Bison Oil Well Cementing
Single Cement Surface Pipe

Date: 12/19/2018
Invoice # 300237
API# 05-123-47869
Foreman: JASON KELEHER

Customer: Anadarko Petroleum Corporation
Well Name: REESE 21-4HZ

County: Weld
State: Colorado
Sec: 21
Twp: 2N
Range: 67W

Consultant: BRYAN
Rig Name & Number: CARTEL 88
Distance To Location: 28
Units On Location: 4045-3103,4033-3201,4028-321
Time Requested: 1300
Time Arrived On Location: 1230
Time Left Location: 1530

WELL DATA

Casing Size OD (in) :	_9.625
Casing Weight (lb) :	36.00
Casing Depth (ft.) :	1,879
Total Depth (ft) :	1889
Open Hole Diameter (in.) :	13.50
Conductor Length (ft) :	80
Conductor ID :	15.25
Shoe Joint Length (ft) :	43
Landing Joint (ft) :	5
Max Rate:	8
Max Pressure:	2000

Cement Data

Cement Name:	BFN III
Cement Density (lb/gal) :	14.2
Cement Yield (cuft) :	1.48
Gallons Per Sack:	7.48
% Excess:	10%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	17.0
Fluid Ahead (bbls):	30.0
H20 Wash Up (bbls):	10.0

Spacer Ahead Makeup
30 BBL WATER, DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results

cuft of Shoe 18.71 cuft
(Casing ID Squared) X (.005454) X (Shoe Joint ft)

cuft of Conductor 61.05 cuft
(Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)

cuft of Casing 966.92 cuft
(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Total Slurry Volume 1046.68 cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

bbls of Slurry 186.41 bbls
(Total Slurry Volume) X (.1781)

Sacks Needed 707 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Mix Water 125.95 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 142.28 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus
Hydrostatic Pressure: 1385.82 PSI

Pressure of the fluids inside casing
Displacement: 791.42 psi
Shoe Joint: 31.80 psi
Total 823.22 psi

Differential Pressure: 562.60 psi

Collapse PSI: 2020.00 psi
Burst PSI: 3520.00 psi

Total Water Needed: 308.23 bbls

X _____
Authorization To Proceed

Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.

Bison Oil Well Cementing
Single Cement Surface Pipe

Customer	Anadarko Petroleum Corporation
Well Name	REESE 21-4HZ

INVOICE #	300237
LOCATION	Weld
FOREMAN	JASON KELEHER
Date	12/19/2018

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DESCRIPTION OF JOB EVENTS

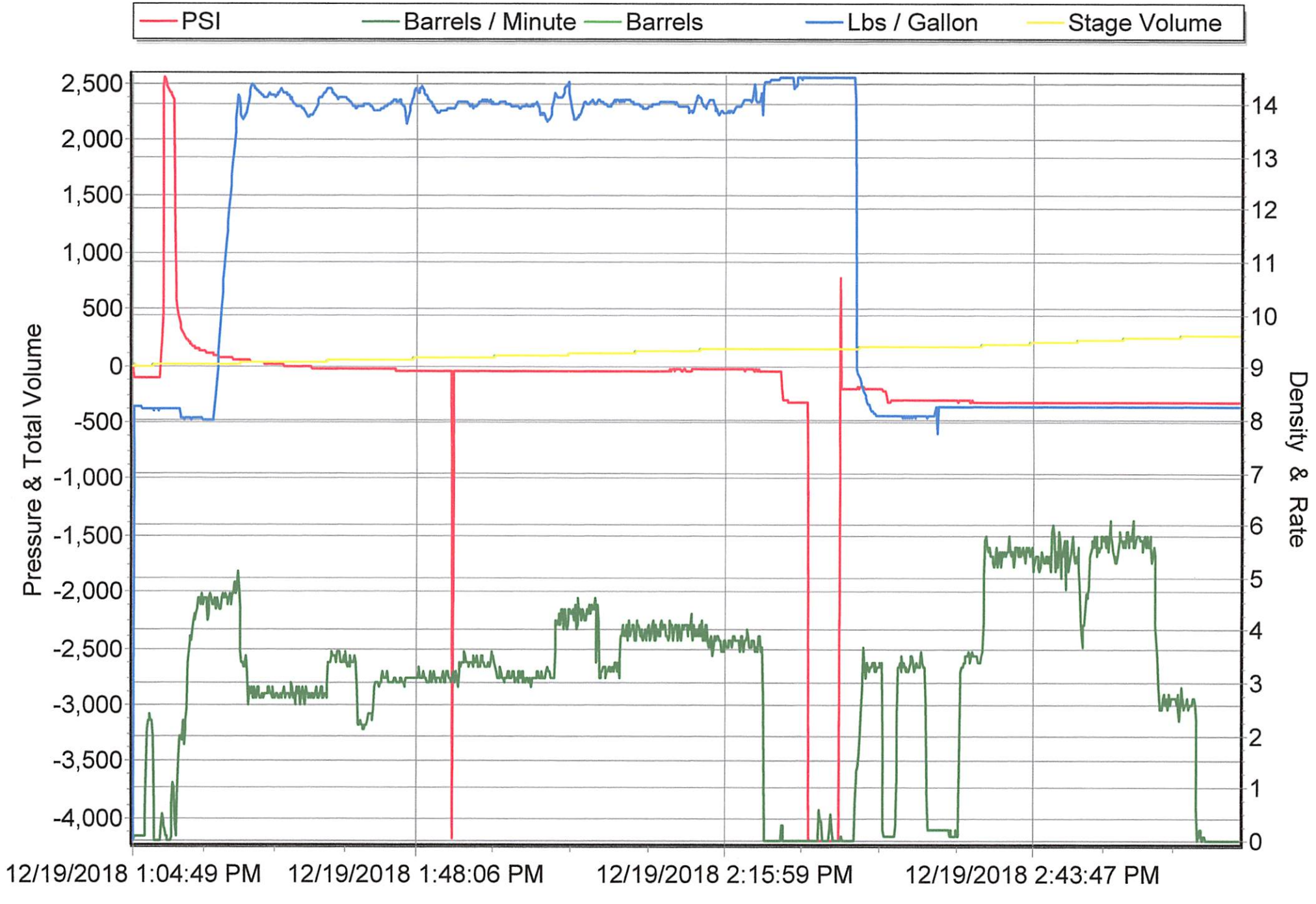
Amount Pumped		Time/Date	Event	Description	Rate	BBLs	Pressure
% Excess	10%	1230	ARRIVE ON LOCATION	ACCESS LOCATION			
Mixed bbls	125.95	1240	MIRU	SPOT EQUIPMENT			
Total Sacks	707	1300	JSA				
bbl Returns	17	1325	PRESSURE TEST LINES	PRESSURE TEST TO 2000 PSI			2000
Water Temp	60	1327	Spacer Ahead	30 BBLS H2O DYE IN 2ND 10	4.5	30	90
		1332	CEMENT	707 SKS CEMENT 14.2 LBS	4	186.4	80
Notes:		1420	SHUT DOWN				
		1428	DROP PLUG				
		1428	START DISPLACEMENT	DISPLACE WITH WATER	3	142.2	600
		1500	BUMP PLUG				1210
		1501	CHECK FLOATS	FLOATS HELD 1 BBL BACK			
		1505	RIG DOWN				
		1530	LEAVE LOCATION				

X _____ Authorized signature

X Co. Man Title

X 12-18-18 Date

REESE 21-4HZ


PSI
Barrels / Minute
Barrels
Lbs / Gallon
Stage Volume
2,500
2,000
1,500
1,000
500
0
-500
-1,000
-1,500
-2,000
-2,500
-3,000
-3,500
-4,000
Pressure & Total Volume
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Density & Rate
12/19/2018 1:04:49 PM
12/19/2018 1:48:06 PM
12/19/2018 2:15:59 PM
12/19/2018 2:43:47 PM