

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

5. Lease Serial No.
NMSF079011

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.
NMNM119482

8. Well Name and No.
SAN JUAN 32-5 UNIT COM 114H

9. API Well No.
30-039-29790-01-S1

10. Field and Pool or Exploratory Area
BASIN FRUITLAND COAL

11. County or Parish, State
RIO ARRIBA COUNTY, NM

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well
 Oil Well Gas Well Other: COAL BED METHANE

2. Name of Operator Contact: ROBBIE A GRIGG
SOUTHLAND ROYALTY COMPANY LLC Email: rgrigg@mspartners.com

3a. Address
400 W 7TH STREET
FORT WORTH, TX 76102

3b. Phone No. (include area code)
Ph: 817-334-7842

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 24 T32N R6W SWNW 1345FNL 225FWL
36.969444 N Lat, 107.416667 W Lon

OIL CONS. DIV DIST. 3
JUL 14 2017

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input checked="" type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

AP

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

UPDATE TO EC375749:

CHANGES:

We will be drilling a 6 1/8" lateral hole.

We will be running 4.5" 11.6# N-80 BTC pre-perforated with 4spf, 90deg phasing, 0.75" dia hole, and 1' blank on each end.

PREVIOUS:

Hole size and liner were 4 3/4" and 2 7/8"

**Notify NMOCD 24 hrs
prior to beginning
operations**

14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #380309 verified by the BLM Well Information System
For SOUTHLAND ROYALTY COMPANY LLC, sent to the Farmington
Committed to AFMSS for processing by JACK SAVAGE on 07/12/2017 (17JWS0133SE)**

Name (Printed/Typed) ROBBIE A GRIGG	Title SUPVR REGULATORY REPORTING
Signature (Electronic Submission)	Date 06/29/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By <u>JACK SAVAGE</u>	Title <u>PETROLEUM ENGINEER</u>	Date <u>07/12/2017</u>
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		
Office Farmington		

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

NMOCD PV

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**Application for Permit to Drill
Drilling Plan
REVISED: 06/29/2017**

SOUTHLAND ROYALTY COMPANY LLC

SAN JUAN 32-5 UNIT COM #114

Re-enter Existing Well

API No. 30-039-29790

Originally Drilled September 25, 2007

Existing Well Surface Location: 1345' FNL & 225' FWL

Section 24, T32N, R06W

Existing Well GL Elev = 6472'

Lat. = 36.96945° N

Long. = 107.41667° W

NAD83

Rio Arriba County, New Mexico

Existing Well Bottomhole Location (Pilot): 869' FSL & 1111' FEL

Section 6, T32N, R06W

TD – 4773'MD/3202'TVD

Existing Lower Casing Window – 4545'-53'MD

Existing Well Lower Lateral #1 - Location: 1315' FSL & 2257' FWL

Section 14, T32N, R06W

TD – 6741'MD/3143'TVD

Existing Upper Casing Window – 4384'-93'MD

Existing Well Upper Lateral #2 - Location: 1636' FSL & 1373' FWL

Section 14, T32N, R06W

TD – 7672'MD/3024'TVD

Proposed Casing Window – 3431'-40'MD

Proposed New Lateral #3 - Location: 660' FNL & 660' FWL

Section 14, T32N, R06W

TD – 9089'MD/3100'TVD

Drilling program written in compliance with onshore Oil and Gas Order No. 1
(III.D.3, effective May 2007) and Onshore Order No. 2 Dated November 18, 1988

A. Names and estimated tops of all geologic groups, formations, members or zones.

Depths referenced to GL of 6472' & RKB 15' @ 6487' - Pilot Hole		
Marker	TVD	MD
San Jose	0	0
Nacimiento	1027'	1028.06'
Ojo Alamo Ss	2397'	2925.1'
Kirtland Sh	2,507'	3,185.33'
Fruitland Fm	2,957'	4,231.74'
Top Fruitland Coal	3,082'	4,497.47'
Target Coal Base 1	3,102'	4,541.6'
Target Coal Base 2	3,162'	4,679.01'
Pictured Cliffs Ss	3,167'	4,690.45'
LAT #3 TOTAL DEPTH:	3,100'	9,653'
Original Pilot Well TD:	3,203'	4,773'

B. Estimated depth and thickness of formations, members or zones potentially containing useable water, oil, gas or prospectively valuable deposits of other minerals that the operator expects to encounter, and the operator's plans for protecting such resources.

Depths referenced to GL of 6472' & RKB 15' @ 6487' - Pilot Hole			
Marker	TVD	MD	
San Jose	0	0	Water - usable
Nacimiento	1027'	1028.06'	Water - usable
Ojo Alamo Ss	2397'	2925.1'	Water
Kirtland Sh	2,507'	3,185.33'	Gas & Water
Fruitland Fm	2,957'	4,231.74'	Gas & Water
Top Fruitland Coal	3,082'	4,497.47'	Gas, Water & Coal
Target Coal Base 1	3,102'	4,541.6'	Gas, Water & Coal
Target Coal Base 2	3,162'	4,679.01'	Gas, Water & Coal
Pictured Cliffs Ss	3,167'	4,690.45'	Gas, Water & Coal
LAT #3 TOTAL DEPTH:	3,100'	9,653'	Gas & Water
Original Pilot Well TD:	3,203'	4,773'	Gas & Water

Conductor: No conductor casing is necessary and none was set.

Surface Casing: Protection of shallow fresh water shall be accomplished by setting surface casing 50' below known fresh water sources and cemented to surface with 9-5/8" surface casing.

Surface casing - 9-5/8" 32.3 ppf, H-40 was set at 202' and 8 bbls of cement was circulated to surface in 2007.

Possible Aquifers: Base 150'

Production Casing: Protection for all other formations will be accomplished by setting 7" casing and cementing to surface. The 7" production casing will be fracture stimulated prior to re-entry for the lateral open hole section.

Production casing - 7" 23 ppf, J-55 was set at 4,763' MD/3203'TVD - TD is 4,773' MD in 2007 and 80 bbls of cement was circulated to the surface in 2007.

Production Liner: Will be pre-perforated, uncemented, unstimulated liners to maintain hole stability.

C. The operator's minimum specifications for blowout prevention equipment and diverter systems to be used, including size, pressure rating, configuration and the testing procedure and frequency. Blowout prevention equipment must meet the minimum standards outlined in Order 2.

BOP equipment and accessories will meet or exceed BLM requirements outlined in 43 CFR Part 3160.

The working pressure of all BOPE shall exceed the anticipated surface pressure to which it may be subjected, assuming a partially evacuated hole with a pressure gradient of 0.22 psi/ft.

Expected Maximum Bottom Hole pressure = 1287 psi, which is less than 2,000 psi working pressure. Therefore, a 2000 psi Class 2 BOPE system is required that consists of the following:

- 2 preventers with either double ram (blind and pipe) or annular preventer and blind rams.
- Kill line (2" minimum)
- 1 Kill line valve (2" minimum)
- 1 choke line valve
- 2 chokes (refer to diagram in Attachment 1)
- Upper Kelly cock valve with handle available
- Safety valve and subs to fit all drill strings in use
- Pressure gauge on choke manifold
- 2" minimum choke manifold
- Fill-up line above the uppermost preventer

See attached diagram for the proposed BOP system. Stack #1 will be nipped-up on the 7-1/16" 5,000 psi B section for the dual lateral re-entry. The BOP will be hydraulically operated.

All ram preventers and related equipment will be tested to 2,000 psi for 10 minutes. Annular preventers will be tested to 70% of rated working pressure for 10 minutes. Surface casing will be tested to 1500 psi. All preventers and surface casing will be tested before drilling out of surface casing. BOP equipment will be tested when initially installed, whenever any seal subject to test pressure is broken, following related repairs and at least once every 30 days. Annular preventers will be functionally operated at least once per week. Rams preventers will be activated each trip, not to exceed once per day.

D. The operator's proposed casing program, including size, grade, weight, type of thread and coupling, the setting depth of each string, and it's condition. The operator must include the minimum design criteria, including casing loading assumptions and corresponding safety factors for burst, collapse, and tensions (body yield and joint strength). The operator must also include the lengths and setting depth of each casing when a tapered casing string is proposed. The hole size for each wellbore section of hole drilled must be included. Special casing designs such as the use of coil tubing or expandable casing may necessitate additional information.

Casing & Hole Size	Grade	Weight	Coupling	Setting Depth (MD)	Condition
9-5/8" (12-1/4")	H-40	24 ppf	ST&C	0' - 202'	Existing casing, set in 2007
7" (8-3/4")	J-55	23 ppf	LT&C	0' - 4763'	Existing casing, set in 2007
4 1/2" (6 1/8") Lateral #3	N-80	11.6 ppf	BTC	3440'-9089'	Used or new casing – perforated liner no cement
Existing perforations Lateral #1 4-1/2" Lateral #2 4-1/2"	J-55	11.6 ppf	LT&C	6 SPF, 0.5" holes 4554'-6741' 4393'-7672'	Perforations will be Isolated with a CIBP at approximately 3451'

4 1/2" Liner - pre-perforated with 4spf, 90deg phasing, 0.75" dia hole, and 1' blank on each end.

Production casing liners will be uncemented, unstimulated and not tested. The purpose of the existing 4 1/2" liners and proposed 4 1/2" liner is to keep the open hole from collapsing. Isolation for the 6 1/8" and 4 1/2" laterals will be maintained by the cased and cemented pilot hole with 7" casing and cement to surface.

Minimum casing design factors used:

Collapse -	1.0
Burst -	1.1
Tension -	1.4

Existing Surface Casing Design - Evacuated/Max SICP (collapse & burst), 100k overpull (tension)

	Size	Weight	Grade	Conn	Collapse	Burst	Tension (conn)	Notes
Surface	9.625	32.3	H40	STC	1,400	2,270	254,000	0' - 202'
					1.000	1.100	1.400	

Collapse	Casing Depth	MW in	MW out	Pres in	Pres out	SF	
	202	0	15.8	0	166	8.44	

Burst	202	9	0	1500	0	1.51	Casing test

Tension	202	Mud Wt	Air Wt	Bouy Wt	BW +100k	2.40	100k over pull
		9	6,525	5,628	105,628		
		BF					BF= 1- (MW)/65.5
		0.8626					

Existing Intermediate Casing Design - Evacuated/Max Mud Wt (collapse & burst), 100k overpull (tension)

Intermediate	Top Interval	Btm Interval	Size	Weight	Grade	Conn	Collapse	Burst	Tension	Notes
	0	4763	7	23	J55	LTC	3,270	4,360	313,000	
							1.000	1.100	1.400	

Collapse	0	4763	Depth TVD	MW in	MW out	Pres in	Pres out	SF - 1.000
			3203	0	9	0	1499	2.18

Burst	0	4763	Depth TVD	MW in	MW out	Pres in	Pres out	SF - 1.1	Frac Pres
			3203	9	0	1499	0	2.91	0
						1499			

Tension	0	4763	3203	Mud Wt	Air Wt	Bouy Wt	BW +100k	SF - 1.4	
				9	73,669	63,547	163,547	1.91	
				BF					BF= 1- (MW)/65.5
				0.8626					

- E. The estimated amount and type(s) of cement expected to be used in the setting of each casing string. If stage cementing will be used, provide the setting depth of the stage tool(s) and the amount and type of cement including additives, to be used for each stage. Provide the yield of each cement slurry and the expected top of cement, with excess, for each cemented string or stage.**

The proposed cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. All indications of useable water shall be reported.

The surface casing shall WAS cemented back to surface. In the event cement does not circulate to surface, remedial cementing shall be done to cement the casing back to surface. If returns are lost and/or cement is not brought to surface, a cement bond log (CBL) will be required to determine the quality of the
The 7" production casing strings WAS tested to .22 psi per foot of the casing string length or 1200 psi, not exceed 70% of the minimum internal yield.

The 7" production casing WAS cemented to surface. The 4-1/2" production liners were installed uncemented. The 4 1/2" production liner will be installed uncemented.

Surface Casing Single Stage Job – (0-202'MD):
EXISTING SURFACE CASING CEMENTED TO SURFACE IN 2007

Production Casing Single Stage Job – (0-4763'MD):
EXISTING PRODUCTION CASING CEMENT TO SURFACE IN 2007

- F. Type and characteristics of the proposed circulating medium or mediums proposed for the drilling of each well bore section, the quantities and types of mud and weighting material to be maintained, and the monitoring equipment to be used on the circulating system. The operator must submit the detailed information when air or gas drill is proposed.**

Interval (MD)	Hole Section	Hole Size	Type	MW (ppg)	VIS (s/qt)	FL (mL/30 min)	PV (cP)	YP (lbs/100ft ²)	Max Salinity (mg/L)	pH
3440'-9089'	Lat #3	4 1/2"	Brine	9.0-10	28-34	NC	1	4	188,000	8-9.1

Sufficient weighting material will be on hand to weight mud up to 10.5 PPG, if required.

The formula for weight up with barite is listed below:

Sacks of Barite per 100 bbl of mud = $1470 \times (W2 - W1) + (35 - W2)$

Where; W1 = current mud weight, W2 = new mud weight

Sacks = $1470 \times (10.5 - 9.0) / (35 - 10.5) = 126 \text{ sx} \times 3 \text{ (300bbls minimum)} = 270 \text{ sx}$

Mud Product	Estimated Quantity on Location
Baroid 41	270 sx
Aquagel Gold Seal	250 sx
Lime	4 sx
Caustic Soda	8 sx
EZ-Mud	20 buckets
Barazan D Plus	20 sx

Pac R	20 sx
Filter-Chek	30 sx
LCM	120 sx

Pit Volume Totalizer (PVT) equipment (or equivalent) will be on each pit to monitor pit levels. A trip tank equipped with a PVT sensor will be used to monitor trip volumes. Possible lost circulation in the Fruitland Coal and Pictured Cliffs Sand. Lost circulation has been successfully mitigated with lost circulation materials.

There will not be a reserve pit for this well. A closed-loop system will be used to recover drilling fluid and dry cuttings during drilling operation. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. Frac tanks will be on location to store fresh water, produced water, drilling mud and brine.

G. The testing, logging, and coring procedures proposed, including drill stem testing procedures, equipment, and safety measures.

Testing: None planned.

Open Hole Logging: LWD gamma ray for both lateral hole sections (from casing exit to TD).

Mud Logging: Lateral hole section from 3440'-9089'. Samples taken every 30'.

Coring: None planned.

Cased Hole Logging: If A CCL – CBL will we run to check cement bond across window area and to locate casing collars to set isolation bridge plug.

H. The expected bottom-hole pressure and any anticipated abnormal pressures, temperatures, or potential hazards that the operator expects to encounter, such as lost circulation and hydrogen sulfide. A description or the operators plans for mitigating such hazards must be included.

Maximum expected BHP @ TD 9089'MD / 3100' TVD (0.45 psi/ft): 1395 psi

Maximum expected BHT @ 3100' TVD: ~140° F

The maximum anticipated bottom hole pressure will be controlled with mud weight and BOP equipment.

No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

I. Any other facets of the proposed operation that the operator would like the BLM to considered in reviewing the application. Examples include, but are not limited to: For directional wells, proposed directional designs, plan view, and vertical section in true vertical and measured depths: Horizontal drilling; and Coil tubing Operations.

Timing:

The operation is expected to start July 2017. A bridge plug will be set to isolate Lateral #1 in the 7" casing. Another bridge plug will be set in the 7" production casing isolating Lateral #2, a whipstock set, and the 4-3/4" sidetrack lateral hole section drilled. Upon completion of the open hole lateral, the drilling rig will move off and the completion rig will be on location approximately two to three weeks to run tubing and set artificial lift.

Directional Plans:

Lateral #3 directional plans attached.

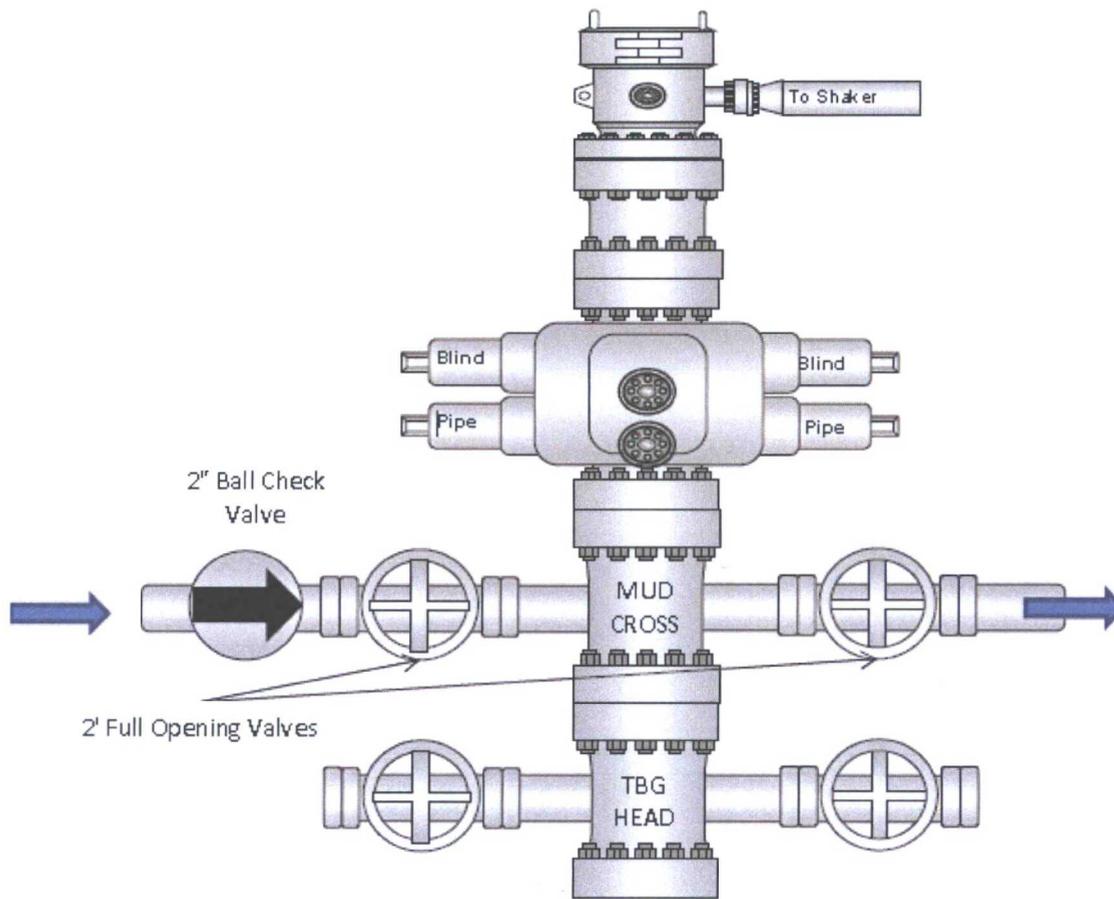
Completion:

The existing directional well has two existing laterals in the Fruitland Coal. 4554'-6741' & 4393'-7672'. A composite bridge plug (CBP) will be set at approximately 4500' to isolate Lateral #1 from the rest of the wellbore. A CBP will be set at approximately 3451' to isolate both Laterals during sidetrack drilling operations and to serve as a base for the whipstock assembly. The lateral will be cased with 2-7/8" pre-perforated uncemented tubing to maintain hole stability for natural open hole completion.

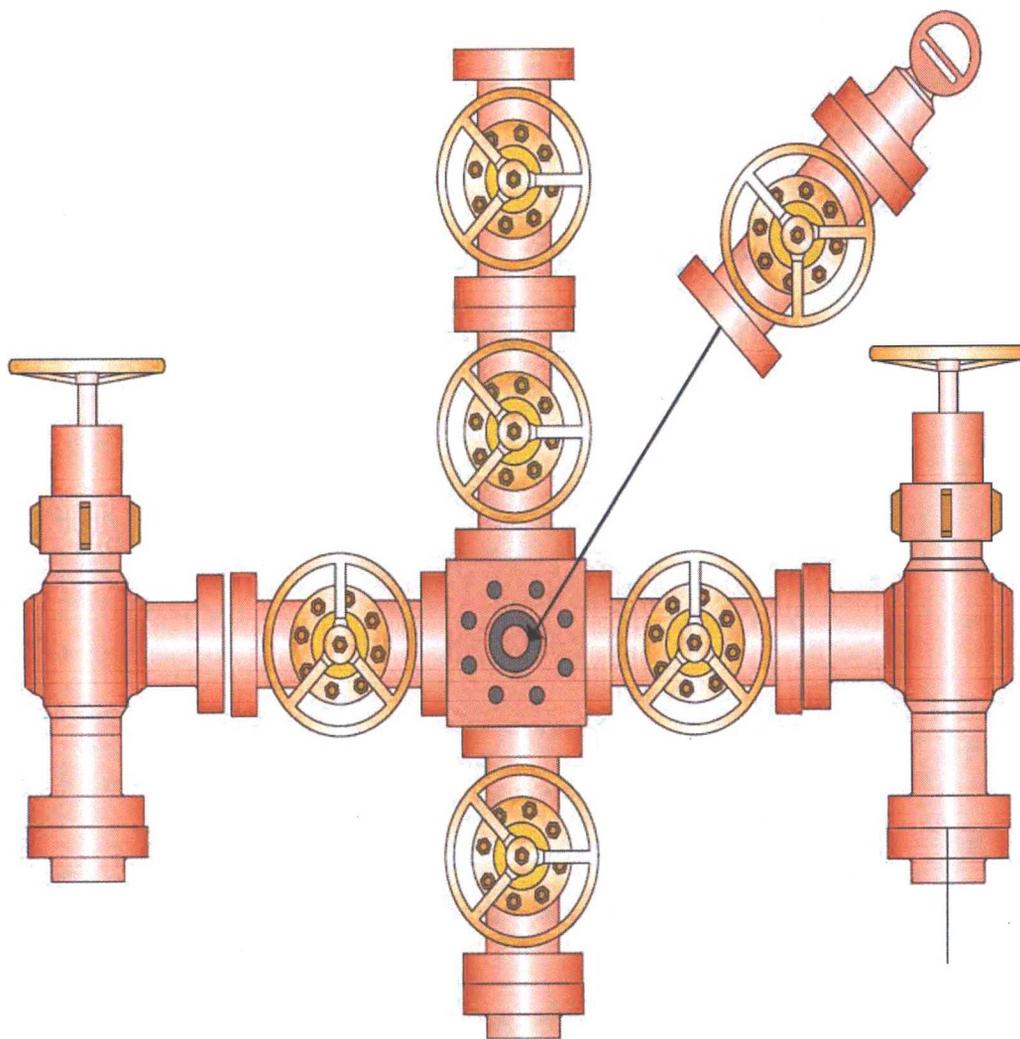
Horizontal Re-entry Procedure:

- Prepare existing well or drilling operations with a service unit.
- Pull tubing and rods.
- Run CBL and check bond across whipstock window area KOP 3440' MD.
- Run gyro survey if needed.
- Set CBP at approximately 4500', below Lateral #2 and above Lateral #1 isolating Lateral #1 from the rest of the wellbore.
- Set CBP at approximately 3451', below proposed window area to set whipstock and isolate existing Lateral #1 and #2.
- Load hole and pressure test casing.
- Move in and rig up drilling rig on completed pilot hole
- Run gyro survey, orient and set whipstock for casing exit @ +/-3440' MD
- Mill window and TOOH for curve BHA.
- Planned KOP @ 3440' MD / 2610' TVD (directional pilot well).
- Drill 4-3/4" from 3440' MD / 2610' TVD to 9089' MD / 3100' TVD at 90°, 272.5° azimuth.
- TOOH and run 2-7/8" pre-perforated liner from approximately 3440' MD to 9089' MD.
- TOOH and retrieve whipstock.
- Secure well, rig down and move off location.

NOTE: Depths and directional plans are based on estimated formation tops. Corrections for KOP and landing points will be made based on actual formation tops from logs.



Proposed Class 2 BOP Stack - STACK #1 (LATERAL RE-ENTRY)



(Minimum 2")

Proposed 2,000 psi Choke Manifold Stack