

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010**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.

OCD Hobbs

5. Lease Serial No.
NMNM125795

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

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

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other8. Well Name and No.
HAWK A-5 92. Name of Operator
APACHE CORPORATIONContact: REESA FISHER
E-Mail: Reesa.Fisher@apachecorp.com

HOBBS OCD

9. API Well No.
30-025-40459-00-C13a. Address
303 VETERANS AIRPARK LANE SUITE 3000
MIDLAND, TX 797053b. Phone No. (include area code)
Ph: 432-818-1062

SEP 14 2015

10. Field and Pool, or Exploratory
Multiple--See Attached

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 5 T21S R37E SESE 990FSL 990FEL

RECEIVED

11. County or Parish, and State
LEA COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Subsurface Commingling
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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 recompleat 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 shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Apache is requesting permission to drill out CBP over Abo perforations, acid/fracture stimulate the Abo and return well to production with Abo & BTD DHC, per the attached procedure. We would like to amend our allocations:

Apache requests permission to add Abo to the Blinebry-Tubb-Drinkard, pursuant to DHC-4646:

Pool Names:	Perforations:
Blinebry Oil & Gas 6660	Blinebry 5849??5955?
Tubb Oil & Gas 60240	Tubb 6249??6459?
Drinkard 19190	Drinkard 6741??6892?
Wantz, Abo 62700	Abo 6994'-7392'

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

DHC-4646

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #312928 verified by the BLM Well Information System For APACHE CORPORATION, sent to the Hobbs Committed to AFMSS for processing by LINDA JIMENEZ on 08/20/2015 (15LJ1699SE)	
Name (Printed/Typed) REESA FISHER	Title SR STAFF REGULATORY ANALYST
Signature (Electronic Submission)	Date 08/17/2015
THIS SPACE FOR FEDERAL OR STATE OFFICE USE	
Approved By CHARLES NIMMER	Title PETROLEUM ENGINEER
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 Hobbs	

APPROVED

SEP 10 2015

Charles Nimmer

Date 09/10/2015

BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

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.

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

SEP 15 2015

Additional data for EC transaction #312928 that would not fit on the form

10. Field and Pool, continued

TUBB OIL & GAS

32. Additional remarks, continued

The allocation method will be as follows based on offset production (See attached application data for exception to Rule 303-C).

OIL	GAS	WATER	
Blinebry	3%	2%	21%
Tubb	2%	5%	17%
Drinkard	9%	4%	32%
Abo	86%	89%	30%

Downhole commingling will not reduce the value of these pools. Ownership is the same for each of these pools.

Attached is updated documentation from prior submission and includes oil, gas & water analysis requested previously by Ed Fernandez. Engineering personnel changes delayed the implementation of this project.

Dowhole Commingle Memo



Date: August 7, 2015
From: Bret Shapot
Subject: Application for Downhole Commingle
Hawk A-5 #9 (API: 30-025-40459)
Unit X, Section 5, T21S, R37E
Lea County, New Mexico

Summary

Apache requests permission to downhole commingle the Wantz Abo (62700) with the existing downhole commingle of Blinebry Oil & Gas (6660), Tubb Oil & Gas (60240), and Drinkard (19190). The ownerships (WI, NRI, and ORRI) of these pools are identical in this wellbore. Following a review of the individual oil, gas, and water samples, the fluids from each of these pools are compatible. This is consistent with results from other similar commingles in the area. Combining these fluids will not result in any damage to these pools. Commingling will improve the efficiency of present and future recovery operations. Cross flow will not be a problem due to having a production lift system capable of keeping the well pumped off thereby maximizing production. This commingling will not reduce the value of the total remaining production.

This well is currently producing from the Blinebry-Tubb-Drinkard and we would like to add Abo production. Apache's performance prediction for the Abo used the offset Hawk A #37 well, which is producing from the Abo only, as a type well. To generate predictions for the Hawk A-5 #9, our engineer, Bret Shapot, utilized the production forecast for the Hawk A #37 and adjusted it by the hydrocarbon net pay in each well relative to the Hawk A #37. Hydrocarbon net pay in the Hawk A #37 and Hawk A-5 #9 are 1.17 ft, and 1.46 ft, respectively.

For the Hawk A-5 #9 from the Abo, we are predicting an initial 30 day IP of 59 BOPD, declining hyperbolically with a b-factor of 1.5 and initial decline rate of 40% per month. After 10.9 years the decline rate stabilizes to a 6% exponential decline. The EUR for the Abo is 43.7 MB at an economic limit of 1 BOPD after 29.5 years of production.

Samples were collected from the Blinebry, Tubb, Drinkard, and Abo for use in the downhole commingle worksheet. Table 1 below details the sample location and explains why each sample is relevant to the downhole commingle. The following list of attachments contains supporting documentation.

If you need additional information or have any questions, please contact Bret Shapot at (432) 818-1601.

Table 1

Zone	Well Sampled		
	Oil	Gas	Water
Blinebry ⁽¹⁾	Hawk A-5 #9	Hawk A-5 #9	WBDU #28
Tubb ⁽²⁾	WBDU #28	Hawk A-5 #9	Hawk A-5 #9
Drinkard ⁽³⁾	WBDU #28	Hawk A-5 #9	Hawk A-5 #9
Abo ⁽⁴⁾	Hawk Fed B-1 #69	Hawk Fed B-1 #69	Hawk Fed B-1 #69

Notes:

1. Off-set Blinebry producer. Not enough water for a Hawk A-5 #9 Blinebry sample
2. Off-set Blinebry producer. Not enough oil for a Hawk A-5 #9 Tubb sample
3. Off-set Blinebry producer. Sample was incompatible with lab instrumentation (foaming)
4. Off-set Abo Producer

List of Attachments

- A1. BLM Downhole Commingle Worksheet
- A2. Current Wellbore Diagram
- A3. Proposed Wellbore Diagram
- A4. Hawk A-5 #9 Area Map
- A5. Proposed Workover Procedure
- A6. Hawk A-5 #9 Allocated Reserves Forecast
- A7. Hawk A #37 Monthly Production History
- A8. Hawk A-5 #9 Monthly Production History
- A9. Hawk A-5 #9 Well Tests
- A10. Hawk A-5 #9 Abo Performance Prediction
- A11. Hawk A-5 #9 Blinebry, Tubb, and Drinkard Decline Analysis
- A12. Oil, Gas, and Water Sample Results

A1. BLM Downhole Commingle Worksheet

Operator: Apache Corp (873)
Lease/Well Name/API Number/Location: Hawk Federal A-5 #009 30-025-40459 P-5-T21S-R37E 990' FSL & 990' FEL
Date: 8/7/2015

Data	Bottom Formation	Intermediate 2 Formation	Intermediate 1 Formation	Upper Formation	Estimated Combined Production Data
Pool name	Wantz, Abo	Drinkard	Tubb O&G (Oil)	Blinebry O&G (Oil)	*
Pool Code	62700	19190	60240	6660	*
State Form C-102 with dedicated Acres Provided	Yes	Yes	Yes	Yes	*
Formation Name	Abo	Drinkard	Tubb	Blinebry	*
Top and Bottom of Pay Section (Perforated or open-Hole Interval)	6994'-7392'	6741'-6892'	6249'-6459'	5849'-5955'	5849'-7392'
Method of production	Artificial Lift	Artificial Lift	Artificial Lift	Artificial Lift	Artificial Lift
Bottom Hole Pressure	2150 psia	750 psia	350 psia	400 psia	2150 psia
Reservoir Drive mechanism	Solution Gas Drive	Solution Gas Drive	Solution Gas Drive	Solution Gas Drive	Solution Gas Drive
Oil gravity and/or BTU	Oil: 38.9, 1198	Oil: 38.5, Gas: 1188	Oil: 36.7, Gas: 1267	Oil: 38.7, Gas: 1192	Oil: 38.6, Gas: 1201
Average Sulfur Content (Wt %)	0.284	1.104	0.503	0.592	0.374
Oil sample Analysis provided	Yes	Yes	Yes	Yes	*
Gas Analysis provided	Yes	Yes	Yes	Yes	*
Produce Water Analysis provided	Yes	Yes	Yes	Yes	*
H2S present	Not Detected	Not Detected	Not Detected	Not Detected	Not Predicted
Producing, Shut-In or New Zone	New Zone (Shut-in)	Producing	Producing	Producing	*
Date and Oil/Gas/Water rates of Last Production (new zones or no production history Operator shall attached production estimated and supporting data)	Estimated IP: 59.1 BOPD 232.8 MCFD 12.4 BWPD	Date: 7/15/2015 5.1 BOPD 16.3 MCFD 9.3 BWPD	Date: 7/15/2015 1.1 BOPD 20.6 MCFD 4.7 BWPD	Date: 7/15/2015 1.9 BOPD 8.1 MCFD 6.0 BWPD	Estimated IP: 67.1 BOPD 255 MCFD 40.3 BWPD
Average decline % (provide back up data)	b = 1.5 di = 40%	37.0%	36.2%	32.7%	b = 1.36 di = 26.8%
Fixed Allocation Percentage	86% / 89% / 31%	9% / 4% / 32%	2% / 5% / 17%	3% / 2% / 21%	*

O G W O G W O G W

Remarks: **PAGE 1 of 2**

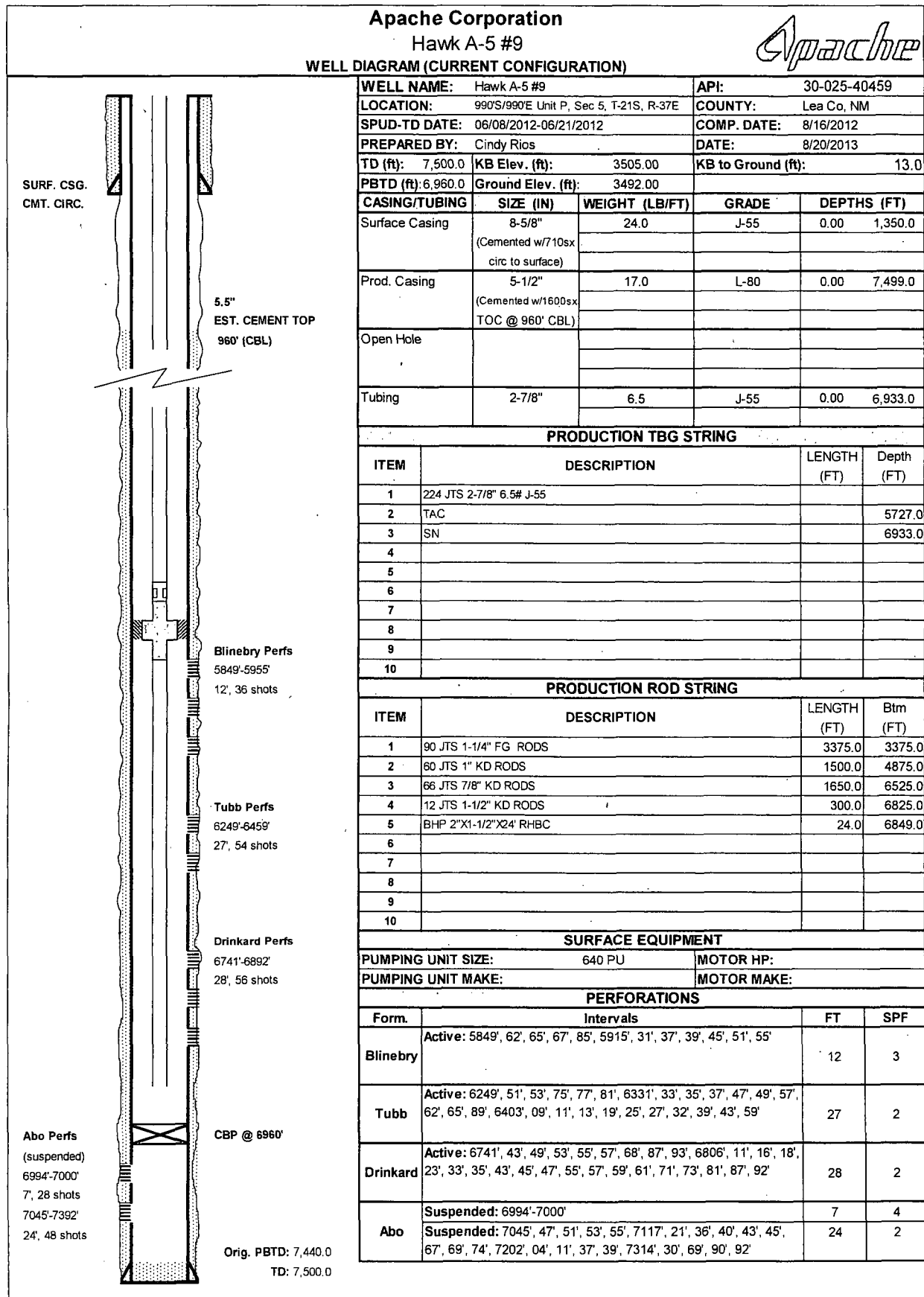
Operator Signature: _____

Date: _____

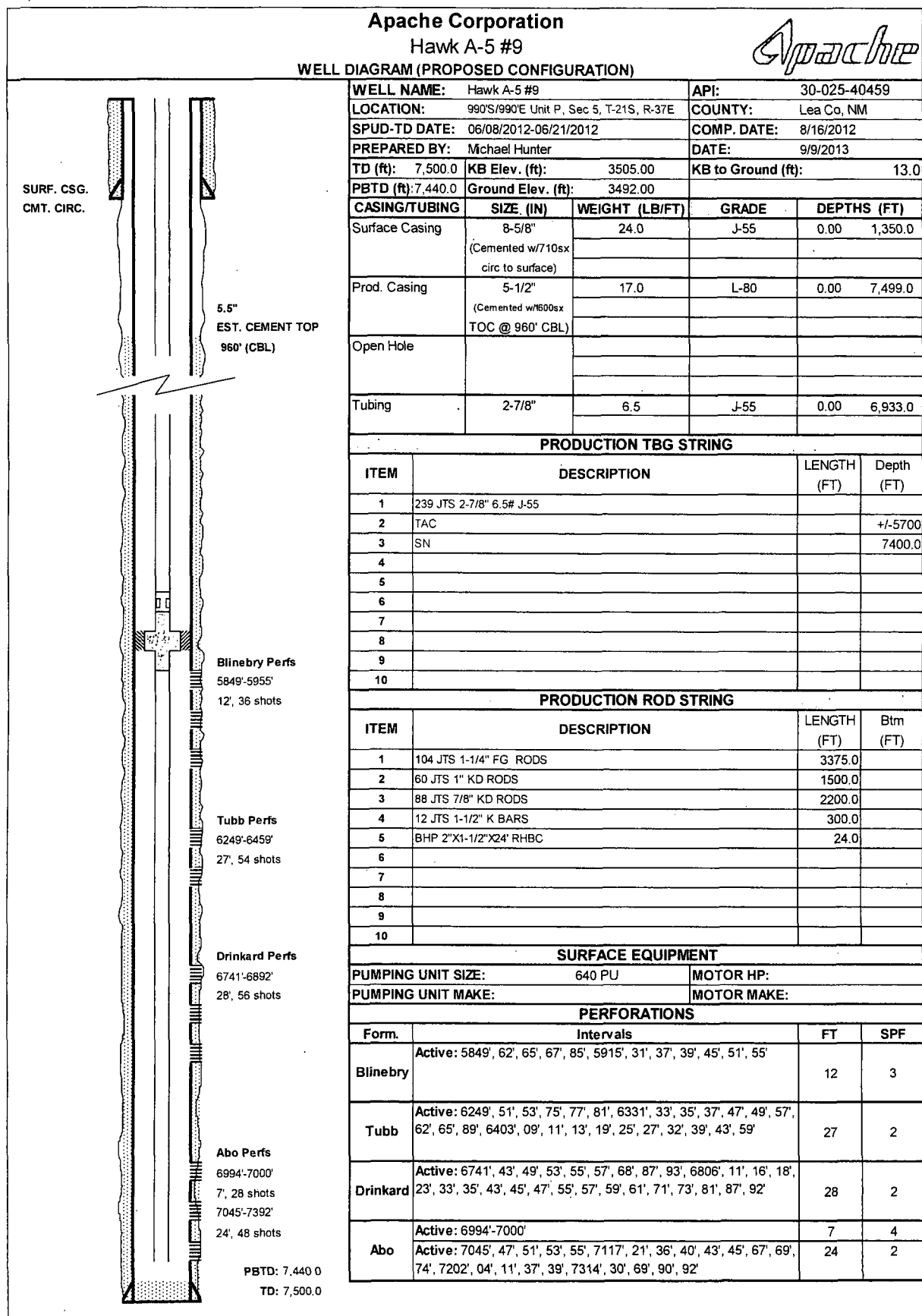
Attached Supporting documents

State Form C-102 with dedicated Acres Provided
Oil sample Analysis provided (Must be current)
Gas Analysis provided (Must be current)
Produce Water Analysis provided (Must be current)
Any additional supporting data (i.e. offset well production and decline curves etc.)
*Utilize weighted average.

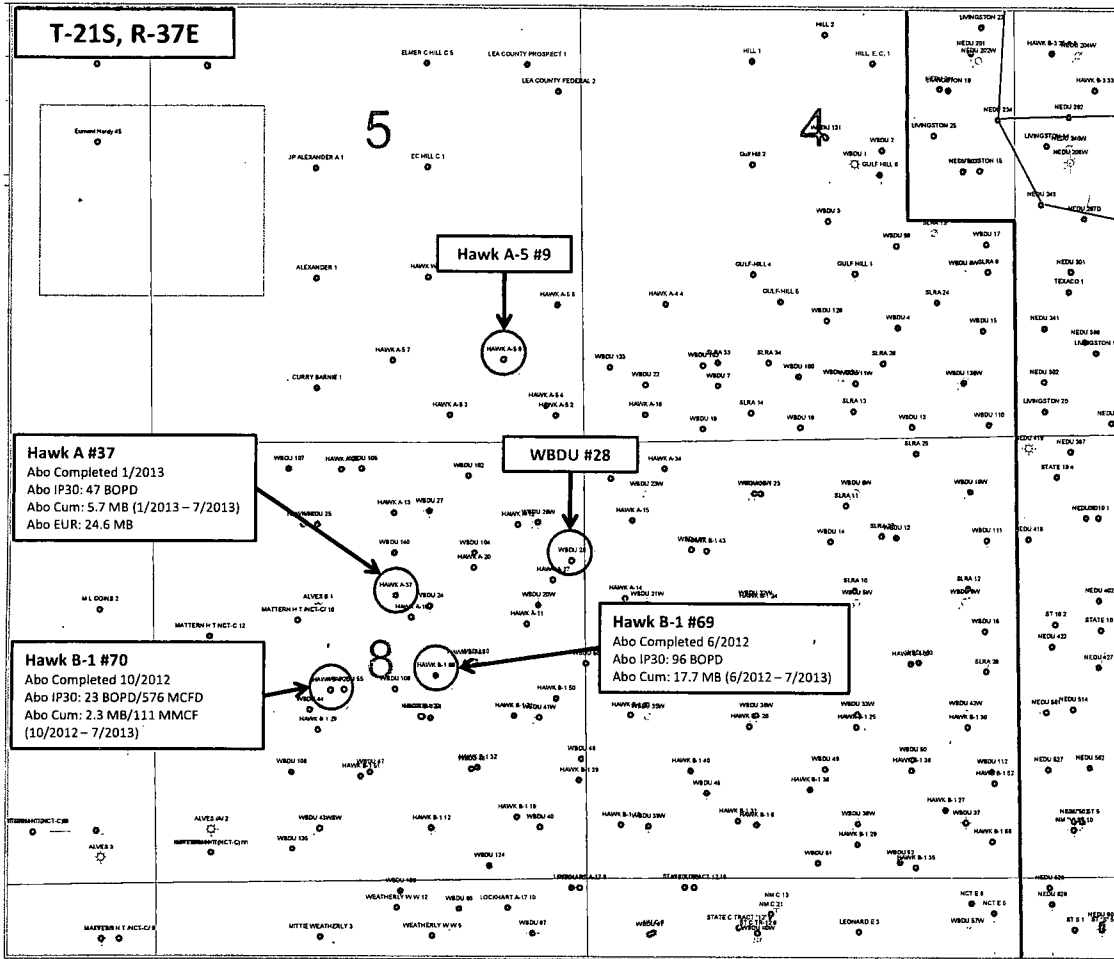
A2. Current Wellbore Diagram



A3. Proposed Wellbore Diagram



A4. Hawk A-5 #9 Area Map



A5. Proposed Workover Procedure

Drill out CBP over Abo Perforations, Acid/Fracture Stimulate the Abo,
Return well to Production with Abo & BTD DHC

September 9, 2013

API: 30-025-40459

990' FSL & 990' FEL, Unit P

Section 5, Township 21S, Range 37E

Lea County, New Mexico

TD: 7500'

PBTD: 7440'

Bridge Plug: 6960'

GL elev: 3492'

KB elev: 3505'

Production Casing: 5-1/2", 17 lb/ft L-80 set @ 7499' w/ 1600 sx cmt (TOC @ 960')

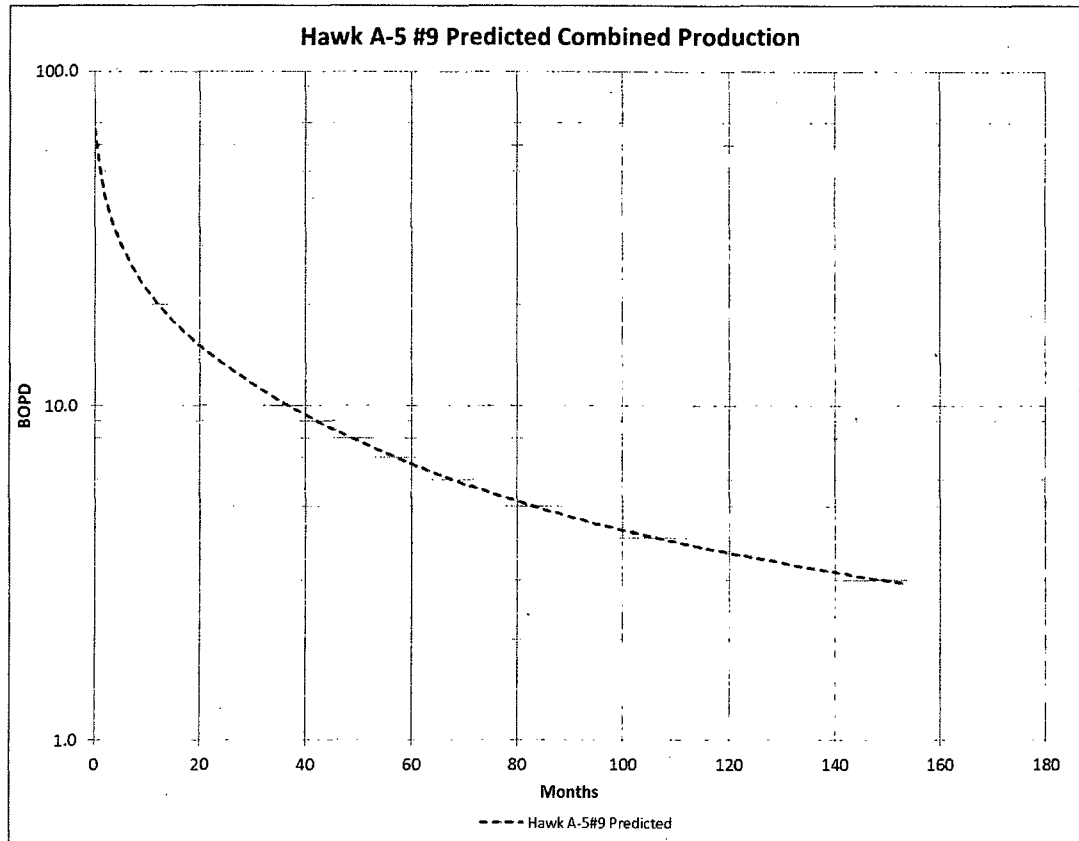
Procedure:

1. MIRU. POOH w/ rods and pump. Install BOP. POOH w/ 2-7/8" tubing
2. RIH w/ 4-3/4" bit on 2-7/8" tubing, drill out CBP @ 6960'. Cont. RIH to PBTD @ +/- 7444'. Circulate well clean
3. RIH w/ casing scraper on 2-7/8" tubing to +/-7420'. POOH
4. RIH w/RBP and treating packer on 3-1/2" N-80 work string. Set RBP @ +/-7420', set packer @ +/- 7225'
5. NU frac equipment
6. Acid frac the Lower Abo with 1,100 gal 15% HCl/7,500 gal x-linked brine/ 6,000 gal retarded 15% HCl/1,500 gal 15% HCl in one stage @ 30+ BPM (max pressure 7,000 psi) as per frac recommendation. Shut-down to obtain fracture closure. After fracture closure, perform 1,500 gal diverted 15% HCl acid stage at matrix rates (max pressure 1,500 psi) to ensure connectivity of hydraulic fracture to the wellbore
7. Re-set RBP @ +/-7225', set packer @ +/- 6950'
8. Acid frac the Middle/Upper Abo with 30,000 gal x-linked brine and 450 lb rock salt/24,300 gal retarded 15% HCl/5,700 gal 15% HCl in four equal stages @ 30+ BPM (max pressure 7,000 psi) as per frac recommendation. Shut-down to obtain fracture closure. After fracture closure, perform 4,200 gal diverted 15% HCl acid stage at matrix rates (max pressure 1,500 psi) to ensure connectivity of hydraulic fracture to the wellbore
9. ND frac equipment. Shut well in overnight to allow acid to spend
10. Open well up and flow back fracture
11. Release packer and retrieve RBP, POOH w/ 3-1/2" tubing
12. RIH w/ 2-7/8" production tubing, set SN @ +/- 7400'. RIH w/ 1-1/2" pump and rods
13. Return well to production. Place well in test

A6. Hawk A-5 #9 Allocated Reserves Forecast

Hawk A-5 #9 Allocated Forecast Reserves						
Zone	Oil		Gas		Water	
	BBL	%	MCF	%	BBL	%
Blinebry	1,730	3.4%	3,872	2.0%	6,331	21.0%
Tubb	961	1.9%	9,829	5.1%	4,978	16.5%
Drinkard	4,619	9.1%	7,714	4.0%	9,599	31.8%
Abo	43,702	85.7%	172,185	88.9%	9,309	30.8%
Total	51,011	100.0%	193,600	100.0%	30,217	100.0%

Hawk A-5 #9 Combined		
qi	67.1	BOPD
qf	1.0	BOPD
b	1.2651	
di	24.7%	/Mo.
GOR	3.8	M/B
WOR	0.6	B/B



A7. Hawk A #37 Monthly Production History

Hawk A #37 Cumulative Production		
Abo		
Oil	Gas	Water
(BBL)	(MCF)	(BBL)
12,775	50,354	2,721

Hawk A #37 Monthly Production					
Month	Abo				
	Oil	Gas	GOR	Water	WOR
	(BBL)	(MCF)	(MCF/BBL)	(BBL)	(BBL/BBL)
Jan-13	1,437	1,912	1.3	761	0.53
Feb-13	1,118	2,980	2.7	359	0.32
Mar-13	862	2,337	2.7	161	0.19
Apr-13	675	2,024	3.0	98	0.15
May-13	621	1,891	3.0	101	0.16
Jun-13	526	1,731	3.3	93	0.18
Jul-13	514	1,668	3.2	84.208	0.16
Aug-13	456	1,642	3.6	60.8	0.13
Sep-13	426	1,520	3.6	60.8	0.14
Oct-13	456	1,611	3.5	60.8	0.13
Nov-13	395	1,459	3.7	30.4	0.08
Dec-13	426	1,490	3.5	60.8	0.14
Jan-14	365	1,459	4.0	30.4	0.08
Feb-14	365	1,398	3.8	30.4	0.08
Mar-14	334	1,642	4.9	30.4	0.09
Apr-14	274	1,520	5.6	60.8	0.22
May-14	365	1,733	4.8	60.8	0.17
Jun-14	274	1,702	6.2	60.8	0.22
Jul-14	274	1,642	6.0	30.4	0.11
Aug-14	274	1,702	6.2	30.4	0.11
Sep-14	274	1,672	6.1	30.4	0.11
Oct-14	274	1,611	5.9	30.4	0.11
Nov-14	274	1,581	5.8	30.4	0.11
Dec-14	243	1,550	6.4	30.4	0.13
Jan-15	213	1,520	7.1	30.4	0.14
Feb-15	243	1,550	6.4	30.4	0.13
Mar-15	213	1,520	7.1	30.4	0.14
Apr-15	0	1,003	N/A	0	N/A
May-15	395	1,794	4.5	212.8	0.54
Jun-15	213	1,490	7.0	30.4	0.14

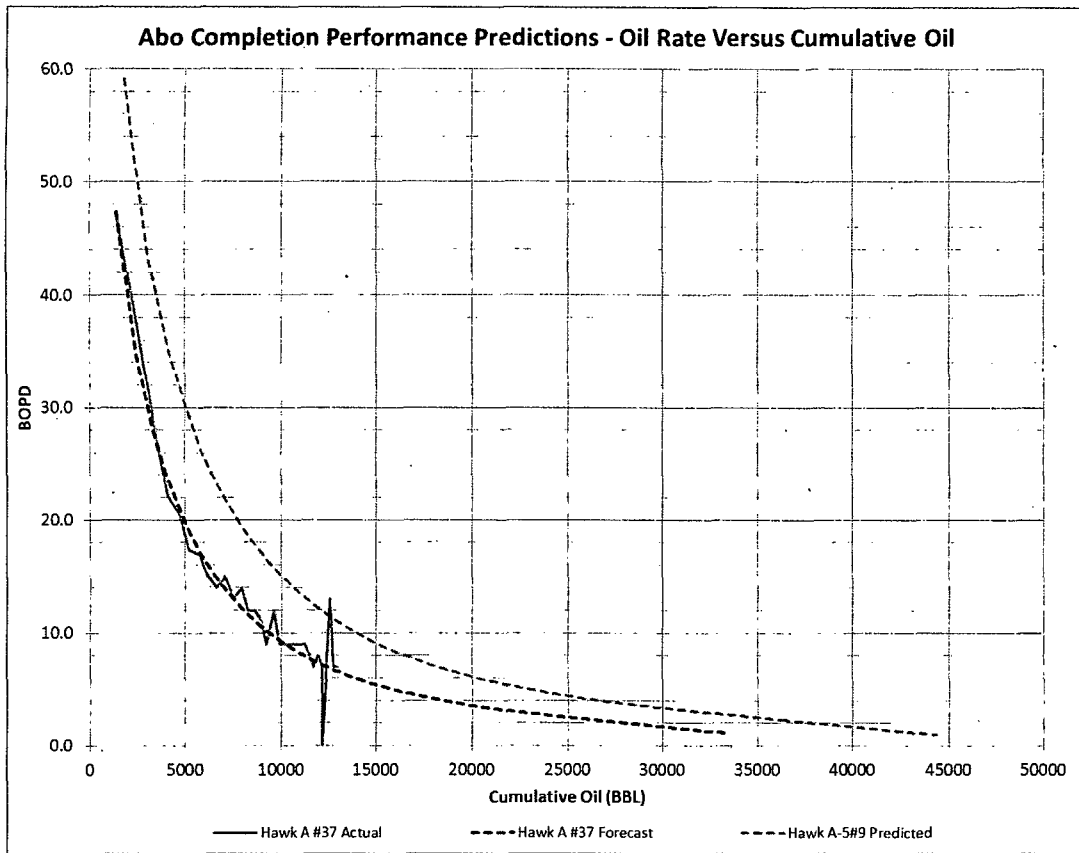
A8. Hawk A-5 #9 Monthly Production History

Hawk A-5 #9 Allocated Cumulative Production			
Formation	Oil (BBL)	Gas (MCF)	Water (BBL)
Blinberry	3,314	7,418	12,130
Tubb	1,854	18,970	9,606
Drinkard	8,938	14,926	18,574

Month	Blinberry			Tubb			Drinkard			Total		
	BOPD	MCFD	BWPD	BOPD	MCFD	BWPD	BOPD	MCFD	BWPD	BOPD	MCFD	BWPD
10/1/2012	10	9	39	6	24	31	28	19	60	44	52	130
11/1/2012	11	16	50	6	40	40	31	31	76	48	87	166
12/1/2012	3	6	7	2	14	6	9	11	11	14	31	24
1/1/2013	4	7	6	2	17	5	10	13	9	16	37	20
2/1/2013	5	11	16	3	27	13	13	21	25	21	59	54
3/1/2013	5	11	15	3	27	12	13	21	23	21	59	50
4/1/2013	4	11	15	2	28	12	11	22	23	17	61	50
5/1/2013	4	9	11	2	24	8	11	19	16	17	52	35
6/1/2013	3	9	10	2	23	8	8	18	16	13	50	34
7/1/2013	4	9	14	2	24	11	10	19	21	16	52	46
8/1/2013	4	11	10	2	27	8	12	22	16	18	60	34
9/1/2013	3	9	5	1	24	4	7	19	8	11	52	17
10/1/2013	3	10	17	2	25	14	8	19	26	13	54	57
11/1/2013	2	9	7	1	24	5	6	19	10	9	52	22
12/1/2013	3	10	13	2	26	10	8	20	20	13	56	43
1/1/2014	3	10	14	1	26	11	7	21	21	11	57	46
2/1/2014	3	10	12	2	27	9	8	21	18	13	58	39
3/1/2014	3	9	8	2	24	7	9	19	13	14	52	28
4/1/2014	3	10	4	2	27	3	8	21	6	13	58	13
5/1/2014	3	11	3	2	28	2	8	22	4	13	61	9
6/1/2014	2	8	1	1	19	1	5	15	2	8	42	4
7/1/2014	2	7	4	1	19	3	5	15	6	8	41	13
8/1/2014	2	8	4	1	19	4	6	15	7	9	42	15
9/1/2014	3	2	15	2	6	12	7	5	23	12	13	50
10/1/2014	2	3	12	1	7	10	6	6	19	9	16	41
11/1/2014	2	3	10	1	8	8	7	6	15	10	17	33
12/1/2014	2	3	11	1	6	8	6	5	16	9	14	35
1/1/2015	2	2	9	1	5	7	5	4	13	8	11	29
2/1/2015	2	2	12	1	5	9	4	4	18	7	11	39
3/1/2015	2	2	14	1	6	11	5	5	22	8	13	47
4/1/2015	2	2	14	1	6	11	5	5	22	8	13	47
5/1/2015	2	3	14	1	7	11	5	5	21	8	15	46
6/1/2015	1	2	3	1	5	2	3	4	5	5	11	10

A9. Hawk A-5 #9 Well Tests

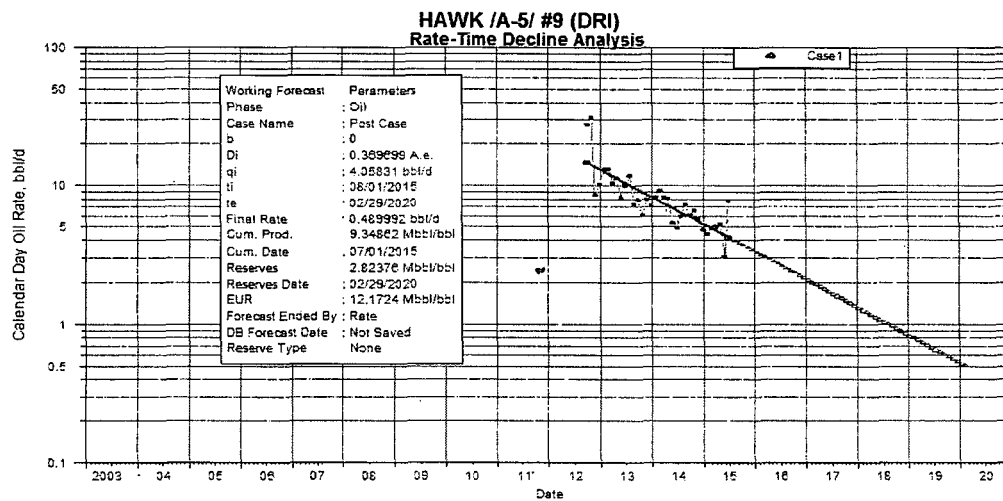
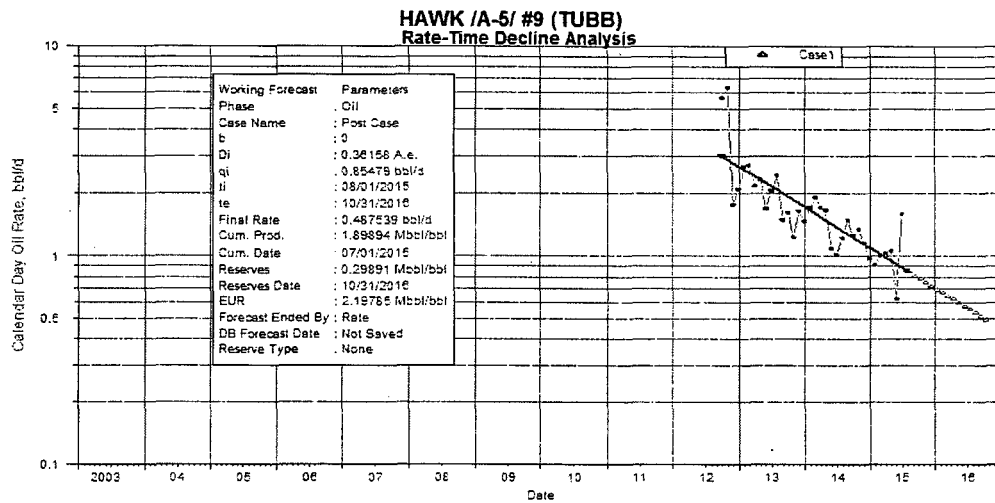
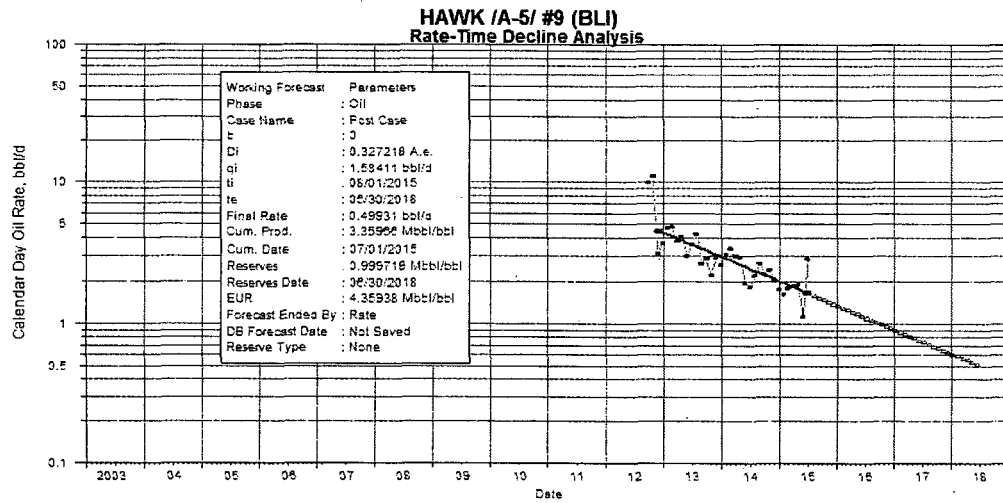
Test Date	Combined Test			Allocated Blinebry			Allocated Tubb			Allocated Drinkard		
	(BBL)	(MCF)	(BBL)	(BBL)	(MCF)	(BBL)	(BBL)	(MCF)	(BBL)	(BBL)	(MCF)	(BBL)
11/24/2012	40	82	85	9.5	14.7	25.5	5.3	37.6	20.2	25.3	29.7	39.3
11/25/2012	40	82	91	9.5	14.7	27.3	5.3	37.6	21.6	25.3	29.7	42.1
11/26/2012	44	82	89	10.4	14.7	26.7	5.8	37.6	21.1	27.8	29.7	41.2
11/27/2012	35	80	80	8.3	14.4	24.0	4.6	36.6	19.0	22.1	29.0	37.0
12/5/2012	6	29	7	1.4	5.2	2.1	0.8	13.3	1.7	3.8	10.5	3.2
1/25/2013	22	79	40	5.2	14.2	12.0	2.9	36.2	9.5	13.9	28.6	18.5
2/1/2013	22	71	54	5.2	12.7	16.2	2.9	32.5	12.8	13.9	25.7	25.0
3/19/2013	12	76	40	2.8	13.6	12.0	1.6	34.8	9.5	7.6	27.5	18.5
4/29/2013	18	60	36	4.3	10.8	10.8	2.4	27.5	8.5	11.4	21.7	16.7
5/1/2013	18	60	36	4.3	10.8	10.8	2.4	27.5	8.5	11.4	21.7	16.7
5/15/2013	10	56	19	2.4	10.1	5.7	1.3	25.7	4.5	6.3	20.3	8.8
6/21/2013	10	51	34	2.4	9.2	10.2	1.3	23.4	8.1	6.3	18.5	15.7
7/17/2013	16	65	23	3.8	11.7	6.9	2.1	29.8	5.5	10.1	23.6	10.6
8/29/2013	13	61	17	3.1	10.9	5.1	1.7	27.9	4.0	8.2	22.1	7.9
9/3/2013	11	76	40	2.6	13.6	12.0	1.4	34.8	9.5	7.0	27.5	18.5
10/10/2013	10	67	16	2.4	12.0	4.8	1.3	30.7	3.8	6.3	24.3	7.4
11/19/2013	10	71	35	2.4	12.7	10.5	1.3	32.5	8.3	6.3	25.7	16.2
12/19/2013	10	72	39	2.4	12.9	11.7	1.3	33.0	9.3	6.3	26.1	18.0
3/9/2014	11	50	19	2.6	9.0	5.7	1.4	22.9	4.5	7.0	18.1	8.8
4/3/2014	11	48	4	2.6	8.6	1.2	1.4	22.0	0.9	7.0	17.4	1.9
4/5/2014	13	54	9	3.1	9.7	2.7	1.7	24.7	2.1	8.2	19.6	4.2
5/22/2014	10	54	1	2.4	9.7	0.3	1.3	24.7	0.2	6.3	19.6	0.5
6/21/2014	3	45	6	0.7	8.1	1.8	0.4	20.6	1.4	1.9	16.3	2.8
7/12/2014	7	47	10	1.7	8.4	3.0	0.9	21.5	2.4	4.4	17.0	4.6
7/13/2014	9	51	11	2.1	9.2	3.3	1.2	23.4	2.6	5.7	18.5	5.1
8/20/2014	7	48	10	1.7	8.6	3.0	0.9	22.0	2.4	4.4	17.4	4.6
9/3/2014	12	8	51	2.8	1.4	15.3	1.6	3.7	12.1	7.6	2.9	23.6
9/19/2014	9	17	45	2.1	3.1	13.5	1.2	7.8	10.7	5.7	6.2	20.8
10/5/2014	8	15	46	1.9	2.7	13.8	1.1	6.9	10.9	5.1	5.4	21.3
10/19/2014	9	18	41	2.1	3.2	12.3	1.2	8.2	9.7	5.7	6.5	19.0
11/5/2014	9	18	36	2.1	3.2	10.8	1.2	8.2	8.5	5.7	6.5	16.7
12/11/2014	8	16	39	1.9	2.9	11.7	1.1	7.3	9.3	5.1	5.8	18.0
5/31/2015	8	44	1	1.9	7.9	0.3	1.1	20.2	0.2	5.1	15.9	0.5
6/27/2015	47	78	85	11.1	14.0	25.5	6.2	35.7	20.2	29.7	28.3	39.3
6/28/2015	27	55	73	6.4	9.9	21.9	3.5	25.2	17.3	17.1	19.9	33.8
6/29/2015	17	47	52	4.0	8.4	15.6	2.2	21.5	12.3	10.7	17.0	24.1
6/30/2015	16	47	54	3.8	8.4	16.2	2.1	21.5	12.8	10.1	17.0	25.0
7/12/2015	8	45	20	1.9	8.1	6.0	1.1	20.6	4.7	5.1	16.3	9.3



Petrophysics Summary					
Well	D (in)	Phi (%)	Phi _h (%)	Sw	SoPhi _h (%)
Hawk A #37	26	7.7%	2.0	42.2%	1.17
Hawk A-5 #9	28.5	8.9%	2.5	42.6%	1.46

Hawk A-37 Production Forecast			Hawk A-5 #9 Production Prediction		
qi	47.3	BOPD	qi	59.1	BOPD
q1	2.6	BOPD	q1	3.2	BOPD
b	1.5		b	1.5	
di	40.0%	/Mo.	di	40.0%	/Mo.
t1	131	Mo	t1	131	Mo
Q1	24.5	MB	Q1	30.7	MB
q2	2.6	BOPD	q2	3.2	BOPD
qf	1	BOPD	qf	1	BOPD
di	6%	/Yr	di	6%	
tf	309	Mo	tf	354	Mo
Qf	33.7	MB	Qf	43.7	Qf

A11. Hawk A-5 #9 Blinebry, Tubb, and Drinkard Decline Analysis





LABORATORY SERVICES
Natural Gas Analysis

www.permianls.com

575.397.3713 2609 W Marland Hobbs NM 88240

For: Apache Corporation
Attention: Brad Beckham
P. O. Box 1849
Eunice, New Mexico 88231

Sample: Identification: Hawk B1 #69
Company: Apache Corporation
Lease:
Plant:

Sample Data: Date Sampled 8/6/2015
Analysis Date 8/7/2015
Pressure-PSIA
Sample Temp F
Atmos Temp F

Sampled by: Brad Beckham
Analysis by: Vicki McDaniel

H2S =

Component Analysis

		Mol Percent	GPM
Hydrogen Sulfide	H2S		
Nitrogen	N2	3.268	
Carbon Dioxide	CO2	0.101	
Methane	C1	80.457	
Ethane	C2	8.548	2.280
Propane	C3	4.385	1.205
I-Butane	IC4	0.449	0.147
N-Butane	NC4	1.407	0.442
I-Pentane	IC5	0.307	0.112
N-Pentane	NC5	0.405	0.146
Hexanes Plus	C6+	<u>0.673</u>	<u>0.291</u>
		100.000	4.624

REAL BTU/CU.FT.

At 14.65 DRY	1198.0
At 14.65 WET	1177.1
At 14.696 DRY	1201.7
At 14.696 WET	1181.2
At 14.73 DRY	1204.5
At 14.73 Wet	1183.7

Specific Gravity

Calculated 0.7109

Molecular Weight 20.5907

Z Factor (DRY) 0.9967

Z Factor (WET) 0.9963



LABORATORY SERVICES
Natural Gas Analysis

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ASTM DISTILLATION

Apache Corporation
Attention: Randy Hunter
P. O. Box 1849
Eunice, New Mexico 88231

Sampled By: Mike Oney/Baker
Sample Date: 7/24/15

Sample ID: Hawk Fed. B1 #69

<u>Percent Distilled</u>	<u>Temperature</u>		
IBP	116		
5	179		
10	225		
20	309	%Recovered =	93.0
30	385	% Residue =	3.0
40	467	% Loss =	4.0
50	555		
60	595		
70	620		
80	675		
90	718		
EP	720		

<u>Total Sulfur</u>	<u>API Gravity</u>	<u>Specific Gravity</u>	<u>RVP</u>
0.284 wt. %	38.9	0.8303	

Distillation	ASTM D 86	Sulfur	ASTM D 4294
Gravity	ASTM D 287	Vapor Pres	ASTM D 323



Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 8/6/2015

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER: APACHE CORPORATION
DISTRICT: NEW MEXICO
AREA/LEASE: HAWK B1
SAMPLE POINT NAME: HAWK FEDERAL B1 #69
SITE TYPE: WELL SITES
SAMPLE POINT DESCRIPTION: WELL HEAD

ACCOUNT REP: MIKE ONEY
SAMPLE ID: 201501027970
SAMPLE DATE: 7/27/2015
ANALYSIS DATE: 8/4/2015
ANALYST: SAMUEL NEWMAN

APACHE CORPORATION, HAWK B1, HAWK FEDERAL B1 #69

FIELD DATA		ANALYSIS OF SAMPLE					
		ANIONS:		mg/L		meq/L	
Initial Temperature (°F):	250	Chloride (Cl ⁻):	107364.4	3028.6	Sodium (Na ⁺):	47085.3	2049.0
Final Temperature (°F):	80	Sulfate (SO ₄ ²⁻):	1088.3	22.7	Potassium (K ⁺):	933.2	23.9
Initial Pressure (psi):	100	Borate (H ₃ BO ₃):	147.7	2.4	Magnesium (Mg ²⁺):	3188.8	262.5
Final Pressure (psi):	15	Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):	10522.7	525.1
		Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):	264.0	6.0
pH:		Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):	0.0	0.0
pH at time of sampling:	6.5	Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):	12.0	0.4
		Phosphate (PO ₄ ³⁻):	ND		Manganese (Mn ²⁺):	0.0	0.0
		Silica (SiO ₂):	ND		Lead (Pb ²⁺):	ND	
					Zinc (Zn ²⁺):	0.0	0.0
ALKALINITY BY TITRATION:		mg/L		meq/L			
Bicarbonate (HCO ₃ ⁻):	305.0	5.0					
Carbonate (CO ₃ ²⁻):	ND						
Hydroxide (OH ⁻):	ND						
		ORGANIC ACIDS:		mg/L		meq/L	
aqueous CO ₂ (ppm):	50.0	Formic Acid:	ND		Aluminum (Al ³⁺):	ND	
aqueous H ₂ S (ppm):	102.0	Acetic Acid:	ND		Chromium (Cr ³⁺):	ND	
aqueous O ₂ (ppb):	ND	Propionic Acid:	ND		Cobalt (Co ²⁺):	ND	
		Butyric Acid:	ND		Copper (Cu ²⁺):	ND	
Calculated TDS (mg/L):	170911	Valeric Acid:	ND		Molybdenum (Mo ²⁺):	ND	
Density/Specific Gravity (g/cm ³):	1.1100				Nickel (Ni ²⁺):	ND	
Measured Specific Gravity	1.1235				Tin (Sn ²⁺):	ND	
Conductivity (mmhos):	ND				Titanium (Ti ²⁺):	ND	
Resistivity:	ND				Vanadium (V ²⁺):	ND	
MCF/D:	No Data				Zirconium (Zr ²⁺):	ND	
BOPD:	No Data				Total Hardness:	39746	N/A
BWPD:	No Data	Anion/Cation Ratio:	1.07		ND = Not Determined		

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FURTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Conditions		Barite (BaSO ₄)		Calcite (CaCO ₃)		Gypsum (CaSO ₄ ·2H ₂ O)		Anhydrite (CaSO ₄)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi		0.000	1.19	62.300	-0.03	0.000	-0.18	0.000
99°F	24 psi		0.000	1.16	61.138	-0.02	0.000	-0.09	0.000
118°F	34 psi		0.000	1.16	60.309	-0.01	0.000	0.00	3.925
137°F	43 psi		0.000	1.16	59.629	0.00	0.000	0.10	106.555
156°F	53 psi		0.000	1.17	59.113	0.00	3.805	0.20	193.137
174°F	62 psi		0.000	1.19	58.803	0.01	14.666	0.30	264.967
193°F	72 psi		0.000	1.21	58.733	0.02	25.111	0.41	323.445
212°F	81 psi		0.000	1.24	58.992	0.02	34.134	0.52	370.197
231°F	91 psi		0.000	1.28	59.526	0.03	40.439	0.62	406.975
250°F	100 psi		0.000	1.33	60.296	0.03	42.503	0.73	435.509

Conditions		Colestite (SrSO ₄)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate (FeCO ₃)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.12	39.539	-0.98	0.000	3.01	6.588	-0.13	0.000
99°F	24 psi	0.13	42.201	-1.00	0.000	2.85	6.584	-0.10	0.000
118°F	34 psi	0.14	44.351	-1.01	0.000	2.74	6.581	-0.06	0.000
137°F	43 psi	0.15	46.676	-1.02	0.000	2.66	6.578	-0.02	0.000
156°F	53 psi	0.16	49.604	-1.03	0.000	2.60	6.576	0.00	0.075
174°F	62 psi	0.17	53.348	-1.03	0.000	2.56	6.574	0.03	0.410
193°F	72 psi	0.19	57.940	-1.04	0.000	2.53	6.572	0.04	0.634
212°F	81 psi	0.21	63.271	-1.05	0.000	2.52	6.572	0.05	0.830
231°F	91 psi	0.24	69.128	-1.05	0.000	2.53	6.572	0.06	0.957
250°F	100 psi	0.26	75.230	-1.05	0.000	2.54	6.573	0.07	1.001

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

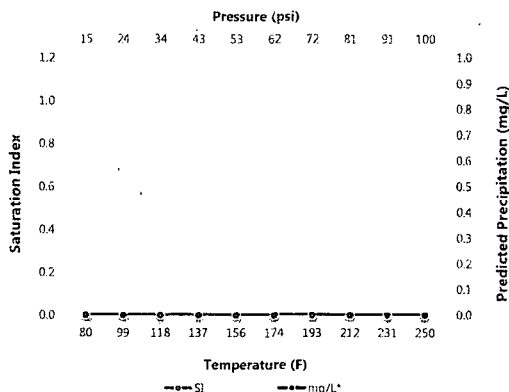
Note 3: Saturation Index predictions on this sheet use pH and alkalinity; %CO₂ is not included in the calculations.

ScaleSoftPitzer™
SSP2010

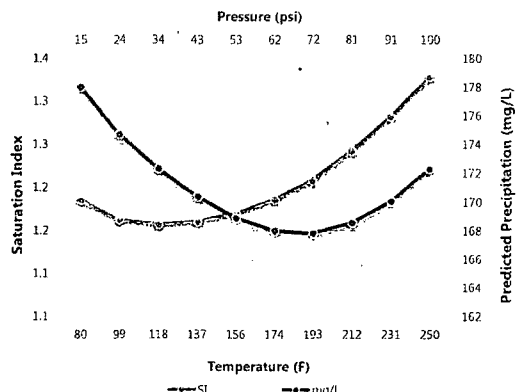
Comments:

ABO FORMATION

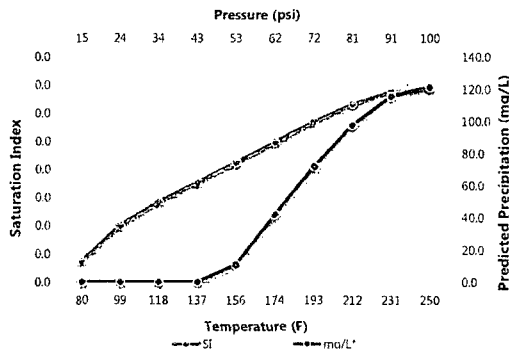
Barite (BaSO₄)



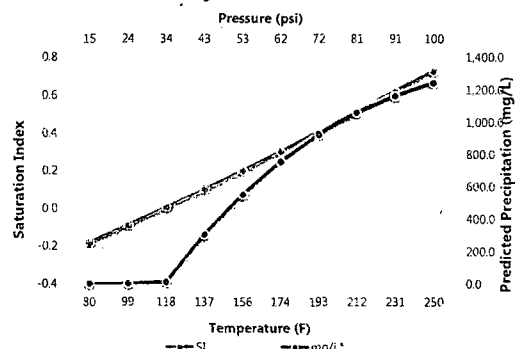
Calcite (CaCO₃)



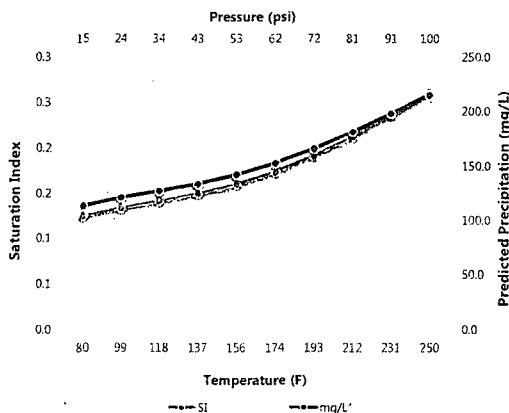
Gypsum (CaSO₄·2H₂O)



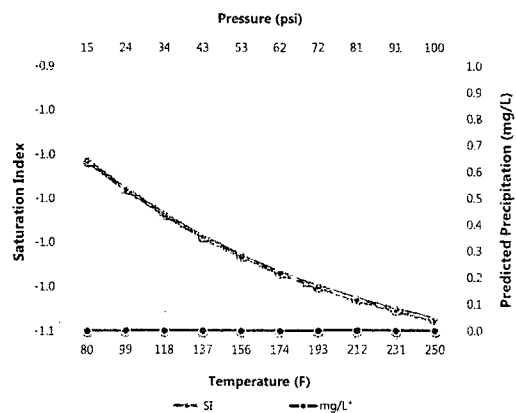
Anhydrite (CaSO₄)



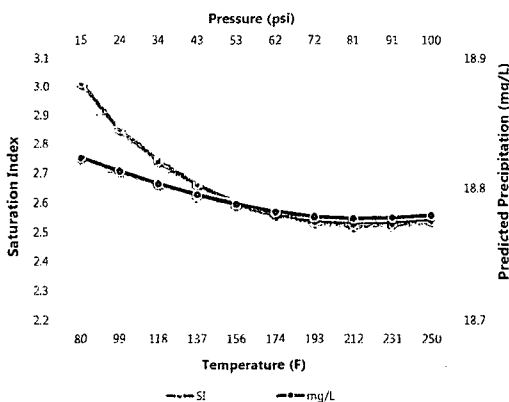
Celestite (SrSO₄)



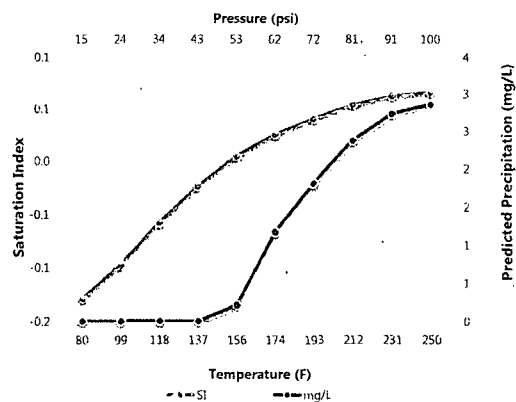
Halite (NaCl)



Iron Sulfide (FeS)



Iron Carbonate (FeCO₃)





LABORATORY SERVICES
Natural Gas Analysis

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575.397.3713 2609 W Marland Hobbs NM 88240

For:	Apache Corporation	Sample:	Blinebry Zone
	Attention: Jim White	Identification:	Hawk A5 #9
	P. O. Box 1849	Company:	Apache Corporation
	Eunice, New Mexico 88231	Lease:	
		Plant:	

Sample Data:	Date Sampled	6/25/2015		
	Analysis Date	6/26/2015		
	Pressure-PSIA		Sampled by:	Kelly
	Sample Temp F		Analysis by:	Vicki McDaniel
	Atmos Temp F			

H2S =

Component Analysis

		Mol Percent	GPM
Hydrogen Sulfide	H2S		
Nitrogen	N2	2.152	
Carbon Dioxide	CO2	0.980	
Methane	C1	79.326	
Ethane	C2	10.872	2.900
Propane	C3	4.275	1.175
I-Butane	IC4	0.483	0.158
N-Butane	NC4	1.009	0.317
I-Pentane	IC5	0.202	0.074
N-Pentane	NC5	0.208	0.075
Hexanes Plus	C6+	<u>0.493</u>	<u>0.213</u>
		100.000	4.912

REAL BTU/CU.FT.

At 14.65 DRY	1191.7
At 14.65 WET	1170.9
At 14.696 DRY	1195.4
At 14.696 WET	1175.0
At 14.73 DRY	1198.1
At 14.73 Wet	1177.5

Specific Gravity

Calculated 0.7091

Molecular Weight 20.5366

Z Factor (DRY) 0.9967

Z Factor (WET) 0.9963



LABORATORY SERVICES
Natural Gas Analysis

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ASTM DISTILLATION

Apache Corporation
Attention: Randy Hunter
P. O. Box 1849
Eunice, New Mexico 88231

Sampled By: Mike Oney/Baker
Sample Date: 6/26/15

Sample ID: Hawk A5 #9 Blinebry

<u>Percent Distilled</u>	<u>Temperature</u>		
IBP	138		
5	161		
10	212		
20	288	%Recovered =	92.0
30	366	% Residue =	4.0
40	436	% Loss =	4.0
50	540		
60	584		
70	635		
80	696		
90	716		
EP			

<u>Total Sulfur</u>	<u>API Gravity</u>	<u>Specific Gravity</u>	<u>RVP</u>
0.592 wt. %	38.7	0.8313	

Distillation	ASTM D 86	Sulfur	ASTM D 4294
Gravity	ASTM D 287	Vapor Pres	ASTM D 323



Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 7/27/2015

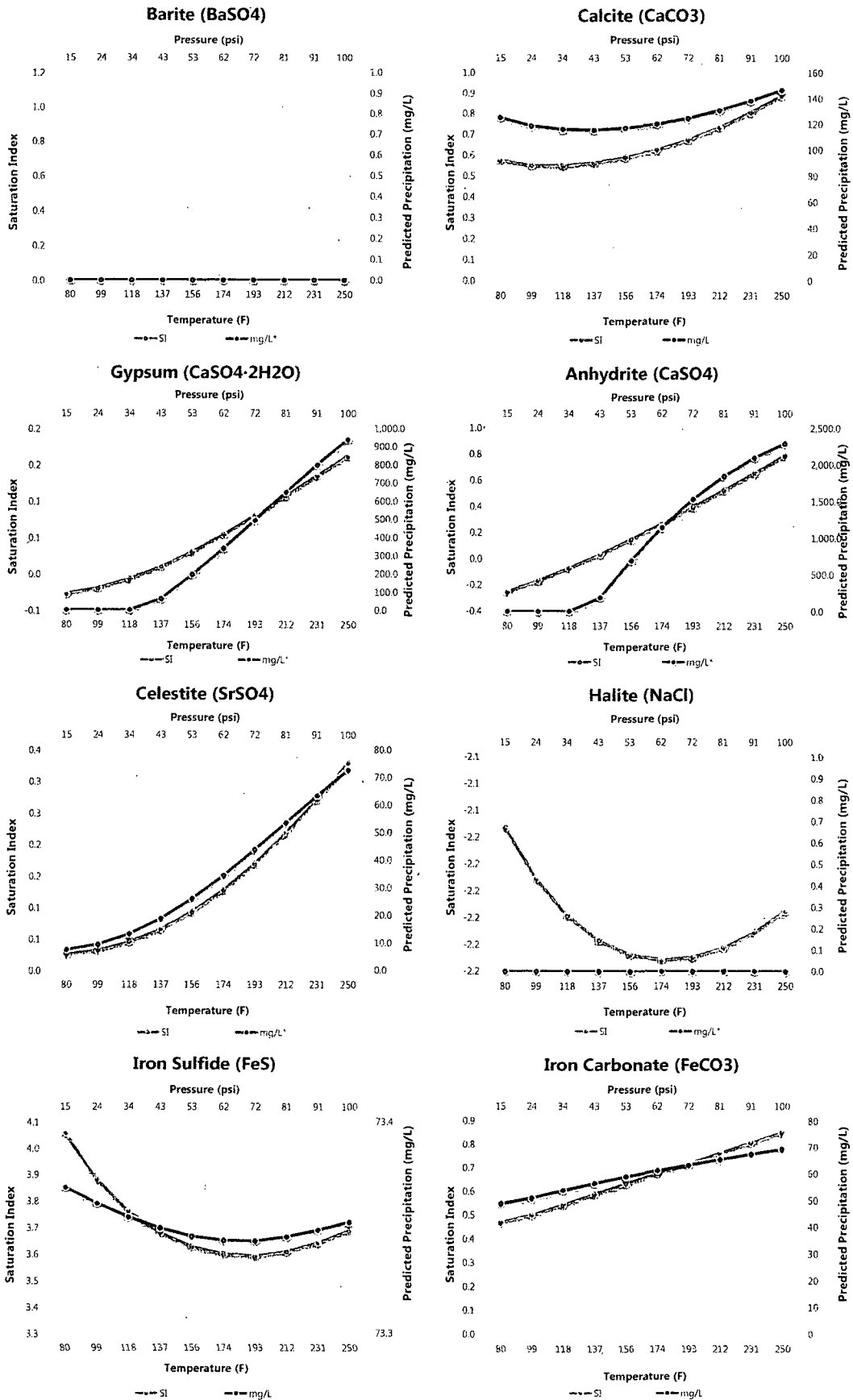
COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER: APACHE CORPORATION
DISTRICT: NEW MEXICO
AREA/LEASE: WEST BLINEBERRY DRINKARD UNIT
SAMPLE POINT NAME: WBDU #28 WELLHEAD DISCHARGE
SITE TYPE: WELL SITES
SAMPLE POINT DESCRIPTION: SWABBED FLUID/WORKOVER

ACCOUNT REP: MIKE ONEY
SAMPLE ID: 201501026173
SAMPLE DATE: 7/14/2015
ANALYSIS DATE: 7/23/2015
ANALYST: SAMUEL NEWMAN

APACHE CORPORATION, WEST BLINEBERRY DRINKARD UNIT, WBDU #28 WELLHEAD DISCHARGE

FIELD DATA			ANALYSIS OF SAMPLE							
			ANIONS:		mg/L	meq/L	CATIONS:		mg/L	meq/L
Initial Temperature (°F):		250	Chloride (Cl):		31067.8		876.4	Sodium (Na ⁺):	16118.6	701.4
Final Temperature (°F):		80	Sulfate (SO ₄ ²⁻):		2051.7		42.7	Potassium (K ⁺):	363.3	9.3
Initial Pressure (psi):		100	Borate (H ₃ BO ₃):		80.5		1.3	Magnesium (Mg ²⁺):	776.9	63.9
Final Pressure (psi):		15	Fluoride (F):		ND			Calcium (Ca ²⁺):	2912.8	145.3
			Bromide (Br):		ND			Strontium (Sr ²⁺):	66.2	1.5
pH:			Nitrite (NO ₂):		ND			Barium (Ba ²⁺):	0.0	0.0
pH at time of sampling:		6.9	Nitrate (NO ₃):		ND			Iron (Fe ²⁺):	46.6	1.7
			Phosphate (PO ₄ ³⁻):		ND			Manganese (Mn ²⁺):	10.1	0.4
			Silica (SiO ₂):		ND			Lead (Pb ²⁺):	ND	
								Zinc (Zn ²⁺):	0.0	0.0
ALKALINITY BY TITRATION:			mg/L	meq/L						
Bicarbonate (HCO ₃):	366.0	6.0						Aluminum (Al ³⁺):	ND	
Carbonate (CO ₃ ²⁻):	ND							Chromium (Cr ³⁺):	ND	
Hydroxide (OH):	ND							Cobalt (Co ²⁺):	ND	
			ORGANIC ACIDS:		mg/L	meq/L				
aqueous CO ₂ (ppm):		100.0	Formic Acid:		ND			Copper (Cu ²⁺):	ND	
aqueous H ₂ S (ppm):		170.0	Acetic Acid:		ND			Molybdenum (Mo ²⁺):	ND	
aqueous O ₂ (ppb):		ND	Propionic Acid:		ND			Nickel (Ni ²⁺):	ND	
			Butyric Acid:		ND			Tin (Sn ²⁺):	ND	
Calculated TDS (mg/L):		53861	Valeric Acid:		ND			Titanium (Ti ²⁺):	ND	
Density/Specific Gravity (g/cm ³):		1.0348						Vanadium (V ²⁺):	ND	
Measured Specific Gravity		1.0378						Zirconium (Zr ²⁺):	ND	
Conductivity (mmhos):		ND						Total Hardness:	10558	N/A
Resistivity:		ND								
MCF/D:		No Data								
BOPD:		No Data								
BWPD:		No Data	Anion/Cation Ratio:			1.00		ND = Not Determined		



SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.



LABORATORY SERVICES
Natural Gas Analysis

www.permianls.com

575.397.3713 2609 W Marland Hobbs NM 88240

For:	Apache Corporation	Sample:	Drinkard Zone
	Attention: Jim White	Identification:	Hawk A5 #9
	P. O. Box 1849	Company:	Apache Corporation
	Eunice, New Mexico 88231	Lease:	
		Plant:	

Sample Data:	Date Sampled	6/25/2015		
	Analysis Date	6/26/2015		
	Pressure-PSIA		Sampled by:	Kelly
	Sample Temp F		Analysis by:	Vicki McDaniel
	Atmos Temp F			

H2S =

Component Analysis

		Mol Percent	GPM
Hydrogen Sulfide	H2S		
Nitrogen	N2	3.067	
Carbon Dioxide	CO2	0.023	
Methane	C1	81.834	
Ethane	C2	8.245	2.199
Propane	C3	3.785	1.040
I-Butane	IC4	0.389	0.127
N-Butane	NC4	1.165	0.366
I-Pentane	IC5	0.269	0.098
N-Pentane	NC5	0.340	0.123
Hexanes Plus	C6+	<u>0.883</u>	<u>0.382</u>
		100.000	4.336

REAL BTU/CU.FT.

At 14.65 DRY	1188.1	Specific Gravity	
At 14.65 WET	1167.4	Calculated	0.7013
At 14.696 DRY	1191.8		
At 14.696 WET	1171.5	Molecular Weight	20.3112
At 14.73 DRY	1194.6		
At 14.73 Wet	1173.9		
		Z Factor (DRY)	0.9968
		Z Factor (WET)	0.9964



LABORATORY SERVICES
Natural Gas Analysis

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575.397.3713 2609 W Marland Hobbs NM 88240

ASTM DISTILLATION

Apache Corporation
Attention: Randy Hunter
P. O. Box 1849
Eunice, New Mexico 88231

Sampled By: Mike Oney/Baker
Sample Date: 7/13/15

Sample ID: ~~Web DVC~~ 28 Drinkard

<u>Percent Distilled</u>	<u>Temperature</u>		
IBP	98		
5	148		
10	192		
20	243	%Recovered =	94.0
30	302	% Residue =	5.0
40	375	% Loss =	1.0
50	461		
60	524		
70	569		
80	605		
90	631		
EP	635		

<u>Total Sulfur</u>	<u>API Gravity</u>	<u>Specific Gravity</u>	<u>RVP</u>
1.104 wt. %	38.5	0.8323	

Distillation	ASTM D 86	Sulfur	ASTM D 4294
Gravity	ASTM D 287	Vapor Pres	ASTM D 323

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	APACHE CORPORATION
DISTRICT:	NEW MEXICO
AREA/LEASE:	HAWK A5
SAMPLE POINT NAME	HAWK A5 #9
SITE TYPE:	WELL SITES
SAMPLE POINT DESCRIPTION:	SWABBED FLUID/WORKOVER

ACCOUNT REP:	MIKE ONEY
SAMPLE ID:	201501023735
SAMPLE DATE:	6/25/2015
ANALYSIS DATE:	7/2/2015
ANALYST:	SAMUEL NEWMAN

APACHE CORPORATION, HAWK A5, HAWK A5 #9

FIELD DATA:		ANALYSIS OF SAMPLE				
		ANIONS:		CATIONS:		
		mg/L	meq/L		mg/L	meq/L
Initial Temperature (°F):	250	Chloride (Cl⁻):	42232.5	1191.3	Sodium (Na⁺):	21186.2
Final Temperature (°F):	80	Sulfate (SO₄²⁻):	1057.7	22.0	Potassium (K⁺):	447.3
Initial Pressure (psi):	100	Borate (H₃BO₃):	120.1	1.9	Magnesium (Mg²⁺):	1159.6
Final Pressure (psi):	15	Fluoride (F⁻):	ND		Calcium (Ca²⁺):	3796.3
		Bromide (Br⁻):	ND		Strontium (Sr²⁺):	85.7
pH:		Nitrite (NO₂⁻):	ND		Barium (Ba²⁺):	0.3
pH at time of sampling:	6.8	Nitrate (NO₃⁻):	ND		Iron (Fe²⁺):	24.5
SI Residual:	mg/L	Phosphate (PO₄³⁻):	ND		Manganese (Mn²⁺):	0.7
Compound:	Total PO4	Silica (SiO₂):	ND		Lead (Pb²⁺):	ND
Residual (ppm):					Zinc (Zn²⁺):	0.0
ALKALINITY BY TITRATION:	mg/L		meq/L			
Bicarbonate (HCO₃⁻):	244.0		4.0		Aluminum (Al³⁺):	ND
Carbonate (CO₃²⁻):	ND				Chromium (Cr³⁺):	ND
Hydroxide (OH⁻):	ND				Cobalt (Co²⁺):	ND
		ORGANIC ACIDS:	mg/L	meq/L	Copper (Cu²⁺):	ND
aqueous CO₂ (ppm):	50.0	Formic Acid:	ND		Molybdenum (Mo²⁺):	ND
aqueous H₂S (ppm):	50.0	Acetic Acid:	ND		Nickel (Ni²⁺):	ND
aqueous O₂ (ppb):	ND	Propionic Acid:	ND		Tin (Sn²⁺):	ND
		Butyric Acid:	ND		Titanium (Ti²⁺):	ND
Calculated TDS (mg/L):	70355	Valeric Acid:	ND		Vanadium (V²⁺):	ND
Density/Specific Gravity (g/cm³):	1.0459				Zirconium (Zr²⁺):	ND
Measured Specific Gravity	1.0494					
Conductivity (mmhos):	ND				Total Hardness:	14366
Resistivity:	ND					N/A
MCF/D:	No Data					
BOPD:	No Data					
BWPD:	No Data	Anion/Cation Ratio:	1.00		ND = Not Determined	

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Conditions		Barite (BaSO ₄)		Calcite (CaCO ₃)		Gypsum (CaSO ₄ ·2H ₂ O)		Anhydrite (CaSO ₄)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.22	0.072	0.69	34.417	-0.30	0.000	-0.51	0.000
99°F	24 psi	0.08	0.031	0.71	34.899	-0.29	0.000	-0.43	0.000
118°F	34 psi	-0.04	0.000	0.75	36.163	-0.28	0.000	-0.33	0.000
137°F	43 psi	-0.14	0.000	0.80	37.675	-0.26	0.000	-0.23	0.000
156°F	53 psi	-0.22	0.000	0.87	39.285	-0.24	0.000	-0.11	0.000
174°F	62 psi	-0.29	0.000	0.93	40.946	-0.22	0.000	0.00	3.752
193°F	72 psi	-0.35	0.000	1.01	42.643	-0.20	0.000	0.13	121.149
212°F	81 psi	-0.39	0.000	1.10	44.489	-0.18	0.000	0.25	215.883
231°F	91 psi	-0.43	0.000	1.19	46.360	-0.15	0.000	0.38	290.435
250°F	100 psi	-0.46	0.000	1.29	48.216	-0.13	0.000	0.51	347.880

Conditions		Celestite (SrSO ₄)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate (FeCO ₃)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-0.24	0.000	-1.89	0.000	3.17	13.489	0.18	4.330
99°F	24 psi	-0.24	0.000	-1.90	0.000	3.04	13.482	0.25	5.801
118°F	34 psi	-0.22	0.000	-1.92	0.000	2.97	13.478	0.34	7.379
137°F	43 psi	-0.21	0.000	-1.93	0.000	2.93	13.477	0.42	8.777
156°F	53 psi	-0.18	0.000	-1.93	0.000	2.91	13.476	0.50	9.953
174°F	62 psi	-0.15	0.000	-1.93	0.000	2.91	13.477	0.58	10.925
193°F	72 psi	-0.12	0.000	-1.93	0.000	2.93	13.479	0.65	11.722
212°F	81 psi	-0.08	0.000	-1.93	0.000	2.96	13.482	0.72	12.438
231°F	91 psi	-0.03	0.000	-1.93	0.000	3.01	13.485	0.78	13.034
250°F	100 psi	0.02	2.862	-1.92	0.000	3.06	13.489	0.84	13.518

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered

Note 2: Predipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

Note 3: Saturation Index predictions on this sheet use pH and alkalinity; %CO₂ is not included in the calculations.

ScaleSoft Pitzer™
SSP2010

Comments:

Drinkard Formation



LABORATORY SERVICES

Natural Gas Analysis

www.permianls.com

575.397.3713 2609 W Marland Hobbs NM 88240

For:	Apache Corporation	Sample:	Tubb Zone
	Attention: Jim White	Identification:	Hawk A5 #9
	P. O. Box 1849	Company:	Apache Corporation
	Eunice, New Mexico 88231	Lease:	
		Plant:	

Sample Data:	Date Sampled	6/25/2015	
	Analysis Date	6/26/2015	
	Pressure-PSIA		Sampled by: Kelly
	Sample Temp F		Analysis by: Vicki McDaniel
	Atmos Temp F		

H2S =

Component Analysis

		Mol Percent	GPM
Hydrogen Sulfide	H2S		
Nitrogen	N2	2.173	
Carbon Dioxide	CO2	0.131	
Methane	C1	76.861	
Ethane	C2	11.029	2.942
Propane	C3	5.819	1.599
I-Butane	IC4	0.757	0.247
N-Butane	NC4	1.825	0.574
I-Pentane	IC5	0.322	0.117
N-Pentane	NC5	0.383	0.138
Hexanes Plus	C6+	<u>0.700</u>	<u>0.303</u>
		100.000	5.921

REAL BTU/CU.FT.

At 14.65 DRY	1267.0
At 14.65 WET	1244.8
At 14.696 DRY	1270.9
At 14.696 WET	1249.3
At 14.73 DRY	1273.8
At 14.73 Wet	1251.8

Specific Gravity

Calculated 0.7437

Molecular Weight 21.5407

Z Factor (DRY) 0.9963

Z Factor (WET) 0.9959



LABORATORY SERVICES
Natural Gas Analysis

www.permianls.com

575.397.3713 2609 W Marland Hobbs NM 88240

ASTM DISTILLATION

Apache Corporation
Attention: Randy Hunter
P. O. Box 1849
Eunice, New Mexico 88231

Sampled By: Mike Oney/Baker
Sample Date: 7/14/15

WBDU 28

Sample ID: Tubb Formation

Percent Distilled

Temperature

IBP	100
5	159
10	204
20	276
30	366
40	441
50	515
60	575
70	639
80	690
90	718
EP	720

%Recovered = 93.0
% Residue = 6.0
% Loss = 1.0

Total Sulfur

API Gravity

Specific Gravity

RVP

0.503 wt.%

36.7

0.8412

Distillation ASTM D 86

Sulfur ASTM D 4294

Gravity ASTM D 287

Vapor Pres ASTM D 323



Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 7/14/2015

COMPLETE WATER ANALYSIS REPORT SSP v. 2010

CUSTOMER: APACHE CORPORATION
DISTRICT: NEW MEXICO
AREA/LEASE: HAWK A5
SAMPLE POINT NAME: HAWK A5 #9
SITE TYPE: WELL SITES
SAMPLE POINT DESCRIPTION: SWABBED FLUID/WORKOVER

ACCOUNT REP: MIKE ONEY
SAMPLE ID: 201501023736
SAMPLE DATE: 6/25/2015
ANALYSIS DATE: 7/2/2015
ANALYST: SAMUEL NEWMAN

APACHE CORPORATION, HAWK A5, HAWK A5 #9

FIELD DATA			ANALYSIS OF SAMPLE			
			ANIONS:	mg/L	meq/L	CATIONS:
Initial Temperature (°F):	250	Chloride (Cl ⁻):	43134.5	1216.8	Sodium (Na ⁺):	21557.2
Final Temperature (°F):	80	Sulfate (SO ₄ ²⁻):	1227.7	25.6	Potassium (K ⁺):	457.4
Initial Pressure (psi):	100	Borate (H ₃ BO ₃):	113.7	1.8	Magnesium (Mg ²⁺):	1181.1
Final Pressure (psi):	15	Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):	3971.3
		Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):	88.3
pH:		Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):	0.3
pH at time of sampling:	6.9	Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):	70.3
SI Residual:	mg/L	Phosphate (PO ₄ ³⁻):	ND		Manganese (Mn ²⁺):	2.7
Compound:	Total PO ₄	Silica (SiO ₂):	ND		Lead (Pb ²⁺):	ND
Residual (ppm):					Zinc (Zn ²⁺):	1.9
ALKALINITY BY TITRATION:	mg/L					
Bicarbonate (HCO ₃ ⁻):	144.0				Aluminum (Al ³⁺):	ND
Carbonate (CO ₃ ²⁻):	ND				Chromium (Cr ³⁺):	ND
Hydroxide (OH ⁻):	ND				Cobalt (Co ²⁺):	ND
		ORGANIC ACIDS:	mg/L	meq/L	Copper (Cu ²⁺):	ND
aqueous CO ₂ (ppm):	50.0	Formic Acid:	ND		Molybdenum (Mo ²⁺):	ND
aqueous H ₂ S (ppm):	51.0	Acetic Acid:	ND		Nickel (Ni ²⁺):	ND
aqueous O ₂ (ppb):	ND	Propionic Acid:	ND		Tin (Sn ²⁺):	ND
		Butyric Acid:	ND		Titanium (Ti ²⁺):	ND
Calculated TDS (mg/L):	71950	Valeric Acid:	ND		Vanadium (V ²⁺):	ND
Density/Specific Gravity (g/cm ³):	1.0471				Zirconium (Zr ²⁺):	ND
Measured Specific Gravity	1.0503					
Conductivity (mmhos):	ND				Total Hardness:	14895
Resistivity:	ND					N/A
MCF/D:	No Data					
BOPD:	No Data					
BWPD:	No Data	Anion/Cation Ratio:		1.00	ND = Not Determined	

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FURTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Conditions		Barite (BaSO ₄)		Calcite (CaCO ₃)		Gypsum (CaSO ₄ ·2H ₂ O)		Anhydrite (CaSO ₄)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.28	0.086	0.44	13.882	-0.23	0.000	-0.44	0.000
99°F	24 psi	0.14	0.049	0.42	13.311	-0.22	0.000	-0.35	0.000
118°F	34 psi	0.02	0.008	0.43	13.315	-0.20	0.000	-0.26	0.000
137°F	43 psi	-0.08	0.000	0.46	13.629	-0.19	0.000	-0.15	0.000
156°F	53 psi	-0.16	0.000	0.49	14.165	-0.17	0.000	-0.04	0.000
174°F	62 psi	-0.23	0.000	0.53	14.881	-0.15	0.000	0.08	90.459
193°F	72 psi	-0.29	0.000	0.59	15.752	-0.13	0.000	0.20	207.558
212°F	81 psi	-0.34	0.000	0.65	16.824	-0.10	0.000	0.33	301.897
231°F	91 psi	-0.37	0.000	0.72	18.016	-0.08	0.000	0.45	376.040
250°F	100 psi	-0.40	0.000	0.81	19.291	-0.06	0.000	0.58	433.113

Conditions		Celestite (SrSO ₄)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate (FeCO ₃)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-0.17	0.000	-1.87	0.000	3.75	33.613	0.36	10.196
99°F	24 psi	-0.17	0.000	-1.89	0.000	3.59	33.420	0.40	11.146
118°F	34 psi	-0.16	0.000	-1.90	0.000	3.47	33.350	0.45	12.287
137°F	43 psi	-0.14	0.000	-1.91	0.000	3.40	33.337	0.51	13.358
156°F	53 psi	-0.11	0.000	-1.91	0.000	3.35	33.359	0.56	14.305
174°F	62 psi	-0.08	0.000	-1.92	0.000	3.33	33.405	0.61	15.129
193°F	72 psi	-0.05	0.000	-1.92	0.000	3.32	33.470	0.65	15.844
212°F	81 psi	-0.01	0.000	-1.91	0.000	3.33	33.574	0.70	16.537
231°F	91 psi	0.04	5.219	-1.91	0.000	3.36	33.696	0.75	17.166
250°F	100 psi	0.09	11.364	-1.90	0.000	3.40	33.827	0.79	17.721

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

Note 3: Saturation Index predictions on this sheet use pH and alkalinity. %CO₂ is not included in the calculations.

ScaleSoft Pitzer™
SNP2010

Comments:

Tubbs Formation

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martínez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

JamI Bailey, Division Director
Oil Conservation Division



Administrative Order DHC-4646

Order Date: November 4, 2013

Application Reference Number: pPRG1328359849

Apache Corporation
303 Veterans Airpark Lane, Ste 3000
Midland, TX 79705

Attention: Reesa Holland Fisher

	Hawk Federal A-5 Well No. 9		
	API No: 30-025-40459		
	Unit P, Section 5, Township 21 South, Range 37 East, NMPM		
	Lea County, New Mexico		
Pool	BLINEBRY OIL AND GAS	Oil	6660
Names:	TUBB OIL AND GAS	Oil	60240
	DRINKARD	Oil	19190
	WANTZ; ABO	Oil	62700

Reference is made to your recent application for an exception to 19.15.12.9A. NMAC of the Division Rules and Regulations to permit the above-described well to commingle production from the subject pools in the wellbore. All four of the subject pools are pre-approved for commingling under 19.15.12.11E. NMAC in specific pool combinations, but there is not a pre-approved commingling with the Tubb Oil and Gas and the Wantz; Abo pools. This Administrative order replaces the existing order DHC-HOB-503 issued by District I on October 17, 2012, for the pre-approved pools prior to the application for commingling of the Wantz; Abo pool.

It appearing that the subject well qualifies for approval for such exception pursuant to the provisions of 19.15.12.11A. NMAC, and that reservoir damage or waste will not result from such downhole commingling, and correlative rights will not be violated thereby, you are hereby authorized to commingle the production as described above and any Division Order which authorized the dual completion or otherwise required separation of the zones is hereby placed in abeyance.

In accordance with 19.15.12.11A.(6) NMAC, the production attributed to any commingled pool within the well shall not exceed the allowable applicable to that pool.

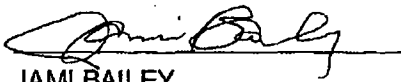
Assignment of allowable and allocation of production from the well shall be as follows:

BLINEBRY OIL & GAS (OIL) POOL	Pct Gas: 7	Pct Oil: 8
TUBB OIL & GAS (OIL) POOL	Pct Gas: 17	Pct Oil: 4
DRINKARD (OIL) POOL	Pct Gas: 13	Pct Oil: 21
WANTZ, ABO (OIL) POOL	Pct Gas: 63	Pct Oil: 67

REMARKS: The operator shall notify the Division's District I office upon implementation of commingling operations.

This Order is subject to like approval from the United States Bureau of Land Management.

Pursuant to 19.15.12.11B, NMAC, the commingling authority granted herein may be rescinded by the Division Director if conservation is not being best served by such commingling.


JAMI BAILEY
Director

JB/prg

cc: Oil Conservation Division – Hobbs District
Bureau of Land Management – Carlsbad Office

**Hawk Federal A-5 #9
30-025-40459
Apache Corporation
September 10, 2015
Conditions of Approval**

1. A new "Well Location and Acreage Dedication Plat" (NMOCD Form C-102) is required with the notice of intent package when opening another pay zone.
2. Subsequent sundry required detailing work done and completion report with the new formation. Operator to include well bore schematic of current well condition when work is complete.
3. Surface disturbance beyond the originally approved pad must have prior approval.
4. Closed loop system required.
5. All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of work over 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.
6. Functional H₂S monitoring equipment shall be on location.
7. 2000 (2M) Blow Out Prevention Equipment to be used. All BOPE and workover procedures shall establish fail safe well control. Ram(s) for the work string(s) used is required equipment. Manual BOP closure system including a blind ram and pipe ram(s) designed to close on all (hand wheels) equipment shall be installed regardless of BOP design. Function test the installed BOPE to 500psig when well conditions allow. Related equipment, (choke manifolds, kill trucks, gas vent or flare lines, etc.) shall be employed when needed for reasonable well control requirements.

Access information for use of Form 3160-5 "Sundry Notices and Reports on Wells"
NM Fed Regs & Forms - http://www.blm.gov/nm/st/en/prog/energy/oil_and_gas.html

§ 43 CFR 3162.3-2 Subsequent Well Operations.

§ 43 CFR 3160.0-9 (c)(1) Information collection.

§ 3162.4-1 (c) Well records and reports.