



ABANDONMENT PROGRAM
OROGO Deadline April 1, 2022
OROGO LEVEL II WELLBORE

PARAMOUNT LAC MAUNOIR C-34
WID # 1995
POTENTIAL H₂S: 0.0%

PROCEDURE APPROVAL & DISTRIBUTION

DATE: July 26, 2022 – Revised November 10, 2022
WELL NAME: PARAMOUNT LAC MAUNOIR C-34
UWID: 300/C-34-6720-12500/0
OPERATIONS AREA: Coleville Lake **PROVINCE:** NWT
OBJECTIVE: Abandon Level II wellbore in accordance with OROGO abandonment guidelines.
AFE No: TBD
AMOUNT:
PRL Supplier Coding: **PR210-9231-xxx (Abandonment program)**

REGULATORY APPROVALS:

REQUIRED: YES

TYPE: OROGO Operations Authorization and ACW.

TYPE: Water License. Permit # TBD.

TYPE: Land Use Permit. Permit# TBD.

AUTHORIZATION RECEIVED by:

DATE:

PROCEDURE COMPLIES WITH CONDITIONS OF AUTHORIZATION: YES NO

TYPE OF WORKOVER: (Abandonment):

PROCEDURE COMPLIES WITH PARAMOUNT RESOURCES LTD. POLICIES ON:

- 1) Paramount Well Control Manual
- 2) AER Servicing **BOP Class III** well.

DISTRIBUTION: FIELD:

CALGARY:

Corey Thomson/Well Files

PREPARED BY:

Richard Heenan – Consultant

DATE: November 10, 2022

REVIEWED



Corey Thomson – Engineer (ARO)

DATE: November 11, 2022

APPROVED BY:



Tim Wood - Manager (ARO)

DATE: November 11, 2022



John Hawkins - Director (ARO)

DATE: November 14, 2022



ABANDONMENT PROGRAM

OBJECTIVE

Suspended wellbore, OROGO Level II well bore. OROGO abandonment deadline April 1, 2022. Abandon the well as per approved ACW and OROGO guidelines. Cut and cap well.

REPORTING

- All rig calls and Daily Reports are to be directed to Corey Thomson (Superintendent/Engineer ARO)
 - Office: 403-261-1250
 - Cell: 403-835-4447
 - E-mail: corey.thomson@paramountres.com

PROGRAM SUMMARY

- Read & record SIP(s). Investigate status of SCVF/GM
- MIRU slick line unit. Pull A-3 tubing plug from 18mcf.
- Set X plug in profile @ 853mKB and P-test. Rig out slick line.
- MIRU Service Rig, P-tank and associated equipment – Rig up BOPs & test
- Release on-off connector @ 853mKB & circulate to fresh water
- RIH bit and scraper for 177.8mm casing on 73mm tubing string to PBTD. Circulate clean. Pull bit and scraper.
- Set permanent bridge plug @ +/- 853mKB & P-test
- Tag cement plug and record depth (Minimum of 15 meters above top perforation required). Pressure test to 7000 kPa for 10 minutes..
- Displace water from wellbore 100mKB to prevent freezing
- Cut and cap the casing strings with vented cap. Install well marker

SAFETY

A safety meeting is to be held with all service company personnel prior to each job. Wellsite supervisor must notify Contractors of known hazards of which Contractor(s) may be unaware. Wellsite supervisor must ensure that workers are aware of their responsibilities and duties under OH&S regulations and that workers comply with regulations. All service companies supplying materials will review Material Safety Data Sheets at this meeting for all products supplied and maintain these Material Safety Data Sheets available for worker's examination on location in compliance with WHIMIS regulations. All safety meetings will be recorded on the Paramount daily report and on the daily tour sheet.

Whenever possible, plan and conduct all workover procedures in a manner which will avoid the mixing of air & hydrocarbons in the well bore and connected surface piping. If mixing does occur, purge prior to pressurizing or exposing mixture to any other possible source of ignition.

Rig anchor locations if required will be approved by Paramount Wellsite Supervisor prior to installation.

REGULATIONS



All applicable regulations, including, but not limited to the specific approved OROGO ACW approval, OROGO Well Suspension and Abandonment Guidelines, Oil and Gas Occupational Safety and Health Regulations (NWT) and Occupational Health and Safety (OHS) Regulations (NWT) are to be strictly adhered to. Written instructions must be posted in doghouse or other conspicuous area prior to the wellsite supervisor leaving the lease. Wellsite supervisor must designate, in writing (see attached Form), a competent person to carry out principal contractor's responsibilities. All verbal notifications and approvals from government regulatory agencies will be recorded on Paramount's daily report tour sheet. The name of the individual contacted, and the subject matter of approval or notification should be recorded on same.

Paramount shall provide all staff and contractors for this program with the OROGO 24-hour incident reporting phone number (867-445-8551) prior to commencing any work or activity.

Paramount shall submit to OROGO an updated operator contact list for this program prior to any work or activity by email at orogo@gov.nt.ca.

Paramount shall submit to OROGO certificates and inspection documents for any service rig, well control and associated equipment (including boilers) at least 10 days prior to the rig commencing work by e mail at orogo@gov.nt.ca.

Paramount shall submit to OROGO all reports required under the Oil and Gas Drilling and Production Regulations in a timely manner to OROGO by email at orogo@gov.nt.ca.

Paramount shall submit to OROGO, completed Change of Well Status form 30 days after the service rig release date or when the abandonment operation has been finished.

WORK ORDERS/FIELD TICKETS

Delivery and field tickets for all work, services performed, or materials purchased must be signed by a Company wellsite supervisor. Record the AFE number and well location on all purchase and work tickets.

MATERIAL TRANSFERS

All materials shipped to this location that are not used must be transferred to an appropriate warehouse point. Transfers of any tubular materials must include complete tally. Company wellsite supervisor will complete such transfers and forward both copies to Calgary office for approval and further handling.



PARAMOUNT LAC MAUNOIR C-34 ABANDONMENT

WELL DATA AND WELLBORE CONFIGURATION

WELL DATA:

Surface Location: LAT: 67°13'02.741" N LONG: 125°07'03.941" W NAD83
UWI: 300/C-34-6720-12500/0
Profile: Slight Deviation (Refer to survey)
BGWP: 600m GL (Default)
WID#: 1995
OPERATING LICENCE# **NWT-OL-2014-009**
OROGO OA# **TBD**
OROGO ACW# **TBD**
Spud Date: January 20, 2004
Rig Release Date: February 23, 2004
KB: 628.0m
GL: 622.8m
KB-GL: 6.8m
PBTD Original: 926.7m KB
TD: 945.0m KB

CONDUCTOR:

Hole size 445mm to 61.0m KB.

339.7mm, 101.71kg/m K-55 BT&C landed at 65m KB.
Cemented with 10tonne (7.4m³) Arctic Set cement + 2.0% CaCl₂. Top filled with additional 10tonne (7.4m³) Arctic Set cement through 25.4mm pipe from surface.

SURFACE:

311 mm to 451.0mKB

32 Joints. 244.5 mm, 59.53 kg/m, L-80, LT&C set at 451.0m KB.
Cemented with 8.5tonnes (7.5m³) Arctic Set + 0.5% D065 + 0.2% D046 + 1.0% D013at 1900kg/m³ tailed in with 17tonnes (13.9m³) Class 'G' + 2.0% CaCl₂ and displaced with 17.7m³ of fresh water. The plug was down at 0735hrs February 15,2004. 5m³ good cement returns to surface.

PRODUCTION:

Hole Size 216 mm to 945.0m KB.

78 Joints. 177.8 mm, 43.16kg/m, L-80, LT&C set at 945.0mKB. Cemented with 21Tonnes (18.8m³) 0:1:0 Class G Cement and displaced with 18.1m³ of fresh water. Trace cement returns observed at surface.

PERFORATIONS:

902.5 – 905.5mKB L. Mount Clark C (plugged)
891.0 – 894.0mKB U. Mount Clark C
876.5 – 879.5mKB Mount Clark B



Formation Tops

geoSCOUT Ref Elev(m):

+626.7

Formation	TVD (m)	Elev (m)	
Cfr_mtyc	339.0	+287.7	
Csaln_rv	508.5	+118.2	
Csaln_sa	587.0	+39.7	
Csaln_cIL	607.0	+19.7	
Cmt_cap	700.0	-73.3	
Cmt_clark	870.0	-243.3	
preCamb	907.0	-280.3	

GEOLOGICAL MARKERS KB ELEVATION 628.0m. FROM GEOLOGICAL REPORT

Formation	Sample Depth (m)	Log Depth (m)	Log Subsea (m)
Franklin Mtn – Cyclic	339.0	339.0	289.0
Saline River – Shale	519.0	508.5	119.5
Saline River - Up salt	565.0	548.5	79.5
Saline River - Lower Shale	591.0	587.0	41.0
Saline River- Lower Salt	607.0	607.0	21.0
Mt. Cap - Upper Shale	705.0	700.0	-72.0
Mt. Cap – Chert	723.0	712.4	-84.4
Mt. Cap - Lower Zone	770.0	741.0	-113.0
Mt. Cap - Clastic Zone	822.0	770.0	-142.0
Mt. Cap – Basal	838.0	815.0	-187.0
Mt. Clarke - A Zone	870.0	870.0	-242.0
Mt. Clarke - B Zone	876.5	876.5	-248.5
Mt. Clarke - C Zone	886.5	889.9	-261.9
Proterozoic	905.5	907.0	-279.0
Total Depth	945.0	945.0	-317.0

SCVF: No vent flow present.

Tubing/Casing Data:

	Surface Casing	Prod. Casing	Production Tubing String	
Size O.D. (mm)	244.5	177.8	73.0	
Weight (kg/m)	59.53	43.16	9.67	
Grade	L-80	L-80	L-80	
Connection	LT&C	LT&C	EUE	
Drift I.D. (mm)	220.45	153.90	59.61	
I.D. (mm)	224.41	157.07	62.0	
Capacity (m ³ /m)	0.040326	0.019377	0.003019	
Collapse (MPa)	21.0	48.4	76.9	
Burst (MPa)	40.0	56.3	72.9	
Tension (daN)	323,000	261,100	64 500	
Annular Volume (m ³ /m)			0.015189	
Depth (mKB)	451.0	945.0	889.5	

Reservoir Data:

Formation	Mount Clark B	Mount Clark C	
Perforations	876.5 879.5	891.0 – 894.0 902.5 – 905.5	Plugged
Reservoir Pressure	6,431 kPa (est)	6,431 kPa	
Reservoir Temperature	12°C	12°C	
H ₂ S %	0	0	



GENERAL REQUIREMENTS

- **Daily reports shall be e-mailed to the Operator's office by 7:00am each day.**
- Before commencing operations, the Wellsite Supervisor will complete a list of nearest available emergency services. This list along with a detailed and accurate description of directions to the location is to be posted in a conspicuous and accessible location known to all personnel.
- Emergency contact list should be completed, posted and available to all on site.
- Ensure that all personnel receive a Paramount orientation, are briefed on the wellsite hazards, safety and first aid equipment locations, escape routes and muster points upon their arrival to the lease. All personnel must be signed in after receiving their briefing and all personnel must sign out when departing the work site.
- Safety and well plan meeting to be held with all service company personnel prior to each job and meetings must be recorded on the Paramount's daily report and on the daily tour sheet.
- All applicable regulations, including, but not limited to the specific approved OROGO ACW approval, OROGO Well Suspension and Abandonment Guidelines, Oil and Gas Occupational Safety and Health Regulations (NWT) and Occupational Health and Safety (OHS) Regulations (NWT) are to be strictly adhered to. Written instructions must be posted in doghouse or other commonly visited area prior to Wellsite Supervisor leaving lease.
- The Wellsite Supervisor is responsible for assessing all worker's competency and ability to perform work.
- All service companies supplying materials will provide Material Safety Data Sheets for all products supplied and maintain these Material Safety Data Sheets available for worker's examination on location in compliance with WHIMIS regulations.
- The Wellsite Supervisor will ensure that dangerous goods shipped or received are classified, packaged, marked, labelled and documented in compliance with the Transportation of Dangerous Goods Regulations. If required, placards must be attached to vehicles transporting dangerous goods. All shipping documents must be forwarded to the Calgary office for filing.
- All operations carried out on behalf of the Operator shall be conducted in a safe and efficient manner in compliance with the Operator's safety regulations and all applicable acts and regulations.
- The Operator expects that all operations conducted will be designed to protect and maintain the quality and integrity of the environment and comply with all environmental acts and regulations.
- BOP equipment will be tested at least once daily, and any equipment found defective should be made serviceable before operations are resumed. Blowout prevention and man-down drills are to be performed weekly and are to be recorded on both the morning reports and tour reports.
- Whenever possible, plan and conduct all completion / workover procedures in a manner which will avoid the mixing of air & hydrocarbons in the wellbore and connected surface piping. If mixing does occur, purge prior to pressurizing or exposing mixture to any other possible source of ignition.
- During the absence of the Wellsite Supervisor, a qualified and competent alternate shall be designated, in writing, to carry out the principal Contractor's responsibilities. Written instructions must be posted in a conspicuous and accessible location known to all personnel prior to the Wellsite Supervisor leaving the location.
- All verbal notifications and approvals received on location from any regulatory agency must be documented and recorded on both morning reports and tour reports and should include a contact name from the agency, phone number and details of the subject matter.
- All field tickets and other supporting documentation submitted for materials purchased and/or services rendered require a correct AFE#, G/L number and accurate identification of the well location along with the Wellsite Supervisor's signature indicating acceptance to the same.



PARAMOUNT LAC MAUNOIR C-34 ABANDONMENT

ABANDONMENT PROGRAM

1. **Submit certificates and inspection documents for any service rig, well control and associated equipment (including boilers) at least 10 days prior to the rig commencing work** by e mail at orogo@gov.nt.ca.
2. The Wellsite Supervisor is responsible to notify (or verify notification has been completed) the OROGO, a minimum of 24 hrs prior to any well servicing abandonment operation.
3. The Wellsite Supervisor is responsible to notify (or verify notification has been completed) the OROGO, a minimum of 24 hours prior to any planned flaring operation. When a permit is applicable for sour gas flaring, a copy of such permit must be on site during any flaring operation and requirements of such permit must be strictly adhered to
4. The Wellsite Supervisor is responsible to verify notifications have been completed to all applicable residents, industrial operators, trappers & guiders within the categorized radius and/or within the emergency planning zone (EPZ) if applicable a minimum of 24 hours prior to any flaring operation.
5. Paramount shall provide all staff and contractors for this program with the OROGO 24-hour incident reporting phone number (867-445-8551) prior to commencing any work or activity.
6. Complete lease access and well handover process. Complete lease inspection. Note the condition of the lease, record any clean-up operations required to address any spills and record any other noteworthy findings on the first morning report. Discuss the transportation arrangements for the tanks and fluid with respect to other activity in the surrounding field area.
7. Prepare location for wireline unit, Service Rig, P-Tank and flare stack & support equipment.
8. Perform SCVF bubble-test, **ensure SCV piping is exposed to determine if it is open and intact**, read and record SIP's. Fill-out the 'Surface Casing Vent Flow / Gas Migration Data Sheet 'and examine surface casing vent for blow or suction. Check and monitor LEL and H₂S levels at wellhead and investigate for evidence of gas migration at surface.
9. Check for the presence of and confirm there is no H₂S.
10. Note: this well is not tied in to a flowline.
11. MIRU service rig complete with a 21 MPa Class III BOP stack. 73 mm rams, kill spool, rig pump, clean tank, and related auxiliary equipment (boiler) to OROGO, OH&S and PRL regulations and guidelines. Ensure Corporate Policies and Procedures are followed prior to commencing operations (see attached). Space out equipment in accordance with OROGO and OH&S requirements.
 - Ensure all necessary safety equipment is strategically positioned, on site and tested to ensure proper operating condition prior to commencing with the workover operations.
 - All personnel must be familiar with the operation of all emergency equipment. Safety and BOP drills are to be conducted on a regular basis and recorded on the "Daily Completion / Workover Report"
 - Conduct a complete inspection of the service rig per requirements of AER Directive 37 and PRL guideline policy. Identify and remediate any deficiencies prior to initiating completion operations
 - Conduct an operational and safety meeting prior to installing BOPs onto the wellhead and pressure testing.



12. If necessary, install temporary rig anchors and conduct pull tests on each anchor to 20000 lbs. Install escape line anchor and pull test to 3000 lbs. Ensure PRL ground disturbance procedures are followed.
13. Move in two 200bbl (32m³) tanks for wellbore displacement. Haul in approximately 20m³ fresh water. Ensure bits, scrapers and pressure test packers for 177.8mm and a few spare 73mm tubing joints are available.
14. Conduct daily pre-job safety meeting and equipment inspection.
15. MIRU slick line unit with lubricator and BOPs. Purge and pressure test the lubricator to 1400kPa (low) and 14MPa (high) with Nitrogen gas. Purge the lubricator each time before running in the hole with tools. Hang the wireline sheave in the derrick.
16. Note: This well contains a shallow hookwall tubing plug at 18mCF. Follow all procedures in OROGO Safety Bulletin SB01 2021 – Shallow Wellbore Plugs (copy attached at the end of this program). Specifically a hazard analysis for the operation considering the specific surface equipment must be performed and documented. A copy is to be submitted to OROGO prior to operations and a summary of operations must be submitted to OROGO – not timing requirements in the bulletin.
17. Fill the tubing with water to 19mCF (about 50 liters) and pressure up to 9,000kPa. This is to confirm equalization as below.
18. RIH with sinker bars and knockout rod to break Kobe sub at base of A pack off. (Kobe sub presumed to be in place – but not documented.) Confirm required length & diameter of probe with slickline contractor. If Kobe sub is successfully broken, pressure above will drop indicating equalization. Allow pressures to stabilize.
19. Pull slip stop, A-3 plug, and collar stop located at 18mcf. (2.5" JUC pulling tool required). Note: If unsuccessful in equalizing below, maintain 9000Pa on plug until elements are released and pressures equalized. This will prevent the plug being blown up hole.
20. Run blind box and tag PBSD and record depth. Confirm as a minimum access to X nipple at 853mKB.
21. Brush 58.75 mm profile at 853 mKB. Set X plug 58.75 mm profile at 853 mKB.
22. Fill tubing with fresh water. Monitor for pressure buildup/flow in the tubing for 10 minutes to ensure X plug is seated and holding. (Tubing is reported as full of frac oil. If correct the BHP inside the tubing is approximately equal to the formation pressure and no pressure response is anticipated in this "negative pressure test". Pressure test the X plug @ 853mKB to 7 MPa for 10 minutes.
23. Release slickline unit.
24. Install the working spool and BOPs onto the BOP test stump. If required warm up the BOP stack with steam. Function test the blind rams and pipe rams on the test stump. Close the blind rams and pressure test the working spool, the blind rams and BOP flange to 1.4 and 14MPa for 10 minutes each. Install a ported tubing pup and stabbing valve through the BOPs on the BOP test stump. Pressure test the pipe rams and stabbing valve to 1.4MPa and 14MPa for 10 minutes each. Pressure test annular preventer to 7000 KPa for 10 minutes.
25. Conduct an accumulator function test. Recharge the accumulator, shut off the pump and record the accumulator pressure. Close each ram and record the start and end pressures and the time to close each ram. Recharge the accumulator and record the time for the accumulator to recharge to the original



pressure. Ensure that hand wheels are available and are the correct type and size for all the BOP rams. Record the number of turns to close each ram manually.

26. Tie in circulating lines with a return line tied into 'P' tank or rig tank as required. Properly stake surface lines and pressure test lines and manifold to 1,400kPa (low) and 14,000kPa (high) and hold each for ten (10) minutes.
27. Install a 73mm landing pup with an open stabbing valve. Close the stabbing valve. Strip the BOPs over the landing pup and nipple up the stack. Close the pipe rams on the landing pup and pressure test the BOP connection to the wellhead to 1.4MPa (low) and 14MPa (high) for 10 minutes each.
28. Release the XL-HD On-off connector at 853mKB by setting string in compression and turning left one – quarter turn.
29. Pull up 1 meter.
30. Forward circulate with fresh water to remove all diesel/frac oil from annulus (approximately 17 m3). Store diesel in tanks on surface and haul to approved disposal. Record on tour sheet and daily report "Displaced well to fresh (non-saline) water" – use this exact wording
31. Pull out of hole with the 73mm tubing while and visually inspect out of the hole for re use. Stand the tubing string.
32. RIH with bit and casing scraper for 177.8mm casing to PBTD (+/- 853m)
Pull out of hole and stand tubing string.
33. Set a permanent bridge plug (BP) as close as practical to PBTD, but at least 5m from a collar. BP may be set with tubing of wireline as is most convenient.
34. Pressure test bridge plug to 7MPa for 10 minutes and POOH. Record on daily report.
35. RIH 73mm tubing to PBTD and pull 1 meter off bottom. Prepare to set balanced cement plug.
36. Move in and rig up cementers. Pressure test the surface lines to **21Mpa**.
Make sure mix water is between **20 to 25 deg C**.
Mix water must be clean potable water.
37. RIH with 73mm, 9,67kg/m, EUE open ended tubing to PBTD and tag. Record depth. Come off bottom. Establish circulation to surface.
38. Circulate a 1m³ balanced (+/- 50 meter) cement plug. Catch and retain samples. Monitor surface samples for "setting" conditions. Record and report same.
Pull tubing above cement top slowly. Circulate clean with fresh water.
39. Wait on cement until surface samples are firm. RIH w/ 73mm tubing and tag cement top. Cement top must be 15m or more above top of bridge plug. A minimum of 1,800 decanewtons must be used to tag plug. Record results on daily report.
40. Pull out of hole and lay down the 73mm tubing. Ensure thread protectors are used.
41. Run a cement bond log from plug back depth (+/- 853 mKB) to surface. Perform field evaluation regarding quality of bond and potential interval(s) for cement squeeze. Transmit log to Calgary office for additional evaluation and confirmation of perforation intervals (if required).
42. If a perforate and cement squeeze is required, notify OROGO office in advance. Perform squeeze as per program addendum supplied separately with this application.
43. RIH with tubing to 500m.
This will displace 2m³ of water to lower final fluid level to 100m to prevent freezing due to permafrost.



POOH. Do not fill hole.

44. Remove BOPs and rig out.
Cover exposed flange securely if well is not to be immediately cut and capped.
45. Prepare “as built” downhole abandonment diagram – using attached proposed diagram as a guide.



Surface Abandonment:

Cut and cap the casing strings at least 1 m below ground level with vented cap as per the procedure below or with Hydro jet vented cap system.

- 46. Confirm LEL and H2S are zero. Reconfirm no indications of gas migration.
- 47. Excavate a 2.5m deep bell hole around the wellhead ensuring that walls of the bell hole are sloped at a maximum of 45 degrees for safe entry and egress and to prevent sloughing in.
- 48. Confirm surface casing vent is open.
Cut a small hole 30 cm below the surface casing bowl and investigate for trapped gas and fluids. Check and monitor LEL and H2S levels.
Attach wellhead to lifting unit (rig, backhoe, picker, etc.). Pull slight tension
Weld cut three (3) windows in the surface casing to access the innermost casing string ensuring that 50% of the circumferential metal remains to prevent possible collapse of the surface casing from the weight of the wellhead. While exercising caution, weld cut the innermost string.

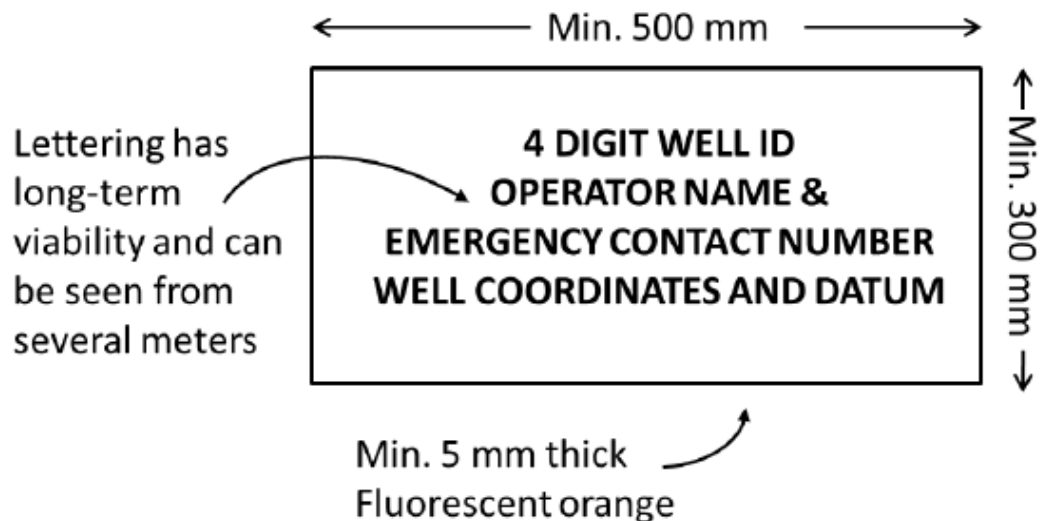
NOTE:

Innermost string can be expected to suddenly drop once completely cut.
Do not place pry bars, hands or fingers in the windows.

- 49. Complete weld cut of the surface casing, lift and remove wellhead from bell hole.
- 50. Stitch weld (non-sealing) steel plate “surface casing and production casing.
Weld inscribe the LSD on top of the steel plate and document with a digital photograph.
- 51. Install abandoned well sign as below.
Verify well coordinates (decimal format to 4 decimal places) in header with handheld GPS field measurement – use NAD 83 Datum
Record well coordinates on daily report.
A buried 5 gallon pail filled with cement may be helpful in supporting the well sign (as below)

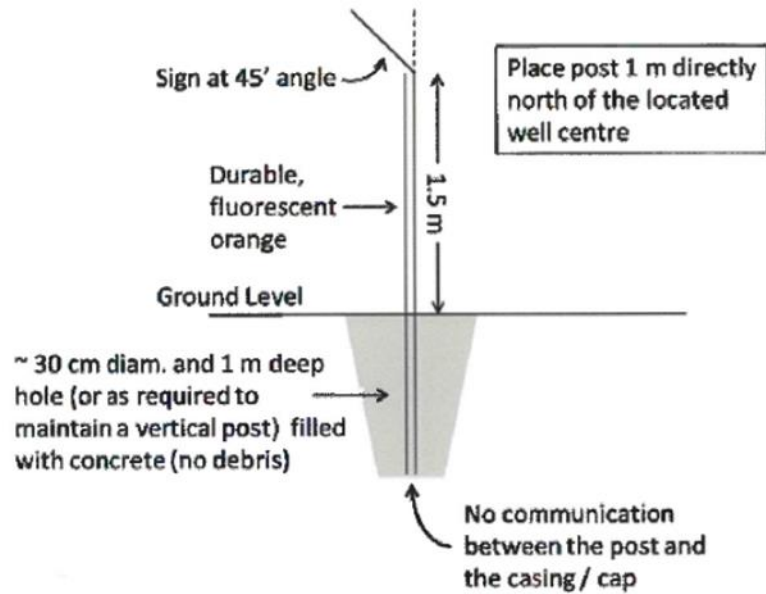
DO NOT WELD SIGNPOST TO CASING.

Visible Well Marker



Well Suspension and Abandonment Guidelines and Interpretation Notes

Post Requirements



52. Prepare field sketch of lease indicating well location, signpost (1 meter north of well) and any relevant features. Submit with daily report.
53. Backfill and compact the excavation, clean up lease and rig out and release all services.



CORPORATE CONTACTS

Paramount Resources Ltd.
2800, 421 - 7th Avenue, SW
Calgary, AB
T2P 4KP

ARO (Calgary):

	<u>Business</u>	<u>Residence</u>	<u>Cellular</u>	<u>Fax</u>
Corey Thomson Engineer, Abandonments E-mail: corey.thomson@paramountres.com	(403) 261-1250		(403) 835-4447	(403) 261-1349
Tim Wood Manager, ARO E-mail: Tim.Wood@paramountres.com	(403) 290-2919		(403) 803-8410	(403) 261-1349

PRODUCTION (District Office):

	<u>Business</u>	<u>Residence</u>	<u>Cellular</u>	<u>Fax</u>
Completions Sub-Surface Foremen				
Martin Doll /	(780) 683-8037		403 926-7192	
Kent Gillett	(780) 683-8037		403 350-2730	

MORNING REPORTS (Calgary):

	<u>Business</u>	<u>Residence</u>	<u>Cellular</u>	<u>Fax</u>
Corey Thomson Abandonment Engineer E-mail: Corey.Thomson@paramountres.com	(403) 261-1250		(403) 835-4447	(403) 261-1349
Tim Wood Abandonment Manager E-mail: Tim.Wood@paramountres.com	(403) 290-2919		(403) 803-8410	(403) 261-1349
Richard Bean Abandonment Superintendent E-mail: Richard.Bean@paramountres.com	(403) 303-1929		(403) 793-4586	(403) 261-1349



CORPORATE POLICY & PROCEDURES

- All operations carried out on behalf of the Operator shall be conducted in a safe and efficient manner in compliance with the Operator's safety regulations and all applicable acts and regulations.
- The Operator expects that all operations conducted will be designed to protect and maintain the quality and integrity of the environment and comply with all environmental acts and regulations.
- All contractors on location must have as a minimum a valid H₂S ticket (if necessary), WHMIS, and be fully covered by the NWT Worker's Compensation Board (WCB) where applicable, carry a minimum of \$5,000,000 liability insurance.
- Before commencing operations, the Wellsite Supervisor will complete a list of nearest available emergency services. This list along with a detailed and accurate description of directions to the location is to be posted in a conspicuous and accessible location known to all personnel.
- Any excavation or installation of anchors (if required) on location shall follow Paramount's Ground Disturbance Requirements:
 - a. Contact 1st Call (Review Paramount's Grey book)
 - b. Prior to excavation – obtain Ground Disturbance Permit
 - i. If pipeline in area, arrange for Hydrovac and hand expose lines within 5 meters of excavation.
- Prior to commencing operations, the Wellsite Supervisor shall:
 - Read and record SIP(s). Examine surface casing vent for blow or suction, record and report findings. Check and monitor LEL and H₂S levels at wellhead and investigate for evidence of gas migration at surface.
- Before commencing operations, the Wellsite Supervisor in conjunction with the Rig Manager will conduct an initial rig inspection using a CAODC or equivalent inspection form. A detailed rig inspection is to be completed weekly thereafter. Confirmation of these inspections is to be recorded on both the morning report and tour report.
- Have on-site access to the AER Drilling/ Servicing Regulations - Directive 36, Workplace Health and Safety Regulations, NWT Oil and Gas Operations Act, NWT Drilling and Production Regulations, OROGO Well Suspension and Abandonment Guidelines.
- The Wellsite Supervisor and Rig Manager will conduct daily walk-around inspections and complete a daily rig inspection report in an effort to identify deficiencies regarding well control and safety related items.
- The Wellsite Supervisor must ensure that all pertinent data (tubulars, logs, tests etc.) are properly recorded on the tour sheets and that samples, where required are collected as required by well licence. Also, the Wellsite Supervisor must ensure that trip sheets are properly completed and maintained.
- During cold weather operations, the Wellsite Supervisor must ensure that Precautions are taken to prevent freezing of the bleed-off and kill lines
- The Wellsite Supervisor must ensure that all personnel are advised and instructed not to trespass off the demised property.
- Safety meetings are to be held every day with wellsite personnel and recorded on both the morning reports and tour reports. Pre-job safety/orientation meetings are to be held prior to commencing new or non-routine work at which time the Wellsite Supervisor shall advise all personnel of known hazards, special precautions and procedures. Hazard assessments must be conducted in accordance to Workplace Health and Safety Regulations and documented accordingly.
- BOP equipment will be function tested at least once daily and any equipment found defective should be made serviceable before operations are resumed. Blowout prevention drills are to be performed weekly and are to be recorded on both the morning reports and tour reports. **All appropriate Certifications for equipment used will be on-site and available for review.** Communicate this information with the contracted services.



- The Wellsite Supervisor will ensure that service companies supplying products and/or materials that require Material Safety Data Sheets review and advise wellsite personnel with the potential hazards associated and the appropriate emergency response to be undertaken when handling the same. As well, in compliance with WHMIS regulations, all MSDS are to be posted in a conspicuous and accessible place know to all personnel for their information and emergency reference. Site Specific Orientation to all personnel on-site must be given for all chemicals and materials used.
- The Wellsite Supervisor will ensure that dangerous goods shipped or received are classified, packaged, marked, labeled and documented in compliance with the Transportation of Dangerous Goods Regulations. If required, placards must be attached to vehicles transporting dangerous goods. All shipping documents must be forwarded to the Calgary office for filing.
- The Operator expects full compliance with all conditions detailed on the Land Use Permit and Water Permit, OA and ACW.
- During the absence of the Wellsite Supervisor, a qualified and competent alternate shall be designated, in writing, to carry out the principal Contractor's responsibilities. Written instructions must be posted in a conspicuous and accessible location known to all personnel prior to the Wellsite Supervisor leaving the location.
- All verbal notifications and approvals received on location from any regulatory agency must be documented and recorded on both morning reports and tour reports and should include a contact name from the agency, phone number and details of the subject matter.

Daily reports shall be prepared by the Wellsite Supervisor and e-mailed (faxed) to the Operator's Calgary office by 07:00Hrs. every morning.

- All field tickets and other supporting documentation submitted for materials purchased and/or services rendered require a correct AFE# and accurate identification of the well location along with the Wellsite Supervisor's signature indicating acceptance to the same.
- All rental equipment must be accounted for and returned promptly upon conclusion of operations. Rental Sheets must be utilized.
- All surplus material and/or equipment must be accounted for and either returned for credit or material transferred to the appropriate warehouse point accordingly. Disposition of scrap material must be documented.
- All Accidents or Incidents shall be reported immediately to the Calgary Office - Attention: Corey Thomson or Richard Bean Complete the Paramount Safe Incident Report and conduct the necessary Investigations immediately. Fax copy to Calgary within 6 hours of incident.
- Ensure that all garbage and debris has been removed from the location. and that any environmental concern has been addressed. Contact the Construction foreman with any concerns.
- Prepare a final wellbore diagram with all pertinent information recorded.
- Forward all paperwork including field logs and computer data files to the Calgary office including copies of all field logs. A paper and digital copy of all Paramount operation reports should be provided. All field tickets, Material Transfers, Incident Reports, well test reports, rig inspection reports and service reports shall be included with the operation report package.



Alternate Cut and Cap Operation

If available, a proprietary Hydrojet cut and cap system may be used to cut the casing(s) a minimum of 1 m below ground level and install a vented (non-sealing) cap on the casing stub below ground level once all downhole operations have been completed and tested as per the program.

In summary the steps are:

- Remove wellhead from the top of the well (down to surface casing bowl flange)
- Place the hydraulic pipe cutter inside the innermost casing
- Apply high-pressure water and abrasive to the cutting tip (typically 1-2m below grade).
- Rotate the cutting tip to sever the casing from the inside out.
(Typically it takes 20 minutes to an hour to complete the cut)
- Remove tool and pull the casing stub out of the ground.
- Compression fit vented cap to the below-ground casing strings.
(Welded options are available for jurisdictions where this is required)
- Backfill the hole (typically about the diameter of the surface casing drill bit)
- Install independent well signpost as per OROGO requirements (detailed above)



Safety Bulletin: Shallow Wellbore Plugs

INTRODUCTION

Some historical suspension operations used shallow wellbore plugs (plugs at approximately 50 mKB). These plugs must be milled out during well abandonment or reactivation programs. Milling out these plugs can pose significant safety risks because the operator cannot properly kill the well with a weighted fluid or assess actual pressures beneath the plug prior to downhole intervention.

The Office of the Regulator of Oil and Gas Operations (OROGO) regulates the safety of oil and gas operations by requiring operators to submit:

- Safety plans (for the Regulator's approval);
- Well-specific suspension and abandonment procedures (for the Regulator's approval);
- Investigation reports for any safety incidents or accidents; and
- Incident status reports.

This safety bulletin lists the factors and requirements operators must address for any wellbore plug that does not allow the wellbore to be safely killed by over balancing the plug, including a margin of safety, with weighted fluid and the drill string. These factors and requirements must be also be addressed in cases where such a wellbore plug is suspected, but not confirmed, to be present based on historical records.

BACKGROUND

During abandonment and suspension operations within OROGO's area of jurisdiction in the Northwest Territories, milling out of a shallow wellbore plug has caused loss of well control, jacking of the tubing string, uncontrolled releases of gas and a serious lost time injury that could have resulted in death.

AGGRAVATING FACTORS

- Unavailable or incomplete historical information on previous well interventions and monitoring;
- Inability to measure any real time potential pressures under the plug;
- Lack of adequate hazard identification, hazard assessment and control measures; and
- Use of unsecure pressurized hoses and equipment during milling operations.

REQUIREMENTS

As of April 23, 2021, all Well Approval applications submitted to OROGO for wellbore interventions must include the following information where any wellbore plug is identified or suspected, requires removal and cannot be over balanced with a combination of weighted fluid and weight on string.

- **Risk Assessment and Well Control:**
 - The operator must assume reservoir pressure is present below the plug.
 - If the combination of kill fluid density and weight-on-bit (drill string) does not overbalance the estimated reservoir pressure at the actual plug depth, a snubbing unit is required.
- **Engineering Controls:**
 - Snubbing units must be installed before starting milling operations for the removal of any applicable wellbore plug. The snubbing unit must remain in place until the plug has been removed and pressures equalized or the well bore sufficiently killed with weighted fluid.
- **Administrative/Elimination:**
 - Before milling out the wellbore plug, operators must conduct and record an on-site risk assessment and hazard analysis of the task. This should include, but not be limited to:
 - i. Identifying hazards and mitigations if pressure is found;
 - ii. Reviewing blow out preventer and evacuation procedures;
 - iii. Inspecting and securing the rig, hoses and other equipment that may encounter pressures from the wellbore;
 - iv. Identifying danger zones and ensuring only essential staff are present and safely positioned to avoid the identified potential hazards in the immediate work area during the milling operations; and

- v. Alerting the medic to be on standby and ensuring they are present for all steps above.

- **Reporting:**

- Operators must submit to OROGO at orogo@gov.nt.ca:
 - A record of the risk assessment and hazard analysis for the operation, as described above, no less than an hour before it begins; and
 - A summary of the operations related to the milling of the plug within an hour of its completion.
- Operators must report all incidents and near misses as soon as circumstances permit, as required under the [Oil and Gas Drilling and Production Regulations](#), to OROGO at 867-445-8551.

Notes:

1. The operator must still comply with any other applicable Act, Regulation or other regulatory requirement, including those of the NT/NU Workers Safety and Compensation Commission.
2. The operator must bring any conflict between this bulletin and its internal policies to the attention of OROGO in its application for a Well Approval. The conflict must be addressed to the satisfaction of the Chief Safety Officer before the Regulator issues the Well Approval.



Michael W. Martin
Chief Safety Officer
Office of the Regulator of Oil and Gas Operations
www.orogo.gov.nt.ca