

## 1 Job Details & Summary

### 1.1 Geometry

Type	Function	OD (in)	ID (in)	Weight (lb/ft)	Thread	Top (ft)	Bottom (ft)	Excess (%)
Casing	Outer	9.625	8.921	36	n/a	0	1552	0
Open Hole	Outer	n/a	8.5	n/a	n/a	1555	17739	8
Casing	Inner	5.5	4.778	20	Buttress	0	17723	0

### 1.2 Equipment / People

Unit Type	Unit	Employee #1	Mileage
Silo	658		
Bulk Trailer	509	Bell, Wesley	110
Bulk Trailer	502	Gabel, Dustin	110
Silo	661		
Silo	656		
Cement Pump	101	Beal, Scott	110
Tractor	301	Hyde, Zack	110
Light Duty Pickup	54		110

### 1.3 Timing

Event	Date/Time
Call Out	10/8/2017 22:00
Depart Facility	10/8/2017 23:00
On Location	10/9/2017 00:15
Rig Up Iron	10/9/2017 09:15
Job Started	10/9/2017 12:27
Job Completed	10/9/2017 16:55
Rig Down Iron	10/9/2017 17:00
Depart Location	10/9/2017 18:00

### 1.4 General Job Information

Metrics	Value
Well Fluid Density	9.9 lb/gal
Well Fluid Type	OBM
Rig Circulation Vol	1440 bbls
Rig Circulation Time	3 hours
Calculated Displacement	392.3 bbls
Actual Displacement	388 bbls
Total Spacer to Surface	80 bbls
Total CMT to Surface	110 bbls

### 1.5 Well Fluid Details

Metrics	Value
Plastic Viscosity	15
Yield Point	10
10 sec. SGS	7
10 min. SGS	11
30 min. SGS	13
Filtrate	20

### 1.6 Job Details

Metrics	Value
Flare Prior to Job	Yes
Flare During Job	No
Flare at End of Job	No
Well Full Prior to Job	Yes
Well Fluid Density Into Well	9.9 lb/gal
Well Fluid Density Out of Well	9.9 lb/gal

### 1.7 Job Details (cont.)

Metrics	Value
BHCT	220 °F
BHST	220 °F

### 1.8 Circulation

Lost Circulation Experienced
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No

### 1.9 Job Execution Information

Job	Fluid	Product	Function	Density (lb/gal)	Yield (ft <sup>3</sup> /sk)	Water Rq. (gal/sk)	Water Rq. (gal/bbl)	Volume (sks)	Volume (bbl)	Top (ft)
1	1	CD Spacer	Spacer	11.00			32.76		80.00	0
1	2	P100-X2	Lead	13.20	1.82	9.89		915.00	297.38	0
1	3	P50-X1	Tail	13.50	1.47	7.43		1880.00	493.86	5645
1	4	Water w/ Clay Protection and Biocide	DisplacementFinal	8.33			41.91		392.30	0

### 1.11 Job Fluid Details

Job	Fluid	Type	Fluid	Product	Function	Conc.	Uom	Start (gal)	End (gal)	Used (gal)
1	1	Spacer	CD Spacer	ASR-20	StrengthRetrogression	180.06	lb/bbl			
1	1	Spacer	CD Spacer	ASF-20	Surfactant	0.50	gal/bbl	40	0	40
1	1	Spacer	CD Spacer	ASF-80	Surfactant	0.50	gal/bbl	40	0	40
1	1	Spacer	CD Spacer	AVS-10	Viscosifier	1.00	lb/bbl			
1	2	Lead	P100-X2	AC3-10	Cement	100.00	%			
1	2	Lead	P100-X2	ABX-20	BondEnhancer	3.00	%BWOB			
1	2	Lead	P100-X2	ADF-11	Defoamer	0.30	%BWOB			
1	2	Lead	P100-X2	AFL-50	FluidLoss	0.50	%BWOB			
1	2	Lead	P100-X2	AR-31	Retarder	0.17	%BWOB			
1	2	Lead	P100-X2	AVS-20	Viscosifier	0.10	%BWOB			
1	3	Tail	P50-X1	ACG-10	Cement	50.00	%			
1	3	Tail	P50-X1	AFA-10	Extender	50.00	%			
1	3	Tail	P50-X1	ADF-11	Defoamer	0.30	%BWOB			
1	3	Tail	P50-X1	AFL-50	FluidLoss	0.20	%BWOB			
1	3	Tail	P50-X1	AR-20	Retarder	0.15	%BWOB			
1	3	Tail	P50-X1	AVS-10	Viscosifier	0.10	%BWOB			
1	3	Tail	P50-X1	AVS-50	Viscosifier	2.00	%BWOB			
1	4	DisplacementFinal	Water w/ Clay Protection and Biocide	ASF-50	ClayProtection	0.08	gal/bbl	32	0	32
1	4	DisplacementFinal	Water w/ Clay Protection and Biocide	Biocide	Other	0.01	gal/bbl	5	0	5

## 2 Job Logs

Line	Event	Date (MM/DD/YY)	Time (HH:MM)	Density (lb/gal)	Pump Rate (bpm)	Pump Volume (bbls)	Pipe Pressure (psi)	Comment
1	Arrive on location	10/9/2017	00:15					Arrive on location,
2	Waiting	10/9/2017	00:25					Wait for rig to finish running casing
3	Rig In	10/9/2017	09:15					Spot in all units, rig in bulk, water, iron and air lines.
4	Waiting	10/9/2017	10:00					Wait for rig to finish circulating well
5	Safety meeting	10/9/2017	12:00					Hold pre job meeting with rig crew and pump crew. Review job hazards and job procedures. Nearest medical facility is Greely Co
6	Fill Lines	10/9/2017	12:27	8.34	2	2	200	Fill lines with fresh water.
7	Pressure Test	10/9/2017	12:29	8.34			5000	Test lines to 5000psi, good test, no leaks
8	Pump Spacer	10/9/2017	12:33	11	3	10	300	Pump Spacer at 11ppg
9	Shut Down	10/9/2017	12:40					Stopped so rig could fix an issue
10	Pump Spacer	10/9/2017	12:43	11	3	70	300	Pump Spacer at 11ppg
11	Pump Lead Cement	10/9/2017	13:00	13.2	6.5	297	500	Pump 297bbls of Lead cement at 13.2ppg, Y:1.82, WR: 9.89, 915sk, 217bbls mix water
12	Pump Tail Cement	10/9/2017	13:50	13.5	5.5	493.9	350	Pump 493.9bbls of Tail Cement at 13.5ppg, Y: 1.47, WR: 7.43, 1880sk, 335bbls mix water. Top of Tail@5645'
13	Shut Down/Clean lines	10/9/2017	15:22					Finish mixing, pump lines clean to rig tank
14	Drop Plugs/Displace	10/9/2017	15:29	8.34				Drop top and bottom plug, Displacement calculated at 392.3bbls with ASF-50 and Biocide
15	Pump	10/9/2017	15:38	8.34	5	50	1200	50bbls of displacement away
16	Pump	10/9/2017	15:45	8.34	8	50	2000	100bbls of displacement away
17	Pump	10/9/2017	15:52	8.34	8	50	2500	150bbls of displacement away
18	Shut Down	10/9/2017	15:55	8.34	0	30	1800	180bbls of displacement away, Shut down, Swap to rig tanks, concern that we had spacer to surface
19	Pump	10/9/2017	15:57	8.34	5	10	2600	Pump To rig tanks,
20	Shut Down	10/9/2017	16:00	8.34			1900	Shut down, Switch returns to shakers
21	Pump	10/9/2017	16:05	8.34	5	10	2000	200bbls of displacement, Spacer to shakers, not enough room in rig



								tanks so continued returns across shakers
22	Shut Down	10/9/2017	16:19	8.34		60	2000	260bbls of displacement away, Swap returns to rig tanks
23	Pump	10/9/2017	16:25	8.34	6	40	2600	300bbls of displacement away, Cement to surface at 280bbls away.
24	Pump	10/9/2017	16:38	8.34	6	50	3300	350bbls of displacement away
25	Slow Rate	10/9/2017	16:40	8.34	3	20	2900	370bbls of displacement away
26	Land Plug	10/9/2017	16:45	8.34	3	18	2500	388bbls of displacement away, Final circulating pressure 2500psi, bump up to 3000psi. Hold for Ten minutes
27	Check Floats	10/9/2017	16:55					Floats hold, 6.5bbls back to truck
28	Job Complete	10/9/2017	16:55					
29	Rig Out	10/9/2017	17:00					
30	Leave Location	10/9/2017	18:00					

### 3 Pump Diagrams

