Confidentiality Requested:
☐ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1153927

Form ACO-1
August 2013
**Form must be Typed**
**Form must be Signed**
**All blanks must be Filled**

# WELL COMPLETION FORM
## WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # 3553
Name: Citation Oil & Gas Corp.
Address 1: 14077 Cutten Rd
Address 2: PO BOX 690688
City: HOUSTON State: TX Zip: 77269 + 0688
Contact Person: Tami Troxel
Phone: ( 281 ) 891-1000
CONTRACTOR: License # 5929
Name: Duke Drilling Co., Inc.
Wellsite Geologist: Ed Glassman
Purchaser:

Designate Type of Completion:

☐ New Well ☐ Re-Entry ☑ Workover

☑ Oil ☐ WSW ☐ SWD ☐ SIOW
☐ Gas ☐ D&A ☐ ENHR ☐ SIGW
☐ OG ☐ GSW ☐ Temp. Abd.
☐ CM *(Coal Bed Methane)*
☐ Cathodic ☐ Other *(Core, Expl., etc.)*:

If Workover/Re-entry: Old Well Info as follows:

Operator: Phillips Petroleum Company
Well Name: Peavey 11
Original Comp. Date: 10/24/1983 Original Total Depth: 3430

☐ Deepening ☑ Re-perf. ☐ Conv. to ENHR ☐ Conv. to SWD
☐ Plug Back ☐ Conv. to GSW ☐ Conv. to Producer

☐ Commingled Permit #:
☐ Dual Completion Permit #:
☐ SWD Permit #:
☐ ENHR Permit #:
☐ GSW Permit #:

03/20/2013 — Spud Date or Recompletion Date
— Date Reached TD
4/20/2013 — Completion Date or Recompletion Date

API No. 15 - 15-051-23525-00-03
Spot Description:
SE - SE - NW - SE Sec. 13 Twp. 11 S. R. 18 ☐ East ☑ West
1334 Feet from ☐ North / ☑ South Line of Section
1384 Feet from ☑ East / ☐ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☑ SE ☐ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Ellis
Lease Name: PEAVEY Well #: 11
Field Name: Bemis-Shutts
Producing Formation: Arbuckle and LKC, Topeka
Elevation: Ground: 1881 Kelly Bushing: 1886
Total Vertical Depth: 3430 Plug Back Total Depth: 3404
Amount of Surface Pipe Set and Cemented at: 1117 Feet
Multiple Stage Cementing Collar Used? ☐ Yes ☑ No
If yes, show depth set: Feet
If Alternate II completion, cement circulated from:
feet depth to: w/ sx cmt.

**Drilling Fluid Management Plan**
*(Data must be collected from the Reserve Pit)*

Chloride content: ppm Fluid volume: bbls
Dewatering method used:
Location of fluid disposal if hauled offsite:
Operator Name:
Lease Name: License #:
Quarter Sec. Twp. S. R. ☐ East ☐ West
County: Permit #:

**AFFIDAVIT**

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

**KCC Office Use ONLY**

☑ **Confidentiality Requested**
Date: 08/02/2013
☑ **Confidential Release Date:** 08/02/2015
☐ **Wireline Log Received**
☐ **Geologist Report Received**
☐ **UIC Distribution**
**ALT** ☑ **I** ☐ **II** ☐ **III** **Approved by:** NAOMI JAMES **Date:** 08/02/2013

1153927

Operator Name: Citation Oil & Gas Corp. Lease Name: PEAVEY Well #: 11

Sec. 13 Twp. 11 S. R. 18 ☐ East ☑ West County: Ellis

**INSTRUCTIONS:** Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken ☐ Yes ☑ No
*(Attach Additional Sheets)*

Samples Sent to Geological Survey ☐ Yes ☑ No

Cores Taken ☐ Yes ☑ No

Electric Log Run ☐ Yes ☑ No

List All E. Logs Run:

☑ Log Formation (Top), Depth and Datum ☐ Sample

| Name | Top | Datum |
|---|---|---|
| Topeka | 2900 | |
| LKC | 3089 | |
| Arbuckle | 3357 | |

CASING RECORD ☑ New ☐ Used
Report all strings set-conductor, surface, intermediate, production, etc.

| Purpose of String | Size Hole Drilled | Size Casing Set (In O.D.) | Weight Lbs. / Ft. | Setting Depth | Type of Cement | # Sacks Used | Type and Percent Additives |
|---|---|---|---|---|---|---|---|
| Liner | 5.5 | 4.5 | 10.5 | 3305 | C | 130 | 2% gel, 75 CD-31 |
| | | | | | | | |
| | | | | | | | |

ADDITIONAL CEMENTING / SQUEEZE RECORD

| Purpose: | Depth Top Bottom | Type of Cement | # Sacks Used | Type and Percent Additives |
|---|---|---|---|---|
| ___ Perforate<br>___ Protect Casing<br>___ Plug Back TD<br>___ Plug Off Zone | - | | | |
| | - | | | |

Did you perform a hydraulic fracturing treatment on this well? ☐ Yes ☐ No *(If No, skip questions 2 and 3)*

Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? ☐ Yes ☐ No *(If No, skip question 3)*

Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? ☐ Yes ☐ No *(If No, fill out Page Three of the ACO-1)*

| Shots Per Foot | PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated | Acid, Fracture, Shot, Cement Squeeze Record *(Amount and Kind of Material Used)* | Depth |
|---|---|---|---|
| 6 | 3357' - 3364' | Treated perfs with 3500 gals HCL. Polymer Treatment Stages 1-6 | 3388 |
| 6 | 3392' - 3388' | Treated perfs with 3500 gals HCL. Polymer Treatment Stages 1-6 | 3388 |
| | | | |
| | | | |
| | | | |

TUBING RECORD: Size: 2 7/8 Set At: 3418 Packer At:

Liner Run: ☑ Yes ☐ No

Date of First, Resumed Production, SWD or ENHR. 4/23/2013

Producing Method: ☐ Flowing ☑ Pumping ☐ Gas Lift ☐ Other *(Explain)*

| Estimated Production Per 24 Hours | Oil Bbls. | Gas Mcf | Water Bbls. | Gas-Oil Ratio | Gravity |
|---|---|---|---|---|---|
| | 62 | 0 | 95 | | 31 |

DISPOSITION OF GAS:
☐ Vented ☐ Sold ☐ Used on Lease
*(If vented, Submit ACO-18.)*

METHOD OF COMPLETION:
☐ Open Hole ☑ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*
☐ Other *(Specify)*

PRODUCTION INTERVAL:
Arbuckle and LKC. Topeka

**Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202**

Conservation Division
Finney State Office Building
130 S. Market, Rm. 2078
Wichita, KS 67202-3802

Kansas
Corporation Commission

Phone: 316-337-6200
Fax: 316-337-6211
http://kcc.ks.gov/



August 02, 2013

Tami Troxel
Citation Oil & Gas Corp.
14077 Cutten Rd
PO BOX 690688
HOUSTON, TX 77269-0688

Re: ACO1
API 15-051-23525-00-02
PEAVEY 11
SE/4 Sec.13-11S-18W
Ellis County, Kansas

Dear Production Department:

We are herewith requesting that the Well Completion Form ACO-1 and attached information for the subject well be held confidential for a period of two years.

Should you have any questions or need additional information regarding subject well, please contact our office.

Respectfully,
Tami Troxel

eoga™
improved oil & gas recovery

April 6, 2013
Mr. Daniel Hansberger
Citation Oil & Gas Corp.
14077 Cutten Road
Houston, TX 77070

Re: Cross-linked Polymer Gel Water Reduction Treatment
Peavey #11 - Bemis-Shutts field - Ellis County, Kansas

Attached is the job log and related surveillance graphs for the cross-linked polymer gel treatment that was recently completed at the above captioned well in order to reduce excessive water production from the Arbuckle formation without damaging oil productivity. The unwanted water originates from an edge or underlying aquifer, and it encroaches on the wellbore through vertical fractures, vugs, or some other type of rock matrix that has ultra-high permeability and conductivity. Immediately prior to the polymer job, a 4.5" liner was run in the well to isolate several Lansing Kansas City injection zones behind pipe. Subsequently, the Arbuckle formation was perforated 3,357'-3,364' and 3,382'-3,388'. Based on swab tests performed before and after an acid job, the Arbuckle indidcated a Productivity Index ranging from 5.8 to 10.9 BPD per psi draw-down, and a maximum producing potential of 5,400 to 9,600 BPD. The polymer volume, gel strength, and injection rate used to place the treatment were based on the pressure response at the well during the job. This "on-the-fly" approach has been routinely used, and was based on our experience applying this process to more than 1,000 Arbuckle wells in Kansas over many years.

The purpose of this project was to place cross-linked polymer gel deep into the water conduit(s) that connect this wellbore to the natural water source. If successful, the treatment should restrict the flow of water into the wellbore, and possibly increase the oil rate if more draw-down on the reservoir can be achieved by lowering the producing fluid level. The treatment may also cause water from the aquifer to be diverted so that it sweeps through, and displaces oil from, less permeable areas of the reservoir that have been by-passed by the natural waterdrive. Injecting polymer deep into the water conduits (i.e. natural fractures or other fracture-like features) should increase the longevity of the treatment because it will force water to flow through more unswept rock before it eventually finds an alternate pathway back to the wellbore; and the longer it takes water to again find the wellbore, the longer the well will produce with a lower water rate, lower fluid level, and higher oil cut percentage.

Arbuckle produced water was used to blend and inject the gels, and a tool was used to monitor (real-time) the bottomhole pressure ("BHP") during the treatment. The BHP data was used to make adjustments to the job based on changing conditions. The treatment began on April 4 and ended on April 6, 2013 after injecting a total of 2,239 barrels of gelant. The job was terminated after it was believed that a large enough volume of sufficiently strong gel was placed, and when a satisfactory level of resistance (as dictated by pressure response) was achieved. Polymer injection started with the tubing on a vacuum; however, positive wellhead pressure was reported after injecing a t toal of about 2,050 barrels of polymer solution, and then increased to a maximum of 490 psi. The maximum pressure gradient exerted on the rock was about 0.56 psi per foot. The polymer concentration ranged from 3,000 ppm at the beginning of the job to 10,000 ppm at the end, and the treatment was placed at an injection rate ranging from 0.75 BPM (1,080 BPD) at the start of the job to 0.5 BPM (720 BPD) at the end. Before ending the job, the polymer solution was over-displaced from the wellbore with 80 barrels of produced water that contained one drum of Baker WLC821 A-Sol P-38 mutual solvent. By the time that the water post-flush was finished, wellhead pressure had decreased to 190 psi. After the post-flush, the well was shut-in for a period of 10-14 days in order to give the gels enough time to reach their maximum strength and maturity before it was reactivated.

We are very grateful for the opportunity to provide this service, and hope that the project is a great success! Please let us know if you have questions, comments, or need more information.

Best regards,

*JT Portwood*

Jay Portwood
Project Engineering and Design

Eclipse IOR Services, LLC
d.b.a. Eclipse Oil & Gas Associates ("eoga")
PO Box 2230 • Keller, Texas 76244-2230
817.431.6336 (off)
817-431.6337 (fax)
www.getmoreoil.com

eoga™
improved oil & gas recovery

# CROSS-LINKED POLYMER GEL
# WATER REDUCTION TREATMENT
# JOB LOG AND SUMMARY PREPARED FOR:

Citation OIL & GAS CORP.

## PEAVEY #11
## BEMIS-SHUTTS FIELD
## ELLIS COUNTY, KANSAS

## April 6, 2013

Eclipse IOR Services, LLC
d.b.a. Eclipse Oil & Gas Associates ("eoga")
PO Box 2230 • Keller, Texas 76244-2230

817.431.6336 (off)
817-431.6337 (fax)
www.getmoreoil.com

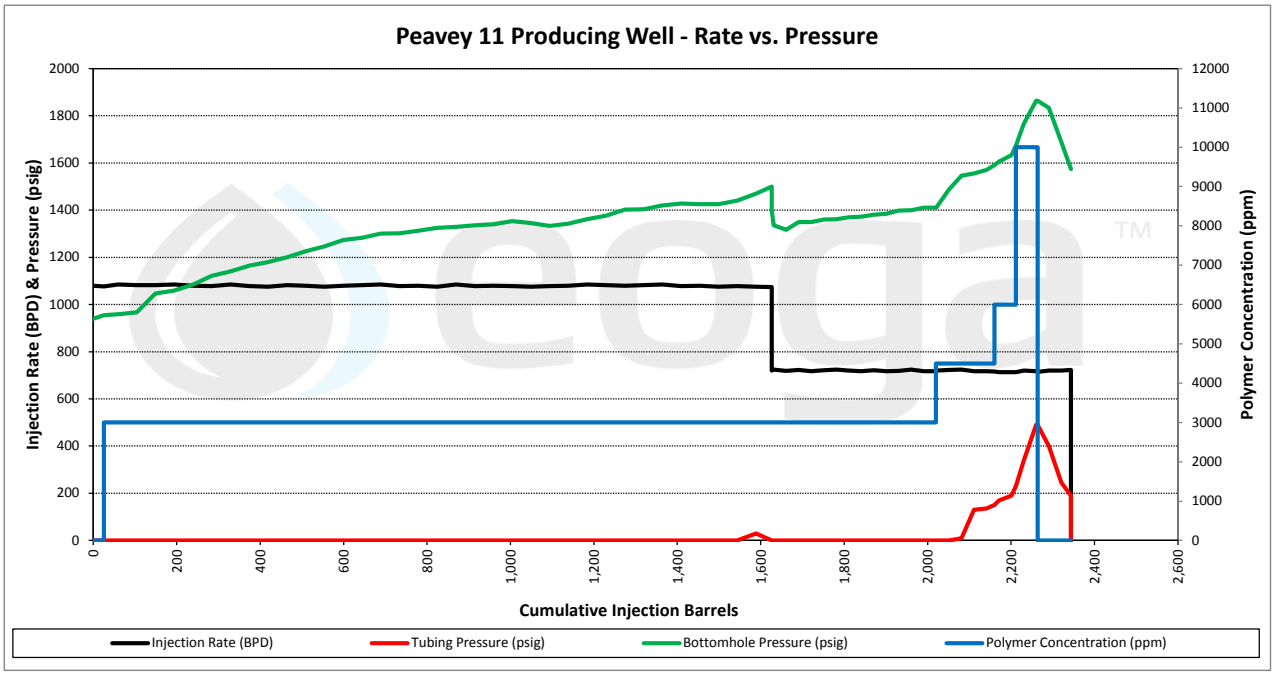
# BULK POLYMER GEL TREATMENT

## Morning Progress Report

| | | | |
|---|---|---|---|
| **Company Name:** | Citation Oil & Gas Corp. | **Location:** | Ellis Co., KS |
| **Field Name:** | Bemis-Shutts | **Date:** | 4/6/2013 |
| **Well Name:** | Peavey #11 | **Est. Cum. Cost:** | $22,300 |

The following is the most recent information available for the bulk polymer gel treatment that is in progress at the above captioned well.

| | Begin | Begin | End | End | BG-100 Polymer | | XL-100 Cross-linker | | Gel | WHP (psi) | | BHP (psi) | | Rate (BPM) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stage No. | Date | Time | Date | Time | Ppm | Lbs. | Ratio | Lbs. | Bbls. | Begin | End | Begin | End | Begin | End | Comments |
| 1 | 4/4/2013 | 7:41 AM | 4/4/2013 | 8:15 AM | 0 | 0 | | 0 | 0 | 0 | 0 | 976 | 991 | 0.75 | 0.75 | 20 barrels water |
| 2 | 4/4/2013 | 8:15 AM | 4/6/2013 | 8:58 AM | 3000 | 2093 | 40 | 455 | 1995 | 0 | 0 | 991 | 1446 | 0.75 | 0.50 | |
| 3 | 4/6/2013 | 8:58 AM | 4/6/2013 | 1:38 PM | 4500 | 220 | 40 | 48 | 140 | 0 | 150 | 1446 | 1627 | 0.50 | 0.50 | |
| 4 | 4/6/2013 | 1:38 PM | 4/6/2013 | 3:23 PM | 6000 | 109 | 40 | 24 | 52 | 150 | 230 | 1627 | 1709 | 0.50 | 0.50 | |
| 5 | 4/6/2013 | 3:23 PM | 4/6/2013 | 5:07 PM | 10000 | 182 | 40 | 40 | 52 | 230 | 490 | 1709 | 1899 | 0.50 | 0.50 | |
| 6 | 4/6/2013 | 5:07 PM | 4/6/2013 | 7:47 PM | 0 | 0 | | 0 | 0 | 490 | 190 | 1899 | 1611 | 0.50 | 0.50 | 80 barrels water |
| **Totals** | | | | | | 2604 | | 566 | 2239 | | | | | | | |





Eclipse IOR Services, LLC
d.b.a. Eclipse Oil & Gas Associates ("eoga")
PO Box 2230 • Keller, Texas 76244-2230

817.431.6336 (off)
817-431.6337 (fax)
www.getmoreoil.com

eoga
improved oil & gas recovery
Project Engineer - Jay Portwood
P.O. Box 2230 Keller, TX 76244-2230
817-431-6336 (off) 817-431-6337 (fax)
817-312-1033 (cell)

## PROJECT INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| **Company Name:** | Citation Oil & Gas Corp. | **Depth to Top Perforation or OH (ft.):** | 3357 | **EOT (ft.):** | 3273 |
| **Field Name:** | Bemis-Shutts | **Depth to Bottom Perforation or OH (ft.):** | 3388 | **Packer (ft.):** | 3273 |
| **Well Name:** | Peavey #11 | **Depth to Mid-Perf (ft.):** | 3373 | **Tbg Size:** | 2.875" |
| **Injector or Producer:** | Producer | **BHP Tool Depth (ft.):** | 3290 | **Tbg. Cap. (bbls./ft.):** | 0.00538 |
| **County/State:** | Ellis/KS | **Type Mix Water Used:** | Produced | **Tbg. Vol. (bbls.):** | 17.61 |
| **Polymer Unit No.:** | 4 | **Mix Water Specific Gravity:** | 1.02 | **Csg Size:** | 4.5" |
| **Polymer Unit Operators:** | Sean Eklund (day) 785-885-8176 / Brad Gordon (night) 785-885-8206 | **Mix Water Pressure Gradient (psi per ft.):** | 0.442 | **Csg. Cap. (bbls./ft.):** | 0.015 |
| **Generator Used (Yes/No):** | Yes | **Expect Positive Surface Pressure @ BHP of:** | 1453 | **Csg Vol. bbls. (Pkr. to Btm. Perf.):** | 1.725 |
| **Customer Contact:** | Daniel Hansberger 281-891-1484 (off) 405-605-9177 (cell) | **Estimated Static BHP (psig):** | 940 | **Total Well Vol. (bbls.):** | 19.33 |

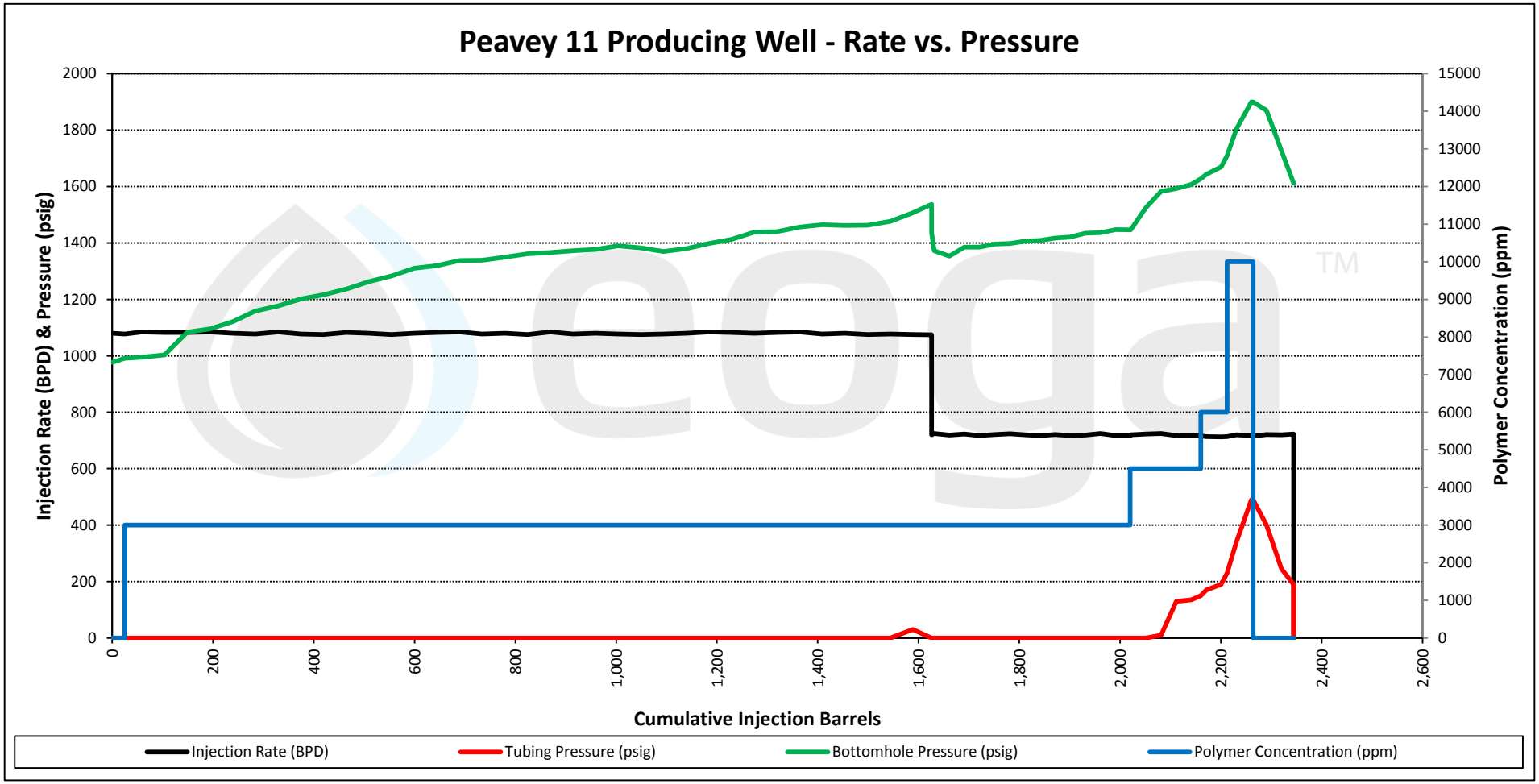
| Date | Time | Elapsed Time Between Readings (Mins.) | Injection Rate BPD | Injection Rate BPM | Total Cum. Injection (Bbls.) | Stage Cum. Injection Bbls. | Tubing Pressure (psig) | PSIG per Bbl Injected | PSIG per Hour Injected | Bottomhole Conditions: Pressure: Actual Reading (psig) | Bottomhole Conditions: Pressure: Calculated to Mid-Perf (psia) | Δp | Hall Plot Cum. psi-time | Injectivity Ratio (Psi ÷ Rate) | Injectivity Index BPD/(Calc. BHP-Static BHP) (BPD per psig) | Pressure Gradient (psig per ft.) | Polymer Concentration (ppm) | Cross-linker Ratio (x:1) | Total Cum. Polymer (lbs.) | Stage Cum. Polymer (lbs.) | Total Cum. X-linker (Lbs.) | Stage Cum. X-linker (Lbs.) | Casing Pressure (psig) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-Apr-13 | 7:41 AM | | 1080 | 0.75 | 0.0 | 0.0 | 0 | | | 940 | 976 | 0 | 0 | 0.90 | | 0.29 | 0 | | 0 | 0 | 0 | 0 | 0 | Begin water pre-flush |
| 4-Apr-13 | 8:15 AM | 0:33 | 1077 | 0.75 | 25.0 | 25.0 | 0 | 0.60 | 27.27 | 955 | 991 | 51 | 31515 | 0.92 | 71.82 | 0.29 | 0 | | 0 | 0 | 0 | 0 | 0 | |
| 4-Apr-13 | 8:15 AM | 0:00 | 1077 | 0.75 | 25.0 | 0.0 | 0 | 0.60 | 27.27 | 955 | 991 | 51 | 31515 | 0.92 | 71.82 | 0.29 | 3000 | 40 | 0 | 0 | 0 | 0 | 0 | Begin 3,000 ppm polymer gel |
| 4-Apr-13 | 9:00 AM | 0:45 | 1085 | 0.75 | 58.9 | 33.9 | 0 | 0.12 | 5.33 | 959 | 995 | 55 | 74670 | 0.92 | 57.09 | 0.30 | 3000 | 40 | 36 | 36 | 8 | 8 | 0 | |
| 4-Apr-13 | 10:00 AM | 1:00 | 1082 | 0.75 | 104.0 | 79.0 | 0 | 0.18 | 8.00 | 967 | 1003 | 63 | 132690 | 0.93 | 40.09 | 0.30 | 3000 | 40 | 83 | 83 | 18 | 18 | 0 | |
| 4-Apr-13 | 11:00 AM | 1:00 | 1082 | 0.75 | 149.1 | 124.1 | 0 | 1.77 | 80.00 | 1047 | 1083 | 143 | 195510 | 1.00 | 10.12 | 0.32 | 3000 | 40 | 130 | 130 | 28 | 28 | 0 | |
| 4-Apr-13 | 12:00 PM | 1:00 | 1085 | 0.75 | 194.3 | 169.3 | 0 | 0.27 | 12.00 | 1059 | 1095 | 155 | 259050 | 1.01 | 9.12 | 0.32 | 3000 | 40 | 178 | 178 | 39 | 39 | 0 | |
| 4-Apr-13 | 1:00 PM | 1:00 | 1080 | 0.75 | 239.3 | 214.3 | 0 | 0.58 | 26.00 | 1085 | 1121 | 181 | 324150 | 1.04 | 7.45 | 0.33 | 3000 | 40 | 225 | 225 | 49 | 49 | 0 | |
| 4-Apr-13 | 2:00 PM | 1:00 | 1078 | 0.75 | 284.2 | 259.2 | 0 | 0.82 | 37.00 | 1122 | 1158 | 218 | 391470 | 1.08 | 5.92 | 0.34 | 3000 | 40 | 272 | 272 | 59 | 59 | 0 | |
| 4-Apr-13 | 3:00 PM | 1:00 | 1085 | 0.75 | 329.4 | 304.4 | 0 | 0.40 | 18.00 | 1140 | 1176 | 236 | 459870 | 1.08 | 5.42 | 0.35 | 3000 | 40 | 319 | 319 | 69 | 69 | 0 | |
| 4-Apr-13 | 4:00 PM | 1:00 | 1078 | 0.75 | 374.3 | 349.3 | 0 | 0.56 | 25.00 | 1165 | 1201 | 261 | 529770 | 1.11 | 4.79 | 0.36 | 3000 | 40 | 366 | 366 | 80 | 80 | 0 | |
| 4-Apr-13 | 5:00 PM | 1:00 | 1075 | 0.75 | 419.1 | 394.1 | 0 | 0.33 | 15.00 | 1180 | 1216 | 276 | 600570 | 1.13 | 4.48 | 0.36 | 3000 | 40 | 413 | 413 | 90 | 90 | 0 | |
| 4-Apr-13 | 6:00 PM | 1:00 | 1082 | 0.75 | 464.2 | 439.2 | 0 | 0.44 | 20.00 | 1200 | 1236 | 296 | 672570 | 1.14 | 4.16 | 0.37 | 3000 | 40 | 461 | 461 | 100 | 100 | 0 | |
| 4-Apr-13 | 7:00 PM | 1:00 | 1080 | 0.75 | 509.2 | 484.2 | 0 | 0.58 | 26.00 | 1226 | 1262 | 322 | 746130 | 1.17 | 3.78 | 0.37 | 3000 | 40 | 508 | 508 | 110 | 110 | 0 | |
| 4-Apr-13 | 8:00 PM | 1:00 | 1075 | 0.75 | 554.0 | 529.0 | 0 | 0.45 | 20.00 | 1246 | 1282 | 342 | 820890 | 1.19 | 3.51 | 0.38 | 3000 | 40 | 555 | 555 | 121 | 121 | 0 | |
| 4-Apr-13 | 9:00 PM | 1:00 | 1080 | 0.75 | 599.0 | 574.0 | 0 | 0.62 | 28.00 | 1274 | 1310 | 370 | 897330 | 1.21 | 3.23 | 0.39 | 3000 | 40 | 602 | 602 | 131 | 131 | 0 | |
| 4-Apr-13 | 10:00 PM | 1:00 | 1082 | 0.75 | 644.1 | 619.1 | 0 | 0.20 | 9.00 | 1283 | 1319 | 379 | 974310 | 1.22 | 3.16 | 0.39 | 3000 | 40 | 649 | 649 | 141 | 141 | 0 | |
| 4-Apr-13 | 11:00 PM | 1:00 | 1085 | 0.75 | 689.3 | 664.3 | 0 | 0.40 | 18.00 | 1301 | 1337 | 397 | 1052370 | 1.23 | 3.00 | 0.40 | 3000 | 40 | 697 | 697 | 151 | 151 | 0 | |
| 5-Apr-13 | 12:00 AM | 1:00 | 1078 | 0.75 | 734.2 | 709.2 | 0 | 0.02 | 1.00 | 1302 | 1338 | 398 | 1130490 | 1.24 | 2.98 | 0.40 | 3000 | 40 | 744 | 744 | 162 | 162 | 0 | |
| 5-Apr-13 | 1:00 AM | 1:00 | 1080 | 0.75 | 779.2 | 754.2 | 0 | 0.24 | 11.00 | 1313 | 1349 | 409 | 1209270 | 1.25 | 2.90 | 0.40 | 3000 | 40 | 791 | 791 | 172 | 172 | 0 | |
| 5-Apr-13 | 2:00 AM | 1:00 | 1075 | 0.75 | 824.0 | 799.0 | 0 | 0.27 | 12.00 | 1325 | 1361 | 421 | 1288770 | 1.27 | 2.79 | 0.40 | 3000 | 40 | 838 | 838 | 182 | 182 | 0 | |
| 5-Apr-13 | 3:00 AM | 1:00 | 1085 | 0.75 | 869.2 | 844.2 | 0 | 0.09 | 4.00 | 1329 | 1365 | 425 | 1368510 | 1.26 | 2.79 | 0.40 | 3000 | 40 | 886 | 886 | 193 | 193 | 0 | |
| 5-Apr-13 | 4:00 AM | 1:00 | 1078 | 0.75 | 914.1 | 889.1 | 0 | 0.16 | 7.00 | 1336 | 1372 | 432 | 1448670 | 1.27 | 2.72 | 0.41 | 3000 | 40 | 933 | 933 | 203 | 203 | 0 | |
| 5-Apr-13 | 5:00 AM | 1:00 | 1080 | 0.75 | 959.1 | 934.1 | 0 | 0.09 | 4.00 | 1340 | 1376 | 436 | 1529070 | 1.27 | 2.70 | 0.41 | 3000 | 40 | 980 | 980 | 213 | 213 | 0 | |
| 5-Apr-13 | 6:00 AM | 1:00 | 1078 | 0.75 | 1004.0 | 979.0 | 0 | 0.29 | 13.00 | 1353 | 1389 | 449 | 1610250 | 1.29 | 2.61 | 0.41 | 3000 | 40 | 1027 | 1027 | 223 | 223 | 0 | |
| 5-Apr-13 | 7:00 AM | 1:00 | 1075 | 0.75 | 1048.8 | 1023.8 | 0 | -0.16 | -7.00 | 1346 | 1382 | 442 | 1691010 | 1.29 | 2.65 | 0.41 | 3000 | 40 | 1074 | 1074 | 233 | 233 | 0 | |
| 5-Apr-13 | 8:00 AM | 1:00 | 1078 | 0.75 | 1093.7 | 1068.7 | 0 | -0.29 | -13.00 | 1333 | 1369 | 429 | 1770990 | 1.27 | 2.74 | 0.41 | 3000 | 40 | 1121 | 1121 | 244 | 244 | 0 | |
| 5-Apr-13 | 9:00 AM | 1:00 | 1080 | 0.75 | 1138.7 | 1113.7 | 0 | 0.22 | 10.00 | 1343 | 1379 | 439 | 1851570 | 1.28 | 2.68 | 0.41 | 3000 | 40 | 1168 | 1168 | 254 | 254 | 0 | |
| 5-Apr-13 | 10:00 AM | 1:00 | 1085 | 0.75 | 1183.9 | 1158.9 | 0 | 0.40 | 18.00 | 1361 | 1397 | 457 | 1933230 | 1.29 | 2.58 | 0.41 | 3000 | 40 | 1216 | 1216 | 264 | 264 | 0 | |
| 5-Apr-13 | 11:00 AM | 1:00 | 1082 | 0.75 | 1229.0 | 1204.0 | 0 | 0.33 | 15.00 | 1376 | 1412 | 472 | 2015790 | 1.30 | 2.48 | 0.42 | 3000 | 40 | 1263 | 1263 | 275 | 275 | 0 | |
| 5-Apr-13 | 12:00 PM | 1:00 | 1080 | 0.75 | 1274.0 | 1249.0 | 0 | 0.58 | 26.00 | 1402 | 1438 | 498 | 2099910 | 1.33 | 2.34 | 0.43 | 3000 | 40 | 1310 | 1310 | 285 | 285 | 0 | |
| 5-Apr-13 | 1:00 PM | 1:00 | 1082 | 0.75 | 1319.1 | 1294.1 | 0 | 0.02 | 1.00 | 1403 | 1439 | 499 | 2184090 | 1.33 | 2.34 | 0.43 | 3000 | 40 | 1357 | 1357 | 295 | 295 | 0 | |
| 5-Apr-13 | 2:00 PM | 1:00 | 1085 | 0.75 | 1364.3 | 1339.3 | 0 | 0.38 | 17.00 | 1420 | 1456 | 516 | 2269290 | 1.34 | 2.26 | 0.43 | 3000 | 40 | 1405 | 1405 | 305 | 305 | 0 | |
| 5-Apr-13 | 3:00 PM | 1:00 | 1078 | 0.75 | 1409.2 | 1384.2 | 0 | 0.18 | 8.00 | 1428 | 1464 | 524 | 2354970 | 1.36 | 2.21 | 0.43 | 3000 | 40 | 1452 | 1452 | 316 | 316 | 0 | |
| 5-Apr-13 | 4:00 PM | 1:00 | 1080 | 0.75 | 1454.2 | 1429.2 | 0 | -0.07 | -3.00 | 1425 | 1461 | 521 | 2440470 | 1.35 | 2.23 | 0.43 | 3000 | 40 | 1499 | 1499 | 326 | 326 | 0 | |
| 5-Apr-13 | 5:00 PM | 1:00 | 1075 | 0.75 | 1499.0 | 1474.0 | 0 | 0.02 | 1.00 | 1426 | 1462 | 522 | 2526030 | 1.36 | 2.21 | 0.43 | 3000 | 40 | 1546 | 1546 | 336 | 336 | 0 | |
| 5-Apr-13 | 6:00 PM | 1:00 | 1078 | 0.75 | 1543.9 | 1518.9 | 0 | 0.31 | 14.00 | 1440 | 1476 | 536 | 2612430 | 1.37 | 2.16 | 0.44 | 3000 | 40 | 1593 | 1593 | 346 | 346 | 0 | |
| 5-Apr-13 | 7:00 PM | 1:00 | 1075 | 0.75 | 1588.7 | 1563.7 | 30 | 0.67 | 30.00 | 1470 | 1506 | 566 | 2700630 | 1.40 | 2.03 | 0.45 | 3000 | 40 | 1640 | 1640 | 357 | 357 | 0 | |
| 5-Apr-13 | 7:50 PM | 0:50 | 1074 | 0.75 | 1626.0 | 1601.0 | 0 | 0.80 | 36.00 | 1500 | 1536 | 596 | 2775630 | 1.43 | 1.92 | 0.46 | 3000 | 40 | 1679 | 1679 | 365 | 365 | 0 | |
| 5-Apr-13 | 7:50 PM | 0:00 | 720 | 0.50 | 1626.0 | 1601.0 | 0 | 0.80 | 36.00 | 1400 | 1436 | 496 | 2775630 | 2.00 | 1.57 | 0.43 | 3000 | 40 | 1679 | 1679 | 365 | 365 | 0 | Reduce rate to 0.5 BPM (720 BPD) |
| 5-Apr-13 | 8:00 PM | 0:10 | 724 | 0.50 | 1631.0 | 1606.0 | 0 | -12.72 | -384.00 | 1336 | 1372 | 432 | 2788990 | 1.89 | 1.83 | 0.41 | 3000 | 40 | 1685 | 1685 | 366 | 366 | 0 | |
| 5-Apr-13 | 9:00 PM | 1:00 | 719 | 0.50 | 1661.0 | 1636.0 | 0 | -0.63 | -19.00 | 1317 | 1353 | 413 | 2868010 | 1.88 | 1.91 | 0.40 | 3000 | 40 | 1716 | 1716 | 373 | 373 | 0 | |
| 5-Apr-13 | 10:00 PM | 1:00 | 722 | 0.50 | 1691.1 | 1666.1 | 0 | 1.06 | 32.00 | 1349 | 1385 | 445 | 2948950 | 1.92 | 1.77 | 0.41 | 3000 | 40 | 1748 | 1748 | 380 | 380 | 0 | |
| 5-Apr-13 | 11:00 PM | 1:00 | 718 | 0.50 | 1721.0 | 1696.0 | 0 | 0.00 | 0.00 | 1349 | 1385 | 445 | 3029890 | 1.93 | 1.75 | 0.41 | 3000 | 40 | 1779 | 1779 | 387 | 387 | 0 | |
| 6-Apr-13 | 12:00 AM | 1:00 | 721 | 0.50 | 1751.1 | 1726.1 | 0 | 0.37 | 11.00 | 1360 | 1396 | 456 | 3111490 | 1.94 | 1.72 | 0.41 | 3000 | 40 | 1811 | 1811 | 394 | 394 | 0 | |
| 6-Apr-13 | 1:00 AM | 1:00 | 724 | 0.50 | 1781.2 | 1756.2 | 0 | 0.03 | 1.00 | 1361 | 1397 | 457 | 3193150 | 1.93 | 1.72 | 0.41 | 3000 | 40 | 1842 | 1842 | 400 | 400 | 0 | |
| 6-Apr-13 | 2:00 AM | 1:00 | 720 | 0.50 | 1811.2 | 1786.2 | 0 | 0.30 | 9.00 | 1370 | 1406 | 466 | 3275350 | 1.95 | 1.67 | 0.42 | 3000 | 40 | 1874 | 1874 | 407 | 407 | 0 | |
| 6-Apr-13 | 3:00 AM | 1:00 | 718 | 0.50 | 1841.1 | 1816.1 | 0 | 0.07 | 2.00 | 1372 | 1408 | 468 | 3357670 | 1.96 | 1.66 | 0.42 | 3000 | 40 | 1905 | 1905 | 414 | 414 | 0 | |
| 6-Apr-13 | 4:00 AM | 1:00 | 721 | 0.50 | 1871.2 | 1846.2 | 0 | 0.30 | 9.00 | 1381 | 1417 | 477 | 3440530 | 1.97 | 1.64 | 0.42 | 3000 | 40 | 1937 | 1937 | 421 | 421 | 0 | |
| 6-Apr-13 | 5:00 AM | 1:00 | 718 | 0.50 | 1901.1 | 1876.1 | 0 | 0.10 | 3.00 | 1384 | 1420 | 480 | 3523570 | 1.98 | 1.62 | 0.42 | 3000 | 40 | 1968 | 1968 | 428 | 428 | 0 | |
| 6-Apr-13 | 6:00 AM | 1:00 | 719 | 0.50 | 1931.0 | 1906.0 | 0 | 0.47 | 14.00 | 1398 | 1434 | 494 | 3607450 | 2.00 | 1.57 | 0.43 | 3000 | 40 | 1999 | 1999 | 435 | 435 | 0 | |
| 6-Apr-13 | 7:00 AM | 1:00 | 725 | 0.50 | 1961.2 | 1936.2 | 0 | 0.07 | 2.00 | 1400 | 1436 | 496 | 3691450 | 1.98 | 1.58 | 0.43 | 3000 | 40 | 2031 | 2031 | 442 | 442 | 0 | |
| 6-Apr-13 | 8:00 AM | 1:00 | 718 | 0.50 | 1991.1 | 1966.1 | 0 | 0.37 | 11.00 | 1411 | 1447 | 507 | 3776110 | 2.02 | 1.52 | 0.43 | 3000 | 40 | 2062 | 2062 | 448 | 448 | 0 | |
| 6-Apr-13 | 8:58 AM | 0:58 | 718 | 0.50 | 2020.0 | 1995.0 | 0 | -0.03 | -1.03 | 1410 | 1446 | 506 | 3857890 | 2.02 | 1.53 | 0.43 | 3000 | 40 | 2093 | 2093 | 455 | 455 | 0 | |
| 6-Apr-13 | 8:58 AM | 0:00 | 718 | 0.50 | 2020.0 | 0.0 | 0 | -0.03 | -1.03 | 1410 | 1446 | 506 | 3857890 | 2.02 | 1.53 | 0.43 | 4500 | 40 | 2093 | 0 | 455 | 0 | 0 | Increase polymer concentration to 4,500 ppm |
| 6-Apr-13 | 9:00 AM | 0:02 | 720 | 0.50 | 2021.0 | 1.0 | 0 | 0.00 | 0.00 | 1410 | 1446 | 506 | 3860710 | 2.01 | 1.53 | 0.43 | 4500 | 40 | 2094 | 1 | 455 | 0 | 0 | |
| 6-Apr-13 | 10:00 AM | 1:00 | 722 | 0.50 | 2051.1 | 31.1 | 0 | 2.59 | 78.00 | 1488 | 1524 | 584 | 3949990 | 2.11 | 1.32 | 0.45 | 4500 | 40 | 2142 | 49 | 466 | 11 | 0 | |
| 6-Apr-13 | 11:00 AM | 1:00 | 725 | 0.50 | 2081.3 | 61.3 | 10 | 1.92 | 58.00 | 1546 | 1582 | 642 | 4042750 | 2.18 | 1.20 | 0.47 | 4500 | 40 | 2189 | 96 | 476 | 21 | 0 | |
| 6-Apr-13 | 12:00 PM | 1:00 | 718 | 0.50 | 2111.2 | 91.2 | 130 | 0.33 | 10.00 | 1556 | 1592 | 652 | 4136110 | 2.22 | 1.16 | 0.47 | 4500 | 40 | 2236 | 143 | 486 | 31 | 0 | |
| 6-Apr-13 | 1:00 PM | 1:00 | 718 | 0.50 | 2141.1 | 121.1 | 135 | 0.50 | 15.00 | 1571 | 1607 | 667 | 4230370 | 2.24 | 1.14 | 0.48 | 4500 | 40 | 2283 | 190 | 496 | 41 | 0 | |
| 6-Apr-13 | 1:38 PM | 0:38 | 716 | 0.50 | 2160.0 | 140.0 | 150 | 1.06 | 31.58 | 1591 | 1627 | 687 | 4290828 | 2.27 | 1.10 | 0.48 | 4500 | 40 | 2313 | 220 | 503 | 48 | 0 | |
| 6-Apr-13 | 1:38 PM | 0:00 | 716 | 0.50 | 2160.0 | 0.0 | 150 | 1.05 | 31.58 | 1591 | 1627 | 687 | 4290828 | 2.27 | 1.10 | 0.48 | 6000 | 40 | 2313 | 0 | 503 | 0 | 0 | Increase polymer concentration to 6,000 ppm |
| 6-Apr-13 | 2:00 PM | 0:22 | 713 | 0.50 | 2170.9 | 10.9 | 170 | 1.38 | 40.91 | 1606 | 1642 | 702 | 4326160 | 2.30 | 1.07 | 0.49 | 6000 | 40 | 2336 | 23 | 508 | 5 | 0 | |
| 6-Apr-13 | 3:00 PM | 1:00 | 713 | 0.49 | 2200.6 | 40.6 | 190 | 0.91 | 27.00 | 1633 | 1669 | 729 | 4424140 | 2.34 | 1.03 | 0.50 | 6000 | 40 | 2398 | 85 | 521 | 18 | 0 | |
| 6-Apr-13 | 3:23 PM | 0:23 | 714 | 0.50 | 2212.0 | 52.0 | 230 | 3.51 | 104.35 | 1673 | 1709 | 769 | 4462619 | 2.40 | 0.97 | 0.51 | 6000 | 40 | 2422 | 109 | 527 | 24 | 0 | |
| 6-Apr-13 | 3:23 PM | 0:00 | 714 | 0.50 | 2212.0 | 0.0 | 230 | 3.64 | 104.35 | 1673 | 1709 | 769 | 4462619 | 2.40 | 0.97 | 0.51 | 10000 | 40 | 2422 | 0 | 527 | 0 | 0 | Increase polymer concentration to 10,000 ppm |
| 6-Apr-13 | 4:00 PM | 0:37 | 720 | 0.50 | 2230.5 | 18.5 | 340 | 5.08 | 152.43 | 1767 | 1803 | 863 | 4527998 | 2.50 | 0.87 | 0.53 | 10000 | 40 | 2487 | 65 | 541 | 14 | 0 | |
| 6-Apr-13 | 5:00 PM | 1:00 | 718 | 0.50 | 2260.4 | 48.4 | 490 | 3.21 | 96.00 | 1863 | 1899 | 959 | 4639778 | 2.65 | 0.78 | 0.56 | 10000 | 40 | 2591 | 169 | 563 | 36 | 0 | |
| 6-Apr-13 | 5:07 PM | 0:07 | 715 | 0.50 | 2264.0 | 52.0 | 490 | 0.00 | 0.00 | 1863 | 1899 | 959 | 4652819 | 2.66 | 0.77 | 0.56 | 10000 | 40 | 2604 | 182 | 566 | 39 | 0 | |
| 6-Apr-13 | 5:07 PM | 0:00 | 715 | 0.50 | 2264.0 | 0.0 | 490 | 0.00 | 0.00 | 1863 | 1899 | 959 | 4652819 | 2.66 | 0.77 | 0.56 | 0 | | 2604 | 0 | 566 | 0 | 0 | Begin water post-flush |

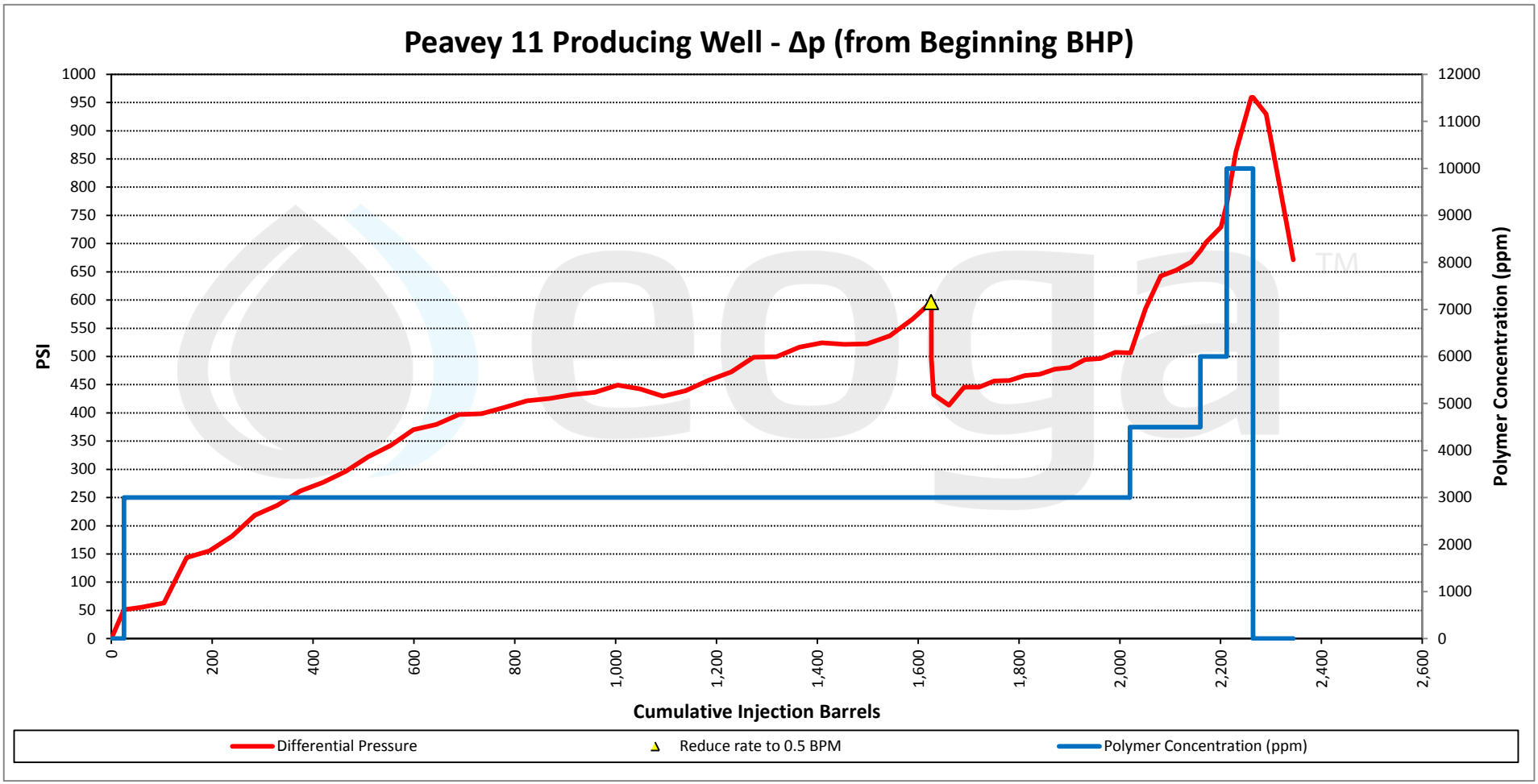
eoga
improved oil & gas recovery
Project Engineer - Jay Portwood
P.O. Box 2230 Keller, TX 76244-2230
817-431-6336 (off) 817-431-6337 (fax)
817-312-1033 (cell)

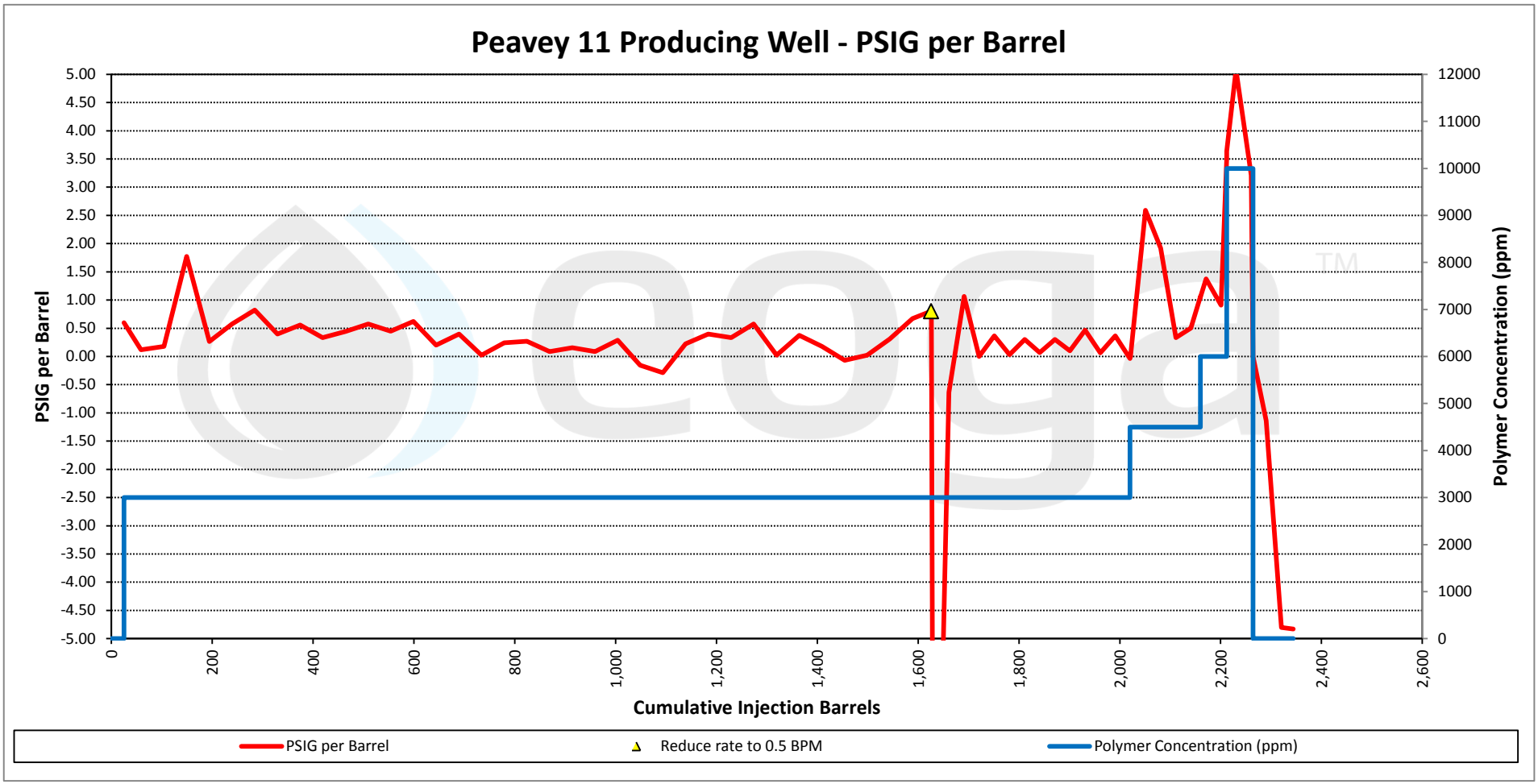
## PROJECT INFORMATION

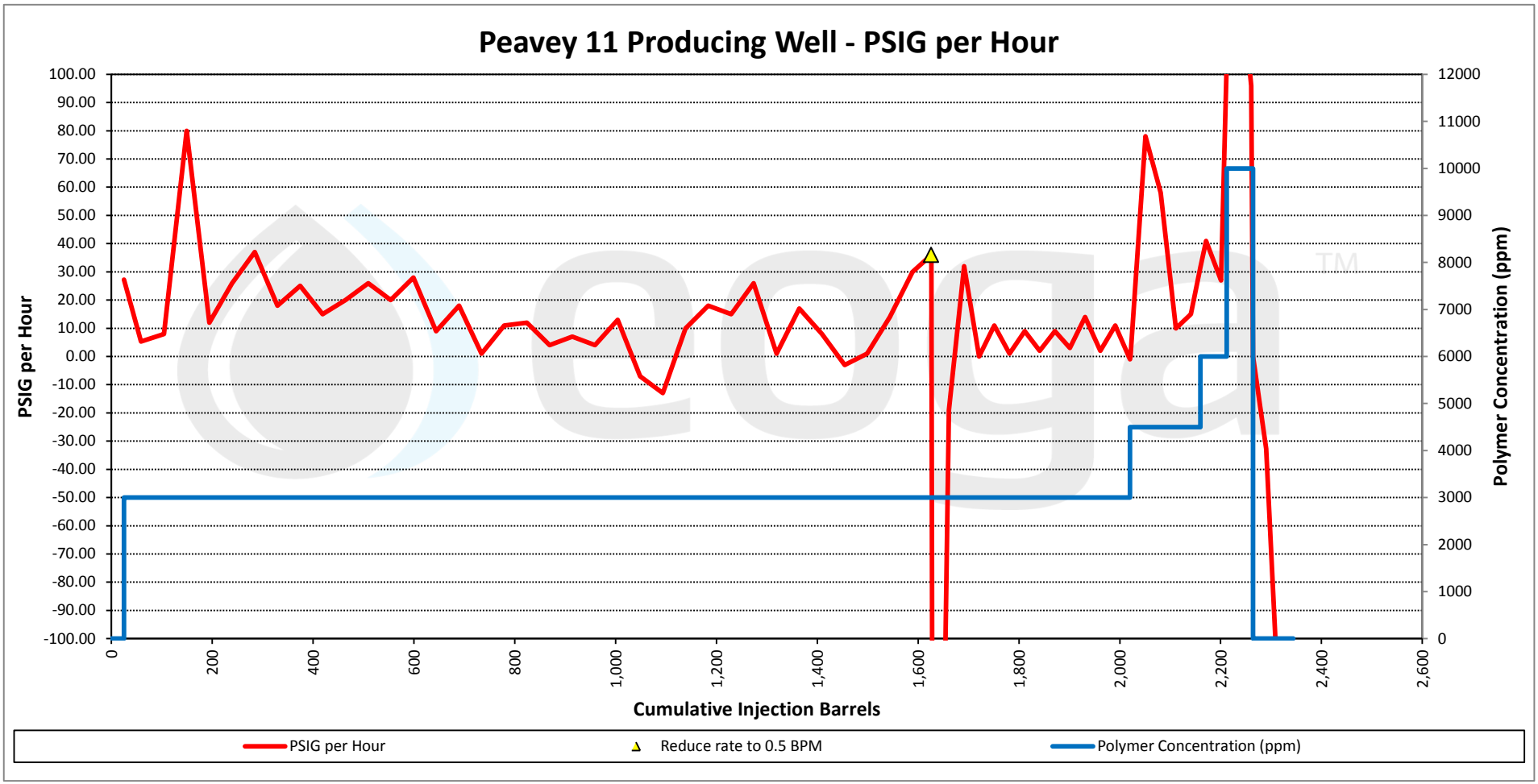
| | | | | | |
|---|---|---|---|---|---|
| **Company Name:** | Citation Oil & Gas Corp. | **Depth to Top Perforation or OH (ft.):** | 3357 | **EOT (ft.):** | 3273 |
| **Field Name:** | Bemis-Shutts | **Depth to Bottom Perforation or OH (ft.):** | 3388 | **Packer (ft.):** | 3273 |
| **Well Name:** | Peavey #11 | **Depth to Mid-Perf (ft.):** | 3373 | **Tbg Size:** | 2.875" |
| **Injector or Producer:** | Producer | **BHP Tool Depth (ft.):** | 3290 | **Tbg. Cap. (bbls./ft.):** | 0.00538 |
| **County/State:** | Ellis/KS | **Type Mix Water Used:** | Produced | **Tbg. Vol. (bbls.):** | 17.61 |
| **Polymer Unit No.:** | 4 | **Mix Water Specific Gravity:** | 1.02 | **Csg Size:** | 4.5" |
| **Polymer Unit Operators:** | Sean Eklund (day) 785-885-8176 / Brad Gordon (night) 785-885-8206 | **Mix Water Pressure Gradient (psi per ft.):** | 0.442 | **Csg. Cap. (bbls./ft.):** | 0.015 |
| **Generator Used (Yes/No):** | Yes | **Expect Positive Surface Pressure @ BHP of:** | 1453 | **Csg Vol. bbls. (Pkr. to Btm. Perf.):** | 1.725 |
| **Customer Contact:** | Daniel Hansberger 281-891-1484 (off) 405-605-9177 (cell) | **Estimated Static BHP (psig):** | 940 | **Total Well Vol. (bbls.):** | 19.33 |

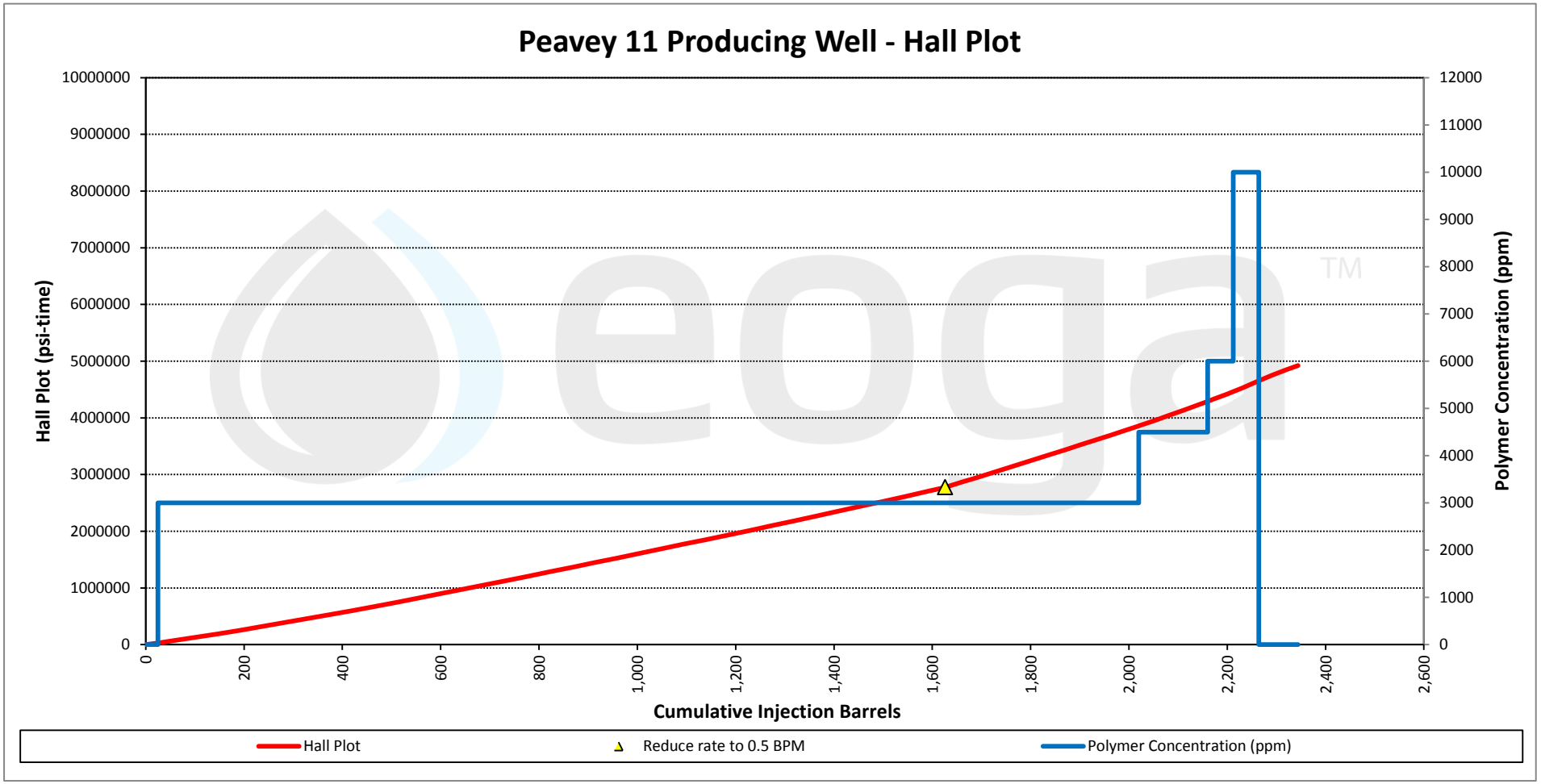
| Date | Time | Elapsed Time Between Readings (Mins.) | Injection Rate BPD | Injection Rate BPM | Total Cum. Injection (Bbls.) | Stage Cum. Injection Bbls. | Tubing Pressure (psig) | PSIG per Bbl Injected | PSIG per Hour Injected | Bottomhole Conditions: Pressure: Actual Reading (psig) | Bottomhole Conditions: Pressure: Calculated to Mid-Perf (psia) | Δp | Hall Plot Cum. psi-time | Injectivity Ratio (Psi ÷ Rate) | Injectivity Index BPD/(Calc. BHP-Static BHP) (BPD per psig) | Pressure Gradient (psig per ft.) | Polymer Concentration (ppm) | Cross-linker Ratio (x:1) | Total Cum. Polymer (lbs.) | Stage Cum. Polymer (lbs.) | Total Cum. X-linker (Lbs.) | Stage Cum. X-linker (Lbs.) | Casing Pressure (psig) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-Apr-13 | 6:00 PM | 0:52 | 721 | 0.50 | 2290.4 | 26.4 | 400 | -1.14 | -32.73 | 1833 | 1869 | 929 | 4748135 | 2.59 | 0.81 | 0.55 | 0 | | 2604 | 0 | 566 | 0 | 0 | |
| 6-Apr-13 | 7:00 PM | 1:00 | 720 | 0.50 | 2320.4 | 56.4 | 245 | -4.80 | -144.00 | 1689 | 1725 | 785 | 4849475 | 2.40 | 0.96 | 0.51 | 0 | | 2604 | 0 | 566 | 0 | 0 | |
| 6-Apr-13 | 7:47 PM | 0:47 | 723 | 0.50 | 2344.0 | 80.0 | 190 | -4.83 | -145.53 | 1575 | 1611 | 671 | 4923500 | 2.23 | 1.14 | 0.48 | 0 | | 2604 | 0 | 566 | 0 | 0 | End job & shut down injection pumps |
| 6-Apr-13 | 7:47 PM | 0:00 | 0 | 0.00 | 2344.0 | 80.0 | 0 | | | | | | | | | | 0 | | 2604 | 0 | 566 | 0 | 0 | ISIP |

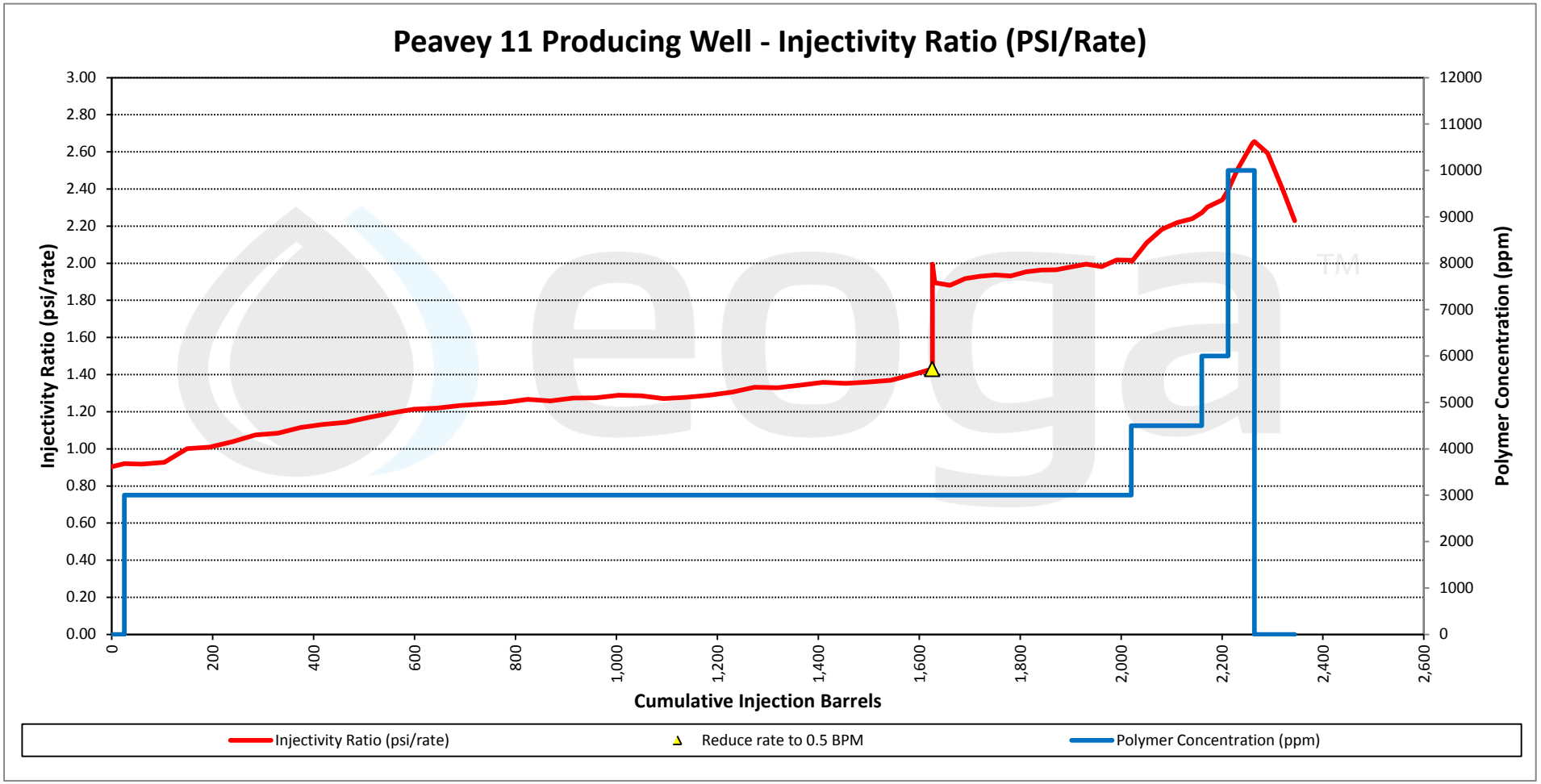

Peavey 11 Producing Well - Rate vs. Pressure
Injection Rate (BPD) & Pressure (psig)
Polymer Concentration (ppm)
Cumulative Injection Barrels
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
Injection Rate (BPD)
Tubing Pressure (psig)
Bottomhole Pressure (psig)
Polymer Concentration (ppm)

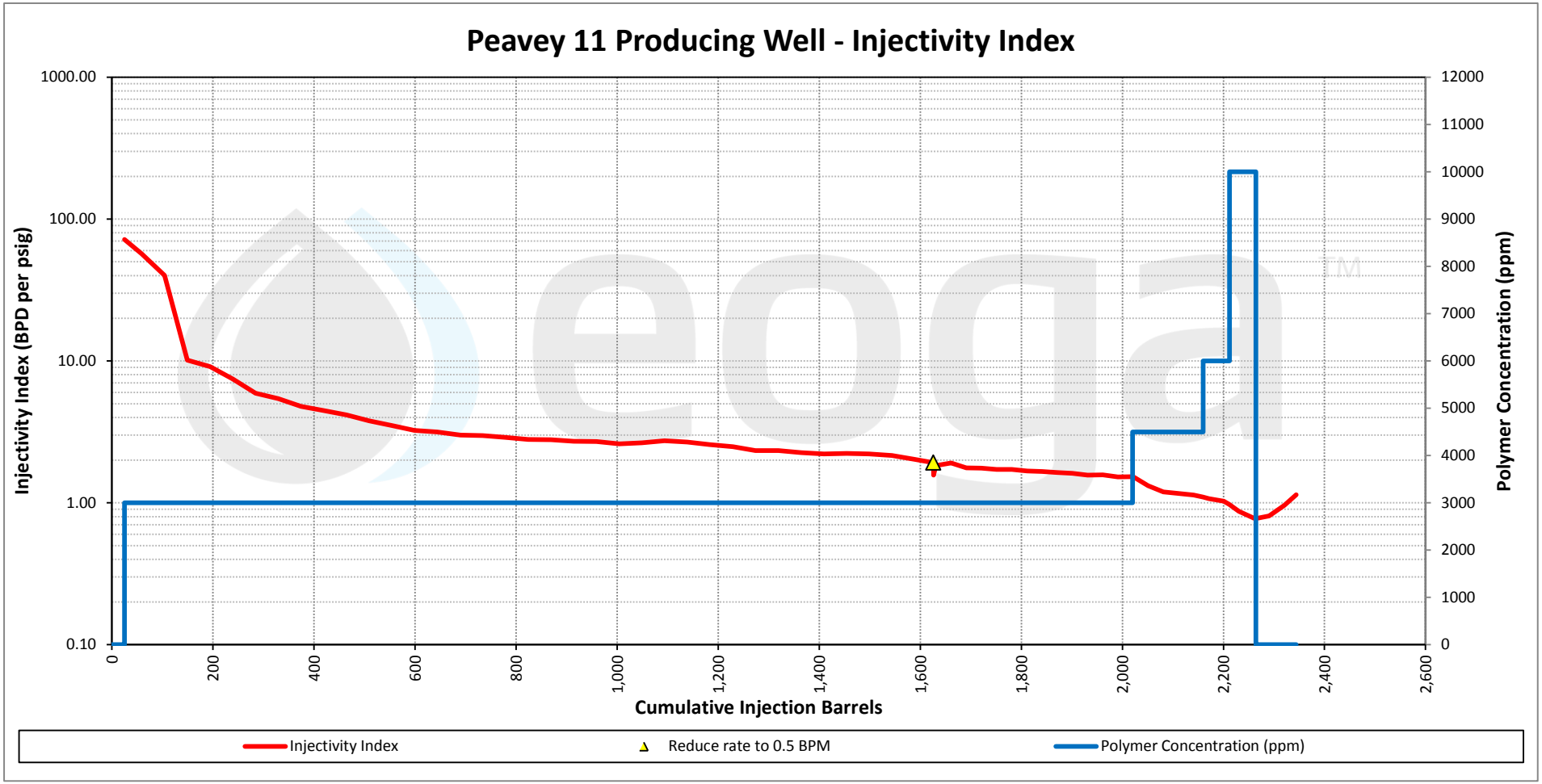

Peavey 11 Producing Well - Δp (from Beginning BHP)
PSI
Polymer Concentration (ppm)
Cumulative Injection Barrels
Differential Pressure
Reduce rate to 0.5 BPM
Polymer Concentration (ppm)

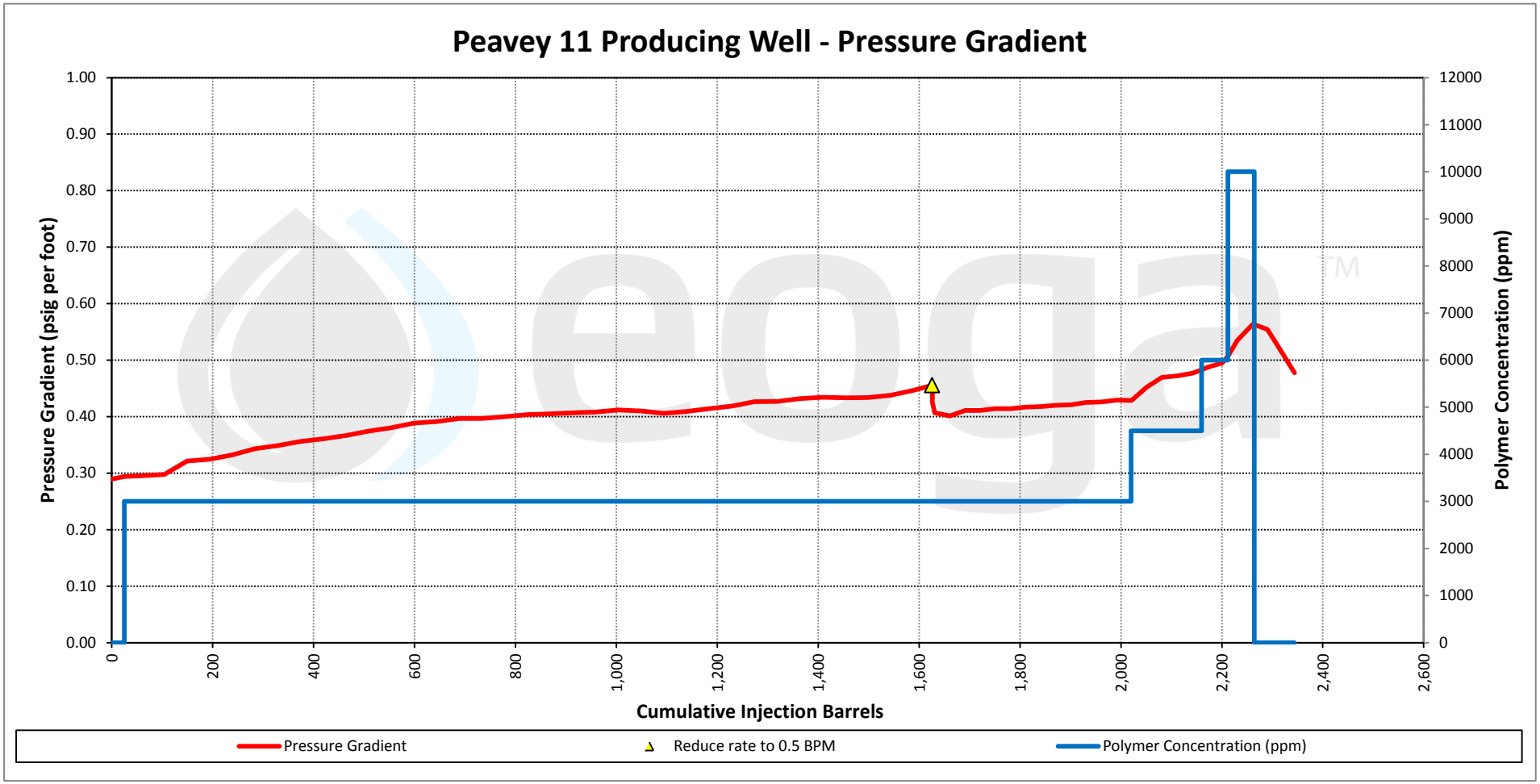

Peavey 11 Producing Well - PSIG per Barrel
PSIG per Barrel
Polymer Concentration (ppm)
Cumulative Injection Barrels
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
-5.00
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
PSIG per Barrel
Reduce rate to 0.5 BPM
Polymer Concentration (ppm)


Peavey 11 Producing Well - PSIG per Hour
PSIG per Hour
Polymer Concentration (ppm)
Cumulative Injection Barrels
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
-50.00
-60.00
-70.00
-80.00
-90.00
-100.00
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
PSIG per Hour
Reduce rate to 0.5 BPM
Polymer Concentration (ppm)


Peavey 11 Producing Well - Hall Plot
Hall Plot (psi-time)
10000000
9000000
8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
Polymer Concentration (ppm)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
Cumulative Injection Barrels
Hall Plot
Reduce rate to 0.5 BPM
Polymer Concentration (ppm)


Peavey 11 Producing Well - Injectivity Ratio (PSI/Rate)
Injectivity Ratio (psi/rate)
Polymer Concentration (ppm)
Cumulative Injection Barrels
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
Injectivity Ratio (psi/rate)
Reduce rate to 0.5 BPM
Polymer Concentration (ppm)


Peavey 11 Producing Well - Injectivity Index
Injectivity Index (BPD per psig)
1000.00
100.00
10.00
1.00
0.10
Polymer Concentration (ppm)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
Cumulative Injection Barrels
Injectivity Index
Reduce rate to 0.5 BPM
Polymer Concentration (ppm)


Peavey 11 Producing Well - Pressure Gradient
Pressure Gradient (psig per foot)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Polymer Concentration (ppm)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
Cumulative Injection Barrels
Pressure Gradient
Reduce rate to 0.5 BPM
Polymer Concentration (ppm)

# ALLIED OIL & GAS SERVICES, LLC 060382

Federal Tax I.D. # 20-8651475

REMIT TO P.O. BOX 93999
SOUTHLAKE, TEXAS 76092

SERVICE POINT: Great Bend Ks

| DATE 3-22-13 | SEC 13 | TWP 11 | RANGE 17 W | CALLED OUT 8:00 AM | ON LOCATION 11:15 AM | JOB START 2:00 PM | JOB FINISH 3:15 PM |
|---|---|---|---|---|---|---|---|
| LEASE Peavey | WELL # W-11 | | LOCATION Hoyt-N To Saline River Rd | | | COUNTY Ellis | STATE Ks |
| OLD OR NEW (Circle one) | | | 2 East 3/4 south East into | | | | |

CONTRACTOR Express Well Service
TYPE OF JOB Liner
HOLE SIZE — T.D.
CASING SIZE 4½ in 5½ DEPTH 3303'
TUBING SIZE DEPTH
DRILL PIPE DEPTH
TOOL DEPTH
PRES. MAX 1400# MINIMUM 600#
MEAS. LINE SHOE JOINT
CEMENT LEFT IN CSG. 15' (Customer Request)
PERFS.
DISPLACEMENT 51 3/2 bbls

OWNER Same

**EQUIPMENT**

PUMP TRUCK CEMENTER Bob S. Russell
#1006 HELPER Pat Helperman
BULK TRUCK
#603 DRIVER Dan Cooper
BULK TRUCK
# DRIVER

**CEMENT**

AMOUNT ORDERED 130 sk 60/40 290 Gel
.75 CD-31, .5 D-160, .25 lb/sk Defoamer

| | | | |
|---|---|---|---|
| COMMON | 78 | @ 17.90 | 1396.20 |
| POZMIX | 52 | @ 9.35 | 486.20 |
| GEL | 2 | @ 23.40 | 46.80 |
| CHLORIDE | | @ | |
| ASC | | @ | |
| CD-31 | 83# | @ 10.30 | 854.90 |
| D-160 | 56# | @ 18.90 | 1058.40 |
| Defoamer | 32# | @ 9.80 | 313.60 |
| | | @ | |
| | | @ | |
| | | @ | |
| | | @ | |
| | | @ | |
| HANDLING | 138 | @ 2.43 | 342.34 |
| MILEAGE | 82 x 2.60 | | 221.20 |
| | | TOTAL | 4724.64 |

**REMARKS:**

Ran 3303' of 4½" liner. Circulated last 2 ft. in Hole. Waiten Welder. Hooked to 4½" csg. Loaded csg. Mixed 130 sks 60/40 2% Gel. .75 CD-31, .5% D-160, .25# Defoamer. Released Plug. Displaced Plug with 51½ bbls. Customer Requested leave 15' bbls Cement in csg. Max Pressure 1400#. Held No Return.

**SERVICE**

| | | | |
|---|---|---|---|
| DEPTH OF JOB | 3303' | | |
| PUMP TRUCK CHARGE | | | 2558.25 |
| EXTRA FOOTAGE | | @ | |
| MILEAGE | 15 | @ 7.20 | 115.50 |
| MANIFOLD | | @ | |
| Head Rental | | @ 275.00 | 275.00 |
| MILV | 15 | @ 4.40 | 66.00 |
| | | TOTAL | 3015.25 |

CHARGE TO: Citation Oil & Gas
STREET
CITY STATE ZIP

**PLUG & FLOAT EQUIPMENT**

| | | | |
|---|---|---|---|
| 1-4½" Buttweld Float Shoe | @ | 496.08 | 496.08 |
| 1-4½ Rubber Plug | @ | 265.68 | 265.59 |
| | @ | | |
| | @ | | |
| | @ | | |
| | TOTAL | | 761.67 |

To: Allied Oil & Gas Services, LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME X Neil Hammond

SIGNATURE X

SALES TAX (If Any)
TOTAL CHARGES 8501.46
DISCOUNT ~~-5246.80~~ -2890.50 IF PAID IN 30 DAYS
$ 5610.96