

**Project: Motiva - Monitoring Well and Soil Boring Data**

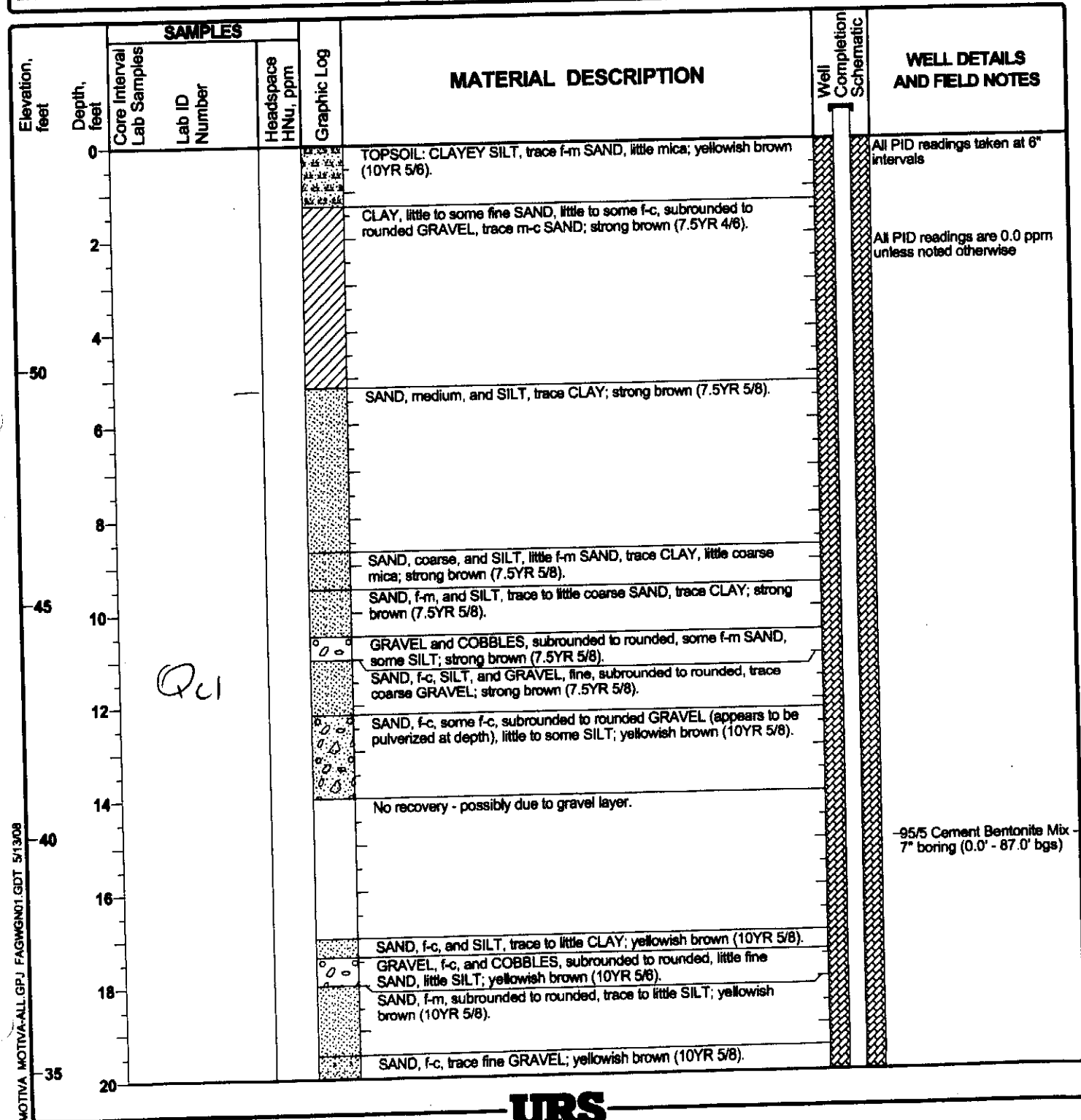
**Log of Monitoring Well D57B**

**Project Location: Delaware City Refinery** *Ec12-43*

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**Project Number: 20240412.W1000**

Date(s) Drilled	6/13/2007	Logged By	Stephen Zahniser	Checked By	
Drilling Method	Roto Sonic	Drill Bit Size/Type		Total Depth of Borehole	147.0 feet
Drill Rig Type	Roto-Sonic	Drilling Contractor	Boart Longyear	Surface Elevation	54.72 NAVD88
Groundwater Level(s)		Sampling Method(s)		Top of Casing Elevation	
Location	Delaware City Refinery - Soy Field		Borehole Completion		



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Elevation, feet	Depth, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Schematic	WELL DETAILS AND FIELD NOTES
		Core Interval Lab Samples	Lab ID Number	Headspace H <sub>2</sub> Nu, ppm				
20						SAND, f-m, little SILT, sand becomes more coarse with depth; SCAA.		
	22					Fe oxide and partially lithified material; very dark grayish brown (10YR 3/2).		
						SAND, f-c, little SILT, sand becomes more fine with depth; yellowish brown (10YR 5/8).		
	24					SAND, fine, little SILT, trace coarse SAND, trace fine GRAVEL; yellowish brown (10YR 5/8).		
30								
	26							
	28					SAND, f-c, and GRAVEL, fine, subangular to subrounded; yellowish brown (10YR 5/8). CLAY seam at 27.5' (<0.1' thick)		
						SAND, medium, some SILT; yellowish brown (10YR 5/8). - dark yellowish brown (10YR 4/4) clay seam at 27.5'		
25	30					SAND, fine, trace fine GRAVEL, rounded, trace medium SAND; yellowish brown (10YR 5/8).		
	32							
	34							
20						SAND, f-m, little coarse, little to some fine GRAVEL, iron oxide layer; yellowish brown (10YR 5/8).		
	36					SAND, fine, trace to little medium; brownish yellow (10YR 6/8).		
	38					SAND, f-m, trace to little coarse, trace SILT; - yellowish brown (10YR 5/8) to 38.4' - dark yellowish brown (10YR 4/4) to 40.0'		
15	40					SAND, fine, trace to little SILT, little mica; dark yellowish brown (10YR 4/6).		
	42					SAND, fine, sorted, trace SILT; yellowish brown (10YR 5/4).		
						SAND, fine, some f-c, subrounded to rounded GRAVEL; dark yellowish brown (10YR 4/4).		
						SAND, fine, trace coarse, rounded SAND, trace rounded GRAVEL;		

Qc1

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Elevation, feet	Depth, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Schematic	WELL DETAILS AND FIELD NOTES
		Core Interval Lab Samples	Lab ID Number	Headspace H <sub>2</sub> Nu, ppm				
44	10					<ul style="list-style-type: none"> <li>- dark yellowish brown (10YR 4/4) to 43.4'</li> <li>- yellowish brown (10YR 5/8) to 45.0'</li> </ul>		
46						<ul style="list-style-type: none"> <li>iron oxide with chemical alteration above and below resulting in white SAND</li> <li>SAND, fine, some SILT;</li> <li>- strong brown (7.5YR 5/8) to 45.5'</li> <li>- partial lithification and CLAY layer alterations, dark reddish brown (5YR 3/3) mottled with strong brown (7.5YR 5/8) 45.5-45.9'</li> <li>SAND, fine, some SILT, little mica; dark reddish brown (5YR 3/3) mottled with strong brown (7.5YR 5/8).</li> </ul>		
48						<ul style="list-style-type: none"> <li>iron oxide (surrounded by thin layer of clay- alteration product); very dark red (2.5YR 2.5/2) underlain by SAND, fine and SILT, underlain by CLAY</li> <li>SAND, f-m, trace coarse SAND, trace fine, subrounded to rounded GRAVEL, fe-mg grains;</li> <li>- strong brown (7.5YR 5/8) to 50.0'</li> <li>- yellowish brown (10YR 5/8) to 51.8'</li> <li>- strong brown (7.5YR 5/8) to 54.6'</li> <li>- brownish yellow (10YR 6/6) to 55.4'</li> <li>- strong brown (7.5YR 5/8) to 56.0'</li> <li>- brownish yellow (10YR 6/6) to 56.4'</li> <li>- strong brown (7.5YR 5/8) to 61.1'</li> <li>- brownish yellow (10YR 6/6) to 62.3'</li> </ul>		
50								
52								
54								
56								
58								
60								
62						SAND, fine, little mica; yellowish brown (10YR 5/6).		
64						SAND, f-m, trace to little coarse SAND, little mica, fe-mg grains; brownish yellow (10YR 6/6).		
66						SAND, f-c, trace to little fine, subrounded GRAVEL, thin CLAY seam at		

Qc1

-95/5 Cement Bentonite Mix  
 7" boring (0.0' - 87.0' bgs)

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Elevation, feet	Depth, feet	SAMPLES			MATERIAL DESCRIPTION	Well Completion Schematic	WELL DETAILS AND FIELD NOTES
		Core Interval Lab Samples	Lab ID Number	Headspace HNu, ppm			
					top, rare CLAY nodules; SCAA.		
	68				SAND, fine, little m-c, trace fine rounded GRAVEL, little mica; yellowish brown (10YR 5/8).		
-15	70						
	72						
	74		Qc1				
-20	76						
	78				SAND, f-c, some f-c, subrounded to rounded GRAVEL (increasing with depth), little mica; yellowish brown (10YR 5/8).		
	80		79 -		SILTY CLAY, micaceous; yellowish red (5YR 5/8) mottled with white (5YR 8/1).		Columbia - Merchantville Contact (79.0')
-25	82				SILTY CLAY, rare to few SANDY SILT lenses; greenish black (GLEYS 2.5/10Y).		
	84		Km				
-30	86						
	88						
-35	90						-95/5 Cement Bentonite Mix - 7" boring (0.0' - 87.0' bgs)

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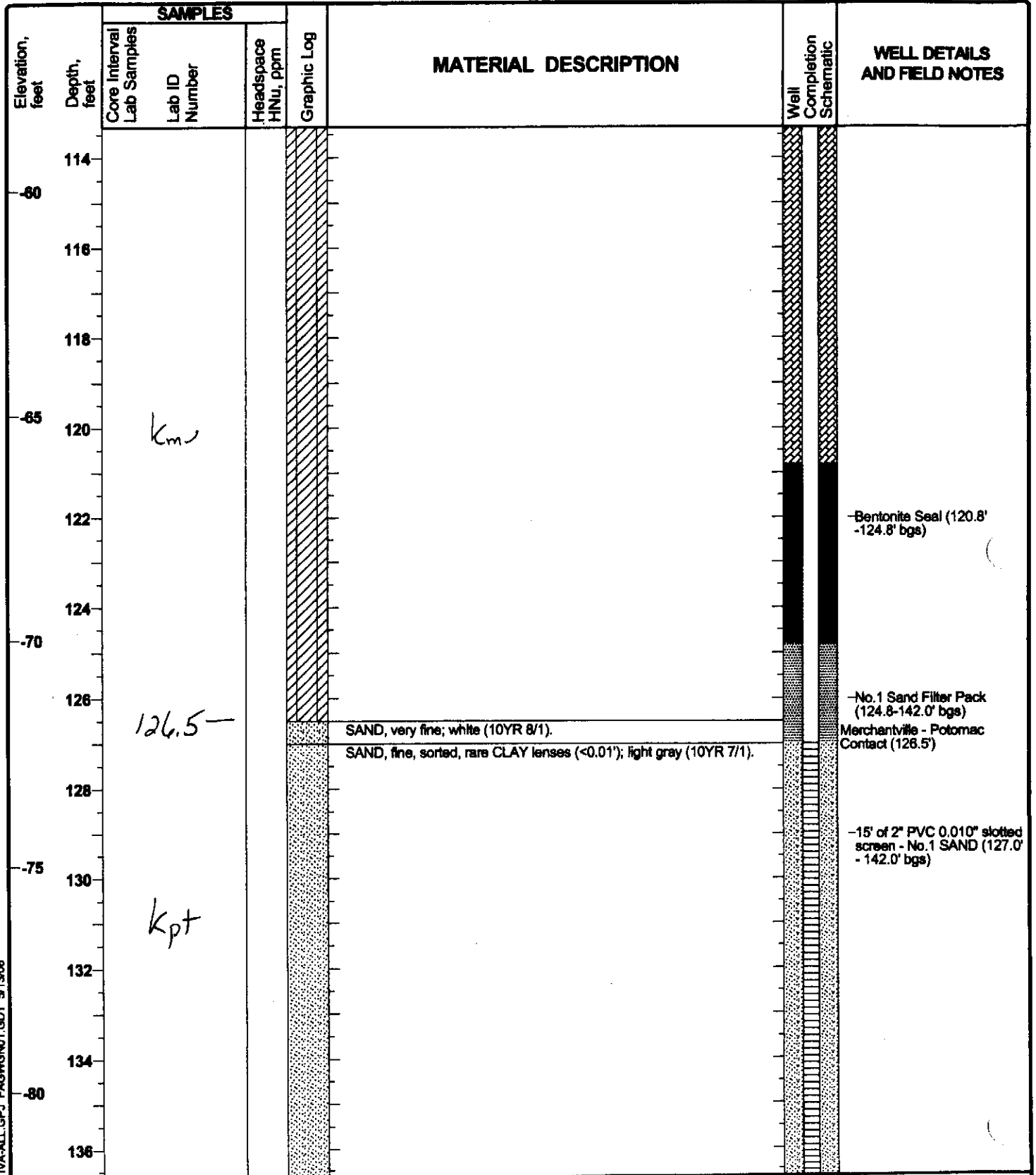
Elevation, feet	Depth, feet	SAMPLES			Graphic Log	MATERIAL DESCRIPTION	Well Completion Schematic	WELL DETAILS AND FIELD NOTES
		Core Interval Lab Samples	Lab ID Number	Headspace HNu, ppm				
90								95/5 Cement Bentonite Mix 6" boring
92								
94								
40								
96								
98								
45	100		Km					
102								
104						SILTY CLAY, micaceous, glauconitic, bioturbated; very dark greenish gray (GLE Y1 2.5/10Y) to greenish gray (GLE Y1 5/10Y).		
50	106							
108								
55	110							
112								
						SILTY CLAY, micaceous; greenish black (GLE Y1 2.5/10Y).		

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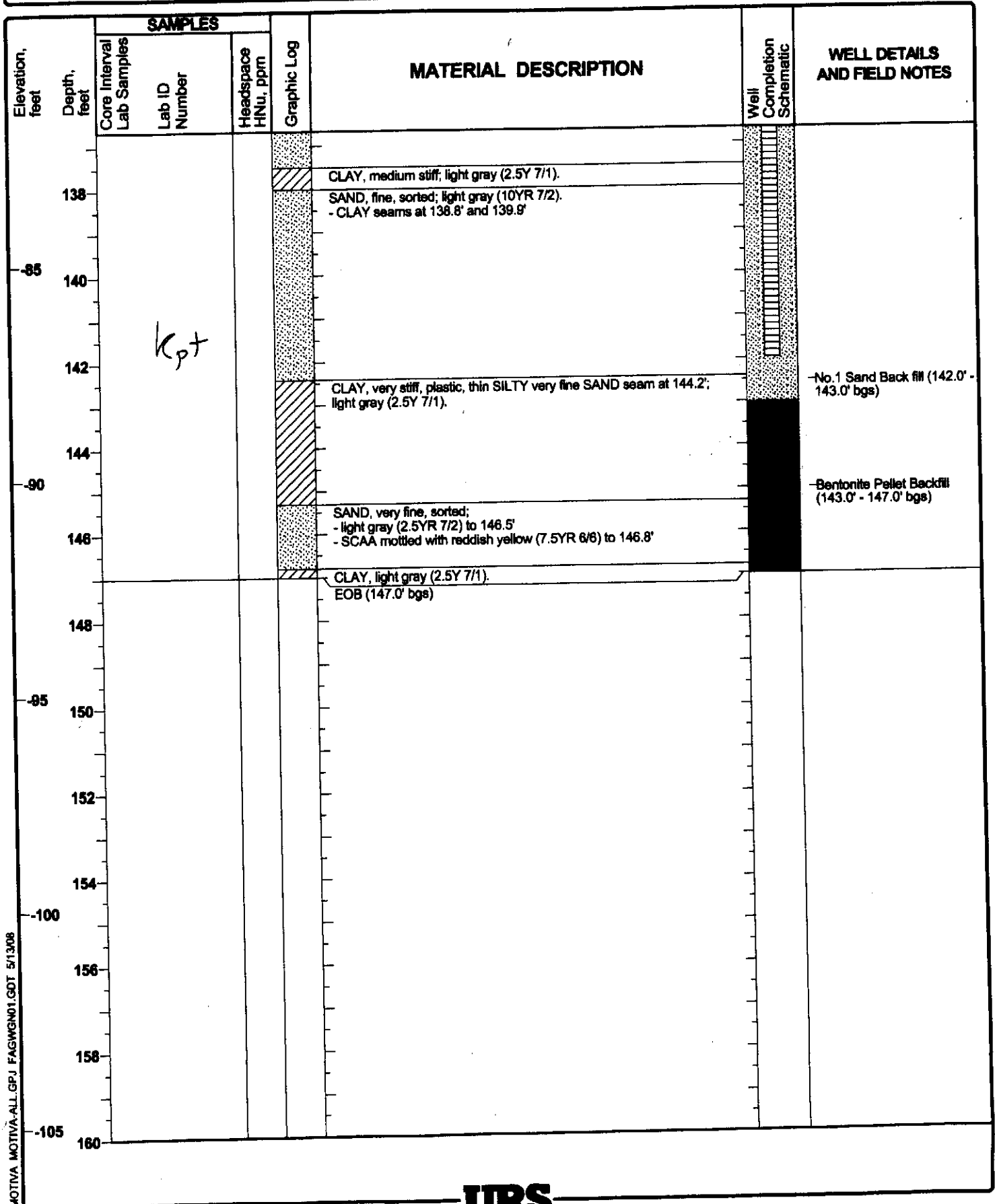


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