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1. GEOLOGICAL MARKERS & FORMATION TOP

The SMU 4-23-L will be a new drill from Pad Site #2 near Sheep Mountain in Huerfano County, CO. The objective of the 4-23-L is to target the Dakota and Entrada formations along with repeat sections of each zone by drilling through faulted zones. A 13 3/8" surface casing string will be set above the Pierre formation at 950 ft, with 9 5/8" intermediate casing through the Pierre and above the 2nd repeat section of the Dakota formation. Then an 8 3/4" hole will be drilled to a TD point of 9978 ft MD (7880 ft TVD) with 7" liner run to bottom and 300 ft inside the 9 5/8" intermediate string.


The names and depths of estimated formation tops are given below in the chart. The chart provides the formation tops for reservoir zones, including the repeat sections.

Formation Top	TVD
Apache Creek	2269
Pierre	2317
Niobrara	2793
Fort Hays	3651
Codell	3714
Carlile	3762
Greenhorn	4146
Dakota	4168
Morrison	4379
Entrada	4585
Sangre De Cristo	4656
Fault 1	4708
Repeat Section 1 Dakota	5038
Repeat Section 1 Entrada	5438
Fault 2	5560
Repeat Section 2 Dakota	5757
Repeat Section 2 Entrada	6137
Fault 3	6154
Repeat Section 3 Dakota	6328
Repeat Section 3 Entrada	6728
Fault 4	6779
TD	7880

Table 1: Formation Tops for SMU 4-23-L

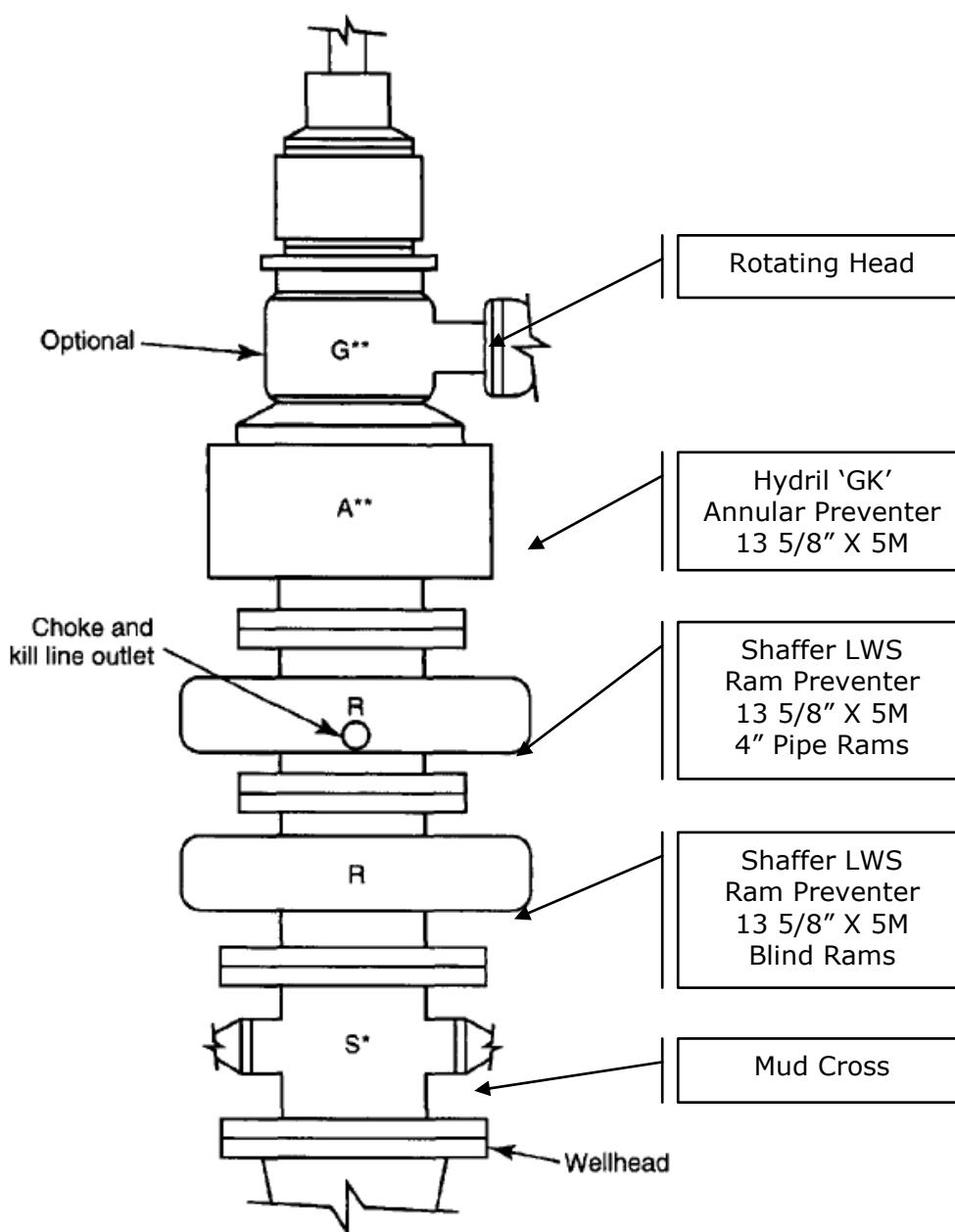
2. ESTIMATED TOPS OF ANTICIPATED WATER, OIL, GAS OR MINERALS

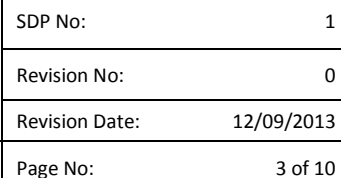
The cells highlighted in green in **Table 1** represent the formation tops of the producing zones. Casing and cementing will be designed to protect hydrocarbon bearing, lost circulation, and usable quality water zones.

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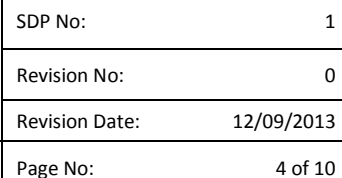
3. THE OPERATORS MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL

A schematic of the BOP is provided below as per the example provided in API RP 53. This schematic is a double ram type preventer with a mud cross, blind ram, pipe ram, annular, and a rotating head. The rated working pressure of the BOP stack is 5,000 psi. The BOP stack will be nipped up after surface casing has been cemented and the "A" section of the wellhead installed. All BOPE will be tested to a minimum of 500 psi over the calculated MASP for the hole interval. The pressure test will be conducted at 2500 psi. A low pressure test of 250 psi will also be performed. The BOPE will be tested every 21 days.





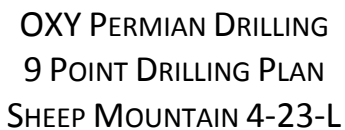
Cement Design 13 3/8" Surface Casing								
Stage	Weight (ppg)	TOC (ft)	BOC (ft)	Hole Size (in)	% Open Hole Excess	Cement Volume (sacks)	Slurry Volume (bbls)	Remarks
Tail	13	Surface	950	17.5	100%	680	241.35	Adjust if hole conditions change.
Top Out	15.8	Surface	-	17.5	-	200	41.32	Top out cement will be pumped if there's not any cement to surface
<u>TAIL SLURRY</u>								
Cement Type:			VARICEM					
Additive:			0.125lb/sk Poly-E-Flake (Lost Circulation Additive)					
Mix Water			10.80 Gal/sk					
Slurry Density:			13 ppg					
Yield:			2.00 ft ³ /sack					
<u>TOP OUT CEMENT</u>								
Cement Type:			Premium					
Additive:			2% Calcium Chloride Pellets (Accelerator)					
Mix Water			5.00 Gal/sk					
Slurry Density:			15.80 ppg					
Yield:			1.16 ft ³ /sack					



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Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Volume bbl
1	Spacer	Fresh Water	8.3	50
2	Cement	Tail Cement	13	241.35
DROP PLUG				
4	Spacer	Displacement Fluid	8.3	137.22
5	Cement	Top Out Cement	15.8	41.32

[illegible]




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Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Volume bbl
1	Spacer	Tuned Spacer	11	40
2	Cement	Lead Cement	13	501.42
3	Cement	Tail Cement	13	25.92
DROP PLUG				
4	Spacer	Displacement Fluid	8.7	572.87


Stage	Weight (ppg)	TOC (ft)	BOC (ft)	Hole Size (in)	% Open Hole Excess	Cement Volume (sacks)	Slurry Volume (bbls)	Remarks
Stage 1 (Tail)	13.5	5651	7500	12.25	25%	570	135.88	Adjust if hole conditions change.
Stage 2 (Lead)	12.30	0	5358	12.25	25%	1057	371.06	Adjust if hole conditions change.
Stage 2 (Tail)	15.80	5358	5651	12.25	25%	100	20.43	Adjust if hole conditions change.
<u>STAGE 1 - TAIL SLURRY</u> Cement Type: EXTENDACEM SYSTEM Additive: 1 lb/sk FDP-C708-03 (Additive Material) Mix Water 5.47 Gal/sk Slurry Density: 13.50 ppg Yield: 1.34 ft ³ /sack								
<u>STAGE 2 - LEAD SLURRY</u> Cement Type: ECONOCEM Additive: 0.4% HR-5 (Retarder) Additive: 1 lb/sk FDP-C708-03 (Additive Material) Additive: 5 lb/sk Kol-Seal (Lost Circulation Additive) Mix Water 10.12 gal/sack Slurry Density: 12.30 ppg Yield: 1.97 ft ³ /sack								
<u>STAGE 2 - TAIL SLURRY</u> Cement Type: Premium Cement Mix Water 4.99 Gal/sk Slurry Density: 15.80 ppg								

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Yield:	1.15 ft ³ /sack
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Cement Design 7" Production Liner								
Stage	Weight (ppg)	TOC (ft)	BOC (ft)	Hole Size (in)	% Open Hole Excess	Cement Volume (sacks)	Slurry Volume (bbls)	Remarks
Lead	13	7200	9678	8.75	25%	241.76	81.60	Adjust if hole conditions change.
Tail	13	9678	9978	8.75	25%	55	13.48	Adjust if hole conditions change.
<u>LEAD SLURRY</u>		Cement Type: EXTENDASEAL Additive: 1.5% CHEM-FOAMER 760, TOTETANK (Foamer) Additive: 1 lb/sk FDP-C708-03 (Additive Material) Mix Water 6.81 gal/sack Slurry Density: 13 ppg Yield: 1.46 ft ³ /sack						
<u>TAIL SLURRY</u>		Cement Type: EXTENDACEM SYSTEM Additive: 1 lb/sk FDP-C708-03 (Additive Material) Mix Water 6.86 Gal/sk Slurry Density: 13 ppg Yield: 1.46 ft ³ /sk						

Detailed Pumping Schedule – 7" Production Liner				
Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Volume bbl
1	Spacer	Tuned Spacer	11	30
2	Cement	Lead Cement	13	81.60
3	Cement	Tail Cement	13	13.48
DROP PLUG				
4	Spacer	Displacement Fluid	8.3	230.74

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Cement Design 7" Production Liner - CONTINGENCY								
Stage	Weight (ppg)	TOC (ft)	BOC (ft)	Hole Size (in)	% Open Hole Excess	Cement Volume (sacks)	Slurry Volume (bbls)	Remarks
Tail	13.50	7200	9978	8.75	25%	385	91.85	Adjust if hole conditions change.
TAIL SLURRY		Cement Type: EXTENDACEM SYSTEM Additive: 1 lb/sk FDP-C708-03 (Additive Material) Additive: 5 lb/sk Kol-Seal (Lost Circulation Additive) Additive: 0.2% Super CBL (Additive Material) Mix Water: 5.48 Gal/sk Slurry Density: 13.50 ppg Yield: 1.35 ft ³ /sack						

5. MUD PROGRAM

Mud specifications are provided in the table below. The properties will be followed, but may change depending on hole conditions. Materials to control a lost circulation event or well control will be on site, too. These products are contained in sacks and delivered to the rigs on a pallet wrapped in plastic. The drilling operation will have a closed looped system with all returns going through a shale shaker and back into the rig's mud pit system. All cuttings will be removed via the cuttings disposal procedure and hauled off to a designated disposal site.

Hole Size (in)	Depth Interval (ft)	Fluid Type	Mud Weight (ppg)	Funnel Visc (s/qt)	PV	YP	Drill Solids (%)
17 ½"	0 - 950	FW spud mud	8.4 – 9.2	28-34	10-15	12-15	<8
12 ¼"	950 – 7500	OBM*	8.7 – 9.2	40 – 45	8 – 12	10 – 14	< 6
8 ¾"	7500 – 9978	OBM*	7.9 – 8.2	40 – 45	8 – 12	10 – 14	< 6

*The OBM will contain an oil/water ratio of 80/20 – to 85/15.

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6. LOGGING PROGRAM

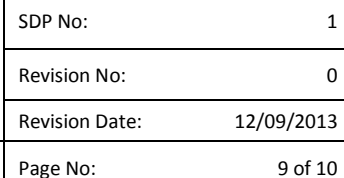
The mud logging program will consist of a quad combo log, which includes Gamma Ray, Formation Density, Neutron, and Sonic. The quad combo will be run in both intermediate and production hole intervals.

7. ANTICIPATED PRESSURES AND TEMPERATURES


The Dakota and Entrada formations are prone to lost circulation. The repeat sections of both the Dakota and Entrada may have the same reservoir pressure as the first set of zones above the fault, which can lead to lower pressures in the deeper repeat sections resulting in lost circulation. The Dakota pressure gradient has been estimated at 0.38 psi/ft and the Entrada at 0.35 psi/ft.

The Morrison shale can lead to wellbore instability and may be seen while drilling through the faulted zones.

Maximum bottom hole temperature will be less than 150°F.

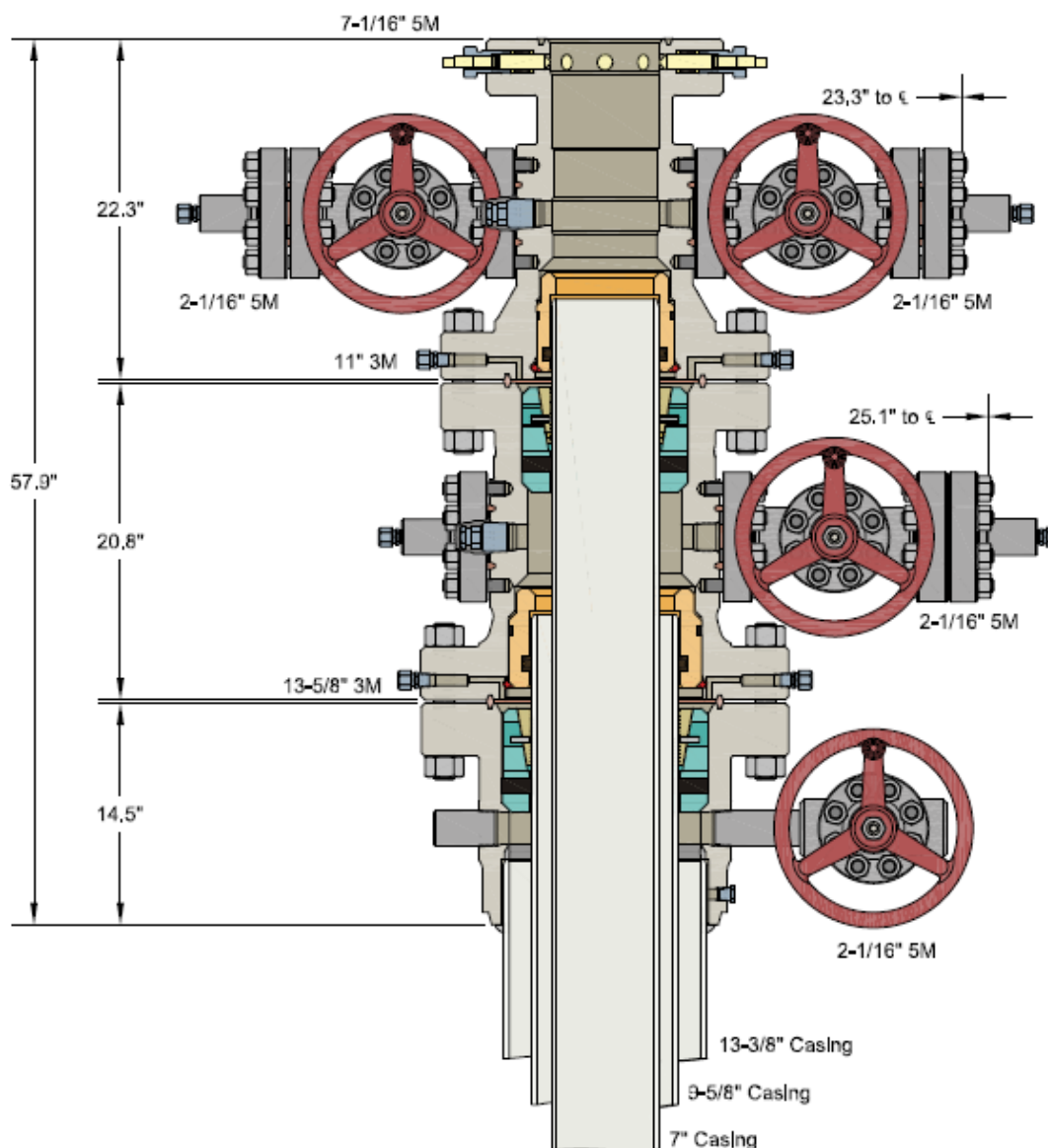


Quality Control
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Drawn by: Matt VanderSchaaf
Checked by:
Client OK:

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9. WELLHEAD SCHEMATIC

The drawing below is a schematic of the 13-3/8" x 9-5/8" x 7" 5M Conventional Wellhead that will be used on the SMU 4-23-L.



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This drawing is the property of GE Oil & Gas Pressure Control LP and is considered confidential. Unless otherwise approved in writing, neither it nor its contents may be used, copied, transmitted or reproduced except for the sole purpose of GE Oil & Gas Pressure Control LP.

OXY USA INCORPORATED
SHEEP MOUNTAIN

13-3/8" x 9-5/8" x 7" 5M Conventional Wellhead
Assembly, With W2-EBS Casing Spool
and T-EBS Tubing Head

DRAWN	VJK	11DEC13
APPRV	KN	11DEC13
FOR REFERENCE ONLY		
DRAWING NO.		SDM-3996