Bison Oil Well Cementing
Single Cement Surface Pipe

Customer	Anadarko Petroleum Corporation
Well Name	farley 23-4hz

INVOICE #	200491
LOCATION	Weld
FOREMAN	Kirk Kallhoff
Date	8/7/2019

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

Amount Pumped			Event	Description	Rate	BBLs	Pressure
% Excess	10%	700 am	arived on location				
Mixed bbls	124.4	715 am	MIRU				
Total Sacks	706	1045 am	JSA				
bbl Returns	9	1113 am	Pressure Test		0.5		1000
Water Temp	60	1114 am	Spacer Ahead	30 bbls h2o dye in 2nd 10	5	30	120
		1119 am	M&P	706 sks cement 14.2 lbs 186.2 bbls slurry	5	186.2	250
Notes:		1159 am	Shutdown				0
		1201 pm	Drop Plug				
		1201 pm	Start Displacement	142.6 bbls h2o	5		450
		1228 pm	Bump Plug	142.6 bbls h2o 540 psi lift	2	142.6	1130
		1229 pm	Test Floats				
		1230 pm	End Job				
		1231 pm	Rig Down				
		100 pm	Leave Location				

X _____ Work Preformed

X Co. Man Title

X 8-7-19 Date

Bison Oil Well Cementing
Single Cement Surface Pipe

Date: 8/7/2019
Invoice # 200491
API#
Foreman: Kirk Kallhoff

Customer: Anadarko Petroleum Corporation
Well Name: farley 23-4hz

County: Weld
State: Colorado
Sec: 12
Twp: 1n
Range: 68w

Consultant: bryan
Rig Name & Number: Cartel 88
Distance To Location: 25
Units On Location: 4047/4039/4032
Time Requested: 900 am
Time Arrived On Location: 700 am
Time Left Location: 1:00pm

WELL DATA

Casing Size OD (in) :	9.625
Casing Weight (lb) :	36.00
Casing Depth (ft.) :	1,878
Total Depth (ft) :	1888
Open Hole Diameter (in.) :	13.50
Conductor Length (ft) :	80
Conductor ID :	15.25
Shoe Joint Length (ft) :	41
Landing Joint (ft) :	8
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:	7.40
% Excess:	10%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	
Fluid Ahead (bbls):	30.0
H20 Wash Up (bbls):	10.0

Spacer Ahead Makeup
30 bbl with Die in 2nd 10

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results

cuft of Shoe 17.80 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 966.61 cuft
(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Total Slurry Volume 1045.46 cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

bbls of Slurry 186.20 bbls
(Total Slurry Volume) X (.1781)

Sacks Needed 706 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Mix Water 124.46 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 142.63 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus

Hydrostatic Pressure: 1385.40 PSI

Pressure of the fluids inside casing

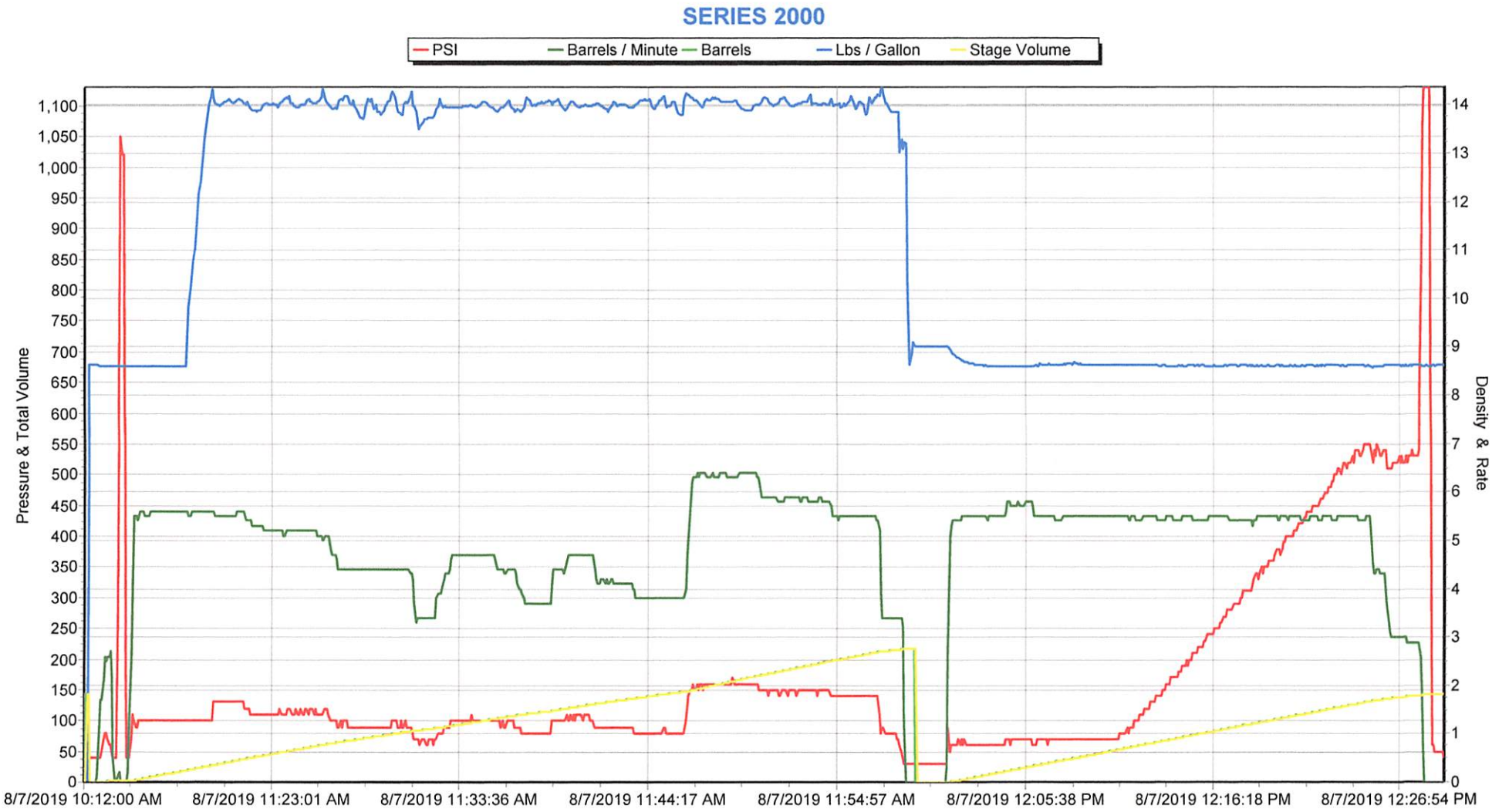
Displacement: 792.08 psi
Shoe Joint: 30.25 PSI
Total 822.33 psi
Differential Pressure: 563.08 psi

Collapse PSI: 2020.00 psi
Burst PSI: 3520.00 psi

Total Water Needed: 307.09 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.


SERIES 2000
PSI
Barrels / Minute
Barrels
Lbs / Gallon
Stage Volume
Pressure & Total Volume
Density & Rate
1,100
1,050
1,000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8/7/2019 10:12:00 AM
8/7/2019 11:23:01 AM
8/7/2019 11:33:36 AM
8/7/2019 11:44:17 AM
8/7/2019 11:54:57 AM
8/7/2019 12:05:38 PM
8/7/2019 12:16:18 PM
8/7/2019 12:26:54 PM