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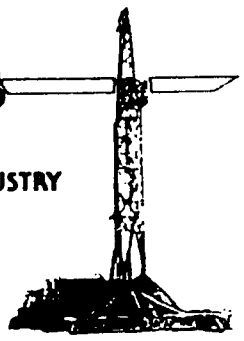

GEOLOGICAL WELLSITE REPORT

ANADARKO PETROLEUM CORPORATION

YOUNGGREN H-2H

SURF: 1250' FNL, 1040 FEL NE/4 Section 07, T32S, R38W

BHL: 3346' FNL, 991' FEL SE/4 Section 07, T32S, R38W

Stevens County, Kansas

Jeffrey R. Barkley

Consulting Geologist

WELL DATA

OPERATOR:	Anadarko Petroleum Corporation
WELL NAME:	Younggren H-2H
LOCATION:	Surface: 1250' FNL, 1040' FEL (NE) Section 7, T32S, R38W Bottom Hole Location: 3346' FNL, 991' FEL, (SE) Section 7, T32S, R38W Stevens County, Kansas
FIELD:	Hugoton
ELEVATION:	G.L. 3183' Driller Measurement Datum: KB 3194'
ROAD DIRECTIONS:	From Hugoton, 8 miles north on Hwy 25, 6 miles west on Dermot Rd., 2 miles south, one mile west, across cattle guard and continue southwest, right fork at blue cattle guard, at next cattle guard northwest past Mesa gas well into location.
DRILLING CONTRACTOR:	Big A Drilling, Rig #2
TOOLPUSHER:	Jose Ortega
GEOLOGICAL WELLSITE SUPERVISION:	Goolsby Brothers & Assoc., Inc.
GEOLOGIST:	Jeff Barkley
DRILLING FLUID PROGRAM:	Pilot Hole: Water to 2170', Air/Foam to 2850' (mud-up for logs in pilot hole) Build Section: gel mud, Lateral: Air.
GEOPHYSICAL LOGGING:	Pilot Hole: Schlumberger AIT/CNL/LDT/PE/GR/SP Build and Lateral: Scientific MWD Gamma Ray
DIRECTIONAL DRILLING:	Scientific
MWD:	Scientific
FOAM UNIT:	Weatherford
CORING:	DOWDCO
TESTING:	Trilobite
AIR EQUIPMENT:	ECD Solutions
HOLE SIZE:	12 1/4"to 2146'. 8 ¾" to 2913', 6 1/8" to total depth.
SURFACE CASING:	9 5/8" to 2126' GL. 7" to 2872'.
SPUD DATE:	04 November 1997 1:30 PM
DATE TD REACHED:	04 December 1997
TOTAL DEPTH:	4515' MD Driller (horizontal well)

SAMPLE PROGRAM:	20 ft intervals 2200' to total depth in pilot hole. 20 or 30 ft intervals in build and lateral.
CORE PROGRAM:	Core #1 2426' to 2486': Herrington & Kreider, 60' recovery Core #2 2598' to 2646': Towanda, 48' recovery Core #3 2646' to 2692': Ft. Riley, 49+' recovery
DST Program	DST #1 2427' to 2486' – Kreider zone – tool malfunction; could not properly open and close tool, obtained questionable pressure data - misrun DST #2 2425 to 2486 re-test Kreider zone – found bridge 35' above bottom, could not get tool to bottom. DST #3 2425' to 2486' – Kreider zone – obtained questionable pressure data, tool plugged with shale cuttings. DST #4 2603 to 2646 – Towanda zone (32 hour shut-in, 16 hour final flow.

Core and DST intervals were in driller's measurements from kelly bushing, Schlumberger measurements were from ground level.

Schlumberger depths
Core #1 2442 – 2502 (Herrington & Kreider)
Core #2 2584 – 2632 (Towanda)
Core #3 2632 – 2681 (Ft Riley (closer to 50' were cut))

DST #1 2443 – 2502
DST #2 2441 – 2502
DST #3 2441 – 2502
DST #4 2589 - 2632

BOTTOM HOLE FORMATION:	Pilot Hole: Permian Council Grove Lateral: Permian Towanda
WELL STATUS:	Towanda Zone Gas Well.
REMARKS:	TVD @ TD: 2637 ft (+557) @ vertical section of 2096' Vertical Section measured along 180 degrees true.

DAILY DRILLING REPORT

6:00 AM Reports

spud well 11/04/97 at 1:30 PM

Day No.	Date	Depth	Feet Made	Rotating Hours
1	11/05/97	710	710	15 1/2
2	11/06/97	1195	485	14 1/2
3	11/07/97	1940	745	23
4	11/08/97	2146	206	5 1/2
5	11/09/97	2146	0	3 (set 9/58")
6	11/10/97	2486	340	11.3/4(incl coring)
7	11/11/97	2486	0	DST #1
8	11/12/97	2486	0	DST #1&2 (both misruns)
9	11/13/97	2486	0	DST #3
10	11/14/97	2598	112*	4 1/2 Core #2
11	11/15/97	2646	48	4 1/2 DST #4
12	11/16/97	2646	0	DST #4
13	11/17/97	2646	0	finish DST #4
14	11/18/97	2775	204	5 1/2 core #3, log pilot hole
15	11/19/97	2783 prior to plug back	8	1/2
16	11/20/97	2250	68	6
17	11/21/97	1984 after 2nd plug back	0	0
18	11/22/97	2290	110**	15 1/4
19	11/23/97	2570	280	19 1/2
20	11/24/97	2710	140	16 3/4
21	11/25/97	2850	140	19 1/2
22	11/26/97	2914	63	10 3/4
23	11/27/97	2914	0	fish
24	11/28/97	2914	0	run & cmt 7" csg
25	11/29/97	2914	0	WOC, rig for air
26	11/30/97	3079	165	13
27	12/01/97	3488	409	13
28	12/02/97	3843	355	17
29	12/03/97	4283	444	16
30	12/04/97	4451	164	5 1/2
31	12/05/97	4515	64	2

*includes 32' downhole depth correction.

** from kick-off point at 2180'

MUD RECORD
Pilot Hole

DEPTH	WT	VIS	WL	PV	GEL	YP	pH	CHLOR
pilot hole:								
857	9.2	32	nc	6	2/5	3	8.5	500
1202	9.6	31	nc	5	2/5	3	8.5	500
1970	10.1	34	nc	6	9/9	16	8.8	9100
start drilling with foam								
1946	2.8	66	nc	--	--	--	8.5	500
2486	2.5	74	nc	--	--	--	8.4	700
mud-up at 2695'								
2691	8.5	47	14.0	10	5/11	15	10.0	500
plug back pilot hole, start build section:								
2250	8.9	38	11.2	10	11/20	6	10.5	1100
2180	8.9+	47	8.8	14	2/8	10	10.8	1100
2592	8.8	52	4.0	17	6/13	20	8.0	2100
2732	8.8	61	3.6	19	7/12	27	8.0	2000
2855	8.7	54	3.2	18	5/9	23	9.0	2000
drilled lateral with air								

SURVEYS
See Attached Directional Surveys

BIT DATA

NO.	MAKE	TYPE	SIZE	DEPTH OUT	FEET MADE	HOURS RUN	REMARKS
1	VAREL	L117	12 1/4	1982	1982	57 ½	
2	VAREL	L117	12 1/4	2146	164	4	
3	Walker-Mac	52F	7 7/8	2783	483	22 3/4	
--	Diamond Core bit		7 27/32	--	157	12 1/2	cut 3 cores total 157'
4	Reed	HP51X	8 3/4	2710	620	62 ½	
5	STC	F27	8 3/4	2914	203	30 1/2	
6*	STC	F27	6 1/4	4515	1601	66 1/2	

*includes some circulation & survey time, generally drilled 30' per hour and circulated remainder of hour to keep hole clean.

Goolsby Brothers & Assoc., Inc. Survey Report

MIN. CURVATURE CALCULATIONS (SPE-3362)

OPERATOR:	ANADARKO PETROLEUM CORPORATION	START:	20-Nov-97 (kick-off)
WELL:	YOUNGGREN H-2H	FINISH:	4-Dec-97
LOCATION:	STEVENS COUNTY, KANSAS	Tool Length:	41 ft
ELEVATION:	3194 (KB)		
		PROP. DIRECTION	180

SURVEY NUMBER	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100	SUB-SEA AT TVD
TIE IN	0	0	0	0	0	0	0	0	3194
2	100	0.4	350.7	100.1	0.4	-0.1	-0.4	0.4	3093.9
3	201	0.4	334.3	200.7	1.1	-0.3	-1.1	0.1	2993.3
4	300	0.5	336.9	300.1	1.8	-0.6	-1.8	0.0	2893.9
5	400	0.3	12.0	400.4	2.4	-0.7	-2.4	0.3	2793.6
6	500	0.1	157.6	500.1	2.5	-0.6	-2.5	0.4	2693.9
7	600	0.1	154.6	600.4	2.3	-0.5	-2.3	0.0	2593.6
8	701	0.6	254.7	700.5	2.1	-1.0	-2.1	0.6	2493.5
9	801	0.6	273.2	801.2	2.0	-1.9	-2.0	0.2	2392.8
10	900	0.8	275.6	900.1	2.1	-3.1	-2.1	0.2	2293.9
11	1000	0.7	278.4	1000.2	2.2	-4.4	-2.2	0.1	2193.8
12	1100	0.7	273.8	1100.2	2.3	-5.6	-2.3	0.1	2093.8
13	1200	0.6	258.3	1200.1	2.3	-6.6	-2.3	0.2	1993.9
14	1300	0.4	298.8	1300.0	2.3	-7.4	-2.3	0.4	1894.0
15	1401	0.5	305.4	1400.6	2.7	-8.0	-2.7	0.1	1793.4
16	1500	0.8	279.5	1500.2	3.1	-9.0	-3.1	0.4	1693.8
17	1601	1.6	266.0	1600.5	3.1	-11.1	-3.1	0.9	1593.5
18	1700	1.8	272.8	1700.1	3.1	-14.0	-3.1	0.3	1493.9
19	1800	1.7	277.4	1799.9	3.3	-17.1	-3.3	0.2	1394.1
20	1901	1.3	290.4	1900.3	3.9	-19.7	-3.9	0.5	1293.7
21	2000	1.0	301.5	1999.9	4.8	-21.5	-4.8	0.4	1194.1
22	2051	1.0	304.2	2050.3	5.2	-22.2	-5.2	0.1	1143.7
23	2185	0.5	18.0	2184.8	6.5	-23.0	-6.5	0.7	1009.2
24	2217	5.0	183.0	2216.7	5.2	-23.0	-5.2	17.1	977.3
25	2248	10.4	183.0	2247.4	1.1	-23.2	-1.1	17.4	946.6
26	2280	15.8	183.0	2278.6	-6.2	-23.6	6.2	16.9	915.4
27	2310	21.0	182.0	2307.0	-15.6	-24.0	15.6	17.4	887.0
28	2342	26.8	181.0	2336.3	-28.6	-24.3	28.6	18.2	857.7
29	2373	32.7	179.0	2363.2	-44.0	-24.3	44.0	19.3	830.8
30	2404	38.1	179.0	2388.4	-61.9	-24.0	61.9	17.4	805.6
31	2436	41.5	179.0	2413.0	-82.4	-23.7	82.4	10.6	781.0
32	2467	46.0	179.0	2435.4	-103.8	-23.3	103.8	14.5	758.6
33	2497	49.0	180.0	2455.7	-125.9	-23.1	125.9	10.3	738.3
34	2528	50.0	180.0	2475.8	-149.5	-23.1	149.5	3.2	718.2
35	2560	50.2	180.0	2496.3	-174.0	-23.1	174.0	0.6	697.7
36	2590	51.0	180.0	2515.4	-197.2	-23.1	197.2	2.7	678.6
37	2623	55.0	179.5	2535.2	-223.6	-23.0	223.6	12.2	658.8
38	2655	57.0	179.4	2553.1	-250.1	-22.7	250.1	6.3	640.9
39	2702	65.2	180.0	2575.8	-291.2	-22.5	291.2	17.5	618.2
40	2732	71.3	179.0	2586.9	-319.1	-22.3	319.1	20.6	607.1
41	2763	74.4	178.0	2596.1	-348.7	-21.5	348.7	10.5	597.9
42	2793	74.7	178.0	2604.1	-377.6	-20.5	377.6	1.0	589.9
43	2824	77.3	178.0	2611.6	-407.6	-19.4	407.6	8.4	582.4
44	2854	83.0	177.0	2616.7	-437.1	-18.1	437.1	19.3	577.3
45	2911	90.1	176.2	2620.1	-493.9	-14.8	493.9	12.5	573.9
46	2942	89.0	176.3	2620.4	-524.8	-12.7	524.8	3.6	573.6
47	2974	88.4	176.0	2621.1	-556.8	-10.6	556.8	2.1	572.9
48	3006	87.9	176.5	2622.1	-588.7	-8.5	588.7	2.2	571.9
49	3038	88.0	177.5	2623.3	-620.6	-6.8	620.6	3.1	570.7
50	3070	88.2	177.0	2624.3	-652.6	-5.3	652.6	1.7	569.7

51	3101	88.2	176.7	2625.3	-683.5	-3.6	683.5	1.0	568.7
52	3135	88.6	176.7	2626.3	-717.4	-1.6	717.4	1.2	567.7
53	3167	88.7	178.0	2627.0	-749.4	-0.1	749.4	4.1	567.0
54	3199	89.2	177.0	2627.6	-781.3	1.2	781.3	3.5	566.4
55	3231	89.5	177.0	2628.0	-813.3	2.9	813.3	0.9	566.0
56	3262	89.5	177.0	2628.2	-844.3	4.5	844.3	0.0	565.8
57	3294	89.7	178.6	2628.5	-876.2	5.8	876.2	5.0	565.5
58	3325	90.1	178.0	2628.5	-907.2	6.7	907.2	2.3	565.5
59	3357	90.4	177.0	2628.4	-939.2	8.1	939.2	3.3	565.6
60	3389	90.4	177.0	2628.1	-971.1	9.8	971.1	0.0	565.9
61	3420	90.1	177.0	2628.0	-1002.1	11.4	1002.1	1.0	566.0
62	3447	90.2	177.0	2627.9	-1029.1	12.8	1029.1	0.4	566.1
63	3479	90.6	177.0	2627.7	-1061.0	14.5	1061.0	1.3	566.3
64	3511	91.1	177.0	2627.2	-1093.0	16.1	1093.0	1.6	566.8
65	3542	91.9	177.0	2626.4	-1123.9	17.8	1123.9	2.6	567.6
66	3574	92.6	178.0	2625.2	-1155.9	19.2	1155.9	3.8	568.8
67	3606	92.7	177.0	2623.7	-1187.8	20.6	1187.8	3.1	570.3
68	3638	92.5	178.0	2622.2	-1219.7	22.0	1219.7	3.2	571.8
69	3675	92.5	178.0	2620.6	-1256.7	23.2	1256.7	0.0	573.4
70	3706	92.5	178.0	2619.3	-1287.6	24.3	1287.6	0.0	574.7
71	3738	92.5	177.0	2617.9	-1319.6	25.7	1319.6	3.1	576.1
72	3767	91.8	178.0	2616.8	-1348.5	27.0	1348.5	4.2	577.2
73	3796	90.5	178.0	2616.2	-1377.5	28.0	1377.5	4.5	577.8
74	3829	89.0	177.0	2616.4	-1410.5	29.4	1410.5	5.6	577.6
75	3866	89.6	178.0	2616.8	-1447.4	31.0	1447.4	3.2	577.2
76	3897	88.4	179.0	2617.4	-1478.4	31.9	1478.4	5.0	576.6
77	3929	88.3	178.0	2618.3	-1510.4	32.7	1510.4	3.1	575.7
78	3961	89.9	178.0	2618.8	-1542.4	33.8	1542.4	5.0	575.2
79	3992	90.1	179.0	2618.8	-1573.3	34.6	1573.3	3.3	575.2
80	4023	88.6	179.0	2619.2	-1604.3	35.2	1604.3	4.8	574.8
81	4055	89.5	179.0	2619.7	-1636.3	35.7	1636.3	2.8	574.3
82	4087	88.6	178.0	2620.2	-1668.3	36.6	1668.3	4.2	573.8
83	4119	87.7	178.0	2621.3	-1700.3	37.7	1700.3	2.8	572.7
84	4151	87.5	178.0	2622.6	-1732.2	38.8	1732.2	0.6	571.4
85	4183	87.8	179.0	2623.9	-1764.2	39.6	1764.2	3.3	570.1
86	4283	89.0	177.0	2626.7	-1864.1	43.1	1864.1	2.3	567.3
87	4378	87.0	179.0	2630.0	-1959.0	46.4	1959.0	3.0	564.0
PRJ@TD	4515	87.0	179.0	2637.2	-2095.7	48.8	2095.7	0.0	556.8

FORMATION TOPS

Sub-sea Depths calculated using a GL & Measurement Datum of 3183 feet.

PILOT HOLE

FORMATION	DEPTH	SUB-SEA
PERMIAN		
Base Stone Corral	1724	1459
Wellington	2164	1019
Chase	2420	763
Krider	2467	716
Winfield Sand	2512	671
Gage Shale	2559	624
Towanda	2591	592
Ft Riley	2641	542
Florence	2694	489
Wreford	2727	456
Council Grove	2749	434

HORIZONTAL SECTION

Tops are from a combination of drilll time and MWD Gamma Tool
Intervals above the 2140 MD not logged by MWD

FORMATION	MEASURED DEPTH	TVD	SUB-SEA
PERMAIN			
Chase	2469	2437	+757
Herrington	2500	2457	+737
Krider	2539	2483	+711
Winfield Sand	2608	2527	+667
Towanda	2818	2611	+583

SAMPLE DESCRIPTIONS
Pilot Hole

SAMPLES DESCRIBED FROM UNLAGGED SAMPLES CAUGHT BY RIG HANDS SAMPLE QUALITY FAIR.

CATCHING 30' SAMPLES FOR CORRELATION.

2170 - 2200	SH (80%) lt-m gy & gy-gn, mar, brick red, pk, sme slty, frm plty, sme sl dolic, sme anhyic. ANHY (20%) wh, trnsl, v lt gy, most cln, sme shy, occ sl dolic.
2200 – 2230	SH (50%) lt gy & gy-gn, mar, pk, brick red, sme slty, frm, plty, sme sl dolic, sme anhyic. ANHY (50%) off-wh, wh, trnsl, lt gy, var cln to sl arg, sme dolic.
2230 – 2260	ANHY (70%) v lt gy, off-wh, trnsl, sme w/ sl mot apr, sme sl dolic. SH (20%) lt-m gy, mar, brick red, sme sl slty, sme dolic. DOL (10%) lt gy, micxl, hd, dns, most v arg, n vis por.
2260 – 2290	ANHY (60%) v lt gy, off-wh, trnsl, sme w/ sl mot apr, sme sl dolic. SH (30%) lt-m gy, mar, brick red, sme sl slty, sme dolic. DOL (10%) lt gy, micxl, hd, dns, most v arg, n vis por.
2290 – 2320	ANHY (70%), off-wh, v lt gy, trnsl, sme w/ sl mot apr, sme sl dolic. SH (25%) lt-m gy, mar, brick red, sme sl slty, sme dolic. DOL (5%) lt gy, micxl, hd, dns, most v arg, n vis por.
2320 – 2350	ANHY (60%), off-wh, v lt gy, trnsl, sme w/ sl mot apr, sme sl dolic. SH (30%) lt-m gy, mar, pk, sme sl slty, sme dolic. DOL (10%) lt gy, micxl, hd, dns, most v arg, n vis por.
2350 – 2380	SH (50%) lt-m gy, mar, pk, sme w/ mot apr, sme dolic. ANHY (30%) off-wh, v lt gy, trnsl, sme sl dolic, sme sl arg. DOL (20%) crm, lt tan, micxl, most sl to mod arg, sme rthy, most dns w/ p vis por.
2380 – 2410	Sample line plugged, no sample caught.
2410 – 2426	DOL (50%) lt gy & gy-brn, buff, micxl, hd, sl to mod arg, sl mot apr, rr vf rexl patch, rr rmnt fos frag, dns, p vis por. ANHY (25%) off-wh, v lt gy, trnsl, sme sl dolic, sme sl arg. SH (25%) lt to m gy, mar, pk.

Core #1 2426' to 2486'
Begin core chip descriptions; in some cases the chips may not be representative of the entire interval.

2427 DOL lt gy, micxl w/ rr small vf-f rexl patch, tr dk styl, scat dk sh incl, hd, dns, n vis por, tr v lt yel mnrl flor.
2428 DOL lt gy to gy-brn, micxl, 2+ cm trnsl to wh to lt gy anhy incl, rr dk sh incl, hd, dns, n vis por, tr v lt yel mnrl flor.
2429 DOL m to dk gy, micxl to vf xl, hd, most v arg, rr 2 mm wh anhy incl, one side of chip wh dk sh lam, hd, dns, n vis por.
2430 DOL lt gy, micxl to vf xl, var cln to sl arg, rr 2 mm trnsl anhy incl, scat .5+ cm dk sh incl, com p-p sh & dk mnrl incl, hd, pos p mic-por, n vis por.
2431 SH dk gy, frm to sft, (from rubble interval), rthy, sl dolic.
2432 DOL lt gy, micxl, frm to sft, slty w/ tr vf qtz sd, sme grdg to dolic sltst, rr wispy dk sh lam, pos mic-por, n vis por, p perm, n flor.
2433 SLTST lt gy to off-wh, sft/fri, sme vf qtz sd, tr wispy sh lam, sl dolic, occ dk mica gr, probably has mic-por, p vis por, probably p perm.
2434 SLTST lt gy to off-wh, sme sdy, similar to above, n flor.
2435 SLTST lt gy to off-wh, similar to above, rr wispy dk sh lam.
2436 SLTST/SH lam & banded alternating lt gy sltst as above and dk gy sh.
2437 SLTST/SH lam & banded lt tg to off-wh sdy sltst and dk gy sh, sl to mod dolic.
2438 SLTST/SH similar to above.
2439 SLTST/SH lam & banded lt gy to off-wh sdy sltst and dk gy sh, sl to mod dolic.
2440 SLTST/SH similar to above w/ incr in sh.
2441 SLTST/SH lam & thin banded sdy sltst & sh similar to above.
2442 SH dk gy, 20% of chip lam & thin intbd lt gy sltst similar to above.
2443 SH dk gy, sft, crumbly, from rubble zone.
2444 SH dk gy, frm, v dolic.
2445 SH m to dk gy, frm, v dolic, scat 1+ cm wh anhy incl.
2446 SH dk gy, v dolic, scat .5 to 1+ cm wh irreg anhy incl.
2447 no chip taken, lithology similar to above.
2448 DOL lt gy, micxl w/ rr vf xl, hd, abnt irreg often ang dk sh incl, n vis por, p perm,
2449 no chip taken, similar to above.
2450 DOL lt gy to gy-brn, micxl to vfxl, mnr f xl, frm, com scat dk sh incl, sme rthy, scat p-p vugs, com vis intxl por, looks like good reservoir rock, spty lt yel mnrl flor, n cut.
2451 SH dk gy, hd, dolic.
2452 DOL lt to m gy to gy-brn, micxl to vf xl w/ mnr f xl, frm, mot apr w/ scat dk shy incl, com isolated and patches of vis p-p to 1 mm spar lined vugs and vis intxl por, looks like good reservoir rock.
2453 DOL similar to above, looks very porous.
2454 DOL similar to above, looks porous.
2455 DOL similar to above, but looks more shaley with less visible porosity.
2456 DOL lt gy to gy-brn, micxl to vf xl, hd, more dk sh incl than above, more dns than above w/ very little vis por and vugs, p vis por.

2457 DOL lt to m gy to gy-brn, micxl to vf xl w/ mnr f xl, frm, mot apr w/ scat dk shy incl, com isolated and patches of vis p-p to 1 mm spar lined vugs and vis intxl por, looks like good reservoir rock.
2458 DOL similar to above, looks porous.
2459 DOL similar to above, looks very porous.
2460 no chip taken to keep core intact, interval similar to above.
2461 DOL similar to above, looks very porous.
2462 no chip taken to keep core intact, interval similar to above.
2463 DOL similar to above, but looks somewhat less porous.
2464 DOL similar to above, looks very porous.
2465 DOL similar to above, but with reduced visible vugular and intxl por.
2466 DOL similar to above, looks porous.
2467 DOL similar to above but darker in color with higher shale content, 1+ cm clr rexl fos shell frag.
2468 DOL similar to above w/ less sh incl, looks porous.
2469 DOL similar to above, looks very porous.
2470 DOL similar to above but darker in color with higher shale content and less vis por.
2471 no chip taken to keep core intact, interval similar to above.
2472 DOL similar to above but darker in color with higher shale content and less vis por.
2473 no chip taken to keep core intact, interval similar to above.
2474 DOL lt gy-brn, similar to above but light in color with v rr dk arg incl, pred vfxl & micxl w/ fr vis intxl por, scat clr rexl c xl, rr p-p vug, n flor.
2475 DOL lt gy-brn, micxl, sft, rthy, occ dk sh lam, p vis por, pos mic-por, probably low perm.
2476 DOL lt gy-brn, micxl & vfxl, frm, rr dk sh incl
2477 DOL lt gy-brn, micxl & vfxl, frm, rr dk sh incl, on side of chip w/ dk sh lam.
2478 no chip taken to keep core intact, interval similar to above.
2479 DOL lt gy-brn, frm, micxl to vfxl, rr dk sh lam, decr in vis intxl from most of chips from 2474'. fr to p vis por.
2480 DOL lt gy-brn, frm, micxl, n significant vfxl, occ dk sh lam, p vis por, pos mic-por, n flor.
2481 SH dk gy to blk.
2482 SH m to dk gy, sl dolic.
2483 SH dk gy, sl dolic.
2484 DOL lt gy, micxl, hd, dns, arg, n vis por.
2485 DOL similar to above.
2486 DOL similar to above.
2487 no chip taken, DOL similar to above w/ occ dk sh lam & intbd.

END CORE #1

Ran DST #1,2,&3

2500 – 2530 Sample line plugged/frozen, no sample.

2530 – 2550 DOL (75%) lt gy to gy-brn, mnr m brn, micxl to vfxl, frm to sft, sme lmy, sme sl sdy, var cln to sl arg, p to fr vis por, n flor. SH (20%) lt to m gy, mnr mar (cvgs). SD (5%) lse grs, vfgr w/ mnr f clr & wh sbrd-sbang qtz.

2550 – 2580	SH (80%) lt to m gy, red-brn, dolic, sme slty. DOL (20%) lt gy to gy-brn, micxl to vfxl, similar to above, most w/ p vis por. n flor.
2580 – 2598	SH (95%) pred red-brn, mnr m gy, red-brn is slty & dolic, sme sl lmy. DOL (5%) similar to above, probably cvgs.

Cored from 2598 to 2646'

Begin core chip descriptions; in some cases the chips may not be representative of the entire interval.

2598	SH lt red-brn, frm to sft, slty, tr vf sd, sl dolic.
2599	SLTST lt gn to gy-gn, frm to sft, tr vf sd, sl dolic.
2600	DOL lt gy, off-wh, v anhyic grdg to dolic anhy, c xl, dns, v p vis por.
2601	DOL dk gy, micxl, v arg, carb, looks like source rock, dns, n vis por, thin intbd & lam lt gy dolic sltst w/ v p vis por.
2602	LS lt to m gy, mudst, frm to hd, sl dolic, sme dk shy bands & lam, var cln to sl arg, sme sl slty, dns, v p vis por.
2603	LS lt gy, similar to above, micxl, scat dk shy lam, dns, v p vis por.
2604	LS similar to above.
2605	LS off-wh to lt gy, mudst to wkst, sft to frm, chky, sl mot apr, scat mica, dk, & vf qtz grs, scat fos frags, p vis por, pos mic-por, p perm, lam & thin intbd of dk gy sh.
2606	LS lt to m to dk gy, mudst to wkst, sme f-m-c rexl patches, most arg w/ shy lam & arg incl, p vis por, probably p perm.
2607	no chip taken to keep core intact.
2608	LS lt gy, wkst, granular/mot apr, pred lt to dk vf to f xls w/ mud mtx, rr rd c cht gr, fr to p vis por, pos low perm.
2609	no chip taken to keep core intact.
2610	LS lt gy, wkst, sme .5+ cm rexl fos (shell) frags, scat dk shy incl, fr to p vis por, probably low perm.
2611	no chip taken to keep core intact.
2612	LS similar to 2608' but with abnt dk gy sh incl & lam, sme w carb coating, sme c rexl areas, mostly p vis por, probably p perm.
2613	no chip taken to keep core intact.
2614	LS off-wh to v lt gy, packst, frm, sl mot apr, abnt fos frags which provide framework of most of chip, mod to abnt mud between xl & grs, sme f-m rexl patches, com vis p-p moldic & vuggy por, sme vis intxl por, fr to g vis por, probably fr perm, tr v lt yel mnrl flor. (this chip from good porosity in the clean bench of the Towanda).
2615	no chip taken to keep core intact.
2616	LS similar to 2614' but with somewhat less fos frags & incr in mud, scat p-p moldic & vuggy por, fr vis por, p to fr perm.(this chip from good porosity in the clean bench of the Towanda)
2617	no chip taken to keep core intact.
2618	LS lt gy, wkst, frm to hd, sl mot apr, sl granular apr, decr in fos frags & incr in mud from above, v rr p-p moldic por, p vis por, probably p perm.

2619 LS similar to above w/ abnt irreg dk gy sh incl, mot dk gy/lt gy apr, wkst grdg to mudst, v p vis por, probably p perm.
2620 LS lt to m gy, wkst w/ sme packst, hd, com fos frags sme of which provide the framework of the chip, mod to abnt mud, sme c rexl fos frags, mnr p-p moldic por, mnr intxl por, mostly p w/ small patches of fr vis por, probably p perm.
2621 no chip taken to keep core intact.
2622 LS lt gy, wkst, frm to hd, sl granular/mot apr, scat fos frags, sme m to c rexl patches, scat p-p moldic & vug por, mnr intxl por, fr vis por, probably p to fr perm. (lower clean bench of Towanda).
2623 no chip taken to keep core intact.
2624 LS lt gy-brn, packst to wkst, mot apr, occ dk arg incl, decr in fos frags from above, rr p-p moldic por, rr intxl por, mostly p w/ tr fr vis por, probably low perm.
2625 no chip taken to keep core intact.
2626 LS similar to 2624'
2627 LS lt to m gy, similar to 2624 but w/ incr in dk gy arg incl. p vis por, p perm.
2628 no chip taken to keep core intact.
2629 LS lt to m gy, similar to 2624 w/ 1.5+ cm pk anhy incl. patches of p-p moldic por assoc w/ fos frags, mnr fr vis por where not anhy.
2630 LS lt to m gy, wkst grdg to mudst, hd, scat dk arg incl, rr fos frag, v sl mot apr, p vis por, 1.5+ cm lt gy to wh anhy incl.
2631 LS similar to above w/ incr in dk sh incl, scat rexl fos frags, occ m gy anhy incl, p vis por, p perm.
2632 SLTST lt to m gy, hd, lmy to dolic, com dk grs & sh incl, sme w/ scat vf qtz sd, rr fos frag, dns, v p vis por.
2633 no chip taken to keep core intact.
2634 SLTST similar to above.
2635 SLTST similar to 2632' but w/ rr m gy anhy incl.
2636 SLTST lt to m gy, similar to 2632' but w/ com dk sh lam, tr mica, p vis por.
2637 SLTST similar to 2636' w/ com sh lam.
2638 SLTST, similar to 2636', sme sdy, com arg mat, p vis por, probably p perm.
2639 SLTST similar to above, sme v sdy, com arg mar, p vis por, probably p perm.
2640 no chip taken to keep core intact.
2641 SLTST similar to 2632' decr in sd from 2639'
2642 SLTST similar to above.
2643 SLTST lt gy, hd, lmy to dolic, com dk grs, occ dk sh incl, tr mica, scat vf qtz sd, dns, p vis por, probably p perm.
2644 SLTST similar to above.
2645 no chip taken to keep core intact.
2646 SH m to dk gy, hd, sl dolic, dns.

end core #2 descriptions.

Ran DST #4

core #3 from 2646 to 2196

2647 SH m to dk gy to gy-gn, hd, sl dolic, dns.
2648 no chip taken to keep core intact.

2649 SH dk gy, hd, blky, sl dolic, dns.
2650 SH m gy-gn to gy, patches of mar & dk gy, hd, blky, sl dolic, dns.
2651 SH lt gy-gn to gy, slty w/ sme grdg to v arg sltst, sl dolic, dns.
2652 SLTST lt gy to gy-gn, v arg, sl dolic, blky, dns.
2653 SLTST similar to above, sme sl sdy, v p vis por, probably p perm.
2654 SLTST similar to above.
2655 SH dk gy, hd, blky, sl dolic.
2656 LS off-wh, crm, mudst w/ mnr wkst, hd, rr rmnt fos frags, rr m to c xl patch & incl, hd, dns, v p vis por.
2657 LS lt to m gy, wkst, hd, com dk arg incl, sl mot apr, scat fos frags, hd, dns, v p vis por.
2658 LS off-wh, crm, wkst to packst, sl granular/mot apr, scat fos frags, scat vf to f xl, hd, p w/ tr fr vis por.
2659 LS off-wh, crm, similar to above, mostly p w/ tr fr vis por.
2660 LS, off-wh, crm, var mudst to wkst, com c xl rexl fos frags, frm, sme chky mtx, mostly p vis por.
2661 LS lt gy to gy-gn, wkst to packst, frm, granular/sl mot apr, com areas of m-c xl rexl fos frags, sme patches of p to fr dev intxl por.
2662 no chip taken to keep core intact.
2663 LS similar to above, sme dk gy arg patches, .5+ cm brach shell, mostly p vis por.
2664 no chip taken to keep core intact.
2665 LS lt gy to gy-gn, wkst to packst, frm, granular/mot apr, scat areas of m-c rexl fos frags, com fos frags, sme .5+ cm (brach shell frags), patches or coatings of dk gy arg/carb mat, mostly p vis por.
2666 LS lt gy, packst, hd, com dk gy incl, granular/sl mot apr, one side of chip w/ dk gy arg/carb coating, mostly p vis por.
2667 LS similar to above, com dk gy/carb patches & incl, scat m-c rexl fos frags, mostly p vis por.
2668 no chip taken to keep core intact.
2669 LS m gy, packst, hd, mot/granular apr, com dk incl & xls, hd, scat rexl fos frags, mostly p vis por.
2670 no chip taken to keep core intact.
2671 LS lt gy, mudst to wkst, scat fos frags, hd, dns, p vis por.
2672 no chip taken to keep core intact.
2673 LS lt to m gy, wkst, hd, sl granular/mot apr, scat c & m rexl fos frags, com dk grs & xls, mostly p vis por.
2674 LS lt to m gy, wkst w/ patches of packst, com fos frags, mnr g moldic por.
2675 no chip taken to keep core intact.
2676 LS lt gy, wkst to packst, frm, granular/sl mot apr, com dk xls & incl, sme m & c rexl fos frags, mnr p dev intxl por.
2677 LS similar to above w/ decr in m& c rexl fos frags, mostly p vis por.
2678 LS lt gy, wkst to packst, frm, granular/sl mot apr, com dk xls, incl & rmnt fos , com fos frags, mostly p w/ mnr patches of p-p moldic & vuggy por.
2679 no chip taken to keep core intact.
2680 LS similar to 2678, mostly p vis por but mnr patches of p-p moldic & vuggy por.
2681 no chip taken to keep core intact.
2682 LS similar to 2678 but v rr moldic & vuggy por.

2683 LS lt to m gy, wkst to packst, frm, granular/sl mot apr, com dk xls, incl, & rmnt fos, abnt fos provide frame for some of chip, patch of dk gy arg/carb coating, mostly p vis por.
2684 no chip taken to keep core intact.
2685 LS, similar to 2683'.
2686 LS, similar to 2683'.
2687 no chip taken to keep core intact.
2688 no chip taken to keep core intact.
2689 DOL m gy, micxl, hd, dns, sl to mod arg, n vis por.
2690 no chip taken to keep core intact.
2691 DOL m gy, micxl, hd, dns, sl to mod arg, sl slty, n vi por.
2692 no chip taken to keep core intact.
2693 DOL m gy, similar to 2691' but w/ irreg wh anhy incl to 0.5+ cm.
2694 no chip taken to keep core intact.
2695 no chip taken to keep core intact.
2696 DOL m gy, micxl, hd, dns, sl to mod arg, sl slty, n vis por.
end core descriptions.

2696 – 2727 SH (90%) lt to m gy, mar, red-brn, probably mostly cavings. DOL (10%) m gy, micxl, hd, dns, mod arg, sme slty, n vi por.
2727 – 2757 SH (75%) lt to m gy, mar, red-brn, probably mostly cavings. SLTST (10%) lt gy, frm, v arg, sl dolic, sme sl sdy, p vis por. LS off-wh, lt gy, var wkst to packst, scat dk arg incl, sl mot apr, scat fos frags, most w/ p vis por, sme w/ fr intxl por.
2757 – 2783 poor sample, sample catching device not providing a sufficient volume of cuttings.
Driller's total depth in pilot hole 2783'.
End Pilot Hole descriptions.

SAMPLE DESCRIPTIONS
Build Section

Kick-Off point 2180' after plugging back pilot hole.

2180 – 2190 CMT (85%) SH (15)% lt gy-gn, m gy, mar, red-brn. tr lt tan micxl DOL & trnsl ANHY.

2190 – 2200 SH (85%) lt red-brn, lt-m gy to gy-gn, mar, sme slty. CMT (10%) DOL (5%) crm, micxl, anhyic, sl arg, dns, n vis por.

2200 – 2210 poor sample, mostly lost circulation material.

2210 – 2220 SH (60%), lt-m gy to gy-gn, lt red-brn, mnr mar, sme slty. CMT (20%) ANHY (15%) wh, lt gy, trnsl, sme dolic. DOL (5%) crm, micxl, often anhyic, sl arg, dns, n vis por.

2220 – 2230	SH (70%), lt to m gy, lt gy-gn, lt red-brn, mnr mar, sme slty, rr anhyic incl. ANHY (15%) wh, lt yel-orng, lt gy, trnsl, sme dolic. CMT (20%). DOL (5%) crm, micxl, often anhyic, sl arg & slty, dns, n vis por.
2230 – 2240	SH (70%), red-brn, lt to m gy, lt gy-gn, mnr mar, sme red-brn is slty, sme sl dolic, rr anhyic incl. ANHY (20%) wh, lt yel-orng, lt gy, trnsl, sme dolic. DOL (5%) crm, micxl, often anhyic, sl arg & slty, dns, n vis por. CMT (5%).
2240 – 2260	SH (60%), red-brn, lt to m gy, lt gy-gn, mnr mar, sme red-brn is slty, sme sl dolic, rr anhyic incl. ANHY (30%) wh, lt yel-orng, lt gy, trnsl, sme dolic. DOL (10%) crm, lt tan, lt gy, micxl, often anhyic, sl arg & slty, dns, n vis por.
2260 – 2280	SH (55%), red-brn, lt to m gy, lt gy-gn, mnr mar, sme red-brn is slty, sme sl dolic, rr anhyic incl. ANHY (35%) wh, lt yel-orng, lt gy, trnsl, sme dolic. DOL (10%) crm, lt tan, lt gy, micxl, often anhyic, sl arg & slty, dns, n vis por.
2280 – 2300	SH (55%) lt gy, lt gy-gn, mnr red-brn, frm, plty, sme sl anhyic. ANHY (40%) off-wh, lt gy, trnsl, sme sl dolic. DOL (5%) off-wh, lt gy, micxl, most anhyic & sl arg, dns, n vis por.
2300 – 2320	SH (50%) lt gy, lt gy-gn, mnr red-brn, frm, plty, sme sl anhyic. ANHY (45%) off-wh, lt gy, trnsl, sme sl dolic. DOL (5%) off-wh, lt gy, micxl, most anhyic & sl arg, dns, n vis por.
2320 – 2330	sample similar to above.
2330 – 2340	SH (50%) lt gy, lt gy-gn, mnr red-brn, frm, plty, sme sl anhyic. ANHY (45%) off-wh, lt gy, trnsl, sme sl dolic. DOL (5%) off-wh, lt gy, micxl, most anhyic & sl arg, dns, n vis por.
2340 – 2360	ANHY (55%) off-wh, lt gy, trnsl, sme sl dolic. SH (40%) lt gy, lt gy-gn, mnr red-brn, frm, plty, sme sl anhyic. DOL (5%) off-wh, lt gy, micxl, most anhyic & sl arg, dns, n vis por.
2360 – 2380	SH (70%) red-brn, lt to m gy & gy-gn, plty, sme sl slty, sme anhyic. ANHY (30%) off-wh, lt gy, trnsl, sme sl dolic. tr DOL.
2380 – 2400	no sample taken.
2400 – 2420	SH (60%) red-brn, lt to m gy & gy-gn, plty, sme sl slty, sme anhyic. ANHY (40%) off-wh, lt gy, trnsl, sme sl dolic. tr DOL.
2420 – 2460	SH (50%) lt to ml gy, red-brn, mnr gy-gn, plty, sme sl slty, sme anhyic. ANHY (50%) off-wh, lt gy, trnsl, sme sl dolic. tr DOL.

2460 – 2480	SH (50%) lt gy to gy-gn, m gy, red-brn, sme dolic. DOL (30%) lt gy, lt tan, crm, micxl, most arg, sme sl anhyic, occ vf-m rexl patches, dns, n vis por. ANHY (20%) similar to above.
2480 – 2500	DOL (50%) lt gy, lt tan, mnr off-wh, micxl, most sl to mod arg, sme anhyic, rr rmnt rexl fos frag, occ vf-f rexl patch, sme sl lmy, hd, dns, v p vis por. SH (40%) lt gy to gy-gn, mnr m gy & red-brn, often sl dolic. ANHY (10%) similar to above.
2500 – 2520	DOL (60%) lt gy to gy-brn, lt tan, mnr off-wh, micxl, most sl to mod arg, sme w/ sl granular apr, rr rmnt rexl fos frag, occ vf-f rexl patch, sme lmy, hd, dns, v p to p vis por. SH (40%) lt gy to gy-gn, mnr m gy & red-brn, often sl dolic. tr ANHY.
2520 – 2540	SLTST (60%) lt gy, off-wh, frm, sl dolic, sme sl sdy, most arg, scat dk gy arg lam, p vis por, pos mic-por. DOL (30%) similar to above. SH (10%) similar to above. tr ANHY.
2540 – 2560	DOL (40%) lt tan, lt to m gy to gy-brn, micxl to vfxl, frm, sl mot apr w/ com dk/carb incl, sme w/ sl gran apr, rr anhy incl, occ fr intxl por. SLTST (30%) similar to above. SH (30%) m gy, lt gy to gy-gn, mnr m gy, frm, plty, sme dolic.
2560 – 2580	no sample caught.
2580 – 2600	SH (50%) lt to m gy to gy-brn, mnr red-brn, frm, sme dolic. DOL (40%) lt to m gy to gy-brn, lt tan, micxl to vf xl, similar to above. CVGS (10%) mostly ANHY.
2600 – 2620	SH (50%) lt to m gy to gy-brn, mnr red-brn, frm, sme dolic. SS (25%) lt gy, lt tan, crm, vf w/ mnr f gr, frm, dolic, var sl to mod cly fl, sme w/ fr vis por. DOL (15%) lt to m gy to gy-brn, lt tan, micxl to vf xl, similar to above. CVGS (10%) mostly ANHY.
2620 – 2640	DOL (60%) lt gy, lt gy-brn, lt tan, micxl w/ mnr vf xl, most slty & arg, sme sl sdy, var p to v p vis por. SH (30%) lt to m gy & gy-brn, red-brn, similar to above. CVGS (10%) mostly ANHY & tr CMT.
2640 – 2660	DOL (70%) lt gy to lt gy-brn, lt brn, lt tan, micxl w/ mnr vf xl, most slty & arg, sme sl sdy, brn w/ scat carb mat var p to v p vis por. SH (20%) lt to m gy & gy-brn, red-brn, similar to above. CVGS (10%) mostly ANHY & tr CMT.

2660 – 2680	DOL (60%) lt tan, crm, lt gy to gy-brn, var micxl to f xl, hd, var cln to mod arg, sme v lmy grdg to dolic ls, sme slty w/ tr qtz sd, var p to fr vis por. SH (30%) lt to m gy to gy-gn, red-brn, sme prob cvgs. SLTST/SS (10%) lt gy to gy-brn, vf to f gr, hd, dolic/calc cmt, var sl to mod cly fl, p w/ sme fr vis por.
2680 – 2700	DOL (40%) similar to previous. SLTST/SS (30%) lt gy, lt gy-brn, vf to f gr ss grdg to sdy sltst, var sl to mod arg, dolic/calc cmt, p w/ mnr fr vis por. SH (30%) lt to m gy, mnr red-brn.
2700 – 2720	poor sample after trip, abundant cavings.
2720 – 2740	SH (50%) lt gy, lt gy-brn, frm, often slty & sl dolic. DOL (40%) lt tan, off-wh, crm, micxl to f xl, frm, sme sdy, cln to sl arg, var p to fr vis por (probably cavings) SLTST/SS (10%) similar to previous.
2740 – 2760	SH (60%) lt to m gy, lt gy-brn, frm, often slty & sl dolic. DOL (30%) lt tan, off-wh, crm, micxl to f xl, sme v lmy grdg to dolic ls, frm, sme sdy, cln to sl arg, var p to fr vis por (probably cavings) SLTST/SS (10%) similar to previous.
2760 – 2780	SH (60%) lt to m gy, lt gy-brn, frm, often slty & sl dolic. DOL (30%) lt tan, off-wh, crm, micxl to f xl, sme v lmy grdg to dolic ls, frm, sme sdy, cln to sl arg, var p to fr vis por (probably cavings) SLTST/SS (10%) similar to previous.
2780 – 2800	SH/SLTST (70%) red-brn, lt to m gy & gy-gn, often slty, sl-mod lmy. LS (15%) crm, lt gy, wkst to packst, hd, com fos frags, patches of dns rexl calc, p vis por. DOL (15%) lt to m gy, sme dk gy, micxl to vfxl, most mod arg, lmy, sme sdy, dns, v p vis por.
2800- -2820	LS (60%) lt gy to gy-brn, wkst to packst, hd, var cln to sl arg, com fos frags & dk incl & xls, var p to fr vis por. SH/SLTST (30%) red-brn, lt to m gy. DOL (10%) lt to m gy, mnr dk gy, micxl to vfxl, most mod arg, lmy, sme sdy, dns, v p vis por.
2820 – 2840	LS (75%) lt gy, lt tan, crm, wkst to packst, rr grst, vf to f xl granular text, com dk incl & xls, com fos frags, var p to g vis por. SH/SLTST (20%) m to dk gy, red-brn, sme prob cvgs. DOL (5%) similar to above.
2840 – 2860	sample similar to above.
2860 – 2880	LS (70%) lt gy to gy-brn, lt tan, crm, wkst to packst, rr grst, vf to f xl granular text, com dk incl & xls, com fos frags, var p to g vis por. SH/SLTST (25%) m to dk gy, red-brn, sme prob cvgs. DOL (5%) similar to above.

2880 – 2900	LS (70%) lt gy, lt tan, crm, packst to wk, rr grst, vf to f xl granular text, com dk incl & xls, com fos frags, var p to g vis por. SH/SLTST (25%) m to dk gy, red-brn, sme prob cvgs. DOL (5%) similar to above.

7" CASING POINT REACHED AT 2913' MD, 2620' TVD.

2900 – 2920	No sample caught.
2920 – 2940	LS (95%) lt to m gy, wkst to packst, hd, var cln to mod arg, com dk incl & xls, sl mot/granular apr, scat fos frags, sme fr vis por.
2940 – 2960	LS (98%) lt to m gy, wkst to packst, hd, var cln to mod arg, com dk incl & xls, sl mot/granular apr, scat fos frags, sme fr vis por.
2960 – 2980	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, sl mot/granular apr, scat fos frags, sme fr vis por.
2980 – 3000	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3000 – 3020	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3020 – 3040	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3040 – 3060	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3060 – 3080	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3080 – 3100	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3100 – 3120	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.

3120 – 3140	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3140 – 3160	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3160 – 3180	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3180 – 3200	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3200 – 3220	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3220 – 3240	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3240 – 3260	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3260 – 3280	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por. Cuttings size becoming increasingly small. 98% of sample is powder.
3280 – 3300	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3300 – 3320	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3320 – 3340	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3340 – 3360	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.

3360 – 3380	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3380 – 3400	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3400 – 3420	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3420 – 3440	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3440 – 3460	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por. Cuttings samples 99.9% powder too small in size to determine lithology and characteristics. Cuttings are not reliable in determining rocks that are being drilled.
3460 – 3480	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3480 – 3500	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, sl incr in arg incl from previous, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.

start collecting cuttings samples after each joint is drilled down.

3550	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3583	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, sme fr vis por.
3615	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ mot/granular apr, scat fos frags, rr clr or trnsl cht, sme w/ fr vis por.

3643	LS (98%) lt to m gy, incr in m w/ mnr dk gy, var mudst to packst, var cln to v arg w/ incr in v arg in this sample, most w/ mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3679	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3711	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, most cln, sme mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3747	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, incr in arg/shy from above, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3779	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, continued incr in arg/shy from above, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3811	LS (99%) lt to m gy, mnr dk gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, continued incr in dk gy arg/shy from above, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3843	SH (50%) m to dk gy, frm, calc, sme grdg to v shy lm mudst. LS (50%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3874	SH (60%) m to dk gy, frm, calc, sme grdg to v shy lm mudst. LS (40%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
3906	SH (60%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst. LS (40%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por.
3937	SH (65%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst. LS (35%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por.

3969	SH (60%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst. LS (40%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por.
4002	SH (50%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst. LS (50%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por.
4033	SH (55%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst. LS (45%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por.
4064	SH (50%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst. LS (50%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por.
4096	LS (60%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por. SH (40%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst.
4128	LS (80%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por. SH (20%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst.
4160	LS (85%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por. SH (15%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst.
4192	LS (90%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por. SH (10%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst.
4224	LS (95%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por. SH (5%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst.

4256	LS (98%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por. SH (2%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst.
4287	LS (98%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, mostly p vis por. SH (2%) m to dk gy, frm, calc, occ sl slty, sme grdg to v shy lm mudst.
4319	sample 99.9% dust. visible cuttings are 98% LS similar to previous.
4355	sample 99.9% dust. visible cuttings are 98% LS similar to previous.
4386	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
4418	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
4451	LS (99%) lt to m gy, off-wh to wh, wkst to packst, hd, var cln to mod arg, scat dk incl & xls, often w/ sl mot/granular apr, scat fos frags, rr clr or trnsl cht, var p to fr vis por.
4483	Cuttings 99.9% powder too fine to distinguish lithology. LS similar to previous w/ incr in m to dk gy v arg, sme grdg to v calc sh.
4515	Cuttings 99.9% powder too fine to distinguish lithology. LS similar to previous w/ continued incr in m to dk gy v arg, sme grdg to v calc sh.

Driller's Total Depth 4515'