



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 1/23/2018
 Invoice # 666263
 API# 05-123-46018
 Foreman: Nick Vigil

Customer: Anadarko Petroleum Corporation
Well Name: Verde 13-2HZ

County: Weld Consultant: Brian/Truett
 State: Colorado Rig Name & Number: Cartel 88
 Distance To Location: 37 Miles
 Sec: 13 Units On Location: 4023/4039/4041
 Twp: 1N Time Requested: 20:00
 Range: 66W Time Arrived On Location: 20:00
 Time Left Location: 23:30

| WELL DATA | Cement Data |
|---|---------------------------------------|
| Casing Size OD (in) : <u>9.625</u> | Cement Name: <u>BFN III</u> |
| Casing Weight (lb) : <u>36.00</u> | Cement Density (lb/gal) : <u>14.2</u> |
| Casing Depth (ft.) : <u>1,866</u> | Cement Yield (cuft) : <u>1.49</u> |
| Total Depth (ft) : <u>1857</u> | Gallons Per Sack: <u>7.48</u> |
| Open Hole Diameter (in.) : <u>13.50</u> | % Excess: <u>5%</u> |
| Conductor Length (ft) : <u>80</u> | Displacement Fluid lb/gal: <u>8.3</u> |
| Conductor ID : <u>15.25</u> | BBL to Pit: |
| Shoe Joint Length (ft) : <u>44</u> | Fluid Ahead (bbls): <u>30.0</u> |
| Landing Joint (ft) : <u>10</u> | H2O Wash Up (bbls): <u>20.0</u> |
| Max Rate: <u>8</u> | Spacer Ahead Makeup |
| Max Pressure: <u>2000</u> | Dye in second 10 bbl |

| Calculated Results | Pressure of cement in annulus |
|---|--|
| cuft of Shoe <u>19.10</u> cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft) | Displacement: <u>141.63</u> bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint) |
| cuft of Conductor <u>61.05</u> cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft) | Pressure of cement in annulus |
| cuft of Casing <u>916.51</u> cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length) | Hydrostatic Pressure: <u>1376.55</u> PSI |
| Total Slurry Volume <u>996.66</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing) | Pressure of the fluids inside casing |
| bbls of Slurry <u>177.51</u> bbls (Total Slurry Volume) X (.1781) | Displacement: <u>785.61</u> psi |
| Sacks Needed <u>669</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement) | Shoe Joint: <u>32.46</u> psi |
| Mix Water <u>119.13</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42 | Total <u>818.07</u> psi |
| | Differential Pressure: <u>558.48</u> psi |
| | Collapse PSI: <u>2020.00</u> psi |
| | Burst PSI: <u>3520.00</u> psi |
| | Total Water Needed: <u>310.76</u> bbls |

X [Signature] 1/23/2018
 Authorization To Proceed

Verde 13-2HZ

