

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 01

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 15:16

DATE COMPLETED: 10/28/06 15:41

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-01R

COORDINATES: N: 446,831 E: 1,361,206

GROUND SURFACE ELEVATION: 2,542.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

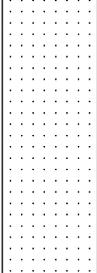
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 85.0 ft

BOTTOM ELEVATION: 2,457.4 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2540	0.0 - 10.0 Yellowish brown and dk. gray silty CLAY, moist		2542.4 0.0	CL	moist	SHOB-01 0-5	
5.0	2535			2532.4 10.0			SHOB-01 5-10	
10.0	2530	10.0 - 15.0 Yellowish brown silty CLAY and black COAL, moist		2527.4 15.0	CL/COAL	SHOB-01 10-15		
15.0	2525	15.0 - 20.0 Reddish brown COAL and greenish gray CLAYSTONE, moist		2522.4 20.0	COAL/Clst	SHOB-01 15-20		
20.0	2520	20.0 - 30.0 Greenish gray CLAYSTONE, moist		2512.4 30.0	Clst	SHOB-01 20-25		
25.0	2515					SHOB-01 25-30		
30.0	2510	30.0 - 55.0 Med. gray to dk. gray SANDSTONE, fine grained, moist to v. moist		2487.4 55.0	Ss	moist to v. moist	SHOB-01 30-35	
35.0	2505					SHOB-01 35-40		
40.0	2500					SHOB-01 40-45 + BD-JE-48		
45.0	2495					SHOB-01 45-50		
50.0	2490					SHOB-01 50-55		
55.0	2485	55.0 - 75.0 Black COAL, wet		2467.4 75.0	COAL	wet	SHOB-01 55-60	
60.0	2480						SHOB-01 60-65	
65.0	2475						SHOB-01 65-70	
70.0	2470						SHOB-01 70-75	
75.0	2465	75.0 - 85.0 Dk. greenish gray CLAYSTONE, wet		2457.4 85.0	Clst	SHOB-01 75-80		
80.0	2460					SHOB-01 80-85		
85.0		<b>Boring completed at 85 ft.</b>						TD = 85'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 02

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/16/06 16:13

DATE COMPLETED: 10/16/06 17:18

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-02R

COORDINATES: N: 446,782 E: 1,363,799

GROUND SURFACE ELEVATION: 2,504.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

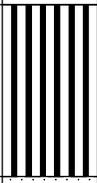
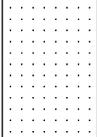
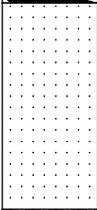
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 210.0 ft

BOTTOM ELEVATION: 2,294.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2504.9	0.0 - 15.0 Grayish brown (2.5Y, 5/2) clayey SILT, tr. sand, sli. moist to moist		2504.9 0.0	MH	sli. moist to moist	SHOB-02 0-5	Driller begins using water at 15'
5.0	2495.0						SHOB-02 5-10	
10.0	2489.9	10' SILT changes color to dk. olive brown (2.5Y, 3/3)		2489.9 15.0			SHOB-02 10-15	
15.0	2485.0	15.0 - 28.0 Olive brown (2.5Y, 4/3) clayey SANDSTONE, v. fine grained		2476.9 28.0	Ss	N/A	SHOB-02 15-20 + BD-RT-11	Driller confirmed coal from 28'-47'
20.0	2480.0						SHOB-02 20-25	
25.0	2475.0	28.0 - 47.0 Black COAL					2476.9 28.0	
30.0	2470.0			2457.9 47.0	COAL	N/A	SHOB-02 45-50	
35.0	2465.0						SHOB-02 50-55	
40.0	2460.0	47.0 - 65.0 Gray (2.5Y, 5/1) silty SANDSTONE					2457.9 47.0	SHOB-02 60-65
45.0	2455.0			2439.9 65.0	Ss	N/A	SHOB-02 65-70	
50.0	2450.0						SHOB-02 70-75	
55.0	2445.0	65.0 - 75.0 Gray (2.5Y, 5/1) silty SANDSTONE, tr. shale					2439.9 65.0	SHOB-02 75-80
60.0	2440.0			2429.9 75.0	Clst	N/A	SHOB-02 80-85	
65.0	2435.0						SHOB-02 85-90	
70.0	2430.0	75.0 - 90.0 Dk. gray (2.5Y, 4/1) CLAYSTONE, tr. v. fine sand					2429.9 75.0	SHOB-02 90-95
75.0	2425.0			2414.9 90.0	Ss/Clst	N/A	SHOB-02 95-100	
80.0	2420.0							
85.0	2415.0	90.0 - 140.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE interbedded w/ sandy CLAYSTONE					2414.9 90.0	
90.0	2410.0							
95.0	2405.0							
100.0	2405.0							

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 02

RECORD OF BORING SHOB-02R

COORDINATES: N: 446,782 E: 1,363,799

GROUND SURFACE ELEVATION: 2,504.9 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0		90.0 - 140.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE interbedded w/ sandy CLAYSTONE <i>continued from previous page</i>			Ss/Clst	N/A	SHOB-02 100-105	
105.0	2400			SHOB-02 105-110				
110.0	2395			SHOB-02 110-115				
115.0	2390			SHOB-02 115-120				
120.0	2385			SHOB-02 120-125				
125.0	2380			SHOB-02 125-130 + BD-RT-12				
130.0	2375			SHOB-02 130-135				
135.0	2370			SHOB-02 135-140				
140.0	2365	140.0 - 145.0 SANDSTONE/CLAYSTONE as above interbedded w/ some v. dk. brown (10YR, 3/1) shale		2364.9	Ss/Clst	N/A	SHOB-02 140-145	
145.0	2360			140.0				
145.0	2360	145.0 - 150.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE interbedded w/ sandy CLAYSTONE		2359.9	Ss/Clst	N/A	SHOB-02 145-150	
150.0	2355			145.0				
150.0	2355	150.0 - 155.0 SANDSTONE/CLAYSTONE as above interbedded w/ COAL		2354.9	Ss/Clst/COAL	N/A	SHOB-02 150-155	
155.0	2350			150.0				
155.0	2350	155.0 - 160.0 SANDSTONE/CLAYSTONE as above w/ little coal, tr. shale		2349.9	Ss/Clst	N/A	SHOB-02 155-160	
160.0	2345			155.0				
160.0	2345	160.0 - 183.0 Gray (2.5Y, 5/1) sandy CLAYSTONE interbedded w/ clayey SANDSTONE, tr. shale		2344.9	Clst/Ss	N/A	SHOB-02 160-165	
165.0	2340			160.0				
165.0	2340	165.0 - 170.0 SANDSTONE/CLAYSTONE as above w/ little coal, tr. shale		2344.9	Clst/Ss	N/A	SHOB-02 165-170	
170.0	2335			165.0				
170.0	2335	170.0 - 183.0 Gray (2.5Y, 5/1) sandy CLAYSTONE interbedded w/ clayey SANDSTONE, tr. shale		2335.0	Clst/Ss	N/A	SHOB-02 170-175	
175.0	2330			170.0				
175.0	2330	175.0 - 180.0 SANDSTONE/CLAYSTONE as above w/ little coal, tr. shale		2330.0	Clst/Ss	N/A	SHOB-02 175-180	
180.0	2325			175.0				
180.0	2325	180.0 - 183.0 SANDSTONE/CLAYSTONE as above w/ little coal, tr. shale		2325.0	Clst/Ss	N/A	SHOB-02 180-185	Driller confirmed coal from 183'-197'
185.0	2320			180.0				
185.0	2320	183.0 - 197.0 Black COAL		2321.9	COAL	N/A		
185.0	2320			183.0				
190.0	2315							
190.0	2315							
195.0	2310							
195.0	2310							
197.0	2305	197.0 - 205.0 Dk. gray (2.5Y, 4/1) sandy CLAYSTONE interbedded w/ clayey SANDSTONE, v. fine grained		2307.9	Clst/Ss	N/A	SHOB-02 195-200	
200.0	2305			197.0				
200.0	2305	205.0 - 210.0 CLAYSTONE/SANDSTONE as above w/ some coal		2299.9	Clst/Ss	N/A	SHOB-02 200-205	
205.0	2300			205.0				
205.0	2300			2294.9			SHOB-02 205-210	
210.0	2295			210.0				TD = 210'

Boring completed at 210 ft.

OB, GNPP, SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 03

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/27/06 14:43

DATE COMPLETED: 10/27/06 15:13

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-03R

COORDINATES: N: 445,681 E: 1,354,560

GROUND SURFACE ELEVATION: 2,565.0 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 90.0 ft

BOTTOM ELEVATION: 2,475.0 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2565	0.0 - 5.0 Lt. yellowish brown SAND, coarse grained, dry		2565.0 0.0	SP	dry	SHOB-03 0-5	
5.0	2560	5.0 - 10.0 Yellowish brown SILT and CLAY, moist		2560.0 5.0	CL-ML	moist	SHOB-03 5-10 + BD-JE-39	
10.0	2555	10.0 - 15.0 Med. gray CLAYSTONE, moist		2555.0 10.0	Clst		SHOB-03 10-15	
15.0	2550	15.0 - 20.0 Med. gray to dk. gray CLAYSTONE and black COAL, moist		2550.0 15.0	Clst/COAL		SHOB-03 15-20	
20.0	2545	20.0 - 25.0 Med. gray CLAYSTONE, moist to wet		2545.0 20.0	Clst	moist to wet	SHOB-03 20-25	
25.0	2540	25.0 - 56.0 Med. gray and greenish gray SILTSTONE, moist to wet		2540.0 25.0	Siltst		SHOB-03 25-30	
30.0	2535						SHOB-03 30-35	
35.0	2530						SHOB-03 35-40	
40.0	2525						SHOB-03 40-45	
45.0	2520						SHOB-03 45-50	
50.0	2515					SHOB-03 50-55		
55.0	2510	56.0 - 78.0 Dk. reddish brown to black COAL, dry		2509.0 56.0	COAL	dry	SHOB-03 55-60	Driller confirmed coal from 57'-77'
60.0	2505						SHOB-03 60-65	
65.0	2500						SHOB-03 65-70	
70.0	2495						SHOB-03 70-75	
75.0	2490						SHOB-03 75-80	
80.0	2485	78.0 - 90.0 Lt. greenish gray SANDSTONE, fine grained, moist to wet		2487.0 78.0	Ss	moist to wet	SHOB-03 80-85	
85.0	2480						SHOB-03 85-90	
90.0		<b>Boring completed at 90 ft.</b>		2475.0 90.0				TD = 90'

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 04

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 14:23

DATE COMPLETED: 10/28/06 14:52

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-04R

COORDINATES: N: 445,475 E: 1,362,459

GROUND SURFACE ELEVATION: 2,540.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,470.7 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				DEPTH (ft)					
0.0	2540	0.0 - 10.0 Dk. brown clayey SILT, moist		2540.7	MH	moist	SHOB-04 0-5		
5.0	2535			0.0			SHOB-04 5-10		
10.0	2530	10.0 - 20.0 Dk. gray CLAYSTONE interbedded w/ dk. yellowish brown and lt. gray SANDSTONE, v. fine grained, moist		2530.7	Cist/Ss	moist	SHOB-04 10-15		
15.0	2525			10.0			SHOB-04 15-20		
20.0	2520			20.0			SHOB-04 20-25		
25.0	2515	20.0 - 38.0 Med. gray SANDSTONE, fine to med. grained, moist to v. moist		2520.7	Ss	moist to v. moist	SHOB-04 25-30		
30.0	2510						20.0		SHOB-04 30-35 + BD-JE-47
35.0	2505						2502.7		SHOB-04 35-40
40.0	2500						38.0		SHOB-04 40-45
45.0	2495	38.0 - 56.0 Dk. reddish brown to black COAL, dry		2484.7	COAL	dry	SHOB-04 45-50	Driller confirmed coal from 38'-56'	
50.0	2490						2480.7		SHOB-04 50-55
55.0	2485						56.0		SHOB-04 55-60
60.0	2480	56.0 - 60.0 Lt. gray CLAYSTONE, moist		2480.7	Cist	moist	SHOB-04 60-65		
65.0	2475	60.0 - 70.0 Lt. gray to med. gray SANDSTONE, v. fine grained, moist		2470.7	Ss	moist	SHOB-04 65-70		
70.0		<b>Boring completed at 70 ft.</b>		70.0				TD = 70'	

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 05

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/29/06 07:27

DATE COMPLETED: 10/29/06 08:07

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-05R

COORDINATES: N: 445,416 E: 1,365,075

GROUND SURFACE ELEVATION: 2,525.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 75.0 ft

BOTTOM ELEVATION: 2,450.7 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2525	0.0 - 10.0 Dk. brown silty CLAY, moist to v. moist		2525.7	CL	moist to v. moist	SHOB-05 0-5	
5.0	2520			0.0			SHOB-05 5-10	
10.0	2515	10.0 - 15.0 Yellowish brown silty CLAY interbedded w/ black COAL, v. moist		2515.7	CL/COAL	v. moist	SHOB-05 10-15	
15.0	2510			10.0			SHOB-05 15-20 + BD-JE-49	
20.0	2505	15.0 - 25.0 Lt. yellowish brown clayey SANDSTONE, v. fine grained, v. moist		2510.7	Ss	v. moist to wet	SHOB-05 20-25	
25.0	2500			15.0				
25.0	2500	20' changes from v. moist to wet		2500.7	Sltst		SHOB-05 25-30	
30.0	2495			25.0				
30.0	2495	25.0 - 30.0 Dk. greenish gray SILTSTONE, moist to v. moist		2495.7		moist to v. moist	SHOB-05 30-35	
35.0	2490			30.0				
35.0	2490	30.0 - 45.0 Med. gray SANDSTONE, fine to med. grained, moist to v. moist		2480.7	Ss		SHOB-05 35-40	
40.0	2485			45.0			SHOB-05 40-45	
45.0	2480							
45.0	2480	45.0 - 65.0 Black COAL, dry		2480.7	COAL	dry	SHOB-05 45-50	Driller confirmed coal from 47'-65'
50.0	2475			45.0			SHOB-05 50-55	
55.0	2470						SHOB-05 55-60	
60.0	2465						SHOB-05 60-65	
65.0	2460	65.0 - 75.0 Dk. greenish gray CLAYSTONE, moist		2460.7	Clst	moist	SHOB-05 65-70	
70.0	2455			65.0			SHOB-05 70-75	
75.0	2450	<b>Boring completed at 75 ft.</b>		75.0				TD = 75'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 06B

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/29/06 15:27

DATE COMPLETED: 10/29/06 15:57

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-06(B)R

COORDINATES: N: 445,376 E: 1,366,390

GROUND SURFACE ELEVATION: 2,516.0 ft

PROJECTION: StatePlane, North Dakota South, 3302

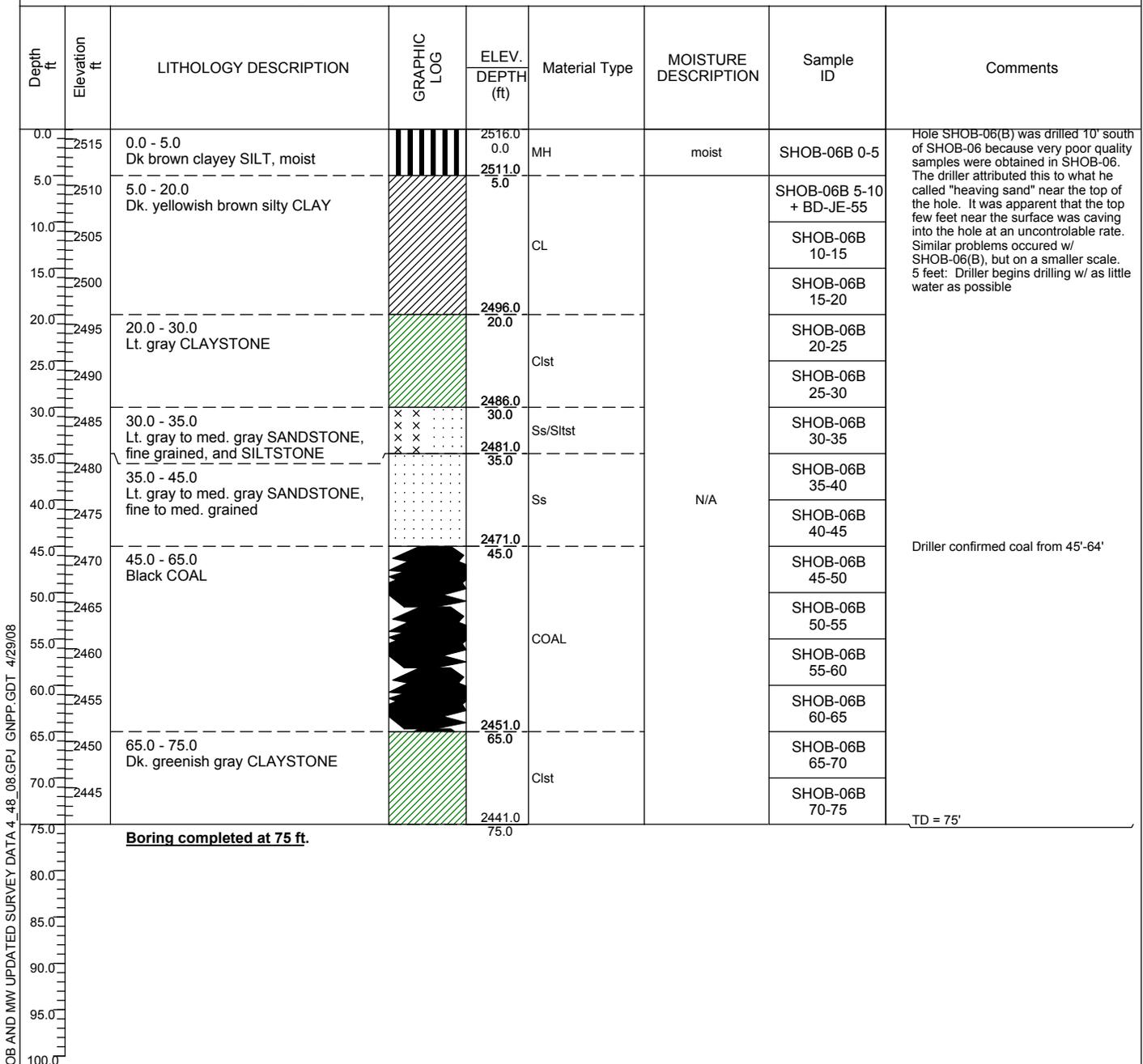
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 75.0 ft

BOTTOM ELEVATION: 2,441.0 ft

HOLE DIAMETER: 5 inches



OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 07

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/29/06 10:23

DATE COMPLETED: 10/29/06 10:54

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-07R

COORDINATES: N: 445,355 E: 1,367,701

GROUND SURFACE ELEVATION: 2,507.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 75.0 ft

BOTTOM ELEVATION: 2,432.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2505	0.0 - 5.0 Dk. gray clayey SILT, moist		2507.9 0.0	MH	moist	SHOB-07 0-5	Driller used water from 5'-15'
5.0	2500	5.0 - 10.0 Dk. gray SILTSTONE		2502.9 5.0	Siltst	N/A	SHOB-07 5-10	
10.0	2495	10.0 - 20.0 Lt. greenish gray CLAYSTONE interbedded w/ lt. yellowish brown SANDSTONE, v. fine grained		2497.9 10.0	Clst/Ss		moist to v. moist	SHOB-07 10-15
15.0	2490			2487.9 20.0	Clst	SHOB-07 15-20		
20.0	2485	20.0 - 30.0 Lt. greenish gray to dk. greenish gray CLAYSTONE, moist to v. moist		2477.9 30.0		SHOB-07 20-25		
25.0	2480			2467.9 40.0	Ss	wet	SHOB-07 25-30 + BD-JE-51	
30.0	2475	30.0 - 40.0 Lt gray to med. gray SANDSTONE, v. fine to fine grained, moist to v. moist		2463.9 44.0			SHOB-07 30-35	
35.0	2470			2467.9 40.0	Clst/Ss	dry	SHOB-07 35-40	
40.0	2465	40.0 - 44.0 Lt. greenish gray and dk. gray CLAYSTONE interbedded w/ med. gray SANDSTONE, fine grained, wet		2463.9 44.0			SHOB-07 40-45	
45.0	2460	44.0 - 65.0 Black COAL, dry			COAL	dry	SHOB-07 45-50	
50.0	2455						SHOB-07 50-55	
55.0	2450						SHOB-07 55-60	
60.0	2445	COAL becomes wet at 60 feet		2442.9 65.0	Ss	wet	SHOB-07 60-65	
65.0	2440	65.0 - 75.0 Lt. gray SANDSTONE, v. fine grained, wet		2432.9			SHOB-07 65-70	
70.0	2435			2432.9			SHOB-07 70-75	

**Boring completed at 75 ft.**

TD = 75'

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

SHEET 1 of 1

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 08

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/27/06 12:20

DATE COMPLETED: 10/27/06 14:01

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-08R

COORDINATES: N: 444,324 E: 1,355,820

GROUND SURFACE ELEVATION: 2,583.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 280.0 ft

BOTTOM ELEVATION: 2,303.2 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0		0.0 - 5.0 Dk. brown SILT w/ some clay, moist to v. moist		2583.2 0.0	ML		SHOB-08 0-5	
5.0	2580	5.0 - 10.0 Dk. greenish gray CLAY w/ little silt, moist to v. moist		2578.2 5.0	CL	moist to v. moist	SHOB-08 5-10	
10.0	2575	10.0 - 15.0 Dk. greenish gray CLAY w/ little silt and dk. yellowish brown SAND, fine grained, moist to v. moist		2573.2 10.0	SP-SC		SHOB-08 10-15	
15.0	2570	15.0 - 30.0 Greenish gray CLAYSTONE, wet		2568.2 15.0	Clst	wet	SHOB-08 15-20 + BD-JE-37	
20.0	2565						SHOB-08 20-25	
25.0	2560						SHOB-08 25-30	
30.0	2555	30.0 - 35.0 Greenish gray CLAYSTONE interbedded w/ black COAL, moist to wet		2553.2 30.0	Clst/COAL		SHOB-08 30-35	
35.0	2550	35.0 - 40.0 Lt. gray SANDSTONE, fine grained, w/ tr. coal, moist to wet		2548.2 35.0	Ss		SHOB-08 35-40	
40.0	2545	40.0 - 45.0 Greenish gray CLAYSTONE w/ some silt, moist to wet		2543.2 40.0	Clst		SHOB-08 40-45	
45.0	2540	45.0 - 50.0 Lt. gray SILTSTONE interbedded w/ SANDSTONE, moist to wet		2538.2 45.0	Siltst		SHOB-08 45-50	Hard SANDSTONE layer from 47'-48'
50.0	2535	50.0 - 70.0 Lt. gray to med. gray SILTSTONE		2533.2 50.0	Siltst/Ss	moist to wet	SHOB-08 50-55	
55.0	2530						SHOB-08 55-60	
60.0	2525						SHOB-08 60-65	
65.0	2520						SHOB-08 65-70	
70.0	2515	70.0 - 89.0 Dk. reddish brown to black COAL, dry		2513.2 70.0	COAL	dry	SHOB-08 70-75	Driller confirmed coal from 70'-89'
75.0	2510						SHOB-08 75-80	
80.0	2505						SHOB-08 80-85	
85.0	2500						SHOB-08 85-90	
90.0	2495	89.0 - 100.0 Lt. gray SILTSTONE and SANDSTONE, fine grained, moist		2494.2 89.0	Siltst/Ss	moist	SHOB-08 90-95	
95.0	2490						SHOB-08 95-100	
100.0	2485			2483.2				

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 08

RECORD OF BORING SHOB-08R

COORDINATES: N: 444,324 E: 1,355,820

GROUND SURFACE ELEVATION: 2,583.2 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2480	100.0 - 130.0 Med. gray SANDSTONE, fine to med. grained, moist		100.0	Ss	moist	SHOB-08 100-105	Driller began using water at 105'
105.0	2475			SHOB-08 105-110				
110.0	2470			SHOB-08 110-115				
115.0	2465			SHOB-08 115-120				
120.0	2460			SHOB-08 120-125				
125.0	2455			SHOB-08 125-130				
130.0	2450	130.0 - 140.0 SANDSTONE as above interbedded w/ lt. gray CLAYSTONE		2453.2 130.0	Ss/Clst	N/A	SHOB-08 130-135	
135.0	2445			SHOB-08 135-140				
140.0	2440	140.0 - 210.0 Med. gray SANDSTONE, fine to med. grained, moist		2443.2 140.0	Ss	N/A	SHOB-08 140-145	
145.0	2435			SHOB-08 145-150				
150.0	2430			SHOB-08 150-155				
155.0	2425			SHOB-08 155-160				
160.0	2420			SHOB-08 160-165				
165.0	2415			SHOB-08 165-170				
170.0	2410			SHOB-08 170-175				
175.0	2405			SHOB-08 175-180				
180.0	2400			SHOB-08 180-185				
185.0	2395			SHOB-08 185-190				
190.0	2390			SHOB-08 190-195				
195.0	2385			SHOB-08 195-200				
200.0	2380	SHOB-08 200-205						
205.0	2375	SHOB-08 205-210						
210.0	2370	210.0 - 215.0 Dk. greenish gray CLAYSTONE and lt. gray SANDSTONE		2373.2 210.0	Clst/Ss	N/A	SHOB-08 210-215	
215.0	2365			SHOB-08 215-220				
220.0	2360	215.0 - 248.0 Dk. greenish gray CLAYSTONE		2368.2 215.0	Clst	N/A	SHOB-08 220-225	
225.0								

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

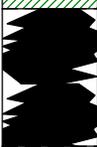
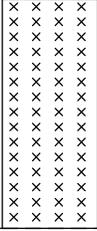
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 08

RECORD OF BORING **SHOB-08R**

COORDINATES: N: 444,324 E: 1,355,820

GROUND SURFACE ELEVATION: 2,583.2 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
225.0	2355	215.0 - 248.0 Dk. greenish gray CLAYSTONE <i>continued from previous page</i>			Clst	N/A	SHOB-08 225-230	Driller confirmed coal from 248'-257'
230.0	2350						SHOB-08 230-235 + BD-JE-38	
235.0	2345						SHOB-08 235-240	
240.0	2340						SHOB-08 240-245	
245.0	2335						SHOB-08 245-250	
250.0	2330	248.0 - 260.0 Black COAL		2335.2 248.0	COAL		SHOB-08 250-255	
255.0	2325	260.0 - 280.0 Lt. gray to med. gray SILTSTONE			Siltst	N/A	SHOB-08 255-260	
260.0	2320						SHOB-08 260-265	
265.0	2315						SHOB-08 265-270	
270.0	2310						SHOB-08 270-275	
275.0	2305						SHOB-08 275-280	
280.0	2300	<b>Boring completed at 280 ft.</b>		2303.2 280.0				TD = 280'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 09

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 13:06

DATE COMPLETED: 10/28/06 14:00

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-09R

COORDINATES: N: 444,106 E: 1,363,733

GROUND SURFACE ELEVATION: 2,575.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,470.1 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2575	0.0 - 10.0 Dk. yellowish brown CLAY w/ little silt, moist		2575.1	CL	moist	SHOB-09 0-5	
5.0	2570			0.0			SHOB-09 5-10	
10.0	2565	10.0 - 15.0 Black COAL, dry		2565.1	COAL	dry	SHOB-09 10-15	
15.0	2560	15.0 - 27.0 Dk. greenish gray and dk. gray CLAYSTONE, sli. moist to moist		2560.1	Clst		SHOB-09 15-20	
20.0	2555			15.0			SHOB-09 20-25	
25.0	2550			2548.1			SHOB-09 25-30	
30.0	2545	27.0 - 30.0 Black COAL		27.0	COAL		SHOB-09 25-30	
35.0	2540	30.0 - 35.0 Lt. gray SANDSTONE, med. grained, sli. moist to moist		2545.1	Ss	sli. moist to moist	SHOB-09 30-35	
40.0	2535			30.0			SHOB-09 35-40 + BD-JE-46	
45.0	2530	35.0 - 60.0 Lt. gray to med. gray SILTSTONE, sli. moist to moist		2540.1	Siltst		SHOB-09 40-45	
50.0	2525			35.0			SHOB-09 45-50	
55.0	2520			SHOB-09 50-55				
60.0	2515			SHOB-09 55-60				
65.0	2510			2515.1			SHOB-09 60-65	
70.0	2505	60.0 - 77.0 Greenish gray SANDSTONE, fine to med. grained, moist to v. moist		60.0	Ss	moist to v. moist	SHOB-09 65-70	
75.0	2500			SHOB-09 70-75				
80.0	2495			2498.1			SHOB-09 75-80	
85.0	2490	77.0 - 95.0 Black COAL		77.0	COAL	N/A	SHOB-09 80-85	
90.0	2485						SHOB-09 85-90	
95.0	2480						2480.1	SHOB-09 90-95
100.0	2470	95.0 - 105.0 Greenish gray SILTSTONE		95.0	Siltst		SHOB-09 95-100	

Driener began using water at 75'  
 Driller confirmed coal from 77'-93'

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 09

RECORD OF BORING **SHOB-09R**

COORDINATES: N: 444,106 E: 1,363,733

GROUND SURFACE ELEVATION: 2,575.1 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2475	95.0 - 105.0 Greenish gray SILTSTONE <i>continued from previous page</i>	x x x x x x x x x x x x	2470.1	Siltst	N/A	SHOB-09 100-105	TD = 105'
105.0		<b>Boring completed at 105 ft.</b>						
110.0								
115.0								
120.0								
125.0								
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 10

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/12/06 07:43

DATE COMPLETED: 10/12/06 09:11

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-10R

COORDINATES: N: 443,989 E: 1,368,973

GROUND SURFACE ELEVATION: 2,515.6 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 200.0 ft

BOTTOM ELEVATION: 2,315.6 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2515	0.0 - 5.0 Dk. olive brown (2.5Y, 4/3) clayey SILT, dry to sli. moist		2515.6 0.0 2510.6 5.0	MH	dry to sli. moist	SHOB-10 0-5	
5.0	2510	5.0 - 15.0 Lt. olive brown (2.5Y, 5/3) sandy SILT, fine grained, sli. moist to moist		2500.6 15.0	ML	sli. moist to moist	SHOB-10 5-10	
10.0	2505						SHOB-10 10-15	
15.0	2500	15.0 - 25.0 Lt. olive brown (2.5Y, 5/3) sandy SILT, fine grained, w/ little olive brown (2.5Y, 4/4) silty clay and shale, sli. moist		2490.6 25.0	ML		SHOB-10 15-20 + BD-RT-03	
20.0	2495						SHOB-10 20-25	
25.0	2490	25.0 - 30.0 Olive brown (2.5Y, 4/4) sandy SILT, sli. moist to moist		2485.6 30.0	ML		SHOB-10 25-30	
30.0	2485	30.0 - 45.0 Dk. olive brown (2.5Y, 3/3) silty CLAYSTONE, sli. moist to moist		2470.6 45.0	Clst		SHOB-10 30-35	
35.0	2480						SHOB-10 35-40	
40.0	2475						SHOB-10 40-45	
45.0	2470	45.0 - 55.0 Dk. gray (5Y, 4/1) SANDSTONE, fine grained, sli. moist to moist		2460.6 55.0	Ss		SHOB-10 45-50	
50.0	2465						SHOB-10 50-55	
55.0	2460	55.0 - 60.0 SANDSTONE as above interbedded w/ tr. lt. yellowish brown sandstone, v. fine grained, sli. moist to moist		2455.6 60.0	Ss		SHOB-10 55-60	55'-60' tr. sand probably slough from above
60.0	2455	60.0 - 80.0 Black COAL, moist		2435.6 80.0	COAL	moist		Driller confirmed he hit coal at 63'
65.0	2450							
70.0	2445	70' COAL turns wet						Driller hits water at 70'
75.0	2440							
80.0	2435	80.0 - 95.0 V. dk. grayish brown (2.5Y, 3/2) CLAYSTONE, wet		2420.6 95.0	Clst	wet	SHOB-10 80-85	
85.0	2430						SHOB-10 85-90	
90.0	2425						SHOB-10 90-95	
95.0	2420	<< Continued >>			Clst		SHOB-10 95-100	
100.0		Log continued on next page						

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 10

RECORD OF BORING **SHOB-10R**

COORDINATES: N: 443,989 E: 1,368,973

GROUND SURFACE ELEVATION: 2,515.6 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2415	95.0 - 105.0 CLAYSTONE as above w/ increased silt content, wet		2410.6	Clst	wet	SHOB-10 100-105	Driller begins using water at 120'
105.0	2410	105.0 - 110.0 V. dk. grayish brown (2.5Y, 3/2) CLAYSTONE, wet		105.0	Clst	sat.	SHOB-10 105-110	
110.0	2405	105'-110' saturated zone	2405.6	Clst	wet	SHOB-10 110-115		
115.0	2400	110.0 - 120.0 CLAYSTONE as above interbedded w/ tr. coal, wet	2395.6	Clst		SHOB-10 115-120		
120.0	2395	120.0 - 135.0 V. dk. grayish brown (2.5Y, 3/2) CLAYSTONE, wet	120.0	Clst		SHOB-10 120-125		
125.0	2390					SHOB-10 125-130		
130.0	2385					SHOB-10 130-135		
135.0	2380	135.0 - 140.0 Dk. olive brown (2.5Y, 3/3) CLAYSTONE	2380.6	Clst		SHOB-10 135-140		
140.0	2375	140.0 - 160.0 Dk. olive brown (2.5Y, 3/3) clayey SANDSTONE	2375.6	Ss		SHOB-10 140-145		
145.0	2370					SHOB-10 145-150		
150.0	2365					SHOB-10 150-155		
155.0	2360					SHOB-10 155-160		
160.0	2355	160.0 - 165.0 Dk. olive brown (2.5Y, 3/3) v. sandy SHALE w/ tr. coal	2355.6	Sh	N/A	SHOB-10 160-165		
165.0	2350	165.0 - 180.0 Gray (5Y, 5/1) SANDSTONE, fine grained	2350.6	Ss		SHOB-10 165-170		
170.0	2345					SHOB-10 170-175		
175.0	2340					SHOB-10 175-180		
180.0	2335	180.0 - 185.0 Gray (5Y, 5/1) clayey SANDSTONE	2335.6	Ss		SHOB-10 180-185		
185.0	2330	185.0 - 200.0 V. dk. grayish brown (2.5Y, 4/2) CLAYSTONE	2330.6	Clst		SHOB-10 185-190		
190.0	2325					SHOB-10 190-195		
195.0	2320					SHOB-10 195-200		
200.0		<b>Boring completed at 200 ft.</b>		200.0				TD = 200'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 11

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 08:45

DATE COMPLETED: 10/28/06 09:42

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-11R

COORDINATES: N: 442,945 E: 1,358,399

GROUND SURFACE ELEVATION: 2,567.3 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 90.0 ft

BOTTOM ELEVATION: 2,477.3 ft

HOLE DIAMETER: 5 inches

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2567.3	0.0 - 5.0 Lt. yellowish brown CLAY, dry		0.0	CL	dry	SHOB-11 0-5 + BD-JE-42	
5.0	2562.3	5.0 - 25.0 Dk. yellowish brown silty CLAY, v. moist		5.0	CL	v. moist	SHOB-11 5-10 SHOB-11 10-15	Driller begins using water at 15'
10.0	2555.0							
15.0	2550.0							
20.0	2545.0							
25.0	2542.3	25.0 - 40.0 Med gray to dk. gray silty CLAYSTONE		25.0	Clst		SHOB-11 15-20 SHOB-11 20-25 SHOB-11 25-30	Driller says there was a hard layer from 26'-30'
30.0	2535.0							
35.0	2530.0							
40.0	2527.3	40.0 - 62.0 Med. gray SILTSTONE		40.0	Siltst	N/A	SHOB-11 30-35 SHOB-11 35-40 SHOB-11 40-45 SHOB-11 45-50 SHOB-11 50-55 SHOB-11 55-60	
45.0	2520.0							
50.0	2515.0							
55.0	2510.0							
60.0	2505.3	62.0 - 80.0 Black COAL		62.0	COAL		SHOB-11 60-65 SHOB-11 65-70 SHOB-11 70-75 SHOB-11 75-80	Driller confirmed coal from 62'-79'
65.0	2500.0							
70.0	2495.0							
75.0	2490.0							
80.0	2487.3	80.0 - 90.0 Dk. greenish gray CLAYSTONE		80.0	Clst		SHOB-11 80-85 SHOB-11 85-90	
85.0	2480.0							
90.0	2477.3	<b>Boring completed at 90 ft.</b>		90.0				TD = 90'



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 12

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/16/06 13:11

DATE COMPLETED: 10/16/06 13:54

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-12R

COORDINATES: N: 442,880 E: 1,361,030

GROUND SURFACE ELEVATION: 2,573.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 110.0 ft

BOTTOM ELEVATION: 2,463.1 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2570	0.0 - 5.0 Dk. olive brown (2.5Y, 3/3) silty CLAY, sli. moist to moist (dry at surface)		2573.1 0.0	CL	dry	SHOB-12 0-5	Driller confirmed coal from 7'-15'
5.0	2565	5.0 - 7.0 Dk. olive brown (2.5Y, 3/3) silty CLAY and some rust colored sandstone, v. fine, sli. moist to moist		2568.1 5.0	CL	sli. moist to moist	SHOB-12 5-10	
10.0	2560	7.0 - 15.0 Black COAL, sli. moist to moist		2566.1 7.0	COAL		SHOB-12 10-15	
15.0	2555	15.0 - 20.0 COAL from above and v. dk. gray (2.5Y, 3/1) CLAYSTONE		2558.1 15.0	Clst		SHOB-12 15-20	
20.0	2550	20.0 - 35.0 Dk. bluish gray (Gley2, 4/10B) silty CLAYSTONE, sli. moist to moist		2553.1 20.0	Clst	SHOB-12 20-25	Driller begins using water at 25'	
25.0	2545	30' CLAYSTONE turns gray (2.5Y, 5/1)		2538.1 35.0	COAL	SHOB-12 25-30 + BD-RT-10		
35.0	2535	35.0 - 40.0 Black COAL		2533.1 40.0	COAL	SHOB-12 30-35		
40.0	2530	40.0 - 50.0 Dk. bluish gray (Gley2, 4/10B) silty CLAYSTONE			Clst	SHOB-12 35-40		
45.0	2525					SHOB-12 40-45		
50.0	2520	50.0 - 65.0 Gray (2.5Y, 5/1) sandy CLAYSTONE		2523.1 50.0	Clst	SHOB-12 45-50		
55.0	2515					SHOB-12 50-55		
60.0	2510					SHOB-12 55-60		
65.0	2505	65.0 - 70.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE		2508.1 65.0	Ss	SHOB-12 60-65		
70.0	2500	70.0 - 78.0 Dk. gray CLAYSTONE		2503.1 70.0	Clst	SHOB-12 65-70		
75.0	2495					SHOB-12 70-75	Driller confirmed coal from 78'-100'	
80.0	2490	78.0 - 100.0 Black COAL		2495.1 78.0	COAL	SHOB-12 75-80		
85.0	2485							
90.0	2480							
95.0	2475							
100.0				2473.1				

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

SHEET 1 of 2

PROJECT: South Heart Project

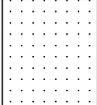
PROJECT NUMBER: 063-2174

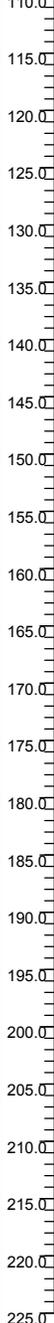
LOCATION: South Heart, ND, Overburden Borehole 12

RECORD OF BORING **SHOB-12R**

COORDINATES: N: 442,880 E: 1,361,030

GROUND SURFACE ELEVATION: 2,573.1 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2470	100.0 - 110.0 Dk. gray (2.5Y, 4/1) SANDSTONE		100.0	Ss	N/A	SHOB-12 100-105	
105.0	2465			2463.1			SHOB-12 105-110	
110.0		<b><u>Boring completed at 110 ft.</u></b>		110.0				TD = 110'



OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 13

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 12:08

DATE COMPLETED: 10/28/06 12:35

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-13R

COORDINATES: N: 442,807 E: 1,363,684

GROUND SURFACE ELEVATION: 2,535.6 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 60.0 ft

BOTTOM ELEVATION: 2,475.6 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2535	0.0 - 5.0 Yellowish brown clayey SILT and some fine grained sand, moist to v. moist		2535.6 0.0	MH		SHOB-13 0-5	
5.0	2530	5.0 - 10.0 Dk. yellowish brown CLAY, moist to v. moist		2530.6 5.0	CL		SHOB-13 5-10	
10.0	2525	10.0 - 15.0 Dk. yellowish brown CLAYSTONE and lt. yellowish brown SANDSTONE, fine grained, moist to v. moist		2525.6 10.0	Clst/Ss	moist to v. moist	SHOB-13 10-15	
15.0	2520	15.0 - 30.0 Lt. yellowish brown and lt. olive brown SANDSTONE, fine grained, moist to v. moist		2520.6 15.0	Ss		SHOB-13 15-20 + BD-JE-45	
20.0	2515	20.0 - 25.0 Dk. reddish brown to black COAL, dry		2515.6 20.0	COAL		SHOB-13 20-25	
25.0	2510	25.0 - 30.0 Med. gray to dk. gray SILTSTONE and COAL, moist to v. moist		2510.6 25.0	Siltst/COAL		SHOB-13 25-30	
30.0	2505	30.0 - 33.0 Med. gray to dk. gray SILTSTONE and COAL, moist to v. moist		2505.6 30.0	Siltst/COAL		SHOB-13 30-35	Driller says coal from 33'-49'
35.0	2500	33.0 - 50.0 Dk. reddish brown to black COAL, dry		2502.6 33.0	COAL	dry	SHOB-13 35-40	
40.0	2495						SHOB-13 40-45	
45.0	2490						SHOB-13 45-50	
50.0	2485	50.0 - 55.0 Greenish gray SILTSTONE, moist to v. moist		2485.6 50.0	Siltst	moist to v. moist	SHOB-13 50-55	
55.0	2480	55.0 - 60.0 Med. gray SANDSTONE, v. fine grained, moist to v. moist		2480.6 55.0	Ss		SHOB-13 55-60	
60.0		<b>Boring completed at 60 ft.</b>		2475.6 60.0				TD = 60'

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 14

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/12/06 14:58

DATE COMPLETED: 10/12/06 16:28

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-14R

COORDINATES: N: 442,772 E: 1,364,991

GROUND SURFACE ELEVATION: 2,545.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 190.0 ft

BOTTOM ELEVATION: 2,355.8 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2545	0.0 - 5.0 Dk. grayish brown (2.5Y, 4/2) silty CLAY, dry to sli. moist		2545.8 0.0	CL	dry to sli. moist	SHOB-14 0-5	Driller confirmed he hit coal at 67'  Driller hit water at 80' upon starting the 80'-100' run
5.0	2540	5.0 - 10.0 Dusky red (2.5Y, 3/2) sandy SILT, dry to sli. moist		2540.8 5.0	ML		SHOB-14 5-10	
10.0	2535	10.0 - 15.0 SILT as above and lt. yellowish brown (2.5Y, 6/3) CLAY, plastic, sli. moist		2535.8 10.0	CL-ML	sli. moist	SHOB-14 10-15	
15.0	2530	15.0 - 25.0 Lt. yellowish brown (2.5Y, 6/3) silty CLAY, sli. moist to moist		2530.8 15.0	CL	sli. moist to moist	SHOB-14 15-20	
20.0	2525	20.0 - 25.0 Lt. yellowish brown (2.5Y, 6/3) silty CLAY, sli. moist to moist		2520.8 25.0	CL		SHOB-14 20-25	
25.0	2520	25.0 - 30.0 Dk. gray (2.5Y, 4/1) silty SANDSTONE, sli. moist		2515.8 30.0	Ss	sli. moist	SHOB-14 25-30	
30.0	2515	30.0 - 67.0 Dk. gray (2.5Y, 4/1) SANDSTONE, fine grained, sli. moist			Ss		SHOB-14 30-35	
35.0	2510				Ss		SHOB-14 35-40 + BD-RT-04	
40.0	2505				Ss		SHOB-14 40-45	
45.0	2500				Ss		SHOB-14 45-50	
50.0	2495				Ss		SHOB-14 50-55	
55.0	2490				Ss		SHOB-14 55-60	
60.0	2485				Ss		SHOB-14 60-65	
65.0	2480	67.0 - 85.0 Black COAL, dry to sli. moist		2478.8 67.0	COAL	dry to sli. moist	SHOB-14 65-70	
70.0	2475	80' COAL turns wet			COAL		wet	
85.0	2460	85.0 - 105.0 V. dk. grayish brown (2.5Y, 3/2) silty CLAYSTONE, tr. v. fine sand, tr. coal, moist to v. moist		2460.8 85.0	Clst	moist to v. moist	SHOB-14 85-90	
90.0	2455				Clst		SHOB-14 90-95	
95.0	2450				Clst		SHOB-14 95-100	

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

SHEET 1 of 2

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 14

# RECORD OF BORING SHOB-14R

COORDINATES: N: 442,772 E: 1,364,991

GROUND SURFACE ELEVATION: 2,545.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				DEPTH (ft)					
100.0	2445								
				2440.8					
105.0	2440	105.0 - 135.0 Dk. gray (2.5Y, 4/1) sandy CLAYSTONE, moist		105.0	Clst	moist to v. moist	SHOB-14 100-105	Increase in moisture content at the beginning of the 20' run (100'-105') as a result of the drilling technique	
									SHOB-14 105-110
110.0	2435								SHOB-14 110-115
115.0	2430								SHOB-14 115-120
120.0	2425				Clst			Increase in moisture content at the beginning of the 20' run (120'-125') as a result of the drilling technique	
125.0	2420					SHOB-14 120-125			
130.0	2415					SHOB-14 125-130			
135.0	2410					SHOB-14 130-135			
				2410.8					
135.0	2410	135.0 - 140.0 CLAYSTONE as above interbedded w/ tr. lt. brown shale		135.0	Clst		SHOB-14 135-140		
140.0	2405	140.0 - 145.0 Dk. gray (2.5Y, 4/1) mottled w/ dk. brown (7.5YR, 3/2) sandy CLAYSTONE, moist		2405.8	Clst		SHOB-14 140-145		
145.0	2400	145.0 - 180.0 V. dk. gray (2.5Y, 3/1) SILTSTONE, moist		2400.8		moist	SHOB-14 145-150		
								SHOB-14 150-155	
150.0	2395							SHOB-14 155-160	
155.0	2390							SHOB-14 160-165	Driller begins using water at 160'
160.0	2385				Siltst	SHOB-14 165-170			
165.0	2380					SHOB-14 170-175			
170.0	2375					SHOB-14 175-180			
175.0	2370					N/A			
180.0	2365	180.0 - 182.0 Dk. grayish brown (2.5Y, 4/2) SHALE		2365.8	Sh		SHOB-14 180-185	Driller confirmed he hit hard shale from 180'-182'	
185.0	2360	182.0 - 190.0 Dk. grayish brown (2.5Y, 4/2) CLAYSTONE		2363.8			SHOB-14 185-190		
							Clst		
190.0	2355.8			2355.8				TD = 190'	
				190.0					

**Boring completed at 190 ft.**

OB\_GNPP\_SH\_OB AND MW\_UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

# NORWEST

Norwest Corporation  
136 East South Temple, 18th Floor  
Salt Lake City, Utah 84111  
(801) 538-0044  
(801) 538-0035 FAX

# Drill Hole Completion Report

Geo Tech  
CONT. CORE

Location

Hole I.D. SH03-15C Location S01 NE S01 Section 15 Twp 139N Rng 98W  
Project Great Northern Power Lease South Heart County STARCK State ND  
Survey System \_\_\_\_\_ North \_\_\_\_\_ East \_\_\_\_\_ Elev. \_\_\_\_\_  
Approx. Location: FNL (FSL) \_\_\_\_\_ FEL (FWL) \_\_\_\_\_ Elev. est 2545  
E 649909 N 5190680

Drilling

Drilling Co. Mohl Driller MARCUS Start 10 / 14 / 06 Finish 10 / 15 / 06  
Total Depth 118 Surface Casing Size NA to \_\_\_\_\_  
Hole Size 5" to \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ to \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ to \_\_\_\_\_  
Casing Size \_\_\_\_\_ to \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ to \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ to \_\_\_\_\_  
Lost Circ. \_\_\_\_\_ to \_\_\_\_\_; \_\_\_\_\_ to \_\_\_\_\_; \_\_\_\_\_ to \_\_\_\_\_; Regained? Y \_\_\_\_\_ N \_\_\_\_\_  
Water Invasion Depths \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
Drilling Conditions Air \_\_\_\_\_ Water? \_\_\_\_\_ Mud \_\_\_\_\_

Coring

Size	From	To	Coal Interval		Seam	Roof	Coal Recovery	Floor
			From	To				
<u>AG</u>	<u>0</u>	<u>110.5</u>	<u>13.0</u>	<u>22.2</u>	<u>9.2</u>		<u>100%</u>	
			<u>23.7</u>	<u>25.1</u>	<u>1.4</u>		<u>100%</u>	
			<u>34.6</u>	<u>37.5</u>	<u>2.9</u>		<u>100%</u>	
			<u>86.0</u>	<u>102.7</u>	<u>D / 16.7</u>		<u>100%</u>	

Logging

Company CENTURY Operator B. MATAS Date 10 / 15 / 06  
Log Depth (ft.) 117.80 Logs Run: Gamma Density Resist Calip Other  
Describe \_\_\_\_\_

Completion

\_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
\_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
\_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
Contractor \_\_\_\_\_ Representative \_\_\_\_\_ Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
If open, explain \_\_\_\_\_

Reclamation

Explain \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Remarks

Continuous Cone- geotech. 12 geotech samples, core to 110.5, rotary to TD  
\_\_\_\_\_  
\_\_\_\_\_  
Report Completed By D. LEPPER Title Geologist Date 10 / 17 / 06

# NORWEST

Norwest Corporation  
 138 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
				REC	ROD
1	0	2	2	2	NA
2	2	4	2	2	NA
3	4	6	2	2	NA
4	6	7.5	1.5	1.5	NA
5	7.5	9.0	1.5	1.5	NA
6	9.0	10.5	1.5	1.5	NA
7	10.5	20.5	10.0	8.1	4.65

Hole SHOB-15C  
 Page 1 of 6  
 Date 10/14/06  
 Name D. LEPPERT

PHOTOS

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
0-2					SOIL - DK @ BROWN, CLAYEY (0-3.1) - calcite w salts FE STN MOD PLAS - RUN ORANGE PUSH CORES C SURFACE
2-3.1					
3.1-10.5					SS - (3.1-10.5) - RUN CI GY, ABNT CW, MOD PLAS, LAM, SALTS/CAL CLEANER VFG, WSRT, mod dk mins - OX ORANGE - SEAT SACS - GYP?
5.4		5.4			
5.75		5.75			
6-8					SS - a/a - RUN SS a/a
8-10.5					- RUN FINER @ BASE - LAMS - CLAYEY (VARIED?)
10.5-12.6					- RUN CORE LOSS (10.5-12.6)
12.6-13.0					CLY (12.6-13.0) DK GR-BRN BENT
13.0-20.9					CU (13.0-20.9) DK GR-BL
13.0		13.0			
13.6		13.6			
14					
14.6		14.6			
16					
16.0		16.0			
17.0		17.0			
18					
18.4		18.4			
20		20.0			

BROKEN UP GETTING OUT  
OF PUSH TUBE

R1

Box 1  
Box 2

cl  
pl - 14  
var -  
s - 20

WOODY - 30215  
PY

BP, PL 85  
BP, PL 85

-RUN

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

# Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
					RQD
8	20.5	30.5	10.0	10.0	60%
9	30.5	40.5	10.0	10.0	80%

Hole SH0315C  
 Page 2 of 6  
 Date 10/14/06  
 Name D. LEPPERLT

Photos

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
		20.0			
		57 S		BP	CO (CONT) WOODY, DK BRN
		20.5			- RUN CLY (20.9-21.1)
		58 (6)			CO (21.1-22.2)
		21.6		85	M. ORG DK BRN - WOODY, TR PY
22		22.2		BP PL	
		22.5		RI	CLY (22.2-23.7)
		GT 2		wavy	
		23.0			
24				BP	CO (23.7-25.1)
				R 1.5	DK GY - BLK w/CLY CTOP
					WOODY -
					GRADATIONAL
					CLY (25.1-25.9)
					SS - (25.9-34.6)
					LT GY, VFG, VAR LAMS, CLY - OCL SL ORG
		27.25		RI	
		GT 3			
28		27.8			
				DI	
				Rubble	
				DI	
30					
				DI	- RUN
				DI	
32					
					SS, FG a/c w/lam - var xbd.
				IRR	INCR ORG BASE, POSS BUVROMI - BIOTURB
34				DI	
		34.6			GRAD
				R 1.5	CO (34.6-37.5)
		510		PY	
36		36.2		CLF	
				O-S	
		511		PL	
					CLY PTG 36.6-36.8
		37.5			
38		38.4			CO/CLY (37.5-38.4)
					INTERBEDDED CO/CLY
					GRAD
				BP	CLY (38.4-39.3)
				wavy, 85	GY, w/ ORG LAYERS CTOP, PLAS - BENT
				RI	
					SS (39.3-40.5) LT GY, VFG, LAMS - CLY
40				Rubble	
				DI	

NO TEST

- RUN

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
10	40.5	50.5	10.0	9.6	8.1
11	50.5	60.5	10.0	10.0	6.3

Hole SH08-15C  
 Page 3 of 6  
 Date 10/14/06  
 Name D. LEPPER

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
					- RUN CORE LOSS (40.5 - 40.9)
42				R1 <sup>D1</sup>	SS, LT GY, FG, A/A (40.9 - 42.2)
					- GRAD CLY (42.2 - 46.0) GY, FRM
44		44.0 GT 4 44.6			
				WASHED	
46				WASHED	(46.0 - 46.4) SS, FG, A/A, OCC CLY ZONES
					CLY (46.4 - 50.5) PREV LT GY, BENT, OCC SLY ZONES
48		48.1 GT 5 48.7		BP, PL 90	
					INCR SLY
50				(CUT) RUBBLE D)	- RUN SANDY
				BP PROS D)	CLY, A/A, w/ OCC thin sly-sdy zones
52					
					ORG LAMS
54					
		55.2 GT 6 55.8			
56					
58				IRR PROS ALL D1	
60					

- RUN

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
12	60.5	70.5	10.0	10.0	9.7
13	70.5	80.5	10.0	10.0	6.3

Hole SH03-15C  
 Page 4 of 6  
 Date 10/15/06  
 Name D. LEPPER

PHOTOS

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
					cont
					CLY ( - 62.5 ) m qy, ch, plas, cont
62		61.5 GT 7 62.0		R1	
				BP PL 85	SLTST (62.5 - 65.1) M GI, MASS, V HD
64		63.8 GT 8 64.4		R4	
				BP PL 90	
66				BP PL	SS (65.1 - 72.8) vfg + muddy a top cleaner - pred-fg, H-M qy, fm xbed, org org, lam e 5-10" dip
				BP 80 x bed	
68		68.0 GT 9 68.5		R1.5	
70				Rubb (D) BP, BED 80 PL	RUN
				BP	
72					
				D1 R4 Rubb	SS (72.8 - 73.6) H qy, f-mg, v hd CMTD-
74					
				R1 Crumbly	SS (73.6 - ) M qy, M gr, w srt, sbrg, abnt dk mine Soft
76		75.2 GT 10 75.7			
				Rubb	
78					
				Rubb	
80					

-RUN

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 538-0044  
 (801) 538-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
14	80.5	90.5	10.0	5.6	4.2
15	90.5	100.5	10.0	10.0	5.0

Hole SHOB-15C  
 Page 5 of 6  
 Date 10/15/06  
 Name D. LEAPINT

PHOTOS

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description	
82					CORE LOSS (80.5-85.0) FINI SS WASHED OUT	
84						
86		86.0 13 86.5 14	87.5	Box 3 (S14S12) 10	R1 crumbly	SS (85.0 - 86.0) GY, F-mgy, crumbly, sft, abnt dk min
88		87.5 S 15	88.6	12	MASSIVE WASHED SLIGHTLY	CO (86.0 - 102.7) V DL-GY-GLK woody NO VIS PY MINOR SD CONTAMINATION ON CORE SURFACE -
90		S 16 90.5		13		RUN woody
92		S 17 92.0 S 18			CLT, Poor 0-5	
94		93.2 S 19 93.8		Box 4 14		py woody
96		S 20 95.6		15		
98		S 21 97.4 S 22		16	PL, 40	
100		S 23				woody = RUN

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 638-0044  
 (801) 638-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered
16	100.5	110.5	10.0	10.6 5.7

Hole SAGB-15C  
 Page 6 of 6  
 Date 10/15/06  
 Name D. ZEPPELT

PHOTOS

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
		100.5 <sup>16</sup>		P	Run ABNT PY
		S24 17			
		101.0			
		S25 18			
102		102.0		ELF 0° PL 1.5M	
		S26 19			
		102.7			
		GT 11	SPL BROKE	R1	CLY (102.7 - 104.4) DK of GY, BENT, FIRM
		103.3			
104		104.5		D1	GRAD
		GT 12		20 PLC SM	SS (104.4 - 107.1)
		105.0		R1.5	GY, VFG, FINE TOP, NAR CLY, SFT -PY STAKS
106				Curv D1 Comp.	
				R1	CLY (107.1 - 110.5) GY, BENT, occ SDV
108					
110				Rubble	Run Rotary to 118.0 for RATHOLE
112					
114					
116					
118					
120					

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 16

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/13/06 07:36

DATE COMPLETED: 10/13/06 08:56

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-16R

COORDINATES: N: 442,706 E: 1,367,607

GROUND SURFACE ELEVATION: 2,529.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 100.0 ft

BOTTOM ELEVATION: 2,429.2 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0		0.0 - 5.0 Dk. olive brown (2.5Y, 3/3) silty CLAY, plastic, organics, moist		2529.2 0.0 2524.2 5.0	CH	moist	SHOB-16 0-5	
5.0	2525	5.0 - 15.0 Dk. olive brown (2.5Y, 3/3) silty CLAY, plastic, little to no organics w/ depth, sli. moist to moist			CL		SHOB-16 5-10 SHOB-16 10-15	
15.0	2520	15.0 - 30.0 Lt. olive brown (2.5Y, 5/4) sandy SILTSTONE, sli. moist to moist		2514.2 15.0	Siltst	sli. moist to moist	SHOB-16 15-20 SHOB-16 20-25 SHOB-16 25-30	
30.0	2515	30.0 - 35.0 V. dk. grayish brown silty SANDSTONE, moist		2499.2 30.0	Ss		SHOB-16 30-35	
35.0	2495	35.0 - 40.0 Dk. greenish gray (Gley1, 4/1) SANDSTONE, moist		2494.2 35.0	Ss	moist	SHOB-16 35-40	
40.0	2490	40.0 - 45.0 Dk. greenish gray (Gley1, 4/1) SANDSTONE interbedded w/ lt. olive brown (2.5Y, 5/4) silty CLAYSTONE, moist		2489.2 40.0	Ss/Clst		SHOB-16 40-45	
45.0	2485	45.0 - 65.0 Olive brown (2.5Y, 4/3) silty SANDSTONE, v. fine grained, wet		2484.2 45.0	Ss	wet	SHOB-16 45-50 SHOB-16 50-55 SHOB-16 55-60 SHOB-16 60-65 + BD-RT-05	Driller began using water at 50'
65.0	2480	65.0 - 85.0 Black COAL		2464.2 65.0	COAL	N/A	SHOB-16 65-70 SHOB-16 70-75 SHOB-16 75-80 SHOB-16 80-85	Driller confirmed coal from 65'-83'
85.0	2445	85.0 - 100.0 Dk. gray (2.5Y, 2.5/1) CLAYSTONE, tr. coal		2444.2 85.0	Clst		SHOB-16 85-90 SHOB-16 90-95 SHOB-16 95-100	
100.0	2430	<b>Boring completed at 100 ft.</b>		2429.2				TD = 100'

OB, GNPP, SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 17

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/27/06 15:40

DATE COMPLETED: 10/27/06 16:27

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-17R

COORDINATES: N: 441,700 E: 1,355,739

GROUND SURFACE ELEVATION: 2,601.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 135.0 ft

BOTTOM ELEVATION: 2,466.7 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2600	0.0 - 5.0 Lt. yellowish brown SAND, fine to med. grained and 60% COAL, sli. moist to moist		2601.7 0.0	SP/COAL		SHOB-17 0-5	
5.0	2595	5.0 - 10.0 COAL (80%) w/ some lt. gray claystone, sli. moist to moist		2596.7 5.0	COAL		SHOB-17 5-10	
10.0	2590	10.0 - 15.0 Lt. gray CLAYSTONE, sli. moist to moist		2591.7 10.0	Clst		SHOB-17 10-15	
15.0	2585	15.0 - 20.0 Lt. gray CLAYSTONE and COAL (60%)		2586.7 15.0	Clst/COAL		SHOB-17 15-20	
20.0	2580	20.0 - 25.0 Dk. greenish gray SILTSTONE, sli. moist to moist		2581.7 20.0	Siltst		SHOB-17 20-25	
25.0	2575	25.0 - 30.0 Dk. greenish gray SILTSTONE and lt. yellowish brown SANDSTONE, tr. coal, sli. moist to moist		2576.7 25.0	Siltst/Ss		SHOB-17 25-30	
30.0	2570	30.0 - 80.0 Lt. yellowish brown to dk. yellowish brown SANDSTONE, fine grained, sli. moist to moist		2571.7 30.0	Ss	sli. moist to moist	SHOB-17 30-35 + BD-JE-40	
35.0	2565						SHOB-17 35-40	
40.0	2560						SHOB-17 40-45	
45.0	2555						SHOB-17 45-50	
50.0	2550						SHOB-17 50-55	
55.0	2545						SHOB-17 55-60	
60.0	2540						SHOB-17 60-65	
65.0	2535						SHOB-17 65-70	
70.0	2530						SHOB-17 70-75	
75.0	2525						SHOB-17 75-80	
80.0	2520	80.0 - 85.0 Lt. gray SILTSTONE interbedded w/ lt. gray SANDSTONE, v. fine grained		2521.7 80.0	Siltst/Ss		SHOB-17 80-85	Driller began using water at 80'
85.0	2515	85.0 - 100.0 Lt. gray SANDSTONE, v. fine grained		2516.7 85.0	Ss	N/A	SHOB-17 85-90	
90.0	2510						SHOB-17 90-95	
95.0	2505						SHOB-17 95-100	
100.0				2501.7				

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 17

RECORD OF BORING **SHOB-17R**

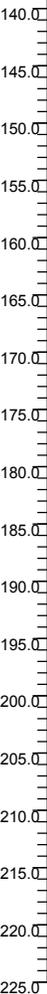
COORDINATES: N: 441,700 E: 1,355,739

GROUND SURFACE ELEVATION: 2,601.7 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2500	100.0 - 103.0 SANDSTONE as above and black COAL		100.0	Ss/COAL	N/A	SHOB-17 100-105	Driller confirmed coal from 103'-122'
105.0	2495	103.0 - 122.0 Black COAL		2498.7 103.0	COAL		SHOB-17 105-110	
110.0	2490						SHOB-17 110-115	
115.0	2485						SHOB-17 115-120	
120.0	2480			2479.7 122.0			SHOB-17 120-125	
125.0	2475	122.0 - 130.0 Greenish gray CLAYSTONE		2471.7 130.0	Clst		SHOB-17 125-130	
130.0	2470	130.0 - 135.0 Lt. greenish gray SANDSTONE, v. fine grained		2466.7 135.0	Ss	SHOB-17 130-135	TD = 135'	

**Boring completed at 135 ft.**

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 18

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 07:20

DATE COMPLETED: 10/28/06 08:19

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-18R

COORDINATES: N: 441,675 E: 1,357,059

GROUND SURFACE ELEVATION: 2,593.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

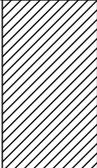
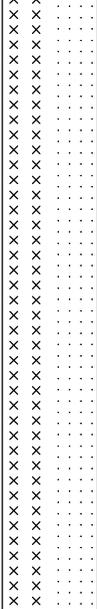
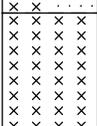
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 130.0 ft

BOTTOM ELEVATION: 2,463.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2590	0.0 - 15.0 Dk. yellowish brown silty CLAY, sli. moist, moist at 5 ft.		2593.9	CL	sli. moist	SHOB-18 0-5	
5.0	2585			0.0				
10.0	2580			15.0				
15.0	2575	15.0 - 20.0 Black COAL (90%) and trace yellowish brown clay (10%), sli. moist		2578.9	COAL	sli. moist	SHOB-18 15-20	
20.0	2570	20.0 - 25.0 Lt. gray CLAYSTONE, wet		2573.9	Clst		SHOB-18 20-25 + BD-JE-41	
25.0	2565			20.0				
25.0	2560	25.0 - 80.0 Lt. gray to med. gray SANDSTONE, v. fine grained, and lt. gray SILTSTONE, wet		2568.9	Ss/Siltst	wet	SHOB-18 25-30	
30.0	2555			25.0			SHOB-18 30-35	
35.0	2550			SHOB-18 35-40				
40.0	2545			SHOB-18 40-45				
45.0	2540			SHOB-18 45-50				
50.0	2535			SHOB-18 50-55				
55.0	2530			SHOB-18 55-60				
60.0	2525			SHOB-18 60-65				
65.0	2520			SHOB-18 65-70				
70.0	2515			SHOB-18 70-75				
75.0	2510	SHOB-18 75-80						
80.0	2505	80.0 - 90.0 Lt. gray to med. gray SILTSTONE, wet		2513.9	Siltst		SHOB-18 80-85	
85.0	2500			80.0			SHOB-18 85-90	
90.0	2495			2503.9			Ss	SHOB-18 90-95
90.0	2495	90.0 - 95.0 Med. gray SANDSTONE, v. fine grained, wet		2498.9	Ss		SHOB-18 95-100	Driller confirmed coal from 96'-116'
95.0	2490	95.0	COAL					
100.0	2485	95.0 - 116.0 Black COAL, wet		2498.9	COAL			

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 18

RECORD OF BORING **SHOB-18R**

COORDINATES: N: 441,675 E: 1,357,059

GROUND SURFACE ELEVATION: 2,593.9 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2490	95.0 - 116.0 Black COAL, wet <i>continued from previous page</i>			COAL	wet	SHOB-18 100-105	
105.0	2485						SHOB-18 105-110	
110.0	2480						SHOB-18 110-115	
115.0	2475	116.0 - 130.0 Lt. greenish gray SANDSTONE, v. fine grained, wet		2477.9	Ss		SHOB-18 115-120	
120.0	2470			116.0			SHOB-18 120-125	
125.0	2465			2463.9			SHOB-18 125-130	

TD = 130'

**Boring completed at 130 ft.**

130.0

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 19

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 10:13

DATE COMPLETED: 10/28/06 10:43

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-19R

COORDINATES: N: 441,597 E: 1,359,662

GROUND SURFACE ELEVATION: 2,563.0 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,493.0 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2560	0.0 - 15.0 Lt. yellowish brown to dk. yellowish brown clayey SILT, dry, moist at 5 ft.		2563.0 0.0	MH	dry	SHOB-19 0-5	Driller confirmed coal from 43' to 60'
5.0	2555							
10.0	2550					SHOB-19 10-15 + BD-JE-43		
15.0	2545	15.0 - 20.0 Yellowish brown CLAY w/ little silt, moist		2548.0 15.0	CL	moist	SHOB-19 15-20	
20.0	2540	20.0 - 30.0 Dk. olive brown and med. gray SILTSTONE, moist						
25.0	2535						SHOB-19 25-30	
30.0	2530	30.0 - 35.0 Dk. olive brown and med. gray SILTSTONE and SANDSTONE, moist		2533.0 30.0	Siltst/Ss	moist	SHOB-19 30-35	
35.0	2525	35.0 - 40.0 Dk. gray SILTSTONE and dk. greenish gray SANDSTONE, fine grained, moist						
40.0	2520			2523.0 40.0	Siltst/Ss		SHOB-19 40-45	
45.0	2515	40.0 - 43.0 Dk. greenish gray SANDSTONE, moist		2520.0 43.0	Ss	dry	SHOB-19 45-50	
50.0	2510	43.0 - 60.0 Dk. reddish brown to black COAL, dry						
55.0	2505						SHOB-19 55-60	
60.0	2500	60.0 - 70.0 Lt. gray and greenish gray CLAYSTONE, moist		2503.0 60.0	Clst	moist	SHOB-19 60-65	
65.0	2495							
70.0		<b>Boring completed at 70 ft.</b>		70.0				TD = 70'

OB\_GNPP\_SH\_OB AND MW\_UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 20

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/28/06 11:12

DATE COMPLETED: 10/28/06 11:40

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-20R

COORDINATES: N: 441,522 E: 1,362,334

GROUND SURFACE ELEVATION: 2,541.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,471.4 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments		
				DEPTH (ft)						
0.0	2540	0.0 - 5.0 Dk. brown silty CLAY and v. lt. gray to white SANDSTONE, v. fine grained, moist to v. moist		2541.4 0.0	CL/Ss	moist to v. moist	SHOB-20 0-5	Hard layer from 4'-6'		
5.0	2535	5.0 - 10.0 V. lt. gray to white SANDSTONE, v. fine grained and lt. yellowish brown sandy CLAYSTONE, moist to v. moist		2536.4 5.0	Ss/Clst		SHOB-20 5-10			
10.0	2530	10.0 - 20.0 Lt. olive brown silty CLAYSTONE, moist to v. moist		2531.4 10.0	Clst		SHOB-20 10-15			
15.0	2525	15.0 - 20.0 Lt. olive brown silty CLAYSTONE, moist to v. moist		2521.4 20.0	Ss		SHOB-20 15-20			
20.0	2520	20.0 - 25.0 Lt. greenish gray SANDSTONE, fine grained, moist to v. moist		2516.4 25.0	Ss		SHOB-20 20-25 + BD-JE-44			
25.0	2515	25.0 - 40.0 Dk. gray clayey SILTSTONE, moist to v. moist		2501.4 40.0	Siltst		SHOB-20 25-30			
30.0	2510						SHOB-20 30-35			
35.0	2505						SHOB-20 35-40			
40.0	2500	40.0 - 60.0 Dk. reddish brown to black COAL, dry		2481.4 60.0	COAL		dry		SHOB-20 40-45	Driller confirmed coal from 40'-59'
45.0	2495								SHOB-20 45-50	
50.0	2490						SHOB-20 50-55			
55.0	2485						SHOB-20 55-60			
60.0	2480	60.0 - 70.0 Med. gray to dk. gray silty CLAYSTONE, moist		2471.4 70.0	Clst	moist	SHOB-20 60-65	TD = 70'		
65.0	2475						SHOB-20 65-70			

**Boring completed at 70 ft.**

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 21

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/15/06 12:30

DATE COMPLETED: 10/15/06 14:54

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-21R

COORDINATES: N: 441,484 E: 1,363,579

GROUND SURFACE ELEVATION: 2,527.6 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 250.0 ft

BOTTOM ELEVATION: 2,277.6 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2525	0.0 - 10.0 V. dk. grayish brown (10YR, 3/2) clayey SILT, sli. moist to moist		2527.6 0.0	MH	sli. moist to moist	SHOB-21 0-5 + BD-RT-09	Note: approx. 500 gallons of water was used to drill hole
5.0	2520			2517.6 10.0			SHOB-21 5-10	
10.0	2515	10.0 - 20.0 Olive brown (2.5Y, 4/3) clayey SILT, tr. fine sand, plastic, sli. moist to moist		2517.6 10.0	MH		SHOB-21 10-15	Driller says there is formation water coming in at 15'-20', requiring the use of drilling water
15.0	2510			2507.6 20.0			SHOB-21 15-20	
20.0	2505	20.0 - 27.0 Dk. grayish brown (2.5Y, 4/2) SILTSTONE	xxxxxx xxxxxx xxxxxx xxxxxx	2507.6 20.0	Siltst		SHOB-21 20-25	
25.0	2500			2500.6 27.0			SHOB-21 25-30	
30.0	2495	27.0 - 28.0 Lt. gray (2.5Y, 7/1) SHALE	xxxxxx xxxxxx xxxxxx xxxxxx	2499.6 28.0	Sh		SHOB-21 30-35	
35.0	2490			2487.6 40.0			SHOB-21 35-40	
40.0	2485	28.0 - 40.0 V. dk. grayish brown (2.5Y, 3/2) clayey SILTSTONE	xxxxxx xxxxxx xxxxxx xxxxxx	2487.6 40.0	Siltst		SHOB-21 40-45	
45.0	2480			2477.6 50.0			SHOB-21 45-50	
50.0	2475	40.0 - 50.0 V. dk. gray (5Y, 3/1) SANDSTONE, fine grained	.....	2477.6 50.0	Ss		SHOB-21 50-55	Driller confirmed coal from 53'-74'
55.0	2470			2452.6 75.0			SHOB-21 55-60	
60.0	2465	50.0 - 75.0 Black (N1) COAL	■■■■■	2452.6 75.0	COAL	N/A	SHOB-21 60-65	
65.0	2460			2432.6 95.0			SHOB-21 65-70	
70.0	2455	75.0 - 95.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE, v. fine grained	.....	2432.6 95.0	Ss		SHOB-21 70-75	
75.0	2450			2427.6			SHOB-21 75-80	
80.0	2445						SHOB-21 80-85	
85.0	2440						SHOB-21 85-90	
90.0	2435						SHOB-21 90-95	
95.0	2430	95.0 - 100.0 Dk. gray (2.5Y, 4/1) clayey	.....	2432.6 95.0	Ss		SHOB-21 95-100	
100.0		Log continued on next page		2427.6				

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 21

RECORD OF BORING SHOB-21R

COORDINATES: N: 441,484 E: 1,363,579

GROUND SURFACE ELEVATION: 2,527.6 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2425	SANDSTONE, v. fine grained, interbedded w/ little coal and little claystone		100.0	Ss	N/A	SHOB-21 100-105	140'-170' samples contain topsoil slough
105.0	2420	100.0 - 120.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE, fine grained		2407.6			SHOB-21 105-110	
110.0	2415			2402.6			SHOB-21 110-115	
115.0	2410			2397.6			SHOB-21 115-120	
120.0	2405	120.0 - 125.0 SANDSTONE as above interbedded w/ little shale		120.0	Ss	N/A	SHOB-21 120-125	
125.0	2400	125.0 - 130.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE, fine grained		125.0			SHOB-21 125-130	
130.0	2395		2392.6	SHOB-21 130-135				
135.0	2390	130.0 - 135.0 SANDSTONE as above interbedded w/ little shale		130.0	Ss		N/A	
135.0	2385	135.0 - 145.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE, fine grained		135.0		SHOB-21 140-145		
140.0	2380		2382.6	SHOB-21 145-150				
145.0	2375	145.0 - 155.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE, fine grained, interbedded w/ COAL		145.0	Ss/COAL	N/A		SHOB-21 150-155
150.0	2370	155.0 - 165.0 Dk. gray (2.5Y, 4/1) sandy SILTSTONE, tr. coal		155.0			SHOB-21 155-160	
155.0	2365		2362.6	SHOB-21 160-165				
160.0	2360	165.0 - 180.0 Dk. gray (2.5Y, 4/1) sandy SILTSTONE		165.0	Siltst		N/A	SHOB-21 165-170
165.0	2355			2347.6		SHOB-21 170-175		
170.0	2350			180.0		SHOB-21 175-180		
175.0	2345	180.0 - 215.0 Dk. gray (2.5Y, 4/1) silty SANDSTONE				Ss		N/A
180.0	2340		SHOB-21 185-190					
185.0	2335		SHOB-21 190-195					
190.0	2330		SHOB-21 195-200					
195.0	2325		SHOB-21 200-205					
200.0	2320		SHOB-21 205-210					
205.0	2315		SHOB-21 210-215					
210.0	2310	215.0 - 230.0 Black COAL		2312.6	COAL	Driller confirmed coal from 215'-230'		
215.0	2305			215.0			SHOB-21 215-220	
220.0	2300						SHOB-21 220-225	
225.0	2295							

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

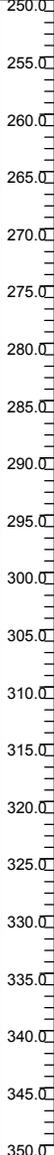
LOCATION: South Heart, ND, Overburden Borehole 21

RECORD OF BORING **SHOB-21R**

COORDINATES: N: 441,484 E: 1,363,579

GROUND SURFACE ELEVATION: 2,527.6 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
225.0	2300	215.0 - 230.0 Black COAL <i>continued from previous page</i>		2297.6	COAL	N/A		TD = 250'
230.0	2295	230.0 - 250.0 Black COAL and gray sandy CLAYSTONE, v. fine grained sand		230.0	COAL/Clst		SHOB-21 235-240	
235.0	2290						SHOB-21 240-245	
240.0	2285						SHOB-21 245-250	
245.0	2280			2277.6				
250.0		<b>Boring completed at 250 ft.</b>		250.0				



OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 22

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/29/06 11:22

DATE COMPLETED: 10/29/06 11:46

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-22R

COORDINATES: N: 441,454 E: 1,364,940

GROUND SURFACE ELEVATION: 2,519.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,449.8 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0		0.0 - 5.0 Dk. yellowish brown clayey SILT, sli. moist		2519.8 0.0	MH	sli. moist	SHOB-22 0-5	
5.0	2515	5.0 - 10.0 Lt. yellowish brown SANDSTONE, v. fine to fine grained, moist		2514.8 5.0	Ss		SHOB-22 5-10	
10.0	2510	10.0 - 20.0 Lt. gray to med. gray SANDSTONE and SILTSTONE, v. fine grained, moist		2509.8 10.0	Ss/Siltst	moist	SHOB-22 10-15	
15.0	2505			2499.8 20.0			SHOB-22 15-20	
20.0	2500	20.0 - 25.0 Dk. yellowish brown SILTSTONE, moist		2494.8 25.0	Siltst		SHOB-22 20-25	
25.0	2495	25.0 - 30.0 Dk. gray CLAYSTONE, moist		2489.8 30.0	Clst		SHOB-22 25-30	
30.0	2490	30.0 - 35.0 Med. gray SANDSTONE, fine to med. grained, moist to v. moist		2484.8 35.0	Ss	moist to v. moist	SHOB-22 30-35	
35.0	2485	35.0 - 39.0 COAL (80%) w/ some dk. gray claystone (20%), moist		2480.8 39.0	COAL/Clst	moist	SHOB-22 35-40 + BD-JE-52	Driller confirmed coal from 39'-56'
40.0	2480	39.0 - 56.0 Dk. reddish brown to black COAL, dry			COAL	dry	SHOB-22 40-45	
45.0	2475						SHOB-22 45-50	
50.0	2470						SHOB-22 50-55	
55.0	2465	56.0 - 60.0 COAL and lt. gray SILTSTONE, moist		2463.8 56.0	COAL/Siltst		SHOB-22 55-60	
60.0	2460	60.0 - 70.0 Lt. gray SANDSTONE, v. fine grained, moist		2459.8 60.0	Ss	moist	SHOB-22 60-65	
65.0	2455						SHOB-22 65-70	
70.0	2450	<b>Boring completed at 70 ft.</b>		2449.8 70.0				TD = 70'

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 23

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/29/06 12:28

DATE COMPLETED: 10/29/06 13:23

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-23R

COORDINATES: N: 441,421 E: 1,366,253

GROUND SURFACE ELEVATION: 2,523.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

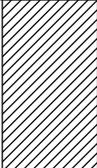
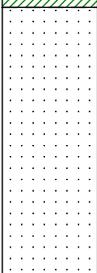
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,418.5 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2520	0.0 - 15.0 Lt. yellowish brown to dk. yellowish brown, silty CLAY, sli. moist to moist		2523.5	CL	sli. moist	SHOB-23 0-5	
5.0	2515			0.0				
10.0	2510			15.0				
15.0	2505	15.0 - 20.0 CLAY as above interbedded w/ little coal		2508.5	CL	sli. moist to moist	SHOB-23 5-10 SHOB-23 10-15 + BD-JE-53	
20.0	2500			20.0				
20.0	2500	20.0 - 30.0 Lt. greenish gray CLAYSTONE, moist		2503.5	Clst	moist	SHOB-23 20-25 SHOB-23 25-30	
25.0	2495			20.0				
30.0	2490			30.0				
30.0	2490	30.0 - 55.0 Lt. gray to med. gray SANDSTONE, v. fine to fine grained, moist to v. moist		2493.5	Ss	moist to v. moist	SHOB-23 30-35 SHOB-23 35-40 SHOB-23 40-45 SHOB-23 45-50 SHOB-23 50-55	
35.0	2485			30.0				
40.0	2480							
45.0	2475							
50.0	2470							
55.0	2465			55.0				
55.0	2465	55.0 - 60.0 Dk. gray CLAYSTONE, moist		2468.5	Clst	moist	SHOB-23 55-60 SHOB-23 60-65	
60.0	2460			60.0				
60.0	2460	60.0 - 74.0 Dk. gray CLAYSTONE interbedded w/ dk. greenish gray SILTSTONE		2463.5	Clst/Siltst	moist to v. moist	SHOB-23 65-70 SHOB-23 70-75	
65.0	2455							
70.0	2450			74.0				
74.0	2445	74.0 - 93.0 Black COAL, wet		2449.5	COAL	wet	SHOB-23 75-80 SHOB-23 80-85 SHOB-23 85-90 SHOB-23 90-95	Driller confirmed coal from 74'-93'
75.0	2440			74.0				
80.0	2435							
85.0	2430							
93.0	2425	93.0 - 105.0 Dk. greenish gray CLAYSTONE, wet		2430.5	Clst		SHOB-23 95-100	
95.0	2420			93.0				
100.0	2418.5							

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

SHEET 1 of 2

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 23

RECORD OF BORING **SHOB-23R**

COORDINATES: N: 441,421 E: 1,366,253

GROUND SURFACE ELEVATION: 2,523.5 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2420	93.0 - 105.0 Dk. greenish gray CLAYSTONE, wet <i>continued from previous page</i>		2418.5	Clst	wet	SHOB-23 100-105	TD = 105'
105.0		<b>Boring completed at 105 ft.</b>						
110.0								
115.0								
120.0								
125.0								
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 24

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/29/06 13:44

DATE COMPLETED: 10/29/06 14:35

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-24R

COORDINATES: N: 441,344 E: 1,368,886

GROUND SURFACE ELEVATION: 2,502.6 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 95.0 ft

BOTTOM ELEVATION: 2,407.6 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2500	0.0 - 15.0 Lt. olive brown and dk. yellowish brown silty CLAYSTONE, sli. moist, becomes moist to v. moist at 5 ft.		2502.6	Clst	sli. moist	SHOB-24 0-5	
5.0	2495			0.0				
10.0	2490			15.0				
15.0	2485	15.0 - 25.0 Dk. olive brown and dk. yellowish brown SANDSTONE, fine grained, moist to v. moist		2487.6	Ss	moist to v. moist	SHOB-24 5-10 SHOB-24 10-15 SHOB-24 15-20 SHOB-24 20-25	
20.0	2480			15.0				
25.0	2475			2477.6				
25.0	2475	25.0 - 30.0 Lt. greenish gray CLAYSTONE interbedded w/ dk. greenish gray SANDSTONE, v. fine grained, moist to v. moist		2472.6	Clst/Ss		SHOB-24 25-30	
30.0	2470			25.0				
30.0	2470	30.0 - 35.0 Med. gray SILTSTONE interbedded w/ COAL, moist		2467.6	Siltst/COAL		SHOB-24 30-35 SHOB-24 35-40 + BD-JE-54	
35.0	2465			30.0				
35.0	2465	35.0 - 45.0 Med. gray to dk. gray CLAYSTONE, moist		2457.6	Clst	moist	SHOB-24 40-45 SHOB-24 45-50 SHOB-24 50-55	
40.0	2460			35.0				
45.0	2455			45.0				
45.0	2455	45.0 - 55.0 Dk. greenish gray CLAYSTONE, moist		2447.6	Clst		SHOB-24 55-60 SHOB-24 60-65	
50.0	2450			45.0				
55.0	2445			55.0				
55.0	2445	55.0 - 65.0 Med. gray SILTSTONE, moist		2437.6	Siltst		SHOB-24 65-70	Driller confirmed coal from 65'-82'
60.0	2440			65.0				
65.0	2435	65.0 - 70.0 Black COAL, dry		2432.6	COAL	dry	SHOB-24 70-75 SHOB-24 75-80	
70.0	2430			70.0				
70.0	2430	70.0 - 82.0 Black COAL, wet		2420.6	COAL	wet	SHOB-24 80-85 SHOB-24 85-90	
75.0	2425			70.0				
80.0	2420	82.0 - 95.0 Dk. greenish gray CLAYSTONE, moist		2407.6	Clst	moist	SHOB-24 90-95	TD = 95'
85.0	2415			82.0				
90.0	2410			95.0				
95.0		<b>Boring completed at 95 ft.</b>		95.0				

OB, GNPP, SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

# NORWEST

Norwest Corporation  
136 East South Temple, 12th Floor  
Salt Lake City, Utah 84111  
(801) 539-0044  
(801) 539-0055 FAX

## Drill Hole Completion Report

Location

Hole I.D. SH08-25C Location NE NW Section 21 Twp 139N Rng 98W  
 Project Great Northern Power Lease South Heart County Smack State ND  
 Survey System \_\_\_\_\_ North \_\_\_\_\_ East \_\_\_\_\_ Elev. \_\_\_\_\_  
 Approx. Location: FNL (FSL) \_\_\_\_\_ FEL (FWL) \_\_\_\_\_ Elev. ~2565  
   E 642311    N 5199816

Drilling

Drilling Co. Mohl Driller Mancos Start 10/19/06 Finish 10/19/06  
 Total Depth 85' Surface Casing Size \_\_\_\_\_ to \_\_\_\_\_  
 Hole Size 5" to \_\_\_\_\_ to \_\_\_\_\_ to \_\_\_\_\_ to \_\_\_\_\_  
 Casing Size NA to \_\_\_\_\_ to \_\_\_\_\_ to \_\_\_\_\_ to \_\_\_\_\_  
 Lost Circ. NA to \_\_\_\_\_; \_\_\_\_\_ to \_\_\_\_\_; \_\_\_\_\_ to \_\_\_\_\_; Regained? Y \_\_\_\_\_ N \_\_\_\_\_  
 Water Invasion Depths \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
 Drilling Conditions Air \_\_\_\_\_ Water \_\_\_\_\_ Mud \_\_\_\_\_

Coring

Size	From	To	Coal Interval		Seam	Roof	Recovery	Floor
			From	To				
<u>Hq</u>			<u>60.0</u>	<u>75.5</u>	<u>D 15.5</u>	<u>Lost</u>	<u>Lost Top</u>	<u>GT4+GT5</u>

Logging

Company CENTURY Operator B. MATAS Date 10/19/06  
 Log Depth (ft.) 85' Logs Run: Gamma Density Resist Calip Other  
 Describe \_\_\_\_\_

Completion

\_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
 \_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
 \_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
 Contractor \_\_\_\_\_ Representative \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_  
 If open, explain \_\_\_\_\_

Reclamation

Explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Remarks

Continuous Core-Geotech. No twin  
Lost Core at Top of Coal ~ Lost approx 2' of coal from log  
VERY WET THROUGHOUT - ON 5 GT samples  
 Report Completed By DAVE GERBERT Title Geologist Date 10/22/06

# NORWEST

Norwest Corporation  
 196 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0066 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	RD
1	0	2	2.0	2.0	0-NA
2	2	4	2.0	2.0	0-NA
3	4	6	2.0	2.0	1.2
4	6	8	2.0	1.9	1.3
5	8	10	2.0	2.0	1.1
6	10	12	2.0	1.8	0
7	12	20	8.0	0.5	0

Hole SHA08-25C  
 Page 1 of 4  
 Date 10/19/06  
 Name D. LEPPERET

PHOTOS

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
0				12A 12B R1	Soil - (0-1.8) dk. brn. clayey.
2				rubble R1.5	DISTINCT subsoil (1.8- of brn. mud crumbly, minor salts/caliche sandy ~ mud cl.
4		4.3 GT1 5.2		Rubble	Run
6				12R, 12H 85 Rubble	Run
8				12R, 12H 70	Sandy subsoil, clayey at base, a/m
10				Rubble	Run micro caliche
12				D1 Rubble	Run
14					
16					
18					
20					Clean Hole out to 12', picking core by core! CORE 12-20 - CORE SKID OUT - REC. 0.4 - Go back in & try to pull it

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

# Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	RECD
8	20	30	10.0	10.0	6.8
9	30	40	10.0	10.0	7.5

Hole SH00-25C  
 Page 2 of 4  
 Date 10/19/06  
 Name D. LEPPERT

PHOTOS

Depth	Graphio Log	Base	Sample	Discontinuities	Lithologic Description
22		No Sample possible BREAKS TOO EASILY		BP 65 PL RGH PL 50 WLTOROG	SS (20-25.6) Pale yell, FG, SOFT-FIRM-BREAKS EASILY ON BPs, typ 0.05 - 0.1, occ Fe stain-py
24				R1.5  R2-3 SPURS R2 curved 5m 0-10	R2-3 but breaks easily on BP - cannot get sample
26				R3 R1	DIST SS (25.6-40.0) yel-OR, PG, w/finely spaced arg lam V. SOFT, CAN EASILY CRUMBLE w/FINERS
28		27.1 GTZ 27.7			
30				Rubble	RUN
32				BP PL 5m 75	
34				BPs PL 5m, 75	SS, ca/a, & finely lam, med f-mg, w/silt
36		35.8 GTZ 36.4		R2 BP PL 5m 75 BP PL 5m 70	CANNOT
38		Cannot sample breaks too easily			
40				Rubble	RUN

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0066 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered (R/S)	
10	40.0	50.0	10.0	6.9	2.4
11	50.0	60.0	10.0	4.8	0

Hole SHOB-2SC  
 Page 3 of       
 Date 10/19/06  
 Name D. LEPPER

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
40					CORE LOSS (40.0 - 43.1)
42					
44		R3 R4		P.L.S.M. 90 P.L.S.M. 80	cemented layer (43.1 - 43.7) <b>SIDERITIC SS</b> OR. HVY FE STN, SS. (43.7 - 54.8) <b>R3</b> top -
46		<del>BRAMLE</del> 46.7 GT3 47.2		Rubble V. SFT BP, PL, SM 60	Pole. gel w/ unv Fe stn, v. soft, crumbles easily, LAM THROUGHOUT. <b>R1</b> CLAYKY SS
48				Rubble	V. SOFT LOOSE SD, gy, F-MG.
50				WAFERS	LAM.
52				V. SOFT Rubble R1	-RUN SS (a/r gy, mostly unconsol f-mg) NO PIECES TO SAMPLE CAN EASILY STICK FINGER IN
54					TR CO @ bottom of core.
56					CORE LOSS (54.8 - 60.0)
58					DRILLER GET TOP OF CO ~ 58.8
60					TR

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

# Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
12	60	70	10.0	9.8	6.9
13	70	80	10	10.2	6.5

Hole SH08-2SC  
 Page 4 of 4  
 Date 10/19/06  
 Name D LEPPERT

PHOTOS

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
		60.0			
		S1			
		60.5			
		S2			
		61.5			
62		S3			
		63.0			
		S4			
64		64.8			
		S5			
66		66.6			
		S6			
68		68.4			
		S7			
70		69.8			
		S8			
		71.4			
72		S9			
		73.0			
		S10			
74		74.0			
		S11			
		75.0			
		S12			
		75.5			
76		76.2			
		GT4			
		76.8			
		77.2			
		GT5			
78		78.2			
80					

CO<sub>2</sub> (60.0-75.5) 15.5  
 salts? / typ?  
 R2  
 Prod BLK  
 = wh. streak, salts - typ?

rubble  
 CLT  
 PLISM, O

BP  
 PL, SM, O  
 85  
 BP PL, SM  
 85  
 IR, S, High  
 salts.

wavy sm  
 85  
 Clin

BR, DEB

90  
 wavy  
 sm

BR PL, SM  
 CLT 10  
 PL, SM - IR

BR PL - Layer

DIST  
 CLY, LT qtz sdy @ top  
 GT4 sandy CLY  
 GT5  
 SS - FG, GY, CWAY

DECK CLY  
 R1

Rotary to TD for Elog, 85'

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 26

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 13:27

DATE COMPLETED: 10/26/06 13:54

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-26R

COORDINATES: N: 440,178 E: 1,363,594

GROUND SURFACE ELEVATION: 2,545.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 90.0 ft

BOTTOM ELEVATION: 2,455.2 ft

HOLE DIAMETER: 5 inches

OB, GNPP, SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2545	0.0 - 5.0 V. lt. grayish brown silty SAND, v. fine grained, dry		2545.2 0.0	SM	dry	SHOB-26 0-5	
5.0	2540	5.0 - 45.0 V. lt. grayish brown silty SANDSTONE, v. fine grained, sli. moist to moist		2540.2 5.0	Ss	sli. moist to moist	SHOB-26 5-10	
10.0	2535						SHOB-26 10-15	
15.0	2530						SHOB-26 15-20	
20.0	2525						SHOB-26 20-25 + BD-RT-30	
25.0	2520						SHOB-26 25-30	
30.0	2515						SHOB-26 30-35	
35.0	2510						SHOB-26 35-40	
40.0	2505				SHOB-26 40-45			
45.0	2500	45.0 - 55.0 Dk. gray SILTSTONE, some clay-sized particles, moist		2500.2 45.0	Siltst	moist	SHOB-26 45-50	
50.0	2495						SHOB-26 50-55	
55.0	2490	55.0 - 60.0 Grayish brown SANDSTONE, fine grained, and some siltstone as above, moist		2490.2 55.0	Ss		SHOB-26 55-60	
60.0	2485	60.0 - 80.0 Black COAL, dry		2485.2 60.0	COAL	dry	SHOB-26 60-65	Driller confirmed coal from 60'-79'
65.0	2480						SHOB-26 65-70	
70.0	2475						SHOB-26 70-75	
75.0	2470							
80.0	2465	80.0 - 90.0 Gray silty CLAYSTONE, moist		2465.2 80.0	Clst	moist	SHOB-26 80-85	
85.0	2460						SHOB-26 85-90	
90.0		<b>Boring completed at 90 ft.</b>		2455.2 90.0				TD = 90'



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 27

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 10:30

DATE COMPLETED: 10/26/06 11:06

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-27R

COORDINATES: N: 440,139 E: 1,364,913

GROUND SURFACE ELEVATION: 2,533.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 90.0 ft

BOTTOM ELEVATION: 2,443.8 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2530	0.0 - 10.0 Dk. brown SILT, tr. fine sand, dry to sli. moist		2533.8 0.0	ML	dry to sli. moist	SHOB-27 0-5	
5.0	2525			2523.8 10.0			SHOB-27 5-10	
10.0	2520	10.0 - 20.0 Dk. brown silty SAND, decreasing fines w/ depth, sli. moist		2513.8 20.0	SM	sli. moist	SHOB-27 10-15	Hard nugget found in 20'-25' section
15.0	2515			2503.8 30.0			SHOB-27 15-20 + BD-RT-27	
20.0	2510	20.0 - 30.0 Grayish brown SANDSTONE, v. fine grained, tr. silt, sli. moist		2498.8 35.0	Ss	moist	SHOB-27 20-25	
25.0	2505			2488.8 45.0			SHOB-27 25-30	
30.0	2500	30.0 - 35.0 SANDSTONE as above interbedded w/ little dk. gray claystone, sli. moist		2473.8 60.0	Ss	moist	SHOB-27 30-35	All samples below 35' contain sandstone slough from 20'-35'
35.0	2495			2458.8 75.0			SHOB-27 35-40	
40.0	2490	35.0 - 45.0 Dk. gray CLAYSTONE, little sand, moist		2453.8 80.0	Clst	moist	SHOB-27 40-45	
45.0	2485			2446.8 87.0			SHOB-27 45-50	
50.0	2480	45.0 - 60.0 Dk. gray SANDSTONE, fine grained, moist		2443.8 90.0	Ss	moist	SHOB-27 50-55	
55.0	2475						SHOB-27 55-60	
60.0	2470	60.0 - 75.0 Black COAL, sli. moist			COAL	sli. moist	SHOB-27 60-65	Driller confirmed water near 70'
65.0	2465						SHOB-27 65-70	
70.0	2460	70' changes from sli. moist to wet		2458.8 75.0	COAL/Clst	wet	SHOB-27 70-75	
75.0	2455			2453.8 80.0			SHOB-27 75-80	
80.0	2450	75.0 - 80.0 Black COAL and gray CLAYSTONE, wet			Clst	moist	SHOB-27 80-85	
85.0	2445						SHOB-27 85-90	
90.0		80.0 - 87.0 Gray CLAYSTONE, moist			Ss	moist		TD = 90'
		87.0 - 90.0 Gray SANDSTONE, moist						

**Boring completed at 90 ft.**

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 28

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 09:17

DATE COMPLETED: 10/26/06 10:02

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-28R

COORDINATES: N: 440,096 E: 1,366,253

GROUND SURFACE ELEVATION: 2,513.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

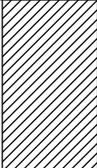
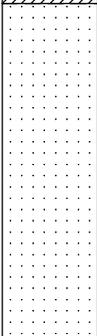
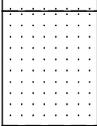
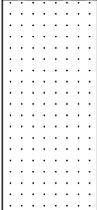
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,408.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				DEPTH (ft)					
0.0	2510	0.0 - 15.0 Dk. grayish brown silty CLAY, sli. moist to moist		2513.9	CL	sli. moist to moist	SHOB-28 0-5		
5.0	2505			0.0			SHOB-28 5-10		
10.0	2500			2498.9			SHOB-28 10-15 + BD-RT-26		
15.0	2495	15.0 - 45.0 Lt. grayish brown silty SANDSTONE, v. fine grained, sli. moist		15.0	Ss	sli. moist	SHOB-28 15-20	Hard nugget found in 25'-30' section	
20.0	2490			SHOB-28 20-25					
25.0	2485			SHOB-28 25-30					
30.0	2480			SHOB-28 30-35					
35.0	2475			SHOB-28 35-40					
40.0	2470			SHOB-28 40-45					
45.0	2465	45.0 - 55.0 Med. grayish brown silty SANDSTONE, v. fine grained, sli. moist to moist		2468.9	Ss	sli. moist to moist	SHOB-28 45-50		
50.0	2460			45.0			SHOB-28 50-55		
55.0	2455	55.0 - 75.0 Med. grayish brown silty SANDSTONE, v. fine grained, increased fines content from above, sli. moist to moist, becomes wet at 60 ft.		2458.9	Ss		SHOB-28 55-60	Driller confirmed water near 60'	
60.0	2450			55.0			SHOB-28 60-65		
65.0	2445			SHOB-28 65-70					
70.0	2440			SHOB-28 70-75					
75.0	2435	75.0 - 94.0 Black COAL, wet		2438.9	COAL	wet	SHOB-28 75-80	Driller confirmed coal from 75'-94'	
80.0	2430			75.0			SHOB-28 80-85		
85.0	2425			SHOB-28 85-90					
90.0	2420			SHOB-28 90-95					
95.0	2415	94.0 - 105.0 Gray CLAYSTONE, wet		2419.9	Clst		SHOB-28 95-100		
100.0		Log continued on next page							

OB, GNPP, SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 28

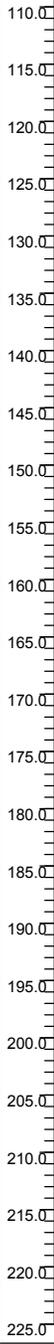
RECORD OF BORING **SHOB-28R**

COORDINATES: N: 440,096 E: 1,366,253

GROUND SURFACE ELEVATION: 2,513.9 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2410	94.0 - 105.0 Gray CLAYSTONE, wet <i>continued from previous page</i>		2408.9	Clst	wet	SHOB-28 100-105	TD = 105'

**Boring completed at 105 ft.**



OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 29

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 08:22

DATE COMPLETED: 10/26/06 08:52

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-29R

COORDINATES: N: 440,072 E: 1,367,554

GROUND SURFACE ELEVATION: 2,508.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 85.0 ft

BOTTOM ELEVATION: 2,423.7 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2508.7	0.0 - 3.0 Dk. brown CLAY, sli. moist		2508.7	CL		SHOB-29 0-5	
5.0	2505.0	3.0 - 25.0 Lt. gray SAND, v. fine grained, clean, sli. moist		2508.7 2506.7 2503.7 3.0	SP	sli. moist	SHOB-29 5-10 SHOB-29 10-15 + BD-RT-25 SHOB-29 15-20 SHOB-29 20-25	
25.0	2485.0	25.0 - 30.0 SAND as above and little olive brown claystone, sli. moist to moist		2483.7 25.0	SP	sli. moist to moist	SHOB-29 25-30	Below 25', sand is likely slough from above, claystone chips are coated w/ sand
30.0	2475.0	30.0 - 50.0 Dk. gray SILTSTONE and sand as above, moist		2478.7 30.0	Siltst	moist	SHOB-29 30-35 SHOB-29 35-40 SHOB-29 40-45 SHOB-29 45-50	
50.0	2455.0	50.0 - 53.0 Dk. gray SILTSTONE, moist		2458.7 50.0 2455.7 53.0	Siltst		SHOB-29 50-55 SHOB-29 55-60	Driller confirmed coal from 53'-72' Driller confirmed water entering at 55'-56'
53.0	2450.0	53.0 - 72.0 Black COAL, w/ sand slough from above, moist, becomes wet at 60 ft.			COAL		SHOB-29 60-65 SHOB-29 65-70	Drilling becomes wet at 60'
72.0	2430.0	72.0 - 85.0 Gray CLAYSTONE, wet		2436.7 72.0	Clst	wet	SHOB-29 70-75 SHOB-29 75-80 SHOB-29 80-85	
85.0	2423.7	<b>Boring completed at 85 ft.</b>		85.0				TD = 85'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

## Drill Hole Completion Report

Location

Hole I.D. SHOB-30C Location NW NE Section 23 Twp 139N Rng 98W  
 Project Great Northern Buy Lease South HEART County STARK State ND  
 Survey System \_\_\_\_\_ North \_\_\_\_\_ East \_\_\_\_\_ Elev. \_\_\_\_\_  
 Approx. Location: FNL (FSL) \_\_\_\_\_ FEL (FWL) \_\_\_\_\_ Elev. ~2515

Drilling

Drilling Co. Mohl Driller Marcus Start 10 / 19 / 06 Finish 10 / 20 / 06  
 Total Depth \_\_\_\_\_ Surface Casing Size NA to \_\_\_\_\_  
 Hole Size 5" to \_\_\_\_\_ to \_\_\_\_\_ to \_\_\_\_\_  
 Casing Size NA to \_\_\_\_\_ to \_\_\_\_\_ to \_\_\_\_\_  
 Lost Circ. NA to \_\_\_\_\_; \_\_\_\_\_ to \_\_\_\_\_; \_\_\_\_\_ to \_\_\_\_\_; Regained? Y \_\_\_\_\_ N \_\_\_\_\_  
 Water Invasion Depths \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
 Drilling Conditions Air \_\_\_\_\_ Water \_\_\_\_\_ Mud \_\_\_\_\_

Coring

Size	From	To	Coal Interval		Seam	Roof	Recovery	Floor
			From	To				
<u>8 1/2"</u>			<u>57.8</u>	<u>9.5</u>	<u>1.7</u>		<u>100%</u>	
<u>16 1/2"</u>			<u>53.15</u>	<u>74.45</u>	<u>D / 243</u>		<u>100%</u>	

Logging

Company CENTURY Operator B. MATKUS Date 10 / 20 / 06  
 Log Depth (ft.) \_\_\_\_\_ Logs Run: Gamma Density Resist Calip Other  
 Describe \_\_\_\_\_

Completion

\_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
 \_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
 \_\_\_\_\_ to \_\_\_\_\_ Cement (Bags) \_\_\_\_\_ Monitoring \_\_\_\_\_  
 Contractor \_\_\_\_\_ Representative \_\_\_\_\_ Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
 If open, explain \_\_\_\_\_

Reclamation

Explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Remarks

Geotech Hdc - continuous core through D, Rotary through C' seam  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Report Completed By D. LEPPERT Title GEOLOGIST Date 10 / 22 / 06

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0056 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered
1	0	2	2	2 (6.0)
2	2	4	2	2 0.7
3	4	6	2	2 0
4	6	8	2	2 0
5	8	10	2	2 0.5
6	10	12	2	2 1.8
7	12	20	8	6.3 4.4

Hole SH08-30C  
 Page 1 of 4  
 Date 10/19/06  
 Name D. LEPPERT

Photos

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
0					Topsoil (0-0.5) dk brn, mod clayey
0.5					Subsoil (0.5-2.9) SANDY, lt yel-brn, calc. Push Cores to 12'
2				Rubber	GRAD RUN SS (2.9-7.8) Similar to above, crumbly
3.0				IR, RGH	
3.7				IR, RGH	
4				IR, RGH	
6				IR, RGH	
8				Rubby	CLAYE & boss, org CO (7.8-9.5) blk-dk brn, divt CLY (9.5-15.6) qly frm, org & top
10				Rubby	GRAD RUN 3 org crumbly
11.0				IR, RGH	
11.6				IR, RGH	
12.4				IR, RGH	
13.0				IR, RGH	
14				IR, RGH	
15.6				Rubby	SS (15.6-16.4) Poss luss area HVY FE STN
16.4				Rubby	CLY (16.4-18.3) DLK GR BZNY CLY mostly c/n, occ org lam
17.1				IR, RGH	
17.7				IR, RGH	
18				IR, RGH	SANDY CLY
20				IR, RGH	

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
				RD	RD
8	20.0	30.0	10.0	9.3	7.2
9	30.0	40.0	10.0	9.8	8.0

Hole SHOB-30C  
 Page 2 of 4  
 Date 10/19/06  
 Name D. LEPPERT  
 Photos

Depth	Graphio Log	Base	Sample	Discontinuities	Lithologic Description
22				IRR PL 90 SPIN. PL	CLY (20.0-26.9) DK GY BENT w/ yellowish sandy ash? layers BANDS ON SANDY LENSES occ org lam.
24		24.2 GT4 24.8			
26		26.3 GT5 26.9 27.2 GT5 27.8		IRR 40 CLN Prob D1 66 IRR CLN FRAC ON BACK	GRAD SS (26.9-29.3) 10 LEVEL, GY, CL FG CLAY i.p., ORG LAMS
28		28.2 GT5 28.8			
30				R 66	CORE LOSS (29.3-30.0) CLAY (30.0-32.5) DK BRN w/ SANDY ZONES
32				PL 90	GRAD CLY, DK GY, CLN, BENT, ORG L TOP (32.5-35.6)
34		34.3 GT6 34.9			
36		36.5 GT7 37.1		J 30 PL, R, CH RUBBL	DISTINCT SS (35.6-39.8) gy, f-mg, abnt org lams, sl. glau. can crumble w/ fingers
38				J, 20 PL, SM	
40					CORE LOSS (39.8-40.0)

# NORWEST

Norwest Corporation  
 196 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0044  
 (801) 539-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered	
10	40	50.	10.	10.6	7.7
11	50	60	10	10.6	8.0

Hole SHOB-30C  
 Page 3 of 4  
 Date 10/20/06  
 Name D. LEPPERT

Depth	Graphic Log	Base	Sample	Discontinuities	Lithologic Description
40				PL 10 R.G. 11-12	SS (40.0-42.7) GY, F-MG, V. SOFT, C CAN PUSH FINGER IN
41.6		41.6		R1	
42		42.2			
43.3		43.3		R3	ERO SS (42.7-44.5) LT GY, CRS GR, HD ↳ nearly fine egl.
44		44.1		SS PL, 90 80, PL,	ERSS SS (44.5-53.15) GY, F-MG, about org lam e top, variable below
46		46.2		R1	
46.8		46.8			
48		about org lam			
50				D1	SS a/a RUN
52		52.2			
52.8		52.8			
53.15		53.15			
53.7		53.7		PY	SHARP CO (e 53.15-74.45) Blk, pycnolast mud/mudly bands e top
54		54.7		80, 85, PL	
56		56.4			
58		58.2		CLT-10 PL SM POOR	
60		60.0		10 PL, sm, clw 90 PL, sl, irr rgh	

INCREMENT

shell

30.8'

4

# NORWEST

Norwest Corporation  
 136 East South Temple, 12th Floor  
 Salt Lake City, Utah 84111  
 (801) 539-0944  
 (801) 539-0055 FAX

## Drill Hole Lithology Log

Core Number	Top	Base	Cut	Recovered
12	60	70	10	10 (R&D) 4.3
13	70	80	10	10 6.7

Hole SH08B-30C

Page 4 of 4

Date 10/20/06

Name D. LEPPER

Photos

Depth	Grapho Log	Base	Sample	Discontinuities	Lithologic Description
60.0					min. sd contain from uphole
60.5			4		
61.2			5	30-50 curved sm, c/n	mud band 0.05
62.1					SOFT- POSS CLAYE } R1
63.8			6		v. dk brn 63.1 v. thin mud band
65.6			7	curved mud + p	
66.6				curved sm, c/n	e 66.6 ~ 0.05 mud
67.4				R2	
69.0				dk brn - woody	
70.0			8	BP, PL	RUN
71.25				shaly dk brn	71.25-71.35 mud - brn
71.8					mostly dk brn - woody to base
73.0			10	BRUDED BP, PL, BS	
73.9			11	BP, BS	py streaks
74.45					GRAD
74.6					CLY (74.45-80.0)
75.2					CL, ORG STRKS INCLAN GMENT, BENT
75.8				R1	
76.5					alnt argillams
78.0				PL, 45	
80.0				PL, SPIND 90	
				PL, RGH 90	

Rotary to TD through C seam

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 30

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Continuous Core / Air Rotary

DATE STARTED: 10/20/06 10:28

DATE COMPLETED: 10/20/06 11:12

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-30C**

COORDINATES: N: 439,954 E: 1,372,841

GROUND SURFACE ELEVATION: 2,518.3 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 220.0 ft

BOTTOM ELEVATION: 2,298.3 ft

HOLE DIAMETER: 5 inches

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2515	0.0 - 75.0 Logged by Dave Leppert of Norwest					SHOB-30 2-7 + BD-RT-14	
5.0	2510						SHOB-30 9.5-14.5	
10.0	2505						SHOB-30 16-21	
15.0	2500						SHOB-30 21-26	
20.0	2495						SHOB-30 26-30	
25.0	2490						SHOB-30 30-32.5	
30.0	2485						SHOB-30 32.5-35	
35.0	2480						SHOB-30 35-40	
40.0	2475						SHOB-30 40-42.7	
45.0	2470						SHOB-30 45-50	
50.0	2465						SHOB-30 50-53	
55.0	2460							Dave Leppert confirmed that coal was from 53.15'-74.45'
60.0	2455							
65.0	2450							
70.0	2445							
75.0	2440	75.0 - 85.0 Dk. gray CLAYSTONE, tr. shale		2443.3 75.0	Clst		SHOB-30 75-80	75 feet: Switch from continuous coring to air rotary Drilling water is being added, so moisture content is N/A
80.0	2435						SHOB-30 80-85	
85.0	2430	85.0 - 90.0 Dk. gray CLAYSTONE, little coal, tr. shale		2433.3 85.0	Clst	N/A	SHOB-30 85-90	
90.0	2425	90.0 - 110.0 Dk. gray CLAYSTONE, tr. shale, tr. coal		2428.3 90.0	Clst		SHOB-30 90-95	
95.0	2420						SHOB-30 95-100	
100.0								

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 30

RECORD OF BORING SHOB-30C

COORDINATES: N: 439,954 E: 1,372,841

GROUND SURFACE ELEVATION: 2,518.3 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2415	90.0 - 110.0 Dk. gray CLAYSTONE, tr. shale, tr. coal <i>continued from previous page</i>			Clst		SHOB-30 100-105	
105.0	2410						SHOB-30 105-110	
110.0	2405	110.0 - 120.0 Dk. gray (5Y, 4/1) SILTSTONE, little coal, tr. shale		2408.3 110.0	Sltst		SHOB-30 110-115	
115.0	2400						SHOB-30 115-120	
120.0	2395	120.0 - 125.0 V. dk. gray (5Y, 3/1) SANDSTONE		2398.3 120.0	Ss		SHOB-30 120-125	
125.0	2390						SHOB-30 125-130	
130.0	2385	125.0 - 135.0 Hard, dk. gray (5Y, 4/1) SANDSTONE		2383.3 135.0	Ss		SHOB-30 130-135	
135.0	2380						SHOB-30 135-140	
140.0	2375	140.0 - 145.0 V. dk. gray (5Y, 3/1) SANDSTONE interbedded w/ some siltstone		2378.3 140.0	Ss		SHOB-30 140-145	
145.0	2370						SHOB-30 145-150	
150.0	2365	145.0 - 150.0 SANDSTONE interbedded w/ SILTSTONE and COAL		2373.3 145.0	Ss/Sltst/COAL		SHOB-30 145-150	
155.0	2360						SHOB-30 150-155	
160.0	2355	150.0 - 170.0 V. dk. gray SANDSTONE, tr. shale, tr. coal		2368.3 150.0	Ss	N/A	SHOB-30 150-155	
165.0	2350						SHOB-30 155-160	
170.0	2345	170.0 - 185.0 Gray (5Y, 5/1) CLAYSTONE, little sand		2348.3 170.0	Clst		SHOB-30 160-165	
175.0	2340						SHOB-30 165-170	
180.0	2335	175.0 - 185.0 Gray (5Y, 5/1) CLAYSTONE, little sand, little coal, little shale		2333.3 185.0	Clst		SHOB-30 170-175	
185.0	2330						SHOB-30 175-180 + BD-RT-15	
190.0	2325	185.0 - 190.0 Gray (5Y, 5/1) CLAYSTONE and COAL (40%), little sand, little shale		2328.3 190.0	Clst/COAL		SHOB-30 180-185	
195.0	2320						SHOB-30 185-190	
200.0	2315	190.0 - 195.0 Black COAL		2323.3 195.0	COAL		SHOB-30 190-195	
205.0	2310						SHOB-30 195-200	
210.0	2305	195.0 - 205.0 Black COAL		2313.3 205.0	COAL		SHOB-30 200-205	200'-205' shale chunks are probably slough
215.0	2300						SHOB-30 205-210	
220.0	2298.3	205.0 - 210.0 Black COAL and dk. gray SANDSTONE		2308.3 210.0	COAL/Ss		SHOB-30 210-215	
225.0	2298.3						SHOB-30 215-220	
		<b>Boring completed at 220 ft.</b>		220.0				TD = 220'

OB, GNPP, SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 31

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/27/06 10:29

DATE COMPLETED: 10/27/06 11:17

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-31R

COORDINATES: N: 438,954 E: 1,359,614

GROUND SURFACE ELEVATION: 2,617.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 150.0 ft

BOTTOM ELEVATION: 2,467.8 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2615	0.0 - 5.0 Dk. brown CLAY, sli. moist to moist		2617.8 0.0	CL		SHOB-31 0-5	
5.0	2610	5.0 - 20.0 Lt. gray SILT and SAND, sli. moist to moist		2612.8 5.0	SP-SM		SHOB-31 5-10 SHOB-31 10-15	
15.0	2605	15'-20' mixed w/ little coal		2597.8 20.0			SHOB-31 15-20 + BD-JE-35	
20.0	2595	20.0 - 25.0 COAL (90%) w/ little greenish gray siltstone (10%), sli. moist to moist		2592.8 25.0	COAL	sli. moist to moist	SHOB-31 20-25	
25.0	2590	25.0 - 30.0 Greenish gray SILTSTONE, sli. moist to moist		2587.8 30.0	Siltst		SHOB-31 25-30	
30.0	2585	30.0 - 45.0 Med. gray SANDSTONE, fine grained, interbedded w/ greenish gray SILTSTONE, sli. moist to moist		2572.8 45.0	Ss/Siltst		SHOB-31 30-35 SHOB-31 35-40 SHOB-31 40-45	
45.0	2570	45.0 - 50.0 SANDSTONE and SILTSTONE as above interbedded w/ some coal, sli. moist to moist		2567.8 50.0	Ss/Siltst		SHOB-31 45-50	
50.0	2565	50.0 - 70.0 Lt. greenish gray SANDSTONE and SILTSTONE, v. fine grained, dry to sli. moist			Ss/Siltst	dry to sli. moist	SHOB-31 50-55 SHOB-31 55-60 SHOB-31 60-65 SHOB-31 65-70	
70.0	2550	70.0 - 77.0 Hard, v. lt. gray SANDSTONE, v. fine grained, dry		2547.8 70.0	Ss	dry	SHOB-31 70-75	Hard SANDSTONE layer from 70'-77'
75.0	2540	77.0 - 119.0 Lt. gray to med. gray SANDSTONE, v. fine grained, sli. moist		2540.8 77.0	Ss	sli. moist	SHOB-31 75-80 SHOB-31 80-85 SHOB-31 85-90 SHOB-31 90-95 SHOB-31 95-100	

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

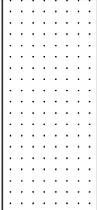
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 31

RECORD OF BORING **SHOB-31R**

COORDINATES: N: 438,954 E: 1,359,614

GROUND SURFACE ELEVATION: 2,617.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2515	77.0 - 119.0 Lt. gray to med. gray SANDSTONE, v. fine grained, sli. moist <i>continued from previous page</i>  105' SANDSTONE is harder, more consolidated		2498.8 119.0	Ss	sli. moist	SHOB-31 100-105	Driller confirmed coal from 119'-137'
105.0	2510						SHOB-31 105-110	
110.0	2505						SHOB-31 110-115	
115.0	2500						SHOB-31 115-120	
120.0	2495	119.0 - 137.0 Dk. reddish brown to black COAL, dry		2480.8 137.0	COAL	dry	SHOB-31 120-125	
125.0	2490						SHOB-31 125-130	
130.0	2485						SHOB-31 130-135	
135.0	2480	137.0 - 140.0 Greenish gray CLAYSTONE, dry		2477.8 140.0	Clst		SHOB-31 135-140	
140.0	2475	140.0 - 150.0 Lt. gray to med. gray SANDSTONE, v. fine grained, moist						
145.0	2470	SHOB-31 145-150 + BD-JE-36						
150.0		<b>Boring completed at 150 ft.</b>						TD = 150'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 32

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 14:24

DATE COMPLETED: 10/26/06 15:23

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-32R

COORDINATES: N: 438,897 E: 1,362,235

GROUND SURFACE ELEVATION: 2,602.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 155.0 ft

BOTTOM ELEVATION: 2,447.2 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2600	0.0 - 5.0 Gray and rust-colored mottled CLAY, moist		2602.2 0.0 2597.2	CL		SHOB-32 0-5	V. thin (approximately 1 to 6 inch) coal seam near 13'
5.0	2595	5.0 - 24.5 Dk. gray SILTSTONE, moist		5.0	Siltst	moist	SHOB-32 5-10	
10.0	2590						SHOB-32 10-15	
15.0	2585						SHOB-32 15-20	
20.0	2580						SHOB-32 20-25	
25.0	2575	24.5 - 27.5 Black COAL, dry to sli. moist		2577.7 24.5 2574.7	COAL	dry to sli. moist	SHOB-32 25-30	
30.0	2570	27.5 - 40.0 Gray SILTSTONE, moist		27.5	Siltst		SHOB-32 30-35 + BD-RT-31	
35.0	2565						SHOB-32 35-40	
40.0	2560	40.0 - 45.0 Gray sandy SILTSTONE, moist		2562.2 40.0	Siltst		SHOB-32 40-45	
45.0	2555	45.0 - 50.0 Gray sandy SILTSTONE w/ some coal, moist		2557.2 45.0	Siltst		SHOB-32 45-50	
50.0	2550	50.0 - 77.5 Gray sandy SILTSTONE, v. fine grained, moist		2552.2 50.0		moist	SHOB-32 50-55	
55.0	2545						SHOB-32 55-60	
60.0	2540						SHOB-32 60-65	
65.0	2535						SHOB-32 65-70	
70.0	2530						SHOB-32 70-75	
75.0	2525	77.5 - 85.0 Gray silty CLAYSTONE, sli. moist to moist		2524.7 77.5	Clst	sli. moist to moist	SHOB-32 75-80	
80.0	2520						SHOB-32 80-85	
85.0	2515	85.0 - 95.0 V. dk. gray sandy CLAYSTONE, moist		2517.2 85.0	Clst	moist	SHOB-32 85-90	
90.0	2510						SHOB-32 90-95	
95.0	2505	<< Continued >>		2507.2 95.0	Ss	moist to v. moist	SHOB-32 95-100	

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

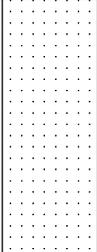
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 32

RECORD OF BORING **SHOB-32R**

COORDINATES: N: 438,897 E: 1,362,235

GROUND SURFACE ELEVATION: 2,602.2 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2500	95.0 - 122.5 V. dk. gray clayey SANDSTONE, moist to v. moist <i>continued from previous page</i>		2479.7	Ss	moist to v. moist	SHOB-32 100-105	
105.0	2495						SHOB-32 105-110	
110.0	2490						SHOB-32 110-115	
115.0	2485						SHOB-32 115-120	
120.0	2480						SHOB-32 120-125	
125.0	2475	122.5 - 145.0 Black COAL, sli. moist to moist		122.5	COAL	sli. moist to moist	SHOB-32 125-130	Driller confirmed coal from 125'-144'
130.0	2470	SHOB-32 130-135						
135.0	2465	SHOB-32 135-140						
140.0	2460	SHOB-32 140-145						
145.0	2455	145.0 - 150.0 Gray silty CLAYSTONE, moist		145.0	Clst	moist	SHOB-32 145-150	
150.0	2450	150.0 - 155.0 Dk. gray SANDSTONE, fine grained, moist		150.0			Ss	
155.0	2447.2	<b>Boring completed at 155 ft.</b>		155.0				Driller used water at 155' to remove drillrod TD = 155'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 33

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 11:29

DATE COMPLETED: 10/26/06 11:55

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-33R

COORDINATES: N: 438,840 E: 1,364,865

GROUND SURFACE ELEVATION: 2,534.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 75.0 ft

BOTTOM ELEVATION: 2,459.1 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0		0.0 - 2.5 Dk. brown SILT, moist		2534.1	ML	moist	SHOB-33 0-5	
5.0	2530	2.5 - 10.0 Yellowish gray SAND, v. fine grained, sli. moist		2534.6	SP	sli. moist	SHOB-33 5-10 + BD-RT-28	
10.0	2525	10.0 - 15.0 Olive brown clayey SAND, v. fine grained, sli. moist		2524.1	SC		SHOB-33 10-15	
15.0	2520	15.0 - 22.0 Dk. grayish brown sandy SILTSTONE, sli. moist to moist		2519.1	Siltst		SHOB-33 15-20	
20.0	2515	22.0 - 25.0 Rust colored SILTSTONE, sli. moist to moist		2512.1	Siltst	sli. moist to moist	SHOB-33 20-25	
25.0	2510	25.0 - 40.0 Dk. olive gray SANDSTONE, v. fine grained, little clay, moist		2509.1	Ss	moist	SHOB-33 25-30	
30.0	2505						SHOB-33 30-35	
35.0	2500						SHOB-33 35-40	
40.0	2495	40.0 - 44.0 COAL (80%) w/ some sandstone (20%) as above		2494.1	COAL	dry to sli. moist	SHOB-33 40-45	Driller confirmed coal from 44'-61'
45.0	2490	44.0 - 62.5 Black COAL, dry to sli. moist		2490.1	COAL		SHOB-33 45-50	
50.0	2485						SHOB-33 50-55	
55.0	2480						SHOB-33 55-60	
60.0	2475						SHOB-33 60-65	
65.0	2470	62.5 - 75.0 Gray CLAYSTONE, moist		2471.6	Clst	moist	SHOB-33 65-70	
70.0	2465						SHOB-33 70-75	
75.0	2460	<b>Boring completed at 75 ft.</b>		2459.1				TD = 75'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 34

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/20/06 12:23

DATE COMPLETED: 10/20/06 13:45

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-34R

COORDINATES: N: 438,808 E: 1,366,202

GROUND SURFACE ELEVATION: 2,516.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 250.0 ft

BOTTOM ELEVATION: 2,266.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2515	0.0 - 5.0 Dk. olive brown (2.5Y, 3/3) SILT, dry to sli. moist (except for wet at surface)		2516.9 0.0 2511.9 5.0	ML	wet dry to sli. moist	SHOB-34 0-5	Approx. 200 gallons of drill water used
5.0	2510	5.0 - 17.0 Pale yellow (2.5Y, 7/4) silty SAND, sli. moist		2499.9 17.0	SM	sli. moist	SHOB-34 5-10 SHOB-34 10-15 + BD-RT-16	
10.0	2505			2494.9 22.0	MH		SHOB-34 15-20	
15.0	2500	17.0 - 22.0 Grayish brown (2.5Y, 5/2) clayey SILT					SHOB-34 20-25	
20.0	2495			2481.9 35.0	Clst	sli. moist to moist	SHOB-34 25-30	
25.0	2490	22.0 - 35.0 V. dk. grayish brown (2.5Y, 3/2) silty CLAYSTONE, sli. moist to moist					SHOB-34 30-35	
30.0	2485			2476.9 40.0	Clst		SHOB-34 35-40	
35.0	2480	35.0 - 40.0 Dk. bluish gray (Gley2, 4/10B) silty CLAYSTONE, sli. moist to moist					SHOB-34 40-45	
40.0	2475			2461.9 55.0	Ss	sli. moist	SHOB-34 45-50	
45.0	2470	40.0 - 55.0 Dk. gray (5Y, 4/1) SANDSTONE, sli. moist					SHOB-34 50-55	
50.0	2465							Began using water to drill at 55', moisture contents below this depth are N/A Driller confirmed coal from 55'-74'
55.0	2460	55.0 - 75.0 Black COAL			COAL			
60.0	2455			2441.9 75.0	Stst	N/A	SHOB-34 75-80	
65.0	2450	75.0 - 85.0 Gray (2.5Y, 5/1) SILTSTONE, some fine sand					SHOB-34 80-85	
70.0	2445			2431.9 85.0	Ss		SHOB-34 85-90	
75.0	2440						SHOB-34 90-95	
80.0	2435	85.0 - 160.0 Gray (2.5Y, 5/1) silty SANDSTONE, mostly fine grained, some med. grained					SHOB-34 95-100	
85.0	2430							
90.0	2425							
95.0	2420							
100.0								

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

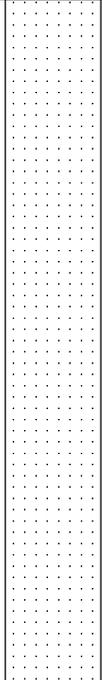
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 34

RECORD OF BORING SHOB-34R

COORDINATES: N: 438,808 E: 1,366,202

GROUND SURFACE ELEVATION: 2,516.9 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2415	85.0 - 160.0 Gray (2.5Y, 5/1) silty SANDSTONE, mostly fine grained, some med. grained <i>continued from previous page</i>			Ss	N/A	SHOB-34 100-105	
105.0	2410			SHOB-34 105-110				
110.0	2405			SHOB-34 110-115				
115.0	2400			SHOB-34 115-120				
120.0	2395			120'-160' tr. coal			SHOB-34 120-125	
125.0	2390			SHOB-34 125-130				
130.0	2385			SHOB-34 130-135				
135.0	2380			SHOB-34 135-140				
140.0	2375			SHOB-34 140-145				
145.0	2370			SHOB-34 145-150				
150.0	2365			SHOB-34 150-155				
155.0	2360			SHOB-34 155-160				
160.0	2355			160.0 - 165.0 V. dk. gray (2.5Y, 3/1) silty CLAYSTONE, tr. coal				
165.0	2350	165.0 - 175.0 V. dk. gray (2.5Y, 3/1) silty CLAYSTONE, some coal (20-30%), tr. shale		2351.9 165.0	Clst/COAL	SHOB-34 165-170		
170.0	2345	175.0 - 180.0 Dk. gray (2.5Y, 4/1) CLAYSTONE, tr. coal		2341.9 175.0	Clst	SHOB-34 175-180		
175.0	2340	180.0 - 190.0 Dk. gray (2.5Y, 4/1) sandy CLAYSTONE, tr. coal		2336.9 180.0	Clst	SHOB-34 180-185		
180.0	2335	190.0 - 220.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE, tr. shale -interbedded with- sandy CLAYSTONE		2326.9 190.0	Ss/Clst	SHOB-34 185-190		
185.0	2330	SHOB-34 190-195 + BD-RT-17				SHOB-34 195-200		
190.0	2325	SHOB-34 200-205				SHOB-34 205-210		
195.0	2320	SHOB-34 210-215				SHOB-34 215-220		
200.0	2315	SHOB-34 215-220				SHOB-34 220-225		
205.0	2310							
210.0	2305							
215.0	2300							
220.0	2295	220.0 - 225.0 SANDSTONE and CLAYSTONE as		2296.9 220.0	Ss/Clst			
225.0	2290			2291.9				

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 34

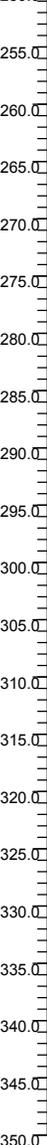
RECORD OF BORING **SHOB-34R**

COORDINATES: N: 438,808 E: 1,366,202

GROUND SURFACE ELEVATION: 2,516.9 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
225.0	2290	above, little coal		225.0	Ss/Clst	N/A	SHOB-34 225-230	
230.0	2285	225.0 - 240.0 SANDSTONE and CLAYSTONE as above, some coal		2276.9			SHOB-34 230-235	
235.0	2280		240.0	SHOB-34 235-240				
240.0	2275	240.0 - 250.0 Dk. gray (2.5Y, 4/1) clayey SANDSTONE, tr. coal	240.0	SHOB-34 240-245				
245.0	2270			2266.9	Ss		SHOB-34 245-250	
250.0		<b>Boring completed at 250 ft.</b>			250.0			TD = 250'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 35

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/25/06 08:28

DATE COMPLETED: 10/25/06 09:04

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-35R

COORDINATES: N: 438,569 E: 1,374,125

GROUND SURFACE ELEVATION: 2,502.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

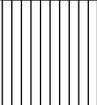
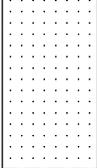
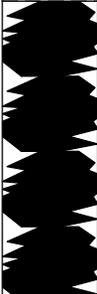
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 85.0 ft

BOTTOM ELEVATION: 2,417.2 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2500	0.0 - 10.0 Grayish brown SILT, little fine sand, sli. moist to moist		2502.2	ML	sli. moist to moist	SHOB-35 0-5	
5.0	2495			0.0			SHOB-35 5-10	
10.0	2490	10.0 - 15.0 Olive brown silty CLAY, moist		2492.2	CL		SHOB-35 10-15 + BD-RT-18	Driller began using water at 45' (total of <100 gallons used) Driller confirmed coal from 48'-71'
15.0	2485	15.0 - 25.0 Dk. grayish brown sandy CLAY, moist		2487.2	CLS		SHOB-35 15-20	
20.0	2480						SHOB-35 20-25	
25.0	2475	25.0 - 30.0 Dk. gray sandy CLAYSTONE, moist		2477.2	Clst	moist	SHOB-35 25-30	
30.0	2470	30.0 - 45.0 Dk. gray clayey SANDSTONE, v. fine grained, mottled w/ dk. brown similar material, moist		2472.2	Ss		SHOB-35 30-35	
35.0	2465			30.0			SHOB-35 35-40	
40.0	2460			30.0			SHOB-35 40-45	
45.0	2455	45.0 - 71.0 Black COAL		2457.2	COAL	N/A	SHOB-35 45-50	
50.0	2450						SHOB-35 50-55	
55.0	2445						SHOB-35 55-60	
60.0	2440						SHOB-35 60-65	
65.0	2435						SHOB-35 65-70	
70.0	2430	71.0 - 85.0 Gray CLAYSTONE		2431.2	Clst		SHOB-35 70-75	
75.0	2425			71.0			SHOB-35 75-80	
80.0	2420			71.0			SHOB-35 80-85	
85.0		<b>Boring completed at 85 ft.</b>		2417.2				TD = 85'
				85.0				

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

SHEET 1 of 1

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 36

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/27/06 08:33

DATE COMPLETED: 10/27/06 09:06

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-36R

COORDINATES: N: 437,598 E: 1,360,883

GROUND SURFACE ELEVATION: 2,585.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,480.1 ft

HOLE DIAMETER: 5 inches

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2585	0.0 - 10.0 Lt. yellowish brown SAND, med. grained, little silt, sli. moist		2585.1 0.0	SP	sli. moist	SHOB-36 0-5	
5.0	2580			2575.1 10.0	SP		SHOB-36 5-10 + BD-JE-33	
10.0	2575	10.0 - 15.0 Dk. brown SAND, med. grained, some silt, sli. moist		2570.1 15.0	Ss/COAL		SHOB-36 10-15	
15.0	2570	15.0 - 20.0 Med. brown SANDSTONE, fine grained, interbedded w/ COAL, dry to sli. moist		2565.1 20.0		SHOB-36 15-20		
20.0	2565	20.0 - 50.0 Lt. yellowish brown SANDSTONE, fine grained, some silt, dry to sli. moist			Ss	dry to sli. moist	SHOB-36 20-25	
25.0	2560					SHOB-36 25-30		
30.0	2555					SHOB-36 30-35		
35.0	2550					SHOB-36 35-40		
40.0	2545					SHOB-36 40-45		
45.0	2540					SHOB-36 45-50		
50.0	2535	50.0 - 60.0 SANDSTONE as above interbedded w/ dk. gray SILTSTONE, moist		2535.1 50.0	Ss/Siltst	moist	SHOB-36 50-55	Sandstone slough from 20'-50' mixes with all samples below 50'
55.0	2530						SHOB-36 55-60	
60.0	2525	60.0 - 75.0 Dk. gray SILTSTONE, some clay, moist		2525.1 60.0	Siltst		SHOB-36 60-65	
65.0	2520						SHOB-36 65-70	
70.0	2515						SHOB-36 70-75	
75.0	2510	75.0 - 78.0 SILTSTONE as above and black COAL, moist		2510.1 75.0 2507.1 78.0	Siltst/COAL	dry	SHOB-36 75-80	Driller confirmed coal from 78'-95'
80.0	2505	78.0 - 95.0 Black COAL, dry			COAL		SHOB-36 80-85	
85.0	2500						SHOB-36 85-90	
90.0	2495						SHOB-36 90-95	
95.0	2490	95.0 - 100.0 Black COAL and lt. gray SILTSTONE,		2490.1 95.0 2485.1	COAL/Siltst	moist	SHOB-36 95-100	

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 36

RECORD OF BORING **SHOB-36R**

COORDINATES: N: 437,598 E: 1,360,883

GROUND SURFACE ELEVATION: 2,585.1 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2485	moist 100.0 - 105.0 Med. gray SANDSTONE, med. grained, moist to wet		100.0	Ss	moist to wet	SHOB-36 100-105	TD = 105'
105.0				2480.1				
				105.0				
110.0								
115.0								
120.0								
125.0								
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 37

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/27/06 07:28

DATE COMPLETED: 10/27/06 08:03

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-37R

COORDINATES: N: 437,534 E: 1,363,512

GROUND SURFACE ELEVATION: 2,564.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 95.0 ft

BOTTOM ELEVATION: 2,469.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0		0.0 - 5.0 Lt. brown CLAY, sli. moist		2564.9 0.0	CL	sli. moist	SHOB-37 0-5	
5.0	2560	5.0 - 10.0 Dk. greenish gray and yellowish brown CLAY, little silt, moist		2559.9 5.0	CL		SHOB-37 5-10	
10.0	2555	10.0 - 20.0 Dk. greenish gray CLAY interbedded w/ COAL, little silt, moist		2554.9 10.0	CL/COAL	moist	SHOB-37 10-15	
15.0	2550						SHOB-37 15-20 + BD-JE-32	
20.0	2545	20.0 - 25.0 Lt. gray to med. gray CLAYSTONE, moist		2544.9 20.0	Clst		SHOB-37 20-25	
25.0	2540	25.0 - 30.0 Yellowish brown SANDSTONE, fine grained, moist to v. moist		2539.9 25.0	Ss		SHOB-37 25-30	
30.0	2535			2534.9 30.0		moist to v. moist	SHOB-37 30-35	
35.0	2530	30.0 - 40.0 SANDSTONE as above interbedded w/ lt. gray SILTSTONE, moist to v. moist			Ss/Siltst		SHOB-37 35-40	
40.0	2525	40.0 - 45.0 Med. brown SILTSTONE interbedded w/ some lt. gray claystone, wet		2524.9 40.0	Siltst	wet	SHOB-37 40-45	
45.0	2520			2519.9 45.0			SHOB-37 45-50	
50.0	2515	45.0 - 50.0 SILTSTONE as above interbedded w/ some sandstone		2514.9 50.0		moist	SHOB-37 50-55	
55.0	2510	50.0 - 60.0 Lt. gray to med. gray SANDSTONE, med. grained, moist			Ss		SHOB-37 55-60	
60.0	2505			2504.9 60.0				
65.0	2500	60.0 - 65.0 SANDSTONE as above interbedded w/ lt. gray SILTSTONE, wet		2499.9 65.0	Ss/Siltst	wet	SHOB-37 60-65	Driller confirmed coal from 65'-81'
70.0	2495	65.0 - 81.0 Black COAL, dry to sli. moist			COAL	dry to sli. moist	SHOB-37 65-70	
75.0	2490						SHOB-37 70-75	
80.0	2485			2483.9 81.0			SHOB-37 75-80	
85.0	2480	81.0 - 85.0 Dk. greenish gray CLAYSTONE and COAL, moist to wet		2479.9 85.0	Clst/COAL	moist to wet	SHOB-37 80-85	
90.0	2475	85.0 - 90.0 Lt. gray SILTSTONE, some clay, moist to wet		2474.9 90.0	Siltst		SHOB-37 85-90	
95.0	2470	90.0 - 95.0 Med. gray and dk. greenish gray silty SANDSTONE, fine grained, moist		2469.9 95.0	Ss	moist	SHOB-37 90-95	TD = 95'

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 38

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 12:37

DATE COMPLETED: 10/26/06 12:58

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-38R

COORDINATES: N: 437,522 E: 1,364,827

GROUND SURFACE ELEVATION: 2,539.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,469.5 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0		0.0 - 5.0 Olive brown clayey SILT, tr. sand, moist		2539.5 0.0	ML	moist	SHOB-38 0-5	
5.0	2535	5.0 - 10.0 Lt. yellowish brown SAND, fine to v. fine grained, sli. moist		2534.5 5.0	SP		SHOB-38 5-10	
10.0	2530	10.0 - 15.0 Gray SAND, fine to v. fine grained, sli. moist		2529.5 10.0	SP		SHOB-38 10-15 + BD-RT-29	
15.0	2525	15.0 - 20.0 Grayish brown clayey SILTSTONE, sli. moist		2524.5 15.0	Siltst	sli. moist	SHOB-38 15-20	
20.0	2520	20.0 - 40.0 Olive gray SANDSTONE, v. fine to fine grained, tr. hard, lt. gray sandstone, sli. moist		2519.5 20.0	Ss		SHOB-38 20-25	
25.0	2515	30' changes from sli. moist to moist					SHOB-38 25-30	
30.0	2510						SHOB-38 30-35	
35.0	2505						SHOB-38 35-40	
40.0	2500	40.0 - 42.0 Rust colored SANDSTONE		2499.5 40.0	Ss		SHOB-38 40-45	Driller confirmed coal from 42'-58'
45.0	2495	42.0 - 58.0 Black COAL, dry to sli. moist		2497.5 42.0	COAL		SHOB-38 45-50	
50.0	2490						SHOB-38 50-55	
55.0	2485						SHOB-38 55-60	
60.0	2480	58.0 - 60.0 Gray silty CLAYSTONE, moist		2481.5 58.0	Clst		SHOB-38 60-65	Driller confirmed water near 60'
65.0	2475	60.0 - 70.0 Gray silty CLAYSTONE, little v. fine sand, wet		2479.5 60.0	Clst	wet	SHOB-38 65-70	
70.0	2470	<b>Boring completed at 70 ft.</b>		70.0				TD = 70'

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 39

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/25/06 09:26

DATE COMPLETED: 10/25/06 09:55

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-39R

COORDINATES: N: 437,289 E: 1,372,764

GROUND SURFACE ELEVATION: 2,517.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,437.4 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2515	0.0 - 5.0 Grayish brown sandy SILT, sli. moist		2517.4 0.0	ML	sli. moist	SHOB-39 0-5	
5.0	2510	5.0 - 8.0 Lt. olive brown SAND, v. fine grained, sli. moist to moist		2512.4 5.0	SP		SHOB-39 5-10	
10.0	2505	8.0 - 15.0 Gray sandy CLAY, sli. moist to moist		2509.4 8.0	CLS		SHOB-39 10-15	
15.0	2500	15.0 - 40.0 Dk. brownish gray SILTSTONE, some v. fine sand, sli. moist to moist		2502.4 15.0	Stst	sli. moist to moist	SHOB-39 15-20 + BD-RT-19	
20.0	2495						SHOB-39 20-25	
25.0	2490						SHOB-39 25-30	
30.0	2485						SHOB-39 30-35	
35.0	2480						SHOB-39 35-40	
40.0	2475	40.0 - 49.0 Dk. gray SANDSTONE, fine grained, sli. moist to moist		2477.4 40.0	Ss		SHOB-39 40-45	
45.0	2470						SHOB-39 45-50	Driller confirmed coal from 49'-68'
50.0	2465	49.0 - 70.0 Black COAL, sli. moist to moist, becomes wet near 60'		2468.4 49.0	COAL		SHOB-39 50-55	
55.0	2460						SHOB-39 55-60	Driller confirmed water near 60'
60.0	2455						SHOB-39 60-65	
65.0	2450						SHOB-39 65-70	
70.0	2445	70.0 - 75.0 COAL and dk. gray CLAYSTONE, little sand, wet		2447.4 70.0	COAL/Clst	wet	SHOB-39 70-75	
75.0	2440	75.0 - 80.0 Dk. gray CLAYSTONE, little sand, wet		2442.4 75.0	Clst		SHOB-39 75-80	
80.0		<b>Boring completed at 80 ft.</b>		2437.4 80.0				TD = 80'

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 40

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/27/06 09:32

DATE COMPLETED: 10/27/06 09:52

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-40R

COORDINATES: N: 436,311 E: 1,359,525

GROUND SURFACE ELEVATION: 2,564.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

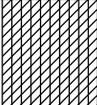
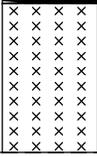
DATUM: NAD 27

HORIZONTAL UNITS: Feet

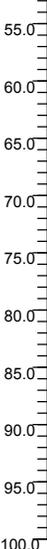
TOTAL DEPTH: 50.0 ft

BOTTOM ELEVATION: 2,514.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0		0.0 - 5.0 Lt. yellowish brown SAND, little clay, dry		2564.9 0.0	SP	dry	SHOB-40 0-5	Sand slough from 0-5' mixes with all samples below 5'
5.0	2560	5.0 - 10.0 Med. gray CLAY, little silt, moist		2559.9 5.0	CL	moist	SHOB-40 5-10	
10.0	2555	10.0 - 20.0 Med. gray SILT and CLAY, moist		2554.9 10.0	CL-ML		SHOB-40 10-15	
15.0	2550						SHOB-40 15-20	
20.0	2545	20.0 - 21.0 Med. gray SANDSTONE, v. fine grained, dry to sli. moist		2544.9 20.0	Ss	dry to sli. moist	SHOB-40 20-25	Driller confirmed coal from 21'-37'
25.0	2540	21.0 - 37.0 Black COAL, dry to sli. moist		2543.9 21.0	COAL		SHOB-40 25-30	
30.0	2535						SHOB-40 30-35	
35.0	2530	37.0 - 50.0 Greenish gray SILTSTONE, some clay, moist		2527.9 37.0	Siltst	moist	SHOB-40 35-40	
40.0	2525						SHOB-40 40-45 + BD-JE-34	
45.0	2520						SHOB-40 45-50	
50.0	2515	<b>Boring completed at 50 ft.</b>			2514.9 50.0			TD = 50'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: R. Tolene  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 41

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/14/06 07:28

DATE COMPLETED: 10/14/06 08:49

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-41R

COORDINATES: N: 436,198 E: 1,363,463

GROUND SURFACE ELEVATION: 2,542.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 200.0 ft

BOTTOM ELEVATION: 2,342.5 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2540	0.0 - 8.0 Lt. olive brown (2.5Y, 5/6) clayey SILT, dry to sli. moist		2542.5 0.0	MH	dry to sli. moist	SHOB-41 0-5	
5.0	2535	8.0 - 11.0 Black COAL, sli. moist to moist		2534.5 8.0	COAL	sli. moist to moist	SHOB-41 5-10	
10.0	2530	11.0 - 15.0 Grayish brown (2.5Y, 5/2) CLAYSTONE, sli. moist to moist		2531.5 11.0	Clst		SHOB-41 10-15	
15.0	2525	15.0 - 20.0 Lt. olive brown (2.5Y, 5/4) silty CLAYSTONE and some claystone (15%) from above, sli. moist to moist		2527.5 15.0	Clst		SHOB-41 15-20	
20.0	2520	20.0 - 25.0 Black COAL, v. moist to wet		2522.5 20.0	COAL	v. moist to wet	SHOB-41 20-25 + BD-RT-07	
25.0	2515	25.0 - 35.0 Dk. gray (2.5Y, 4/1) silty CLAYSTONE, some v. fine sand, moist		2517.5 25.0	Clst	moist	SHOB-41 25-30	
30.0	2510	35.0 - 45.0 Dk. gray (5Y, 4/1) silty SANDSTONE, v. fine grained, moist		2507.5 35.0	Ss		SHOB-41 30-35	
35.0	2505	45.0 - 61.0 Black COAL, sli. moist		2497.5 45.0	COAL		SHOB-41 35-40	
40.0	2500	61.0 - 65.0 COAL from above and some dk. gray (5Y, 4/1) clayey sandstone, v. fine grained, wet		2481.5 61.0	COAL		SHOB-41 40-45	
45.0	2495	65.0 - 80.0 Dk. gray (5Y, 4/1) clayey SANDSTONE, v. fine grained becoming fine grained below 75 ft., moist		2477.5 65.0	Ss	wet	SHOB-41 65-70	
50.0	2490	80.0 - 85.0 SANDSTONE interbedded w/ CLAYSTONE and COAL		2462.5 80.0	Ss/Clst/COAL	moist	SHOB-41 70-75	
55.0	2485	85.0 - 90.0 Olive gray (5Y, 4/2) clayey SANDSTONE		2457.5 85.0	Ss		SHOB-41 75-80	
60.0	2480	90.0 - 95.0 Olive gray (5Y, 4/2) sandy CLAYSTONE		2447.5 90.0	Clst		SHOB-41 80-85	
65.0	2475			2442.5 95.0	Clst/Sh	N/A	SHOB-41 85-90	
70.0	2470						SHOB-41 90-95	
75.0	2465						SHOB-41 95-100	

Driller confirmed coal from 45'-61'

Driller begins using water at 80'  
 Total of 100-200 gallons used to drill  
 from 80'-200'

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 41

**RECORD OF BORING SHOB-41R**

COORDINATES: N: 436,198 E: 1,363,463

GROUND SURFACE ELEVATION: 2,542.5 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2440	95.0 - 100.0 CLAYSTONE as above interbedded w/ SHALE		100.0	Ss	N/A	SHOB-41 100-105	Driller says formation produces water below 100'
105.0	2435	100.0 - 125.0 Olive gray (5Y, 4/2) clayey SANDSTONE		SHOB-41 105-110				
110.0	2430			SHOB-41 110-115				
115.0	2425			SHOB-41 115-120				
120.0	2420			SHOB-41 120-125				
125.0	2415	125.0 - 155.0 Olive gray (5Y, 4/2) clayey SANDSTONE, v. fine grained		2417.5 125.0	Ss	N/A	SHOB-41 125-130	125'-155' cuttings recovered as slurry
130.0	2410			SHOB-41 130-135				
135.0	2405			SHOB-41 135-140				
140.0	2400			SHOB-41 140-145				
145.0	2395			SHOB-41 145-150				
150.0	2390		SHOB-41 150-155	155'-160' cuttings recovered as chips				
155.0	2385	155.0 - 159.0 Dk. gray (5Y, 4/1) clayey SANDSTONE	2387.5 155.0		Ss	SHOB-41 155-160	Driller confirmed coal stringer from 159'-162'	
160.0	2380	159.0 - 162.0 Black COAL	2383.5 159.0		COAL	SHOB-41 160-165		
165.0	2375	162.0 - 180.0 Dk. gray (5Y, 4/1) clayey SANDSTONE, tr. shale, tr. coal	2380.5 162.0		Ss	N/A	SHOB-41 165-170	
170.0	2370		SHOB-41 170-175					
175.0	2365		SHOB-41 175-180					
180.0	2360	180.0 - 185.0 SANDSTONE as above and COAL (30%)		2362.5 180.0	Ss/COAL	N/A	SHOB-41 180-185	
185.0	2355	185.0 - 200.0 Dk. gray (5Y, 4/1) clayey SANDSTONE, tr. shale, tr. coal		2357.5 185.0			SHOB-41 185-190	
190.0	2350			SHOB-41 190-195				
195.0	2345		SHOB-41 195-200	2342.5 200.0	Ss	N/A	TD = 200'	
200.0	2340	<b>Boring completed at 200 ft.</b>						

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 42

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/25/06 11:25

DATE COMPLETED: 10/25/06 12:00

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-42R

COORDINATES: N: 436,046 E: 1,370,055

GROUND SURFACE ELEVATION: 2,501.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,431.2 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				DEPTH (ft)					
0.0	2500	0.0 - 15.0 V. dk. grayish brown clayey SILT, sli. moist to moist		2501.2	MH	sli. moist to moist	SHOB-42 0-5 + BD-RT-21	Driller began using water at 10'	
5.0	2495			0.0			SHOB-42 5-10		
10.0	2490			15.0			SHOB-42 10-15		
15.0	2485	15.0 - 35.0 Dk. olive gray silty SANDSTONE		2486.2	Ss	N/A	SHOB-42 15-20		
20.0	2480			20.0			SHOB-42 20-25		
25.0	2475			25.0			SHOB-42 25-30		
30.0	2470			30.0			SHOB-42 30-35		
35.0	2465			35.0			SHOB-42 35-40		
40.0	2460	35.0 - 56.0 Black COAL		2466.2	COAL	N/A	SHOB-42 40-45		Driller confirmed coal from 37'-56'
45.0	2455						45.0		
50.0	2450						50.0	SHOB-42 50-55	
55.0	2445						55.0	SHOB-42 55-60	
60.0	2440	56.0 - 70.0 Dk. gray CLAYSTONE		2445.2	Clst	N/A	SHOB-42 60-65	TD = 70'	
65.0	2435						65.0		SHOB-42 65-70
70.0							70.0		

**Boring completed at 70 ft.**

TD = 70'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 43

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/25/06 10:14

DATE COMPLETED: 10/25/06 10:56

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-43R**

COORDINATES: N: 435,939 E: 1,374,054

GROUND SURFACE ELEVATION: 2,519.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 100.0 ft

BOTTOM ELEVATION: 2,419.2 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2519.2	0.0 - 5.0 Lt. grayish brown silty SAND, sli. moist		0.0	SM	sli. moist	SHOB-43 0-5	
5.0	2514.2	5.0 - 10.0 Dk. gray silty CLAYSTONE, sli. moist to moist		5.0	Clst	sli. moist to moist	SHOB-43 5-10	
10.0	2509.2	10.0 - 16.0 Dk. olive brown silty CLAYSTONE, sli. moist to moist		10.0	Clst		SHOB-43 10-15	
16.0	2503.2	16.0 - 18.0 Black COAL, wet		16.0	COAL	wet	SHOB-43 15-20 + BD-RT-20	Driller confirmed coal stringer from 16'-18' 20'-60' samples contain sand slough from above
18.0	2501.2	18.0 - 25.0 Dk. olive brown silty CLAYSTONE, wet		18.0	Clst		SHOB-43 20-25	
25.0	2494.2	25.0 - 30.0 CLAYSTONE as above w/ little coal, wet		25.0	Clst		SHOB-43 25-30	
30.0	2489.2	30.0 - 35.0 Dk. olive brown silty CLAYSTONE		30.0	Clst	N/A	SHOB-43 30-35	Driller began using water at 30'
35.0	2484.2	35.0 - 45.0 Dk. gray CLAYSTONE		35.0	Clst		SHOB-43 35-40	
45.0	2474.2	45.0 - 68.0 Dk. gray clayey SANDSTONE		45.0	Ss		SHOB-43 40-45	
68.0	2451.2	68.0 - 90.0 Black COAL		68.0	COAL		SHOB-43 45-50	
70.0	2445.2						SHOB-43 50-55	
75.0	2440.2						SHOB-43 55-60	
80.0	2435.2						SHOB-43 60-65	
85.0	2430.2						SHOB-43 65-70	Driller confirmed coal from 68'-84'
90.0	2429.2	90.0 - 100.0 Dk. gray CLAYSTONE and COAL from above		90.0	Clst/COAL	SHOB-43 70-75		
95.0	2425.2					SHOB-43 75-80		
100.0	2420.2						SHOB-43 80-85	
							SHOB-43 85-90	
							SHOB-43 90-95	
							SHOB-43 95-100	TD = 100'

Boring completed at 100 ft.

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 44

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/11/06 12:20

DATE COMPLETED: 10/11/06 13:20

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-44R

COORDINATES: N: 434,761 E: 1,368,692

GROUND SURFACE ELEVATION: 2,521.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 160.0 ft

BOTTOM ELEVATION: 2,361.8 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments		
				DEPTH (ft)						
0.0	2520	0.0 - 10.0 Olive brown (2.5Y, 4/3) silty CLAY, little fine sand, tr. fine gravel, sli. moist		2521.8	CL		SHOB-44 0-5	0'-20' drilled w/ water (samples for this interval were obtained from the corresponding core hole, SHOB-44C)		
5.0	2515			0.0					SHOB-44 5-10	
10.0	2510	10.0 - 40.0 Lt. olive brown (2.5Y, 5/3) SAND, fine to med. grained, sli. moist to moist		2511.8	SP	sli. moist to moist	SHOB-44 10-15	20'-40' drilled w/ air only (no water)		
15.0	2505			10.0					SHOB-44 15-20	
20.0	2500	25'-35' tr. coarse to v. coarse sand		2481.8			SHOB-44 20-25			
25.0	2495								40.0	SHOB-44 25-30
30.0	2490								45.0	SHOB-44 30-35
35.0	2485								45.0	SHOB-44 35-40
40.0	2480	40.0 - 45.0 Olive brown (2.5Y, 4/3) SANDSTONE, fine grained		2476.8	Ss		SHOB-44 40-45	40' and below, driller uses water Roughly 100 gallons of total water was used to drill this hole		
45.0	2475	45.0 - 63.0 Black (2.5Y, 2.5/1) COAL		2458.8	COAL		SHOB-44 60-65	Driller confirmed coal from 46'-63'		
50.0	2470								63.0	
55.0	2465	63.0 - 65.0 Dk. gray (2.5Y, 4/1) SILTSTONE		2456.8	Siltst		SHOB-44 65-70			
60.0	2460								65.0	
65.0	2455	65.0 - 80.0 Dk. gray (2.5Y, 3/1) CLAYSTONE		2441.8	Clst	N/A	SHOB-44 70-75			
70.0	2450								80.0	
75.0	2445	80.0 - 95.0 CLAYSTONE as above w/ some fine sand		2426.8	Clst		SHOB-44 75-80			
80.0	2440								95.0	SHOB-44 80-85
85.0	2435								95.0	SHOB-44 85-90
90.0	2430	95.0 - 100.0 Olive (2.5Y, 4/3) SANDSTONE, fine		2421.8	Ss		SHOB-44 90-95			
95.0	2425								95.0	SHOB-44 95-100

Log continued on next page

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

SHEET 1 of 2

PROJECT: South Heart Project

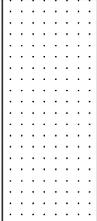
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 44

RECORD OF BORING **SHOB-44R**

COORDINATES: N: 434,761 E: 1,368,692

GROUND SURFACE ELEVATION: 2,521.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2420	grained 100.0 - 120.0 Dk. grayish brown (2.5Y, 4/2) silty SANDSTONE, v. fine grained, w/ tr. to little shale		100.0	Ss	N/A	SHOB-44 100-105	
105.0	2415			SHOB-44 105-110 + BD-RT-01				
110.0	2410			SHOB-44 110-115				
115.0	2405			SHOB-44 115-120				
120.0	2400	120.0 - 130.0 Dk. gray (2.5Y, 4/1) sandy CLAYSTONE		2401.8 120.0	Clst	N/A	SHOB-44 120-125	
125.0	2395			SHOB-44 125-130				
130.0	2390	130.0 - 135.0 Olive gray (2.5Y, 4/2) sandy CLAYSTONE interbedded w/ COAL		2391.8 130.0	Clst/COAL	N/A	SHOB-44 130-135	
135.0	2385			SHOB-44 135-140				
140.0	2380	135.0 - 140.0 CLAYSTONE as above interbedded w/ some coal (approximately 25%)		2381.8 135.0	Clst	N/A	SHOB-44 140-145	
145.0	2375			SHOB-44 145-150 + BD-RT-02				
150.0	2370	140.0 - 145.0 Dk. gray (5Y, 4/1) silty SANDSTONE		2376.8 145.0	Ss	N/A	SHOB-44 150-155	
155.0	2365			SHOB-44 155-160				
160.0	2361.8	<b>Boring completed at 160 ft.</b>		160.0				TD = 160'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 45

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/26/06 07:21

DATE COMPLETED: 10/26/06 07:43

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-45R

COORDINATES: N: 432,247 E: 1,364,634

GROUND SURFACE ELEVATION: 2,550.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,480.4 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2550	0.0 - 5.0 Grayish brown silty SAND, sli. moist		2550.4 0.0	SM	sli. moist	SHOB-45 0-5	
5.0	2545	5.0 - 10.0 Lt. olive gray SAND, v. fine grained, sli. moist		2545.4 5.0	SP		SHOB-45 5-10	
10.0	2540	10.0 - 20.0 Dk. olive brown sandy CLAYSTONE, sli. moist to moist		2540.4 10.0	Clst	sli. moist to moist	SHOB-45 10-15	
15.0	2535			2530.4 20.0			SHOB-45 15-20 + BD-RT-24	
20.0	2530	20.0 - 35.0 Olive gray SANDSTONE, v. fine to fine grained, tr. clay, sli. moist to moist			Ss		SHOB-45 20-25	
25.0	2525						SHOB-45 25-30	
30.0	2520						SHOB-45 30-35	
35.0	2515	35.0 - 40.0 SANDSTONE as above (85%) interbedded w/ some gray sandstone (15%), fine grained, moist		2515.4 35.0	Ss	moist	SHOB-45 35-40	
40.0	2510	40.0 - 56.0 Black COAL, moist		2510.4 40.0	COAL		SHOB-45 40-45	Driller confirmed coal from 42'-56'
45.0	2505						SHOB-45 45-50	
50.0	2500	50' changes from moist to wet					SHOB-45 50-55	Driller hits water near 50'
55.0	2495	56.0 - 70.0 Gray CLAYSTONE, wet		2494.4 56.0	Clst	wet	SHOB-45 55-60	
60.0	2490						SHOB-45 60-65	
65.0	2485						SHOB-45 65-70	
70.0		<b>Boring completed at 70 ft.</b>		2480.4 70.0				

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP.GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

SHEET 1 of 1

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 46

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/25/06 13:11

DATE COMPLETED: 10/25/06 13:45

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-46R

COORDINATES: N: 432,157 E: 1,367,294

GROUND SURFACE ELEVATION: 2,540.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 100.0 ft

BOTTOM ELEVATION: 2,440.4 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2540	0.0 - 5.0 Grayish brown SILT, tr. sand, sli. moist		2540.4 0.0	ML	sli. moist	SHOB-46 0-5	Driller confirmed coal stringer from 16'-19'
5.0	2535	5.0 - 16.0 Gray SILTSTONE, sli. moist		2535.4 5.0	Stst		SHOB-46 5-10	
10.0	2530	10' changes from sli. moist to moist		2524.4	COAL	SHOB-46 10-15 + BD-RT-22		
15.0	2525	16.0 - 19.0 Black COAL, moist		16.0 2521.4	COAL	SHOB-46 15-20		
20.0	2520	19.0 - 25.0 Lt. olive brown silty SANDSTONE, tr. shale, moist		19.0	Ss	SHOB-46 20-25		
25.0	2515	25.0 - 40.0 V. dk. brownish gray CLAYSTONE, some silt, moist		2515.4 25.0	Clst	SHOB-46 25-30		
30.0	2510					SHOB-46 30-35		
35.0	2505					SHOB-46 35-40		
40.0	2500	40.0 - 50.0 Dk. gray clayey SANDSTONE, moist		2500.4 40.0	Ss	SHOB-46 40-45		
45.0	2495					SHOB-46 45-50		
50.0	2490	50.0 - 65.0 Dk. gray SANDSTONE, tr. clay, moist		2490.4 50.0	Ss	SHOB-46 50-55		
55.0	2485					SHOB-46 55-60		
60.0	2480					SHOB-46 60-65	Driller begins using water at 60'. Cuttings become wet just before using water.	
65.0	2475	65.0 - 85.0 Black COAL		2475.4 65.0	COAL	SHOB-46 65-70	Driller confirmed coal from 67'-85'	
70.0	2470					SHOB-46 70-75		
75.0	2465					SHOB-46 75-80		
80.0	2460					SHOB-46 80-85		
85.0	2455	85.0 - 100.0 Gray silty CLAYSTONE, little coal		2455.4 85.0	Clst	SHOB-46 85-90		
90.0	2450					SHOB-46 90-95		
95.0	2445					SHOB-46 95-100		
100.0		<b>Boring completed at 100 ft.</b>		2440.4				TD = 100'

OB\_GNPP\_SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 47

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/13/06 10:01

DATE COMPLETED: 10/13/06 11:24

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-47R

COORDINATES: N: 430,880 E: 1,365,958

GROUND SURFACE ELEVATION: 2,535.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 210.0 ft

BOTTOM ELEVATION: 2,325.9 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2535	0.0 - 5.0 Lt. yellowish brown (2.5Y, 6/3) SILT, little sand, dry to sli. moist		2535.9 0.0	ML	dry to sli. moist	SHOB-47 0-5	
5.0	2530	5.0 - 15.0 Grayish brown (2.5Y, 5/2) clayey SILT, sli. moist to moist		2530.9 5.0	MH	sli. moist to moist	SHOB-47 5-10 SHOB-47 10-15	
15.0	2520	15.0 - 20.0 Lt. olive brown (2.5Y, 5/3) silty SAND, sli. moist to moist		2520.9 15.0	SM		SHOB-47 15-20	
20.0	2515	20.0 - 40.0 Dk. grayish brown (2.5Y, 4/2) SANDSTONE, fine grained, moist		2515.9 20.0	Ss	moist	SHOB-47 20-25 + BD-RT-06 SHOB-47 25-30 SHOB-47 30-35 SHOB-47 35-40	
40.0	2495	40.0 - 56.0 Black COAL, wet		2495.9 40.0	COAL			40 feet: Driller hits water at top of coal Driller confirmed coal from 40'-56'
56.0	2480	56.0 - 60.0 Dk. gray (2.5Y, 4/1) CLAYSTONE and COAL, wet		2479.9 56.0	Clst	wet	SHOB-47 55-60	
60.0	2475	60.0 - 70.0 Dk. gray (2.5Y, 4/1) CLAYSTONE, some sand, little to some coal (decreasing w/ depth), wet		2475.9 60.0	Clst		SHOB-47 60-65 SHOB-47 65-70	coal from 60'-70' is likely slough from above
70.0	2465	70.0 - 75.0 Dk. gray (2.5Y, 4/1) SHALE, wet		2465.9 70.0	Sh		SHOB-47 70-75	
75.0	2460	75.0 - 90.0 Gray (5Y, 5/1) silty CLAYSTONE, tr. sand, wet		2460.9 75.0	Clst		SHOB-47 75-80	
90.0	2445	90.0 - 100.0 CLAYSTONE as above w/ little olive (5Y, 5/3) shale		2445.9 90.0	Clst	N/A	SHOB-47 80-85 SHOB-47 85-90 SHOB-47 90-95 SHOB-47 95-100	Driller began using water at 80'

Log continued on next page

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ\_GNPP\_GDT\_4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 47

RECORD OF BORING SHOB-47R

COORDINATES: N: 430,880 E: 1,365,958

GROUND SURFACE ELEVATION: 2,535.9 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2435	100.0 - 185.0 Dk. gray (5Y, 4/1) sandy CLAYSTONE, tr. shale, tr. coal		100.0	Clst	N/A	SHOB-47 100-105	
105.0	2430							
110.0	2425							
115.0	2420							
120.0	2415							
125.0	2410							
130.0	2405							
135.0	2400							
140.0	2395							
145.0	2390							
150.0	2385							
155.0	2380							
160.0	2375							
165.0	2370							
170.0	2365							
175.0	2360	180' color changes to v. dk. grayish brown (2.5Y, 3/2)		2350.9	Clst/COAL		SHOB-47 180-185	Driller says coal was from 185'-197' This is not obvious from samples due to mixing caused by air rotary technique when drilling at depths
185.0	2350							
190.0	2345							
195.0	2340							
195.0	2340	195.0 - 200.0 Black COAL (90%) w/ little claystone from above (10%)		2340.9	COAL			
200.0	2335	200.0 - 205.0 CLAYSTONE from above (50%) and black COAL (50%)		2335.9	COAL/Clst	SHOB-47 200-205		
205.0	2330	205.0 - 210.0 CLAYSTONE from above (80%) w/ some black coal (20%)		2330.9	Clst		SHOB-47 205-210	TD = 210'
210.0	2325.9	210.0						

**Boring completed at 210 ft.**

OB, GNPP, SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 48

DRILL RIG: Portadrill 524

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/25/06 14:15

DATE COMPLETED: 10/25/06 15:07

DRILLING FLUIDS: None

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-48R**

COORDINATES: N: 430,797 E: 1,368,569

GROUND SURFACE ELEVATION: 2,550.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 150.0 ft

BOTTOM ELEVATION: 2,400.4 ft

HOLE DIAMETER: 5 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
0.0	2550	0.0 - 5.0 Olive brown silty CLAY, tr. rust colored shale, tr. black claystone, moist		2550.4 0.0	CL	moist	SHOB-48 0-5 + BD-RT-23	Water coming from coal seam between 25' and 30'. Moisture content below 25' is affected by natural water flowing in from above.
5.0	2545	5.0 - 10.0 Lt. gray SANDSTONE, <1' layer of dry, v. hard sandstone around 7', moist		2545.4 5.0	Ss	dry	SHOB-48 5-10	
10.0	2540	10.0 - 25.0 Dk. gray SILTSTONE, moist		2540.4 10.0	Siltst	moist	SHOB-48 10-15	
15.0	2535						SHOB-48 15-20	
20.0	2530						SHOB-48 20-25	
25.0	2525	25.0 - 30.0 Black COAL (75%) w/ some dk. gray siltstone (25%), moist to v. moist		2525.4 25.0	COAL	moist to v. moist	SHOB-48 25-30	
30.0	2520	30.0 - 45.0 Dk. gray SILTSTONE, wet		2520.4 30.0	Siltst		SHOB-48 30-35	
35.0	2515						SHOB-48 35-40	
40.0	2510						SHOB-48 40-45	
45.0	2505	45.0 - 55.0 Greenish gray clayey SILTSTONE, tr. shale, tr. coal, wet		2505.4 45.0	Siltst		SHOB-48 45-50	
50.0	2500						SHOB-48 50-55	
55.0	2495	55.0 - 65.0 SILTSTONE as above (70%) w/ some coal (30%), wet		2495.4 55.0	Siltst		SHOB-48 55-60	
60.0	2490						SHOB-48 60-65	
65.0	2485	65.0 - 70.0 Dk. olive gray silty SANDSTONE, v. fine grained, little clay, wet		2485.4 65.0	Ss	wet	SHOB-48 65-70	
70.0	2480	70.0 - 75.0 Dk. olive gray SILTSTONE, wet		2480.4 70.0	Siltst		SHOB-48 70-75	
75.0	2475	75.0 - 90.0 Dk. brownish gray clayey SILTSTONE, wet		2475.4 75.0	Siltst		SHOB-48 75-80	
80.0	2470						SHOB-48 80-85	
85.0	2465						SHOB-48 85-90	
90.0	2460	90.0 - 115.0 Gray silty SANDSTONE, wet		2460.4 90.0	Ss		SHOB-48 90-95	
95.0	2455						SHOB-48 95-100	
100.0	2450							

Log continued on next page

OB\_GNPP\_SH\_OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

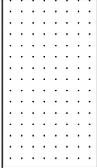
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 48

**RECORD OF BORING SHOB-48R**

COORDINATES: N: 430,797 E: 1,368,569

GROUND SURFACE ELEVATION: 2,550.4 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				DEPTH (ft)				
100.0	2450	90.0 - 115.0 Gray silty SANDSTONE, wet <i>continued from previous page</i>			Ss		SHOB-48 100-105	110'-115' chunks of v. hard SANDSTONE
105.0	2445						SHOB-48 105-110	
110.0	2440						SHOB-48 110-115	
115.0	2435	115.0 - 120.0 SANDSTONE as above w/ some coal		2435.4 115.0	Ss		SHOB-48 115-120	
120.0	2430	120.0 - 137.5 Black COAL, wet		2430.4 120.0	COAL	wet	SHOB-48 120-125	
125.0	2425						SHOB-48 125-130	
130.0	2420						SHOB-48 130-135	
135.0	2415						SHOB-48 135-140	
140.0	2410	137.5 - 150.0 Gray silty CLAYSTONE, wet		2412.9 137.5	Clst		SHOB-48 140-145	
145.0	2405						SHOB-48 145-150	
150.0	2400.4			150.0				

**Boring completed at 150 ft.**

TD = 150'

OB\_GNPP\_SH\_OB\_AND\_MW\_UPDATED\_SURVEY\_DATA\_4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Marcus Lang

GEOLOGIST: J. Elliott  
 CHECKED: R. Tolene  
 DATE: 2/2/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 101

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 14:25

DATE COMPLETED: 10/07/07 15:04

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-101R**

COORDINATES: N: 445,511 E: 1,361,125

GROUND SURFACE ELEVATION: 2,568.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,463.8 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0		0.0 - 2.5 Olive gray (5Y, 4/1) Silty CLAY, sli. moist to moist		2566.3	CL		SHOB-101 0-2.5	
5.0	2565	2.5 - 5.5 Olive gray (5Y, 4/1) Silty CLAYSTONE, sli. moist to moist		2563.3	Clst	sli. moist to moist	SHOB-101 2.5-5	
10.0	2560	5.5 - 10.0 Black (N1) COAL, sli. moist		2558.8	Coal	sli. moist	SHOB-101 5-7.5	
15.0	2555	10.0 - 26.0 Olive gray (5Y, 4/1) Silty CLAYSTONE, moist			Clst	moist	SHOB-101 7.5-10	
20.0	2550						SHOB-101 10-12.5	
25.0	2545	12.5' Color changes to olive black (5Y, 2/1)		2542.8			SHOB-101 12.5-15	Driller began using water at 20'
30.0	2540	15' Color changes to lt. olive gray (5Y, 6/1)		2540.8	Coal		SHOB-101 15-17.5	
35.0	2535	17.5' Color changes to olive gray (5Y, 4/1)		2533.8			SHOB-101 17.5-20	Driller confirmed coal from 26'-28'
40.0	2530	20' Color changes to olive black (5Y, 2/1)					SHOB-101 20-25	
45.0	2525	26.0 - 28.0 Black (N1) COAL			Clst		SHOB-101 25-30	
50.0	2520	28.0 - 35.0 Olive gray (5Y, 4/1), clayey SILTSTONE					SHOB-101 30-35	
55.0	2515	35.0 - 55.0 Med. gray (N5), Silty CLAYSTONE		2513.8			SHOB-101 35-40	
60.0	2510	55.0 - 74.0 Med. dark gray (N4), clayey SILTSTONE, some very fine grained sand				N/A	SHOB-101 40-45	
65.0	2505						SHOB-101 45-50 + BD-SAH-48	
70.0	2500						SHOB-101 50-55	
75.0	2495	74.0 - 92.0 Black (N1) COAL		2494.8			SHOB-101 55-60	
80.0	2490						SHOB-101 60-65	
85.0	2485						SHOB-101 65-70	
90.0	2480			2476.8			SHOB-101 70-75	Driller confirmed coal from 74'-92', circulation was lost at 74'
95.0	2475	92.0 - 105.0 Med. dark gray (N4), clayey SILTSTONE					SHOB-101 75-80	
100.0	2470						SHOB-101 80-85	
							SHOB-101 85-90	
							SHOB-101 90-95	
							SHOB-101 95-100	

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 101

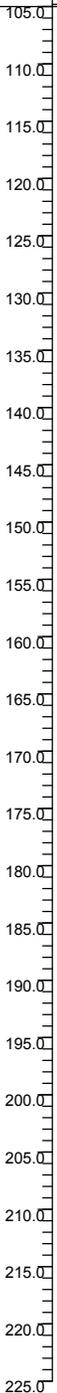
**RECORD OF BORING SHOB-101R**

COORDINATES: N: 445,511 E: 1,361,125

GROUND SURFACE ELEVATION: 2,568.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2465		x x x x x x x x x x x x x x x x x x x x	2463.8	Siltst	N/A	SHOB-101 100-105	TD=105'

**Boring completed at 105 ft.**



OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 102

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/08/07 07:17

DATE COMPLETED: 10/08/07 07:43

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-102R**

COORDINATES: N: 445,455 E: 1,363,760

GROUND SURFACE ELEVATION: 2,540.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 65.0 ft

BOTTOM ELEVATION: 2,475.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2540	0.0 - 2.5 Mod. olive brown (5Y, 4/4), SILT, dry		2537.9	ML	Dry	SHOB-102 0-2.5	
5.0	2535	2.5 - 7.5 Dusky yellow (5Y, 6/4), SILTSTONE interbedded w/ pale olive (10Y, 6/2), carbonaceous SHALE, dry		2532.9	Siltst		SHOB-102 2.5-5	
10.0	2530	7.5 - 12.5 Pale olive (10Y, 6/2) and Lt. olive Brown (5Y, 5/6) CLAYSTONE		2527.9	Clst		SHOB-102 5-7.5	
15.0	2525	12.5 - 35.0 Olive gray (5Y, 4/1), SILTSTONE w/ some clay			Siltst		SHOB-102 7.5-10	Driller began using water at 15'
20.0	2520	15' color changed to Light olive gray (5Y, 3/2)					SHOB-102 10-12.5	
25.0	2515						SHOB-102 12.5-15 + BD-SAH-49	
30.0	2510						SHOB-102 15-17.5	
35.0	2505			2505.4			SHOB-102 17.5-20	
40.0	2500	35.0 - 50.0 Black (N1) COAL			Coal	N/A	SHOB-102 20-25	Sample SHOB-102 30-35' has some gravel sized coal peices (<3%)  Driller cofirmed coal from 35'-52'
45.0	2495						SHOB-102 25-30	
50.0	2490			2490.4			SHOB-102 30-35	
55.0	2485	50.0 - 55.0 Black (N1) COAL and Med. olive gray (5Y, 5/1), clayey SILTSTONE		2485.4			Coal/Siltst	
60.0	2480	55.0 - 65.0 Med. olive gray (5Y, 5/1), clayey SILTSTONE		2475.4	Siltst		SHOB-102 40-45	
65.0		<b>Boring completed at 65 ft.</b>					SHOB-102 45-50	TD=65'
70.0							SHOB-102 50-55	
75.0							SHOB-102 55-60	
80.0							SHOB-102 60-65	

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 103

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/08/07 08:01

DATE COMPLETED: 10/08/07 08:34

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-103R**

COORDINATES: N: 443,681 E: 1,365,044

GROUND SURFACE ELEVATION: 2,570.3 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,465.3 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2570	0.0 - 2.5 Pale yellowish brown (10YR, 6/2), SILT, sli. moist		2567.8	ML	Sli. moist	SHOB-103 0-2.5	
5.0	2565	2.5 - 7.5 Mod. yellow brown (10YR, 5/4), very fine grained SAND with silt, dark yellowish orange weathering spots, dry		2562.8	SM	Dry	SHOB-103 2.5-5 SHOB-103 5-7.5	Driller confirmed coal stringer 7'-13'
10.0	2560	7.5 - 12.5 Black (N1) COAL, about 10% weathered dark orange		2555.3	Coal		SHOB-103 7.5-10	
15.0	2555	12.5 - 15.0 Dark yellowish brown (10YR, 4/2) CLAYSTONE mixed with above coal		2550.3	Clst		SHOB-103 10-12.5	Sample SHOB-103 15-17.5' is contaminated/ interbedded with coal
20.0	2550	15.0 - 20.0 Dark yellowish brown (10YR, 4/2) clayey SILTSTONE w/ dark yellowish orange (10YR, 6/6) weathering and gypsum crystals(<3%)		2545.3	Silst		SHOB-103 12.5-15 SHOB-103 15-17.5	Driller began using water at 20'
25.0	2545	20.0 - 25.0 Olive gray (5Y, 3/2) silty CLAYSTONE		2540.3	Clst/Coal		SHOB-103 17.5-20	Driller confirmed 1/2 ft coal stringer at 27', stringer has strong sulfur smell
30.0	2540	25.0 - 30.0 Above CLAYSTONE mixed with black COAL (abt. 50% each)		2515.3	Clst		SHOB-103 20-25 + BD-SAH-50 SHOB-103 25-30	
35.0	2535	30.0 - 55.0 Med. dark gray (N4) silty CLAYSTONE					SHOB-103 30-35 SHOB-103 35-40 SHOB-103 40-45 SHOB-103 45-50 SHOB-103 50-55	
40.0	2530	55.0 - 75.0 Med. dark gray (N4) SILTSTONE w/ some clay				N/A	SHOB-103 55-60 SHOB-103 60-65 SHOB-103 65-70 SHOB-103 70-75	
45.0	2525	75.0 - 90.0 Black (N1) COAL		2495.3	Silst		SHOB-103 75-80 SHOB-103 80-85 SHOB-103 85-90	Driller confirmed coal from 75'-92'
50.0	2520	90.0 - 95.0 30-35% Black coal mixed with Med. dark gray (N4) SILTSTONE		2480.3	Coal		SHOB-103 75-80 SHOB-103 80-85 SHOB-103 85-90	
55.0	2475	<< Continued >>		2475.3	Silst/Coal		SHOB-103 90-95	
100.0					Silst		SHOB-103 95-100	

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 103

RECORD OF BORING **SHOB-103R**

COORDINATES: N: 443,681 E: 1,365,044

GROUND SURFACE ELEVATION: 2,570.3 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2470	95.0 - 105.0 Med. dark gray (N4) SILTSTONE w/ gravel sized coal pieces present (<3%) <i>continued from previous page</i> <b>Boring completed at 105 ft.</b>	x x x x x x x x x x x x x x x	2465.3	Siltst	N/A	SHOB-103 100-105	TD=105'
105.0								
110.0								
115.0								
120.0								
125.0								
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 104

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/08/07 08:53

DATE COMPLETED: 10/08/07 09:32

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-104R**

COORDINATES: N: 443,579 E: 1,367,673

GROUND SURFACE ELEVATION: 2,544.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 110.0 ft

BOTTOM ELEVATION: 2,434.5 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2540	0.0 - 5.0 Dark yellowish brown (10YR, 4/2) SILT, Sli. moist		2539.5	ML	Sli. moist	SHOB-104 0-2.5 SHOB-104 2.5-5	
5.0	2535	2.5' Microcrystalline pieces with strong reaction to HCl, abt. 30% of layer has weathered to a dark yellowish orange (10YR, 6/6)		2534.5	Ss		SHOB-104 5-7.5	Driller confirmed coal stringer from 10'-17'
10.0	2530	5.0 - 10.0 Light olive gray (5Y, 5/2) v. fine grained SANDSTONE, abt. 30% has weathered to a dark yellowish orange (10YR, 6/6)		2527.0	Coal		SHOB-104 7.5-10 SHOB-104 10-12.5 SHOB-104 12.5-15	Sample SHOB-104 15-17.5 is about 10% clay
15.0	2525	10.0 - 17.5 Black (N1) COAL		2524.5	Clst/Coal		SHOB-104 15-17.5	
20.0	2520	17.5 - 20.0 Black COAL (15-20%) and brownish gray (5YR, 4/1) silty CLAYSTONE		2519.5	Clst		SHOB-104 17.5-20	Driller began using water at 25'
25.0	2515	20.0 - 25.0 Olive gray (5Y, 4/1) silty CLAYSTONE w/ abt. 3% gypsum crystals		2514.5	Stlst/Coal		SHOB-104 20-25 SHOB-104 25-30	
30.0	2510	25.0 - 30.0 Brownish black (5YR, 2/1) SILTSTONE interbedded w/ black (N1) COAL					SHOB-104 30-35	
35.0	2505	30.0 - 85.0 Olive gray (5Y, 4/1) SILTSTONE w/ small amounts of clay					SHOB-104 35-40 + BD-SAH-51	
40.0	2500						SHOB-104 40-45	
45.0	2495						SHOB-104 45-50+ BD-SAH-52	
50.0	2490						SHOB-104 50-55	
55.0	2485						SHOB-104 55-60	
60.0	2480						SHOB-104 60-65	
65.0	2475						SHOB-104 65-70	
70.0	2470						SHOB-104 70-75	
75.0	2465						SHOB-104 75-80	
80.0	2460						SHOB-104 80-85	Driller confirmed coal from 83'-99'
85.0	2455	85.0 - 100.0 Black (N1) COAL		2459.5			SHOB-104 85-90	
90.0	2450						SHOB-104 90-95	
95.0	2445						SHOB-104 95-100	Driller said bottom of coal seam was
100.0	2440			2444.5	Coal			

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

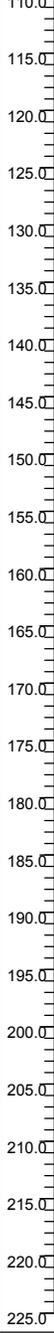
LOCATION: South Heart, ND, Overburden Borehole 104

**RECORD OF BORING SHOB-104R**

COORDINATES: N: 443,579 E: 1,367,673

GROUND SURFACE ELEVATION: 2,544.5 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2440	100.0 - 110.0 Med. gray (N5) CLAYSTONE		2434.5	Clst	N/A	SHOB-104 100-105	"producing water" Sample SHOB-104 100-105 contaminated w/ coal from above ( sample is about 25-30% coal)
105.0							SHOB-104 105-110	
110.0	2435	<b><u>Boring completed at 110 ft.</u></b>						TD=110'



OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 105

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 09:37

DATE COMPLETED: 10/07/07 10:18

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-105R**

COORDINATES: N: 443,015 E: 1,355,776

GROUND SURFACE ELEVATION: 2,589.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 110.0 ft

BOTTOM ELEVATION: 2,479.1 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0		0.0 - 5.0 Dark yellowish brown (10YR, 4/2) SILT, dry to sli. moist		2584.1	ML	Dry to sli. moist	SHOB-105 0-2.5 SHOB-105 2.5-5	
5.0	2585	5.0 - 10.0 Black (N1) COAL		2579.1	Coal		SHOB-105 5-7.5 SHOB-105 7.5-10	Driller confirmed coal stringer at 6'
10.0	2580	10.0 - 17.5 Dark yellowish brown (10YR, 4/2) silty CLAYSTONE w/ 35% black COAL		2571.6	Clst/Coal		SHOB-105 10-12.5 SHOB-105 12.5-15	Driller began using water at 12.5'
15.0	2575	17.5 - 20.0 Pale olive (10YR, 6/2) CLAYSTONE w/ rust colored weathering		2569.1	Clst		SHOB-105 15-17.5 SHOB-105 17.5-20	
20.0	2570	20.0 - 25.0 Brownish black (5YR, 2/1) silty CLAYSTONE w/ about 5% coal gravel		2564.1	Clst		SHOB-105 20-25 + BD-SAH-43 SHOB-105 25-30	Driller confirmed coal stringer from 24'-25'
25.0	2565	25.0 - 45.0 Med. olive gray (5Y, 5/1) clayey SILTSTONE, samples have 5-10% coal gravel			Siltst		SHOB-105 30-35 SHOB-105 35-40 SHOB-105 40-45	
30.0	2560	45.0 - 55.0 Med. Olive gray (5Y, 5/1) SILTSTONE, strong reaction with HCl, layer harder to drill and cuttings had oatmeal like texture		2544.1	Siltst		SHOB-105 45-50 SHOB-105 50-55	
35.0	2555	55.0 - 80.0 Olive gray (5Y, 4/1) clayey SILTSTONE, samples have 5-10% coal gravel		2534.1	Siltst	N/A	SHOB-105 55-60 SHOB-105 60-65 SHOB-105 65-70 SHOB-105 70-75 SHOB-105 75-80	
40.0	2550	80.0 - 95.0 Black (N1) COAL		2509.1	Coal		SHOB-105 80-85 SHOB-105 85-90 SHOB-105 90-95	Driller confirmed coal from 79'-96', coal has strong sulfur smell
45.0	2545	95.0 - 100.0 Black (N1) COAL and Olive gray (5Y,		2494.1	Siltst/Coal		SHOB-105 95-100	
50.0	2540			2489.1				

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 105

RECORD OF BORING **SHOB-105R**

COORDINATES: N: 443,015 E: 1,355,776

GROUND SURFACE ELEVATION: 2,589.1 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2485	4/1 SILTSTONE (abt. 50% each)	x x x x x				SHOB-105 100-105	
105.0	2480	Olive gray (5Y, 4/1) SILTSTONE, samples have 5-10% coal gravel	x x x x x		Siltst	N/A	SHOB-105 105-110	
110.0		105' smaller proportion coal gravel (<3%)	x x x x x	2479.1	Siltst			TD=110'
115.0		<b>Boring completed at 110 ft.</b>						
120.0								
125.0								
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 106

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 08:35

DATE COMPLETED: 10/07/07 09:18

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-106R

COORDINATES: N: 442,978 E: 1,357,081

GROUND SURFACE ELEVATION: 2,575.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,470.8 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2575	0.0 - 7.5 Dark yellowish brown (10YR, 4/2) clayey SILT, dry			ML ML ML	Dry	SHOB-106 0-2.5 SHOB-106 2.5-5	
5.0	2570	2.5' SILT changes color to light olive gray (5Y, 5/2)		2568.3				
10.0	2565	5' SILT becomes sli. moist		2565.8	ML	Sli. moist	SHOB-106 5-7.5 SHOB-106 7.5-10 SHOB-106 10-12.5 SHOB-106 12.5-15 SHOB-106 15-17.5	
15.0	2560	7.5 - 10.0 Above SILT interbedded w/ Mod. brown (5YR, 4/4) SILT		2555.8	CL			
20.0	2555	10.0 - 20.0 Olive gray (5Y, 4/1) silty CLAY, sli. moist		2550.8	Clst		SHOB-106 17.5-20 SHOB-106 20-25 + BD-SAH-42 SHOB-106 25-30	Driller began using water at 20'
25.0	2550	20.0 - 25.0 Olive gray (5Y, 4/1), silty CLAYSTONE, some coal			Clst		SHOB-106 30-35	
30.0	2545	25.0 - 35.0 Greenish gray (5G, 6/1) CLAYSTONE, some coal		2540.8	Clst/Coal Clst/Coal		SHOB-106 35-40	
35.0	2540	35.0 - 40.0 Brownish gray (5YR, 4/1) CLAYSTONE and 20-25% black (N1) COAL		2535.8			SHOB-106 40-45 SHOB-106 45-50	
40.0	2535	40.0 - 70.0 Med. Olive gray (5Y, 5/1) silty CLAYSTONE			Clst	N/A	SHOB-106 50-55 SHOB-106 55-60 SHOB-106 60-65 SHOB-106 65-70	
45.0	2530	70.0 - 75.0 Above CLAYSTONE and abt. 70% black COAL		2505.8	Clst/Coal		SHOB-106 70-75	Driller confirmed coal from 73'-91'
50.0	2525	75.0 - 90.0 Black (N1) COAL		2500.8			SHOB-106 75-80 SHOB-106 80-85 SHOB-106 85-90	
55.0	2520				Coal			
60.0	2515							
65.0	2510							
70.0	2505	90.0 - 95.0 Medium blueish gray (5B, 5/1) CLAYSTONE w/ 20% black COAL		2485.8	Clst/Coal		SHOB-106 90-95	
75.0	2500	95.0 - 100.0 Med. blueish gray (5B, 5/1)		2480.8	Clst		SHOB-106 95-100	
80.0	2495			2475.8				
85.0	2490							
90.0	2485							
95.0	2480							
100.0	2475							

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 106

RECORD OF BORING **SHOB-106R**

COORDINATES: N: 442,978 E: 1,357,081

GROUND SURFACE ELEVATION: 2,575.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2475	CLAYSTONE 100.0 - 105.0 Med. blueish gray (5B, 5/1) clayey SILTSTONE	x x x x x x x x x x x x x x x		Siltst	N/A	SHOB-106 100-105	TD=105'
105.0	2470.8							
110.0		<b>Boring completed at 105 ft.</b>						
115.0								
120.0								
125.0								
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 107

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 10:32

DATE COMPLETED: 10/07/07 11:29

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-107R**

COORDINATES: N: 443,359 E: 1,359,766

GROUND SURFACE ELEVATION: 2,579.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 120.0 ft

BOTTOM ELEVATION: 2,459.9 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0		0.0 - 7.5 Dark yellowish brown (10YR, 4/2) to pale yellowish brown (10YR, 6/2) SILT, dry			ML	Dry	SHOB-107 0-2.5 SHOB-107 2.5-5 SHOB-107 5-7.5	
5.0	2575			2572.4				
7.5		7.5 - 10.0 Light olive gray (5Y, 5/2) silt to very fine grained sand, sandy SILT, sli. moist		2569.9	ML	Sli. moist	SHOB-107 7.5-10	
10.0	2570			2567.4	Siltst		SHOB-107 10-12.5	Driller confirmed coal stringer 13'-19'
15.0	2565			2562.4	Coal		SHOB-107 12.5-15	
20.0	2560	10.0 - 12.5 Above and dusky brown clay and Coal, SILTSTONE, sli. moist		2559.9	Clst/Coal		SHOB-107 15-17.5	Driller began using water at 20'
25.0	2555	12.5 - 17.5 Black (N1) COAL		2554.9	Clst		SHOB-107 17.5-20	
30.0	2550	17.5 - 20.0 Black (N1) COAL (abt. 80%) and pale yellowish brown (10YR, 6/2) CLAYSTONE					SHOB-107 20-25 SHOB-107 25-30	
35.0	2545	20.0 - 25.0 Grayish olive (10YR, 4/2) CLAYSTONE w/ abt. 10% coal gravel			Siltst		SHOB-107 30-35 SHOB-107 35-40	
40.0	2540	25.0 - 45.0 Olive gray (5Y, 4/1) clayey SILTSTONE		2534.9			SHOB-107 40-45	
45.0	2535	45.0 - 55.0 Above SILTONE interbedded w/ black coal		2524.9	Siltst/Coal		SHOB-107 45-50 SHOB-107 50-55	Samples SHOB-107 45-50 and SHOB-107 50-55 are 40-50% coal Driller confirmed small coal stringer at 46.5' Driller confirmed small coal stringer at 50'
55.0	2525	55.0 - 85.0 Med. dark gray (N4) clayey SILTSTONE, from 65'-85' samples are abt. 5% black coal gravel				N/A	SHOB-107 55-60 SHOB-107 60-65 SHOB-107 65-70	
60.0	2520						SHOB-107 70-75 + BD-SAH-44	
70.0	2510				Siltst		SHOB-107 75-80	
80.0	2500			2494.9			SHOB-107 80-85	
85.0	2495	85.0 - 105.0 Black (N1) COAL			Coal		SHOB-107 85-90 SHOB-107 90-95	Driller confirmed coal from 85.5'-107'
90.0	2490						SHOB-107 95-100	
100.0	2480							

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 107

RECORD OF BORING **SHOB-107R**

COORDINATES: N: 443,359 E: 1,359,766

GROUND SURFACE ELEVATION: 2,579.9 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0		85.0 - 105.0 Black (N1) COAL <i>continued from previous page</i>		2474.9	Coal	N/A	SHOB-107 100-105	
105.0	2475	105.0 - 110.0 Black coal (abt. 85%), remaining portion is Dusky brown (5YR, 2/2)		2469.9	Silt/Coal		SHOB-107 105-110	
110.0	2470	SILTSTONE		2464.9	Siltst		SHOB-107 110-115	
115.0	2465	110.0 - 115.0 Dusky brown (5YR, 2/2) SILTSTONE, w/ some coal		2459.9	Ss		SHOB-107 115-120	
120.0	2460	115.0 - 120.0 Med. olive gray, (5y, 3/2) very fine grained SANDSTONE						TD=120
125.0		<b>Boring completed at 120 ft.</b>						
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 108

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 13:32

DATE COMPLETED: 10/07/07 14:04

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-108R**

COORDINATES: N: 442,840 E: 1,362,345

GROUND SURFACE ELEVATION: 2,560.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 100.0 ft

BOTTOM ELEVATION: 2,460.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2560	0.0 - 5.0 Olive gray (5Y, 4/1), silty CLAY, moist		2555.4	CL	Moist	SHOB-108 0-2.5 SHOB-108 2.5-5		
5.0	2555	5.0 - 12.5 Olive gray (5Y, 4/1), silty CLAYSTONE		2547.9	Clst		SHOB-108 5-7.5 SHOB-108 7.5-10 SHOB-108 10-12.5	Driller began using water at 6.5'	
12.5	2550	12.5 - 17.5 Med. dark gray (N4) CLAYSTONE		2542.9	Clst		SHOB-108 12.5-15	Driller confirmed coal stringer 17'-19'	
17.5	2545	17.5 - 20.0 Black (N1) COAL		2540.4	Coal		SHOB-108 15-17.5		
20.0	2540	20.0 - 30.0 Olive gray (5Y, 4/1) CLAYSTONE, little silt		2530.4	Clst		SHOB-108 17.5-20 SHOB-108 20-25 SHOB-108 25-30		
30.0	2530	30.0 - 37.0 Med. dark gray (N4) to dark gray (N3) silty CLAYSTONE		2523.4	Clst		SHOB-108 30-35		
37.0	2525	37.0 - 38.0 Thin SHALE layer		2522.4	Sh		SHOB-108 35-40		
40.0	2520	38.0 - 45.0 Med. dark gray (N4) to dark gray (N3) silty CLAYSTONE, some coal		2515.4	Clst		SHOB-108 40-45		
45.0	2515	45.0 - 66.0 Med. Dark gray (N4) clayey SILTSTONE, some very fine grained sand			Siltst	N/A	SHOB-108 45-50		
50.0	2510						SHOB-108 50-55		
55.0	2505						SHOB-108 55-60		
60.0	2500						SHOB-108 60-65 + BD-SAH-47		
65.0	2495	66.0 - 86.0 Black (N1) COAL		2494.4	Coal		SHOB-108 65-70		
70.0	2490						SHOB-108 70-75		
75.0	2485						SHOB-108 75-80		
80.0	2480						SHOB-108 80-85		
85.0	2475	86.0 - 100.0 Med. dark gray (N4) silty CLAYSTONE		2474.4	Clst		SHOB-108 85-90		
90.0	2470						SHOB-108 90-95		
95.0	2465						SHOB-108 95-100		
100.0		<b>Boring completed at 100 ft.</b>							

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 109

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/08/07 09:40

DATE COMPLETED: 10/08/07 10:17

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-109R**

COORDINATES: N: 442,668 E: 1,368,941

GROUND SURFACE ELEVATION: 2,525.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 100.0 ft

BOTTOM ELEVATION: 2,425.5 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2525	0.0 - 5.0 Dark yellowish brown (10YR, 4/2) silty SAND, fine to very fine, sli. moist		2520.5	SM		SHOB-109 0-2.5 SHOB-109 2.5-5 SHOB-109 5-7.5 + BD-SAH-53		
5.0	2520	2.5' color change to pale yellowish brown (10YR, 6/2)				Sli. moist	SHOB-109 7.5-10 SHOB-109 10-12.5 SHOB-109 12.5-15		
10.0	2515	5.0 - 40.0 Yellowish brown (10YR, 5/2) SANDSTONE			Ss		SHOB-109 15-17.5 SHOB-109 17.5-20	Driller began using water at 20'	
15.0	2510						SHOB-109 20-25 SHOB-109 25-30		
20.0	2505	25' color change to Dark yellowish brown (10Y, 4/2)					SHOB-109 30-35 SHOB-109 35-40		
25.0	2500						SHOB-109 40-45 SHOB-109 45-50		
30.0	2495	40.0 - 50.0 Dark yellowish brown (10YR,4/2) to med. brown (5YR, 4/4) silty SANDSTONE, trace brownish black (5YR, 2/1) very hard coal		2485.5	Ss		SHOB-109 50-55 SHOB-109 55-60		
35.0	2490						SHOB-109 60-65 SHOB-109 65-70		
40.0	2485						SHOB-109 70-75 SHOB-109 75-80	Driller confirmed coal from 70'-89', coal has sulfur smell	
45.0	2480	50.0 - 70.0 Dark yellowish brown (10YR, 3/2) clayey SILTSTONE, some sand		2475.5	Siltst	N/A	SHOB-109 80-85 SHOB-109 85-90	Coal samples contaminated by above sand, Driller noted water present in coal seam	
50.0	2475						SHOB-109 90-95		
55.0	2470	70.0 - 89.0 Black (N1) COAL		2455.5	Coal		SHOB-109 95-100	Samples below coal are contaminated w/ coal	
60.0	2465								
65.0	2460								
70.0	2455								
75.0	2450								
80.0	2445								
85.0	2440								
90.0	2435	89.0 - 100.0 Medium dark gray (N4) clayey SILTSTONE		2436.5	Siltst				
95.0	2430								
100.0		<b>Boring completed at 100 ft.</b>							

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/8/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 110

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 11:47

DATE COMPLETED: 10/07/07 12:25

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-110R

COORDINATES: N: 441,641 E: 1,358,301

GROUND SURFACE ELEVATION: 2,582.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 105.0 ft

BOTTOM ELEVATION: 2,477.7 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2580	0.0 - 2.5 Light olive gray (5Y, 5/2) SILT, dry		2580.2	ML	Dry	SHOB-110 0-2.5	
5.0	2575	2.5 - 5.0 Mod. olive brown (5Y, 4/4) SILTSTONE and weathered coal stringer		2577.7	Siltst/Coal		SHOB-110 2.5-5.0	
10.0	2570	5.0 - 7.5 Dusky yellow (5Y, 6/4) silty CLAYSTONE, moist		2575.2	Clst	Moist	SHOB-110 5-7.5	Driller began using water at 7.5'
15.0	2565	7.5 - 20.0 Mod. Olive brown (5Y, 4/4) SILTSTONE		2562.7	Siltst	N/A	SHOB-110 7.5-10	Driller confirmed coal stringer 21'-23'
20.0	2560	20.0 - 25.0 Above SILTSTONE interbedded w/ black (N1) COAL		2557.7	Siltst/Coal		SHOB-110 10-12.5	
25.0	2555	25.0 - 45.0 Light olive gray (5Y, 5/4) clayey SILTSTONE w/ abt. 3% coal gravel			Siltst		SHOB-110 12.5-15	
30.0	2550						SHOB-110 15-17.5	
35.0	2545						SHOB-110 17.5-20	
40.0	2540						SHOB-110 20-25	
45.0	2535						SHOB-110 25-30	
50.0	2530	45.0 - 50.0 Above SILTSTONE interbedded w/ harder SHALE that has a strong reaction to HCl		2532.7	Siltst/Sh		SHOB-110 30-35	
55.0	2525	50.0 - 60.0 Med. dark gray (N4) CLAYSTONE w/ a small amount of silt		2522.7	Clst		SHOB-110 35-40	
60.0	2520	60.0 - 70.0 Med. dark gray (N4) SILTSTONE			Siltst		SHOB-110 40-45	
65.0	2515					SHOB-110 45-50		
70.0	2510	70.0 - 75.0 Above SILTSTONE mixed w/ COAL (abt. 50%)		2512.7	Siltst/Coal	SHOB-110 50-55 + BD-SAH-45		
75.0	2505	75.0 - 90.0 Black (N1) COAL		2507.7	Coal	SHOB-110 55-60		
80.0	2500					SHOB-110 60-65		
85.0	2495					SHOB-110 65-70		
90.0	2490	90.0 - 95.0 Black COAL and Olive gray (5Y, 4/1) SILTSTONE		2492.7	Siltst/Coal	SHOB-110 70-75		
95.0	2485	<< Continued >>		2487.7	Siltst	SHOB-110 75-80		
100.0						SHOB-110 80-85		
						SHOB-110 85-90		
						SHOB-110 90-95		
						SHOB-110 95-100		

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 110

RECORD OF BORING **SHOB-110R**

COORDINATES: N: 441,641 E: 1,358,301

GROUND SURFACE ELEVATION: 2,582.7 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2480	95.0 - 105.0 Olive gray (5Y, 4/1) SILTSTONE w/ <5% coal continued from previous page	x x x x x x x x x x x x x x x	2477.7	Siltst	N/A	SHOB-110 100-105	TD=105'
105.0								
110.0		<b>Boring completed at 105 ft.</b>						
115.0								
120.0								
125.0								
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 111

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 12:43

DATE COMPLETED: 10/07/07 13:05

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-111R

COORDINATES: N: 441,582 E: 1,360,982

GROUND SURFACE ELEVATION: 2,549.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,479.5 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0		0.0 - 5.0 Dark yellow brown (10YR, 4/2) silty CLAY, sli. moist		2544.5	ML	Sli. moist	SHOB-111 0-2.5 SHOB-111 2.5-5	Driller began using water at 10'
5.0	2545	5.0 - 12.5 Dark yellow brown (10YR, 4/2) silty CLAYSTONE, moist		2537.0	Clst	Moist	SHOB-111 5-7.5 SHOB-111 7.5-10	
10.0	2540	12.5 - 15.0 Med. gray (N5) CLAYSTONE		2534.5	Clst		SHOB-111 10-12.5	
15.0	2535	15.0 - 17.5 Olive gray (5Y, 4/1) silty CLAYSTONE		2532.0	Clst		SHOB-111 12.5-15 SHOB-111 15-17.5	
20.0	2530	17.5 - 38.0 Ollive gray (5Y, 4/1) clayey SILTSTONE, little very fine grained sand			Siltst		SHOB-111 17.5-20 SHOB-111 20-25 SHOB-111 25-30	
25.0	2525						SHOB-111 30-35	
30.0	2520						SHOB-111 35-40	
35.0	2515			2511.5		N/A	SHOB-111 40-45	
40.0	2510	38.0 - 57.0 Black (N1) COAL			Coal		SHOB-111 45-50 SHOB-111 50-55	
45.0	2505						SHOB-111 55-60	
50.0	2500						SHOB-111 60-65 + BD-SAH-46	
55.0	2495			2492.5			SHOB-111 65-70	
60.0	2490	57.0 - 70.0 Med. dark gray (N4) silty CLAYSTONE		2479.5	Clst			
65.0	2485							
70.0	2480	<b>Boring completed at 70 ft.</b>						TD=70'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/8/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 112

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/08/07 10:39

DATE COMPLETED: 10/08/07 11:13

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-112R**

COORDINATES: N: 441,359 E: 1,367,584

GROUND SURFACE ELEVATION: 2,522.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 120.0 ft

BOTTOM ELEVATION: 2,402.7 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2520	0.0 - 2.5 Olive gray (5Y, 4/1) clayey SILT, moist		2520.2	ML		SHOB-112 0-2.5	Driller confirmed thin coal stringer at 8' Samples below 9' are contaminated w/ coal Driller began using water at 13'
5.0	2515	2.5 - 8.0 Med. dark gray (N4) to olive gray (5Y, 4/1) CLAYSTONE, moist		2514.7	Clst	Moist	SHOB-112 2.5-5	
10.0	2510	8.0 - 9.0 Black (N1) COAL, sli. moist		2513.7	Coal	Sli. moist	SHOB-112 5-7.5	
15.0	2505	9.0 - 12.5 Pale yellowish brown (10YR, 6/2) silty CLAYSTONE, moist		2510.2	Clst	Moist	SHOB-112 7.5-10	
20.0	2500	12.5 - 20.0 Light olive gray (5Y, 5/2) CLAYSTONE, moist		2502.7	Clst		SHOB-112 10-12.5	
25.0	2495	20.0 - 30.0 Light olive gray (5Y, 5/2) silty CLAYSTONE		2492.7	Clst		SHOB-112 12.5-15	
30.0	2490	30.0 - 60.0 Light olive gray (5Y, 5/2) sandy SILTSTONE		2462.7	Siltst		SHOB-112 15-17.5	
35.0	2485						SHOB-112 17.5-20 + BD-SAHD-54	
40.0	2480						SHOB-112 20-25	
45.0	2475						SHOB-112 25-30	
50.0	2470						SHOB-112 30-35	
55.0	2465					N/A	SHOB-112 35-40	
60.0	2460	60.0 - 80.0 Light olive gray (5Y, 5/2) silty SANDSTONE		2442.7	Ss		SHOB-112 40-45	
65.0	2455						SHOB-112 45-50	
70.0	2450						SHOB-112 50-55	
75.0	2445						SHOB-112 55-60	
80.0	2440	80.0 - 90.0 Olive gray (5Y, 4/1) silty SANDSTONE		2432.7	Ss		SHOB-112 60-65	
85.0	2435						SHOB-112 65-70	
90.0	2430	90.0 - 109.0 Black (N1) COAL			Coal		SHOB-112 70-75	
95.0	2425						SHOB-112 75-80	
100.0							SHOB-112 80-85	
							SHOB-112 85-90	
							SHOB-112 90-95	
							SHOB-112 95-100	

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

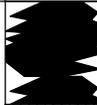
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 112

RECORD OF BORING **SHOB-112R**

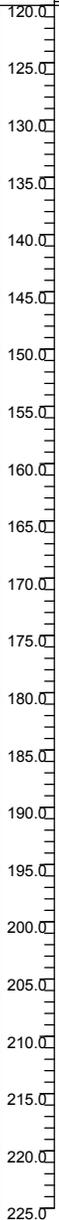
COORDINATES: N: 441,359 E: 1,367,584

GROUND SURFACE ELEVATION: 2,522.7 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2420	90.0 - 109.0 Black (N1) COAL <i>continued from previous page</i>		2413.7	Coal	N/A	SHOB-112 100-105	
105.0	2415						SHOB-112 105-110	
110.0	2410	109.0 - 120.0 Med. dark gray (N4) silty CLAYSTONE		2402.7	Clst		SHOB-112 110-115	
115.0	2405						SHOB-112 115-120	

**Boring completed at 120 ft.**

TD=120'



OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 113

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/07/07 07:28

DATE COMPLETED: 10/07/07 08:13

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-113R**

COORDINATES: N: 440,276 E: 1,359,624

GROUND SURFACE ELEVATION: 2,599.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 120.0 ft

BOTTOM ELEVATION: 2,479.5 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2595	0.0 - 5.0 Grayish brown (5YR, 3/2) silty CLAY, dry		2594.5	CL	Dry	SHOB-113 0-2.5 SHOB-113 2.5-5		
5.0	2590	5.0 - 7.5 Mod. olive brown (5Y, 4/4) clay w/ small amount of silt, silty CLAY, sli. moist		2592.0	CL	Sli. moist	SHOB-113 5-7.5		
10.0	2585	7.5 - 12.5 Light olive gray (5Y, 5/2) and light olive brown (5Y, 5/6) CLAY, sli. moist to moist		2587.0	CL		SHOB-113 7.5-10	Driller confirmed coal stringer 12'-15'	
15.0	2580	12.5 - 15.0 Black (N1) COAL		2584.5	Coal		SHOB-113 10-12.5		
20.0	2575	15.0 - 17.5 Dark yellowish brown (10 YR, 4/2) CLAYSTONE sli. moist, mixed w/ black COAL from above		2582.0	Clst/Coal		SHOB-113 12.5-15	Driller began using water at 17.5'	
25.0	2570	17.5 - 20.0 Med. bluish gray (5B, 5/1) CLAYSTONE		2579.5	Clst		SHOB-113 15-17.5		
30.0	2565	20.0 - 40.0 Med. bluish gray (5B, 5/1) clayey SILTSTONE					SHOB-113 17.5-20		
35.0	2560	40.0 - 45.0 Med. bluish gray (5B, 5/1) clayey SILTSTONE interbedded w/ black (N1) COAL					SHOB-113 20-25 SHOB-113 25-30 + BD-SAH-40		
40.0	2555	45.0 - 90.0 Olive gray (5Y, 4/1) clayey SILTSTONE		2559.5	Stst		SHOB-113 30-35		
45.0	2550						SHOB-113 35-40		
50.0	2545			2554.5	Stst/Coal		SHOB-113 40-45	Sample SHOB-113 45-50 has coal from above stringer (5% or less)	
55.0	2540					N/A	SHOB-113 45-50		
60.0	2535						SHOB-113 50-55		
65.0	2530						SHOB-113 55-60		
70.0	2525						SHOB-113 60-65		
75.0	2520						SHOB-113 65-70		
80.0	2515						SHOB-113 70-75		
85.0	2510						SHOB-113 75-80		
90.0	2505			2509.5				SHOB-113 80-85 + BD-SAH-41	
95.0	2500							SHOB-113 85-90	
100.0	2500			2504.5	Stst/Coal			SHOB-113 90-95	Driller confirmed coal from 92' -109'
		<< Continued >> Log continued on next page			Coal		SHOB-113 95-100		

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 113

RECORD OF BORING **SHOB-113R**

COORDINATES: N: 440,276 E: 1,359,624

GROUND SURFACE ELEVATION: 2,599.5 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0		95.0 - 110.0 Black (N1) COAL <i>continued from previous page</i>			Coal	N/A	SHOB-113 100-105	
105.0	2495						SHOB-113 105-110	
110.0	2490	110.0 - 115.0 Black (N1) COAL mixed with dark greenish gray (5GY, 4/1) clayey SILTSTONE		2489.5	Siltst/Coal		SHOB-113 110-115	
115.0	2485			2484.5			SHOB-113 115-120	
120.0	2480	115.0 - 120.0 Olive gray (5Y, 4/1) clayey SILTSTONE		2479.5	Siltst		TD=120'	
125.0		<b><u>Boring completed at 120 ft.</u></b>						
130.0								
135.0								
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 114

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 10:48

DATE COMPLETED: 10/06/07 11:11

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-114R**

COORDINATES: N: 440,209 E: 1,362,246

GROUND SURFACE ELEVATION: 2,545.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 75.0 ft

BOTTOM ELEVATION: 2,470.8 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2545	0.0 - 7.5 Olive gray (5Y, 4/1) silty CLAY, sli. moist			CL	Sli. Moist	SHOB-114 0-2.5 SHOB-114 2.5-5 SHOB-114 5-7.5	Driller began using water at 12'	
5.0	2540			2538.3					
7.5	2535	7.5 - 15.0 Olive gray (5Y, 4/1) silty CLAYSTONE, moist			Clst	Moist	SHOB-114 7.5-10 SHOB-114 10-12.5		
10.0	2530			2530.8					
15.0	2525	15.0 - 20.0 Light olive gray (5Y, 5/2) clayey SILTSTONE			Siltst	N/A	SHOB-114 12.5-15 SHOB-114 15-17.5		
20.0	2520	20.0 - 25.0 Dusky yellow brown (10YR, 2/2) CLAYSTONE		2525.8	Clst		SHOB-114 17.5-20		
25.0	2515			2520.8					
25.0	2515	25.0 - 45.0 Light olive gray (5Y, 5/2) clayey SILTSTONE			Siltst		SHOB-114 20-25 SHOB-114 25-30		
30.0	2510								SHOB-114 30-35
35.0	2505								SHOB-114 35-40 + BD-SAH-29
40.0	2500			2500.8					SHOB-114 40-45
45.0	2495	45.0 - 60.0 Black (N1) COAL			Coal		SHOB-114 45-50		
50.0	2490							SHOB-114 50-55	
55.0	2485			2485.8				SHOB-114 55-60	
60.0	2480	60.0 - 75.0 Medium gray (N5) clayey SILTSTONE			Siltst		SHOB-114 60-65		
65.0	2475							SHOB-114 65-70	
70.0	2470			2470.8			SHOB-114 70-75		
75.0		<b>Boring completed at 75 ft.</b>						TD=75'	

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 115

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/08/07 11:31

DATE COMPLETED: 10/08/07 11:58

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-115R**

COORDINATES: N: 440,423 E: 1,368,454

GROUND SURFACE ELEVATION: 2,500.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 90.0 ft

BOTTOM ELEVATION: 2,410.7 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2500	0.0 - 2.5 Dark yellowish brown (10YR, 3/2) silty CLAY		2498.2	CL	Moist	SHOB-115 0-2.5	Driller began using water at 7'
5.0	2495	2.5 - 20.0 Dark olive gray (5Y, 3/1) silty CLAYSTONE, sil. moist				Sli. moist to moist	SHOB-115 2.5-5	
10.0	2490				Clst		SHOB-115 5-7.5	
15.0	2485	15' trace of coal and coarse sand			Clst		SHOB-115 7.5-10	
20.0	2480			2480.7			SHOB-115 10-12.5	
25.0	2475	20.0 - 27.0 Olive gray (5Y, 4/1) silty SANDSTONE, some well cemented peices		2473.7	Ss		SHOB-115 12.5-15	
30.0	2470	27.0 - 29.0 Light olive gray (5Y, 4/1) to med. olive brown (5Y, 4/4) silty CLAYSTONE		2471.7	Clst		SHOB-115 15-17.5	
35.0	2465	29.0 - 55.0 Medium dark gray (N4) silty CLAYSTONE					SHOB-115 17.5-20	
40.0	2460						SHOB-115 20-25	
45.0	2455						SHOB-115 25-30	
50.0	2450	50' tr. SHALE		2445.7		N/A	SHOB-115 30-35	
55.0	2445	55.0 - 59.0 Medium dark gray (N4) silty CLAYSTONE		2441.7	Clst		SHOB-115 35-40 + BD-SAH-55	
60.0	2440	59.0 - 78.0 Black (N1) COAL					SHOB-115 40-45	
65.0	2435						SHOB-115 45-50	
70.0	2430						SHOB-115 50-55	
75.0	2425			2422.7			SHOB-115 55-60	
80.0	2420	78.0 - 90.0 Medium dark gray (N4) silty CLAYSTONE					SHOB-115 60-65	
85.0	2415						SHOB-115 65-70	
90.0	2410.7						SHOB-115 70-75	
							SHOB-115 75-80	
							SHOB-115 80-85	
							SHOB-115 85-90 + BD-SAH-56	
<p><b>Boring completed at 90 ft.</b></p>								TD=90'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 116

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/03/07 14:23

DATE COMPLETED: 10/03/07 14:50

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-116R**

COORDINATES: N: 440,075 E: 1,370,177

GROUND SURFACE ELEVATION: 2,497.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,427.5 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2495	0.0 - 2.5 Olive gray (5Y, 4/1) SILT w/ some clay, sli. moist to moist		2495.0	ML	Sli. moist to moist	SHOB-116 0-2.5	Driller began using water at 15'
5.0	2490	2.5 - 7.5 Olive gray (5Y, 4/1) silty CLAYSTONE, sli. moist		2490.0	Clst	Sli. moist	SHOB-116 2.5-5	
10.0	2485	7.5 - 12.5 Olive gray (5Y, 4/1) clayey SILTSTONE		2485.0	Siltst		SHOB-116 5-7.5	
15.0	2480	12.5 - 25.0 Light olive gray (5Y, 5/2) silty CLAYSTONE		2472.5	Clst		SHOB-116 7.5-10	
20.0	2475	20' little shale					SHOB-116 10-12.5	
25.0	2470	25.0 - 40.0 Light olive gray (5Y, 5/2) CLAYSTONE		2457.5	Clst		SHOB-116 12.5-15	
30.0	2465	40.0 - 55.0 Black (N1) COAL		2442.5	Coal	N/A	SHOB-116 15-17.5	
35.0	2460	55.0 - 70.0 Dark olive gray (5Y, 3/1) SILTSTONE					SHOB-116 17.5-20	
40.0	2455	65' tr. SHALE		2427.5	Siltst		SHOB-116 20-25	
45.0	2450						SHOB-116 25-30	
50.0	2445						SHOB-116 30-35	
55.0	2440						SHOB-116 35-40 + BD-SAH-13	
60.0	2435						SHOB-116 40-45	
65.0	2430						SHOB-116 45-50	
70.0							SHOB-116 50-55	
75.0							SHOB-116 55-60	
80.0							SHOB-116 60-65	
85.0							SHOB-116 65-70	

**Boring completed at 70 ft.**

TD=70'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 117

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/05/07 15:24

DATE COMPLETED: 10/05/07 15:48

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-117R

COORDINATES: N: 439,944 E: 1,371,502

GROUND SURFACE ELEVATION: 2,507.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,427.9 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV. (ft)	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
0.0	2505	0.0 - 2.5 Dark yellowish brown (10YR, 3/2) clayey SILT, sli. moist		2505.4	ML	Sli. moist	SHOB-117 0-2.5	
5.0	2500	2.5 - 5.0 Moderate yellow brown (10YR, 5/4) clayey SILT w/ gravel, sli.moist		2502.9	ML		SHOB-117 2.5-5	
10.0	2495	5.0 - 7.5 Medium Brown (5YR, 4/4) CONGLOMERATE, moist		2500.4	Clst	Moist	SHOB-117 5-7.5	
15.0	2490	7.5 - 10.0 Pale olive (10Y, 6/2) CLAYSTONE, moist		2497.9	Siltst		SHOB-117 7.5-10	
20.0	2485	10.0 - 12.5 Pale olive (10Y, 6/2) clayey SILTSTONE, moist		2495.4	Siltst		SHOB-117 10-12.5	
25.0	2480	12.5 - 15.0 Olive gray (5Y, 3/2) silty CLAYSTONE, moist		2492.9	Clst		SHOB-117 12.5-15	
30.0	2475	15.0 - 30.0 Moderate olive brown (5Y, 4/8) clayey SILTSTONE, moist		2477.9	Siltst		SHOB-117 15-17.5	Driller began using water at 20'
35.0	2470	30.0 - 35.0 Olive gray (5Y, 4/1) silty CLAYSTONE		2472.9	Clst		SHOB-117 17.5-20	
40.0	2465	35.0 - 45.0 Medium dark gray (N4) sandy SILTSTONE, very fine grained		2462.9	Siltst/Coal	N/A	SHOB-117 20-25	
45.0	2460	45.0 - 50.0 50% SILTSTONE from above and 50% black COAL		2457.9	Coal		SHOB-117 25-30	Driller confirmed coal from 48'-65'
50.0	2455	50.0 - 65.0 Black (N1) COAL		2442.9	Coal		SHOB-117 30-35	
55.0	2450	65.0 - 80.0 Medium dark gray (N4) clayey SILTSTONE		2427.9	Siltst		SHOB-117 35-40	
60.0	2445						SHOB-117 40-45	
65.0	2440						SHOB-117 45-50	
70.0	2435						SHOB-117 50-55	
75.0	2430						SHOB-117 55-60	
80.0							SHOB-117 60-65	
							SHOB-117 65-70 + BD-SAH-25	
							SHOB-117 70-75	
							SHOB-117 75-80	
Boring completed at 80 ft.								TD=80

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 118

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 07:29

DATE COMPLETED: 10/06/07 08:06

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-118R**

COORDINATES: N: 439,881 E: 1,374,171

GROUND SURFACE ELEVATION: 2,490.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 85.0 ft

BOTTOM ELEVATION: 2,405.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2490	0.0 - 7.5 Olive gray (5Y, 4/1) clayey SILT, moist			ML	Moist	SHOB-118 0-2.5 SHOB-118 2.5-5 SHOB-118 5-7.5	Driller Began using water at 7.5'
5.0	2485			2482.9				
7.5	2480	7.5 - 25.0 Light olive gray (5Y, 5/2) CLAYSTONE, little silt, trace sand			Clst		SHOB-118 7.5-10 SHOB-118 10-12.5 SHOB-118 12.5-15 SHOB-118 15-17.5 SHOB-118 17.5-20	
10.0	2475							
15.0	2470							
20.0	2465			2465.4				
25.0	2460	25.0 - 30.0 Medium gray (N5) SILTSTONE		2460.4	Siltst		SHOB-118 20-25 + BD-SAH-27 SHOB-118 25-30	
30.0	2455	30.0 - 35.0 Olive gray (5Y, 4/1) CLAYSTONE		2455.4	Clst		SHOB-118 30-35	
35.0	2450	35.0 - 47.0 Olive gray (5Y, 4/1) SILTSTONE			Siltst		SHOB-118 35-40 SHOB-118 40-45	
40.0	2445			2443.4		N/A	SHOB-118 45-50	Driller confirmed coal from 47'-71'
45.0	2440	47.0 - 71.0 Black (N1) COAL			Coal		SHOB-118 50-55 SHOB-118 55-60 SHOB-118 60-65 SHOB-118 65-70	
50.0	2435							
55.0	2430							
60.0	2425							
65.0	2420	71.0 - 85.0 Medium dark gray (N4) SILTSTONE		2419.4	Siltst		SHOB-118 70-75 + BD-SAH-28 SHOB-118 75-80 SHOB-118 80-85	
70.0	2415							
75.0	2410							
80.0	2405.4			2405.4				
85.0		<b>Boring completed at 85 ft.</b>						TD=85'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 119

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 14:24

DATE COMPLETED: 10/06/07 15:05

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-119R**

COORDINATES: N: 438,498 E: 1,360,892

GROUND SURFACE ELEVATION: 2,604.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 135.0 ft

BOTTOM ELEVATION: 2,469.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2600	0.0 - 2.5 Moderate olive brown (5Y, 4/4) silty CLAY, dry		2601.9	CL	Dry	SHOB-119 0-2.5	Driller began using water at 9' Driller confirmed coal from 11'-15.5'
5.0	2595	2.5 - 11.0 Moderate olive brown (5Y, 4/4) CLAY, sli. moist to moist		2593.4	CL	Sli. moist to moist	SHOB-119 2.5-5 SHOB-119 5-7.5	
10.0	2590	11.0 - 15.5 Black (N1) COAL		2588.9	Coal	Moist	SHOB-119 7.5-10 SHOB-119 10-12.5 SHOB-119 12.5-15 SHOB-119 15-17.5 SHOB-119 17.5-20	
15.0	2585	15.5 - 25.0 Dark greenish gray (5G, 4/1) CLAYSTONE, with sand and gravel sized coal fragments		2579.4	Clst		SHOB-119 20-25 SHOB-119 25-30	
20.0	2580	25.0 - 35.0 Moderate olive brown (5Y, 4/4) CLAYSTONE		2569.4	Clst		SHOB-119 30-35	
25.0	2575	35.0 - 40.0 Moderate brown (5YR, 3/4) CLAYSTONE interbedded w/ 1 ft COAL stringer		2564.4	Clst/Coal		SHOB-119 35-40	
30.0	2570	40.0 - 75.0 Dark yellowish brown (10YR, 4/2) SILTSTONE w/ very fine sand		2529.4	Siltst	N/A	SHOB-119 40-45 SHOB-119 45-50 SHOB-119 50-55 SHOB-119 55-60 SHOB-119 60-65 SHOB-119 65-70 SHOB-119 70-75	
35.0	2565	75.0 - 85.0 Above SILTSTONE interbedded w/ Medium dark gray (N4) CLAYSTONE		2519.4	Sltst/Clst		SHOB-119 75-80 + BD-SAH-34 SHOB-119 80-85	
40.0	2560	85.0 - 106.0 Medium dark gray (N4) SILTSTONE			Slst		SHOB-119 85-90 SHOB-119 90-95 SHOB-119 95-100	

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 119

RECORD OF BORING **SHOB-119R**

COORDINATES: N: 438,498 E: 1,360,892

GROUND SURFACE ELEVATION: 2,604.4 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2500	85.0 - 106.0 Medium dark gray (N4) SILTSTONE <i>continued from previous page</i>	XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX	2498.4	Slst	N/A	SHOB-119 100-105	Driller confirmed coal from 106'-122'
105.0	2495	106.0 - 122.0 Black (N1) COAL	XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX		Coal		SHOB-119 105-110	
110.0	2490		XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX				SHOB-119 110-115	
115.0	2485		XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX	2482.4			SHOB-119 115-120	
120.0	2480	122.0 - 135.0 Olive gray (5Y, 4/1) clayey SILTSTONE	XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX		Slst		SHOB-119 120-125	
125.0	2475		XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX				SHOB-119 125-130	
130.0	2470		XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX	2469.4			SHOB-119 130-135	
135.0		<b><u>Boring completed at 135 ft.</u></b>						TD=135'
140.0								
145.0								
150.0								
155.0								
160.0								
165.0								
170.0								
175.0								
180.0								
185.0								
190.0								
195.0								
200.0								
205.0								
210.0								
215.0								
220.0								
225.0								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 120

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/03/07 13:18

DATE COMPLETED: 10/03/07 13:55

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

RECORD OF BORING **SHOB-120R**

COORDINATES: N: 438,751 E: 1,367,510

GROUND SURFACE ELEVATION: 2,531.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 100.0 ft

BOTTOM ELEVATION: 2,431.2 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2530	0.0 - 2.5 Dark yellowish brown (10YR, 4/2) SILT w/ orgaincs, moist		2528.7	ML	Moist	SHOB-120 0-2.5		
5.0	2525	2.5 - 5.0 Pale yellowish brown (10YR, 6/2) sandy SILTSTONE, sli. moist		2526.2	Siltst		SHOB-120 2.5-5 SHOB-120 5-7.5		
10.0	2520	5.0 - 30.0 Light olive gray (5Y, 6/1) very fine grained SANDSTONE, sli. moist			Ss	Sli. moist	SHOB-120 7.5-10 SHOB-120 10-12.5 + BD-SAH-11 SHOB-120 12.5-15 SHOB-120 15-17.5 SHOB-120 17.5-20 SHOB-120 20-25 SHOB-120 25-30	Samples below 30' are contaminated by sandstone from 5-30' interval	
30.0	2500	30.0 - 40.0 Dark olive gray (5Y, 5/1) SILTSTONE, moist		2501.2	Siltst		SHOB-120 30-35 SHOB-120 35-40		
40.0	2490	40.0 - 55.0 Medium dark gray (N4) to brownish black (5YR, 2/1) CLAYSTONE, moist		2491.2	Clst	Moist	SHOB-120 40-45 SHOB-120 45-50 SHOB-120 50-55		
55.0	2475	55.0 - 65.0 Medium gray (N5) silty SANDSTONE, fine to very fine grained, moist		2476.2	Ss		SHOB-120 55-60 SHOB-120 60-65		
65.0	2465	65.0 - 80.0 Black (N1) COAL, sli. moist		2466.2	Coal	Sli. moist	SHOB-120 65-70 SHOB-120 70-75		Driller began using water at 72'
80.0	2450	80.0 - 100.0 Dark olive gray (5Y, 3/1) SILTSTONE		2451.2	Siltst	N/A	SHOB-120 75-80 SHOB-120 80-85 SHOB-120 85-90 + BD-SAH-12 SHOB-120 90-95 SHOB-120 95-100		Driller said that natural water is entering the coal
100.0		<b>Boring completed at 100 ft.</b>		2431.2					TD=100

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA\_4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 121

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/03/07 12:40

DATE COMPLETED: 10/03/07 13:05

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-121R**

COORDINATES: N: 438,716 E: 1,368,804

GROUND SURFACE ELEVATION: 2,515.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,435.1 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2515	0.0 - 2.5 Dark yellowish brown (10YR, 4/2) SILT, moist		2512.6	ML	Moist	SHOB-121 0-2.5	
5.0	2510	2.5 - 5.0 Dark yellowish brown (10YR, 4/2) gravelly, sandy SILT, dry		2510.1	ML	Dry	SHOB-121 2.5-5	
10.0	2505	5.0 - 15.0 Medium yellowish brown (10YR, 5/2) fine grained SANDSTONE, clay content increases with depth, sli. moist to moist		2500.1	Ss	Sli. moist to moist	SHOB-121 5-7.5 SHOB-121 7.5-10 SHOB-121 10-12.5 SHOB-121 12.5-15 SHOB-121 15-17.5	No sample recovery for 17.5-20' interval Driller began using water at 21'
15.0	2500	15.0 - 35.0 Olive gray (5Y, 4/1) CLAYSTONE, moist		2480.1	Clst	Moist	SHOB-121 20-25 SHOB-121 25-30 SHOB-121 30-35 + BD-SAH-10	
20.0	2495							
25.0	2490							
30.0	2485							
35.0	2480	35.0 - 49.0 Medium dark gray (N4) SANDSTONE		2466.1	Ss		SHOB-121 35-40 SHOB-121 40-45 SHOB-121 45-50	
40.0	2475							
45.0	2470							
50.0	2465	49.0 - 67.0 Black (N1) COAL		2448.1	Coal	N/A	SHOB-121 50-55 SHOB-121 55-60 SHOB-121 60-65	Coal samples are highly contaminated by above sediments. Driller confirmed coal from 49'-67'
55.0	2460							
60.0	2455							
65.0	2450	67.0 - 80.0 Dark olive gray (5Y, 3/1) SILTSTONE		2435.1	Siltst		SHOB-121 65-70 SHOB-121 70-75 SHOB-121 75-80	
70.0	2445							
75.0	2440							
80.0		<b>Boring completed at 80 ft.</b>						TD=80'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 122

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/03/07 15:18

DATE COMPLETED: 10/03/07 15:40

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-122R

COORDINATES: N: 438,682 E: 1,370,152

GROUND SURFACE ELEVATION: 2,498.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 60.0 ft

BOTTOM ELEVATION: 2,438.7 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2495	0.0 - 10.0 Yellowish gray (5Y, 7/2) SILT, dry to sli. moist			ML	Sli. moist	SHOB-122 0-2.5 SHOB-122 2.5-5 SHOB-122 5-7.5 + BD-SAH-14	
5.0	2490			2488.7			SHOB-122 7.5-10	
10.0	2485	10.0 - 12.5 Light olive gray (5Y, 5/1) clayey SILTSTONE, moist		2486.2	Siltst	Moist	SHOB-122 10-12.5 SHOB-122 12.5-15	
15.0	2480	12.5 - 30.0 Light olive gray (5Y, 5/1) CLAYSTONE, moist			Clst		SHOB-122 15-17.5 SHOB-122 17.5-20	Driller began using water at 20'
20.0	2475						SHOB-122 20-25 SHOB-122 25-30	Driller confirmed coal for 30'-47'
25.0	2470	25' Some coarse sand and fine gravel		2468.7				
30.0	2465	30.0 - 50.0 Black (N1) COAL			Coal	N/A	SHOB-122 30-35 SHOB-122 35-40 SHOB-122 40-45 SHOB-122 45-50	
35.0	2460							
40.0	2455							
45.0	2450			2448.7			SHOB-122 50-55	
50.0	2445	50.0 - 60.0 Dark olive gray (5Y, 3/1) SILTSTONE			Siltst		SHOB-122 55-60	
55.0	2440			2438.7				
60.0		<b>Boring completed at 60 ft.</b>						TD=60'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 123

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/05/07 14:52

DATE COMPLETED: 10/05/07 15:17

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-123R**

COORDINATES: N: 438,633 E: 1,371,464

GROUND SURFACE ELEVATION: 2,507.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,427.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2505	0.0 - 2.5		2504.9	ML		SHOB-123 0-2.5		
		Dark olive gray (5Y, 3/1) SILT, sli. moist		2502.4	ML	Sli. moist	SHOB-123 2.5-5		
5.0	2500	2.5 - 5.0		2499.9	Ss		SHOB-123 5-7.5		
		Dark yellowish brown (10YR, 4/2) clayey SILT, sli. moist			Siltst	Moist	SHOB-123 7.5-10		
10.0	2495	5.0 - 7.5					SHOB-123 10-12.5		
		Light olive gray (5Y, 5/2) silty SANDSTONE, sli. moist		2489.9	Clst		SHOB-123 12.5-15		
15.0	2490	7.5 - 17.5		2487.4	Siltst		SHOB-123 15-17.5	Driller begins using water at 20'	
		Light olive gray (5Y, 5/2) clayey SILTSTONE, tr. rust colored silt, moist		2482.4	Siltst		SHOB-123 17.5-20		
20.0	2485	17.5 - 20.0			Clst		SHOB-123 20-25 + BD-SAH-23		
		Olive gray (5Y, 3/2) CLAYSTONE, moist					SHOB-123 25-30		
25.0	2480	20.0 - 25.0					SHOB-123 30-35		
		Olive gray (5Y, 3/2) clayey SILTSTONE		2472.4			SHOB-123 35-40		
30.0	2475	25.0 - 35.0			Siltst		SHOB-123 40-45		
		Medium dark gray (N4) CLAYSTONE, some silt					SHOB-123 45-50	Driller confirmed coal from 49'-60'	
35.0	2470	35.0 - 49.0					SHOB-123 50-55		
		Medium dark gray (N4) sandy SILTSTONE, very fine grained		2458.4	Coal	N/A	SHOB-123 55-60		
40.0	2465	49.0 - 66.0					SHOB-123 60-65		
		Black (N1) COAL		2441.4			SHOB-123 65-70		
45.0	2460	66.0 - 80.0			Siltst		SHOB-123 70-75		
		Medium dark gray (N4) clayey SILTSTONE					SHOB-123 75-80		
50.0	2455			2427.4				TD=80'	
55.0	2450	<b>Boring completed at 80 ft.</b>							
60.0	2445								
65.0	2440								
70.0	2435								
75.0	2430								
80.0									

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA\_4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 124

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/05/07 15:32

DATE COMPLETED: 10/05/07 15:58

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-124R**

COORDINATES: N: 438,588 E: 1,372,808

GROUND SURFACE ELEVATION: 2,508.6 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,428.6 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2505	0.0 - 2.5 Dark yellowish brown clayey SILT, sli moist to moist		2506.1	ML	Sli. moist to moist	SHOB-124 0-2.5	
5.0	2500	2.5 - 15.0 Light olive gray (5Y, 5/2) clayey SILTSTONE, moist		2493.6	Siltst	Moist	SHOB-124 2.5-5 SHOB-124 5-7.5 SHOB-124 7.5-10 SHOB-124 10-12.5 + BD-SAH-24	
15.0	2490	15.0 - 25.0 Light olive gray (5Y, 5/2) CLAYSTONE, trace rust colored silt, moist		2483.6	Clst		SHOB-124 12.5-15 SHOB-124 15-17.5 SHOB-124 17.5-20	Driller began using water at 17.5'
25.0	2485	25.0 - 45.0 Olive gray (5Y, 4/1) SILTSTONE		2463.6	Siltst		SHOB-124 20-25 SHOB-124 25-30 SHOB-124 30-35 SHOB-124 35-40 SHOB-124 40-45	
45.0	2460	45.0 - 67.0 Black (N1) COAL		2441.6	Coal	N/A	SHOB-124 45-50 SHOB-124 50-55 SHOB-124 55-60 SHOB-124 60-65	Driller confirmed coal from 45'-67'
67.0	2435	67.0 - 80.0 Medium dark gray (N4) clayey SILTSTONE		2428.6	Siltst		SHOB-124 65-70 SHOB-124 70-75 SHOB-124 75-80	Driller said that natural water is entering the coal at 60'
80.0		<b>Boring completed at 80 ft.</b>						TD=80'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project  
 PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 125

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 11:25

DATE COMPLETED: 10/06/07 12:17

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-125R

COORDINATES: N: 437,977 E: 1,361,825

GROUND SURFACE ELEVATION: 2,584.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 135.0 ft

BOTTOM ELEVATION: 2,449.8 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0		0.0 - 5.0 Olive gray (5Y, 4/1) silty CLAY, sli. moist		2579.8	ML	Sli. moist	SHOB-125 0-2.5 SHOB-125 2.5-5.0	
5.0	2580	5.0 - 7.5 Black (N1) COAL, dry to sli. moist		2577.3	Coal	Dry to Sli. moist	SHOB-125 5-7.5	Samples contaminated by coal stringer
10.0	2575	7.5 - 15.0 Olive gray (5Y, 4/1) CLAYSTONE, moist		2569.8	Clst	Moist	SHOB-125 7.5-10 SHOB-125 10-12.5	Driller began using water at 12.5'
15.0	2570	15.0 - 20.0 Olive black (5Y, 7/1) CLAYSTONE		2564.8	Clst		SHOB-125 12.5-15 SHOB-125 15-17.5	
20.0	2565	20.0 - 25.0 Olive gray (5Y, 4/1) silty CLAYSTONE, moist		2559.8	Clst		SHOB-125 17.5-20 SHOB-125 20-25 SHOB-125 25-30	
25.0	2560	25.0 - 34.0 Medium dark gray (N4) CLAYSTONE		2550.8	Clst		SHOB-125 30-35	
30.0	2555	34.0 - 35.0 Black (N1) COAL		2549.8	Coal		SHOB-125 35-40	
35.0	2550	35.0 - 50.0 Medium light gray (N6) SILTSTONE		2534.8	Siltst		SHOB-125 40-45 SHOB-125 45-50 + BD-SAH-31	
40.0	2545	50.0 - 60.0 Medium light gray (N6) clayey SILTSTONE		2524.8	Siltst	N/A	SHOB-125 50-55 SHOB-125 55-60	
45.0	2540	60.0 - 63.0 hard SHALE		2521.8	Sh		SHOB-125 60-65	
50.0	2535	63.0 - 75.0 Medium gray (N5) CLAYSTONE		2509.8	Clst		SHOB-125 65-70 SHOB-125 70-75	
55.0	2530	75.0 - 90.0 Dark greenish gray (5GY, 4/1) SILTSTONE		2494.8	Siltst		SHOB-125 75-80 SHOB-125 80-85 SHOB-125 85-90	
60.0	2525	90.0 - 105.0 Medium light gray (N6) sandy SILTSTONE, very fine grained sand			Siltst		SHOB-125 90-95 SHOB-125 95-100	
65.0	2520							
70.0	2515							
75.0	2510							
80.0	2505							
85.0	2500							
90.0	2495							
95.0	2490							
100.0	2485							

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 125

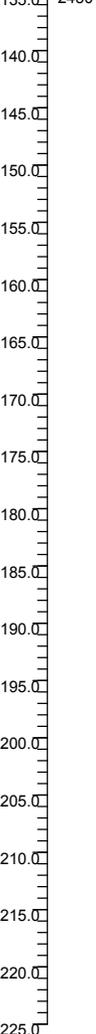
RECORD OF BORING **SHOB-125R**

COORDINATES: N: 437,977 E: 1,361,825

GROUND SURFACE ELEVATION: 2,584.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0			x x x x x		Siltst		SHOB-125 100-105	Driller confirmed coal from 103'-121'  Samples below 120' contaminated w/ coal from above
105.0	2480	105.0 - 121.0 Black (N1) COAL	x x x x x	2479.8		N/A	SHOB-125 105-110	
110.0	2475		x x x x x		Coal		SHOB-125 110-115	
115.0	2470		x x x x x				SHOB-125 115-120	
120.0	2465		x x x x x	2463.8			SHOB-125 120-125	
125.0	2460	121.0 - 135.0 Medium gray (N5) clayey SILTSTONE, trace fine grained sand	x x x x x		Siltst		SHOB-125 125-130	
130.0	2455		x x x x x				SHOB-125 130-135	
135.0	2450	<b><u>Boring completed at 135 ft.</u></b>		2449.8				TD=135'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 126

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 15:32

DATE COMPLETED: 10/06/07 16:32

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-126R**

COORDINATES: N: 437,642 E: 1,359,541

GROUND SURFACE ELEVATION: 2,603.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 145.0 ft

BOTTOM ELEVATION: 2,458.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0		0.0 - 2.5		2600.9	CL		SHOB-126 0-2.5	
	2600	Dark yellowish brown (10YR, 4/2) silty CLAY, sli. moist		2598.4	Clst	Sli. moist	SHOB-126 2.5-5.0	
5.0		2.5 - 5.0		2595.4	Clst		SHOB-126 5-7.5	
	2595	Moderate olive brown (5Y, 4/4) CLAYSTONE, sli. moist		2592.9	Coal	Dry	SHOB-126 7.5-10	Driller confirmed coal stringer from 8'-10.5'
10.0		5.0 - 8.0		2590.9	Ss	Sli. moist	SHOB-126 10-12.5	
	2590	Olive gray (5Y,4/2) CLAYSTONE, sli. moist		2585.9	Clst	Moist	SHOB-126 12.5-15	
20.0		8.0 - 10.5		2583.4	Siltst		SHOB-126 15-17.5	
	2585	Black (N1) COAL, dry					SHOB-126 17.5-20	
25.0		10.5 - 12.5					SHOB-126 20-25 + BD-SAH-35	
	2580	Dark yellowish brown (10YR,4/2) silty SANDSTONE, sli. moist					SHOB-126 25-30	
30.0		12.5 - 17.5					SHOB-126 30-35	
	2575	Olive yellow (5Y, 5/2) CLAYSTONE, moist					SHOB-126 35-40	
35.0		17.5 - 20.0			Ss		SHOB-126 40-45	
	2570	Olive yellow (5Y, 5/2) clayey SILTSTONE, sli. moist					SHOB-126 45-50	
40.0		20.0 - 75.0					SHOB-126 50-55	
	2565	Light olive gray (5Y, 5/2) silty SANDSTONE, very fine grained, sli. moist			Ss	Sli. moist	SHOB-126 55-60	
45.0		35' Color change to Light olive brown (5Y, 5/6)					SHOB-126 60-65 + BD-SAH-36	
	2560						SHOB-126 65-70	
50.0							SHOB-126 70-75	
	2555			2528.4			SHOB-126 75-80	
55.0		75.0 - 80.0			Ss		SHOB-126 80-85	
	2550	Light olive gray (5Y, 5/2) silty SANDSTONE, sli. moist		2523.4			SHOB-126 85-90	Driller began using water at 86'
60.0		80.0 - 85.0			Ss	Moist		
	2545	Olive gray (5Y, 4/2) silty SANDSTONE, moist		2518.4				No sample recovery from 90'-100'
65.0		85.0 - 117.0						
	2540	Medium dark gray (N4) silty CLAYSTONE			Clst	N/A		
70.0								
	2535							
75.0								
	2530							
80.0								
	2525							
85.0								
	2520							
90.0								
	2515							
95.0								
	2510							
100.0								
	2505							

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 126

RECORD OF BORING **SHOB-126R**

COORDINATES: N: 437,642 E: 1,359,541

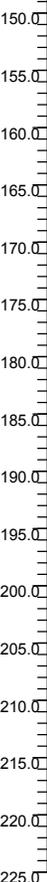
GROUND SURFACE ELEVATION: 2,603.4 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2500	85.0 - 117.0 Medium dark gray (N4) silty CLAYSTONE <i>continued from previous page</i>		2486.4	Clst	N/A	SHOB-126 100-105	No Sample recovery from 105'-110'
105.0	2495						SHOB-126 110-115	
110.0	2490						SHOB-126 115-120	
115.0	2485	117.0 - 131.0 Black (N1) COAL		2472.4	Coal	N/A	SHOB-126 120-125	Driller confirmed coal from 117'-131'
120.0	2480						SHOB-126 125-130	
125.0	2475						SHOB-126 130-135	
130.0	2470	131.0 - 145.0 Medium dark gray (N4) clayey SILTSTONE		2458.4	Siltst	N/A	SHOB-126 135-140	TD=145'
135.0	2465						SHOB-126 140-145	
140.0	2460							

**Boring completed at 145 ft.**

TD=145'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 127

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/03/07 08:39

DATE COMPLETED: 10/03/07 10:00

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-127R**

COORDINATES: N: 437,451 E: 1,366,219

GROUND SURFACE ELEVATION: 2,510.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,430.8 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2510	0.0 - 7.0 Dark yellowish brown (10YR, 3/2) SILT, sli. moist			ML		SHOB-127 0-2.5 SHOB-127 2.5-5	
5.0	2505			2503.8		Sli. moist	SHOB-127 5-7.5	
7.0	2500	7.0 - 45.0 Moderate yellowish brown (10YR, 5/4) SILTSTONE, sli. moist			Stst	Moist	SHOB-127 7.5-10	Driller begins using water at 17.5' Driller lost circulation, tried again to drill with water, driller abandons hole and pulls forward to start new hole (SHOB-127R (B))
10.0	2495	12' SILTSTONE becomes moist					SHOB-127 10-12.5	
15.0	2490						SHOB-127 12.5-15	
20.0	2485	20' color change to pale yellowish brown (10YR, 5/2)					SHOB-127 15-17.5	
25.0	2480						SHOB-127 17.5-20	
30.0	2475					SHOB-127B 20-25		
35.0	2470					SHOB-127B 25-30		
40.0	2465			2465.8		SHOB-127B 30-35 + BD-SAH-08		
45.0	2460	45.0 - 55.0 Olive gray (5Y, 4/1) CLAYSTONE				SHOB-127B 35-40		
50.0	2455			2455.8		SHOB-127B 40-45		
55.0	2450	55.0 - 80.0 Medium dark gray (N4) SANDSTONE, fine grained			Clst	SHOB-127B 45-50		
60.0	2445				Ss	SHOB-127B 50-55		
65.0	2440					SHOB-127B 55-60		
70.0	2435					SHOB-127B 60-65		
75.0	2430					SHOB-127B 65-70		
80.0	2430.8	<b>Boring completed at 80 ft.</b>		2430.8			SHOB-127B 70-75	
							SHOB-127B 75-80	TD=80'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/8/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 128

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/03/07 11:32

DATE COMPLETED: 10/03/07 11:56

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-128R

COORDINATES: N: 437,443 E: 1,367,429

GROUND SURFACE ELEVATION: 2,506.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 60.0 ft

BOTTOM ELEVATION: 2,446.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2505	0.0 - 2.5 Dark yellowish brown (10YR, 4/2) SILT, sli. moist		2503.9	ML	Sli. moist	SHOB-128 0-2.5	Driller began using water at 20'
5.0	2500	2.5 - 7.5 Dark yellowish brown (10YR, 4/2) silty SAND, very fine grained, sli. moist		2498.9	SM		SHOB-128 2.5-5	
10.0	2495	7.5 - 15.0 Dark yellowish brown (10YR, 4/2) SILT, sli. moist		2491.4	ML		SHOB-128 5-7.5	
15.0	2490	15.0 - 17.5 Dark yellowish brown (10YR, 4/2) fine grained SANDSTONE, sli. moist		2488.9	Ss	Moist to v. moist	SHOB-128 7.5-10	
20.0	2485	17.5 - 30.0 Dark yellowish brown (10YR, 4/2) sandy SILTSTONE, very fine grained, moist to very moist		2476.4	Siltst	N/A	SHOB-128 10-12.5	
25.0	2480	30.0 - 40.0 Dark yellowish brown (10YR, 4/2) silty CLAYSTONE, trace shale		2466.4	Cist		SHOB-128 12.5-15	
30.0	2475	40.0 - 50.0 Dark yellowish brown (10YR, 3/2) SILTSTONE, little sand		2456.4	Siltst		SHOB-128 15-17.5	
35.0	2470	50.0 - 60.0 Olive gray (5Y, 4/1) fine grained SANDSTONE		2446.4	Ss		SHOB-128 17.5-20	
40.0	2465						SHOB-128 20-25	
45.0	2460						SHOB-128 25-30 + BD-SAH-09	
50.0	2455						SHOB-128 30-35	
55.0	2450						SHOB-128 35-40	
60.0							SHOB-128 40-45	
							SHOB-128 45-50	
							SHOB-128 50-55	
							SHOB-128 55-60	

**Boring completed at 60 ft.**

TD=60'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

SHEET 1 of 1

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 129

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/04/07 07:26

DATE COMPLETED: 10/04/07 07:55

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-129R**

COORDINATES: N: 437,416 E: 1,368,806

GROUND SURFACE ELEVATION: 2,502.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 68.0 ft

BOTTOM ELEVATION: 2,434.7 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2500	0.0 - 2.5 Olive gray (5Y, 4/1) SILT, sli. moist		2500.2	ML	Sli. moist	SHOB-129 0-2.5	Driller beagn using water at 20'	
5.0	2495	2.5 - 12.5 Pale yellowish brown (10YR, 6/2) very fine grained sandy SILT, dry to sli. moist		2490.2	ML	Dry to sli. moist	SHOB-129 2.5-5 SHOB-129 5-7.5 SHOB-129 7.5-10 SHOB-129 10-12.5		
15.0	2485	12.5 - 17.5 Dark yellowish brown (10YR, 4/2) silty SANDSTONE, moist, very fine grained		2485.2	Ss	Moist	SHOB-129 12.5-15 SHOB-129 15-17.5		
20.0	2480	17.5 - 25.0 Dark yellowish brown (10YR, 4/2) fine grained SANDSTONE, moist		2477.7	Ss	N/A	SHOB-129 17.5-20 SHOB-129 20-25 SHOB-129 25-30		
30.0	2470	25.0 - 50.0 Moderate olive gray (5Y, 5/1) CLAYSTONE mixed with gravel and sand, trace coal fragments		2452.7	Clst Clst		SHOB-129 30-35 SHOB-129 35-40 SHOB-129 40-45		
45.0	2460	40' Color change to olive gray (5Y, 4/1)		2452.7			SHOB-129 45-50		
50.0	2450	50.0 - 60.0 Olive gray (5Y, 4/1) silty CLAYSTONE		2442.7	Clst		SHOB-129 50-55 + BD-SAH-15 SHOB-129 55-60		
60.0	2440	60.0 - 68.0 Olive gray (5Y, 4/1) sandy SILTSTONE, very fine grained		2434.7	Siltst		SHOB-129 60-65 SHOB-129 65-68		
<p><b>Boring completed at 68 ft.</b> <span style="float: right;">TD=68'</span></p>									

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 130

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/05/07 13:56

DATE COMPLETED: 10/05/07 14:23

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-130R**

COORDINATES: N: 437,353 E: 1,370,096

GROUND SURFACE ELEVATION: 2,498.5 ft

PROJECTION: StatePlane, North Dakota South, 3302

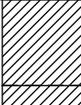
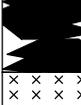
DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 60.0 ft

BOTTOM ELEVATION: 2,438.5 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2495	0.0 - 7.5 Dark yellowish brown (10YR, 4/2) silty CLAY, sli. moist			CL	Sli. moist	SHOB-130 0-2.5 SHOB-130 2.5-5 SHOB-130 5-7.5		
5.0	2490	7.5 - 10.0 Olive gray (5Y, 3/2) CLAY, moist		2491.0 2488.5	CL	Moist	SHOB-130 7.5-10 + BD-SAH-22		
10.0	2485	10.0 - 27.0 Dark yellowish brown (10YR, 4/2) clayey SILTSTONE, moist to very moist			Siltst	Moist to v. moist	SHOB-130 10-12.5 SHOB-130 12.5-15		
15.0	2480						SHOB-130 15-17.5 SHOB-130 17.5-20	Driller began using water at 20'	
20.0	2475			2471.5			SHOB-130 20-25 SHOB-130 25-30	Driller confirmed coal from 27'-43'	
25.0	2470	27.0 - 43.0 Black (N1) COAL			Coal		SHOB-130 30-35 SHOB-130 35-40	Sample SHOB-130, 35-40' appears to be contaminated w/ siltstone from above	
30.0	2465					N/A	SHOB-130 40-45		
35.0	2460			2455.5			SHOB-130 45-50 SHOB-130 50-55	Samples below coal seam are probably med. dark gray (N4), but this is not evident b/c contamination from above	
40.0	2455	43.0 - 60.0 Dark yellowish brown (10YR, 4/2) clayey SILTSTONE,			Siltst		SHOB-130 55-60		
45.0	2450			2438.5					
50.0	2445	<b>Boring completed at 60 ft.</b>							
55.0	2440							TD=60'	

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 131

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 13:25

DATE COMPLETED: 10/06/07 14:04

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-131R**

COORDINATES: N: 436,293 E: 1,360,819

GROUND SURFACE ELEVATION: 2,542.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 120.0 ft

BOTTOM ELEVATION: 2,422.1 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2540	0.0 - 2.5 Brownish black (5YR, 2/1) silty CLAY, sli. moist		2539.6	CL	Sli. moist	SHOB-131 0-2.5	
5.0	2535	2.5 - 5.0 Light olive gray (5Y 5/2) silty CLAY, dry		2537.1	CL	Dry	SHOB-131 2.5-5	
10.0	2530	5.0 - 25.0 Moderate yellowish brown (10YR, 5/4) clayey SILT, dry			ML		SHOB-131 5-7.5	
15.0	2525						SHOB-131 7.5-10	
20.0	2520						SHOB-131 10-12.5	
25.0	2515	25.0 - 30.0 Olive gray (5Y, 3/2) silty CLAYSTONE		2517.1	Clst		SHOB-131 12.5-15	
30.0	2510	30.0 - 40.0 Light olive gray (5Y 5/2) clayey SILTSTONE		2512.1	Siltst		SHOB-131 15-17.5	
35.0	2505	40.0 - 45.0 SILTSTONE as above w/ little coarse sand		2502.1	Siltst		SHOB-131 17.5-20	
40.0	2500	45.0 - 65.0 Moderate olive brown (5Y, 4/4) very fine grained silty SANDSTONE		2497.1	Siltst	SHOB-131 20-25 + BD-SAH-33	Driller began using water at 30'	
45.0	2495				Ss	SHOB-131 25-30		
50.0	2490					SHOB-131 30-35		
55.0	2485					SHOB-131 35-40		
60.0	2480					SHOB-131 40-45		
65.0	2475	65.0 - 70.0 Olive gray (5Y, 3/2) SILTSTONE		2477.1	Siltst	SHOB-131 45-50		
70.0	2470	70.0 - 80.0 Light olive gray (5Y, 5/2) sandy SILTSTONE		2472.1	Siltst	SHOB-131 50-55		
75.0	2465					SHOB-131 55-60		
80.0	2460	80.0 - 95.0 Olive gray (5Y, 3/2) very fine grained SANDSTONE		2462.1	Siltst	SHOB-131 60-65		
85.0	2455					SHOB-131 65-70		
90.0	2450					SHOB-131 70-75		
95.0	2445	<< Continued >>		2447.1	Ss	SHOB-131 75-80	Driller commented about water in the sandstone	
100.0	2445					SHOB-131 80-85		
								SHOB-131 85-90
								SHOB-131 90-95
								SHOB-131 95-100

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

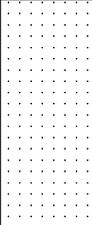
PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 131

RECORD OF BORING **SHOB-131R**

COORDINATES: N: 436,293 E: 1,360,819

GROUND SURFACE ELEVATION: 2,542.1 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2440	95.0 - 120.0 Olive gray (5Y, 3/2) very fine grained SANDSTONE, w/ some clay <i>continued from previous page</i>			Ss	N/A	SHOB-131 100-105	
105.0	2435						SHOB-131 105-110	
110.0	2430						SHOB-131 110-115	
115.0	2425			2422.1			SHOB-131 115-120	

**Boring completed at 120 ft.**

TD=120'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 132

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 12:35

DATE COMPLETED: 10/06/07 13:10

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-132R**

COORDINATES: N: 436,649 E: 1,362,134

GROUND SURFACE ELEVATION: 2,562.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 85.0 ft

BOTTOM ELEVATION: 2,477.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV. (ft)	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
0.0	2560	0.0 - 2.5 Moderate yellow brown (10YR, 5/4) clayey SILT, sli. moist	[Hatched pattern]	2559.9	ML		SHOB-132 0-2.5	
5.0	2555	2.5 - 7.5 Dark yellowish orange (10YR, 6/6) silty CLAY, sli. moist	[Hatched pattern]	2554.9	CL		SHOB-132 2.5-5 SHOB-132 5-7.5	
10.0	2550	7.5 - 10.0 Above CLAY interbedder w/ COAL stringer, sli. moist	[Hatched pattern]	2544.9	Clst	Sli. moist	SHOB-132 7.5-10 SHOB-132 10-12.5 SHOB-132 12.5-15 SHOB-132 15-17.5 SHOB-132 17.5-20	
15.0	2545	10.0 - 17.5 Greenish gray (5GY, 6/1) CLAYSTONE, sli. moist	[Green hatched pattern]	2542.4	Clst			
20.0	2540	17.5 - 20.0 Greenish gray (5GY, 6/1) and mod. yellow brown (10YR, 5/4) CLAYSTONE, sli. moist	[Green hatched pattern]	2537.4	Clst			
25.0	2535	20.0 - 25.0 Light olive gray (5Y, 5/2) silty CLAYSTONE, sli. moist	[Green hatched pattern]	2532.4	Ss	Moist	SHOB-132 20-25 SHOB-132 25-30	
30.0	2530	25.0 - 30.0 Dark yellowish brown (10YR, 4/2) fine-grained, clayey SANDSTONE that react to HCl, moist	[Green hatched pattern]	2527.4	Clst		SHOB-132 30-35	Driller began using water at 35'
35.0	2525	30.0 - 35.0 Olive gray (5Y, 3/2) silty CLAYSTONE, moist	[Green hatched pattern]		Siltst		SHOB-132 35-40 SHOB-132 40-45 SHOB-132 45-50 + BD-SAH-32 SHOB-132 50-55	
40.0	2520	35.0 - 58.0 Grayish olive (5Y, 4/2) clayey SILTSTONE	[Green hatched pattern]	2504.4		N/A	SHOB-132 55-60 SHOB-132 60-65 SHOB-132 65-70 SHOB-132 70-75	Driller confirmed coal from 58'-74'
45.0	2515	58.0 - 74.0 Black (N1) COAL	[Black solid pattern]		Coal			
50.0	2510	74.0 - 85.0 Medium dark gray (N4) clayey SILTSTONE	[Green hatched pattern]	2488.4				
55.0	2505							
60.0	2500							
65.0	2495							
70.0	2490							
75.0	2485							
80.0	2480							
85.0		<b>Boring completed at 85 ft.</b>		2477.4				TD=85'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 133

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/03/07 07:32

DATE COMPLETED: 10/03/07 08:15

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-133R**

COORDINATES: N: 436,181 E: 1,364,789

GROUND SURFACE ELEVATION: 2,527.0 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 75.0 ft

BOTTOM ELEVATION: 2,452.0 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2525	0.0 - 2.5 Dark yellowish brown (10YR, 4/2) SILT, sli. moist	[Hatched]	2524.5	ML	Sli. moist	SHOB-133 0-2.5		
5.0	2520	2.5 - 7.0 Dark yellowish brown (10YR, 4/2) silty CLAY, moist	[Hatched]	2520.0	CL	Moist	SHOB-133 2.5-5 SHOB-133 5-7.5		
10.0	2515	7.0 - 17.5 Pale olive (10Y, 5/2) CLAYSTONE, moist	[Hatched]	2509.5	Clst		SHOB-133 7.5-10 SHOB-133 10-12.5	Driller began using water at 12.5'	
15.0	2510	17.5 - 20.0 Medium olive brown (5Y, 5/4) SHALE	[Dotted]	2507.0	Sh	N/A	SHOB-133 12.5-15 SHOB-133 15-17.5	Driller began using mud pit at 22'	
20.0	2505	20.0 - 25.0 Dark greenish gray (5G, 4/1) fine grained SANDSTONE	[Dotted]	2502.0	Ss		SHOB-133 17.5-20 SHOB-133 20-25 SHOB-133 25-30 + BD-SAH-07		
25.0	2500	25.0 - 42.0 Olive gray (5Y, 4/1) interbedded SILTSTONE and SANDSTONE	[Dotted]		Siltst/Ss		SHOB-133 30-35 SHOB-133 35-40		
30.0	2495								
35.0	2490								
40.0	2485	42.0 - 65.0 Black (N1) COAL	[Solid Black]	2485.0		N/A	SHOB-133 40-45 SHOB-133 45-50	Driller confirmed coal from 42'-60'	
45.0	2480						SHOB-133 50-55		
50.0	2475						SHOB-133 55-60		
55.0	2470						SHOB-133 60-65		
60.0	2465						SHOB-133 65-70		
65.0	2460	65.0 - 75.0 Dark olive gray (5Y, 3/1) SILTSTONE	[Dotted]	2462.0			SHOB-133 70-75		
70.0	2455			2452.0	Siltst				
75.0		<b>Boring completed at 75 ft.</b>						TD=75'	

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 134

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/02/07 16:07

DATE COMPLETED: 10/02/07 16:32

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-134R**

COORDINATES: N: 436,088 E: 1,366,088

GROUND SURFACE ELEVATION: 2,507.6 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,427.6 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2505	0.0 - 5.0 Dark yellowish brown (10YR, 4/2) SILT sli. moist		2502.6	ML	Sli. moist	SHOB-134 0-2.5 SHOB-134 2.5-5	No sample recovery for 15'-17.5' interval Driller began using water at 17'
5.0	2500	5.0 - 7.5 Dark yellowish brown (10YR, 4/2) sandy SILT, moist		2500.1	ML	Moist	SHOB-134 5-7.5	
10.0	2495	7.5 - 20.0 Dark yellowish brown clayey (10YR, 4/2) SILT, moist to very moist		2487.6	ML	Moist to very moist	SHOB-134 7.5-10 SHOB-134 10-12.5 SHOB-134 12.5-15 SHOB-134 17.5-20	
15.0	2490							
20.0	2485	20.0 - 45.0 Grayish olive (10Y, 4/2) SANDSTONE, coarse to fine grained		2462.6	Ss	N/A	SHOB-134 20-25 + BD-SAH-06 SHOB-134 25-30 SHOB-134 30-35 SHOB-134 35-40 SHOB-134 40-45	
25.0	2480							
30.0	2475							
35.0	2470							
40.0	2465							
45.0	2460	45.0 - 80.0 Medium dark gray (N4) fine grained SANDSTONE, trace coal fragments		2427.6	Ss	N/A	SHOB-134 45-50 SHOB-134 50-55 SHOB-134 55-60 SHOB-134 60-65 SHOB-134 65-70 SHOB-134 70-75 SHOB-134 75-80	
50.0	2455							
55.0	2450							
60.0	2445							
65.0	2440							
70.0	2435							
75.0	2430							
80.0		<b>Boring completed at 80 ft.</b>						TD=80'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 135

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/04/07 09:00

DATE COMPLETED: 10/04/07 09:40

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-135R**

COORDINATES: N: 436,131 E: 1,367,403

GROUND SURFACE ELEVATION: 2,504.7 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 70.0 ft

BOTTOM ELEVATION: 2,434.7 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2500	0.0 - 7.5 Pale yellowish brown (10YR, 6/2) clayey SILT, dry to sli. moist			ML	Dry to sli. moist	SHOB-135 0-2.5 SHOB-135 2.5-5 SHOB-135 5-7.5	
7.5	2495	7.5 - 10.0 Moderate yellowish brown (10YR, 5/2) CLAYSTONE, moist		2497.2	Clst	Moist	SHOB-135 7.5-10 SHOB-135 10-12.5	Driller began using water at 15'
10.0	2490	10.0 - 25.0 Moderate yellowish brown (10YR, 5/2) sandy SILTSTONE, very fine grained sand, moist		2494.7	Siltst Siltst		SHOB-135 12.5-15 SHOB-135 15-17.5 SHOB-135 17.5-20	
17.5	2485	17.5' - 25' Hard bits of sand and gravel mixed in		2479.7		N/A	SHOB-135 20-25 SHOB-135 25-30	Driller confirmed coal from 26'-42'
25.0	2480	25.0 - 40.0 Black (N1) COAL			Coal		SHOB-135 30-35 SHOB-135 35-40	
40.0	2475	40.0 - 70.0 Olive gray (5Y, 4/1) gravelly, silty SANDSTONE, trace coal		2464.7		N/A	SHOB-135 40-45 SHOB-135 45-50 SHOB-135 50-55 SHOB-135 55-60 SHOB-135 60-65 SHOB-135 65-70 + BD-SAH-17	All samples below coal appear to be gravel and sands from above
45.0	2470				Ss			
50.0	2465							
55.0	2460							
60.0	2455							
65.0	2450							
70.0	2445							
70.0	2440			2434.7				
<p><b>Boring completed at 70 ft.</b> <span style="float: right;">TD=70'</span></p>								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 136

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/04/07 08:18

DATE COMPLETED: 10/04/07 08:42

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-136R**

COORDINATES: N: 436,016 E: 1,368,720

GROUND SURFACE ELEVATION: 2,514.9 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 75.0 ft

BOTTOM ELEVATION: 2,439.9 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0		0.0 - 7.5 Light olive gray (5Y, 5/2) SILT, sli. moist			ML	Sli. moist	SHOB-136 0-2.5 SHOB-136 2.5-5 SHOB-136 5-7.5		
5.0	2510			2507.4					
7.5		7.5 - 10.0 Moderate olive brown (5Y, 4/4) CLAYSTONE, moist		2504.9	Clst	Moist	SHOB-136 7.5-10 SHOB-136 10-12.5 SHOB-136 12.5-15 SHOB-136 15-17.5 SHOB-136 17.5-20 SHOB-136 20-25 SHOB-136 25-30	Driller began using water at 20'	
10.0	2505								
15.0	2500								
20.0	2495								
25.0	2490				Ss				
30.0	2485								
35.0	2480								
40.0	2475			2474.9					
40.0		40.0 - 60.0 Black (N1) COAL			Coal	N/A	SHOB-136 30-35 SHOB-136 35-40 SHOB-136 40-45 SHOB-136 45-50 SHOB-136 50-55 SHOB-136 55-60	Driller confirmed coal from 41'-58'  Driller mentioned water in coal	
45.0	2470								
50.0	2465								
55.0	2460								
60.0	2455			2454.9					
60.0		60.0 - 75.0 Dark greenish gray (5GY, 4/1) silty CLAYSTONE			Clst		SHOB-136 60-65 SHOB-136 65-70 + BD-SAH-16 SHOB-136 70-75		
65.0	2450								
70.0	2445								
75.0	2440	<b>Boring completed at 75 ft.</b>							TD=75'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 137

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/02/07 13:40

DATE COMPLETED: 10/02/07 14:05

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-137R**

COORDINATES: N: 434,931 E: 1,364,604

GROUND SURFACE ELEVATION: 2,512.0 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 50.0 ft

BOTTOM ELEVATION: 2,462.0 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2510	0.0 - 7.5 Dark yellowish brown SILT, trace organics			ML		SHOB-137 0-2.5 SHOB-137 2.5-5	
5.0	2505			2504.5			SHOB-137 5-7.5	
7.5	2500	7.5 - 12.5 Grayish brown (5YR, 3/2) SILT			ML		SHOB-137 7.5-10	Driller began using water at 10'
10.0	2495			2499.5			SHOB-137 10-12.5	12.5' Driller lost circulation, attempted to fill void w/ bentonite powder (WYO-BEN, Inc. extra high yield bentonite, Billings, MT)
12.5	2490	12.5 - 23.0 Dark yellowish brown (10YR, 4/2) SILTSTONE, trace coal			Siltst		SHOB-137 12.5-15	
15.0	2485			2489.0			SHOB-137 15-17.5	
23.0	2480	23.0 - 38.0 Black (N1) COAL			Coal	N/A	SHOB-137 17.5-20	Century geophysics indicated coal from 23'-38'
25.0	2475			2474.0			SHOB-137 20-25 SHOB-137 25-30	
38.0	2470	38.0 - 50.0 Unknown, samples were coal from hole collapse above.					SHOB-137 30-35 SHOB-137 35-40	Driller confirmed bottom of coal at 38'
40.0	2465			2462.0			SHOB-137 40-45 SHOB-137 45-50	
<p><b>Boring completed at 50 ft.</b></p>								TD=50'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/8/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 138

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/02/07 10:24

DATE COMPLETED: 10/02/07 11:45

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-138R**

COORDINATES: N: 434,802 E: 1,366,098

GROUND SURFACE ELEVATION: 2,510.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 120.0 ft

BOTTOM ELEVATION: 2,390.4 ft

HOLE DIAMETER: 5.625 inches

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2510	0.0 - 10.5 Pale yellowish brown (10YR, 6/2) SILT, dry			ML	Dry	SHOB-138 0-2.5		
5.0	2505						SHOB-138 2.5-5		
							SHOB-138 5-7.5		
7.5	2500	7.5' Becomes very moist		2499.9		Very moist	SHOB-138 7.5-10	Driller began using water 10'	
10.0	2495	10' Becomes wet					SHOB-138 10-12.5		
10.5	2495	10.5 - 17.5 Pale yellowish brown (10YR, 6/2) SILTSTONE, with black (N1) COAL		2492.9	Siltst/Coal		SHOB-138 12.5-15	Below 17.5' heavy contamination from above	
15.0	2490						SHOB-138 15-17.5		
17.5	2490	17.5 - 30.0 Dark yellow brown (10YR, 4/2) fine gravel/ coarse SANDSTONE, trace coal			Ss		SHOB-138 17.5-20		
25.0	2485								SHOB-138 20-25
30.0	2480					2480.4			SHOB-138 25-30
30.0	2480	30.0 - 40.0 Dark yellow brown (10YR, 4/2) gravelly SILTSTONE, fine grained, trace coal			Siltst		SHOB-138 30-35		
35.0	2475					2470.4			SHOB-138 35-40
40.0	2470	40.0 - 50.0 Dark yellow brown (10YR, 4/2) SILTSTONE, trace fine grained gravel, trace coal			Siltst		SHOB-138B 40-45	From hole 138B: 40-50' Olive gray (5Y, 4/1) clayey SANDSTONE, trace coal	
45.0	2465					2460.4			SHOB-138B 45-50
50.0	2460	50.0 - 60.0 Olive gray CLAYSTONE, some olive black organic fragments			Clst	N/A	SHOB-138B 50-55		
55.0	2455						2450.4		
60.0	2450	60.0 - 70.0 Medium dark gray (N4) CLAYSTONE, little fine grained sand, some dark brown material			Clst		SHOB-138B 60-65	Hole fills w/ "soupy" soil, driller moved forward 20ft and started new hole (SHOB-138B)	
65.0	2445					2440.4			SHOB-138B 65-70
70.0	2440	70.0 - 105.0 Medium dark gray (N4) clayey SANDSTONE/ sandy CLAYSTONE			Ss/Clst		SHOB-138B 70-75 + BD-SAH-02		
75.0	2435								SHOB-138B 75-80
80.0	2430								SHOB-138B 80-85
85.0	2425								SHOB-138B 85-90
90.0	2420								SHOB-138B 90-95
95.0	2415								SHOB-138B 95-100

Log continued on next page



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/8/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

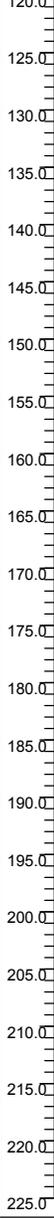
LOCATION: South Heart, ND, Overburden Borehole 138

RECORD OF BORING **SHOB-138R**

COORDINATES: N: 434,802 E: 1,366,098

GROUND SURFACE ELEVATION: 2,510.4 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2410	100-105' trace coal		2405.4	Ss/Clst	N/A	SHOB-138B 100-105	Driller confirmed about 6" coal stringer at 100'
105.0	2405	105.0 - 120.0 Medium dark gray (N4) CLAYSTONE, little coal		2390.4	Clst		SHOB-138B 105-110	Below 105' chips become harder
110.0	2400						SHOB-138B 110-115	
115.0	2395						SHOB-138B 115-120 + BD-SAH-03	
120.0		<b>Boring completed at 120 ft.</b>						TD=120'



OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/8/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 139

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/02/07 12:30

DATE COMPLETED: 10/02/07 13:05

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-139R**

COORDINATES: N: 433,527 E: 1,364,688

GROUND SURFACE ELEVATION: 2,514.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,434.2 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2510	0.0 - 7.5 Dusky yellow (5Y, 6/4) sandy SILT			ML		SHOB-139 0-2.5 SHOB-139 2.5-5 SHOB-139 5-7.5	Driller began using water at 0'
5.0	2505	7.5 - 17.5 Dusky yellow (5Y 6/4) SILTSTONE, trace coal		2506.7	Siltst		SHOB-139 7.5-10 SHOB-139 10-12.5	
10.0	2500	17.5 - 20.0 Light olive gray (5Y, 5/2) CLAYSTONE		2496.7	Clst		SHOB-139 12.5-15 SHOB-139 15-17.5	
15.0	2495	20.0 - 30.0 Dusky yellow (5Y, 6/4) CLAYSTONE		2494.2	Clst		SHOB-139 17.5-20 SHOB-139 20-25 + BD-SAH-04	
20.0	2490	30.0 - 50.0 Olive gray (5Y, 4/1) CLAYSTONE		2484.2	Clst	N/A	SHOB-139 25-30 SHOB-139 30-35 SHOB-139 35-40 SHOB-139 40-45	
25.0	2485	45' tr. coal		2464.2			SHOB-139 45-50	
30.0	2480	50.0 - 55.0 Olive gray (5Y, 3/2) SANDSTONE, some gravel, tr. coal		2459.2	Ss		SHOB-139 50-55 SHOB-139 55-60 SHOB-139 60-65 SHOB-139 65-70	
35.0	2475	55.0 - 70.0 Olive gray (5Y, 4/1) hard CLAYSTONE		2444.2	Clst		SHOB-139 70-75 SHOB-139 75-80	
40.0	2470	70.0 - 80.0 Olive gray (5Y, 4/1) SILTSTONE		2434.2	Siltst			
45.0	2465	77' trace very hard shale						TD=80'
50.0	2460	<b>Boring completed at 80 ft.</b>						

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 140

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/02/07 14:47

DATE COMPLETED: 10/02/07 15:27

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-140R**

COORDINATES: N: 433,513 E: 1,366,037

GROUND SURFACE ELEVATION: 2,520.2 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,440.2 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2520	0.0 - 7.5 Very pale orange (10YR, 8/2) SILT, little sand, dry moisture increasing w/ depth		2512.7	ML	Dry to moist w/ depth	SHOB-140 0-2.5 SHOB-140 2.5-5 SHOB-140 5-7.5	
7.5	2510	7.5 - 20.0 Pale yellowish brown (10YR, 6/2) clayey SILTSTONE, moist		2500.2	Siltst	Moist	SHOB-140 7.5-10 SHOB-140 10-12.5 SHOB-140 12.5-15 SHOB-140 15-17.5 SHOB-140 17.5-20	Driller began using water at 17'
20.0	2500	20.0 - 35.0 Moderate yellowish brown (10YR, 5/2) coarse grained SANDSTONE		2485.2	Ss	N/A	SHOB-140 20-25 SHOB-140 25-30	
35.0	2485	35.0 - 40.0 Grayish brown (5YR, 3/2) silty CLAYSTONE		2480.2	Clst		SHOB-140 30-35 SHOB-140 35-40	Samples from 40'-80' contaminated with sandstone from above
40.0	2480	40.0 - 50.0 Moderate yellowish brown (10YR, 5/2) SANDSTONE		2470.2	Ss	SHOB-140 40-45 + BD-SAH-05 SHOB-140 45-50		
50.0	2470	50.0 - 80.0 Medium dark gray (N4) SILTSTONE, tr. shale		2440.2	Siltst	SHOB-140 50-55 SHOB-140 55-60 SHOB-140 60-65 SHOB-140 65-70 SHOB-140 70-75 SHOB-140 75-80		
<p><b>Boring completed at 80 ft.</b> <span style="float: right;">TD=80'</span></p>								

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 141

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/04/07 10:22

DATE COMPLETED: 10/04/07 10:58

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

# RECORD OF BORING SHOB-141R

COORDINATES: N: 433,279 E: 1,367,623

GROUND SURFACE ELEVATION: 2,558.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 110.0 ft

BOTTOM ELEVATION: 2,448.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2555	0.0 - 2.5 Moderate olive brown (5Y, 4/4) clayey SILT, sli. moist		2555.9	ML	Sli. moist	SHOB-141 0-2.5	
5.0	2550	2.5 - 10.0 Moderate olive brown (5Y, 4/4) silty CLAYSTONE, moist		2548.4	Clst	Moist	SHOB-141 2.5-5 SHOB-141 5-7.5	
10.0	2545	10.0 - 12.5 Black (N1) COAL (approximately 70%) with some CLAYSTONE, dry to sli. moist		2545.9	Clst/Coal	Dry to sli. moist	SHOB-141 7.5-10	Driller confirmed coal stringer from 10'-14'
15.0	2540	12.5 - 14.0 Black (N1) COAL, dry to sli. moist		2544.4	Coal		SHOB-141 10-12.5	
20.0	2535	14.0 - 35.0 Light olive gray (5Y, 5/2) CLAYSTONE, moist			Clst	Moist	SHOB-141 12.5-15 SHOB-141 15-17.5 SHOB-141 17.5-20	Driller began using water at 20'
25.0	2530	20' Color change to olive gray (5Y, 3/2)		2523.4			SHOB-141 20-25 + BD-SAH-18 SHOB-141 25-30	
30.0	2525	30' Color change to dark gray (N3)		2518.4	Coal		SHOB-141 30-35	Driller confirmed coal from 35'-39'
35.0	2520	35.0 - 40.0 Black (N1) COAL					SHOB-141 35-40	
40.0	2515	40.0 - 55.0 Olive gray (5Y, 4/1) CLAYSTONE			Clst		SHOB-141 40-45 SHOB-141 45-50 SHOB-141 50-55	
45.0	2510	55.0 - 70.0 Medium dark gray (N4) SILTSTONE		2503.4		N/A	SHOB-141 55-60 SHOB-141 60-65 SHOB-141 65-70	
50.0	2505	70.0 - 84.0 Olive gray (5Y, 4/1) sandy SILTSTONE, very fine grained		2488.4			SHOB-141 70-75 SHOB-141 75-80	
55.0	2495	84.0 - 98.0 Black (N1) COAL		2474.4			SHOB-141 80-85	Driller confirmed coal from 84'-98'
60.0	2490				Coal		SHOB-141 85-90 SHOB-141 90-95	
65.0	2485			2460.4	Siltst		SHOB-141 95-100 + BD-SAH-19	
70.0	2480							
75.0	2475							
80.0	2470							
85.0	2465							
90.0	2460							
95.0	2460							
100.0	2460							

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007



PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 142

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/04/07 12:33

DATE COMPLETED: 10/04/07 13:16

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-142R**

COORDINATES: N: 432,202 E: 1,366,009

GROUND SURFACE ELEVATION: 2,519.1 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 80.0 ft

BOTTOM ELEVATION: 2,439.1 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2515	0.0 - 7.5 Pale yellowish brown (10YR, 6/2) clayey SILT, dry to sli. moist			ML	Dry to sli. moist	SHOB-142 0-2.5 SHOB-142 2.5-5 SHOB-142 5-7.5	
5.0	2510	7.5 - 20.0 Dark yellowish brown (10YR, 4/2) silty CLAY, moist		2511.6	CL	Moist	SHOB-142 7.5-10 SHOB-142 10-12.5 SHOB-142 12.5-15 SHOB-142 15-17.5 SHOB-142 17.5-20	Driller begins using water at 17'
10.0	2505	20.0 - 30.0 Dark yellowish brown (10YR, 4/2) CLAYSTONE, trace coal fragments		2499.1	Clst		SHOB-142 20-25 SHOB-142 25-30 + BD-SAH-21	
15.0	2500	25' little sand		2489.1				
20.0	2495	30.0 - 45.0 Dark yellowish brown (10YR, 4/2) gravelly, clayey SANDSTONE, little coal		2474.1	Ss		SHOB-142 30-35 SHOB-142 35-40 SHOB-142 40-45	
25.0	2490	45.0 - 55.0 Olive gray (5Y, 4/1) poorly sorted SANDSTONE, trace coal		2464.1	Ss	N/A	SHOB-142 45-50 SHOB-142 50-55	
30.0	2485	55.0 - 60.0 Light olive gray (5Y, 6/1) CLAYSTONE		2459.1	Clst		SHOB-142 55-60	
35.0	2480	60.0 - 65.0 Medium dark gray (N4) CLAYSTONE, little coal, hard		2454.1	Clst		SHOB-142 60-65 SHOB-142 65-70	
40.0	2475	65.0 - 80.0 Grayish black to black (N2.5) CLAYSTONE, little coal			Clst		SHOB-142 70-75 SHOB-142 75-80	
45.0	2470	70' trace shale		2439.1				
50.0	2465	<b>Boring completed at 80 ft.</b>						

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 143

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/06/07 08:39

DATE COMPLETED: 10/06/07 09:37

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-143R**

COORDINATES: N: 430,917 E: 1,364,599

GROUND SURFACE ELEVATION: 2,563.4 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 95.0 ft

BOTTOM ELEVATION: 2,468.4 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2560	0.0 - 5.0 Olive gray (5Y, 4/1) silty CLAY, moist		2558.4	CL	Moist	SHOB-143 0-2.5	
5.0	2555	5.0 - 10.0 Olive gray (5Y, 4/1) silty CLAYSTONE, moist		2553.4	Clst		SHOB-143 2.5-5	
10.0	2550	10.0 - 13.0 Black (N1) COAL, moist		2550.4	Coal		SHOB-143 5-7.5	
15.0	2545	13.0 - 20.0 Olive gray (5Y, 3/2) to mod. olive brown (5Y, 4/4) silty CLAYSTONE, moist		2543.4	Clst		SHOB-143 7.5-10	
20.0	2540	20.0 - 25.0 Olive gray (5Y, 4/1) clayey SILTSTONE, moist		2538.4	Siltst		SHOB-143 10-12.5	
25.0	2535	25.0 - 30.0 Medium dark gray (N4) CLAYSTONE, moist		2533.4	Clst		SHOB-143 12.5-15	
30.0	2530	30.0 - 50.0 Olive gray (5Y, 4/1) sandy SILTSTONE, very fine grained, moist			Siltst		SHOB-143 15-17.5	
35.0	2525	47" Thin shale layer		2513.4			SHOB-143 17.5-20	
40.0	2520	50.0 - 65.0 Medium gray (N5) very fine grained silty SANDSTONE		2498.4	Ss		SHOB-143 20-25 + BD-SAH-30	
45.0	2515	65.0 - 79.0 Black (N1) COAL		2484.4	Coal		SHOB-143 25-30	
50.0	2510	79.0 - 90.0 Medium dark gray (N4) clayey SILTSTONE		2473.4	Siltst	SHOB-143 30-35		
55.0	2505	90.0 - 95.0 SILTSTONE as above (40%) mixed with SHALE (60%)		2468.4	Siltst/Sh	SHOB-143 35-40		
60.0	2500					N/A	SHOB-143 40-45	
65.0	2495					N/A	SHOB-143 45-50	
70.0	2490					N/A	SHOB-143 50-55	
75.0	2485					N/A	SHOB-143 55-60	
80.0	2480					N/A	SHOB-143 60-65	
85.0	2475					N/A	SHOB-143 65-70	
90.0	2470					N/A	SHOB-143 70-75	
95.0	2468.4					N/A	SHOB-143 75-80	
100.0						N/A	SHOB-143 80-85	
						N/A	SHOB-143 85-90	
						N/A	SHOB-143 90-95	

**Boring completed at 95 ft.**

TD=95'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA\_4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: J.Elliott  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 144

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 10/04/07 11:23

DATE COMPLETED: 10/04/07 12:00

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

**RECORD OF BORING SHOB-144R**

COORDINATES: N: 430,844 E: 1,367,262

GROUND SURFACE ELEVATION: 2,527.0 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 100.0 ft

BOTTOM ELEVATION: 2,427.0 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments	
				(ft)					
0.0	2525	0.0 - 5.0 Yellowish gray, silty CLAY, dry		2522.0	CL	Dry	SHOB-144 0-2.5 SHOB-144 2.5-5		
5.0	2520	5.0 - 10.0 Pale yellow (10YR, 6/2) clayey SILT, sli. moist		2517.0	ML	Sli moist	SHOB-144 5-7.5		
10.0	2515	10.0 - 15.0 Moderate yellow brown CLAYSTONE w/ small amount of silt, moist		2512.0	Clst	Moist	SHOB-144 7.5-10		
15.0	2510	15.0 - 20.0 Dark yellow brown (10YR, 4/2) CLAYSTONE w/ small amount of silt, moist to very moist		2507.0	Clst	Moist to v. moist	SHOB-144 10-12.5		
20.0	2505	20.0 - 25.0 Dark yellow brown (10YR, 4/2) silt to very fine sand, SILTSTONE		2502.0	Siltst		SHOB-144 12.5-15 SHOB-144 15-17.5	Driller began using water at 20'	
25.0	2500	25.0 - 30.0 Dark yellow brown (10YR, 4/2) to light olive gray (5YR, 5/2) poorly sorted (fine-grained sand to 1cm gravel), SANDSTONE with some gravel size grains		2497.0	Ss		SHOB-144 17.5-20 SHOB-144 20-25 SHOB-144 25-30 + BD-SAH-20		
30.0	2495	30.0 - 35.0 Light olive gray (5YR, 5/2) clay w/ <15% sand and silt, CLAYSTONE		2492.0	Clst		SHOB-144 30-35		
35.0	2490	35.0 - 60.0 Medium olive gray (5YR, 4/2) very fine sand w/ about 10% 1-2.5 mm gravel 1/2 of which is coal fragments SANDSTONE		2467.0	Ss	N/A	SHOB-144 35-40 SHOB-144 40-45 SHOB-144 45-50 SHOB-144 50-55 SHOB-144 55-60	Driller said there was coal from 58'-75', this was not clear in the samples because after 60' sand was washing in from above	
40.0	2485	60.0 - 80.0 Olive gray (5YR 3/2), very fine sand to gravel, about 10-15% 1-2 mm gravel that is almost all coal SANDSTONE		2447.0	Ss		SHOB-144 60-65 SHOB-144 65-70 SHOB-144 70-75 SHOB-144 75-80		
45.0	2480	80.0 - 100.0 Olive gray (5Y, 3/2) fine sand to 3 mm gravel, coarse SANDSTONE w/ some 0.5-6 mm coal gravel		2427.0	Ss		SHOB-144 80-85 SHOB-144 85-90 SHOB-144 90-95 SHOB-144 95-100	TD=100	
50.0	2475	<b>Boring completed at 100 ft.</b>							

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 4/29/08



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S.Harkins  
 CHECKED: A. Vargo  
 DATE: 11/7/2007

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 201

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 06/16/10 11:17

DATE COMPLETED: 06/16/10 12:50

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-201R

COORDINATES: N: 444,214 E: 1,361,032

GROUND SURFACE ELEVATION: 2,621.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 160.0 ft

BOTTOM ELEVATION: 2,461.8 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0	2620	0.0 - 30.0 Dark yellowish brown (10 YR 4/2) silty SAND w/ trace clay, moist			SM	Moist	SHOB-201 0-5	
5.0	2615						SHOB-201 5-10	
10.0	2610						SHOB-201 10-15	
15.0	2605						SHOB-201 15-20 + BD-PDS-02	
20.0	2600						SHOB-201 20-25	
25.0	2595			2591.8			SHOB-201 25-30	Driller began adding water at 27'
30.0	2590	30.0 - 40.0 Olive gray (5Y 4/1) silty CLAY			CH		SHOB-201 30-35	Driller confirmed change from silty sand to clay at 32'
35.0	2585						SHOB-201 35-40	
40.0	2580	40.0 - 60.0 Olive gray (5Y 4/1) silty CLAY w/ slightly less silt than above			CH		SHOB-201 40-45	
45.0	2575						SHOB-201 45-50	
50.0	2570						SHOB-201 50-55 + BD-PDS-03	
55.0	2565						SHOB-201 55-60	
60.0	2560	60.0 - 65.0 Black (N1) COAL			COAL	N/A	SHOB-201 60-65	Driller confirmed coal from 59'-66' with a small parting before the last 2' Sample SHOB-201 60-65 is > 90% coal Sample SHOB-201 65-70 is approximately 60% coal
65.0	2555	65.0 - 70.0 Black (N1) COAL and olive gray (5Y 4/1) CLAYSTONE					SHOB-201 65-70	
70.0	2550	70.0 - 75.0 Olive gray (5Y 4/1) silty CLAYSTONE w/ about trace coal gravel	SHOB-201 70-75					
75.0	2545		SHOB-201 75-80					
80.0	2540	75.0 - 85.0 Olive gray (5Y 4/1) silty CLAYSTONE			Clst		SHOB-201 80-85	Driller confirmed 2' coal stringer from 84'-86'
85.0	2535						SHOB-201 85-90	
90.0	2530	85.0 - 90.0 Black (N1) COAL w/ trace olive gray (5Y 4/1) silty claystone			COAL		SHOB-201 90-95	Driller confirmed 0.5'-1' coal stringer at 90'
95.0	2525	90.0 - 100.0 Olive gray (5Y 4/1) silty CLAYSTONE					SHOB-201 95-100	
100.0	2521.8	Log continued on next page						

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP\_GDT 7/19/10



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: P. Schlicht  
 CHECKED: J. Waples  
 DATE: 6/24/2010

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 201

RECORD OF BORING **SHOB-201R**

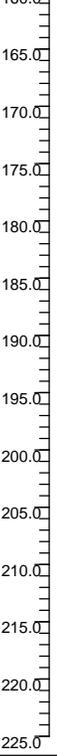
COORDINATES: N: 444,214 E: 1,361,032

GROUND SURFACE ELEVATION: 2,621.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2520	100.0 - 110.0 Olive gray (5Y 4/1) silty CLAYSTONE w/ little coal sand		2511.8	Clst	N/A	SHOB-201 100-105	Driller confirmed coal from 128'-145' Sample SHOB-201 130-135 is > 90% coal
105.0	2515						SHOB-201 105-110	
110.0	2510	110.0 - 120.0 Olive gray (5Y 4/1) silty CLAYSTONE		2501.8	Clst	SHOB-201 110-115		
115.0	2505					SHOB-201 115-120		
120.0	2500	120.0 - 125.0 Olive gray (5Y 4/1) silty CLAYSTONE w/ trace coal sand		2496.8	Clst	SHOB-201 120-125		
125.0	2495					SHOB-201 125-130		
130.0	2490	125.0 - 130.0 Olive gray (5Y 4/1) silty CLAYSTONE w/ about some coal sand		2491.8	Clst	SHOB-201 130-135		
135.0	2485					SHOB-201 135-140		
140.0	2480	130.0 - 145.0 Black (N1) COAL		2476.8	COAL	SHOB-201 140-145		
145.0	2475					SHOB-201 145-150		
150.0	2470	145.0 - 150.0 Black (N1) COAL w/ some olive gray (5Y 4/1) silty claystone		2471.8	COAL	SHOB-201 150-155		
155.0	2465					SHOB-201 155-160		
160.0	2461.8	<b>Boring completed at 160 ft.</b>		2461.8	Clst			

TD = 160'

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 7/19/10



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: P. Schlicht  
 CHECKED: J. Waples  
 DATE: 6/24/2010

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

LOCATION: South Heart, ND, Overburden Borehole 202

DRILL RIG: Gardner Denver 14W

INCLINATION: -90°

DRILLING METHOD: Air Rotary

DATE STARTED: 06/16/10 09:08

DATE COMPLETED: 06/16/10 22:23

DRILLING FLUIDS: Water

DRILL LUBRICANTS: Jet-Lube Kopr Kote

## RECORD OF BORING SHOB-202R

COORDINATES: N: 444,181 E: 1,362,412

GROUND SURFACE ELEVATION: 2,578.8 ft

PROJECTION: StatePlane, North Dakota South, 3302

DATUM: NAD 27

HORIZONTAL UNITS: Feet

TOTAL DEPTH: 110.0 ft

BOTTOM ELEVATION: 2,468.8 ft

HOLE DIAMETER: 5.625 inches

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
0.0		0.0 - 5.0 Olive gray (5Y 3/2) CLAY, moist		2573.8	CH	Moist	SHOB-202 0-5	
5.0	2575	5.0 - 10.0 Olive gray (5Y 3/2) silty CLAY, w/ trace gypsum crystals, sli. moist		2568.8	CL	Slightly Moist	SHOB-202 5-10	Driller confirmed coal stringer from 9'-16'
10.0	2570	10.0 - 15.0 Black (N1) COAL		2563.8	COAL		SHOB-202 10-15	Driller began using water at 15'
15.0	2565	15.0 - 20.0 Black (N1) COAL and dusky yellowish brown (10YR 2/2) CLAYSTONE		2558.8	COAL/Clst		SHOB-202 15-20	
20.0	2560	20.0 - 30.0 Olive gray (5Y4/1) CLAYSTONE		2548.8	Clst		SHOB-202 20-25	
25.0	2555	30.0 - 35.0 Olive gray (5Y4/1) CLAYSTONE and black (N1) COAL		2543.8	Clst/COAL		SHOB-202 25-30 + BD-PDS-01	Driller confirmed coal stringer from about 30'-33'
30.0	2550	35.0 - 40.0 Olive gray (5Y4/1) CLAYSTONE		2538.8	Clst		SHOB-202 30-35	
35.0	2545	40.0 - 55.0 Olive gray (5Y4/1) silty CLAYSTONE		2523.8	Clst		SHOB-202 35-40	
40.0	2540	55.0 - 60.0 Olive gray (5Y4/1) clayey SILTSTONE		2518.8	Siltst	N/A	SHOB-202 40-45	
45.0	2535	60.0 - 75.0 Olive gray (5Y4/1) silty CLAYSTONE, w/ some v. fine sand		2503.8	Clst		SHOB-202 45-50	
50.0	2530	75.0 - 80.0 Olive gray (5Y4/1) silty CLAYSTONE, w/ some v. fine sand and trace coal gravel		2498.8	Clst		SHOB-202 50-55	
55.0	2525	80.0 - 85.0 Olive gray (5Y4/1) silty CLAYSTONE and black (N1) COAL		2493.8	Clst/COAL		SHOB-202 55-60	Driller confirmed coal from 81'-96'
60.0	2520	85.0 - 95.0 Black (N1) COAL		2483.8	COAL		SHOB-202 60-65	Sample SHOB-202 80-85 is about 90% coal
65.0	2515	95.0 - 100.0 Black (N1) COAL and olive gray (5Y		2478.8	COAL/Clst		SHOB-202 65-70	
70.0	2510						SHOB-202 70-75	
75.0	2505						SHOB-202 75-80	
80.0	2500						SHOB-202 80-85	
85.0	2495						SHOB-202 85-90	
90.0	2490						SHOB-202 90-95	
95.0	2485						SHOB-202 95-100	
100.0	2480							

Log continued on next page

OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 7/19/10



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: J. Waples  
 DATE: 6/24/2010

PROJECT: South Heart Project

PROJECT NUMBER: 063-2174

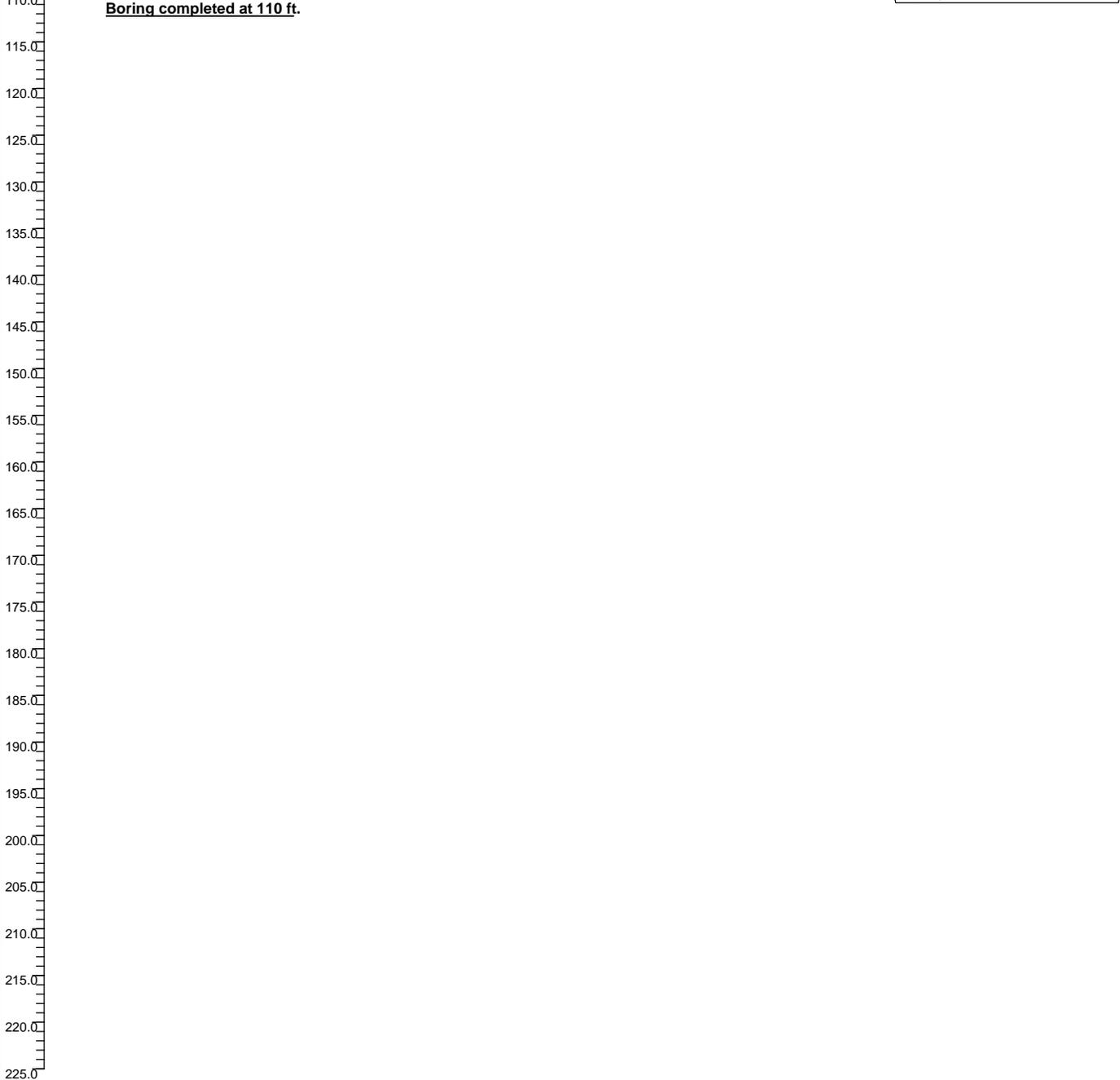
LOCATION: South Heart, ND, Overburden Borehole 202

**RECORD OF BORING SHOB-202R**

COORDINATES: N: 444,181 E: 1,362,412

GROUND SURFACE ELEVATION: 2,578.8 ft

Depth ft	Elevation ft	LITHOLOGY DESCRIPTION	GRAPHIC LOG	ELEV.	Material Type	MOISTURE DESCRIPTION	Sample ID	Comments
				(ft)				
100.0	2475	4/1) CLAYSTONE		2468.8	Clst	N/A	SHOB-202 100-105	
105.0	2470	100.0 - 110.0 Olive gray (5Y4/1) CLAYSTONE					SHOB-202 105-110	
110.0		<b><u>Boring completed at 110 ft.</u></b>						TD=110'



OB\_GNPP\_PHASE III SH OB AND MW UPDATED SURVEY DATA 4\_48\_08.GPJ GNPP.GDT 7/19/10



SCALE: 1 in = 16.7 ft  
 DRILLING CONTRACTOR: Mohl Drilling  
 DRILLER: Jason Mohl

GEOLOGIST: S. Harkins  
 CHECKED: J. Waples  
 DATE: 6/24/2010

## Lithologic Log Notes

### Abbreviations

ND = North Dakota

ft or ' = feet

NAD = North American Datum

NA or N/A = not applicable

In = inch

HCL = Hydrochloric acid

sli. = slightly

v. = very

TD = total depth

tr. = trace

mod.= moderate

dk. = dark

lt. = light

w/ = with

% = percent

med. = medium

in or " = inch

approx. = approximately

mm = millimeter

dia. = diameter

WL = water level

> = greater than

< = less than

### Abbreviations from Unified Soil Classification System (USCS)

GW = well-graded gravel

GP = poorly-graded gravel

GM = silty gravel

GC = clayey gravel

SW= well-graded sand

SP = poorly-graded sand

SM = silty sand

SC = clayey sand

ML = silt

CL = clay

CH = fat clay

Soil lens is indicated by parenthesis. Example: SM(SP) indicates lenses of SP in predominantly SM unit

See ASTM International (2000) for description of USCS visual-manual procedure

### Soil Descriptions

Consistency or Density, Geological Society of America (GSA) or Munsell color name (code), grain size, USCS name, minor characteristics, plasticity, moisture

For Munsell color code see either Munsell Color (1998) or Rock-Color Chart Committee (1991).

## Component Proportion

Trace	0-5%
Little	5-12%
Some	12-30%
And	30-50%

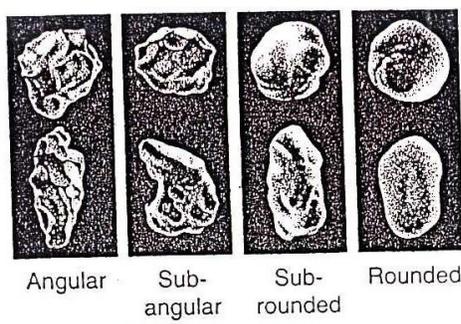
---

## MOISTURE

---

Dry	Absence of moisture, dusty, dry to the touch
Slightly Moist	Apparent moisture but well below optimum moisture content
Moist	Damp, but no visible water; at or near optimum moisture content
Very Moist	Above optimum moisture content
Wet	Visible free water, below water table

---



GRAIN-SIZE		Engineers
mm	inches	Sieve
305	12.0	Boulders
76.2	3.0	3.0 in. Cobbles
19.05	0.75	Gravel - coarse
4.75	0.19	No. 4 Gravel - fine
2.0	0.08	No. 10 Sand - coarse
0.425		No. 40 Sand - medium
0.074		No. 200 Sand - fine
0.005		Silt
		Clay

## Rock Descriptions

### Abbreviations

Clst = claystone  
 Slst = siltstone  
 Ss = sandstone  
 Sh = Shale

## REFERENCES

ASTM International. 2000.

Designation D2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) in *2000 Annual Book of ASTM Standards: Soil and Rock (1) D420-D5779*. ASTM International, West Conshohocken, PA.

Munsell Color. 1998.

Munsell Soil Color Charts revised Washable Edition. Gretag Macbeth, New Windsor, New York.

Rock-Color Chart Committee. 1991.

*The Geological Society of America Rock-Color Chart with genuine Munsell® color chips*. Distributed by the Geological Society of America, Boulder, Colorado.