

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Hobbs

FORM 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.*5. Lease Serial No.
NMLC031741A

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 FEDERAL A-5 3 ✓2. Name of Operator
APACHE CORPORATION ✓Contact: REESA FISHER
E-Mail: Reesa.Fisher@apachecorp.com9. API Well No.
30-025-37380 ✓3a. Address
303 VETERANS AIRPARK LANE SUITE 3000
MIDLAND, TX 797053b. Phone No. (include area code)
Ph: 432-818-106210. Field and Pool, or Exploratory
BLI(O)/TUBB(O)/DRNKD/ABO

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

Sec 5 T21S R37E SWSE 330FSL 1650FEL ✓

APR 25 2016

11. County or Parish, and State

LEA COUNTY 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 CIBP over Abo perforations, acid/fracture stimulate the Abo and return well to production with Abo & BTB DHC, per the attached procedure. We would like to amend our allocations:

Apache requests permission to add Abo to the Blinebry-Tubb-Drinkard DHC-HOB-0138, per the following:

Pool Names:	
Blinebry Oil & Gas	6660
Tubb Oil & Gas	60240
Drinkard	19190
Wantz, Abo	62700
Perforations: Blinebry	5737?-6025?
Tubb	6255?-6388?
Drinkard	6736?-6850?
Abo	6988?-7190'

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

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

**Electronic Submission #317645 verified by the BLM Well Information System
For APACHE CORPORATION, sent to the Hobbs
Committed to AFMSS for processing by LINDA JIMENEZ on 10/05/2015 ()**

Name (Printed/Typed) REESA FISHER

Title SR STAFF REGULATORY ANALYST

Signature (Electronic Submission)

Date 09/24/2015

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Forrest L. Rennie
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.

Title Retention Engineer Date 4/21/2016Office Caulsroad 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.

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

MAY 09 2016

Additional data for EC transaction #317645 that would not fit on the form

32. Additional remarks, continued

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

OIL	GAS	WATER	
Bliebry	16%	30%	9%
Tubb	19%	6%	22%
Drinkard	15%	0%	66%
Abo	50%	64%	3%

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

Hawk Federal A-5 3
30-025-37380
Apache Corporation
Conditions of Approval

Notify BLM at 575-393-3612 (Lea County) a minimum of 24 hours prior to commencing work. If there is no response, leave a voice mail with the API#, workover purpose and a call back phone number.

Operators to complete proposed production test a minimum 90 days from date of approval.

1. A minimum of a **2000 (2M)** BOP to be used. All blowout preventer (BOP) and related equipment (BOPE) shall comply with reasonable well control requirements. A two ram system with a blind ram and a pipe ram designed for the size of the work string shall be adequate. Tapered work strings will require an additional pipe ram. The manifold shall comply with Onshore Oil and Gas Order #2 Attachment I (**2M Diagrams of Choke Manifold Equipment**). The accumulator system shall have an immediately available power source to close the rams and retain 200 psi above pre-charge. The pre-charge test shall follow requirements in Onshore Order #2.
2. Surface disturbance beyond the originally approved pad must have prior approval.
3. Closed loop system required.
4. 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.
5. Operator to have H2S monitoring equipment on location.
6. **Subsequent sundry and Completion report with well test and wellbore schematic required.**

KGR 04212016

A1. BLM Downhole Commingle Worksheet

Operator: Apache Corp (873)

Lease/Well Name/API Number/Location: Hawk Federal A-5 #003 30-025-37380 O-5-T21S-R37E 330' FSL & 1650' FEL

Date: 9/21/2015

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)	6988'-7190'	6736'-6850'	6255'-6388'	5737'-6025'	5737'-7190'
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: 36.8 BOPD 350 MCFD 3.7 BWPD	Date: 8/2015 1 BOPD 0 MCFD 9 BWPD	Date: 8/1/2015 2 BOPD 6 MCFD 3 BWPD	Date: 8/1/2015 1 BOPD 20 MCFD 1 BWPD	Estimated IP: 40.9 BOPD 377 MCFD 16.7 BWPD
Average decline % (provide back up data)	b = 0.91 di = 20.8% per Mo.	6.0%	6.0%	6.0%	b = 1.36 di = 26.8%
Fixed Allocation Percentage	50% / 64% / 3%	14% / 0% / 66%	19% / 6% / 22%	16% / 30% / 9%	*

O G W O G W O G W

Remarks:

PAGE 1 of 1

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.

DATE IN	SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.
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ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

1220 South St. Francis Drive, Santa Fe, NM 87505



ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
 [DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
 [PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
 [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
 [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
 [EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] TYPE OF APPLICATION - Check Those Which Apply for [A]

- [A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

- [B] Commingling - Storage - Measurement
☒ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

- [C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

- [D] Other: Specify _____

[2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or Does Not Apply

- [A] ☐ Working, Royalty or Overriding Royalty Interest Owners
 [B] ☐ Offset Operators, Leaseholders or Surface Owner
 [C] ☐ Application is One Which Requires Published Legal Notice
 [D] ☒ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
 [E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,
 [F] ☐ Waivers are Attached

[3] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

REESA FISHER
 Print or Type Name

Signature

Reesa Fisher

SR STAFF REG TECH
 Title

9/24/2015
 Date

HAWK FEDERAL A-5 #3

Reesa.Fisher@apachecorp.com
 e-mail Address

HOBBS OCD

APR 25 2016

RECEIVED



Dowhole Commingle Memo

Date: September 21, 2015
From: Bret Shapot
Subject: Application for Downhole Commingle
Hawk A-5 #3 (API: 30-025-37380)
Unit O, 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 B-1 #69 well, which is producing from the Abo only, as a type well. To generate predictions for the Hawk A-5 #3, our engineer, Bret Shapot, utilized the production forecast for the Hawk B-1 #69 and adjusted it by the hydrocarbon net pay in each well relative to the Hawk B-1 #69. Hydrocarbon net pay in the Hawk B-1 #69 and Hawk A-5 #3 are 2.61 ft, and 1.05 ft, respectively.

For the Hawk A-5 #3 from the Abo, we are predicting an initial 30 day IP of 36.8 BOPD, declining hyperbolically with a b-factor of 0.91 and initial decline rate of 20.8% per month. The EUR for the Abo when commingled is 20.8 MB at an economic limit of 0.4 BOPD after 28.4 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

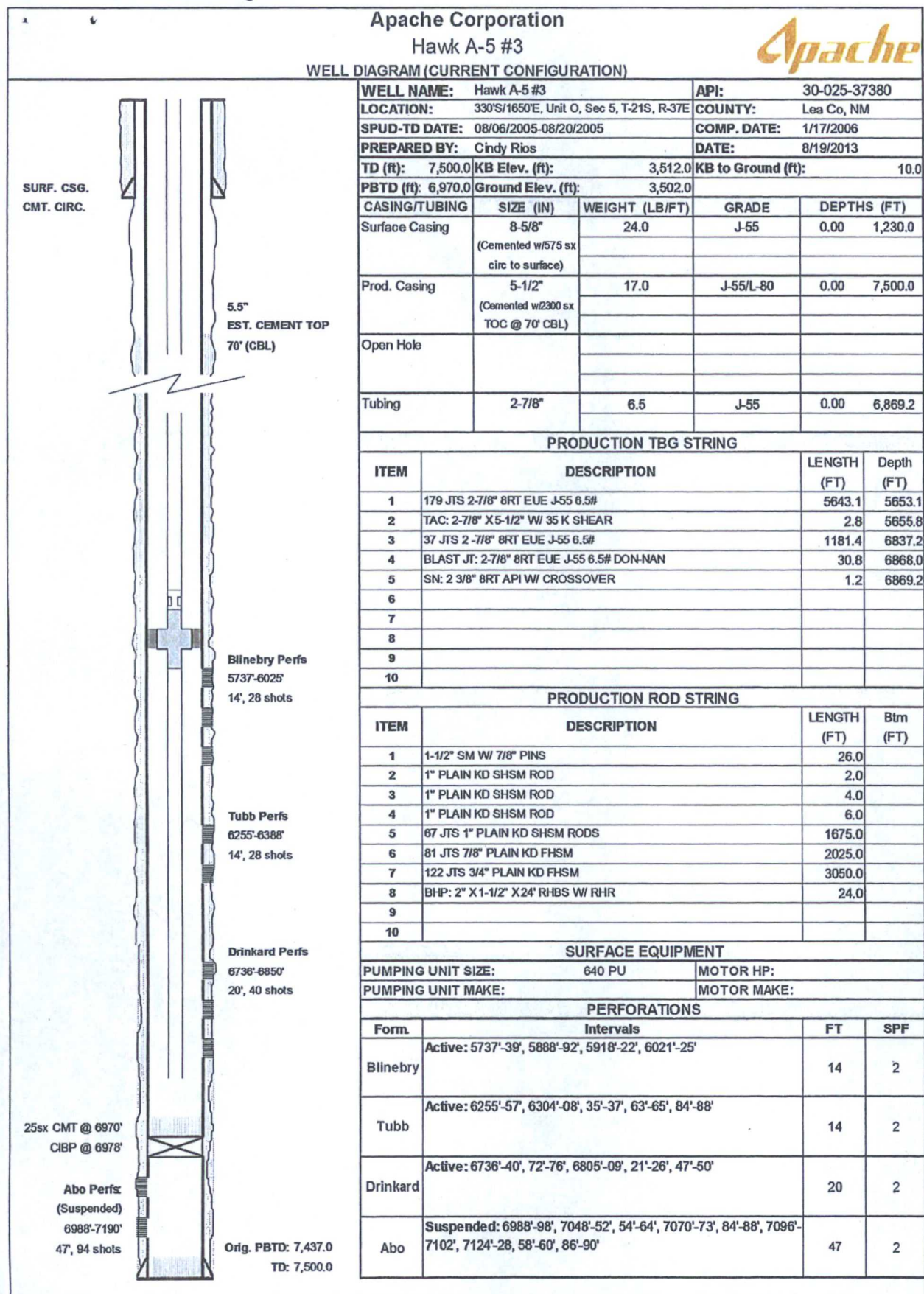
Notes:

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

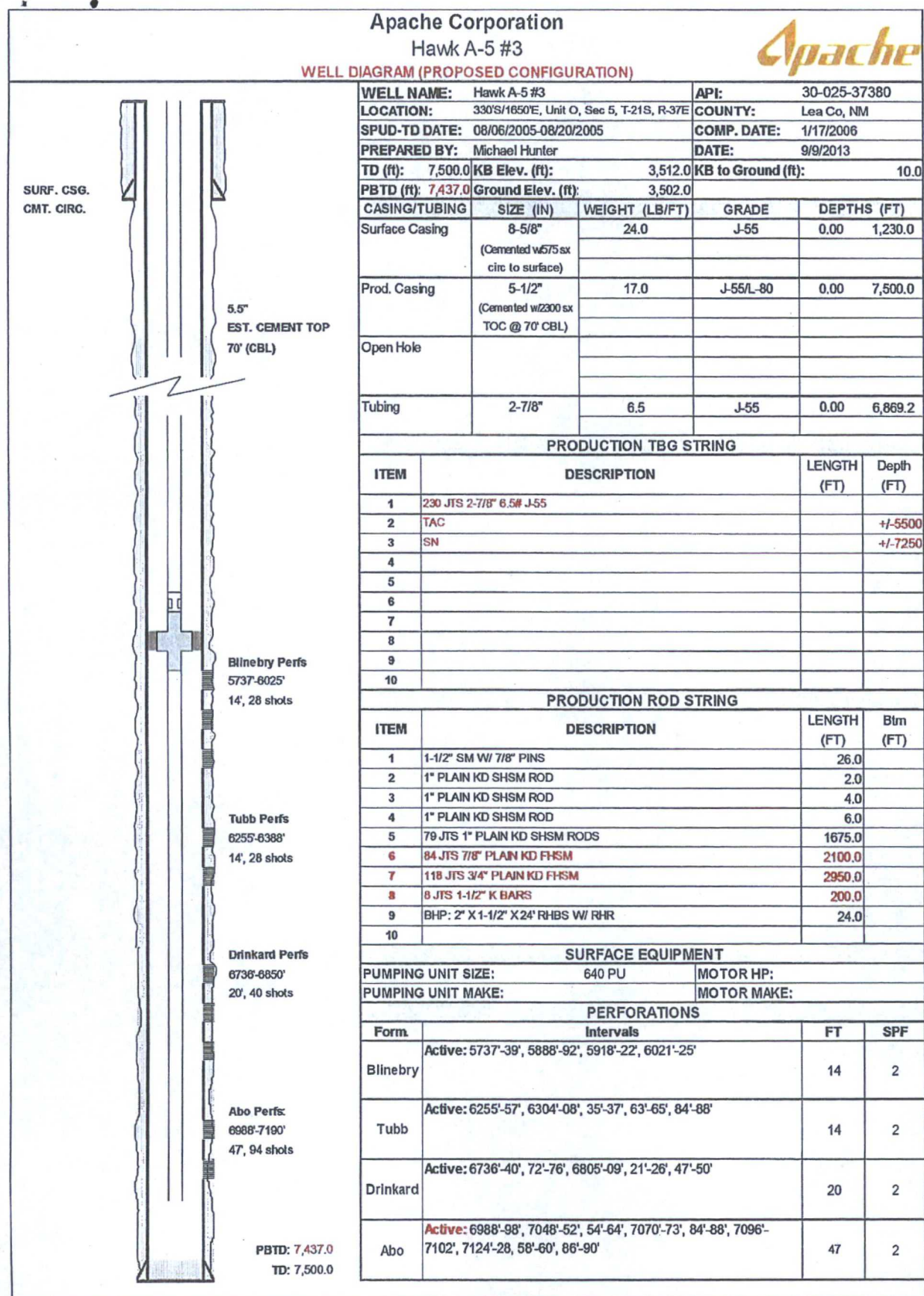
List of Attachments

- A1. BLM Downhole Commingle Worksheet
- A2. Current Wellbore Diagram
- A3. Proposed Wellbore Diagram
- A4. Hawk A-5 #3 Area Map
- A5. Proposed Workover Procedure
- A6. Hawk A-5 #3 Allocated Reserves Forecast
- A7. Hawk B-1 #69 Monthly Production History
- A8. Hawk A-5 #3 Monthly Production History
- A9. Hawk A-5 #3 Well Tests
- A10. Hawk A-5 #3 Abo Performance Prediction
- A11. Hawk A-5 #3 Blinebry, Tubb, and Drinkard Decline Analysis
- A12. Oil, Gas, and Water Sample Results

A2. Current Wellbore Diagram



A3. Proposed Wellbore Diagram



A5. Proposed Workover Procedure

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

API: 30-025-37380

330' FSL & 1650' FEL, Unit O

Section 5, Township 21S, Range 37E

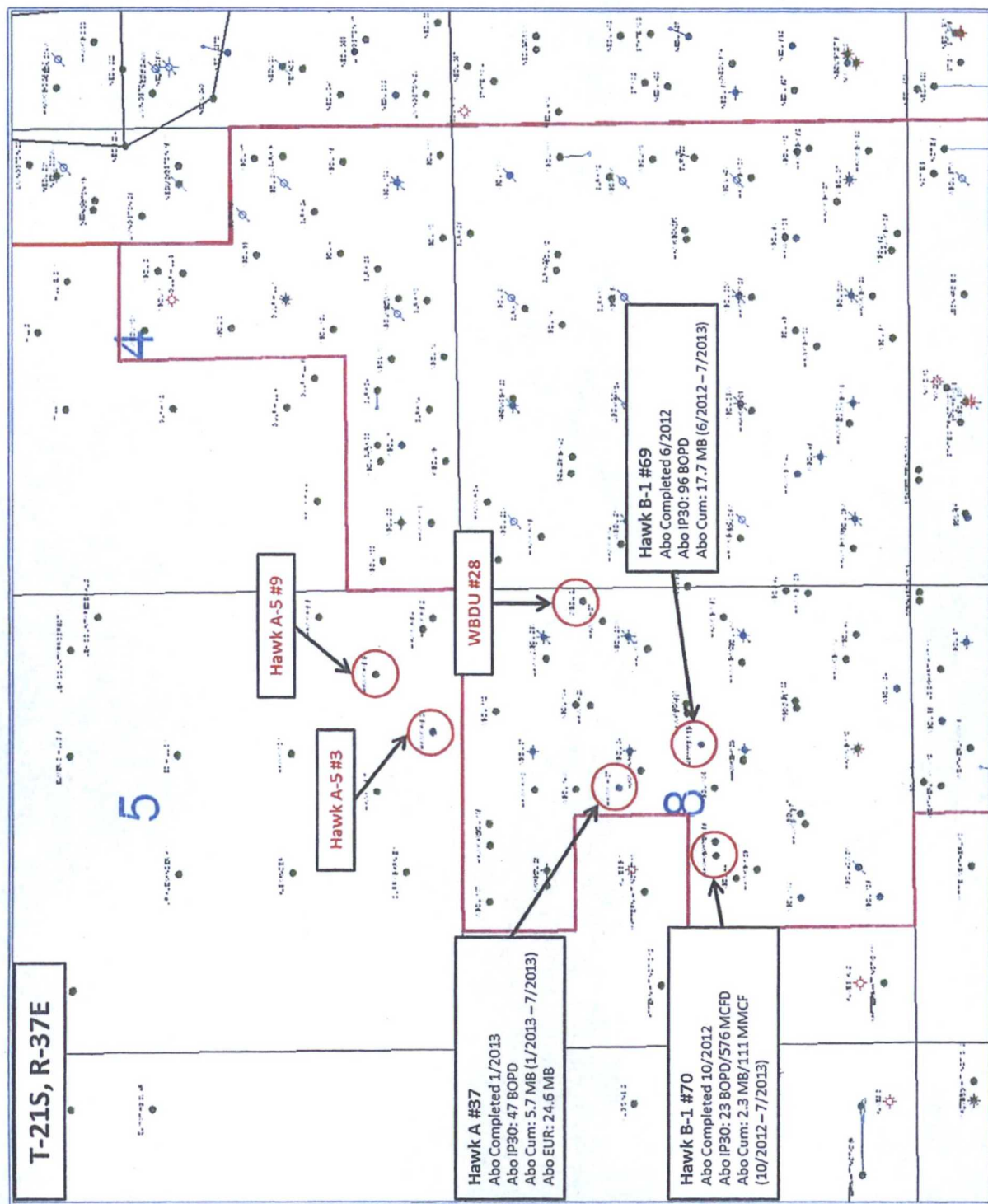
Lea County, New Mexico

Production Casing: 5-1/2", 17 lb/ft J-55/L-80 set @ 7500' w/ 2300 sx cmt (TOC @ 70')

Procedure:

- Day 1:** MIRU. POOH w/ rods and pump. NU BOP. POOH w/ 2-7/8" production tubing.
- Day 2:** RIH w/ 4-3/4" bit on 2-7/8" tubing, drill out CBP @ 6970'. Cont. RIH to PBTD @ +/- 7437'. Circulate well clean. POOH.
- Day 3:** RIH w/ casing scraper on 2-7/8" tubing to +/- 7437'. POOH
RIH w/ treating packer on 3-1/2" L-80 work string. Set packer @ +/- 6,950'
- Day 4:** MIRU Acid Crew.
Acidize the Drinkard w/ 10,000 gals 15% HCl and ball sealers in 3 equal stages @ +/- 10 BPM.
Release packer and POOH w/ 3-1/2" tubing.
MIRU WL. RIH w/ junk basket to knock off balls, POOH
Shut well in overnight to allow acid to spend
- Day 5:** Open well up and flow back.
RIH w/ 2-7/8" production tubing, set SN @ +/- 7220'.
- Day 6:** RIH w/ 1-1/2" pump and rods
Return well to production. Place well in test

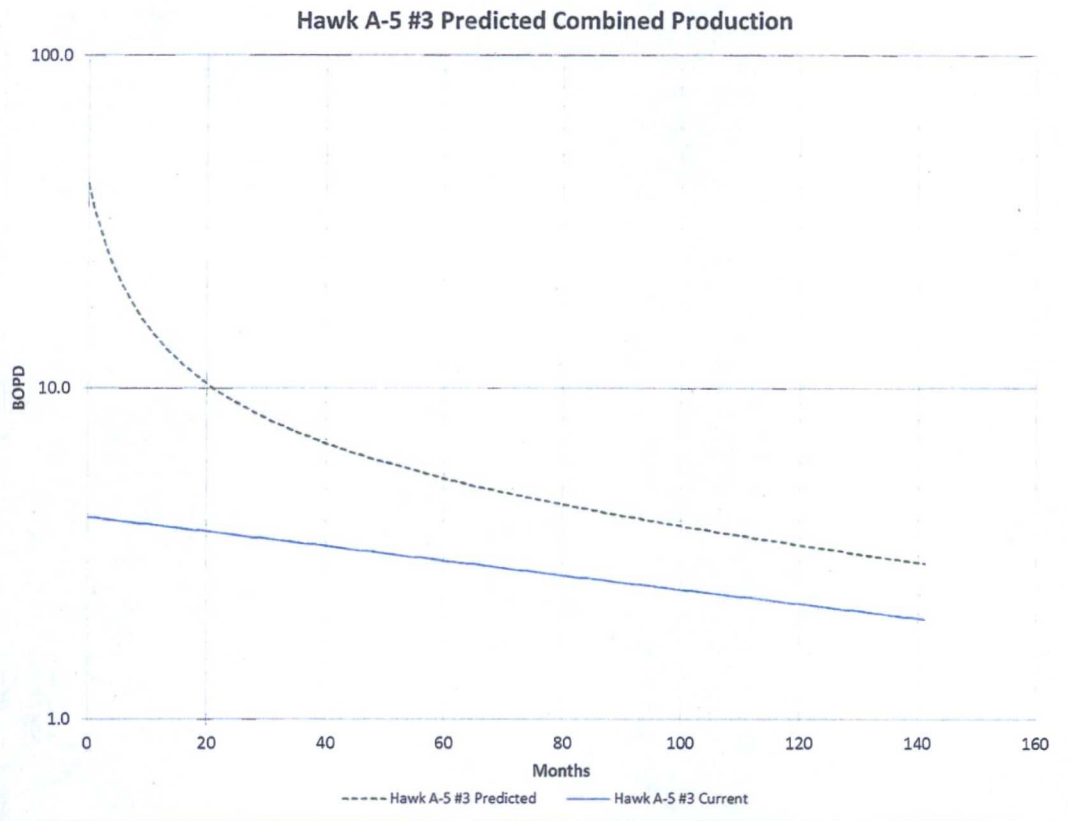
A4. Hawk A-5 #3 Area Map



A6. Hawk A-5 #3 Allocated Reserves Forecast

Hawk A-5 #3 Allocated Forecast Reserves						
Zone	Oil		Gas		Water	
	BBL	%	MCF	%	BBL	%
Blinebry	6,776	16%	114,027	30%	7,093	9%
Tubb	7,780	19%	21,354	6%	18,051	22%
Drinkard	5,944	14%	0	0%	53,431	66%
Abo	20,800	50%	245,440	64%	2,080	3%
Total	41,300	100.0%	380,822	100.0%	80,655	100.0%

Hawk A-5 #3 Combined		
qi	40.9	BOPD
qf	1.0	BOPD
b	1.2000	
di	20.0%	/Mo.



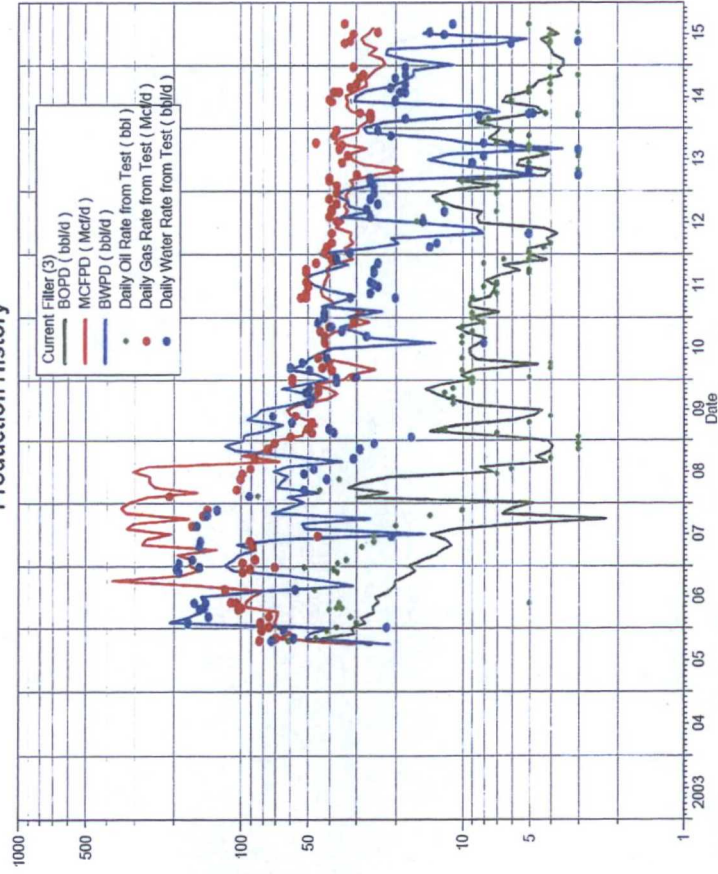
A8. Hawk A-5 #3 Production History

Hawk A-5 #3 Allocated Cumulative Production			
Formation	Oil (BBL)	Gas (MCF)	Water (BBL)
Blinbry	12,461	226,458	15,904
Tubb	14,309	42,410	40,476
Drinkard	10,931	0	119,808
CUM	37,701	268,868	176,189

Hawk A-5 #3 BTD Allocations			
	Oil	Gas	Water
Blinbry	0.331	0.842	0.090
Tubb	0.380	0.158	0.230
Drinkard	0.290	0.000	0.680

Hawk A-5 #3 Reserves			
	Oil	Gas	Water
Blinbry	6,776	114,027	7,093
Tubb	7,780	21,354	18,051
Drinkard	5,944	0	53,431
Total	20,500	135,382	78,575

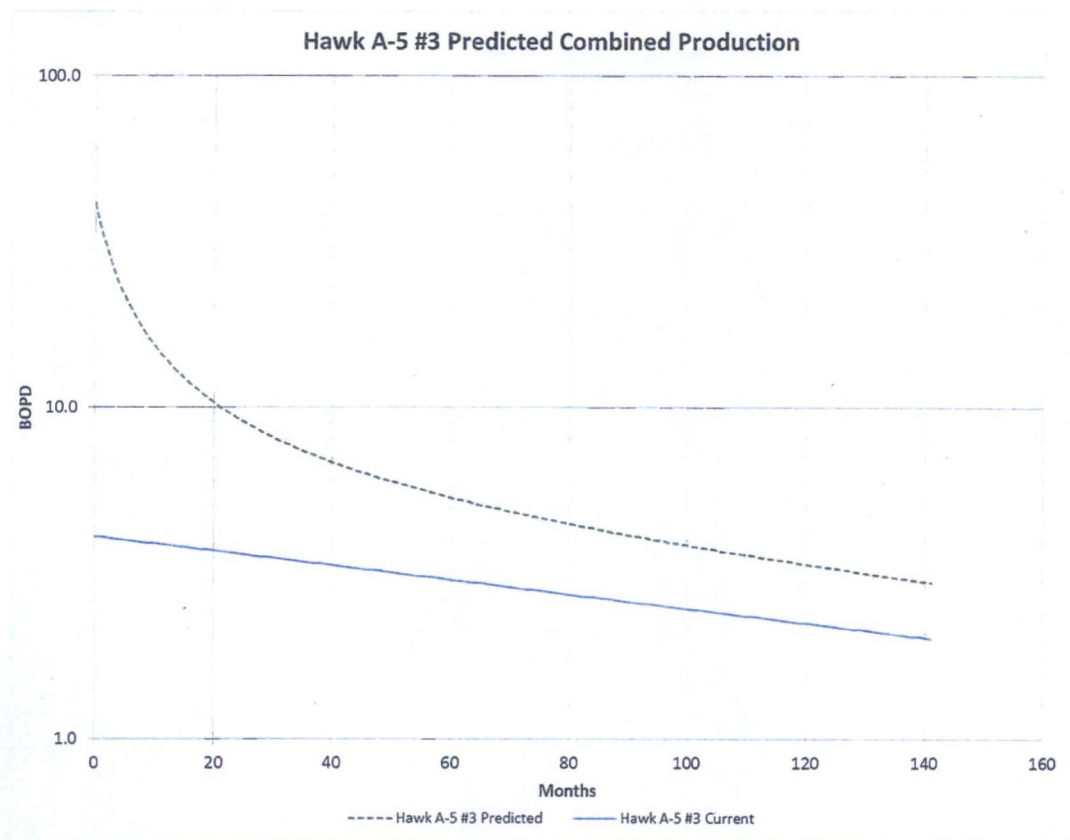
Hawk A-5 #3 Production History



A6. Hawk A-5 #3 Allocated Reserves Forecast

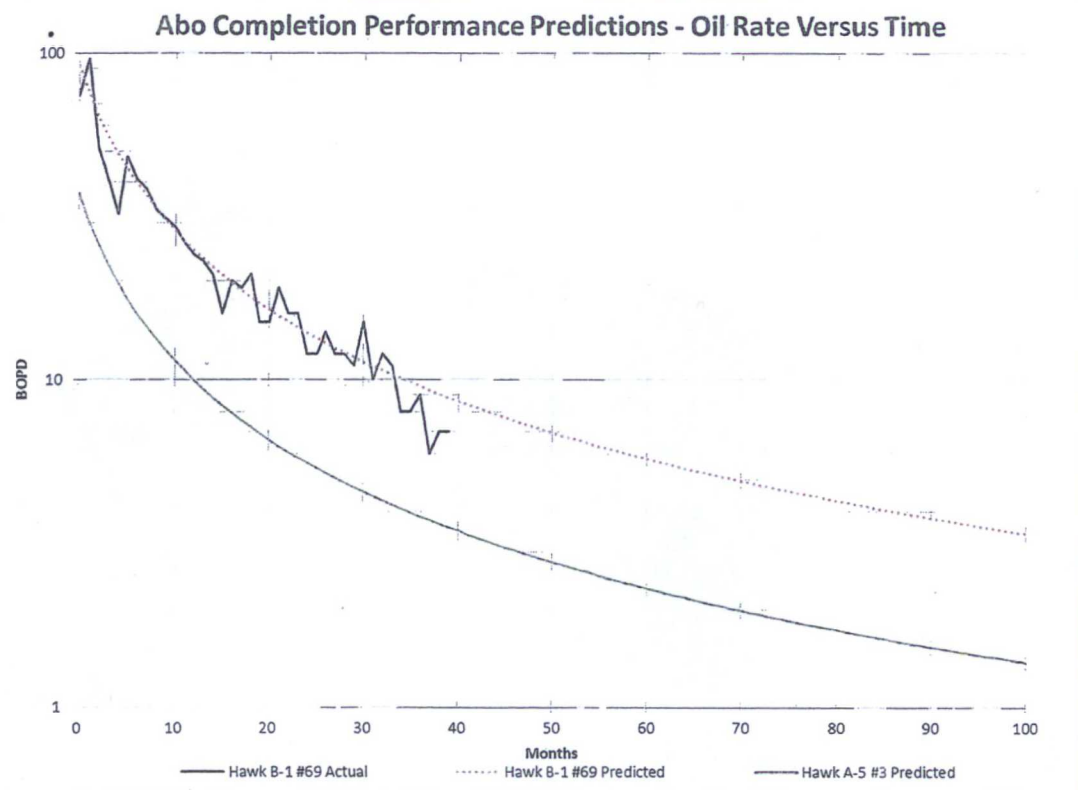
Hawk A-5 #3 Allocated Forecast Reserves						
Zone	Oil		Gas		Water	
	BBL	%	MCF	%	BBL	%
Blinebry	6,776	16%	114,027	30%	7,093	9%
Tubb	7,780	19%	21,354	6%	18,051	22%
Drinkard	5,944	14%	0	0%	53,431	66%
Abo	20,800	50%	245,440	64%	2,080	3%
Total	41,300	100.0%	380,822	100.0%	80,655	100.0%

Hawk A-5 #3 Combined		
qi	40.9	BOPD
qf	1.0	BOPD
b	1.2000	
di	20.0%	/Mo.



A9. Hawk A-5 #3 Recent Well Tests

Well	Test Date	Oil (BBL)	Gas (MCF)	Water (BBL)	WOR (BBL/BBL)	GOR (MCF/BBL)
Hawk A-5 #3	1/16/2010	5	31	30	6.0	6.2
Hawk A-5 #3	2/26/2010	10	39	49	4.9	3.9
Hawk A-5 #3	3/12/2010	4	43	60	15.0	10.8
Hawk A-5 #3	4/8/2010	4	40	53	13.3	10.0
Hawk A-5 #3	5/7/2010	10	45	41	4.1	4.5
Hawk A-5 #3	8/3/2010	10	42	8	0.8	4.2
Hawk A-5 #3	9/10/2010	10	42	27	2.7	4.2
Hawk A-5 #3	10/10/2010	9	44	35	3.9	4.9
Hawk A-5 #3	11/2/2010	10	40	39	3.9	4.0
Hawk A-5 #3	11/29/2010	8	31	45	5.6	3.9
Hawk A-5 #3	12/27/2010	9	42	42	4.7	4.7
Hawk A-5 #3	1/24/2011	9	42	42	4.7	4.7
Hawk A-5 #3	4/21/2011	9	54	32	3.6	6.0
Hawk A-5 #3	4/22/2011	9	51	20	2.2	5.7
Hawk A-5 #3	5/17/2011	7	51	26	3.7	7.3
Hawk A-5 #3	6/24/2011	8	50	24	3.0	6.3
Hawk A-5 #3	7/7/2011	7	50	25	3.6	7.1
Hawk A-5 #3	7/21/2011	7	51	26	3.7	7.3
Hawk A-5 #3	9/14/2011	5	51	25	5.0	10.2
Hawk A-5 #3	10/4/2011	5	51	25	5.0	10.2
Hawk A-5 #3	11/10/2011	8	46	24	3.0	5.8
Hawk A-5 #3	12/1/2011	7	39	37	5.3	5.6
Hawk A-5 #3	12/3/2011	5	39	37	7.4	7.8
Hawk A-5 #3	1/9/2012	5	42	32	6.4	8.4
Hawk A-5 #3	2/9/2012	4	41	14	3.5	10.3
Hawk A-5 #3	3/4/2012	4	39	13	3.3	9.8
Hawk A-5 #3	4/29/2012	5	39	5	1.0	7.8
Hawk A-5 #3	7/8/2012	16	37	15	0.9	2.3
Hawk A-5 #3	8/2/2012	15	40	26	1.7	2.7
Hawk A-5 #3	9/2/2012	7	39	12	1.7	5.6
Hawk A-5 #3	9/15/2012	12	39	27	2.3	3.3
Hawk A-5 #3	10/15/2012	12	37	24	2.0	3.1
Hawk A-5 #3	11/12/2012	13	40	26	2.0	3.1
Hawk A-5 #3	12/15/2012	7	37	25	3.6	5.3
Hawk A-5 #3	1/27/2013	7	37	25	3.6	5.3
Hawk A-5 #3	2/24/2013	10	40	26	2.6	4.0
Hawk A-5 #3	3/15/2013	8	40	26	3.3	5.0
Hawk A-5 #3	4/2/2013	3	30	3	1.0	10.0
Hawk A-5 #3	5/2/2013	3	20	5	1.7	6.7
Hawk A-5 #3	6/12/2013	5	35	9	1.8	7.0
Hawk A-5 #3	7/22/2013	3	33	8	2.7	11.0
Hawk A-5 #3	8/27/2013	5	36	3	0.6	7.2
Hawk A-5 #3	9/20/2013	5	35	6	1.2	7.0
Hawk A-5 #3	10/3/2013	7	46	8	1.1	6.6
Hawk A-5 #3	11/15/2013	5	38	21	4.2	7.6
Hawk A-5 #3	12/15/2013	6	37	24	4.0	6.2
Hawk A-5 #3	2/21/2014	8	26	18	2.3	3.3
Hawk A-5 #3	3/9/2014	3	26	8	2.7	8.7
Hawk A-5 #3	3/22/2014	3	26	5	1.7	8.7
Hawk A-5 #3	3/23/2014	4	29	5	1.3	7.3
Hawk A-5 #3	5/30/2014	6	39	20	3.3	6.5
Hawk A-5 #3	6/10/2014	6	40	20	3.3	6.7
Hawk A-5 #3	7/24/2014	5	36	18	3.6	7.2
Hawk A-5 #3	7/25/2014	4	38	19	4.8	9.5
Hawk A-5 #3	8/20/2014	5	32	21	4.2	6.4
Hawk A-5 #3	9/10/2014	4	30	18	4.5	7.5
Hawk A-5 #3	10/16/2014	4	29	20	5.0	7.3
Hawk A-5 #3	11/4/2014	3	28	18	6.0	9.3
Hawk A-5 #3	12/18/2014	4	31	18	4.5	7.8
Hawk A-5 #3	5/4/2015	4	34	6	1.5	8.5
Hawk A-5 #3	5/17/2015	4	32	3	0.8	8.0
Hawk A-5 #3	6/26/2015	4	31	12	3.0	7.8
Hawk A-5 #3	7/8/2015	3	24	14	4.7	8.0
Hawk A-5 #3	8/24/2015	5	34	11	2.2	6.8

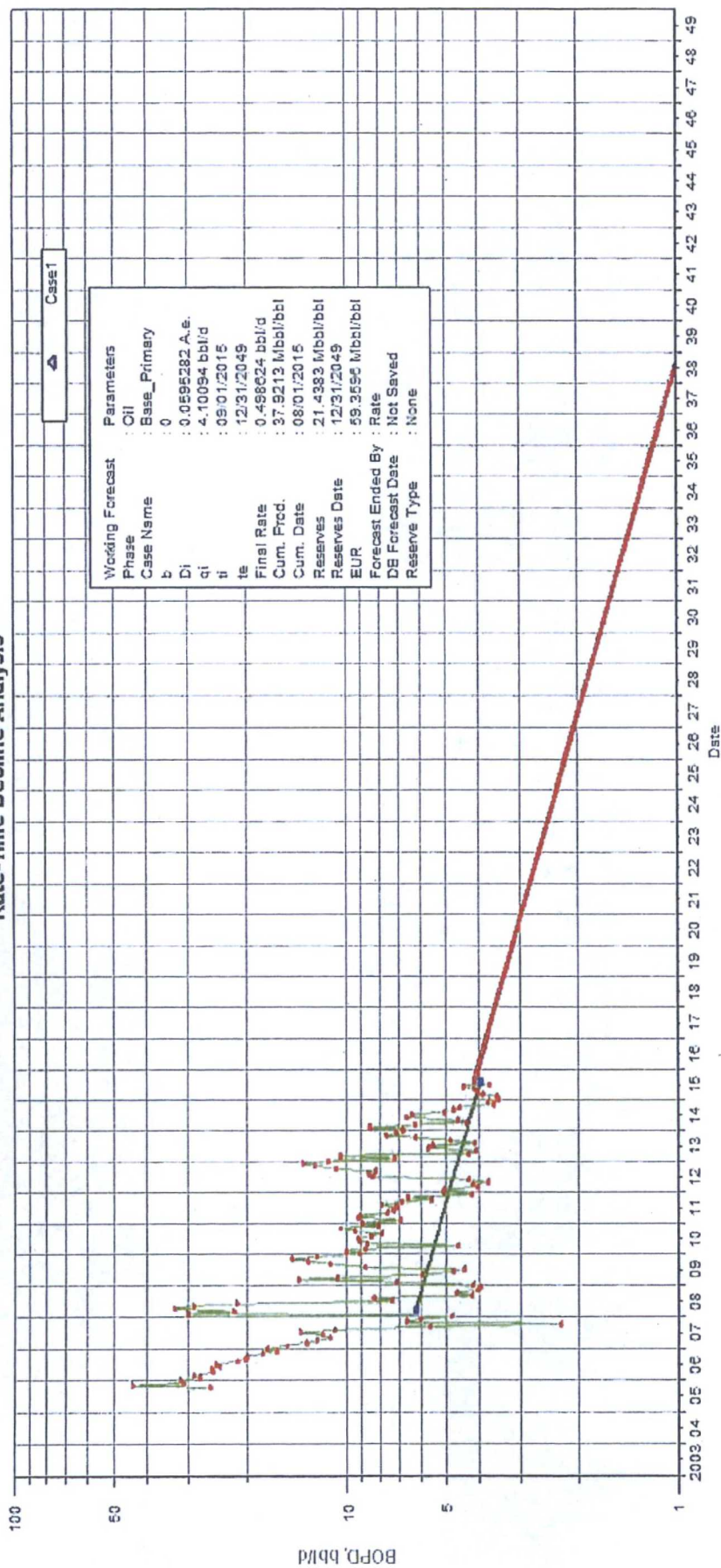


Hawk B-1 #69		
qi	91.3	BOPD
qf	1.0	BOPD
b	0.91	
di	20.8%	/Mo.
tf	302	Mo
Qf	51	MB
Hawk A-5 #3 (Abo)		
qi	36.8	BOPD
qf	1.0	BOPD
b	0.91	
di	20.8%	/Mo.
tf	135	Mo
Qf	17.2	MB

Well	h (ft)	Phi	Sw	SoPhiH (ft)
Hawk B-1 #69	33	0.112	0.293	2.61
Hawk A-5 #3	17	0.095	0.347	1.05

A11. Hawk A-5 #3 Blinebry, Tubb, and Drinkard Decline Analysis

Hawk A-5 #3 Decline Analysis Rate-Time Decline Analysis



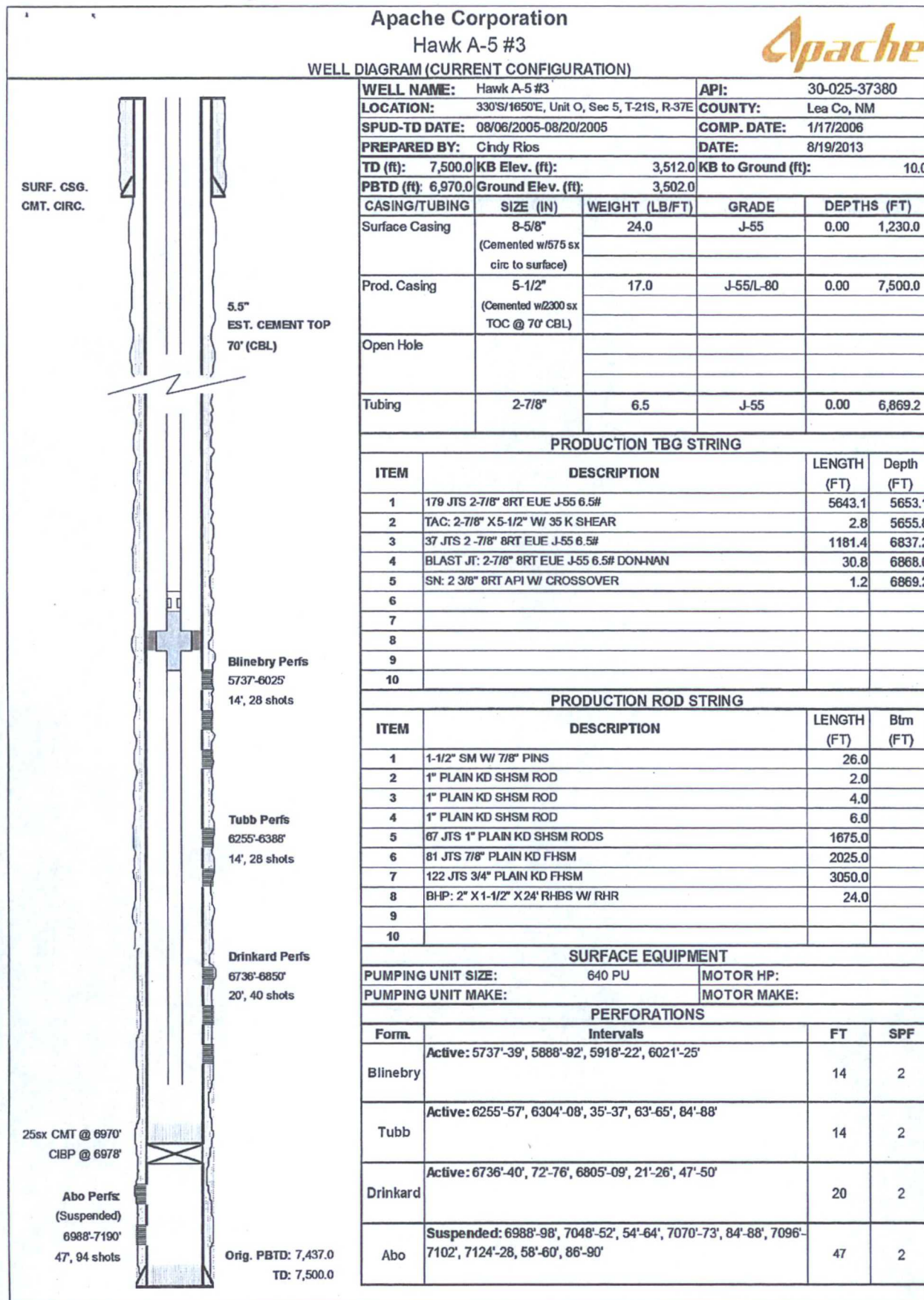
A7. Hawk B-1 #69 Monthly Production History

Hawk B-1 #69 Cumulative Abo Production		
Oil	Gas	Water
(BBL)	(MCF)	(BBL)
28,318	225,935	5,238

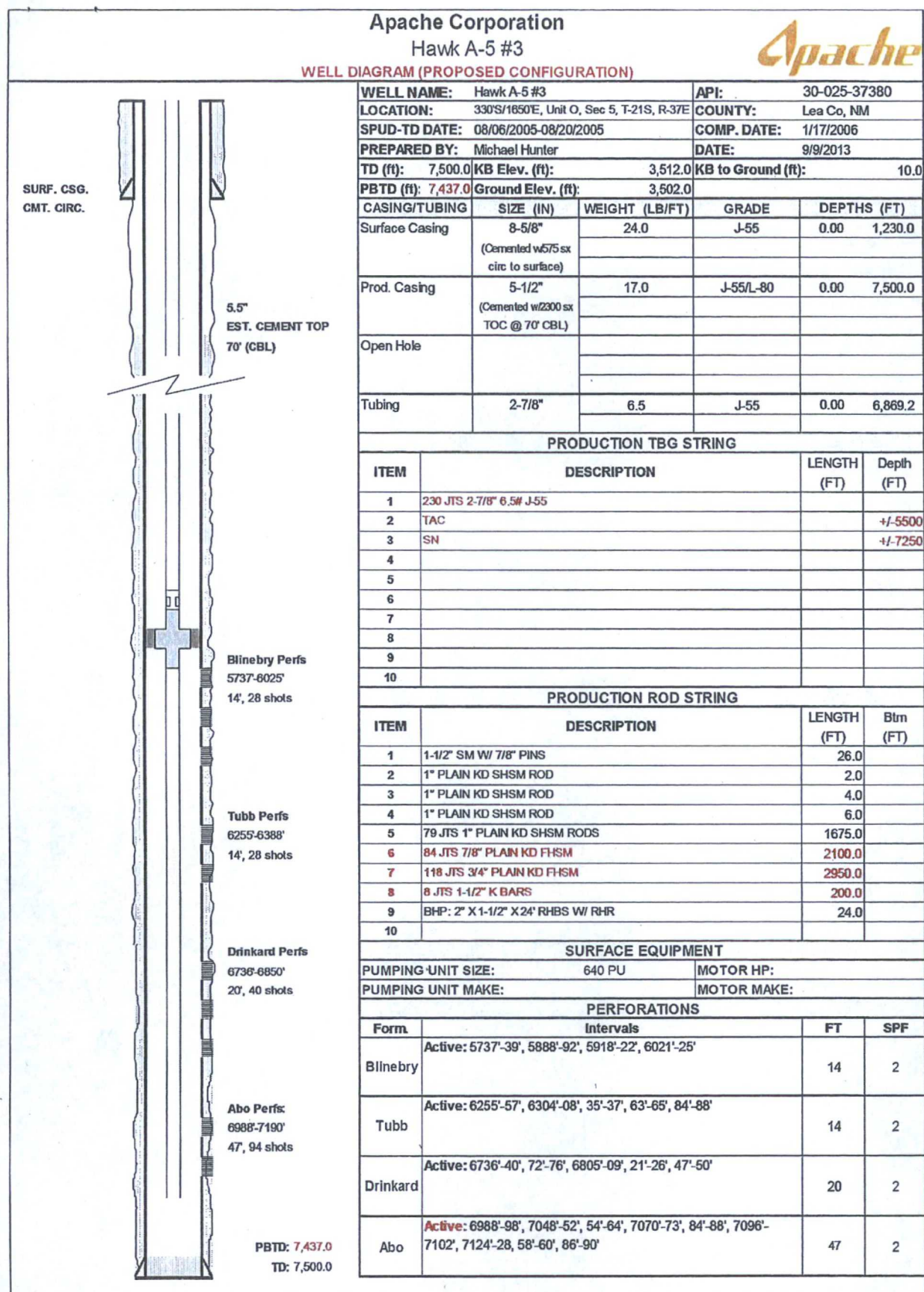
Hawk B-1 #69 Monthly Production					
Month	BOPD	MCFD	BWPD	GOR	WOR
Jun-12	74	119	65	1.6	0.9
Jul-12	96	314	29	3.3	0.3
Aug-12	51	210	2.42	4.1	0.0
Sep-12	41	162	1.6	4.0	0.0
Oct-12	32	132	1.22	4.1	0.0
Nov-12	48	176	10	3.7	0.2
Dec-12	41	403	2.19	9.8	0.1
Jan-13	38	205	2.1	5.4	0.1
Feb-13	33	240	5	7.3	0.2
Mar-13	31	169	1.44	5.5	0.0
Apr-13	29	163	4	5.6	0.1
May-13	26	166	1.21	6.4	0.0
Jun-13	24	173	0.41	7.2	0.0
Jul-13	23	176	0.55	7.7	0.0
Aug-13	21	178	0.37	8.5	0.0
Sep-13	16	169	0	10.6	0.0
Oct-13	20	184	0.68	9.2	0.0
Nov-13	19	198	0.78	10.4	0.0
Dec-13	21	161	1.03	7.7	0.0
Jan-14	15	153	0.54	10.2	0.0
Feb-14	15	128	29	8.5	1.9
Mar-14	19	181	13	9.5	0.7
Apr-14	16	203	0.43	12.7	0.0
May-14	16	186	0.06	11.6	0.0
Jun-14	12	177	0.03	14.8	0.0
Jul-14	12	183	0.02	15.3	0.0
Aug-14	14	180	0.03	12.9	0.0
Sep-14	12	179	0.03	14.9	0.0
Oct-14	12	177	0.03	14.8	0.0
Nov-14	11	171	0.03	15.5	0.0
Dec-14	15	168	0	11.2	0.0
Jan-15	10	174	0	17.4	0.0
Feb-15	12	176	0	14.7	0.0
Mar-15	11	179	0	16.3	0.0
Apr-15	8	184	0	23.0	0.0
May-15	8	184	0	23.0	0.0

Jun-15	9	181	0	20.1	0.0
Jul-15	6	189	0	31.5	0.0
Aug-15	7	190	0	27.1	0.0
Sep-15	7	187	0	26.7	0.0

A2. Current Wellbore Diagram



A3. Proposed Wellbore Diagram





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

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: 7/24/15

Sample ID: Hawk Fed. B1 #69

Percent Distilled

Temperature

IBP	116
5	179
10	225
20	309
30	385
40	467
50	555
60	595
70	620
80	675
90	718
EP	720

%Recovered = 93.0
% Residue = 3.0
% Loss = 4.0

Total Sulfur

API Gravity

Specific Gravity

RVP

0.284 wt. %

38.9

0.8303

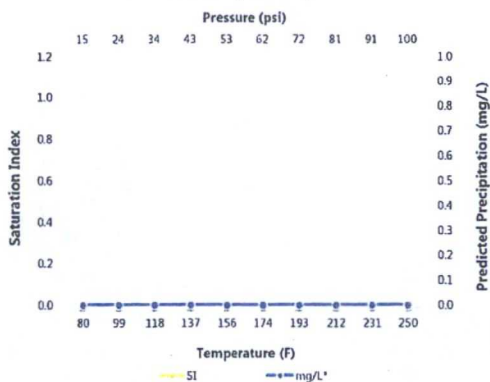
Distillation ASTM D 86

Sulfur ASTM D 4294

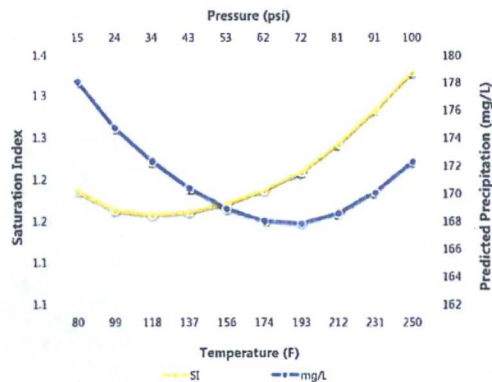
Gravity ASTM D 287

Vapor Pres ASTM D 323

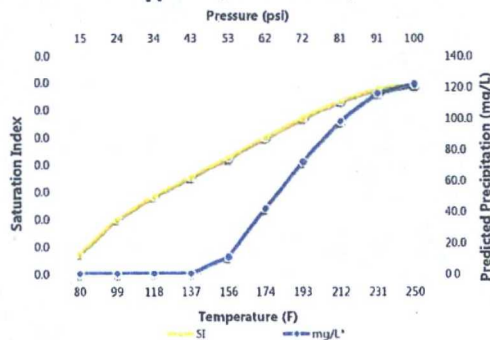
Barite (BaSO₄)



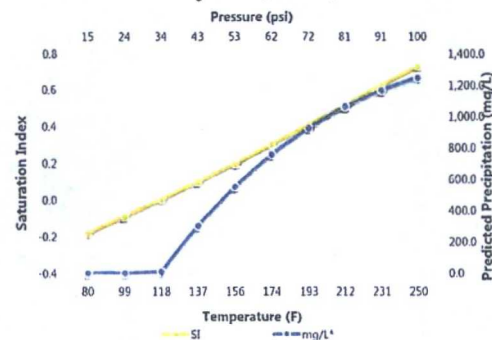
Calcite (CaCO₃)



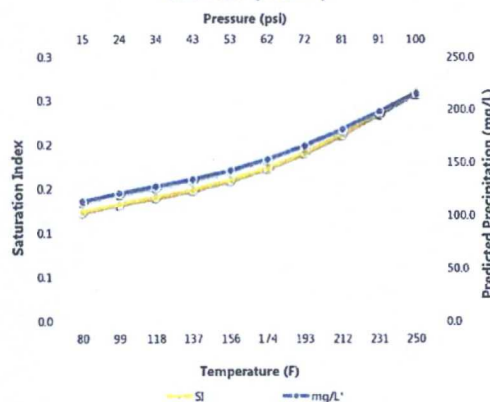
Gypsum (CaSO₄·2H₂O)



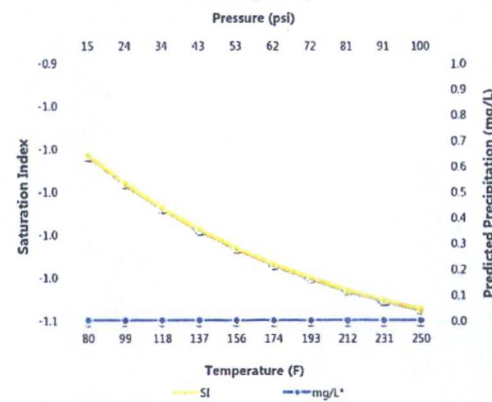
Anhydrite (CaSO₄)



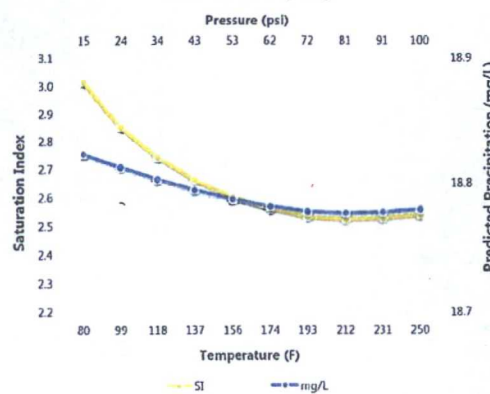
Celestite (SrSO₄)



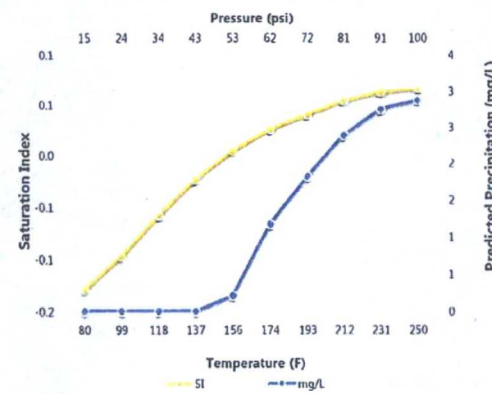
Halite (NaCl)



Iron Sulfide (FeS)



Iron Carbonate (FeCO₃)



SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FURTHER 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:	Blinberry 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

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: 6/26/15

Sample ID: Hawk A5 #9 Blinebry

Percent Distilled

Temperature

IBP	138
5	161
10	212
20	288
30	366
40	436
50	540
60	584
70	635
80	696
90	716
EP	

%Recovered = 92.0
% Residue = 4.0
% Loss = 4.0

Total Sulfur

API Gravity

Specific Gravity

RVP

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	ACCOUNT REP:	MIKE ONEY
DISTRICT:	NEW MEXICO	SAMPLE ID:	201501026173
AREA/LEASE:	WEST BLINEBERRY DRINKARD UNIT	SAMPLE DATE:	7/14/2015
SAMPLE POINT NAME	WBDU #28 WELLHEAD DISCHARGE	ANALYSIS DATE:	7/23/2015
SITE TYPE:	WELL SITES	ANALYST:	SAMUEL NEWMAN
SAMPLE POINT DESCRIPTION:	SWABBED FLUID/WORKOVER		

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

FIELD DATA			ANALYSIS OF SAMPLE					
			ANIONS:				CATIONS:	
				mg/L	meq/L		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				Aluminum (Al ³⁺):	ND	
Bicarbonate (HCO ₃ ⁻):	366.0	6.0				Chromium (Cr ³⁺):	ND	
Carbonate (CO ₃ ²⁻):	ND					Cobalt (Co ²⁺):	ND	
Hydroxide (OH ⁻):	ND					Copper (Cu ²⁺):	ND	
			ORGANIC ACIDS:	mg/L	meq/L	Molybdenum (Mo ²⁺):	ND	
aqueous CO ₂ (ppm):			100.0 Formic Acid:	ND		Nickel (Ni ²⁺):	ND	
aqueous H ₂ S (ppm):			170.0 Acetic Acid:	ND		Tin (Sn ²⁺):	ND	
aqueous O ₂ (ppb):			ND Propionic Acid:	ND		Titanium (Ti ²⁺):	ND	
			Butyric Acid:	ND		Vanadium (V ²⁺):	ND	
Calculated TDS (mg/L):			53861 Valeric Acid:	ND		Zirconium (Zr ²⁺):	ND	
Density/Specific Gravity (g/cm ³):						Total Hardness:	10558	N/A
Measured Specific Gravity								
Conductivity (mmhos):								
Resistivity:								
MCF/D:			No Data					
BOPD:			No Data					
BWPD:			No Data					
			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		0.000	0.58	43.786	-0.03	0.000	-0.25	0.000
99°F	24 psi		0.000	0.55	41.550	-0.02	0.000	-0.17	0.000
118°F	34 psi		0.000	0.55	40.600	-0.01	0.000	-0.07	0.000
137°F	43 psi		0.000	0.56	40.445	0.01	21.450	0.04	65.766
156°F	53 psi		0.000	0.59	40.936	0.03	67.464	0.15	244.626
174°F	62 psi		0.000	0.63	42.006	0.05	118.676	0.27	401.774
193°F	72 psi		0.000	0.67	43.602	0.08	172.593	0.40	535.347
212°F	81 psi		0.000	0.74	45.796	0.11	226.855	0.53	645.466
231°F	91 psi		0.000	0.81	48.409	0.13	279.329	0.66	733.767
250°F	100 psi		0.000	0.89	51.365	0.16	328.146	0.79	802.864

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	0.02	2.567	-2.15	0.000	4.06	25.679	0.47	17.067
99°F	24 psi	0.03	3.252	-2.17	0.000	3.88	25.676	0.50	17.799
118°F	34 psi	0.04	4.572	-2.18	0.000	3.76	25.674	0.54	18.773
137°F	43 psi	0.06	6.524	-2.19	0.000	3.68	25.672	0.59	19.726
156°F	53 psi	0.09	9.041	-2.19	0.000	3.63	25.671	0.63	20.604
174°F	62 psi	0.13	12.008	-2.20	0.000	3.60	25.670	0.68	21.405
193°F	72 psi	0.17	15.279	-2.19	0.000	3.59	25.670	0.72	22.139
212°F	81 psi	0.22	18.698	-2.19	0.000	3.61	25.671	0.76	22.881
231°F	91 psi	0.27	22.115	-2.19	0.000	3.64	25.672	0.81	23.579
250°F	100 psi	0.33	25.403	-2.18	0.000	3.69	25.673	0.85	24.229

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

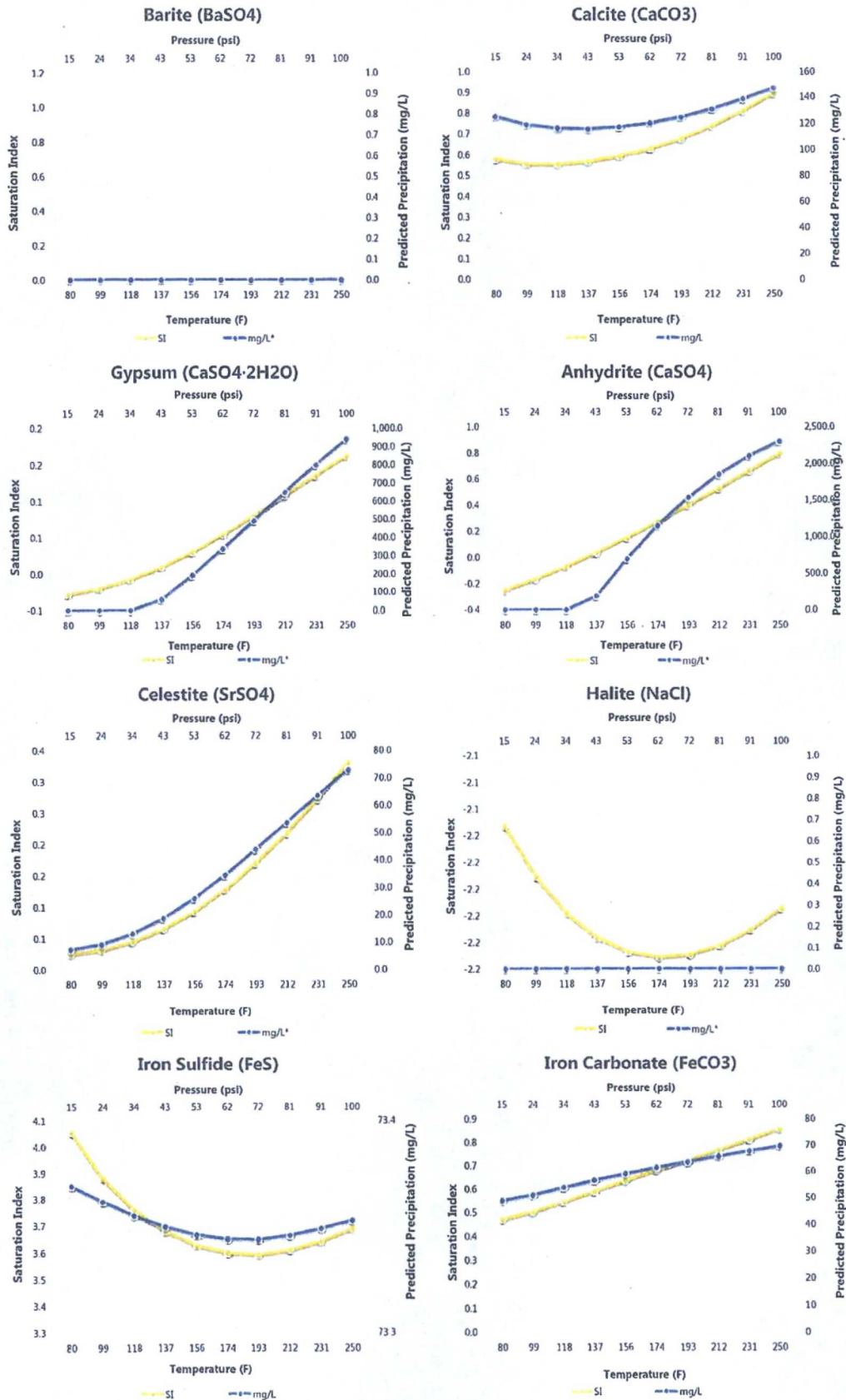
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

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

ScaleSoftPitzer™
SSP2010

Comments:

Blineberry formation



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
At 14.65 WET	1167.4
At 14.696 DRY	1191.8
At 14.696 WET	1171.5
At 14.73 DRY	1194.6
At 14.73 Wet	1173.9

Specific Gravity

Calculated 0.7013

Molecular Weight 20.3112

Z Factor (DRY) 0.9968

Z Factor (WET) 0.9964



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: 7/13/15

Sample ID: ~~Web DVC~~ 28 Drinkard

Percent Distilled

Temperature

IBP	98
5	148
10	192
20	243
30	302
40	375
50	461
60	524
70	569
80	605
90	631
EP	635

%Recovered = 94.0
% Residue = 5.0
% Loss = 1.0

Total Sulfur

API Gravity

Specific Gravity

RVP

1.104 wt. %

38.5

0.8323

Distillation ASTM D 86
Gravity ASTM D 287

Sulfur ASTM D 4294
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: 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:	mg/L	meq/L	CATIONS:
Initial Temperature (°F):			250 Chloride (Cl ⁻):	42232.5		1191.3 Sodium (Na ⁺):
Final Temperature (°F):			80 Sulfate (SO ₄ ²⁻):	1057.7		22.0 Potassium (K ⁺):
Initial Pressure (psi):			100 Borate (H ₃ BO ₃):	120.1		1.9 Magnesium (Mg ²⁺):
Final Pressure (psi):			15 Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):
pH:			Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):
pH at time of sampling:			Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):
SI Residual:	mg/L		6.8 Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):
Compound:	Total PO ₄		Phosphate (PO ₄ ³⁻):	ND		Manganese (Mn ²⁺):
Residual (ppm):			Silica (SiO ₂):	ND		Lead (Pb ²⁺):
ALKALINITY BY TITRATION:	mg/L	meq/L				Zinc (Zn ²⁺):
Bicarbonate (HCO ₃ ⁻):	244.0	4.0				Aluminum (Al ³⁺):
Carbonate (CO ₃ ²⁻):	ND					Chromium (Cr ³⁺):
Hydroxide (OH ⁻):	ND					Cobalt (Co ²⁺):
			ORGANIC ACIDS:	mg/L	meq/L	Copper (Cu ²⁺):
aqueous CO ₂ (ppm):			50.0 Formic Acid:	ND		Molybdenum (Mo ²⁺):
aqueous H ₂ S (ppm):			50.0 Acetic Acid:	ND		Nickel (Ni ²⁺):
aqueous O ₂ (ppb):			ND Propionic Acid:	ND		Tin (Sn ²⁺):
			Butyric Acid:	ND		Titanium (Ti ²⁺):
Calculated TDS (mg/L):			70355 Valeric Acid:	ND		Vanadium (V ²⁺):
Density/Specific Gravity (g/cm ³):						Zirconium (Zr ²⁺):
Measured Specific Gravity						
Conductivity (mmhos):						Total Hardness:
Resistivity:						
MCF/D:						
BOPD:						
BWPD:						

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	0.22	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		Celestine (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: 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.

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Comments:

Drinkard Formation



LABORATORY SERVICES
Natural Gas Analysis

www.permianls.com

575.397.3713 2609 W Marland Hobbs NM 88240

For: Apache Corporation
Attention: Jim White
P. O. Box 1849
Eunice, New Mexico 88231

Sample: Tubb Zone
Identification: Hawk A5 #9
Company: Apache Corporation
Lease:
Plant:

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

Sampled by: Kelly
Analysis by: Vicki McDaniel

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

W3DDA 28

Sample ID: Tubb Formation

<u>Percent Distilled</u>	<u>Temperature</u>		
IBP	100		
5	159		
10	204		
20	276	%Recovered =	93.0
30	366	% Residue =	6.0
40	441	% Loss =	1.0
50	515		
60	575		
70	639		
80	690		
90	718		
EP	720		

<u>Total Sulfur</u>	<u>API Gravity</u>	<u>Specific Gravity</u>	<u>RVP</u>
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:	mg/L	meq/L
Initial Temperature (°F):		250 Chloride (Cl ⁻):	43134.5	1216.8	Sodium (Na ⁺):	21557.2	938.1
Final Temperature (°F):		80 Sulfate (SO ₄ ²⁻):	1227.7	25.6	Potassium (K ⁺):	457.4	11.7
Initial Pressure (psf):		100 Borate (H ₃ BO ₃):	113.7	1.8	Magnesium (Mg ²⁺):	1181.1	97.2
Final Pressure (psf):		15 Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):	3971.3	198.2
		Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):	88.3	2.0
pH:		Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):	0.3	0.0
pH at time of sampling:		6.9 Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):	70.3	2.5
SI Residual:	mg/L	Phosphate (PO ₄ ³⁻):	ND		Manganese (Mn ²⁺):	2.7	0.1
Compound:	Total PO ₄	Silica (SiO ₂):	ND		Lead (Pb ²⁺):	ND	
Residual (ppm):					Zinc (Zn ²⁺):	1.9	0.1
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	N/A
Resistivity:	ND						
MCF/D:	No Data						
BOPD:	No Data						
BWPD:	No Data	Anion/Cation Ratio:		1.00			

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.

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SSP2010

Comments:

Tubbs Formation

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

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

David R. Catanach, Division Director
Oil Conservation Division



Administrative Order DHC-4645-A

Order Date: October 2, 2015

Application Reference Number: pMAM1527158958

Apache Corporation
303 Veterans Airpark Lane, Suite 3000
Midland, Tx 79705

Attention: Ms. Reesa Fisher

Hawk Federal A-5 Well No. 3
API No. 30-025-37380
Unit O, Section 5, Township 21 South, Range 37 East NMPM
Lea County, New Mexico

Pool	BLINEBRY OIL AND GAS (OIL)	Oil (6660)
Names:	DRINKARD	Oil (19190)
	WANTZ; ABO	Oil (62700)
	TUBB OIL AND GAS (OIL)	Oil (60240)

Reference is made to your recent application for an exception to Division Rule 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.

It appears that the subject well qualifies for approval for such exception pursuant to the provisions of Division Rule 19.15.12.11A. NMAC, and since 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 Division Rule 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.

As per the application, the assignment of allowable and allocation of oil and gas production from the subject well for the Blinebry Oil and Gas (Oil) Pool, Drinkard Pool, and Tubb Oil and Gas (Oil) Pool shall be based on the decline curve analysis of production of the subject well. Further, the Blinebry Oil and Gas (Oil) Pool, Drinkard Pool, and Tubb Oil and Gas (Oil) Pool allocation

percentages were based on DHC-0138 HOB, approved on March 3, 2006. The assignment of allowable and allocation of oil and gas production from the subject well for the Wantz; Abo Pool shall be based on the analysis of the historical production from surrounding wells in the same pool.

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

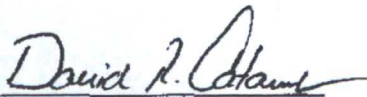
BLINEBRY OIL AND GAS (OIL) POOL	Pct. Oil: 16	Pct. Gas: 30
TUBB OIL AND GAS (OIL) POOL	Pct. Oil: 19	Pct. Gas: 6
DRINKARD POOL	Pct. Oil: 15	Pct. Gas: 0
WANTZ; ABO POOL	Pct. Oil: 50	Pct. Gas: 64

It is also understood that notice of this application, pursuant to Division Rule 19.15.4.12A.(6), is not required since the interest ownership between the zones to be commingled is common throughout.

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

This Order supersedes Division Order DHC-4645, issued on November 4, 2013.

Pursuant to Division Rule 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.



David R. Catanach
Director

DRC/mam

cc: New Mexico Oil Conservation Division – Hobbs
Bureau of Land Management - Carlsbad