DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

NM OIL CONSERVATION
ARTESIA DISTRICT
SEP 17 2015
RECEIVED

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-42280	84330	ROSS DRAW ~~UNDESIGNATED~~ WOLFCAMP (GAS)

Property Code	Property Name	Well Number
40485	RDX FEDERAL COM 28	7H

OGRID No.	Operator Name	Elevation
246289	RKI EXPLORATION & PRODUCTION	3008'

Surface Location

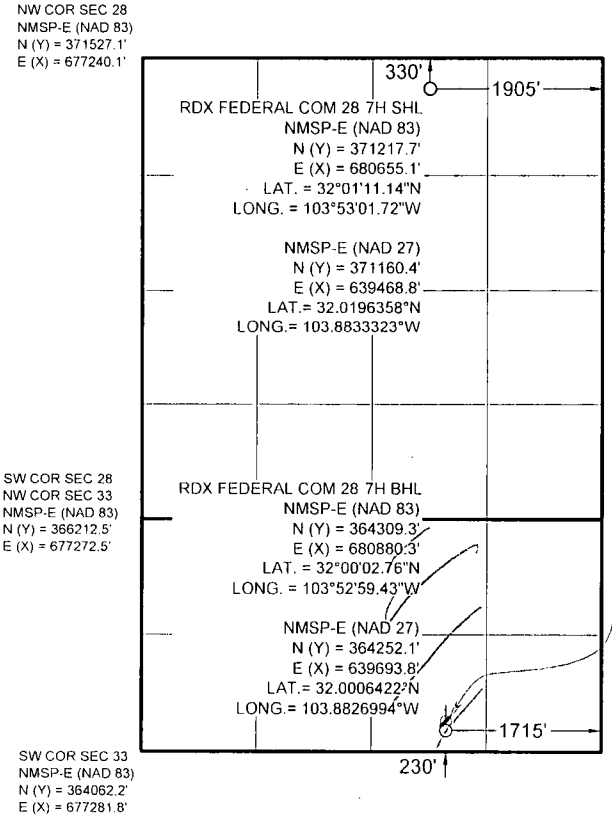
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	28	26 S	30 E		330	NORTH	1905	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
2	33	26 S	30 E		230	SOUTH	1715	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidated Code	Order No.
224.78			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Heather Brehm 10/28/2014
Signature Date

HEATHER BREHM
Print Name

hbrehm@rkixp.com
E-mail Address

SURVEYORS CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

April 29, 2013 Revised 02-11-14
Date of Survey

Signature and Seal of Professional Surveyor:

JAMES E. TOMPKINS NEW MEXICO 14729 REGISTERED PROFESSIONAL LAND SURVEYOR

James E. Tompkins

Job No.: WTC48881
JAMES E. TOMPKINS 14729
Certificate Number

RKI Exploration & Production, LLC
Drilling Program

Well RDX 28-7H
Location Surface: 330 FNL 1,905 FEL Sec. 28-26S-30E
Bottom Hole: 230 FSL 1,715 FEL Sec. 30-26S-30E

County Eddy
State New Mexico

1) The elevation of the unprepared ground is 3,125 feet above sea level.
18 KB 3,143
2) A rotary rig will be utilized to drill the well to 14,950 feet and run casing.
This equipment will then be rigged down and the well will be completed with a workover rig.

3) Proposed depth is 14,950 feet measured depth

4) Estimated tops:

	MD	TVD	Thickness	Fluid		
Rustler	700	700		Freshwater		
Salado	1,100	1,100				
Lamar Lime	3,498	3,498				
Base of Lime	3,523	3,523		Oil	BHP	
Delaware Top	3,564	3,564		Oil	1,568	psi
Bell Canyon Sand	3,564	3,564		Oil		
Cherry Canyon Sand	4,621	4,621		Oil		
Kingrea	6,260	6,260		Oil	2,754	psi
Bone Spring	7,329	7,329		Oil		
Bone Spring 1st Sand	8,132	8,132		Oil	3,578	psi
Bone Spring 2nd Sand	8,720	8,720		Oil	3,837	psi
Bone Spring 3rd Sand	9,940	9,940		Oil	4,374	psi
KOP	10,047	10,047		Oil	4,421	psi
Wolfcamp	10,347	10,333		Oil	4,547	psi
Landing Point (Wolfcamp)	11,047	10,691			4,704	psi
					-	psi
Total Depth	17,315	10,691			230	Degrees F
Lateral Length	6,268 MD					

*Note: All mineral resources encountered will be protected by running casing and raising cement across all encountered resources.

See COA

5) Casing program:

Hole Size	Top	Bottom	OD Csg	Weight	Grade	Connection	Burst	Pressure Max	Burst SF
17 1/2"	0	~~1,000~~	13 3/8"	54.5	J-55	STC	2730	468	5.83
12 1/4"	0	7,329	9 5/8"	40	HCL-80	LTC	5750	3811	1.51
8 3/4"	0	17,315	5 1/2"	20	P-110	BTC	12630	10000	1.26

*Burst SF = Burst / Pmax

725

Hole Size	Top	Bottom	OD Csg	Weight	Grade	Connection	Collapse	Mud Weight	Collapse SF
17 1/2"	0	~~1,000~~	13 3/8"	54.5	J-55	STC	1580	9.0	3.38
12 1/4"	0	7,329	9 5/8"	40	HCL-80	LTC	4230	10.0	1.11
8 3/4"	0	17,315	5 1/2"	20	P-110	BTC	12100	11.5	1.17

*Collapse SF = [Collapse/(mw x 0.052 x Depth)]

Hole Size	Top	Bottom	OD Csg	Weight	Grade	Connection	Tension	Tension Load	Tension SF
17 1/2"	0	~~1,000~~	13 3/8"	54.5	J-55	STC	420000	54500	7.71
12 1/4"	0	7,329	9 5/8"	40	HCL-80	LTC	936000	293160	3.19
8 3/4"	0	17,315	5 1/2"	20	P-110	BTC	641000	346300	1.85

*All casing load assumptions are based on Air Wt. Burst design assumes Max Frac Pressure (10K), & Collapse design assumes evacuated & max Mud Weight during interval.

Minimum Design Standards

Collapse	1.1
Burst	1
Tension	1.9

All casing will be new
Casing design subject to revision based on geologic conditions encountered

Cement program:

6) **Surface**		17 1/2" hole				
Pipe OD		13 3/8"				
Setting Depth		~~1,000 ft~~ 725				
Annular Volume		0.6947 cf/ft				
Tail		200				
Shoe Joint		36.5				
Excess		1			100 %	
					383 ft	
Lead	642 sx		1.75 cf/sk	13.5 ppg		9.13 gal/sk
Tail	200 sx		1.33 cf/sk	14.8 ppg		6.32 gal/sk

Lead: "C" + 4% PF20 (gel) + 2% PF1 (CC) + .125 pps PF29 (CelloFlake) + .4 pps PF46 (antifoam)

Tail: "C" + 1% PF1 (CC)

Top of cement: Surface

3 centralizers on bottom 3 jts 1 per jt, then 1 every other jt

Intermediate		12 1/4" hole				
Pipe OD		9 5/8"				
Setting Depth		7,329 ft				
Annular Volume		0.3132 cf/ft		0.323 cf/ft		
DV Tool		5,500 ft				
Excess	1st Stage	0.6			60 %	
	2nd Stage	1.6			160 %	
Stage 1:						
Lead	619 sx		1.48 cf/sk	13 ppg		7.609 gal/sk

Lead: PVL + 1.3% PF44 + 5% PF174 + .5% PF606 + .4% PF13 + .1% PF153 + .4 pps PF45

Top of cement: 5,500 ft DV tool: 5,500 ft

1 per joint bottom 3 joints, then 1 every 3th jt

Stage 2:					
Lead	1308 sx	2.87 cf/sk	11.6 ppg		16.793 gal/sk
Tail	175 sx	1.33 cf/sk	14.8 ppg		6.331 gal/sk

Lead: 35/65 Poz "C" + 5% PF44 + 6% PF20 + .2% PF13 + .125 ps PF29 + .4 pps PF46

Tail: "C" + .2% PF13

Top of cement: SURFACE ft

1 per joint bottom 3 joints, then 1 every 3th jt

Production		8 3/4" hole				
Pipe OD (in OH)		5 1/2"				
Setting Depth		17,315 ft				
Annular Volume		0.2526 cf/ft		0.2526 cf/ft		
Excess		0.35			35 %	
Lead	626 sx		1.47 cf/sk	13 ppg		gal/sk
Tail	1331 sx		1.89 cf/sk	13 ppg		9.632 gal/sk

Lead: PVL +1.3% PF44 + 5% PF174 + .5% PF606 + .3% PF 813 + .1% PF153 +.4pps PF45

Tail: AcidSolid PVL + 5% PF174 + .7% PF606 + .2% PF153 + .5% PF13 + 30% PF151 + .4 pps PF47

Top of cement: 7,029 ft

1 per joint bottom 3 joints, then every 3rd joint to top of cement

*NOTE: A cement bond log will be ran across 9 5/8" Intermediate casing

7) Pressure control equipment:

The blowout preventer equipment will be 5,000 psi rated as shown in the attached BOP diagram and consist of the following:
Annular preventer
Pipe rams
Blind rams
Pipe rams
Drilling spool or blowout preventer with 2 side outlets (choke side shall be a 3" minimum diameter, kill side shall be at least 2" diameter
Choke line shall be 3" minimum diameter
2 choke line valves, 3" minimum diameter
2 chokes with 1 remotely controlled from the rig floor
Kill line, 2" minimum diameter
2 kill line valves and a check valve, 2" minimum diameter.
Upper and lower kelly cock valves with handles readily available
Safety valves and subs to fit all drill string connections in use shall be readily available
Inside BOP or float available
Pressure gauge on choke manifold
All BOPE subjected to pressure shall be flanged, welded, or clamped
Fill-up line above uppermost preventer

See COA

A 13 3/8" SOW x 13 5/8" 5M multi-bowl casing head will be installed and utilized until Total Depth is reached. The 9 5/8" casing will be landed in the head on a casing mandrel, and the stack will not be broken until total depth has been reached. Before drilling out the 9 5/8" casing will be tested to .22 psi/ft of casing setting depth or 1,500 psi whichever is greater, but not exceeding 70% of the burst rating of the pipe.
After drilling approximately 10 feet of new formation an EMW test of 11.0 ppg will be performed.
Pipe rams will be operated and checked each 24 hour period and each time the drill string is out of the hole. These function test will be documented on the daily driller's log.

8) Mud program:

Top	Bottom	Mud Wt.	Vis	PV	YP	Fluid Loss	Type System
0	~~1,000~~ 725	8.3 to 8.5	28 to 30	1 - 6	1 - 6	NC	Fresh Water ND
~~1,000~~	7,329	9.8 to 10	28 to 30	1 - 10	1 - 12	NC	Brine
7,329	9,940	8.8 to 9.3	35 to 40	8 - 10	10 - 12	NC	Cut Brine
9,940	14,950	9.3 to 10.5	45 to 55	8 - 12	6 - 10	10 to 15	Cut Brine

*Enough Barite will be stored on location to weight up mud system to an 11.5 ppg mud weight if needed (2751 sx from 9.3 ppg to 11.5 ppg - 2000 bbl system). Formula: Barite Required (lbs) = [(35.05 x (Wf-Wi))/(35.05-Wf)] x Mud Volume (gals).
*Pason PVT equipment will monitor all pit levels at all times, in the event an influx occurred.

9) Logging, coring, and testing program:

No drill stem test or cores are planned
Neutron/Density, Resistivity, Gamma Ray, Caliper will be run at Pilot Hole Total Depth.
Neutron, Gamma Ray, Caliper will be run from TD to surface

10) Potential hazards:

No H2S is known to exist in the area.
Lost circulation can occur, lost circulation material will be readily available if needed.

11) Anticipated start date ASAP
Duration 35 days

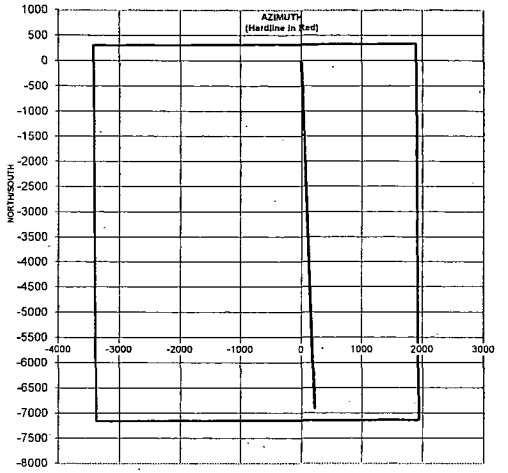
RKI EXPLORATION

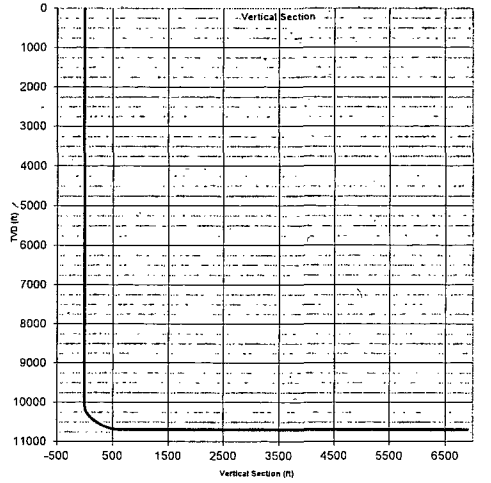
RIG:

WELL:	RDX 28-7H (Eddy, NM)
LOCATION:	330' FNL & 1905' FEL Sec. 28-26S-30E
BHL:	230' FSL & 1715' FEL Sec. 33-26S-30E

Target Direction:	178.13 deg
North/South Hard Line:	
East/West Hard Line:	

STATION NUMBER	SURVEY DEPTH	INC	AZMTH	TVD	N-S	E-W	VERT. SECTION	DLS/100	BR
Tie-In									
	1800.0			1800					
	1900.0			1900					
	2000.0			2000					
	2100.0			2100					
	2200.0			2200					
	2300.0			2300					
	2400.0			2400					
	2500.0			2500					
	2600.0			2600					
	2700.0			2700					
	2800.0			2800					
	2900.0			2900					
	3000.0			3000					
	5000.0			5000					
	7000.0			7000					
	9000.0			9000					
KOP	10047.0		178.13	10047					
	10147.0	10.00	178.13	10146	-9	0.3	8.7	10.0	10.0
	10247.0	20.00	178.13	10243	-35	1.1	34.6	10.0	10.0
	10347.0	30.00	178.13	10333	-77	2.5	76.8	10.0	10.0
	10447.0	40.00	178.13	10415	-134	4.4	134.0	10.0	10.0
	10497.0	45.00	178.13	10452	-168	5.5	167.8	10.0	10.0
	10597.0	45.00	178.13	10523	-238	7.8	238.5		
	10647.0	50.00	178.13	10557	-275	9.0	275.4	10.0	10.0
	10747.0	60.00	178.13	10614	-357	11.7	357.2	10.0	10.0
	10847.0	70.00	178.13	10656	-447	14.6	447.7	10.0	10.0
	10947.0	80.00	178.13	10682	-544	17.8	544.2	10.0	10.0
EOC	11047.0	90.00	178.13	10691	-643	21.0	643.7	10.0	10.0
	11147.0	90.00	178.13	10691	-743	24.3	743.7		
	11247.0	90.00	178.13	10691	-843	27.5	843.7		
	11347.0	90.00	178.13	10691	-943	30.8	943.7		
	11447.0	90.00	178.13	10691	-1043	34.1	1043.7		
	11547.0	90.00	178.13	10691	-1143	37.3	1143.7		
	11647.0	90.00	178.13	10691	-1243	40.6	1243.7		
	11747.0	90.00	178.13	10691	-1343	43.8	1343.7		
	11847.0	90.00	178.13	10691	-1443	47.1	1443.7		
	11947.0	90.00	178.13	10691	-1543	50.4	1543.7		
	12047.0	90.00	178.13	10691	-1643	53.6	1643.7		
	12147.0	90.00	178.13	10691	-1743	56.9	1743.7		
	12247.0	90.00	178.13	10691	-1843	60.2	1843.7		
	12347.0	90.00	178.13	10691	-1943	63.4	1943.7		
	12447.0	90.00	178.13	10691	-2043	66.7	2043.7		
	12547.0	90.00	178.13	10691	-2143	70.0	2143.7		
	12647.0	90.00	178.13	10691	-2242	73.2	2243.7		
	12747.0	90.00	178.13	10691	-2342	76.5	2343.7		
	12847.0	90.00	178.13	10691	-2442	79.7	2443.7		
	12947.0	90.00	178.13	10691	-2542	83.0	2543.7		
	13047.0	90.00	178.13	10691	-2642	86.3	2643.7		
	13147.0	90.00	178.13	10691	-2742	89.5	2743.7		
	13247.0	90.00	178.13	10691	-2842	92.8	2843.7		
	13347.0	90.00	178.13	10691	-2942	96.1	2943.7		
TD	17315.4	90.00	178.13	10691	-6908	225.6	6912.1		





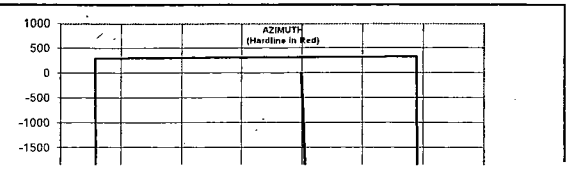
RKI EXPLORATION

RIG:

WELL:	RDX 28-7H (Eddy, NM)
LOCATION:	330' FNL & 1905' FEL Sec. 28-26S-30E
BHL:	230' FSL & 1715' FEL Sec. 33-26S-30E

Target Direction:	178.13 deg
North/South Hard Line:	
East/West Hard Line:	

STATION NUMBER	SURVEY DEPTH	INC	AZMTH	TVD	N-S	E-W	VERT. SECTION	DLS/100	BR



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LOCATION:	330' FNL & 1905' FEL Sec. 28-26S-30E	North/South Hard Line:	
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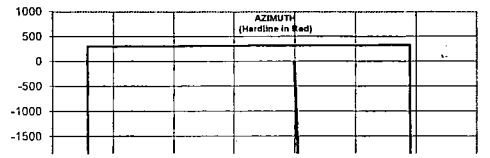
STATION NUMBER	SURVEY DEPTH	INC	AZMTH	TVD	N-S	E-W	VERT. SECTION	DLS/100	BR



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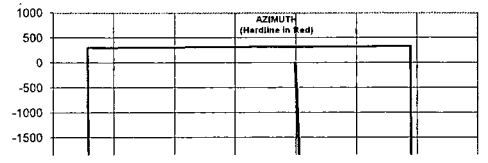
STATION NUMBER	SURVEY DEPTH	INC	AZMTH	TVD	N-S	E-W	VERT. SECTION	DLS/100	BR
PTB									



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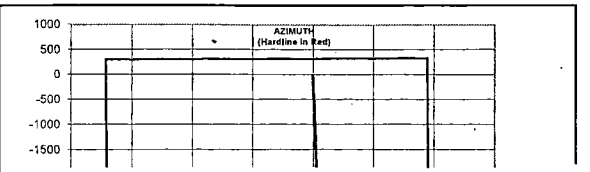

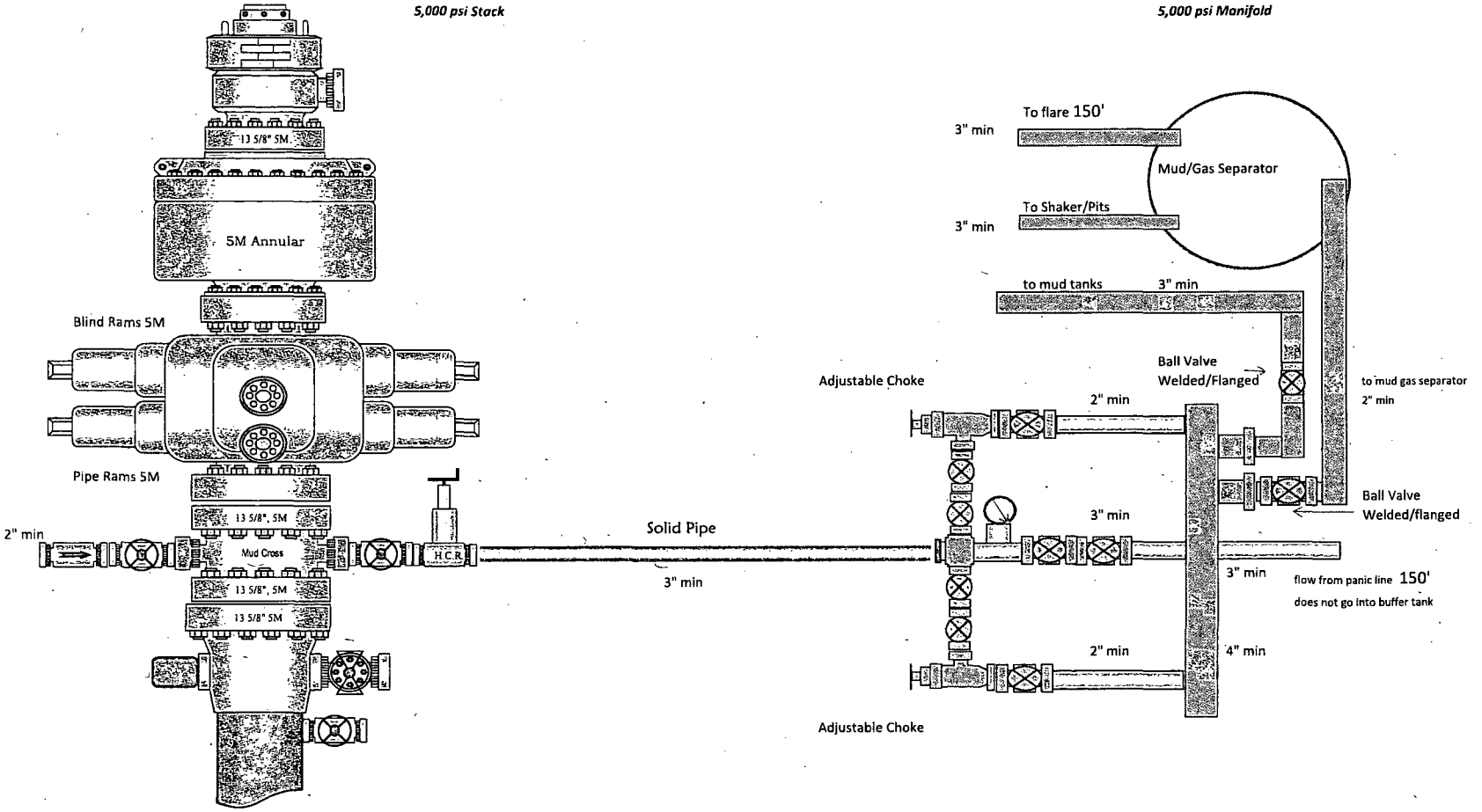
5,000 psi Stack
5,000 psi Manifold
13 5/8" 5M
5M Annular
Blind Rams 5M
Pipe Rams 5M
13 5/8", 5M
Mud Cross
13 5/8", 5M
13 5/8" 5M
H.C.R.
2" min
Solid Pipe
3" min
To flare 150'
3" min
Mud/Gas Separator
To Shaker/Pits
3" min
to mud tanks
3" min
Adjustable Choke
Ball Valve
Welded/Flanged
to mud gas separator
2" min
2" min
3" min
Ball Valve
Welded/flanged
3" min
flow from panic line 150'
does not go into buffer tank
2" min
4" min
Adjustable Choke

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**RKI Exploration & Production, LLC**
LEASE NO.:	**NMNM-0480904A**
WELL NAME & NO.:	**RDX Federal Com 28-7H**
SURFACE HOLE FOOTAGE:	**0330' FNL & 1905' FEL**
BOTTOM HOLE FOOTAGE:	**0230' FSL & 1715' FEL Sec. 33, T. 26 S., R 30 E.**
LOCATION:	**Section 28, T. 26 S., R 30 E., NMPM**
COUNTY:	**Eddy County, New Mexico**

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Water Basin:
After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH.

- ON A THREE STRING DESIGN; IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.

Possibility of water flows in the Salado and Castile.
Possibility of lost circulation in the Delaware.
Abnormal pressure may be encountered when entering in the 3rd Bone Spring Sand.

1. The **13-3/8** inch surface casing shall be set at approximately **725** feet (**in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt**) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Formation below the 13-3/8 inch shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing, which shall be set at approximately **7329** feet, is:

Operator has proposed DV tool at depth of 5500 feet. Operator is to submit sundry if DV tool depth varies by more than 100 feet from approved depth.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve approved top of cement on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

The intermediate casing must be kept filled with fluid to satisfy BLM's collapse rating conditions.

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

   ☒ Cement should tie-back at least 300 feet into previous casing string. Operator shall provide method of verification.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. **Operator has proposed a multi-bowl wellhead assembly that has a weld on head with no o-ring seals. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 5000 (5M) psi.**

   a. **Wellhead manufacturer is supplying the test plug/retrieval tool for the operator's third party tester to use during the BOP/BOPE test. Operator shall use the supplied test plug/retrieval tool.**
   b. **Operator shall install the wear bushing required by the wellhead manufacturer. This wear bushing shall be installed by using the test plug/retrieval tool.**
   c. **Wellhead manufacturer representative shall be on location when the intermediate casing mandrel is landed. Operator shall submit copy of manufacturer's wellsite report with subsequent report.**
   d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
   e. **If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.**

5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

   a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

   b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

   c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

   d. The results of the test shall be reported to the appropriate BLM office.

   e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**

   f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

   g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

Proposed mud weight may not be adequate for drilling through Wolfcamp.

E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

F. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

KGR 08142015