

December 15, 2016

OROGO  
Department of Industry, Tourism and Investment  
Government of the Northwest Territories  
P.O. Box 1320  
Yellowknife NT  
X1A 2L9  
Canada

**Attn: Chief Conservation Officer**

**Re: Responses to Information Request #1 ACW-2016-004  
for Paramount et al Fort Liard 0-35 Well (well ID 1868) ACW-2016-004**

**Enclosed please find the information requested in the above request.**

To facilitate matters we have generated the response following the format of your Information request.

**Information Request No. 1**

**Application to Alter the Condition of a Well**

**Abandonment of the Fort Liard 0-35 Well (well ID 1868) ACW-2016-004**

- 1) *Please provide a copy of the Well History Report for well operations conducted in 2009.*

Enclosed please find a report on the operations conducted in 2009

- 2) *The abandonment program proposes to leave in place a permanent bridge plug at 50mKB. With the bridge plug left in place at 50mKB, please describe how Paramount will confirm that there is no casing pressure below the bridge plug and, consistent with industry best practices, how the entire wellbore from the zonal abandonment at 1355mKB is vented to surface.*

The bridge plug will be drilled out to provide communication.

Enclosed please find a revised program describing this change, and also the change in the well signage.

- 3) Please provide confirmation that there is no gas migration or surface casing vent flow associated with the Fort Liard 0-35 well.

There was no evidence of either gas migration or surface casing vent flow in either the 2015 or 2016 shut in well inspections. Copies of these are enclosed.

The supplied program has an additional surface casing vent check included before the start of operations.

Please contact Dick Heenan at 403 818 4408 or [dickheenan@shaw.ca](mailto:dickheenan@shaw.ca) if you have any questions regarding this project and application.

Regards,

A handwritten signature in blue ink that reads "Lloyd Doyle". The signature is written in a cursive style with a large initial 'L'.

Lloyd Doyle  
Corporate Operating Officer  
Paramount Resources Ltd



**Final Operational/Workover Report**  
**Well Suspension**  
**Para et al Fort Liard O-35**  
**Well ID #: 1868**  
**UWI: 300O356010123154**

On January 30, 2009 Paramount Resources Ltd. moved Concord Well Servicing rig # 84 onto Para et al Fort Liard O-35 to perform a workover operation to suspend the well as per section 218 of the Canada Oil and Gas Drilling Regulations. Service rig operations were completed on February 2, 2009 and the final wireline work was completed on February 22, 2009. A chronological summary of the operations follows.

- 30/1/2009:** Moved on and rigged up service rig.
- 31/1/2009:** Removed the wellhead and installed and tested the BOP's. Unset packer and pulled one joint of tubing from the well.
- 1/2/2009:** Pulled plug from wellbore at 40 mKB. Pulled plug from wellbore at 1450 mKB. Pulled out of the hole with the production tubing, recovering production packer and tubing conveyed perforating assembly. Ran and set a permanent bridge plug at 1470 mKB.
- 2/2/2009:** Ran in hole with test packer. Set packer at 1430 mKB. Pressure tested bridge plug and packer to 14 MPa for 15 minutes. Pulled tubing from the hole, recovering test packer. Dump bailed 8 linear meters of cement onto the bridge plug at 1470 mKB. Set a permanent bridge plug at 1335 mKB. Pressure tested the bridge plug to 14 MPa for 15 minutes. Dump bailed 8 linear meters of cement onto the bridge plug. Rigged out the service rig.
- 22/2/2009:** Ran and set a permanent bridge plug at 50 mKB.

# Abandonment Program for Paramount et al Fort Liard O-35

## Revision 1: 20161215

### WELL INFORMATION:

Well Name: Para et al Fort Liard O-35  
Location: 60-10-123-15  
Coordinates: Latitude: 60° 04' 48.084" 60.0448084°  
Longitude: 123° 21' 22.767" 123.2122767°  
UWI: 3000356010123150  
WID: 1868  
Pool: Mattson  
Field: Fort Liard  
Province: NWT  
Well Status: Suspended (downhole zones abandoned with bridge plugs and cement).

KB Elevation: 455.64 m                      KB to CF: 5.85m  
Ground Elevation: 449.40 m                KB to Grd: 6.25m  
PBSD: 2095 mKB  
TD: 2121.0 mKB

Surface Hole: 311 mm to 507 mKB  
Surface Casing: 244.5 mm 53.57 kg/m, J-55, LT&C set at 507 mKB.  
Cemented with 28t (21.19m<sup>3</sup>) 0:1:0 'G' cement plus 1% CaCl<sub>2</sub>.  
Cement returns to surface - 3.0 m<sup>3</sup>.

Intermediate Hole: 222 mm to 1456 mKB  
Intermediate Casing: 177.8 mm, 38.69 kg/m, J-55, LT&C set at 1455.4mKB.  
Cemented with 17.0t 1:1:2 'G' cement plus 0.5% T-10 and 11.0t  
0:1:0 'G' cement plus 0.8% NFL-2 plus 1.0% A-11.  
Cement top at surface w/ 3 m<sup>3</sup> scavenger cement returns.

Main Hole: 156mm  
Liner: 114.3mm, 17.26kg/m, J-55, LT&C, set from 1344 to 2109 mKB.  
Cemented with 21.0t 0:1:0 "G" cement+ 1.0% NFL-2.

Casing Bowl: 279 mm x 244 mm    ABB-VG-100-21 mPa

Tubing Head: 279 mm x 179 mm    ABB-VG-OF-21 mPa

Production Tubing and Downhole Equipment:  
None - See Attached Diagram

## **Operational Program:**

Note: This is essentially a surface abandonment as downhole operations were completed in 2009. This program forms a part of the “Liard 2016/17 Abandonment” and is governed by the existing Operations Authorization and supporting documents (Safety Plan, Environmental Protection Plan, and Emergency Response Plan which are already on file with OROGO). These documents will be onsite for reference by the site supervisor, along with a bridging document including site specific extracts, emergency contact numbers etc.

This document focuses on the describing the operations planned for the well.

## **Overview:**

The bridge plug set at 50mKB must be drilled out to the extent that there cannot be pressure trapped below it.

The well will then be cut and capped.

The Paramount et al Fort Liard O-35 well was initially completed as a Mattson sweet gas well. Over its life five Mattson zones have been produced, followed by the Fantasque zone. The well is now depleted and was suspended in 2009. The field is shut-in with some of the facilities decommissioned. The associated Shiha trans-border pipeline (under NEB jurisdiction) was deactivated in 2008.

The Mattson perforations were abandoned by setting a bridge plug at 1470 mKB (18 meters above the top perforation). The Fantasque perforations were abandoned by setting a bridge plug at 1335 mKB (20 meters above the top perforation). Both bridge plugs were satisfactorily pressure tested to 14 MPa for 15 minutes and then capped with 8 meters of cement. Both zonal abandonments meet the requirements of NEB-OGDPR (1979) 211(2)(a) in force at the time and the current OROGO – OGDPR 56 (a) & 56 (b).

The surface and production casing were both cemented full length with returns to surface. It is not known if the cement top around the liner extends past the intermediate casing shoe at 1455m, but only the Mattson formation (already depleted) is present below this point. Therefore all zones are believed to be isolated outside the casing.

A further bridge plug is was set in the 178mm casing at 50 mKB on 20090222.

The purpose of this program is to cut and cap the casing, resulting in a permanent abandonment.

## Operations:

1. Perform a surface casing vent check.
2. Isolate field piping and bleed down (if needed).
3. Open the wellhead valves and confirm there is no significant pressure.  
SI pressure on October 2016 SI well inspection was 0kPa  
Check for combustible gas & H<sub>2</sub>S (note there is no history of H<sub>2</sub>S on this well).
4. Rig up service rig and install and test BOPs.
5. Drill out existing bridge plug at +/- 50m
  - a. Make up 155mm drill bit (center bored preferred), collars, and power swivel.  
(A 152mm bit is also acceptable)
  - b. Run in hole and drill out the bridge plug at 50mKB with water.  
No pressure or gas is anticipated below the plug, but as it is only at 50m, if there is anything below the plug, it will come to surface quickly so be prepared to shut-in the well if needed.
  - c. Push the plug down 2m to ensure that slips and sealing elements have been destroyed.  
Note: Most bridge plugs are designed so that they vent (lose pressure integrity) as a safety precaution before the slips are drilled but as the model of this plug is not known, drill through the slips until the packer moves to ensure a loss of pressure integrity. It is not necessary to chase the plug to bottom.
6. Pressure test to confirm casing integrity
  - d. Ensure hole is full of water, close the BOPs and pressure test well casing to 7000kPa for 10 minutes.  
Acceptance criteria is a maximum pressure drop of 10% over 10 minutes. (Ref AER D-36 & Addendum 2015-05-19 7.2).  
One "bump" of fluid/pressure is permitted to account for any air in the system, but the 10 minute clock must be re-started.  
Report results in tour book and on daily completions report.  
Contact Calgary office if pressure test is not successful.

7. Pull out of hole.  
Do not fill hole when pulling pipe/collars.  
When pipe is out of the hole, fill casing with water to approximately 5m below ground level.
8. Remove BOPs and rig down service rig.
9. Cut and cap well
  - e. Excavate around wellbore approximately 1.5 meters (or more) below ground level).  
Slope sides 1:1 or shallower.
  - f. Cut and remove rathole/mousehole 1m below ground level (not ice pad level) if present.  
Backfill rathole /mousehole with 1 m cement plug if required.
  - g. Cut and remove conductor pipe at least 1.2 meters below ground level.  
(not ice-pad level)
  - h. Support casing bowl with picker or similar.
  - i. Cut three 60 degree windows in surface casing just below the bowl.  
Then rough cut production casing. Production casing may drop.
  - j. Cut surface and production casing at least 1 meter below ground level.  
(not ice-pad level)
  - k. Stitch weld a 6mm steel plate over the casing stubs (do not seal).  
Bead weld Fort Liard O-35 on capping plate.
10. Prepare and install well sign
  - a. Bead weld well coordinates and date on 5mm plate (500mm X 300mm) as follows:  
**Fort Liard O-35 60-10-123-15**  
**YYYY-MM-DD**
  - b. Install abandoned well sign on a piece of 60mm tubing (or similar – minimum 25mm)  
Signpost to be located 1 meter north of the well and set in a suitable cement plug (e.g. a 22 liter pail or a section of 244mm surface casing full of cement at

least 1 meter below ground level).

Finished sign should be approximately 1.5 m above ground level and painted iridescent orange.

11. Backfill the hole with a 0.3m crown to allow for possible subsidence.

Note: Re-use of excavated backfill material is contingent on a satisfactory result of test from environmental consultant. If material around well center is contaminated (e.g. with diesel from previous operations), new fill material will have to be brought in.

12. Rig down and remove all equipment and material used in the operations from the lease.

Haul any remain fluid to an approved waste disposal location.

END

Calgary contact (always phone rather than email for urgent matters)

Dick Heenan      403 818-4408      dickheenan@shaw.ca

R Heenan

20161215

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

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

WellSign

Non-sealing steel plate  
 1m north of well  
 1.5m high - set in cement

Cut 1m below ground

Bridge plug vent drilled out  
 (plug does not seal)

244.5 mm, 53.57 kg/m, J-55, LT&C  
 28t 0:1:0 'G'+ 1.0% CaCl<sub>2</sub>  
 3m<sup>3</sup> cement returns to surface

507m

1335

1344

1355.0 - 1362.0

1365.0 - 1370.0

Int. casing shoe at 1455 mKB

*Fantasque perforations*

177.8 mm, 38.69 kg/m, J-55, LT&C  
 14.2t 1:1:2 'G'  
 2m<sup>3</sup> cement scavenger returns to surface

8 m cement plug

Bridge plug

1470

1478 - 1482

*Mattson perforations*

Tubing conveyed perforating assembly

Medium grit CaCO<sub>2</sub>

1511

1512

Baker 'WG' bridge plug

Baker L10 on-off connector w/47.6 mm 'F' profile

1513

Baker A3 Lok-Set packer

1518

46.02 mm 'R' nipple w/ 44.7 mm No Go

1525

Separation sub

1530 - 1532.5

*Mattson perforations*

Tubing conveyed perforating assembly

1542

Silica sand

1545

Baker 'WR' bridge plug

1549 - 1555

*Mattson perforations*

1629

Medium grit CaCO<sub>2</sub>

1636

Baker 'WR' bridge plug

1642.5 - 1645.5

1648.0 - 1651.0

*Mattson perforations*

Medium grit CaCO<sub>2</sub>

1742

1748

Baker L10 on-off connector w/47.6 mm 'F' profile

w/ 'FSG' plug in place

Baker A3 Lok-Set packer

1752

1756

46 mm 'R' nipple w/ 44.7 mm No Go

Separation sub

1761 - 1764

*Mattson perforations*

2049

2057

2058

2064 - 2065

Tubing conveyed perforating assembly

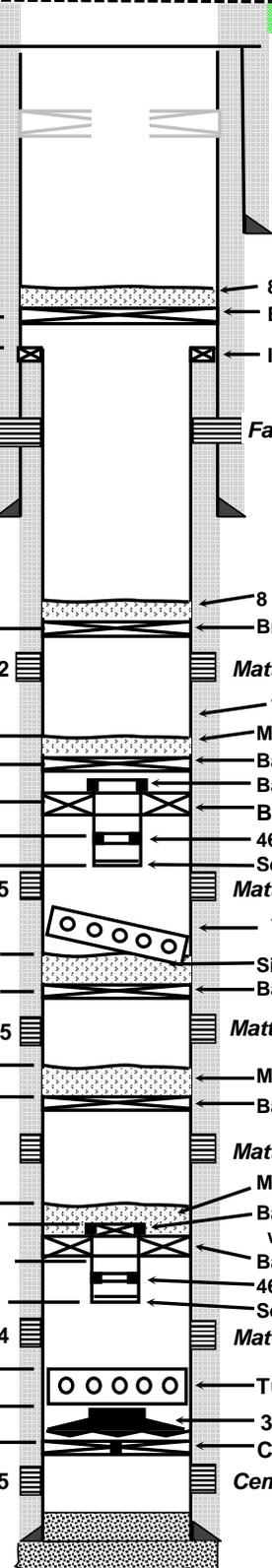
3 7/8" Drill bit

Cement retainer

*Cement squeeze perforations*

114.3 mm, 17.36 kg/m, J-55, LT&C  
 21t 0:1:0 'G' cement

PBTD 2095 mKB  
 Liner Bottom 2109mKB  
 TD 2121 mKB



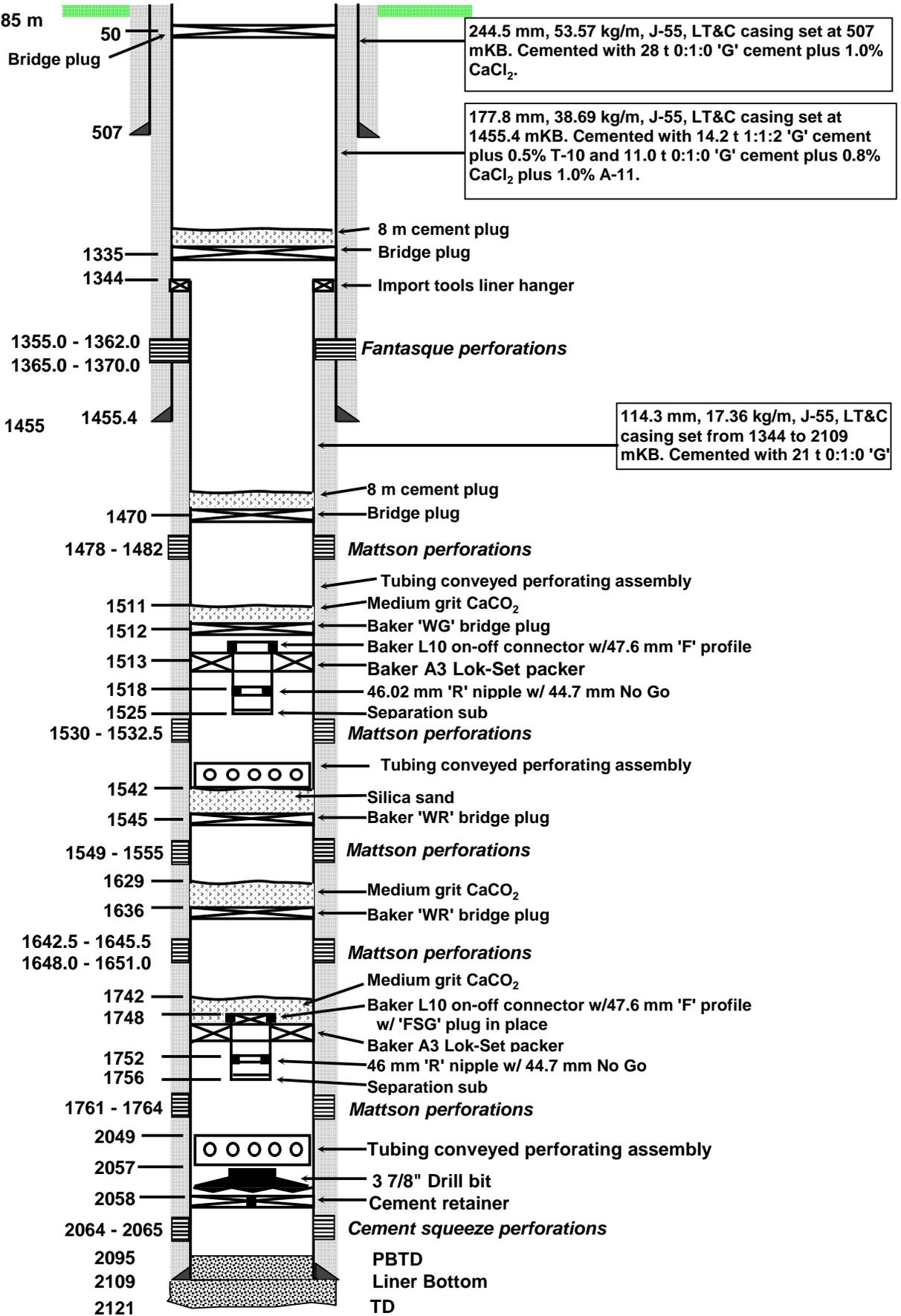
# PARA ET AL FORT LIARD O-35

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



## WELL INSPECTION REPORT

Well Name: Para et al Fort Liard O-35

Coordinates: Lat: 60 ° 4 ' 48 " Long: 123 ° 21 ' 22 "

Operator: Paramount Resources Status: Suspended

File: \_\_\_\_\_ WID: 1868

Date of Inspection August 26, 2015

### EVALUATION

1. Is visible well marker in place? Yes;
2. Is wellhead chained and locked? Yes;
3. Completed in H<sub>2</sub>S zone?? Select
4. Does well contain tubing? No;
5. Does well contain pump and rods? No;
6. Is there a packer/plug above the perfs? Select
7. Is there any lease equipment? Yes;
8. Is area brush cleared (10 m around wellhead)? No;
9. Do wellhead valves operate freely? Yes; serviced with grease
10. Are tapped bull plugs in place? Yes;
11. Is the surface casing dead and open? Yes;
12. Is there any gas migration outside the surface casing? No;
13. Shut in production casing pressure: 50 kPa
14. Shut in intermediate casing pressure: N/A kPa
15. Shut in production tubing pressure: N/A kPa
16. Shut in surface casing pressure: Ø kPa
17. H<sub>2</sub>S readings (if so, record the following): Select
  - Tubing: N/A ppm Intermediate casing: N/A ppm
  - Production casing: Ø ppm Surface casing: Ø ppm
18. Pressure rating of all components: 3000 psi.
19. Is additional clean up required? No;
20. Drilling sump condition: gravel
21. Are there any environmental concerns? No;
22. Photographs of wellhead, valves, signage and lease required: Yes
23. Is wellhead schematic attached? No;

### COMMENTS:

Pressure test casing hanger seals (primary/secondary) Failed - No tubing hanger

"I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate"

Randy McAuley

Inspected By

August 26, 2015

Date Signed



Signature of Responsible Officer of Company

**Lloyd Doyle, P.Eng.**  
Corporate Operating Officer

### Instructions:

Send three copies of the completed form with original signatures, along with the appropriate supporting technical documentation, to:

Chief Conservation Officer, OROGO  
Department of Industry, Tourism and Investment  
Government of the Northwest Territories  
P.O. Box 1320  
Yellowknife NT X1A 2L9

## WELL INSPECTION REPORT

Well Name: Para et al Fort Liard O-35

Coordinates: Lat: 60 ° 4 ' 48 " Long: 123 ° 21 ' 22 "

Operator: Paramount Resources Status: Suspended

File: \_\_\_\_\_ WID: 1868

Date of Inspection October 4, 2016

### EVALUATION

1. Is visible well marker in place? Yes;
2. Is wellhead chained and locked? Yes;
3. Completed in H<sub>2</sub>S zone?? Select
4. Does well contain tubing? No;
5. Does well contain pump and rods? No;
6. Is there a packer/plug above the perfs? Select
7. Is there any lease equipment? Yes;
8. Is area brush cleared (10 m around wellhead)? No;
9. Do wellhead valves operate freely? Yes;
10. Are tapped bull plugs in place? Yes;
11. Is the surface casing dead and open? Yes;
12. Is there any gas migration outside the surface casing? No;
13. Shut in production casing pressure: 0 kPa
14. Shut in intermediate casing pressure: N/A kPa
15. Shut in production tubing pressure: N/A kPa
16. Shut in surface casing pressure: Ø kPa
17. H<sub>2</sub>S readings (if so, record the following): Select
  - Tubing: N/A ppm Intermediate casing: N/A ppm
  - Production casing: Ø ppm Surface casing: Ø ppm
18. Pressure rating of all components: 1 1/2 head, 2 9/16 5000 psi valves
19. Is additional clean up required? Yes; pipeline parts, tarp
20. Drilling sump condition: gravel
21. Are there any environmental concerns? No;
22. Photographs of wellhead, valves, signage and lease required: Yes
23. Is wellhead schematic attached? No;

### COMMENTS:

Pressure test casing head seals with artic pack, failed

"I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate"

Randy McAuley

Inspected By

Signature of Responsible Officer of Company

Date Signed

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