

Para et al Fort Liard A-01 60 10 123 15

WID 1858

Report on Well Abandonment Operations

20170203 - 20170312

Richard Heenan  
Heenan Energy Services  
20170413

## Executive Summary

The Para et al Fort Liard A-01 well, was initially completed as a Mattson sweet gas well, but after testing, was deemed uneconomic and was never put on production. It was decided to abandon the A-01 well, along with another well that had never been placed on production (I-46) and three other former producing wells (F-36, O-35 and N-01). The required land use permit and water license were obtained, and requests for Approval to Alter the Condition of a Well we made to abandon all five wells.

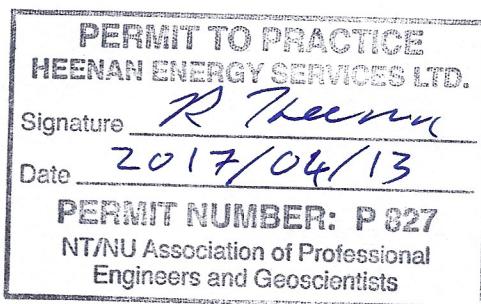
The Mattson perforations had been suspended by setting an FSG plug at 1773 mKB (in the on-off connector above the existing packer assembly @ 1574 mKB) and a collar stop, G pack-off and slip stop @ 19mKB.

A check of the surface casing vent on 20170203 indicated "no bubbles" in 15 minutes (consistent with previous shut-in well inspections). The two plugs were removed with slickline. Some difficulty was encountered removing the G pack-off due to the shallow depth and some flaring of the slip-stop and fishing neck of the G pack-off.

The Savanna service rig was moved in and BOPs installed and tested without incident. A refractometer test indicated the water in the well had a salinity from 10,000 to 28,000 ppm, exceeding the 4,000 ppm limit for fluids left in an abandoned well. The tubing and packer were removed from the well. A permanent bridge plug was set at 1778.5m and pressure tested to 7MPa. The well was circulated to fresh water. A cement cap of 1 m<sup>3</sup> was set on top of the bridge plug with a cement to at 1728.5m (50 linear meters).

A final 10 minute bubble test on the surface casing vent on 20170312 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

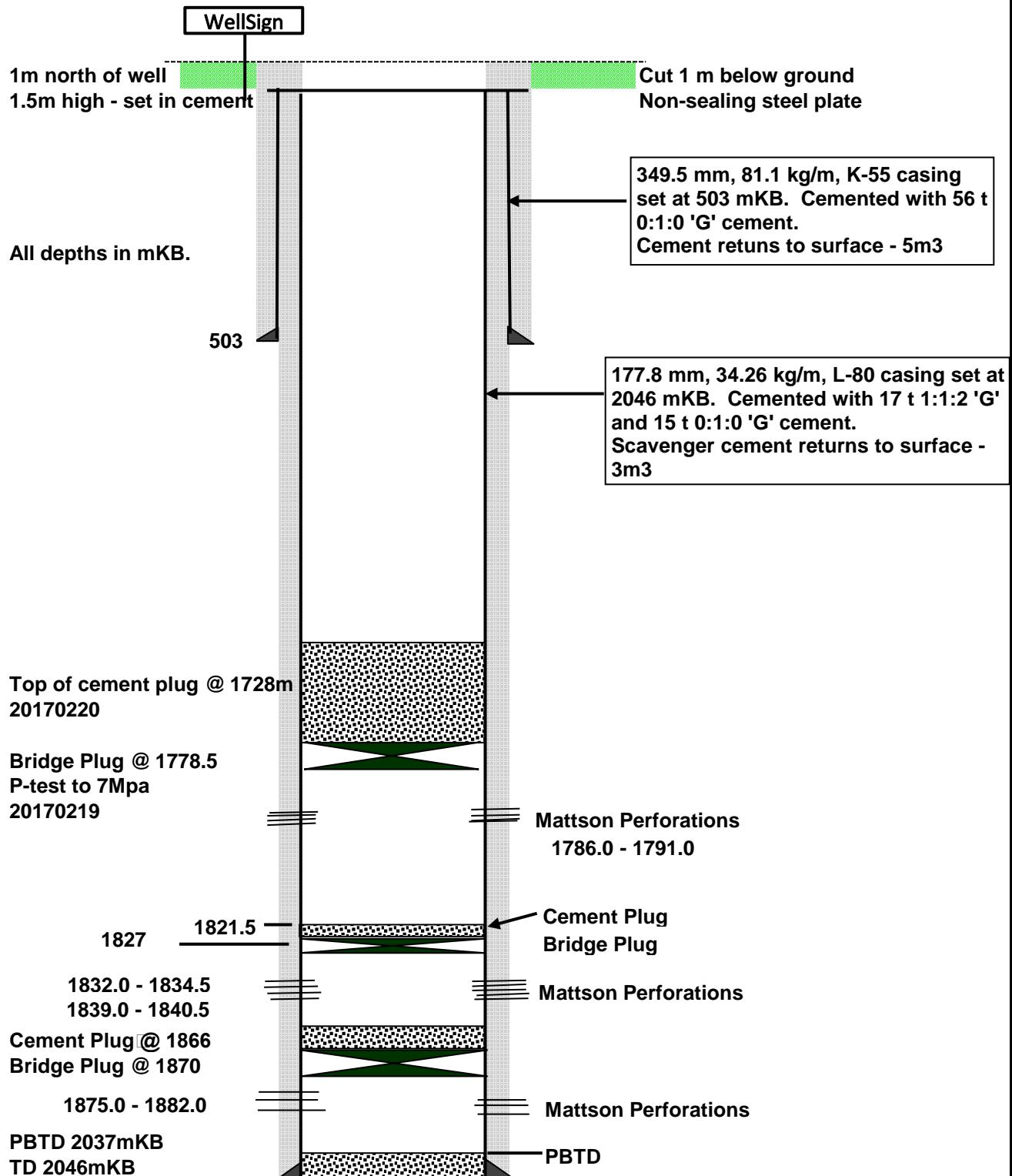
As abandoned

Prior to operations

Daily Completion Reports – 20170203 - 20170312

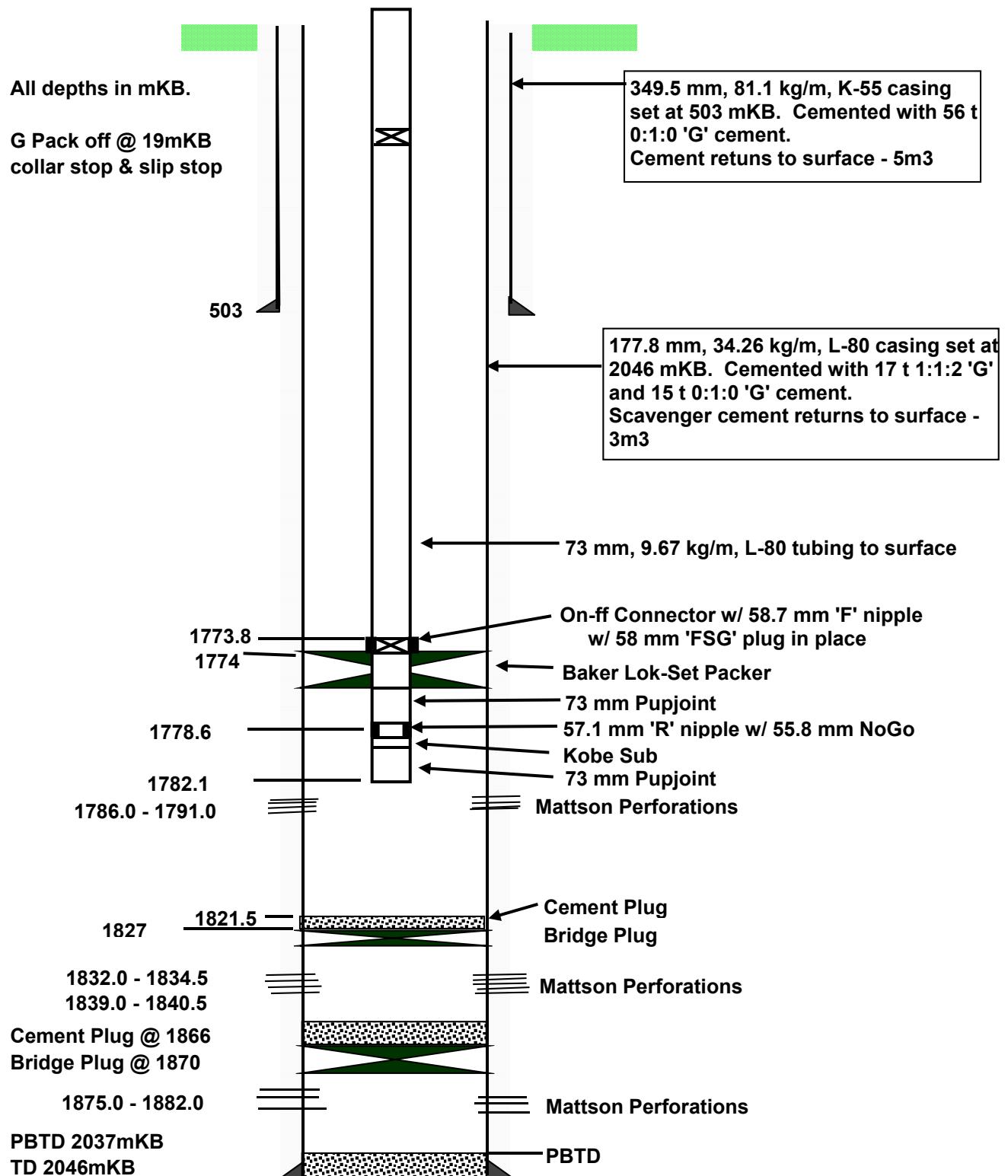
Change of Well Status Form

**PARAMOUNT ET AL FORT LIARD A-01**  
As abandonned



# PARAMOUNT ET AL FORT LIARD A-01

(As at March 22, 2000)





# Daily Completion and Workover

Report Date: 2017-02-03  
Report # 1.0

## PARAMOUNT ET AL FORT LIARD A-01

Rig:

Business Unit: NORTHERN COU

Total AFE Amount: 367,733.00  
AFE Number: 17N770027  
Daily Cost Total: 16,560  
Cum Cost to Date: 16,560

API/UWI 300/A-01/6010-12315/0	Surface Legal Location 300/A-01-6010-12315	Field Name Liard	License # 0001858
Well Configuration Type Vertical	Casing Flange Elevation (m) 517.20	Ground Elevation (m) 517.20	Original KB Elevation (m) 522.70
Last Casing String		PBTD (All) (mKB)	

Objective Abandon Well
Operation at 6am Well shut in waiting on Service rig.

Operations Summary Check tubing / casing pressures; preformed bubble test on surface casing vent.
Operations Next Report Period MIRU service rig.

Road Condition Ice/Snow	Weather Clear	Report Start Date 2017-02-03	Report End Date 2017-02-04
Head Count		Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)

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

Start Time	End Time	Dur (hr)	Code 1	Code 2	Comments
07:30	08:00	0.50	SMTG	Safety Meeting	Held safety meeting with all personnel discussing lease road; lease; overhead lifts; tag lines; high pressure and slickline hazards. Completed Field Level Risk Assessment and Safe Work Permits.
08:00	16:00	8.00	SLine	Slickline Wireline	Checked the well pressures and observed SITP at 0 kPa and SICP at 143 kPa; performed a 15 minute bubble test on the surface casing vent and observed no bubbles. Rigged in Bonnett Wireline Services crossover; slickline BOP's and full lubricator onto the wellhead top section; pressure tested the crossover; BOP's and lubricator to 1,200 kPa with N2. RIH and recovered the slip stop NOTE it took 3 hours of hand jarring to free up the slip stop - observed the bottom of the slip stop flared out from going over the top of the G-pack-off fish neck; RIH and latch onto the G-pack-off and jarred for 1.5 hours to free; then recovered the collar stop from 17 mCF in 1 run. RIH and recovered the equalizing prong in one run; RIH and recovered the FSG plug in 3 runs. Rigged out slickline lubricator; BOP's and crossover. Installed the cap back onto the wellhead top section.
16:00	16:30	0.50	CLLS	Clean & Secure Lease	Shut in and secured the wellhead. Cleaned up the lease.

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)



## Daily Completion and Workover

Report Date: 2017-02-18  
Report # 2.0

### PARAMOUNT ET AL FORT LIARD A-01

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Total AFE Amount: 367,733.00  
AFE Number: 17N770027  
Daily Cost Total: 30,138  
Cum Cost to Date: 46,698

API/UWI 300/A-01/6010-12315/0	Surface Legal Location 300/A-01-6010-12315	Field Name Liard	License # 0001858
Well Configuration Type Vertical	Casing Flange Elevation (m)	Ground Elevation (m) 517.20	Original KB Elevation (m) 522.70
Last Casing String		PBTD (All) (mKB)	

Objective  
Abandon Well

Operation at 6am  
heat BOP's and kill fluids

#### Operations Summary

MIRU Savanna rig #126 and associated equipment from 300/F-36-6010-12315 to location. Spotted and rigged up rig; boiler; pump and tank. Stump tested the BOP's; removed the wellhead top section; installed and tested the BOP's. Released the Baker packer. Reverse circulated bottom's up.

#### Operations Next Report Period

POOH with packer assembly; check packer - RIH with permanent bridge plug; circulated well to fresh water.

Road Condition Ice/Snow	Weather Snow	Report Start Date 2017-02-18	Report End Date 2017-02-18
Head Count	Personnel Total Hours (hr)		Cum Personnel Total Hours (hr)

#### Daily Contacts

Title	Job Contact	Mobile
Area Operations Manager	Patrick Kelly, Area Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962

#### 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 winter driving; spotting and rigging up equipment; overhead lifts; high pressure; two men carrying line pipe; lease and lease road hazards. Orientated 2 men to Paramount Orientation. Completed Safe Work Agreement and Field Risk Assessment forms.
08:00	10:30	2.50	RMOV	Rig Move	Moved Savanna service rig and equipment from 300/F-36-6010-12315 to location. Cooper Barging bed truck was required to pull the support vehicle / doghouse up Km #27 hill.
10:30	13:30	3.00	SRIG	Rig Up/Down	Spotted and rigged up Savanna service rig; 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.
13:30	15:00	1.50	BOPT	Pressure Test BOP's	Checked well pressures and observed 73 mm SITP = 0 kPa; SICP = 140 kPa. Changed the rams in the BOP's. Hauled in 12 m <sup>3</sup> of fresh water and placed in the rig tank. Stump tested the class III BOP's blind rams and 73 mm pipe rams to 1400 kPa and 21,000 kPa for 10 minutes each and the annular preventors to 1400 kPa and 10,000 kPa for 10 minutes each.
15:00	16:00	1.00	BOP1	Install BOP's	Bled off the annulus pressure and observed the well dead; removed the wellhead top section and installed the class III BOP's; pressure tested the 73 mm pipe rams and ring gasket to 1400 kPa and 21,000 kPa for 10 minutes each.
16:00	17:00	1.00	WKLL	Kill Well	Pumped 1.5 m <sup>3</sup> of fresh water down the tubing and observed a 0.3 m <sup>3</sup> of diesel fuel then water returns. Checked the sample salinity and observed 10,000 ppm with a pH - 8.0. Stopped circulating and reverse circulated with 7.0 m <sup>3</sup> to check for gas - took sample of fluid from bottom's up and observed 28,000 ppm salinity and pH-9.5.
17:00	17:30	0.50	CLLS	Clean & Secure Lease	Shut in and secured the well for night. Boiler man to heat kill fluids and BOP's 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)



# Daily Completion and Workover

Report Date: 2017-02-19  
Report # 3.0

## PARAMOUNT ET AL FORT LIARD A-01

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Total AFE Amount: 367,733.00  
AFE Number: 17N770027  
Daily Cost Total: 37,362  
Cum Cost to Date: 84,060

API/UWI 300/A-01/6010-12315/0	Surface Legal Location 300/A-01-6010-12315	Field Name Liard	License # 0001858
Well Configuration Type Vertical	Casing Flange Elevation (m)	Ground Elevation (m) 517.20	Original KB Elevation (m) 522.70
Last Casing String	PBTD (All) (mKB)		

Objective Abandon Well
Operation at 6am
Heat BOP's and kill fluids
Operations Summary POOH with Baker packer BHA; RIH set and tested Tryton Tools PBP; circulated the well to fresh water.
Operations Next Report Period Place cement plug on top of the PBP; POOH laying down 73 mm tubing; rig out service rig and equipment.

Road Condition Ice/Snow	Weather Snow	Report Start Date 2017-02-19	Report End Date 2017-02-19
----------------------------	-----------------	---------------------------------	-------------------------------

Head Count	Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)
------------	----------------------------	--------------------------------

Daily Contacts		Job Contact	Mobile
Area Operations Manager	Patrick Kelly, Area 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	780-278-0263	

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 tripping tubing; circulating; high pressure and keeping Mind On Task hazards.
08:00	11:30	3.50	PULT	Pull Tubing	Pulled 185 joints of 73 mm 9.67 kg/m L-80 EUE tubing; 1 - 3.0 m x 73 mm 9.67 kg/m L-80 EUE pup joint; 1 - joint of 73 mm 9.67 kg/m L-80 EUE tubing; Baker on-off connector c/w 58.7 mm F profile; 177 mm x 73 mm EUE Baker Lok-Set Packer assembly; 2.4 m x 73 mm 9.67 kg/m L-80 EUE pup joint; Baker R nipple c/w 57.1 mm profile and 55.8 mm No-Go; Kobe sub and 2.4 m x 73 mm 9.67 kg/m L-80 EUE pup joint. Observed the packer rubbers slightly swollen with no rips or tears.
11:30	15:30	4.00	RUTB	Run Tubing	Made up Tryton Tools 177.8 mm x 73 mm EUE permanent bridge plug on a 3.0 m 9.67kg/m L-80 EUE pup joint; tallied and ran 187 joints of 73 mm 9.67 kg/m L-80 EUE tubing; spaced out with 1 - 2.4 m x 73 mm 9.67 kg/m L-80 EUE pup joint to place the COE of the bridge plug at 1778.5 mKB - Note observed the casing collars with the CCL tool at 1764.0 mKB and 1773.5 mKB.
15:30	17:00	1.50	PTST	Pressure Test	Filled the tubing with 5.5 m <sup>3</sup> of clean fresh water and slowly pressured up to 14,000 kPa; picked up the tubing and sheared the setting pins in the PBP. Bled off the tubing; pressured up the annulus to 7,000 kPa for 10 minutes - held solid. Bled off the casing and released the setting tools from the PBP; picked up 0.5 m. Circulated the wellbore with clean fresh water - Note: salinity of water in returns = 14,000 ppm and 8.5 pH.
17:00	17:30	0.50	CLLS	Clean & Secure Lease	Shut in and secured the well for night. Boiler man to heat 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)	Blm (mKB)	Current Status

Tubing Components				
Item Des		Top (mKB)		
Tubing	*	-3.48		
Packer		1,777.74		

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



# Daily Completion and Workover

Report Date: 2017-02-20

Report # 4.0

## PARAMOUNT ET AL FORT LIARD A-01

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Total AFE Amount: 367,733.00

AFE Number: 17N770027

Daily Cost Total: 119,406

Cum Cost to Date: 203,466

API/UWI 300/A-01/6010-12315/0	Surface Legal Location 300/A-01-6010-12315	Field Name Liard	License # 0001858
Well Configuration Type Vertical	Casing Flange Elevation (m) 517.20	Ground Elevation (m) 517.20	Original KB Elevation (m) 522.70
Last Casing String		PBTD (All) (mKB)	

Objective Abandon Well
Operation at 6am
Heat BOP'S and well fluids
Operations Summary
Spot 1.0 m <sup>3</sup> of cement on top of the PBP; POOH laying down tubing; removed the BOP's and rigged out rig and equipment.

Operations Next Report Period
Well ready to cut and cap

Road Condition Ice/Snow	Weather Snow	Report Start Date 2017-02-20	Report End Date 2017-02-20
Head Count		Personnel Total Hours (hr)	

Daily Contacts		Job Contact	Mobile
Area Operations Manager	Patrick Kelly, Area 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	780-278-0263	

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:30	08:00	0.50	SMTG	Safety Meeting	Moved in with Trican Well Service - cement equipment; Beaver Construction - water truck and Energetic - vacuum truck. Held safety meeting with all personnel discussing running tubing; high pressure; spotting; rigging in equipment; circulating; pulling tubing and back-washing hazards. Checked MSDS for cement and chemicals on location. Safety orientated 2 Energetic employees to Paramount Safety Orientation. Performed a 10 minute bubble test on the surface casing vent and observed no bubbles.
08:00	11:00	3.00	Cement	Cement Squeeze	Checked the well pressures SITP = 0kPa; SICP = 0kPa. Rigged in Trican Well Service pump lines onto the 73 mm tubing; broke circulation down the tubing with returns up the annulus; pressure tested the pump lines to 14,000 kPa; batch mixed and pumped 1.4 tonne of 0:1:0 class G cement containing 0.3% LRT and 0.6% TLF-HT ( 1.0 m <sup>3</sup> of cement slurry ) down the 73 mm tubing; followed by 4.8 m <sup>3</sup> of fresh water to place a balance plug around the end to the tubing. Pulled 8 joints of 73 mm tubing; back-washed 5.5 m <sup>3</sup> of fresh water and observed a small amount of contaminated cement water on bottom's up. Rigged out and released Trican Well Service cementing equipment. Top of cement at 1728.5 mKB.
11:00	14:00	3.00	PULT	Pull Tubing	Pulled and laid down 179 joints of 73 mm 9.67 kg/m L-80 EUU tubing; 3.0 m x 73 mm 9.67 kg/m L-80 EUU pup joint and Tryton Tools setting tool assembly. Held BOP drill while laying down the tubing - well shut in and secured in 47 seconds - held safety meeting discussing observations during BOP drill.
14:00	14:30	0.50	BOPR	Remove BOP's	Rigged out the work floor and removed the class III BOP's; placed and cap over the casing bowl.
14:30	16:30	2.00	SRIG	Rig Up/Down	Rigged out Savanna service rig; boiler; pump and tank. Tank trucks emptied the boiler; rig tank and 60 m <sup>3</sup> tanks.
16:30	17:00	0.50	CLLS	Clean & Secure Lease	Cleaned up the lease and prepared to move to N-01 in AM

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

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

Tubing Components				
Item Des			Top (mKB)	
Tubing				
Packer				
Casing Strings				
Csg Des	Grade	Wt/Len (lb/ft)	Set Depth (mKB)	



# Daily Completion and Workover

Report Date: 2017-03-12  
Report # 5.0

## PARAMOUNT ET AL FORT LIARD A-01

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Total AFE Amount: 367,733.00  
AFE Number: 17N770027  
Daily Cost Total: 19,885  
Cum Cost to Date: 267,725

API/UWI 300/A-01/6010-12315/0	Surface Legal Location 300/A-01-6010-12315	Field Name Liard	License # 0001858
Well Configuration Type Vertical	Casing Flange Elevation (m) 517.20	Ground Elevation (m) 517.20	Original KB Elevation (m) 522.70
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.

FINAL REPORT

Operations Next Report Period  
Well cut and capped

Road Condition Ice/Snow	Weather Snow	Report Start Date 2017-03-12	Report End Date 2017-03-12
----------------------------	-----------------	---------------------------------	-------------------------------

Head Count	Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)
------------	----------------------------	--------------------------------

### Daily Contacts

Title	Job Contact	Mobile
Area Operations Manager	Patrick Kelly, Area 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	780-278-0263

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
08:00	08:30	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.
08:30	13:00	4.50	cut and cap	cut and cap wellhead / casing	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 349.5 mm surface casing; cut the 177.8 mm casing; then the 349.5 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 349.5 mm casing and welded Laird A-01 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 Fort Liard A-01 - 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)
Fresh Water	0.0	0.0		

### Perforations

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

### Tubing Components

Item Des	Top (mKB)
Tubing	-3.48
Packer	1,777.74

### Casing Strings

Csg Des	Grade	Wt/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

Well Name	Grid	WID
Para et al Fort Liard A-01	60° 10' N 123° 15' W	1858
Date	<input type="checkbox"/> First Filing for this Well	Interest Identifier
March 13 2017		

#### 2. WELL LICENSEE / OPERATOR IDENTIFICATION

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

#### 3. NEW STATUS INFORMATION

Status Effective Date	Field Code				
Year	Month	Day	Pool Code		
2017	3	12	Seq Code		
Completion Interval (mKB)			Field Name	Liard	
Top	1786.0		Pool Name	Mattson	
Base	1791.0		Issuance of new pool codes will be made after receipt of this application.		

#### 4. WELL TYPE

<input 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 <u>Uneconomic - tested but never placed on production</u>

#### 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 _____
----------------------------------	---------------