 80,
Wa. Si, Ti
Jo. 15, Pl,
Si, Ti,
slickensides,
rake=15

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1067

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
130	25	5.1 5.0	100										485
135	26	5. 5.	100	F	R3							- 135-140 feet: shale beds are 0.01-0.05 feet thick with spacings of 0.05-0.2 feet, wavy	480
140	27	5.1 5.1	99									- 140-145 feet: shale beddings are less discrete, contain rip-up clasts	475
145	28	4.7 5.0	93	F	R3							- 145-155 feet: shale beds are 0.1 thick on average with spacings of 0.05-0.2 feet	470
150	29	5.3 5.0	100										465
155	30	.0 .0	100	F	R3							- 153.2-154 feet: vertical incipient fracture, 80 degrees - 155-157.5 feet: shale beds are 0.1 feet thick on average with spacing of 0.05-0.2 feet	460
160	31	.0 .0	100									- 159.5 feet: slickenside along bedding joint	455
165	32	5.0 5.0	100	F	R3							- 157.5-168 feet: shale beds are 0.01 feet thick with spacings of 0.05-0.2 feet 167.2-167.6 feet: vertical joint, 75 degrees 168-174.6 feet: shale beds are 0.01-0.05 feet	450

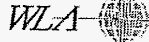
Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1067

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
170	33	5/5	100	F	R3					D	thick with spacings of 0.02-0.1 feet, shale is very sparry, wavy; stylolites		445
175											Boring terminated at 174.5 feet		440
180											NOTE A: Water level data Date - Depth (below ground surface) 6/28 - 8.2 feet 7/5 - 8.0 feet 7/6 - 7.8 feet 8/1 - 8.2 feet		435
185													430
190													425
195													420
200													415
205													410

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



SOIL LOG - Boring No. B-1078

Drilling Method Hollow stem auger (8" OD)/ NQ core (3")	Boring Location Coordinates: AL State Grid (ft) 1533819.2 N; 627721.5 E	Total Depth 75 feet
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W. J. ... 3-14-07
Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0							603.6	0.0	
							602.6	1.0	
		CME 1	20						
5							599.9	3.7	
		CME 2	63						5-10.5 feet: very infrequent (<2%) white nodules ~2mm which do not react with acid
10							593.1	10.5	
		CME 3	19.2						
		SPT 4	50/1"	0			591.5	12.1	SPT refusal at 12.1 feet. Continuation of borehole description on rock log.

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



ROCK LOG - Boring No. B-1078

Drilling Method Hollow stem auger (8" OD)/ NQ core (3")	Boring Location Coordinates: AL State Grid (ft) 1533819.2 N; 627721.5 E		Total Depth 75 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750	Elevation (Datum NAVD 88) 603.6 feet	Ground Water Depth See Note A	Date Started 5/25/06
Casing Size and Depth PVC: 4.5 inch O.D. / 12 feet	Borehole Inclination Vertical	Logged by A. Tillery	Date Completed 5/26/06

W. Adams 57907
Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% ROD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	3.0 / 3.0	6	CW SW	R3						CLAY, olive yellow (2.5Y 6/6), wet, very soft, few sand LIMESTONE (micrite) with calcareous shale interbeds; medium dark gray (N4) to dark gray (N3); slightly weathered; medium strong; rock is stained near fractures		590
20	2	4.5 / 5.0	9	F	R3						LIMESTONE (micrite) with interbedded calcareous shale; medium dark gray (N4) to dark gray (N3); fresh; medium strong; contacts are slightly gradual; 50% shale - 20-25 feet: shale beds are 0.2-9 cm thick (average of 0.5 cm), some stylolites, rip-up clasts, possible pyrite		585
25	3	4.9 / 5.0	10										580
30	4	5.1 / 5.0	9	F	R3			Bj, 20, Pl, Sm			SHALE (calcareous) with limestone interbeds; medium dark gray (N4) to dark gray (N3); fresh; medium strong LIMESTONE (micrite and wackestone) interbedded with calcareous shale; limestone is medium light gray (N6) and shale is medium dark gray (N4); fresh; medium strong - 26-27.5 feet: beds are mostly fine grained except at 27-27.5 feet, which is wackestone		575
35	5	5.0 / 5.0	95					Bj, 10, Pl, Sl-Ro		LSI	SHALE (calcareous) with limestone (micrite) interbeds; shale is medium dark gray (N4) and limestone is medium light gray (N6); fresh; medium strong LIMESTONE (wackestone and micrite); limestone is medium light gray (N6); fresh; medium strong		570
40	6	4.8 / 5.0	96	F	R3						SHALE; alternating micrite and shale beds; shale is medium dark gray (N4) and limestone is medium light gray (N6); fresh; medium strong; 60% shale; contacts of shale beds with micrite are clear, no alteration, bioturbation or otherwise (35-40 feet)		565
45	7	5.0 / 5.0	34								LIMESTONE (micrite and wackestone) interbedded with shale; limestone is medium light gray (N6) and shale is medium dark gray (N4); fresh; medium strong - 43.5-44 feet: wackestone - 44-44.8 feet: small wavy shale beds, some brecciation		560
50	8	5.0 / 5.0	88	F	3						LIMESTONE (micrite and wackestone); limestone is medium light gray (N6); fresh; medium strong; some larger grains bordering on wackestone - 46.4-57.1 feet: wide to moderately wide spaced stylolitic features		555

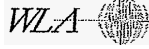
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1078

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	9	5.0 / 5.0	78	SW to F					staining		- 53-53.5 feet: few small wavy shale beds 0.5-1 cr thick, small fossils		550
60	10	5.1 / 5.0	100						Bj, 20, Wa, SI		LIMESTONE (micrite and wackestone) Interbedded with calcareous shale; limestone is medium light gray (N6) and shale is dark gray (N3); fresh; medium strong; shale beds are very thin LIMESTONE (micrite and wackestone); limestone is medium light gray (N6); fresh; medium strong; no shale beds; stylolites spaced 0.05-0.1 feet		545
65	11	4.9 / 5.0	90	F	R3				Jo, 70-80, Ro, staining Bj, 5, Pl, Ro	S	LIMESTONE (micrite); light olive gray (5Y 6/1); fresh; medium strong; wavy stylolites spaced 1-5 cm apart; few wackestone interbeds	62-63 feet: losing water return, improvement at 63 feet	540
70	12	4.8 / 5.0	90	SW to F							- 63.8 feet: some wackestone grains (>10%) - 65.6-66 feet: wackestone - 65.4-66.5 feet: brown/tan staining and white powder on broken surfaces, possible indication of groundwater flow		535
75	13	5.0 / 5.0	92	F					Bj, 10, Wa, Ro staining		LIMESTONE (micrite and wackestone); limestone is light gray (N7); fresh; medium strong; mainly very fine to fine grained; homogeneous very thin wavy stylolite lines - 70.9-71.5 feet: fracture zone with staining, indication of groundwater movement along fractures		530
80											Boring terminated at 75.0 feet		525
85											NOTE A: Water level data Date - Depth (below ground surface) 5/26 - 2.1 feet		520
90													515

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299


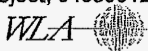


SOIL LOG - Boring No. B-1079

Drilling Method Hollow stem auger (8" OD)/ NQ core (3")	Boring Location Coordinates: AL State Grid (ft) 1533742.4 N; 628277 E		Total Depth 150 feet
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750	Elevation (Datum NAVD 88) 604.8 feet	Ground Water Depth See Note A	Date Started 5/22/06
Sampling Method CME/SPT	Borehole Inclination Vertical	Logged by A. Tillery	Date Completed 5/24/06

Reviewed by / Date WLA 5-10-07
DSC 5-9-07 Rev. 1

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								604.8	Lithology	0.0	
								604.3	TOPSOIL	0.5	
		CME 1		60					CL CLAY with gravel, brown (7.5YR 4/4), moist, very stiff, trace manganese oxide nodules, clay reacts with acid. Gravel is subrounded to sub angular, clasts are limestone fragments or small quartz grains		
5		CME 2		26.4				599.8	ML SILT with sand, light olive brown (2.5Y 5/4), moist, very soft	5.0	
10		CME 3		18				596.3	CL CLAY, dark yellowish brown (10YR 4/6), very stiff, few sand and gravel clasts, trace manganese oxide nodules	8.5	
		SPT 4	38/3	0				593.0		11.8	CME blocked by long limestone clast at 11.5 feet SPT refusal at 11.8 feet with 38/3". Continuation of borehole description on rock log.
15											
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1079	
 			
Drilling Method Hollow stem auger (8" OD)/ NQ core (3")		Boring Location Coordinates: AL State Grid (ft) 1533742.4 N; 628277 E	
Drilling Contractor (Driller) and Rig MILLER (Bilbrey) / CME 750		Elevation (Datum NAVD 88) 604.8 feet	Ground Water Depth See Note A
Casing Size and Depth PVC: 4.5 inch O.D. / 11.5 feet		Borehole Inclination Vertical	Logged by A. Tillery
			Total Depth 150 feet
			Date Started 5/22/06
			Date Completed 5/24/06

WLA 5-10-07
 Reviewed by / Date *DSC 5-9-07* *Rev. 1*

Depth (ft)	Run No.	Recovery / C t	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	3.5 / 3.5	100	F	R3						LIMESTONE (micrite) with interbedded shale; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong; micrite is medium grained; shale beds moderately thin; 10% shale	First core run begun at 11.5 feet.	590
15-17											- 15.5-17 feet: shale rich zone	Good fluid returns, milky gray, 2900 psi down pressure	
20	2	4.7 / 5.0	88								LIMESTONE (micrite) with interbedded shale; micrite is medium gray (N5) and shale is dark gray (N3); fresh; weak		585
25	3	5.0 / 5.0	98	F	R3							Drillers using circulating mud tub	
25-30											- 25 feet: increase in shale beds to 15%; micrite very fine-grained, very closely spaced incipient fractures, locally healed with calcite		580
30	4	5.0 / 5.0	100										575
30-35											- 31-32.5 feet: zone of faults (minor) which exhibit prominent slickensides, indicative of bedding parallel slip, 10-20°		
35	5	5.0 / 5.0	79	F	R3					F			570
35-40													
40	6	5.0 / 5.0	84										565
40-45													
45	7	5.0 / 5.0	96	F	R3							Good fluid return	560
45-50													
50		5.3 / 5.0	100										555

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1079

Depth (feet)	Rin No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	9	5.0 / 5.0	95						o, 10, St,	F	- 54.4-55.4 feet: bioturbated zone - 55 feet: increase in shale beds to 25%, micrite is light gray (N6) - 57-59 feet: shale rich zone		550
60	10	4.9 / 5.0	94	F	R3						LIMESTONE interbedded with shale; limestone is medium light gray (N6) and shale is dark gray (N3); fresh; medium strong; occurrence of green hydrocarbon residue on shale beds		545
65	11	5.0 / 5.0	92						i, 5, LRo, Pl, poor fit		- 64-69 feet: regularly spaced minor faults or brecciated zones 20-30°, poorly developed slickensides, poor core recovery. 5 to 10% shale, with wavy beds spaced at 0.05 feet.		540
70	12	0.9 / 1.0	60										535
75	13	4.0 / 4.0	70	F	R3								530
80	14	5.1 / 5.0	90							LSR			525
85	15	5.1 / 5.0	100						j, 5, Pl, m, poor				520
90	16	5.1 / 5.0	96	F	R3						- 82.2-85.5 feet: very bioturbated		515
90	17	5.0 / 5.0	100	F	R3				a, 20, Pl, m, slickensides, strike=70				515

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1079

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
95	18	4.8 / 5.0	96										510
100	19	5.2 / 5.0	100	F	R3								505
105	20	5.0 / 5.0	100								- 103.8-105 feet: shale bed	Good fluid return, milky gray-white	500
110	21	4.9 / 5.0	98	F	R3						LIMESTONE (micrite); medium gray (N5); fresh; weak		495
115	22	4.9 / 5.0	98							LSR	- 109-110.8 feet: shale bed	Driller replaces water pressure gauge	490
120	23	5.0 / 5.0	100	F	R3						- 114-115 feet: shale rich zone		485
125	24	5.2 / 5.0	100								LIMESTONE (micrite) with minor shale interbeds; micrite is medium light gray (N6) to light gray (N7) and shale is medium dark gray (N4); fresh; weak; beds dip ~10°-15°; shale beds wavy with diffuse boundaries; 10% shale		480
130	25	5.0 / 5.0	100	F	R3							Driller replaces mud tub fluid	475
											LIMESTONE (micrite) with interbeds of wackestone; micrite is medium light gray (N6) to		

Bj, 20, Pl, Sm, calcit coating
Bj, 5-10, Pl, Sm, poor fit
Bj, 10, Pl, Si-Ro

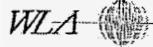
Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1079

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
135	26	5.0 / 5.0	100								medium dark gray (N4) and wackestone is medium gray (N5); fresh; weak; diffuse relic fossil/oolite pods		470
140	27	5.0 / 5.0	100	F	R3			a, 15, Pl, m, ke=80		LSR	- 139 feet: color change of wackestone to medium light gray (N6)	Driller replaces mud tub fluid	465
145	28	5.0 / 5.0	100								LIMESTONE (micrite) with minor interbedded shale; medium dark gray (N4); very fine grained; 10% shale beds		460
150	29	5.1 / 5.0	100	F	R3								455
155											Boring terminated at 150 feet		450
160											NOTE A: Water level data Date - Depth (below ground surface) 8/24 - 3.2 feet		445
165													440
170													435

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299



SOIL LOG - Boring No. B-1080

Drilling Method	Boring Location Coordinates: AL State Grid (ft)	Total Depth
	615.8 feet	Ground Water Depth See Note A
Sampling Method CME/SPT	Borehole Inclination Vertical	Date Started 4/25/06
	Logged by M. Osborne	Date Completed 4/26/06

Reviewed by / Date *M. Osborne 3-14-07*
DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks	
0									615.8	0.0		
		CME 1		12					CL	614.8	1.0	
		SPT 2	14 21 31	15.6					GC SP	614.1	1.8	1 foot: soil core refusal on a dry white limestone clast (1.5 inches). Advanced SPT through interval.
5		CME 3		36	6.1		CHE		CL	610.4	5.4	
										607.4	8.4	
		CME 4		12					CL	605.8	10.0	
10		SPT 5	50/1"	0								Auger and SPT refusal at 9.9 feet. Continuation of borehole description on rock log.
15												
20												
25												
30												

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299


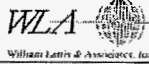


ROCK LOG - Boring No. B-1080

Drilling Method Hollow stem auger (8" OD)/ NQ core (3")	Boring Location Coordinates: AL State Grid (ft) 1532389.9 N; 630169 E		Total Depth 35 feet
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME 45	Elevation (Datum NAVD 88) 615.8 feet	Ground Water Depth See Note A	Date Started 4/25/06
Casing Size and Depth HW: 4.5 inch O.D. / 9.1 feet	Borehole Inclination Vertical	Logged by M. Osborne	Date Completed 4/26/06

Reviewed by / Date *M. Osborne 3-13-07*
DSC 3-13-07



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
10	1	2.1 2.0	75	SW	R3						LIMESTONE (packstone) interbedded with shale; packstone is medium gray (N5) and shale is dark gray (N3); slightly weathered; medium strong; wavy to planar laminations to fine bedding; shale beds are 0.1-1.5 inches thick with spacings of 1-6 inches	First core run begun at 9.3 feet. 9.9-24.6 feet: Good fluid return, downhole pressure 500-650 psi	605
15	2	4.9 5.0	74	SW	R3						- 13.8 feet: vertical stylolites, color grades darker		600
20	3	4.9 5.0	88	SW	R3						- 18-23 feet: possible small dissolved shell "ghosts"		595
25	4	5.0 5.0	82	SW	R3					NV	LIMESTONE (packstone and wackestone) interbedded with shale; limestone is medium gray (N5) and shale is dark gray (N3); slightly weathered; medium strong - 21.6 feet: 0.05 feet thick shaly zone with clay infilling, appears to be thin metabentonite - 19.2-30.5 feet: shale beds are 0.05-0.2 feet thick, subhorizontal (5°-15°); irregular calcite crystal-filled vugs	24.6-35.0 feet: Loss of fluid return 24.8 feet: lost fluid return and did not recover	590
30	5	4.8 5.0	94	SW	R3						- 30-35 feet: fine to laminated beds, wavy		585
35	6	3.6 3.7	92	SW	R3						- 34.2 feet: shaly zone 0.1 feet thick with clay infilling 34.5-34.6 feet: metabentonite		580
40											Boring terminated at 35.0 feet NOTE A: Water level data Date - Depth (below ground surface) 4/27 -9.0 feet 8/14 -9.0 feet		575
45													570
50													

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1082	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")	Boring Location Coordinates: AL State Grid (ft) 1532500.00, 888888.00		Total Depth 13 feet
Drilling Contractor (Driller) and Rig MACTEC (Warren) / CME 45	Elevation (Datum NAVD 88) 621 feet	Ground Water Depth See Note A	Date Started 5/11/06
Sampling Method Split Spoon/ HQ core	Borehole Inclination Vertical	Logged by M. Osborne	Date Completed 5/12/06

M. Osborne 3-13-07

Reviewed by / Date DSC 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0								ASPHALT	SM	621	
0.2										620.8	
1.3	SPT 1	*	18					silty SAND, yellowish brown (10YR 5/8), moist, loose to medium dense (Fill)	CL	619.7	* SPT1 blow counts not recorded due to rig geologist omission
3			3								
4	SPT 2		4	18							
7			7								
5.3								CLAY, reddish brown (5YR 4/4), moist, stiff to very stiff	CH	615.7	
6.0								- 6.0 feet: color changes to mottled brownish yellow (10YR 6/6) and white (10YR 8/1); manganese nodules			Auger chattering SPT and auger refusal at 7.4 feet. Continuation of borehole description in rock log.
7.5	SPT 3		2	18						613.5	
4			4								
12			12								

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1082	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1532535.4 N; 628502.6 E	Total Depth 75 feet
Drilling Contractor (Driller) and Rig MACTEC (Warren) / CME 45		Elevation (Datum NAVD 88) 621 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 8.4 feet		Borehole Inclination Vertical	Logged by M. Osborne
			Date Started 5/11/06
			Date Completed 5/12/06

M. Osborne 3-14-07
Reviewed by / Date *DSC* 3-13-07



Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
10	1	1.8 4.5	22	SW CW	R3 R0						LIMESTONE (wackestone); medium light gray (N6) to medium gray (N4) with olive gray (5Y 4/1); slightly weathered to completely weathered; medium strong - 8-8.4 feet: soil-filled cavity, several clay fillings - 10.8-12.9 feet: soil-filled void, contains medium stiff clay	good fluid return, brown	610
15	2	0.9 5.0	10	CW							- 13-16 feet: soil-filled void, contains medium stiff clay		605
20	3	4.5 5.1	41	SW CW MW	R3						LIMESTONE (wackestone) interbedded with shale; medium light gray (N6) to medium dark gray (N4); completely to moderately weathered; medium strong; fossiliferous packstone interbeds; sparry structures - 17.8-19.2 feet: highly fractured zone, shale beds highly weathered, less than 0.1' clay infilling between beds	down pressure 800 psi, good fluid return, brown	600
25	4	5.0 5.0	90	MW	R3	BHTV	NG					BHTV and NG analysis were conducted over the length of cored section	595
30	5	5.0 5.0	100	F SW SW	R3						- 26.6 feet: clay filled vug LIMESTONE; crystalline, medium light gray (N6) to medium bluish gray (5B 5/1); fresh; medium strong; white calcite crystals along break LIMESTONE (packstone) with calcareous shale interbeds; packstone is medium gray (N5) and shale is dark gray (N3); fresh to slightly weathered; medium strong		590
35	6	5.0 5.0	100	SW	R3						LIMESTONE (micrite) with calcareous shale interbeds; micrite is medium gray (N5) and shale is dark gray (N3); slightly weathered; weak to medium strong; fossiliferous, shale beds increase with depth - 33.3 feet: calcite vug		585
40	7	5.0 5.0	100	F	R3						LIMESTONE (packstone); medium gray (N5); fresh; medium strong; mainly subhorizontal stylolites; sparry crystalline structure throughout - 37-43 feet: subvertical fracture and several vugs healed with calcite		580
45	8	5.0 5.0	100								SHALE; interbedded with packstone; dark gray		575

Project Name and No.: NuStar - Bellefonte COL Project: 6468061299





ROCK LOG - Boring No. B-1082

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
50	9	5.0 / 5.0	100		SW R2					C	(N3); slightly weathered; weak; moderate to extreme bioturbation	850 psi down pressure, good fluid return, gray	570
55	10	5.0 / 5.0	100		SW to F R3						LIMESTONE (packstone) interbedded with shale; packstone is medium dark gray (N4) to medium bluish gray (5B 5/1) and shale is dark gray (N3); fresh to slightly weathered; medium strong; calcite mineralization occurring along shale beds; 25% shale		565
60	11	5.0 / 5.0	100		SW to F R2 to R3						SHALE interbedded with wackestone; shale is dark gray (N3) and wackestone is medium dark gray (N4); fresh to slightly weathered; weak to medium strong; extreme bioturbation		560
65	12	5.0 / 5.0	100		SW R2						SHALE (calcareous) interbedded with limestone (wackestone and packstone); grayish black (N2); slightly weathered; weak; localized fossiliferous beds; 40% limestone		555
70	13	5.0 / 5.0	100		R2						- 68.4-69.4 feet: shale beds thin to laminated, dominated by wackestone		550
75	14	3.2 / 3.2	100		R2						- 73.5 feet: limestone color shifts to medium gray (N5) - 74 feet: fossil rich bed 0.2 feet thick	PVC: 4 inch O. D. installed after drilling for BHTV test	545
80											Boring terminated at 75.0 feet		540
85											NOTE A: Water level data Date - Depth (below ground surface) 8/17 - 13.2 feet		535

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1086	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1533155.7 N; 628520.7 E	Total Depth 75.3 feet
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME550		Elevation (Datum NAVD 88) 607.2 feet	Ground Water Depth See Note A
Sampling Method Split Spoon/ HQ core		Borehole Inclination Vertical	Logged by J. Hoeft
			Date Started 6/13/06
			Date Completed 6/13/06

M. J. Hoeft 3-14-07
Reviewed by / Date *DSC* 3-13-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Remarks
0									CH	607.2	
2	SPT 1		2	18	22.3	58/33	GSZ			605	
5	SPT 2		4	18	18.4		CHE				
7	SPT 3		5	18							
7.5	SPT 4		12/1"	1						599.7	- becomes stiff, yellowish brown (10 YR 5/6), mottled with bluish gray (5B 6/1) streaks, chert gravel and manganese nodules
7.5										7.5	Auger and SPT refusal at 7.5 feet (blow count 12/0"). Continuation of borehole description on rock log.
10											
15											
20											
25											
30											

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1086	
 			
Drilling Method Hollow stem auger (8" OD)/ HQ core (3.8")		Boring Location Coordinates: AL State Grid (ft) 1533155.7 N; 628520.7 E	Total Depth 75.3 feet
Drilling Contractor (Driller) and Rig MACTEC (Akins) / CME550		Elevation (Datum NAVD 88) 607.2 feet	Ground Water Depth See Note A
Casing Size and Depth HW: 4.5 inch O.D. / 8 feet		Borehole Inclination Vertical	Logged by J. Hoeft
			Date Started 6/13/06
			Date Completed 6/13/06

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology		Remarks	Elevation (feet)
10	1	3.8 / 4.0	87.5	F	R3							LIMESTONE (micrite) with interbeds of calcareous shale; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong	Fluid return good throughout boring	595
15	2	5.1 / 4.9	100									- 7.5-15 feet: shale banding is 0.05-0.2 feet thick with spacings of 0.05-0.2 feet		590
20	3	5.0 / 4.8	100	F	R3							- 15-19.2 feet: shale is <0.05 ft thick with spacing of 0.05-0.2 feet		585
25	4	5.2 / 5.1	100	F	R3	BHTV				D		- 19.2-31 feet: shale is 0.05-0.15 ft thick, increase in shale bed spacing to 0.1-0.3 feet	BHTV and NG analysis were conducted over the length of cored section	580
30	5	5.0 / 5.0	100									- 31-47.5 feet: shale beds are ~ 0.05 feet thick with spacings of 0.2-0.3 feet	30 feet: Unconfined Compression Test	575
35	6	4.9 / 5.0	97											570
40	7	5.3 / 5.0	100	F	R3									565
45	8	4.9 / 5.0	98									- 39.6 feet: calcite layer 0.05 feet thick		560

Reviewed by / Date *W. J. Hoeft* 3-14-07
DSC 3-13-07

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1086

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology		Elevation (feet)		
											Lithology	Remarks			
50	9	5.0 / 5.0	99	F	R3					D	<p>LIMESTONE (micrite) with calcareous shale bedding; micrite is medium gray (N5) and shale is dark gray (N3); fresh; medium strong; spar in rock fabric at 47.5-51 feet, very crystalline; less prominent shale banding</p> <p>- 51-60 feet: shale bedding < 0.02 ft. thick with spacing 0.03-0.2 ft., not as much shale bedding from 54.5 to 57.5 ft.</p>		555		
55	10	4.5 / 5.0	90	F	R3									550	
60	11	4.8 / 5.0	96												545
65	12	5.6 / 5.1	100												540
70	13	4.9 / 5.0	97	F	R3										535
75	14	4.1 / 3.9	100												530
80															525
85													520		


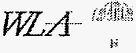
Bj, S, Wa, Sl, Ti, calcite mineralization and polished surface

Boring terminated at 75.3 ft

NOTE A: Water level data
 Date - Depth (below ground surface)
 6/14 - 9.2 feet
 7/23 - 12.0
 9/13 - 9.2 feet


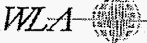
First foot of run #12: deliberate slow drilling rate

PVC: 4 inch O. D. installed after drilling for BHTV test
 PVC: 4 inch O. D. set for BHTV testing

Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		SOIL LOG - Boring No. B-1088	
 			
Drilling Method Hollow stem auger (8" OD)/ NQ core (3")		Boring Location Coordinates: AL State Grid (ft) 1533043.3 N; 628497.2 E	
		Total Depth 71.2 feet	
Sampling Method UD Shelby Tube		Borehole Inclination Vertical	Logged by D. Stepanof
		Date Completed 8/17/06	

Reviewed by / Date W. Walden 3/21/07
DSC 3-20-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content (%)	Atterberg Limit (LL/PI)	Other Testing	Lithology	Soil Type (USCS)	Elevation (feet)	Lithology		Remarks
											608.1	0.0	
0									CH	608.1	CLAY, dark yellowish brown (10YR 4/4), moist	0.0	Auger to 4.0 feet
5	UD 1		18	17.2	72/51	GSZ H SG CN				605			1-5 feet: Bulk sample taken for Standard Proctor test (LL=58%, PI=34%)
10	UD 2		6						GC	599.6	clayey GRAVEL, gray (10YR 5/1), (weathered limestone)	8.5	5-10 feet: Bulk sample taken for Modified Proctor test (LL=54%, PI=32%) Shelby tube refusal at 8.5 feet. Sample not retained.
11										597.1		11.0	Auger refusal at 11.0 feet. Continuation of borehole description in rock log.

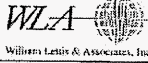
Project Name and No.: NuStart - Bellefonte COL Project; 6468061299		ROCK LOG - Boring No. B-1088	
 			
Drilling Method Hollow stem auger (8" OD)/ NQ core (3")		Boring Location Coordinates: AL State Grid (ft) 1533043.3 N; 628497.2 E	Total Depth 71.2 feet
Drilling Contractor (Driller) and Rig MACTEC (Gibson) / CME 45		Elevation (Datum NAVD 88) 608.1 feet	Ground Water Depth See Note A
Casing Size and Depth NW: 3.5 inch O.D. / 11 feet		Borehole Inclination Vertical	Logged by D. Stepanof
			Date Started 8/15/06
			Date Completed 8/17/06

M. Stepanof 3-14-07

Reviewed by / Date DSC 3-13-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
15	1	1.0 / 1.0	0								LIMESTONE (micrite) with calcareous shale interbeds; micrite is gray (N5) and shale is dark medium gray (N4); fresh; medium strong; strong HCl reaction	down pressure 300-400 psi, good fluid return, light gray	595
15	2	5.0 / 5.0	100	F	R3						- 11-71 feet: shale is 0.01-0.3 feet thick, wavy, wispy - 15-17 feet: bioturbation filled with packstone, wavy beds, stylolites present		590
20	3	5.0 / 5.0	94										590
25	4	5.1 / 5.0	100	F	R3							26.3 feet: Unconfined Compression Test down pressure 700 psi, good fluid return, light gray	585
30	5	5.0 / 5.0	100										580
35	6	5.0 / 3.0	100									- 33.8 feet: incipient fracture	575
40	7	5.0 / 5.0	100	F	R3							- 37.4 feet: incipient fracture	570
45	8	7.2 / 7.2	100										565
50	9	1.0 / 1.0	100									- 47.5 feet: calcite-filled fracture 0.01 feet thick	560

Project Name and No.: NuStart - Bellefonte COL Project: 6468061299



ROCK LOG - Boring No. B-1088

Depth (feet)	Run No.	Recovery / Cut	% RQD	Logging	Strength	In-Situ Testing	Lithology	Discontinuity Log	Discontinuity Description	Geologic Unit	Lithology	Remarks	Elevation (feet)
55	10	4.5	98	F	R3						- 52-57 feet: few fossils in shale, incipient fractures	55.1 feet: Unconfined Compression Test	555
60	11	4.5	98					Bj, 10, Pl, Sm, Ti, slickensides		D	- 57.5 feet: calcite-filled fracture with slickensides		550
65	12	5.0	88	F	R3			Bj, 15, Wa, Sl, Bj, 50, Wa, Sl, Ti, Bj, 15-60, Wa, Sl, Ti, Bj, 10, Wa, Sl, Ti			- 63-66 feet: few wackestone interbeds 0.05 feet thick - 63.7-64.0 feet: high angle fracturing - 66-71.2 feet: packstone-filled burrows in calcite		545
70	13	4.4	101					Bj, 10, Wa, Sl, Ti, calcite filling			- 68 feet: calcite-filled fracture	67.6 feet: Unconfined Compression Test	540
75											Boring terminated at 71.2 feet	NOTE A: Water level data Date - Depth (below ground surface) 3/17 - 10.0 feet 3/19 - 1.0 feet 3/20 - 2.0 feet	535
80													530
85													525
90													520