

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OMB NO. 1004-0135  
Expires: July 31, 2010

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

**Carlsbad Field Office**  
**EOG Hobbs**

5. Lease Serial No.  
MNM02965A  
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  Other

8. Well Name and No.  
RATTLESNAKE 28 FED COM 704H

2. Name of Operator  
EOG RESOURCES INCORPORATED  
Contact: STAN WAGNER  
E-Mail: stan\_wagner@eogresources.com

9. API Well No.  
30-025-42876-00-X1

3a. Address  
MIDLAND, TX 79702

3b. Phone No. (include area code)  
Ph: 432-686-3689

10. Field and Pool, or Exploratory  
WC-025 G09 S263327G

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Sec 28 T26S R33E NWNE 730FNL 2100FEL

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

JUN 30 2016  
RECEIVED

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

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

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 recomplate 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 recompletion 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.)

EOG Resources intends to pump this previously discussed intermediate cement procedure for our approved casing design on this well.

The purpose of this sundry is to provide to BLM a detailed design and procedure for this job as attached. The job will be pumped within the next 5 days.

Also attached are results from the previously pumped job on the Hawk 26 Fed 709H for informational purposes.

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

- Please submit CBL to BLM CFO

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

**Electronic Submission #342815 verified by the BLM Well Information System  
For EOG RESOURCES INCORPORATED, sent to the Hobbs  
Committed to AFMSS for processing by MUSTAFA HAQUE on 06/24/2016 (16MH0006SE)**

|                                   |                          |
|-----------------------------------|--------------------------|
| Name (Printed/Typed) STAN WAGNER  | Title REGULATORY ANALYST |
| Signature (Electronic Submission) | Date 06/22/2016          |

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

|   |                                 |                 |
|---|---------------------------------|-----------------|
| Approved By (BLM Approver Not Specified) <u>Mustafa Haque</u>   | Title <b>PETROLEUM ENGINEER</b> | Date 06/24/2016 |
| 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    |

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 \*\***

*MHS/OCJ  
6/30/2014*

**Rattlesnake 28 Fed Com 704H  
30-025-42876  
EOG Resources, Inc  
Surface Location: Sec. 28, T. 26S, R. 33E  
Conditions of Approval**

**DRILLING**

- **Run GR/Cement Bond Log from at least 100' above 7 5/8" float collar to surface with 500 psi surface pressure.**
- **Submit Cement Bond Log (CBL) copy to BLM.**



**Rattlesnake 28 FC 704H**  
**Foam Cement Job Procedure**  
**June 22, 2016**

1. Drill 9-7/8" and 8-3/4" intermediate hole section to  $\pm 11,200'$  MD. TOH with 4-1/2" DP. LD BHA.
  - a. Note: 10-3/4" surface casing is set at 970' MD
  - b. 9-7/8" intermediate hole section will be drilled from SCP to  $\pm 8000'$  MD
  - c. 8-3/4" intermediate hole section will be drilled from 8000' to TD
  - d. Complete losses are expected at  $\pm 7300'$  MD
2. Install 7-5/8" casing rams in top section of double BOP. Test door seals to 1500 psi.
3. RIH with 7-5/8" casing as follows.
  - a. From TD to  $\pm 8000'$  - 7-5/8" 29.7# HCP110 Flushmax III - No centralizers
  - b. From  $\pm 8000'$  to Surface - 7-5/8" 29.7# HCP110 LTC - One centralizer every other joint
  - c. Maximum allowable pressure on 7-5/8" casing = 4000 psi
4. Kill well as needed by pumping 10 ppg BW down BS. Do not pump any weighted and/or viscosified mud down the 7-5/8" x 10-3/4" annulus.
5. Land 7-5/8" casing on shoulder with mandrel hanger.
6. Shut 7-5/8" casing rams. Monitor casing pressure. Pump pipe capacity using 9.0 ppg reused water (~600 bbls). Record final rate and pressure. Pump 50 bbls of 9.0 ppg RW down 10-3/4" x 7-5/8" annulus. Shut down and record final pump in rate, pressure and ISIP. Do not exceed 500 psi while pumping down BS.
7. RU foam cementing equipment that includes two fluid pump trucks, one N<sub>2</sub> pump truck, batch mixer and foam cement trailer. Check to make certain that the foam generator has a **10/64** choke bean installed. The first stage will be pumped conventionally down the 7-5/8" casing with the 7-5/8" rams CLOSED (no returns to surface). RU to pump second stage down both valves on the 10-3/4" x 7-5/8" annulus.
8. Make certain to check the chlorides, pH and temperature of the mix water as soon as the cementing company arrives on location. Mix water should be similar to water used for field blend test.

Fresh water required to mix cement:  
 $(40+63+40+229+40+5+134 = 551) \times 1.5 \sim 1000$  bbls

9. Pump FIRST STAGE as follows:

| First Stage Cement Slurry Design Criteria |   |
|---|---|
| Previous Casing:                          | 10-3/4" 40.5# J55 STC set at 970' MD  |
| Bit Size:                                 | 9.875" from SCP to ±8000' MD, 8.750" from ±8000' to TD                                      |
| BHST:                                     | 177 °F  |
| BHCT:                                     | 135 °F  |
| Cement Volumes Based on:                  | 10.47" AHS from SCP to 6500', 10" AHS from 6500' to 8000', 9" AHS from 8000' to TD          |
| Excess added to AHS volumes:              | 25%   |
| TOC:                                      | 7300' (Note: Complete LC expected at ±7300')  |
| Pump Schedule                             |   |
| Pressure Test:                            | Pressure test lines to 4000 psi, Set fluid pumps to kick out at 3000 psi                    |
| Spacer:                                   | 40 bbls of fresh water  |
| Tail Cement:                              | 50:50 Class H:Poz + 0.25% CPT20A + 0.40% CPT49 + 0.20% CPT35 + 0.80% CPT16A + 0.25% CPT503P |
| Displacement:                             | Drop plug → 20 bbls fresh water → ±472 bbls reused water → ±20 bbls fresh water             |

| First Stage Cement Slurry Properties |                            |                             |          |
|--------------------------------------|----------------------------|-----------------------------|----------|
| Estimated Volume:                    | 550 Sacks                  | 300 Reading:                | 79 Rpm   |
| Density:                             | 14.4 Ppg                   | 200 Reading:                | 56 Rpm   |
| Yield:                               | 1.20 ft <sup>3</sup> /sack | 100 Reading:                | 37 Rpm   |
| Mix Water:                           | 4.81 gal/sack              | 6 Reading:                  | 12 Rpm   |
| Total Mixing Water:                  | 63 Bbls                    | 3 Reading:                  | 11 Rpm   |
| Thickening Time:                     | 3.07 hrs.min               | 8 hr Compressive Strength:  | Psi      |
| Free Water:                          | 0 %                        | 24 hr Compressive Strength: | 1351 Psi |
| Fluid Loss:                          | 22 ml/ 30 min              | 48 hr Compressive Strength: | 2186 Psi |
| <b>Top of cement:</b>                | <b>7300 Feet</b>           | Compressive Strengths @     | 177 °F   |

10-3/4" 40.5# J55 Burst = 3130 psi, Collapse = 1580 psi

7-5/8" 29.7# HCP110 LTC Burst = 9470 psi, Collapse = 7150 psi, JS = 769 kips

7-5/8" 29.7# HCP110 Flushmax III Burst = 7574 psi, Collapse = 5350 psi, JS = 563 kips

10. Back-out landing joint. Install and pressure test pack-off bushing.
11. Continue WOC until the first stage cement has had at least 4 hours of time since bumping plug.
12. Close blind rams. Pressure up on the inside of the 7-5/8" casing to 500 psi and maintain throughout cement job.
13. RU to pump down the 10-3/4" x 7-5/8" annulus. Pump at least 50 bbls of RW down annulus. Shut down and record final pump rate, pressure and ISIP.
14. Pump SECOND STAGE as follows:
  - a. Try not exceed the following pressures while pumping the noted fluid weights.
    - i. 1500 psi - 14.8 ppg + N<sub>2</sub>
    - ii. 1000 psi - 14.8 ppg + 0 scf/bbl N<sub>2</sub>

| Second Stage Cement Slurry Design Criteria |  |
|--|--|
| Previous Casing:                           | 10-3/4" 40.5# J55 STC set at 970'  |
| Bit Size:                                  | 9.875" from SCP to 8000' MD, 8.750" from 8000' to TD                     |
| BHST:                                      | 140 °F   |
| BHCT:                                      | 108 °F   |
| Cement Volumes Based on:                   | 10.47' AHS from SCP to 6500', 10" AHS from 6500' to 7300'                |
| Excess added to AHS volumes:               | 50%  |
| TOC:                                       | Surface  |
| Pump Schedule                              |  |
| Pressure Test:                             | Pressure test lines to 2500 psi, Set fluid pumps to kick out at 2000 psi |
| Cement:                                    | Class C + 5% Gypsum + 3% CaCl <sub>2</sub> + 0.1 gps Plexfoam 7          |

| Second Stage Cement Slurry Properties |                            |                             |          |
|---------------------------------------|----------------------------|-----------------------------|----------|
| Estimated Volume:                     | 1450 Sacks                 | 300 Reading:                | 138 Rpm  |
| Density:                              | 14.8 Ppg                   | 200 Reading:                | 115 Rpm  |
| Yield:                                | 1.42 ft <sup>3</sup> /sack | 100 Reading:                | 88 Rpm   |
| Mix Water:                            | 6.62 gal/sack              | 6 Reading:                  | 19 Rpm   |
| Total Mixing Water:                   | 229 Bbls                   | 3 Reading:                  | 14 Rpm   |
| Thickening Time:                      | 1:27 hrs:min               | 8 hr Compressive Strength:  | 811 Psi  |
| Free Water:                           | 0 %                        | 12 hr Compressive Strength: | 1280 Psi |
| Fluid Loss:                           | 417 ml/ 30 min             | 24 hr Compressive Strength: | 2262 Psi |
| Top of cement:                        | 0 Feet                     | Compressive Strengths @     | 80 °F    |

15. The following volumes will be pumped down the 10-3/4" x 7-5/8" annulus.

| Stage     | Density ppg | Base Slurry Volume Bbls | Cumulative Cement Bbls | Base Slurry Rate Bpm | N2 SCFPB Base Slurry | N2 SCF/Min | Total Stage N2 SCF | Foamer Rate GPM | Foamer Volume Gals | Cum Foamer Gals | Cum N2 SCF | Tot Min |
|-----------|-------------|-------------------------|------------------------|----------------------|----------------------|------------|--------------------|-----------------|--------------------|-----------------|------------|---------|
| Spacer    | 8.4         | 50                      | 0                      | 4                    | 0                    | 0          | 0                  | 0.00            | 0.0                | 0               | 0          |         |
| Foam 1    | 14.8        | 13                      | 13                     | 4                    | 650                  | 2600       | 8450               | 1.6             | 5.2                | 5.2             | 8450       | 3.25    |
| Foam 2    | 14.8        | 13                      | 26                     | 4                    | 625                  | 2500       | 8125               | 1.6             | 5.2                | 10.4            | 16575      | 6.50    |
| Foam 3    | 14.8        | 16                      | 42                     | 4                    | 600                  | 2400       | 9600               | 1.6             | 6.4                | 16.8            | 26175      | 10.5    |
| Foam 4    | 14.8        | 16                      | 58                     | 4                    | 575                  | 2300       | 9200               | 1.6             | 6.4                | 23.2            | 35375      | 14.5    |
| Foam 5    | 14.8        | 16                      | 74                     | 4                    | 550                  | 2200       | 8800               | 1.6             | 6.4                | 29.6            | 44175      | 18.5    |
| Foam 6    | 14.8        | 16                      | 90                     | 4                    | 525                  | 2100       | 8400               | 1.6             | 6.4                | 36.0            | 52575      | 22.5    |
| Foam 7    | 14.8        | 16                      | 106                    | 4                    | 500                  | 2000       | 8000               | 1.6             | 6.4                | 42.4            | 60575      | 26.5    |
| Foam 8    | 14.8        | 16                      | 122                    | 4                    | 475                  | 1900       | 7600               | 1.6             | 6.4                | 48.8            | 68175      | 30.5    |
| Foam 9    | 14.8        | 16                      | 138                    | 4                    | 450                  | 1800       | 7200               | 1.6             | 6.4                | 55.2            | 75375      | 34.5    |
| Foam 10   | 14.8        | 16                      | 154                    | 4                    | 400                  | 1600       | 6400               | 1.6             | 6.4                | 61.6            | 81775      | 38.5    |
| Foam 11   | 14.8        | 32                      | 186                    | 4                    | 375                  | 1500       | 12000              | 1.6             | 12.8               | 74.4            | 93775      | 46.5    |
| Foam 12   | 14.8        | 36                      | 222                    | 4                    | 350                  | 1400       | 12600              | 1.6             | 14.4               | 88.8            | 94375      | 55.5    |
| Foam 13   | 14.8        | 36                      | 258                    | 4                    | 275                  | 1100       | 9900               | 1.6             | 14.4               | 103.2           | 104275     | 64.5    |
| Foam 14   | 14.8        | 36                      | 294                    | 4                    | 175                  | 700        | 6300               | 1.6             | 14.4               | 117.6           | 110575     | 73.5    |
| Foam 15   | 14.8        | 32                      | 326                    | 4                    | 100                  | 400        | 3200               | 1.6             | 12.8               | 130.4           | 113775     | 81.5    |
| Tail      | 14.8        | 21                      | 347                    | 4                    | 0                    | 0          | 0                  | 0               | 0                  |                 | 113775     |         |
| Fresh Wtr | 8.4         | 5                       |                        |                      |                      |            |                    |                 |                    |                 |            |         |

14.8 ppg foamed cement is being foamed down to a 10.0 ppg

Foamer+Stabilizer rate = 0.4 gal/bbl

1 bpm = 0.4 gal/min  
2 bpm = 0.8 gal/min  
3 bpm = 1.2 gal/min  
4 bpm = 1.6 gal/min  
5 bpm = 2.0 gal/min

16. Displace the foam cement with 5 bbls of fresh water.
17. Monitor the shut-in pressure on the 10-3/4" x 7-5/8" annulus for 4 hours. Continue normal rig activities while WOC. Bleed off pressure on the inside of the 7-5/8" casing. Change out rams and pressure test BOPE.
18. If the pressure remains positive (>0 psi), RDMO cementing equipment.
19. If the pressure is not positive and the well is on a vacuum.
  - a. Make certain to have at least 850 sx (200 bbls) of Class C + 2% CaCl<sub>2</sub> "top off" cement on location.
  - b. Pressure up on the inside of the 7-5/8" casing to 500 psi and maintain while pumping cement.
  - c. After waiting at least 4 hours from bumping the plug, fill the 10-3/4" x 7-5/8" annulus with 14.8 ppg class C + 2% CaCl<sub>2</sub> cement to surface. Flush lines with 4 bbls of fresh water. Do not exceed 1000 psi.
  - d. Record the amount of cement required to fill annulus.
  - e. Bleed the casing off of the inside of the 7-5/8" casing.
  - f. RDMO cementers.
20. Continue on with normal drilling operations for at least 48 hours to allow cement to obtain maximum compressive strength.
21. If required as a COA for the BLM, run a GR/Cement Bond log from at least 100' above the 7-5/8" float collar to surface with 500 psi surface pressure.
22. Send CBL to the BLM.



# Cementing Post Job Report

EOG – Hawk 26 Fed 709H

Intermediate Casing

Submitted By: Joe Huwel

Cell: 281.723.3126

Email: [joe.huwel@nineenergyservice.com](mailto:joe.huwel@nineenergyservice.com)

Date: June 21, 2016

300 W 7th St Ste 1500  
 Fort Worth, TX 76102  
 (817) 984-5100  
**CREST**  
 PUMPING TECHNOLOGIES  
 P.O. Box 117  
 Jacksboro, TX 76458  
 (940) 567-3392

CUSTOMER: EOG Resources  
 LEASE: Hawk 26 Fed  
 JOB TYPE: DV Intermediate

TICKET NO: 153577  
 WELL NUMBER: 709H  
 DATE: 6/18/2016

## Cement Job Log

| DATE                                 | TIME       | DESCRIPTION            | RATE (BPM) | VOLUME (BBL)                   | PRESSURE (PSI)     |                    | DETAILS OF OPERATION AND PROCEDURES |           |                     |      |                                       |
|--------------------------------------|------------|------------------------|------------|--------------------------------|--------------------|--------------------|-------------------------------------|-----------|---------------------|------|---------------------------------------|
|                                      |            |                        |            |                                | TUBING             | CASING             |                                     |           |                     |      |                                       |
| 6/18/2016                            | 1900       | Requested              |            |                                |                    |                    |                                     |           |                     |      | Time Requested On Location            |
| 6/18/2016                            | 1845       | Arrived                |            |                                |                    |                    |                                     |           |                     |      | Time Arrived On Location              |
| 6/18/2016                            | 1910       | Assessment             |            |                                |                    |                    |                                     |           |                     |      | Rig RIH W/ Casing 600' From TD        |
| 6/18/2016                            | 1915       | JSA Meeting            |            |                                |                    |                    |                                     |           |                     |      | Pre Rig Up JSA Meeting W/ Crest       |
| 6/18/2016                            | 1920       | Rig Up Equip.          |            |                                |                    |                    |                                     |           |                     |      | Spot Equipment / Rig Up Ground        |
| 6/18/2016                            | 2010       | Casing @ TD            |            |                                |                    |                    |                                     |           |                     |      | Casing On Bottom / Rig Circulating    |
| 6/18/2016                            | 2130       | JSA Meeting            |            |                                |                    |                    |                                     |           |                     |      | Pre Job JSA Meeting W/ All Parties    |
| 6/18/2016                            | 2142       | Test Held              | 1.5        | 2                              |                    |                    | X                                   |           |                     |      | Prime / Test Lines To 5,000psi        |
| 6/18/2016                            | 2145       | Pump Spacer            | 6.5        | 20                             |                    |                    | 640                                 |           |                     |      | Start Fresh H2O Spacer Ahead          |
| 6/18/2016                            | 2148       | Pump Cement            | 7.4        | 118                            |                    |                    | 1,140                               |           |                     |      | Start 550sxs Single Slurry @14.4ppg   |
| 6/18/2016                            | 2207       | Drop Plug              | X          | X                              |                    |                    | X                                   |           |                     |      | Shut Down / Drop Antelope Top Plug    |
| 6/18/2016                            | 2210       | Displacement           | 8.1        | 415                            |                    |                    | 500                                 |           |                     |      | Start Fresh H2O Displacement          |
| 6/19/2016                            | 0007       | Displacement           | 8.2        | 76                             |                    |                    | 660-1910                            |           |                     |      | Caught Hydrostatic Lift Pressure      |
| 6/19/2016                            | 0016       | Displacement           | 3.6        | 20                             |                    |                    | 1,550                               |           |                     |      | Slow Rate To Land Plug                |
| 6/19/2016                            | 0022       | Plug Down              | X          | X                              |                    |                    | 2,100                               |           |                     |      | Land Antelope Top Plug                |
| 6/19/2016                            | 30 Minutes | Casing Test            |            | X                              |                    |                    | 2,100                               |           |                     |      | Hold 2,000psi For Casing Test         |
| 6/19/2016                            | 0052       | Test Passed            |            |                                |                    |                    | PASS                                |           |                     |      | Test Passed Pressure Held 30min       |
| 6/19/2016                            | 0053       | Floats Held            |            |                                |                    |                    | Good                                |           |                     |      | Check Floats (3.5bbls Back)           |
| 6/19/2016                            | 0110       | Rig Down Equip         |            |                                |                    |                    |                                     |           |                     |      | Rig Down Cement Head / Rig Floor      |
| 6/19/2016                            | 0230       | Rig Up Equip.          |            |                                |                    |                    |                                     |           |                     |      | Rig Up Iron To Backside Casing Valves |
| 6/19/2016                            | X          | Wait On Cement         |            |                                |                    |                    |                                     |           |                     |      | Wait On 1st Stage Cement To Cure      |
| <b>Engineer</b>                      |            | <b>Supervisor</b>      |            | <b>Casing Tools</b>            |                    |                    |                                     | <b>SX</b> |                     |      |                                       |
| Joe Huwel                            |            | Bryan Besselaar        |            | <b>Manufacturer</b>            | <b>Description</b> | <b>Depth</b>       |                                     | YLD       |                     |      |                                       |
|                                      |            | Don Kidd               |            |                                |                    |                    |                                     | H2O       |                     |      |                                       |
| <b>Cement</b>                        |            | <b>Injection Skid</b>  |            |                                |                    |                    |                                     | PPG       |                     |      |                                       |
| Kamrin Almond                        |            | Richard Smith          |            |                                |                    |                    |                                     |           |                     |      |                                       |
| 110038                               |            | Unit 1402              |            | <b>Customer Supplied Plugs</b> |                    |                    |                                     |           |                     |      |                                       |
| <b>Operator</b>                      |            | <b>Bulk</b>            |            | <b>Manufacturer</b>            | <b>Bottom</b>      | <b>Top</b>         |                                     |           |                     |      |                                       |
| Brian Gentry                         |            | Dasmon J               |            | <i>Antelope</i>                |                    | X                  |                                     |           |                     |      |                                       |
| DP-22                                |            | 2072-3324              |            | <i>Non-Rotating</i>            |                    |                    |                                     |           |                     |      |                                       |
| <b>Operator</b>                      |            | <b>Bulk</b>            |            |                                |                    |                    |                                     |           |                     |      |                                       |
| Dasmond Jones                        |            | Harry Stevens          |            | <b>Mud Info</b>                |                    | <b>Water Test</b>  |                                     |           |                     |      |                                       |
| DP-19                                |            | 2086-3315              |            | Type                           | F/W                | Ph                 | 7                                   | 550       | SX                  |      | 50/50 Poz H                           |
| <b>Batch Mixer / Blender</b>         |            | <b>Bulk</b>            |            | PPG                            | 8.4                | Chldr              | 300                                 | 1.2       | YLD                 | 0.25 | % CPT-503p                            |
| Roy Garcia                           |            | Anthony V.             |            |                                |                    | Temp               | 96                                  | 4.82      | H2O                 | 0.6  | % CPT-16 A                            |
| BM 4404                              |            | 2063-3309              |            |                                |                    | Sulf               | 200                                 | 14.4      | PPG                 | 0.2  | % CPT-35                              |
| <b>Hole &amp; Casing Information</b> |            | <b>Previous Casing</b> |            |                                |                    |                    |                                     |           |                     | 0.4  | % CPT-49                              |
| Hole Size #1:                        | 9 7/8      |                        |            |                                |                    | TOTAL HOLE DEPTH   | 11,195                              |           |                     | 0.2  | % CPT-20A                             |
| Hole Size #2:                        | 8 3/4      | TD                     | 1,358      |                                |                    |                    |                                     |           |                     |      |                                       |
| Casing Size:                         | 7 5/8      |                        | 10 3/4     |                                |                    | TOTAL PIPE DEPTH   | 11,167                              |           |                     |      |                                       |
| Casing Wt.:                          | 29.7#/ft   |                        | 40.5#/ft   |                                |                    |                    |                                     |           |                     |      |                                       |
| Casing ID:                           | 6.875      |                        |            |                                |                    | SHOE JOINT         | 42.70                               |           |                     |      |                                       |
| Grade:                               | P-110      |                        |            |                                |                    |                    |                                     |           |                     |      |                                       |
| DP/Tub Size:                         |            |                        |            |                                |                    | DISPLACEMENT POINT | 11,124                              | 510.60    | BBLs                |      |                                       |
| DP/Tub Weight                        |            |                        |            |                                |                    |                    |                                     |           |                     |      |                                       |
| DP/Tub ID:                           |            |                        |            |                                |                    |                    |                                     |           |                     |      |                                       |
| TOTAL FLUID PUMPED                   |            |                        | 651        | BBL                            |                    | BURST PRESSURE     | 7,576                               | 9470      | Book Burst Pressure |      |                                       |

|  |                                  |                          |
|--|----------------------------------|--------------------------|
| Ft. Worth, TX 76102<br>(817) 484-5100<br><br>P.O. Box 117<br>Jacksboro, TX 76458<br>(840) 567-3392 | CUSTOMER: <u>EOG Resources</u>   | TICKET NO: <u>153577</u> |
|  | LEASE: <u>Hawk 26 Fed</u>        | WELL NUMBER: <u>709H</u> |
|  | JOB TYPE: <u>DV Intermediate</u> | DATE: <u>6/18/2016</u>   |

## Cement Job Log (Continued 2)

| DATE              | TIME            | DESCRIPTION                    | RATE (BPM)              | VOLUME (BBL) | PRESSURE (PSI) |            | DETAILS OF OPERATION AND PROCEDURES                                 |   |                  |
|-------------------|-----------------|--------------------------------|-------------------------|--------------|----------------|------------|---|---|------------------|
|                   |                 |                                |                         |              | TUBING         | CASING     |   |   |                  |
| 6/19/2016         | 0432            | Test Valves                    |                         |              |                |            | Test Casing Valves To 3,000psi                                      |   |                  |
| 6/19/2016         | 0434            | Test Lines                     |                         |              |                |            | Test Lines To 5,000psi  |   |                  |
| 6/19/2016         | 0457            | Establish Rate                 | 5.1                     | 50           |                | 200        | Start Injection Rate Test W/ Fresh H2O                              |   |                  |
| 6/19/2016         | 0508            | Injection Rate                 |                         |              |                |            | Injection Test Passed 5bpm @200psi                                  |   |                  |
| 6/19/2016         | 0516            | Mixing Cement                  |                         |              |                |            | Batch Mix Lead Cement To 14.8ppg                                    |   |                  |
| 6/19/2016         | 0528            | N2 Rate 2,500                  | 4.3                     | 13           |                | 990        | Start 1,460sxs Nitrified Foamed Lead Cement @14.8ppg                |   |                  |
| 6/19/2016         | 0531            | N2 Rate 2,300                  | 4.3                     | 13           |                | 1,140      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0535            | N2 Rate 2,200                  | 4.3                     | 16           |                | 1,210      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0539            | N2 Rate 2,060                  | 4.3                     | 16           |                | 1,330      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0543            | N2 Rate 1,900                  | 4.3                     | 16           |                | 1,420      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0546            | N2 Rate 1,700                  | 4.3                     | 16           |                | 1,490      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0550            | N2 Rate 1,600                  | 4.3                     | 36           |                | 1,380      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0558            | N2 Rate 1,500                  | 4.3                     | 36           |                | 1,640      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0606            | N2 Rate 1,400                  | 4.3                     | 36           |                | 1,710      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0615            | N2 Rate 1,000                  | 4.3                     | 36           |                | 1,690      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0623            | N2 Rate 1,000                  | 4.3                     | 24           |                | 1,410      | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0629            | N2 Rate 900                    | 4.3                     | 24           |                | 940        | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0633            | N2 Rate 700                    | 2.3                     | 23           |                | 600        | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0643            | N2 Rate 600                    | 2.4                     | 22           |                | 490        | N2 Lead Cement Rate And Pressure                                    |   |                  |
| 6/19/2016         | 0652            | N2 Off Line                    | 3.1                     | 21           |                | 410        | Pump Lead Cap Cement @14.8ppg                                       |   |                  |
| 6/19/2016         | 0659            | Displacement                   | 1.9                     | 4            |                | 190        | Start Displacement W/ Biocide Correplex Inhibitor Treated Fresh H2O |   |                  |
| 6/19/2016         | 0701            | Shut Down                      |                         |              |                | 0          | Shut Down / Monitor Annular Pressure                                |   |                  |
| 6/19/2016         | 0716            | Test Complete                  |                         |              |                | 0          | Monitoring Complete Pressure 0psi                                   |   |                  |
| 6/19/2016         | X               | Waiting On Rig                 |                         |              |                |            | Wait On Wire Line Temperature Survey                                |   |                  |
| 6/19/2016         | 1400            | Temp Survey                    |                         |              |                |            | Wire Line Survey Results TOC @740'                                  |   |                  |
| 6/19/2016         | 1432            | Top Out CMT                    | 2.6                     | 56           |                | 140        | Start 850sxs TopOut Cement @14.8ppg                                 |   |                  |
| 6/19/2016         | 1456            | Displacement                   |                         |              |                | 380        | Cement Squeezed Off W/ 235sxs Gone                                  |   |                  |
| 6/19/2016         | 1457            | Displacement                   | 1.8                     | 4            |                | 450        | Start Displacement W/ Biocide Correplex Inhibitor Treated Fresh H2O |   |                  |
| 6/19/2016         | 1459            | Shut Down                      | Pressure Held For 10min |              |                | 410        | Shut Down / Monitor Annular Pressure                                |   |                  |
| 6/19/2016         | 1510            | Rig Dwn Equip                  |                         |              |                |            | Rig Down Cementing Equipment  |   |                  |
| 6/19/2016         | 1740            | Departure                      |                         |              |                |            | Depart EOG Resources Location                                       |   |                  |
| <b>Supervisor</b> | <b>Bulk</b>     | <b>Casing Tools</b>            |                         |              | <b>1460</b>    | <b>SX</b>  | <b>Class C Cement</b>   |   |                  |
| Joe Huwel         | Bryan Besselaar | <b>Manufacturer</b>            | <b>Description</b>      | <b>Depth</b> | 1.42           | <b>YLD</b> | 5   | % | Gypsum           |
|                   | Don Kidd        |                                |                         |              | 6.62           | <b>H2O</b> | 3   | % | Calcium Chloride |
| <b>Cementer</b>   | <b>Bulk</b>     |                                |                         |              | 14.8           | <b>PPG</b> | 0.1   | % | CPT-7            |
| Kamrin Almond     | Richard Smith   |                                |                         |              |                |            |   |   |                  |
| 110038            | Unit 1402       | <b>Customer Supplied Plugs</b> |                         |              |                |            |   |   |                  |
| <b>Operator</b>   | <b>Bulk</b>     | <b>Manufacturer</b>            | <b>Bottom</b>           | <b>Top</b>   |                |            |   |   |                  |
| Brian Gentry      | Dasmon J        |                                |                         |              |                |            |   |   |                  |
| DP-22             | 2072-3324       |                                |                         |              |                |            |   |   |                  |
| <b>Operator</b>   | <b>Bulk</b>     |                                |                         |              |                |            |   |   |                  |
| Dasmond Jones     | Harry Stevens   | <b>WATER TEST</b>              |                         |              |                |            |   |   |                  |
| DP-19             | 2086-3315       | Ph                             |                         |              | <b>850</b>     | <b>SX</b>  |   |   | Class C Cement   |

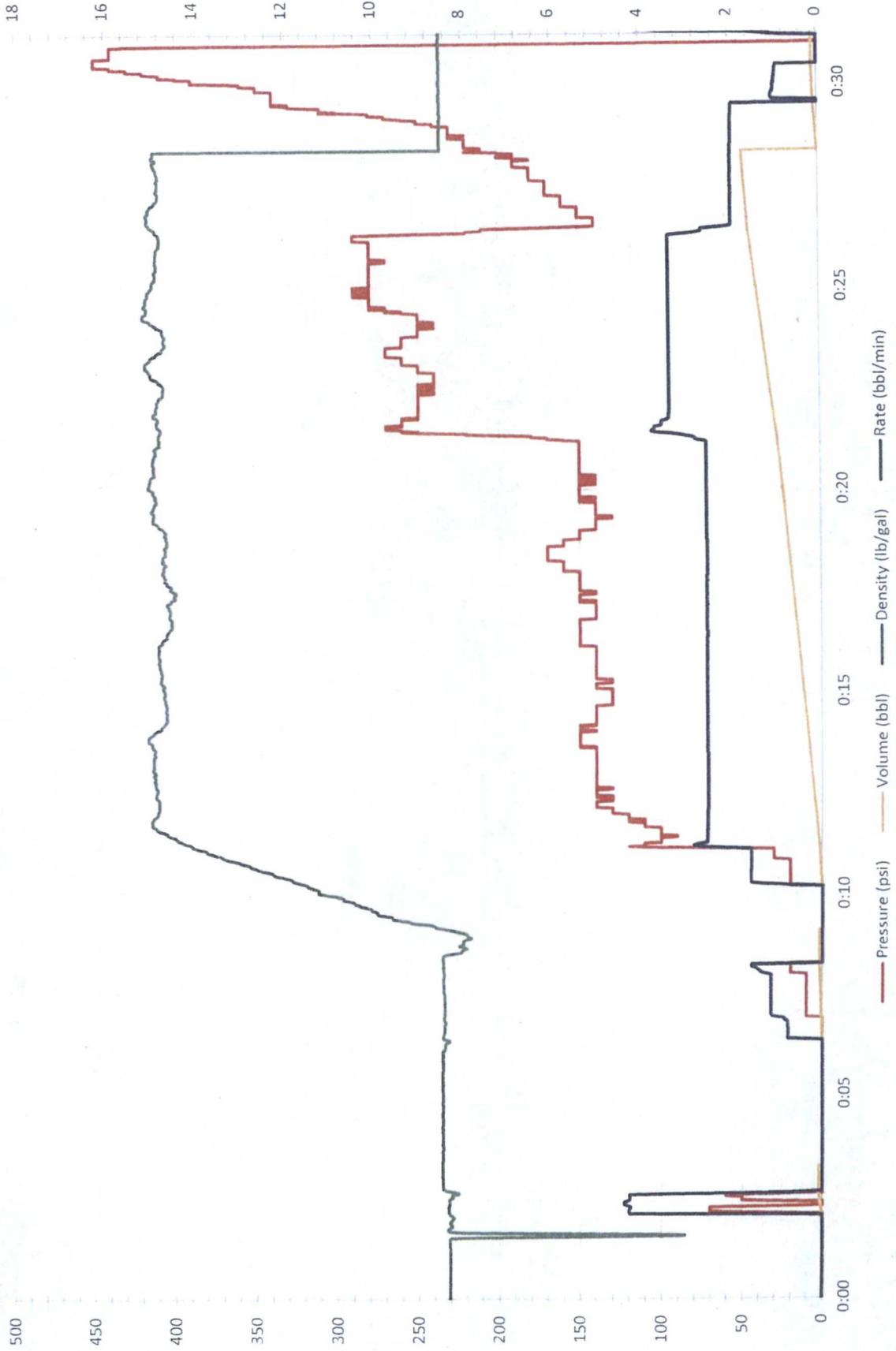
# Hawk 26 Fed 709 H Intermediate Bottom Stage



# Hawk 26 Fed 709H Intermediate Top Stage



# EOG Hawk 26 Fed 709H Intermediate - Fill Casing





**Job Information**

|            |                  |       |        |    |             |                     |
|------------|------------------|-------|--------|----|-------------|---------------------|
| Company:   | EOG              | TVD:  | 11200  | ft | Test Date:  | 6/13/2016           |
| Well Name: | Hawk 26 Fed 709H | MD:   | 11200  | ft | Requestor:  | Russel Roberts      |
| County:    | Lea              | BHST: | 177    | °F | Job Type:   | Intermediate Casing |
| District:  | WTX              | BHCT: | 135    | °F | Slurry:     | Stg 1 Primary       |
| Analyst:   | Justin           | Rig:  | HP 659 |    | Blend Type: | Field Blend         |

**Slurry Information**

|                |      |     |         |      |            |
|----------------|------|-----|---------|------|------------|
| Mix Water      | 4.82 | gps | Yield   | 1.20 | (cu ft/sk) |
| Slurry Density | 14.4 | ppg | Mud Wt. | 9    | ppg        |

**Slurry Recipe**

Cement Blend: 50/50 Class H

Sack Weight 87 lbs/sk

|           |          |                         |
|-----------|----------|-------------------------|
| .25 %bwoc | CPT-503P | Defoamer                |
| 0.6 %bwoc | CPT-16A  | Fluid Loss Additive     |
| 0.2 %bwoc | CPT-35   | Dispersant              |
| 0.4 %bwoc | CPT-49   | Bonding/Expansion Agent |
| 0.2 %bwoc | CPT-20A  | Cement Retarder         |

| Thickening Time @ 135°F |      |         |            | Compressive Strengths @ 177°F |        |  |  |
|-------------------------|------|---------|------------|-------------------------------|--------|--|--|
| Time to Temp            | Time | Bc      | Final psi: | Time                          | UCA CS |  |  |
| 41                      | 3:30 | 70 BC's | 6237       | 24 hr:                        | 1351   |  |  |
|                         |      |         |            | 48 hr:                        | 2186   |  |  |
|                         |      |         |            | 50 psi:                       | 17:27  |  |  |
|                         |      |         |            | 500 psi:                      | 19:31  |  |  |

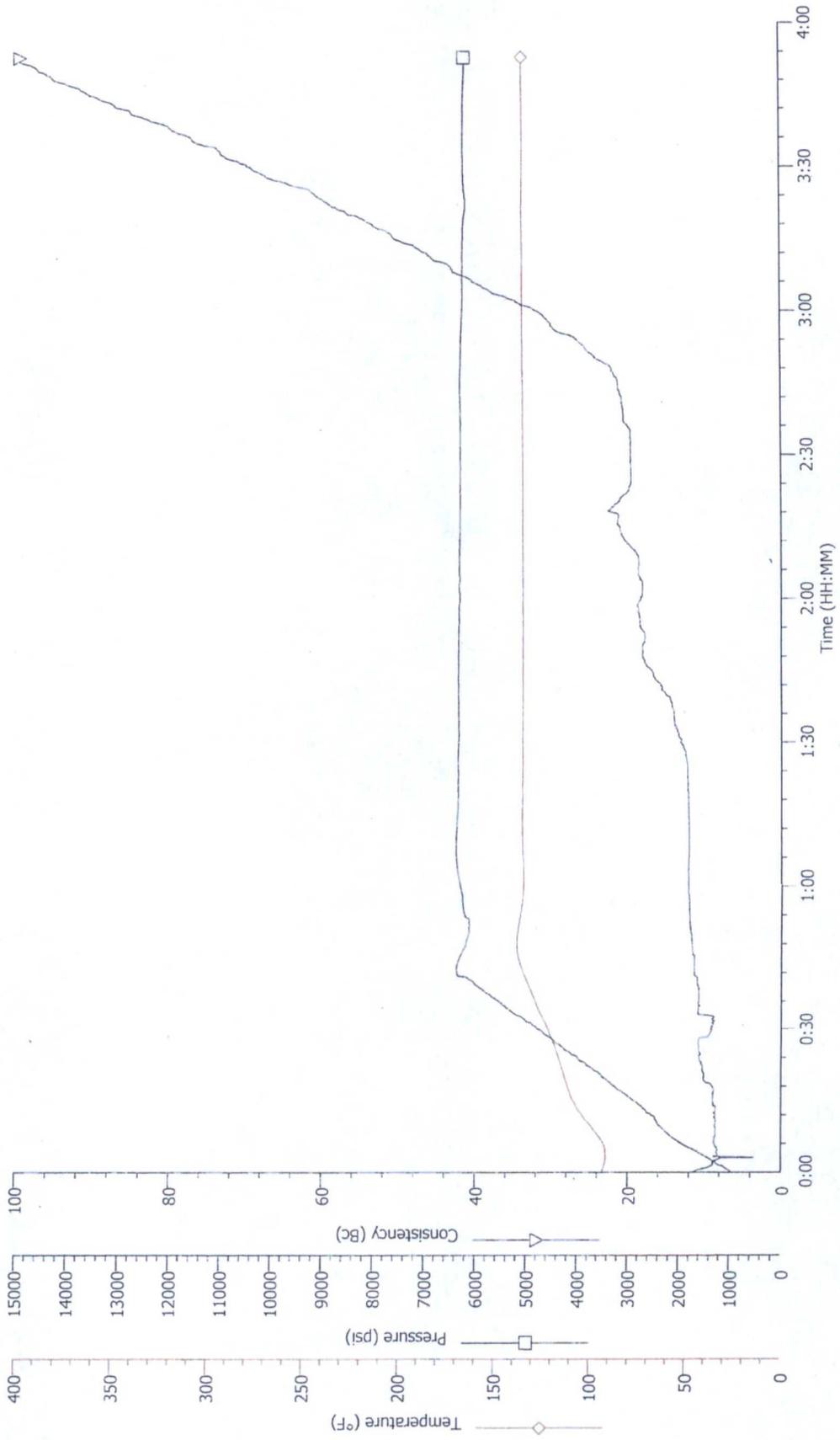
| Fluid Properties |     |          |  | Rheological data (cP) |     |     |     |    |    |    |   |
|------------------|-----|----------|--|-----------------------|-----|-----|-----|----|----|----|---|
| FL               | FF  |          |  | Temperature           | 300 | 200 | 100 | 60 | 30 | 6  | 3 |
| 135              | 135 |          |  | 80°F                  | 52  | 38  | 22  | 17 | 13 | 9  | 8 |
| 22 ml/30 min.    | 0 % | 0 ml/250 |  | 135°F                 | 38  | 28  | 18  | 15 | 13 | 10 | 9 |

**Comments**

CREST PUMPING TECHNOLOGIES  
EOG

BHCT: 135

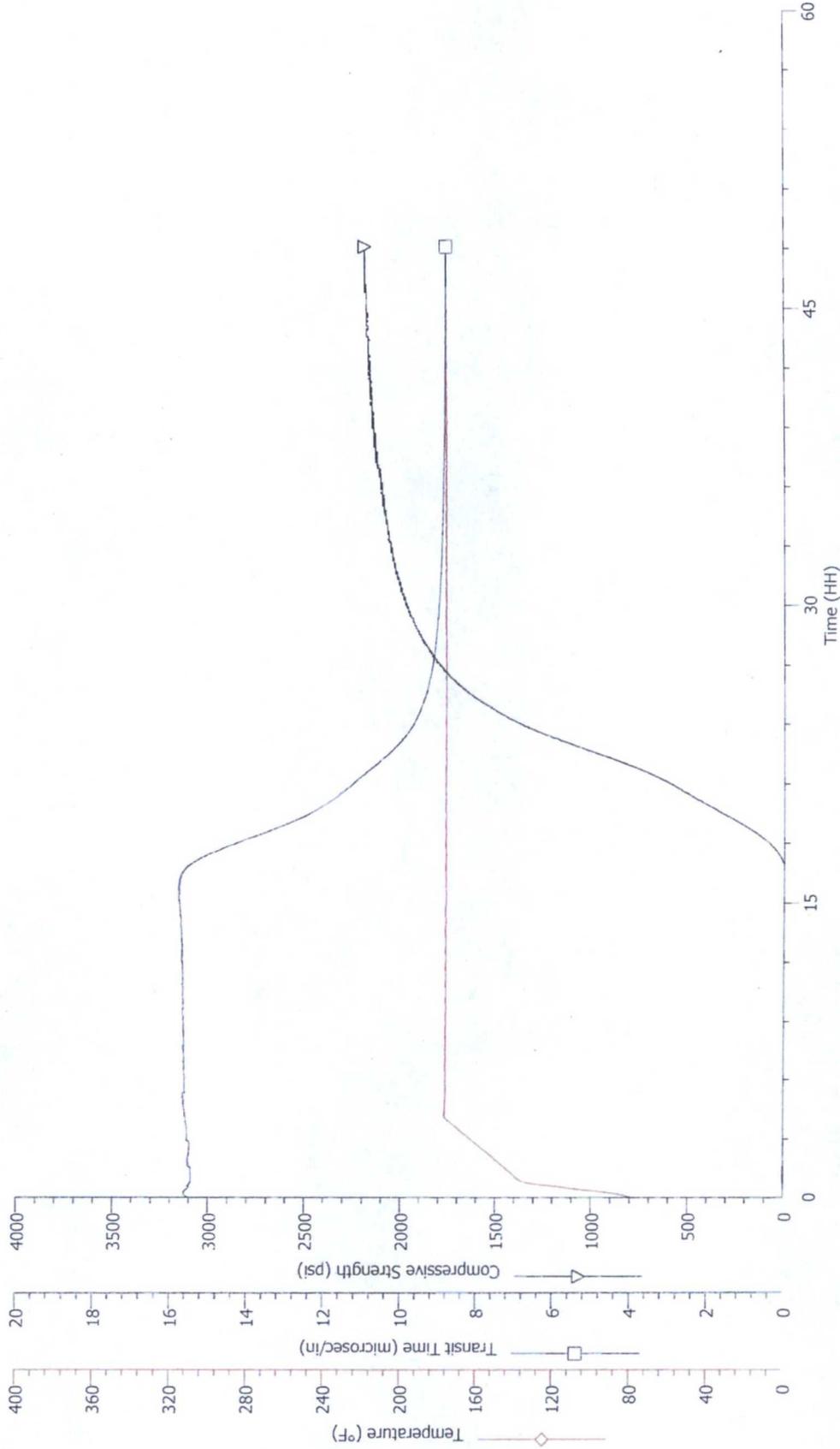
Job Type: Intermediate Casing  
Time to 70Bc: 3:30:40



BHST: 177  
50 psi @ 17:27:00  
500 psi @ 19:31:30

Strength: 2193 psi  
Algorithm: Compressive strength type B (more than 14 lb/gal)

Customer: EOG  
Test Start: 6/13/2016 4:41:09 PM  
Test Stop: 6/15/2016 4:48:47 PM





**Job Information**

|            |                  |       |        |    |             |                  |
|------------|------------------|-------|--------|----|-------------|------------------|
| Company:   | EOG              | TVD:  | 7500   | ft | Test Date:  | 6/13/2016        |
| Well Name: | Hawk 26 Fed 709H | MD:   | 7500   | ft | Requestor:  | Russel Roberts   |
| County:    | Lea              | BHST: | 140    | °F | Job Type:   | Backside Squeeze |
| District:  | STX              | BHCT: | 108    | °F | Slurry:     | Stg 2 Primary    |
| Analyst:   | Kyle             | Rig:  | HP 659 |    | Blend Type: | Field Blend      |

**Slurry Information**

|                |      |     |         |      |            |
|----------------|------|-----|---------|------|------------|
| Mix Water      | 6.62 | gps | Yield   | 1.42 | (cu ft/sk) |
| Slurry Density | 14.8 | ppg | Mud Wt. | 9    | ppg        |

**Slurry Recipe**

Cement Blend: Class C Sack Weight 94 lbs/sk

|           |            |                      |
|-----------|------------|----------------------|
| 5 %bwoc   | GYPSUM     | Thixotropic Additive |
| 3 %bwoc   | CaCl2      | Accelerator          |
| .1 gal/sk | Plexfoam 7 | Cement Foamer        |

| Thickening Time @ |      | 108°F   |            | Compressive Strengths @ |      |    | 80°F |
|-------------------|------|---------|------------|-------------------------|------|----|------|
| Time to Temp      | Time | Bc      | Final psi: | Time                    | UCA  | CS |      |
| 10                | 1:04 | 70 BC's | 4507       | 8 hr:                   | 811  |    |      |
|                   |      |         |            | 12 hr:                  | 1280 |    |      |
|                   |      |         |            | 24 hr:                  | 2262 |    |      |
|                   |      |         |            | 48 hr:                  | 3182 |    |      |
|                   |      |         |            | 72 hr:                  | 3595 |    |      |
|                   |      |         |            | 50 psi:                 | 2:20 |    |      |
|                   |      |         |            | 500 psi:                | 5:37 |    |      |

| Fluid Properties |                |          |  | Rheological data (cP) |     |     |     |     |    |    |    |
|------------------|----------------|----------|--|-----------------------|-----|-----|-----|-----|----|----|----|
| FL               |                | FF       |  | Temperature           | 300 | 200 | 100 | 60  | 30 | 6  | 3  |
| Temperature (°F) | 108            | 80       |  | 80°F                  | 134 | 118 | 87  | 74  | 43 | 17 | 12 |
|                  | 441 ml/30 min. | 0 %      |  | 108°F                 | 299 | 259 | 218 | 172 | 65 | 24 | 21 |
|                  |                | 0 ml/250 |  |                       |     |     |     |     |    |    |    |

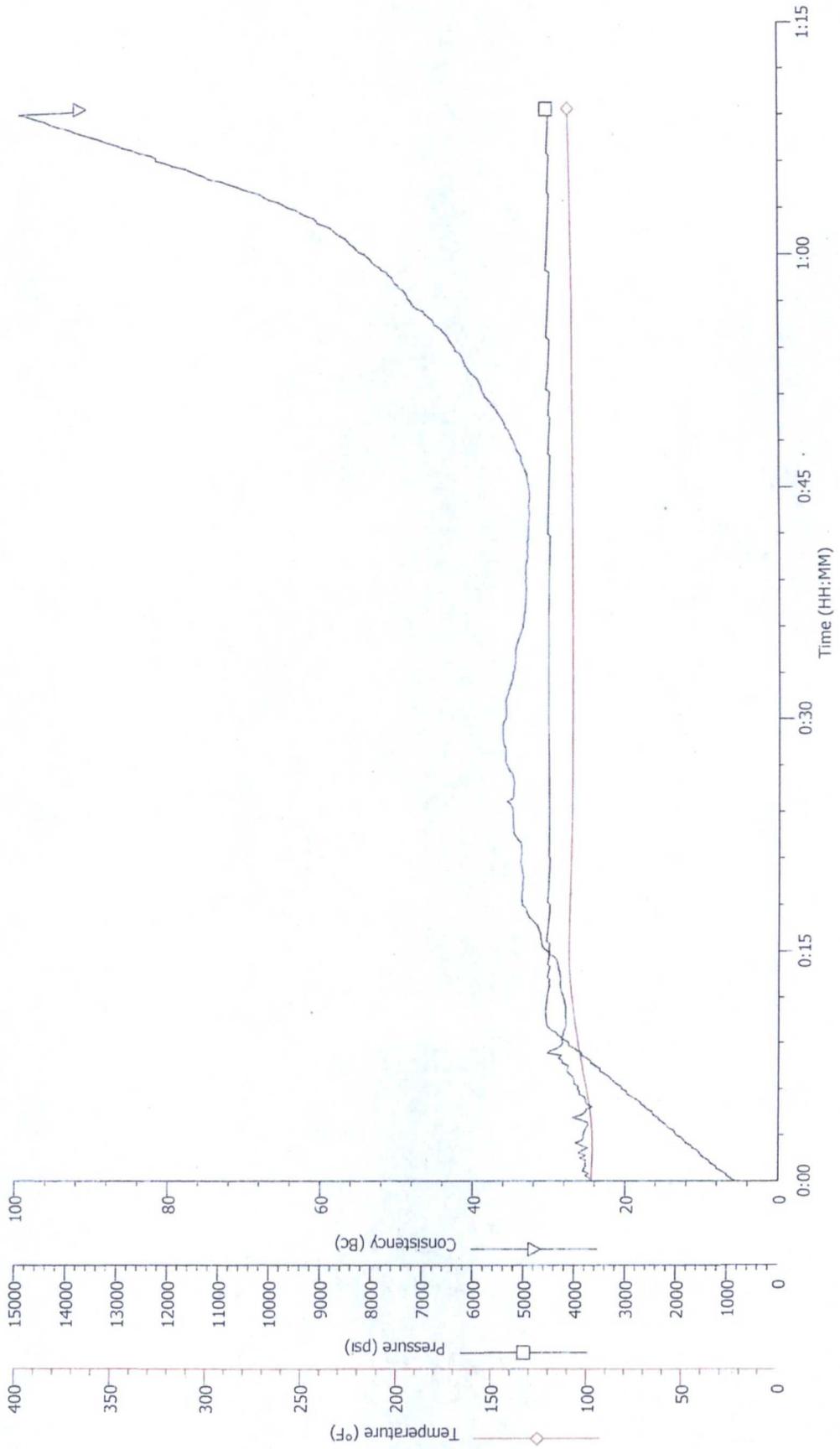
**Comments**

3 Cube Average @ 10 ppg = 1257 psi at 100 deg

**CREST PUMPING TECHNOLOGIES**  
EOG

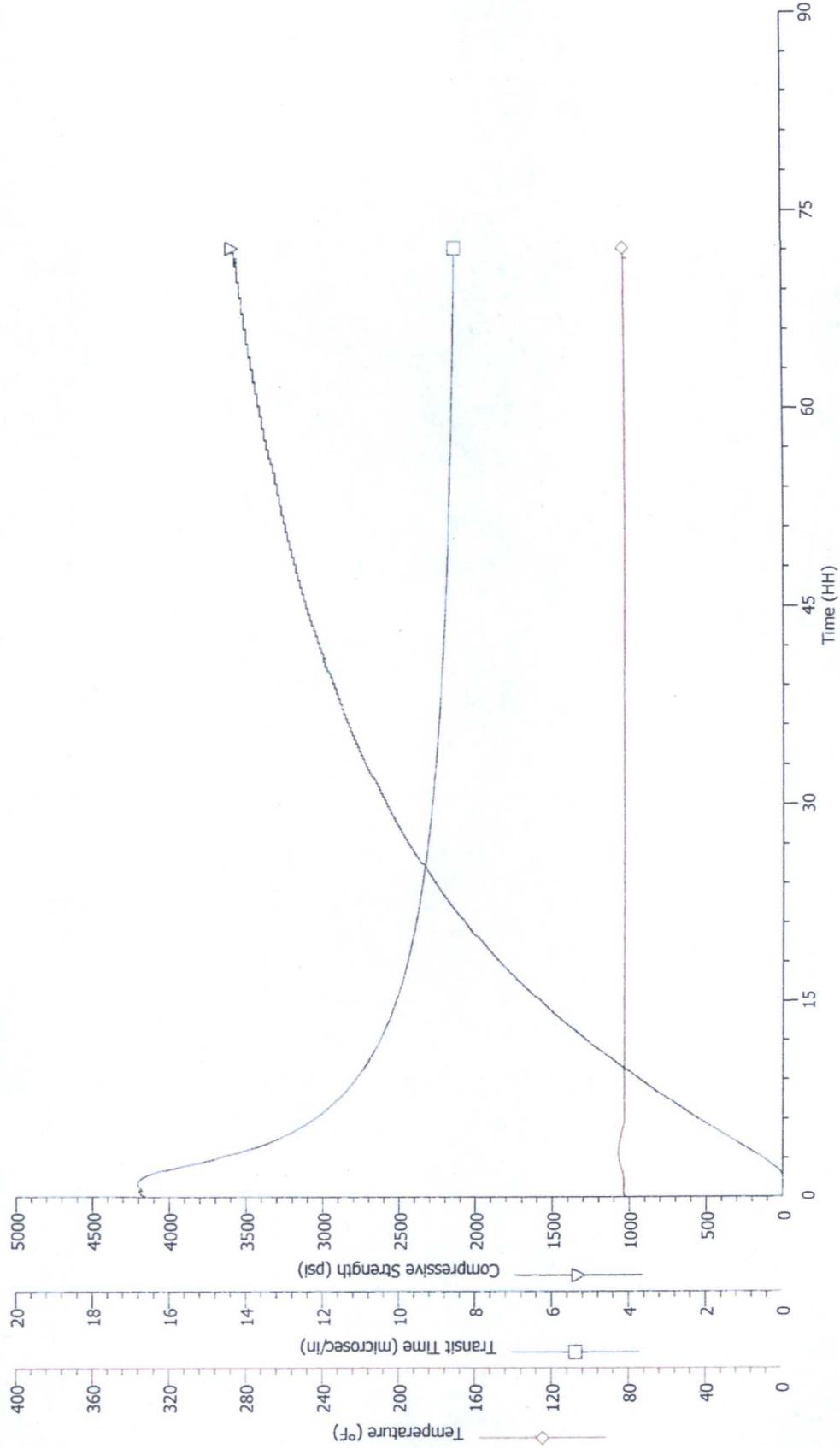
BHCT: 108

Job Type: Backside Squeeze  
Time to 70Bc: 1:04:10



BHST: 80  
50 psi @ 2:20:30  
500 psi @ 5:37:30

Customer: EOG  
Strength: 3595 psi  
Algorithm: Compressive strength type A (more than 14 lb/gal)



## Stan Wagner

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**From:** Steve Munsell  
**Sent:** Wednesday, June 22, 2016 10:04 AM  
**To:** Stan Wagner; Bruce Coit  
**Subject:** Need sundry for Rattlesnake 28 FC 704H - Two Stage Foam Cement Job  
**Attachments:** Rattlesnake 28 FC 704H Foam Cmt Job - 6.22.2016.pdf; EOG Hawk 26 Fed 709H Intermediate Post Job Report.pdf

Bruce/Stan,

Please submit the following info to the BLM in order to get an approved sundry for the subject well's upcoming 7-5/8" cement job.

Last week we received an approved sundry notice to cement the Hawk 26 Fed Com 709H well. That job went very well. We are planning on running the cement bond log, which was a COA for the Hawk well, as soon as tomorrow. As soon as the CBL data is available I will forward that data to the BLM. The post job cementing report is attached.

There is no doubt that this technique is by far the best method of obtaining a successful cement job for these wells.

Please let me know if additional info is needed.

Plans are to pump the subject job in the next five days or so.

Thanks.

**Steve Munsell**  
EOG Resources – Midland Division  
Drilling Engineering Advisor  
Office: 432.686.3609  
Cell: 432.894.1256  
Email: [steve\\_munsell@eogresources.com](mailto:steve_munsell@eogresources.com)