

# HALLIBURTON

iCem® Service

**ENERPLUS RESOURCES (USA) CORP-EBUS**

Ft. Lupton District, COLORADO

**For: COLBY HANSEN**

Date: Thursday, January 23, 2020

**ENERPLUS LLOYDMINSTER 7-66-3-10-2N**

Sincerely,

**MITCHELL CAMPER AND CREW**

## Legal Notice

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### Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

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## 1.0 Cementing Job Summary

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### 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **Lloydminster 7-66-3-10-2N** cement **Job Type** casing job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

**Approximately 27bbls of cement were returned to surface.**

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

**Halliburton Fort Lupton**

*The Road to Excellence Starts with Safety*

<b>Sold To #:</b> 357635		<b>Ship To #:</b> 3848917		<b>Quote #:</b> 0022672751		<b>Sales Order #:</b> 0906254950	
<b>Customer:</b> ENERPLUS RESOURCES (USA) CORP-EBUS				<b>Customer Rep:</b> Colby Hansen			
<b>Well Name:</b> LLOYDMINSTER			<b>Well #:</b> 7-66-3-10-2N			<b>API/UWI #:</b> 05-123-46142-00	
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> PIERCE		<b>County/Parish:</b> WELD		<b>State:</b> COLORADO	
<b>Legal Description:</b> SE SE-34-8N-66W-436FSL-1237FEL							
<b>Contractor:</b> CYCLONE				<b>Rig/Platform Name/Num:</b> CYCLONE 37			
<b>Job BOM:</b> 7523 7523							
<b>Well Type:</b> HORIZONTAL OIL							
<b>Sales Person:</b> HALAMERICA\HB41307				<b>Srv Supervisor:</b> Mitchell Camper			

**Job**

<b>Formation Name</b>			
<b>Formation Depth (MD)</b>	<b>Top</b>		<b>Bottom</b>
<b>Form Type</b>			<b>BHST</b>
<b>Job depth MD</b>	17814ft		<b>Job Depth TVD</b> 7560
<b>Water Depth</b>			<b>Wk Ht Above Floor</b> 4
<b>Perforation Depth (MD)</b>	<b>From</b>		<b>To</b>

Well Data										
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Casing	0	9.625	8.921	36		J-55	0	1653	0	1653
Casing	0	5.5	4.892	17		HCP110	0	17814	0	7560
Open Hole Section			8.5				1653	17830	1653	7560

Tools and Accessories									
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make
						<b>Top Plug</b>	5.5	1	ANT
<b>Float Shoe</b>	5.5	1	CIT	17814		<b>Bottom Plug</b>	5.5	1	INV
<b>Float Collar</b>	5.5	1	CIT	17765					
						<b>Plug Container</b>	5.5	1	HES

**Fluid Data**

<b>Stage/Plug #: 1</b>									
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	Tuned Prime Cement Spacer Base - RKS/SE	TUNED PRIME CEMENT SPACER SYS	80	bbl	11.5	3.79	23.53	8	2788

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
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2	ElastiCem	ELASTICEM (TM) SYSTEM	2690	sack	13.2	1.6	7.67	8	20632
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	MMCR Displacement	MMCR Displacement	20	bbl	8.48				
0.50 gal/bbl		<b>MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)</b>							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
4	Displacement		392	bbl	8.34				
<b>Cement Left In Pipe</b>		<b>Amount</b>	51 ft		<b>Reason Shoe Track</b>			<b>Shoe Joint</b>	
<b>Mix Water:</b>		pH 7	<b>Mix Water Chloride:</b> <300 ppm			<b>Mix Water Temperature:</b> 61 °F			
<b>Cement Temperature:</b>		N/A	<b>Plug Displaced by:</b> 8.33 lb/gal F.W.			<b>Disp. Temperature:</b> 58 °F			
<b>Plug Bumped?:</b>		Yes	<b>Bump Pressure:</b> 2650 psi			<b>Floats Held?:</b> Yes			
<b>Cement Returns:</b>		27 bbl	<b>Returns Density:</b> N/A			<b>Returns Temperature:</b> N/A			
<b>Comment</b> Plug bumped at calculated displacement, final circulating pressure of 2650 psi, held for 5 min at psi, floats held, 5 bbl back to the truck. 27 Bbl of cement to surface.									

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	PS Pump Press <i>(psi)</i>	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	Comments
Event	1	Call Out	Call Out	1/23/2020	07:00:00	USER				CREW CALLED OUT AT 07:00 1/23/2020, REQUESTED ON LOCATION 13:30 1/23/2020. CREW PICKED UP CEMENT, CHEMICALS (20 GAL D-AIR, 45 GAL MUSOL-A, 45 GAL DUAL SPACER-B, 20 GAL MMCR), 100 LBS SUGAR, PLUG CONTAINER AND MANIFOLD FROM FORT LUPTON,CO. BULK 660: 11592295/11689672, BULK 660: 11138996/10866484, PUMP ELITE: 11897034/11645460.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	1/23/2020	10:30:00	USER				DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW
Event	3	Crew Leave Yard	Crew Leave Yard	1/23/2020	10:40:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive At Loc	Arrive At Loc	1/23/2020	11:50:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 9.625" 36# @ 1653', CASING: 5.5" 17# @ 17814', 51' SHOE JOINT, 8.5" OPEN HOLE, TVD @ 7560', 9.8 PPG WELL FLUID, FRESH WATER DISPLACEMENT.
Event	5	Safety Meeting - Pre Rig-Up	Safety Meeting - Pre Rig-Up	1/23/2020	12:00:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	1/23/2020	12:10:00	USER				CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.
Event	7	Safety Meeting - Pre Job	Pre-Job Safety Meeting	1/23/2020	17:45:00	USER	-3.00	8.56	0.00	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	8	Start Job	Start Job	1/23/2020	18:13:18	COM6	-4.00	0.34	0.00	START JOB DATA RECORDING.
Event	9	Drop Bottom Plug	Drop Bottom Plug	1/23/2020	18:13:45	USER	14.00	8.82	1.40	PLUG LEFT PLUG CONTAINER, VERIFIED BY COMPANY MAN.
Event	10	Test Lines	Test Lines	1/23/2020	18:15:15	COM6	71.00	8.30	0.00	KICKOUTS SET @ 500 PSI, KICKED OUT @ 860PSI, 5TH GEAR STALL OUT @ 1750 PSI. PRESSURE TESTED IRON TO 4780 PSI.

Event	11	Pump Spacer 1	Pump Spacer 1	1/23/2020	18:18:02	COM6	180.00	8.25	0.00	PUMP 80 BBLS OF TUNED SPACER @ 11.5 LB/GAL, ADDED 45 GAL MUSOL-A, 45 GAL DUAL SPACER-B, 5 GAL D-AIR, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	12	Pump Cement	Pump Cement	1/23/2020	18:32:34	COM6	918.00	13.16	8.40	PUMP 2690 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.60 YIELD, 7.67 GAL/SK, 767 BBLS, CALCULATED TOC @ SURFACE, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	13	Shutdown	Shutdown	1/23/2020	20:14:03	COM6	51.00	14.68	0.00	SHUTDOWN TO DROP TOP PLUG AND CLEAN PUMPS AND LINES.
Event	14	Drop Top Plug	Drop Top Plug	1/23/2020	20:36:39	COM6	-4.00	8.28	0.00	TOP PLUG WAS LOADED DIRECTLY INTO LANDING JOINT, VERIFIED BY COMPANY MAN
Event	15	Pump Displacement	Pump Displacement	1/23/2020	20:36:42	COM6	-5.00	8.28	0.00	BEGIN CALCULATED DISPLACEMENT 412BBL FRESH/BRINE WATER. 20 GAL MMCR IN FIRST 20 BBL,
Event	16	Bump Plug	Bump Plug	1/23/2020	21:32:38	COM6	3710.00	8.02	0.00	PLUG BUMPED AT CALCULATED DISPLACEMENT, FINAL CIRCULATING PRESSURE OF 2650 PSI. 27BBL OF CEMENT TO SURFACE.
Event	17	Check Floats	Check Floats	1/23/2020	21:34:21	USER	3626.00	8.01	0.00	RELEASED PRESSURE BACK TO THE TRUCK, FLOATS HELD, 5 BBL BACK.
Event	18	End Job	End Job	1/23/2020	21:36:54	COM6	2.00	8.09	0.00	END JOB DATA RECORDING.
Event	19	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	1/23/2020	21:40:00	USER	-5.00	8.07	0.00	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	20	Rig-Down Completed	Rig-Down Completed	1/23/2020	22:30:00	USER				ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL.
Event	21	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	1/23/2020	23:00:00	USER				DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.

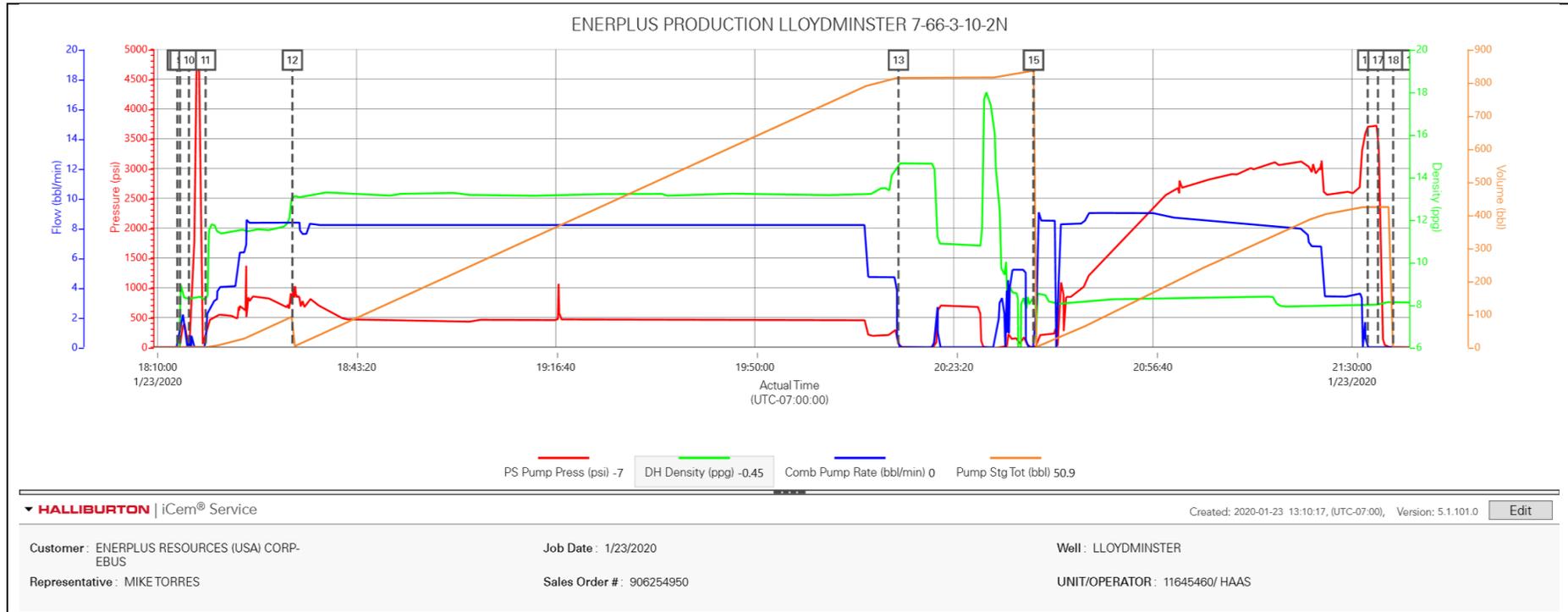
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Event 22 Crew Leave Location Crew Leave Location 1/23/2020 23:10:00 USER

THANK YOU FOR USING HALLIBURTON - MITCHELL CAMPER AND CREW.

3.0 Attachments

3.1 ENERPLUS PRODUCTION LLOYDMINSTER 7-66-3-10-2N-Custom Results.png



3.2 ENERPLUS PRODUCTION LLOYDMINSTER 7-66-3-10-2N-Custom Results (1).png

ENERPLUS PRODUCTION LLOYDMINSTER 7-66-3-10-2N						
Description	Actual Time (UTC-07:00:00)	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	
8 Start Job	18:13:18	-4.00	0.34	0.00	0.00	
9 Drop Bottom Plug	18:13:45	14.00	8.82	1.40	0.30	
10 Test Lines	18:15:15	71.00	8.30	0.00	2.10	
11 Pump Spacer 1	18:18:02	180.00	8.25	0.00	0.00	
12 Pump Cement	18:32:34	918.00	13.16	8.40	92.80	
13 Shutdown	20:14:03	51.00	14.68	0.00	813.90	
14 Drop Top Plug	20:36:39	-4.00	8.28	0.00	834.00	
15 Pump Displacement	20:36:42	-5.00	8.28	0.00	834.00	
16 Bump Plug	21:32:38	3710.00	8.02	0.00	423.60	
17 Check Floats	21:34:21	3626.00	8.01	0.00	423.60	
18 End Job	21:36:54	2.00	8.09	0.00	0.00	

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Created: 2020-01-23 13:10:17, (UTC-07:00), Version: 5.1.101.0