

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 Road, 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

HOBBS OGD

State of New Mexico

Form C-101
Revised November 14, 2012

MAR 05 2013

Energy Minerals and Natural Resources

Oil Conservation Division

☐ AMENDED REPORT

RECEIVED

1220 South St. Francis Dr.

Santa Fe, NM 87505

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address ConocoPhillips Company P. O. Box 51810 Midland, TX 79710		² OGRID Number 217817
		³ API Number 025-34633
⁴ Property Code 39761	⁵ Property Name Arrowhead State 15	⁶ Well No. 1

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
A	15	17S	33E		1087	North	1235	East	Lea

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County

9. Pool Information

Pool Name Maljamar; Grayburg - San Andres	Pool Code 43329
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Additional Well Information

¹¹ Work Type re-entry	¹² Well Type OIL	¹³ Cable/Rotary rotary	¹⁴ Lease Type State	¹⁵ Ground Level Elevation 4147'
¹⁶ Multiple NO	¹⁷ Proposed Depth 13800	¹⁸ Formation Grayburg	¹⁹ Contractor	²⁰ Spud Date 05/31/1999
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

21. Proposed Casing and Cement Program

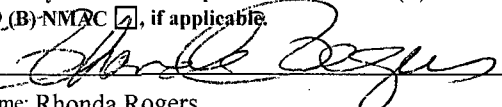
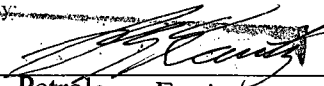
Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
surf	17 1/2"	13 3/8"	48#	404'	400 sx C	0
Production	11"	8 5/8"	32#	4977'	1900 sx C	0

Casing/Cement Program: Additional Comments

I have attached the procedures we are using to re-enter the well and complete in the Grayburg.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Date Unless Drilling Underway
Annular	3000	4	C

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☒ , if applicable. Signature:  Printed name: Rhonda Rogers Title: Staff Regulatory Technician E-mail Address: rogerr@conocophillips.com Date: 02/28/2013 Phone: (432)688-9174		OIL CONSERVATION DIVISION Approved By:  Title: Petroleum Engineer Approved Date: 03/05/13 Expiration Date: 03/05/15 Conditions of Approval Attached	
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MAR 06 2013



API# 30-025-34633
Arrowhead State 15-1: Re-Entry
Maljamar Field
Lea County, New Mexico

The subject workover consists of re-entering the plugged & abandoned Arrowhead State 15-1 and recompleting in the Grayburg. The Grayburg will be selectively perforated over the gross interval 4320-4460 and frac-treated w/ 205,000 gal & 295,000# sand.

The Arrowhead State 15-1 was drilled by Patterson Petroleum to a TD @ 13,826 on July 12, 1999 and was subsequently P&A'd on July 17, 1999 w/o setting production casing. The well was drilled on a farm-out to test the Atoka/Morrow. The farm-out is limited to rights below the San Andres. The well is cased w/ an 8-5/8" intermediate string @ 4977 cemented to surface. The reported top of San Andres is @ 4520. Re-entry would present an opportunity to test the Grayburg in the un-developed NE/NE of section 15. Based on offset Grayburg production, gross reserves may be 100 MBO & 120 MMSCF w/ a first year average daily production rate of 30 BOPD.

Access to the Grayburg would require the drilling out of 3 cement plugs: a 30 ft surface plug and 2-100 ft. cement plugs. The well could be surfaced equipped w/ surplus equipment. The Arrowhead State 15-1 is located approximately 600-700 ft. S of the Phillips State Battery-2.

WELL CATEGORY, BOP CLASS AND EXCEPTIONS

Well Category One:

H2S:	130 ppm (Leamex 5-6 Battery).	
Well Rate:	P&A.	
	<u>H2S</u>	<u>ROE- ft.</u>
	100 ppm	0
	500 ppm	0

BOPE Class One: Hydraulic BOP recommended.

PROCEDURE

1. Prior to move-in of well service unit:

Prep site location (Arrowhead State 15-1 P&A'd 07.1999)
Weld 8-5/8", 32# casing extension to surface. Weld 3000# slip-on tubing head.
Set surplus Phillips State E pumping unit (228)
Install & test anchors.
Install 2-7/8" flowline (approx 650 ft.) from Phillips State E Battery-2
Run power to Arrowhead State 15-1 location for 20 Hp service

Note:

Arrowhead State 15-1: located 893 FN & 575 FW (1062 FNW) of active Phillips State E-20
Arrowhead State 15-1: located approximately 500-800 SSE of Phillips State E Battery-2

2. Spot 12 clean 500 bbl frac tanks. Prior to frac date, load tanks w/ fresh water. Water to be biocide-treated by SLB.

3. MI & RU service unit. NU hydril BOP. RU reverse unit.

PU & RIH w/ 7-7/8" bit, 10: 3-1/2" DC & 2-7/8", J-55 tbg (8-5/8", 32# ID: 7.921", Drift ID: 7.796"), Drill-out following cmt plugs:

top	btm	Ftg	
surface	30	30	07.17.99: 10 sx (30 ft) 8-5/8" cased-hole cmt plug
350	450	100	07.17.99: 30 sx (100 ft) 8-5/8" cased-hole cmt plug
1570	1670	100	07.17.99: 30 sx (100 ft) 8-5/8" cased-hole cmt plug

The following is a summary of the current down hole well configuration:

Arrowhead State 15-1 (30-025-34633)			07.17.99: P&A
1087 FNL & 1235 FEL, 15A-17S-33E			
Elev.: 4175 KB; 4157 GL (KB - GL: 18 ft.)	Depth: ft. (RKB)		
	top	btm	
13-3/8", 48#, H-40	surface	404	06.02.99: Cmt w/ 400 sx. Circ 76 sx to surface.
8-5/8", 32#, J-55	surface	4977	06.12.99: Cmt w/ 1900 sx. Circ 65 sx to surface.
Cement Plugs	surface	30	07.17.99: 10 sx (30 ft) 8-5/8" cased-hole cmt plug
	350	450	07.17.99: 30 sx (100 ft) 8-5/8" cased-hole cmt plug
	1570	1670	07.17.99: 30 sx (100 ft) 8-5/8" cased-hole cmt plug
	4655	4850	07.17.99: 50 sx (195 ft) 8-5/8" cased-hole cmt plug
	6010	6110	07.17.99: 30 sx (100 ft) 7-7/8" OH cmt plug
	8010	8110	07.17.99: 30 sx (100 ft) 7-7/8" OH cmt plug
	9420	9520	07.17.99: 30 sx (100 ft) 7-7/8" OH cmt plug
	12310	12410	07.17.99: 30 sx (100 ft) 7-7/8" OH cmt plug
	13720	13820	07.17.99: 30 sx (100 ft) 7-7/8" OH cmt plug
TD		13826	07.12.99: TD 7-7/8" hole

RIH to cmt plug @ 4655. Circ well clean.

Close pipe-rams. Test 8-5/8", 32#, J-55 csg @ 500#.

Circ well w/ biocide treated fresh water. POOH.

4. RU SLB. Pull Cement Isolation Scanner (CIS) from PBD @ 4655 to surface:

8-5/8" x 11" & 8-5/8" x 13-3/8" annular cement column reported to surface
8-5/8", 32# internal casing condition unknown (csg set: 06.99, P&A: 07.99)

RD SLB.

5. RU SLB.

RIH w/ cased-hole GR/N/collar log (8-5/8", 32#). Pull log from PBD @ 4655 to 3000. POOH.

NU lubricator & test @ 500#.

Perforate following Grayburg intervals @ 60-degree phasing w/ 3-3/8", HSD PowerJet 3406, HMX, 22.8 gm. (EHD: 0.37 in.; Penetration: 37 in.):

Interval	Feet	SPF	Perforations
4320-4340	20	2	40
4360-4380	20	2	40
4400-4420	20	2	40
4440-4460	20	2	40

6. RIH w/ 2-7/8", 6.5#, J-55 tbg string w/ PKR & RBP (8-5/8", 32#). Test tbg below slips @ 5000# while RIH (2-7/8", 6.5#, J-55 Internal Yield Prs: 7260#).

Acidize perforated intervals w/ total of 4000 gal (95 bbl) 15% NE Fe HCl:

Perforated Interval 4440-4460: Acidize w/ 1000 gal (23.8 bbl) 15% NEFE HCl

Set RBP @ 4470 (between lowermost perforation: 6580 and PBD: 4655).

Pull EOT to 4460. Pump 23.8 bbl 15% NEFe HCl followed by 2.0 bbl fresh water.

SD & allow well to equalize.

Set PKR @ 4430 (between perforations: 4420 & 4440)

Flush w/ 35 bbl fresh water (Anticipated treating prs: 2700# @ 3 BPM)

Record ISIP

Perforated Interval 4400-4420: Acidize w/ 1000 gal (23.8 bbl) 15% NEFE HCl

Set RBP @ 4430 (between perforations: 4420 & 4440).

Pull EOT to 4420. Pump 23.8 bbl 15% NEFe HCl followed by 1.7 bbl fresh water.

SD & allow well to equalize.

Set PKR @ 4390 (between perforations: 4380 & 4400)

Flush w/ 35 bbl fresh water (Anticipated treating prs: 2700# @ 3 BPM)

Record ISIP

Perforated Interval 4360-4380: Acidize w/ 1000 gal (23.8 bbl) 15% NEFE HCl

Set RBP @ 4390 (between perforations: 4380 & 4400).

Pull EOT to 4380. Pump 23.8 bbl 15% NEFe HCl followed by 1.5 bbl fresh water.

SD & allow well to equalize.

Set PKR @ 4350 (between perforations: 4340 & 4360)

Flush w/ 35 bbl fresh water (Anticipated treating prs: 2700# @ 3 BPM)

Record ISIP

Perforated Interval 4320-4340: Acidize w/ 1000 gal (23.8 bbl) 15% NEFE HCl

Set RBP @ 4350 (between perforations: 4340 & 4360).

Pull EOT to 4340. Pump 23.8 bbl 15% NEFe HCl followed by 1.3 bbl fresh water.

SD & allow well to equalize.

Set PKR @ 4300 (above perforation: 4320)

Flush w/ 35 bbl fresh water (Anticipated treating prs: 2700# @ 3 BPM)

Record ISIP

POOH w/ 2-7/8", 6.5#, J-55 tbg w/ PKR & RBP.

7. PU & RIH w/ 3-1/2", 9.3#, N-80 tbg w/ PKR (8-5/8", 32#).

Test tbg below slips @ 8000# (3-1/2", 9.3#, N-80 Internal Yield Prs: 10,160#)

Set PKR @ approximately 4100 (uppermost perforation: 4320; refer to CIS log for collars).

Load 3-1/2" x 8-5/8" annulus. Note fill volume. Test annulus @ 500#.

8. RU SLB. Set treating line pop-off to release @ 7500#.
 Set pump trips @ 8000#
 Install spring-operated relief valve on csg-tbg annulus. Pre-set @ 500#.
 Load 3-1/2" x 8-5/8" annulus. Note annulus fill volume. Place 200# on csg.
 Test surface lines @ 8500#.

Frac 4320-4460 down 3-1/2", 9.3#, N-80 tbg w/ 205,000 gal YF120Flex & 250,000# 20/40 Jordan-Unimin sand & 45,000# 20/40 Super LC. Mark flush @ 2#. Flush w/ 2000 gal WF110 (capacity to uppermost perforation: 2060 gal; 49.0 bbl). Anticipated treating rate: 30 BPM @ 5000#.

	Fluid	Proppant	Clean Vol.		Proppant		Slurry Vol		Pump Time @ 30 BPM	
			gal	bbl	ppg	lbs	gal	bbl	min.	cum min.
Pad	YF120Flex		65000	1547.6	0.00	0	65000	1547.6	51.6	51.6
Stage	YF120Flex	20/40 Jordan-Unimin	5000	119.0	0.25	1250	5057	120.4	4.0	55.6
Stage	YF120Flex	20/40 Jordan-Unimin	5000	119.0	0.50	2500	5113	121.7	4.1	59.7
Stage	YF120Flex	20/40 Jordan-Unimin	5000	119.0	0.75	3750	5170	123.1	4.1	63.8
Stage	YF120Flex	20/40 Jordan-Unimin	5000	119.0	1.00	5000	5227	124.4	4.1	67.9
Stage	YF120Flex	20/40 Jordan-Unimin	10000	238.1	1.25	12500	10566	251.6	8.4	76.3
Stage	YF120Flex	20/40 Jordan-Unimin	10000	238.1	1.50	15000	10680	254.3	8.5	84.8
Stage	YF120Flex	20/40 Jordan-Unimin	10000	238.1	1.75	17500	10793	257.0	8.6	93.3
Stage	YF120Flex	20/40 Jordan-Unimin	10000	238.1	2.00	20000	10906	259.7	8.7	102.0
Stage	YF120Flex	20/40 Jordan-Unimin	15000	357.1	2.25	33750	16529	393.5	13.1	115.1
Stage	YF120Flex	20/40 Jordan-Unimin	15000	357.1	2.50	37500	16699	397.6	13.3	128.4
Stage	YF120Flex	20/40 Jordan-Unimin	15000	357.1	2.75	41250	16869	401.6	13.4	141.8
Stage	YF120Flex	20/40 Jordan-Unimin	20000	476.2	3.00	60000	22718	540.9	18.0	159.8
Stage	RCP YF120Flex	20/40 Super LC	15000	357.1	3.00	45000	17039	405.7	13.5	173.3
Flush	WF110		2000	47.6	0.00	0	2000	47.6	1.6	174.9
			207000	4928.6		295000	220364	5246.8	174.9	

Report ISIP, SITP(5 min), SITP(10 min) & SITP(15 min). RD SLB.

SION to allow resin-coated sand to cure.

9. Flow back well until dead. POOH & LD 3-1/2", 9.3#, N-80 frac string & PKR.
10. RIH w/ 2-7/8", 6.5#, J-55 tbg & 7-7/8" bit. If necessary, clean-out to 4600 (lowermost perforation: 4460; PBD: 4655).
11. Downhole equip per PROPOSED design in WellView.

Estimated surface production @100% runtime: 150 BPD.

Estimated post-frac load volume: 5,000 bbl.

Production rate after load recovery: 50 BFPD

	Capacity		Internal Diam. : in.		Internal Yield (Burst): psi	
	bbl / ft	gal /ft	nom.	drift	100%	80%
2-7/8", 6.5#, J-55	0.00579	0.2431	2.441	2.347	7260	5808
8-5/8", 32#, J-55	0.0609	2.5599	7.921	7.796	3930	3144
3-1/2", 9.3#, N-80	0.0087	0.3652	2.992	2.867	10160	8128
2-7/8" x 8-5/8", 32#	0.0529	2.2226				
3-1/2" x 8-5/8", 32#	0.0490	2.0601				

	Arrowhead State 15-1 (30-025-34633)
	1087 FNL & 1235 FEL, 15A-17S-33E
	Elev.: 4175 KB; 4157 GL (KB - GL: 18 ft.)
06.01.99	Spud 17-1/2" hole. Drl to 405. Run 13-3/8", 48#, H-40 @ 404.
06.02.99	Cmt 13-3/8", 48#, H-40 @ 404 w/ 400 sx. Circ 76 sx.
	Drl 11" hole: 405-700
06.03.99	Drl 11" hole: 700-2475.
06.04.99	Drl 11" hole: 2475-3000
06.05.99	Drl 11" hole: 3000-3335
06.06.99	Drl 11" hole: 3355-3580
06.07.99	Drl 11" hole: 3580-3800
06.08.99	Drl 11" hole: 3800-4015
06.09.99	Drl 11" hole: 4015-4205
06.10.99	Drl 11" hole: 4205-4470
06.11.99	Drl 11" hole: 4470-4722

Depth	Inclination
405	1.25
901	0.50
1400	0.50
1886	1.00
2135	0.50
2385	0.75
2633	1.25
2884	1.50
2979	1.25
3229	1.00
3479	0.75
3730	1.50
3887	0.75
4126	1.00
4376	1.00

06.12.99	Drl 11" hole: 4722-4800. Run 8-5/8", 32#, J-55 @ 4977. Cmt w/ 1900 sx. Circ 65 sx to surface.	4626	1.00
06.13.99	Drl 7-7/8" hole: 4800-5167	5118	1.00
06.14.99	Drl 7-7/8" hole: 5167-6011	5600	1.00
06.15.99	Drl 7-7/8" hole: 6011-6675	6085	1.50
06.16.99	Drl 7-7/8" hole: 6675-7325	6320	1.00
06.17.99	Drl 7-7/8" hole: 7325-7700	6806	1.00
06.18.99	Drl 7-7/8" hole: 7700-8275	7276	1.25
06.19.99	Drl 7-7/8" hole: 8275-8860	7681	0.75
06.20.99	Drl 7-7/8" hole: 8860-9425	8180	0.50
06.21.99	Drl 7-7/8" hole: 9425-9800	8679	0.50
06.22.99	Drl 7-7/8" hole: 9800-10390	9179	0.75
06.23.99	Drl 7-7/8" hole: 10390-10856	9679	1.00
06.24.99	Drl 7-7/8" hole: 10856-11110	10150	1.00
06.25.99	Drl 7-7/8" hole: 11110-11450	10630	1.00
06.26.99	Drl 7-7/8" hole: 11450-11700	11116	1.00
06.27.99	Drl 7-7/8" hole: 11700-11895	11615	1.50
06.28.99	Drl 7-7/8" hole: 11895-11981	11738	2.50
06.29.99	Drl 7-7/8" hole: 11981-12085	11865	3.50
06.30.99	Drl 7-7/8" hole: 12085-12124	11970	4.50
07.01.99	Drl 7-7/8" hole: 12124-12223	12056	5.25
07.02.99	Drl 7-7/8" hole: 12223-12255	12129	5.25
07.03.99	Drl 7-7/8" hole: 12255-12336	12190	7.25
07.04.99	Drl 7-7/8" hole: 12236-12455	12222	8.00
07.05.99	Drl 7-7/8" hole: 12455-12735	12284	9.30
07.06.99	Drl 7-7/8" hole: 12735-12894	12300	8.90
07.07.99	Drl 7-7/8" hole: 12894-12991	12315	8.50
07.08.99	Drl 7-7/8" hole: 12991-13114	12347	8.30
07.09.99	Drl 7-7/8" hole: 13114-13297	12380	7.90
07.10.99	Drl 7-7/8" hole: 13297-13472.	12412	7.00
07.11.99	Drl 7-7/8" hole: 13472-13690	12444	7.00
07.12.99	Drl 7-7/8" hole: 13690-13826 TD.	12476	7.00
07.14.99	Logging	12508	7.20
07.17.99	P&A well:	12540	6.60
	30 sx Cl H cmt plug: 13720-13820	12572	5.90
	30 sx Cl H cmt plug: 12310-12410	12604	5.70
	30 sx Cl H cmt plug: 9420-9520	12635	5.50
	30 sx Cl H cmt plug: 8010-8110	12668	5.50
	30 sx Cl C cmt plug: 6010-6110	12699	4.80
	50 sx Cl C cmt plug: 4655-4850	12730	3.80
	30 sx Cl C cmt plug: 1570-1670	12762	2.80
	30 sx Cl C cmt plug: 350-450	12793	2.50
	10 sx Cl C cmt plug: 0-30	12808	2.50
		12824	2.40
		12856	2.10
		12970	1.00
		13065	1.75
		13162	1.75
		13257	1.50

13343	1.25
13447	1.00
13826	1.50