

Paramount et al Fort Liard O-35 60 10 123 15

WID 1868

Report on Well Abandonment Operations

20170303 – 20170311

## Executive Summary

The Paramount et al Fort Liard O-35 well, was initially completed as a Mattson and subsequently a Fantasque sweet gas well. It was one of three connected to the Liard gathering system and the Shiha pipeline. Due to low gas production, the field was shut in and the pipeline suspended in 2008. It was decided to abandon the O-35 well, along with two other former producing wells (N-01 and F-36) and two wells that had never been placed on production (I-46 and A-01). The required land use permit and water license were obtained, and requests for Approval to Alter the Condition of a Well were made to

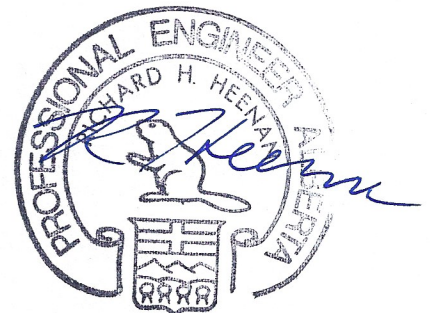
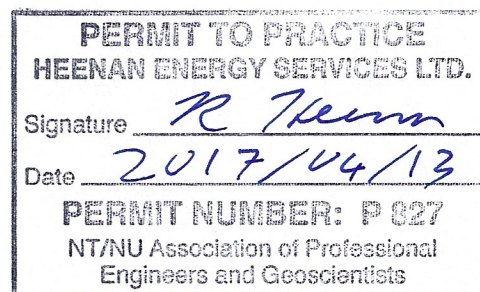
The Fantasque and Mattson zones had been abandoned in 2009 by setting bridge plugs and capping them with 8 meters of cement. The well was circulated to inhibited water, as required at the time and a bridge plug set at 50 meters in anticipation of a future surface abandonment. As of February 1, 2017, these methods were not considered acceptable and the approved ACW required that the top bridge plug be drilled out and the well circulated to fresh water.

A check of the surface casing vent on 20170201 indicated "no bubbles" in 10 minutes (consistent with previous shut-in well inspections).

The Savanna service rig was moved in 20170303 and BOPs installed and tested without incident. The bridge plug was milled up and pushed to bottom at 13274mKB. (Initial attempts to drill the bridge plug with a tri-cone bit were not successful and it appear that the top back-up ring of the bridge plug was rotating.) The well was circulated to fresh water. The casing, bridge plug at 1335mKB, and the cement cap were pressure tested to 7 MPa.

A final 10 minute bubble test on the surface casing vent on 20170311 showed "no bubbles". Surface and production casing were cut 1.1 meter below ground level and steel caps stitch welded (non-sealing) on the casing stubs. The hole around the casing was back filled to grade with the original excavated material. A well sign was installed 1 meter north of the casing stub.

A Change of Well Status Form was submitted 20170313.



The following are attached to this report

Wellbore Diagrams

As abandoned

Prior to operations

Daily Completion Reports – 20170303 – 20170311

Change of Well Status Form

**PARA ET AL FORT LIARD O-35**  
 60° 10' N 123° 15' W      WID = 1868  
 As Abandoned

KB = 455.6 m  
 GL = 449.4 m  
 KB to CF = 5.85 m  
 Non-sealing steel plate  
 1m north of well  
 1.5m high - set in cement

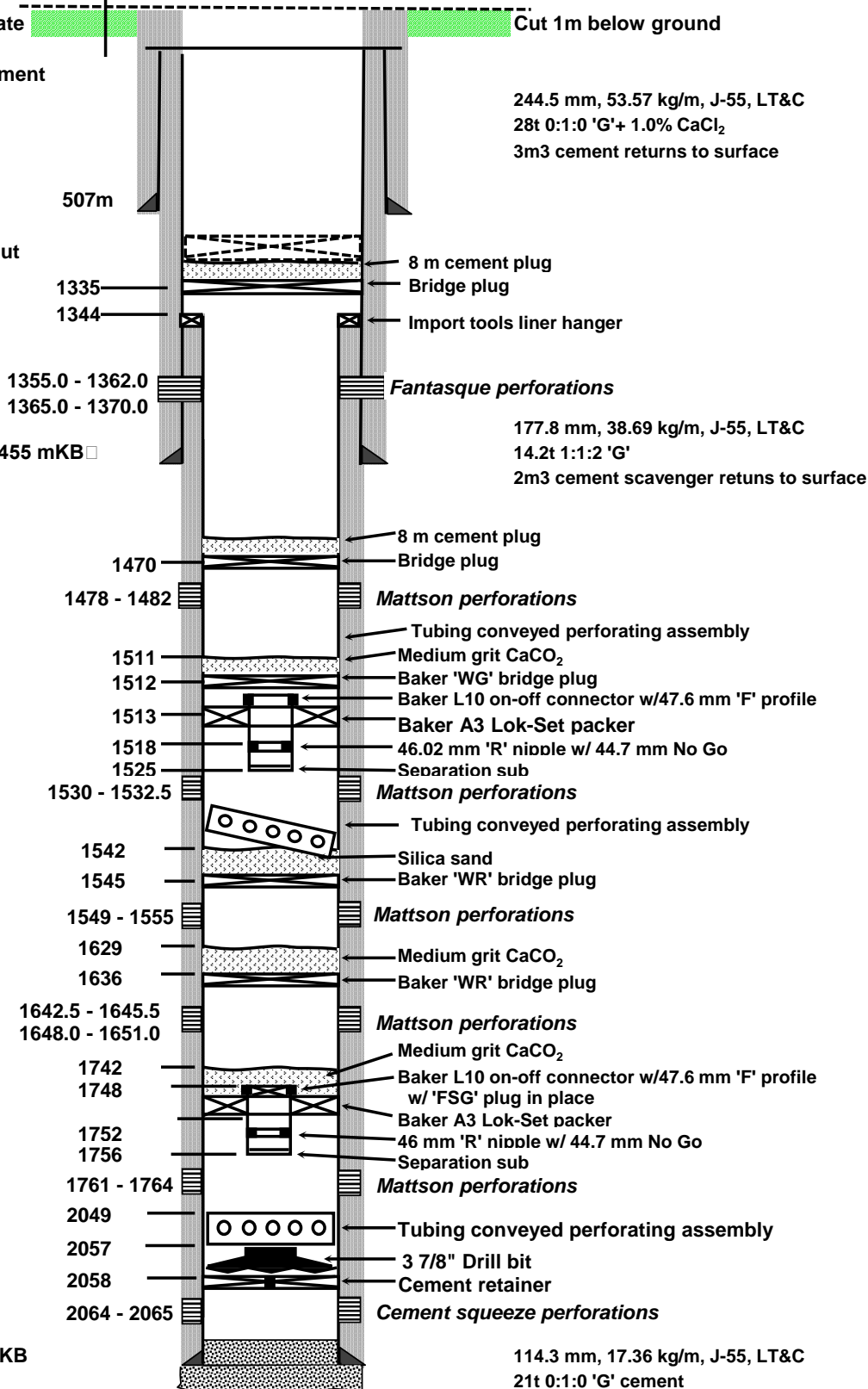
Well Sign

Cut 1m below ground

Bridge plug drilled out  
 & pushed to PBTD

Int. casing shoe at 1455 mKB

PBTD 2095 mKB  
 Liner Bottom 2109mKB  
 TD 2121 mKB



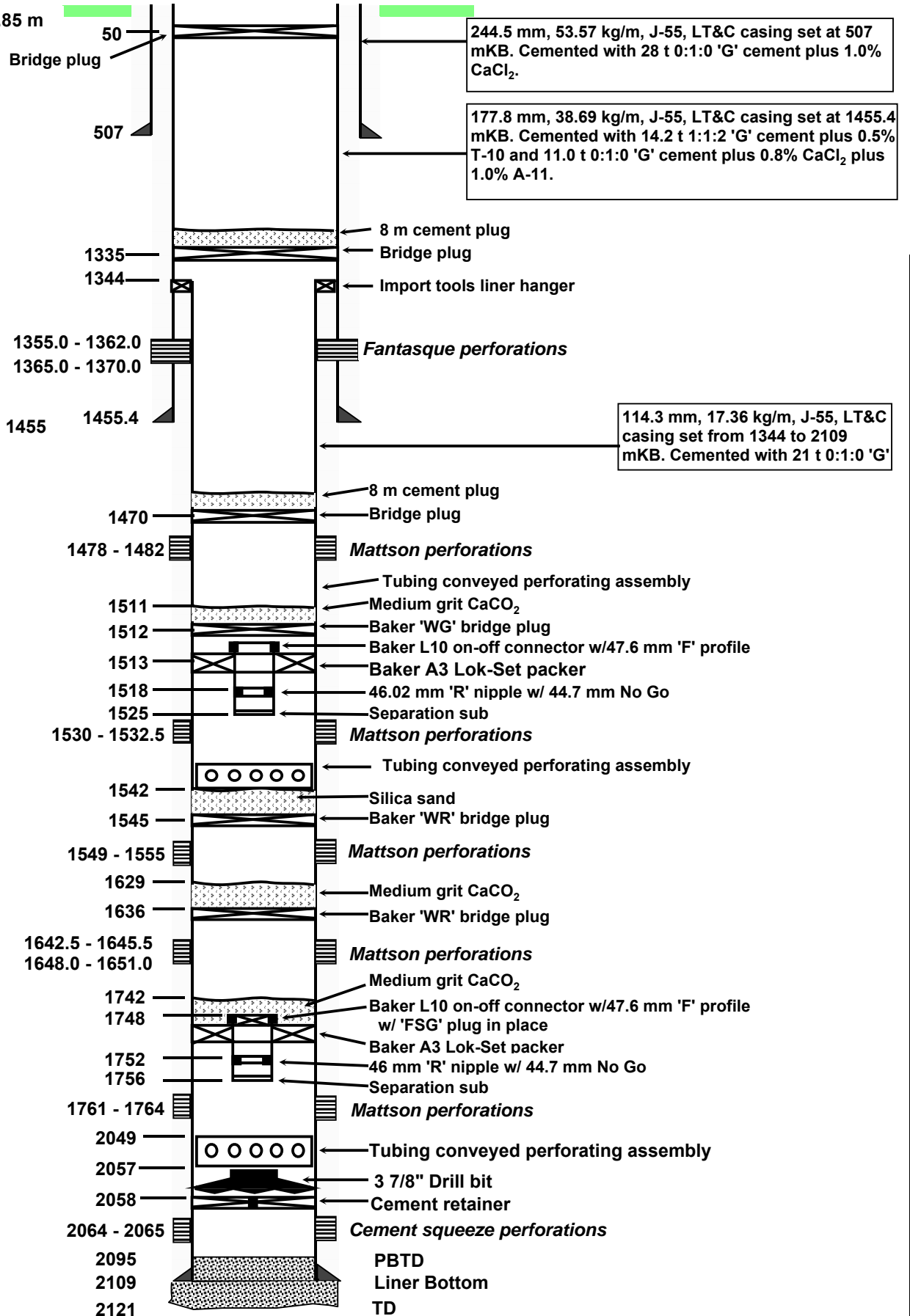
# PARA ET AL FORT LIARD O-35

60° 10' N, 123° 15' W

WID = 1868

Bottomhole Configuration (as of Feb 22, 2009)

KB = 455.6 m  
GL = 449.4 m  
KB to CF = 5.85 m







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## Daily Completion and Workover

PARA ET AL FORT LIARD O-35

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-03  
Report # 1.0

Total AFE Amount: 350,026.00  
AFE Number: 17N770031  
Daily Cost Total: 45,258  
Cum Cost to Date: 45,258

API/UWI 300O35601012315	Surface Legal Location	Field Name Ft. Liard	License # 1868
Well Configuration Type Vertical	Casing Flange Elevation (m) 5.85	Ground Elevation (m) 449.40	Original KB Elevation (m) 455.64
Last Casing String		PBTD (All) (mKB)	

Objective Abandon Well
Operation at 6am Heat BOP's and kill fluids.

Operations Summary MIRU service rig and equipment; removed wellhead and N/U and tested the BOP's. RIH with bit and collars to 48 mKB.
Operations Next Report Period Drill out the bridge plug at 50 mKB - RIH to PBTD and circulate the wellbore to fresh water.

Road Condition Ice/Snow	Weather Clear	Report Start Date 2017-03-03	Report End Date 2017-03-03
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Head Count	Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)
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Daily Contacts		
Title	Job Contact	Mobile
Operations Manager	Patrick Kelly , Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	403-895-4364

Time Log					
Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:00	08:00	1.00	SMTG	Safety Meeting	Held safety meeting with all personnel discussing winter driving; spotting and rigging up equipment; overhead lifts; high pressure; two men carrying line pipe; lease and lease road hazards. Completed Safe Work Agreement and Field Risk Assessment forms.
08:00	09:30	1.50	RMOV	Rig Move	Moved Savanna service rig and equipment from 300/N-01-6010-123153 to location. Cooper Barging bed truck was required to pull the support vehicle / doghouse up Km #26.5 hill.
09:30	13:00	3.50	SRIG	Rig Up/Down	Spotted and rigged up Savanna service rig #126; boiler; pump and tank to Paramount Resources; OH&S; Northwest Territories and OROGO regulations. Note rig tank; boiler and 400 bbl tanks placed on rig matting. Put heat onto the BOP's and wellhead.
13:00	14:00	1.00	BOPT	Pressure Test BOP's	Stump tested the class III BOP's blind rams and 60 mm pipe rams to 1400 kPa and 21,000 kPa and the annular preventors to 1400 kPa and 10,000 kPa for 10 minutes each. Check the SITP = 0 kPa. SICP = 0 kPa.
14:00	15:30	1.50	BOPI	Install BOP's	Removed the wellhead top section and installed the class III BOP's. Pressure tested the 60 mm pipe rams and ring gaskets to 1400 kPa and 21.0 MPa for 10 minutes each.
15:30	16:30	1.00	ASSM	Install New Downhole Assembly	Tallied and ran 156 mm Valco rock bit s/n 12970; 89 mm Reg x 79 mm IF bit sub; 5 - 79 mm IF drill collars and tagged solid at 48.79 mKB; pulled and laid down 1 - 79 mm drill collar; installed a 79 mm IF pin x 73 mm box crossover; 73 mm EUE pin x 60 mm EUE box crossover and 1 - 3.08 m x 60 mm 6.99 kg/m J-55 EUE pup joint.
16:30	17:00	0.50	CLLS	Clean & Secure Lease	Shut in and secured the well for night. Boiler man to heat the BOP's and fluids overnight.

Report Fluids Summary				
Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

Perforations				
Time	Linked Zone	Top (mKB)	Blm (mKB)	Current Status

Tubing Components	
Item Des	Top (mKB)

Casing Strings			
Csg Des	Grade	WV/Len (lb/ft)	Set Depth (mKB)





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## Daily Completion and Workover

PARA ET AL FORT LIARD O-35

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-04  
Report # 2.0

Total AFE Amount: 350,026.00  
AFE Number: 17N770031  
Daily Cost Total: 34,777  
Cum Cost to Date: 80,035

API/UWI 300035601012315	Surface Legal Location 60-10-123-15	Field Name Ft. Liard	License # 1868
Well Configuration Type Vertical	Casing Flange Elevation (m) 5.85	Ground Elevation (m) 449.40	Original KB Elevation (m) 455.64
Last Casing String		PBTD (All) (mKB)	

Objective  
Abandon Well

Operation at 6am

Heat BOP's and kill fluids

Operations Summary

Drilled on permanent bridge plug from 48.79 mKB to 48.93 mKB.

Operations Next Report Period

POOH with bit and RIH with mill and mill out bridge plug.

Road Condition

Ice/Snow

Weather

Clear

Report Start Date

2017-03-04

Report End Date

2017-03-04

Head Count

Personnel Total Hours (hr)

Cum Personnel Total Hours (hr)

### Daily Contacts

Title	Job Contact	Mobile
Operations Manager	Patrick Kelly, Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	403-895-4364

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:30	08:00	0.50	SMTG	Safety Meeting	Held safety meeting with all personnel discussing cold weather; frost bite; drilling with power swivel; overhead lifts; circulating and steam hazards.
08:00	09:00	1.00	Tub Drill	Drill out with Tubing	Performed a 10 minute bubble test on the surface casing vent and observed no bubbles. Installed the pack-off head onto the annular preventors; installed the power swivel; tagged the top of the bridge plug at 48.79 mKB.
09:00	16:30	7.50	Tub Drill	Drill out with Tubing	Drilled on the bridge plug from 48.79 mKB to 48.93 mKB at 110 rpm with 1,000 - 2000 daN weight on bit; circulating down the tubing at 450 liters / minute at 1,000 kPa with returns up the casing. Observed a small amount of cutting in the returns. Varied the pump rate from 100 liters / minute up to a maximum of 500 liters /minute; changed the rotation several times from 60 rpm to 130 rpm and observed no drill off or torque in the last 2.5 hours.
16:30	17:30	1.00	CLLS	Clean & Secure Lease	Laid down the power swivel; drained the pump and lines; shut in and secured the well for night. Boiler man heating BOP's and kill fluids overnight.

### Report Fluids Summary

Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

### Perforations

Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

### Tubing Components

Item Des	Top (mKB)

### Casing Strings

Csg Des	Grade	W/Len (lb/ft)	Set Depth (mKB)





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## Daily Completion and Workover

PARA ET AL FORT LIARD O-35

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-05  
Report # 3.0

Total AFE Amount: 350,026.00  
AFE Number: 17N770031  
Daily Cost Total: 31,097  
Cum Cost to Date: 111,132

API/UWI 300035601012315	Surface Legal Location 60-10-123-15	Field Name Ft. Liard	License # 1868
Well Configuration Type Vertical	Casing Flange Elevation (m) 5.85	Ground Elevation (m) 449.40	Original KB Elevation (m) 455.64
Last Casing String		PBTD (All) (mKB)	

Objective  
Abandon Well

Operation at 6am

Heat BOP's and kill fluids

Operations Summary

POOH with bit BHA; RIH with mill BHA; milled up the permanent bridge plug and pushed it to PBTD; circulated the wellbore to fresh water.

Operations Next Report Period

POOH laying down tubing and BHA. Rig out rig and equipment.

Road Condition

Ice/Snow

Weather

Clear

Report Start Date

2017-03-05

Report End Date

2017-03-05

Head Count

Personnel Total Hours (hr)

Cum Personnel Total Hours (hr)

### Daily Contacts

Title	Job Contact	Mobile
Operations Manager	Patrick Kelly, Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	403-895-4364

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:00	07:30	0.50	SMTG	Safety Meeting	Held safety meeting with all personnel on location discussing tripping collars; overhead lifts; circulating; power swivel; cold weather and winter driving hazards.
07:30	08:00	0.50	PULT	Pull Tubing	Removed the pack-off head; pulled 1 joint of 60 mm tubing; crossover; 4 - 79 mm drill collars; crossover and 156 mm bit. Observed the bit in-gauge and in good condition.
08:00	09:00	1.00	RUTB	Run Tubing	RIH with 154 mm Reg 5 - bladed junk mill; 89 mm Reg x 79 mm IF bit sub; 4 - 79 mm IF drill collars; 79 mm x 73 mm EUE crossover; 73 mm EUE x 60 mm EUE crossover; 3.0 m x 60 mm 6.99 kg/m J-55 EUE pup joint; installed a pack-off head and picked up the power swivel.
09:00	12:30	3.50	Tub Drill	Drill out with Tubing	Drilled out the permanent bridge plug from 48.96 mKB to 49.22 mKB with 1,000 daN to 2,000 daN weight on bit; rotating at 110 rpm and circulating down the tubing at 300 liters / minute with 500 kPa; observed the bridge plug move down to 54.5 mKB freely. Laid down the power swivel and removed the pack-off head.
12:30	15:00	2.50	RUTB	Run Tubing	Tallied and ran 132 joints of 60 mm 6.99 kg/m J-55 EUE tubing and tagged solid at 1327.26 mKB.
15:00	16:30	1.50	Circulate	circulate	Circulated the wellbore to fresh water.
16:30	17:00	0.50	PTST	Pressure Test	Stopped circulating; shut in the returns and pressure tested the cement plug; casing and bridge plug to 7.0 MPa for 10 minutes - held solid. Bled off the casing.
17:00	17:30	0.50	CLLS	Clean & Secure Lease	Pulled and laid down 2 joints of 60 mm 6.99 kg/m J-55 EUE tubing. Shut in and secured the well for night. Boiler man to heat BOP's and fluids overnight.

### Report Fluids Summary

Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

### Perforations

Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

### Tubing Components

Item Des	Top (mKB)

### Casing Strings

Csg Des	Grade	WT/Len (lb/ft)	Set Depth (mKB)





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## Daily Completion and Workover

PARA ET AL FORT LIARD O-35

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-06  
Report # 4.0

Total AFE Amount: 350,026.00  
AFE Number: 17N770031  
Daily Cost Total: 28,295  
Cum Cost to Date: 139,427

API/UWI 300035601012315	Surface Legal Location 60-10-123-15	Field Name Ft. Liard	License # 1868
Well Configuration Type Vertical	Casing Flange Elevation (m) 5.85	Ground Elevation (m) 449.40	Original KB Elevation (m) 455.64
Last Casing String		PBTD (All) (mKB)	

Objective Abandon Well
Operation at 6am Heat fluids on location
Operations Summary POOH with mill and collars; N/D BOP's; rig out service rig and equipment. Prepared to move in AM.
Operations Next Report Period Cut and cap wellhead / casing

Road Condition Ice/Snow	Weather Blowing snow	Report Start Date 2017-03-06	Report End Date 2017-03-06
Head Count	Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)	

Daily Contacts			
Title	Job Contact		Mobile
Operations Manager	Patrick Kelly , Operations Manager		403-519-1780
Consultant	Dick Heenan, Consultant		403-818-4408
Consultant	Terry Pollard, Consultant		780-361-5962
Rig Manager	Craig Hewlett, Rig Manager		403-895-4364

Time Log					
Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:00	07:30	0.50	SMTG	Safety Meeting	Held safety meeting discussing cold weather; high winds; frost bite; laying down tubing and collars; BOP removal and rigging out equipment hazards.
07:30	11:30	4.00	PULT	Pull Tubing	Pulled and laid down 130 joints of 60 mm 6.99 kg/m J-55 EUE tubing; 60 mm EUE box x 73 mm EUE pin crossover; 73 mm EUE x 79 mm IF crossover; 4 - 79 mm IF drill collars; 79 mm IF x 89 mm Reg bit sub and 153 mm Mill. Observed the mill in good condition.
11:30	13:30	2.00	BOPR	Remove BOP's	Removed the class III BOP's and installed a cap on top of the casing bowl.
13:30	16:00	2.50	SRIG	Rig Up/Down	Rigged out Savanna rig; pump and tank. Continued to heat kill fluids in the rig's tank and 60 m <sup>3</sup> tank.
16:00	16:30	0.50	CLLS	Clean & Secure Lease	Clean up and secured the lease. Boiler man to continue heating fluids overnight.

Report Fluids Summary				
Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

Perforations				
Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

Tubing Components	
Item Des	Top (mKB)

Casing Strings			
Csg Des	Grade	WT/Len (lb/ft)	Set Depth (mKB)





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## Daily Completion and Workover

PARA ET AL FORT LIARD O-35

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-11  
Report # 5.0

Total AFE Amount: 350,026.00  
AFE Number: 17N770031  
Daily Cost Total: 15,730  
Cum Cost to Date: 156,347

API/UWI 300O35601012315	Surface Legal Location 60-10-123-15	Field Name Ft. Liard	License # 1868
Well Configuration Type Vertical	Casing Flange Elevation (m) 5.85	Ground Elevation (m) 449.40	Original KB Elevation (m) 455.64
Last Casing String		PBTD (All) (mKB)	

Objective  
Abandon Well

Operation at 6am

### Operations Summary

Dug bell hole around the wellhead; removed the wellhead; cut and capped casings; back-filled bellhole; placed well sign 1.0 m on the north side of the cut casings.

### Operations Next Report Period

Well cut and capped - FINAL REPORT

Road Condition Ice/Snow	Weather Clear	Report Start Date 2017-03-11	Report End Date 2017-03-11
Head Count	Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)	

### Daily Contacts

Title	Job Contact	Mobile
Operations Manager	Patrick Kelly, Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	403-895-4364

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:30	08:00	0.50	SMTG	Safety Meeting	Conducted a 10 minute bubble test on the surface casing vent and observed no bubbles. Moved in with Zedi back-hoe and welder; held safety meeting with all personnel discussing digging bellhole; cutting off wellhead and casings; welding; overhead lifts and back-filling hazards. Completed Safe Work Agreement and Ground Disturbance Checklist.
08:00	12:30	4.50	cut and cap casing	cut and cap casings	Back-hoe dug a 1.5 m bell hole around the wellhead / casings c/w stairs down one side; checked the bellhole for LEL's and observed 0% LEL readings; secured the wellhead with the back-hoe; cut three windows in the 244.5 mm surface casing; cut the 177.8 mm casing; then the 244.5 mm casing and removed the wellhead to the edge on the lease. Cut both casings 1.1 m below ground level; stitch welded steel caps on the 177.8 mm casing and 244.5 mm casing and welded Ft. Liard O-35 onto the top cap. Back filled the bellhole with dirt in the same order it was removed - installed a well sign 1 meter north of the cut casings ( sign post cemented in a 22 liter pail and buried 1 meter below ground level with 1.6 m above ground level c/w O-35 - 6010 - 123- 15 and to-day's date welded onto the sign ).
FINAL REPORT					

### Report Fluids Summary

Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

### Perforations

Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

### Tubing Components

Item Des	Top (mKB)

### Casing Strings

Csg Des	Grade	W/Len (lb/ft)	Set Depth (mKB)



# Office of the Regulator of Oil and Gas Operations (OROGO)

## Change of Well Status

This form must be filed with the Office of the Regulator of Oil and Gas Operations within 14 days of a change in well status.

### 1. WELL IDENTIFICATION

<b>Well Name</b>	<b>Grid</b>	<b>WID</b>
Paramount et al Fort Liard O-35	60° 10' N 123° 15' W	1868
<b>Date</b> March 13, 2017	<input type="checkbox"/> First Filing for this Well	<b>Interest Identifier</b>

### 2. WELL LICENSEE / OPERATOR IDENTIFICATION

<b>Filing Company Name</b>	Paramount Resources Ltd.		
<b>Contact Name (PRINT)</b>	Pat Kelly		
<b>Telephone No.</b>	(403) 290-3600	<b>Fax No.</b>	
<b>Email</b>	Patrick.Kelly@paramountres.com		

### 3. NEW STATUS INFORMATION

<b>Status Effective Date</b>	<b>Field Code</b>	
Year Month Day	<b>Pool Code</b>	
2017 3 11	<b>Seq Code</b>	
<b>Completion Interval (mKB)</b>	<b>Field Name</b>	Liard
Top 1355.0	<b>Pool Name</b>	Mattson
Base 1370.0	Issuance of new pool codes will be made after receipt of this application.	

### 4. WELL TYPE

<input checked="" type="checkbox"/> 1 Producer	<input type="checkbox"/> 4 Steam-Assisted Gravity Drain
<input type="checkbox"/> 2 Injection	<input type="checkbox"/> 5 Injection - Drilling Discharge
<input type="checkbox"/> 3 Observation	<input type="checkbox"/> 6 Other

### 5. WELL FLUID PRODUCTION

<input type="checkbox"/> 0 Not Applicable	<input type="checkbox"/> 5 Acid Gas	<input type="checkbox"/> 10 Nitrogen
<input type="checkbox"/> 1 Crude Oil	<input type="checkbox"/> 6 Solvent	<input type="checkbox"/> 11 Liquefied Petroleum Gas
<input checked="" type="checkbox"/> 2 Gas	<input type="checkbox"/> 7 Steam	<input type="checkbox"/> 12 Bitumen
<input type="checkbox"/> 3 Water	<input type="checkbox"/> 8 Air	
<input type="checkbox"/> 4 Brine	<input type="checkbox"/> 9 Carbon Dioxide	

### 6. WELL MODE

<input type="checkbox"/> 1 Pumping	<input type="checkbox"/> 3 Suspended	<input type="checkbox"/> 5 Shut-in (if > 60 days)
<input type="checkbox"/> 2 Flowing	<input type="checkbox"/> 4 Gas Lift	<input checked="" type="checkbox"/> 6 Abandoned

### 7. OTHER

<input type="checkbox"/> # Other	Details
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