



ELM
Environmental Liability Management

Routine Well Abandonment Program

Strategic Oil and Gas Ltd. C/O Alvarez & Marsal Canada
Inc.

STRATEGIC ET AL CAMERON C-16
300/C16 60-10N 117-30W

Elm Inc. Project Number: STRA050

Original Program: Ken Nikiforuk, Consultant for A&M
Developed by: Christopher Gagnon EIT
Reviewed by: Malcolm McKean P.Eng

December 20, 2022

ROUTINE ABANDONMENT PROGRAM

BACKGROUND (as currently approved):

- Suspended vertical well
- Well produced from Sulphur Point formation
- Suspended with a G packoff plug at 97 mKB, PX plug in the XN Nipple at 1397 mKB. WR plugs at 1409 mKB and 1417.5 mKB.

ABSTRACT (as currently approved):

- Move on and rig up service rig
- Move on slickline and recover the tubing plugs
- Pull out the tubing
- Abandon Sulphur Point with bridge plug and cement
- Move on wireline to run cement bond log
- Circulate well to fresh water
- Perforate and cement squeeze as required
- Cut and cap the well

UPDATED CONTACTS:

Elm Inc. Calgary Office

Elm Inc. Calgary Office		
Malcolm McKean P.Eng, Vice President Liability	██████████ – Cell	Malcolm@elminc.ca
Christopher Gagnon EIT, Operations Engineer	██████████ – Cell	Christopher@elminc.ca

Elm Inc. Field Staff

Elm Inc. Field Staff		
To be determined	To be determined	To be determined

Client Contact

Client Contact		
Duncan MacRae – Director, A&M	██████████ - Cell	dmacrae@alvarzeandmarsal.com

Regulator Contact

Regulator Contact		
OROGO - Office	867-767-9097	orogo@gov.nt.ca
OROGO - 24-hour emergency line	1-867-445-8551	
NWT Spill Line	1-867-920-8130	

December 20, 2022

DOCUMENTATION & REPORTING:

Daily operation reports are to be emailed prior to 7:00 am the next day following operations. They are to be sent to the ELM Inc office via ElmDownholeOffice@elminc.ca

Daily reports are to include a detailed description of the day's events along with all third party services that were utilized and their respective billing charges. These billing charges are to be added and represented by a daily operational cost. These total daily operational costs are to be reflected in a to-date accumulative cost. Along with the daily report the email must include a brief description of the work that was done that day, as well as a 24 hour forecast for the work to be done the following day.

Any incident or injury is to be reported immediately, after appropriate first- and/or medical-aid has been administered to the Elm Inc. office staff in Calgary. After the situation has been placed under control and all affected parties have been aided or corrected, an incident investigation is to take place and attempt to gather all necessary information via written witness statements and summarized in an incident investigation form. Elm Inc. Calgary office staff will then inform the appropriate client representatives of what has taken place.

After the abandonment has been completed, the well site supervisor is to provide the office staff in Calgary with all third-party purchase orders and field tickets/service reports, material transfers, waste manifests along with all appropriate field safety documents. This needs to be completed immediately following the job.

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 worker comply with regulations. All service companies supplying materials will review Safety Data Sheets at this meeting for all products supplied and maintain these Safety Data Sheets available for worker's examination on location in compliance with WHIMIS regulations. All Safety meetings will be recorded on the daily reports.

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.

All applicable regulations, including, but not limited to the NWT Office of the Regulator of Oil and Gas Operations (OROGO) and Occupational Health and Safety regulations, are to be strictly

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adhered to. Written instructions must be posted in the doghouse or other conspicuous area prior to the wellsite supervisor leaving the lease. Wellsite supervisor must designate, in writing, a competent person to carry out principal contractor's responsibilities. All verbal notifications and approvals from government regulatory agencies will be recorded on the daily report. The name of the individual contacted, and the subject matter of approval or notification should be recorded on the same.

REGULATORY:

OROGO regulations require that the Well Approval as signed by the regulator must be posted in a clearly visible location on the work site. The well approval, its additional terms, and this well abandonment program must be precisely followed.

ABANDONMENT PROGRAM:

Use the attached abandonment program with the following changes

Step 6 (p.3) Contact Calgary office with the results of the bubble test.

Step 19 (p. 4) Note there may be trapped pressure underneath the G-packoff plug. There is potential for retrieving tools and plug to slingshot up the wellbore when the plug is unseated. Perform a risk assessment and hazard analysis for removing this tubing plug (refer to OROGO safety bulletin OROGO-SSB-1). Document and submit the assessments to orogo@gov.nt.ca a minimum of one hour before starting the plug retrieval operation.

Step 27 (p. 4) Rig out and release slick line. Prepare a summary of the tubing plug operations and send by email to orogo@gov.nt.ca within one hour of completing the tubing plug removal.

Step 29 (p. 4): Pull and stand the 73mm tubing. Lay down any tubing that appears to be corroded or otherwise damaged. If necessary, move on a work string of good tubing.

Step 30 (p. 4) Pick up and RIH with 139.7 mm permanent bridge plug on 73.0 mm tubing. Position and land the BP at 1389 mKB. Refer to Computalog's Perforating Log dated March 20, 2005. Ensure the BP is not set within 5 meters of a casing collar. Collars located at 1354.1, 1367.7, 1381.1 and 1394.5 mKB.

Step 42 (p. 5) Perform cement bond log from PBTD to surface. Ensure data is transferred for evaluation communications allow. Evaluation results to be forwarded to Calgary Office and OROGO as soon as they are available.

Step 44 (p. 5) Correlate all perforating operations to the recently performed cement bond log. Pick up and RIH with 86 mm ERHSC perf guns loaded with 25-gram charges spaced

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at 17 spm and 60-degree phasing. Position and perforate 1.0 meters at a depth to be determined. POOH and inspect guns to ensure all shots fired.

Step 63 (p. 6) MIRU waterjet cut and cap crew. Cut and cap wellbore 1.5 meters below ground level as per vendor's procedure. Ensure pictures are taken.

FINAL REPORTING

1. Prepare a final downhole diagram showing the final well configuration
2. Ensure that all tickets and costs are recorded on the morning reports. If a vendor has not submitted their tickets, then put in an estimated cost.
3. Tickets are to be coded with the well name, AFE number, date, and field supervisor's signature. Ensure vendors electronically send all invoices to

ELM Inc.
#1000, 205 – 5th Avenue SW
Calgary AB T2P 2V7
AP@elminc.ca

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Elm Inc. Terms of Service:

1. The price estimate for this well is presented as a most probable cost based on similar repair operations and is to be used for AFE purposes only. This estimate is only as good as the information provided to Elm. Elm will co-ordinate and supervise the entire operation, pay all third party services and submit a final invoice based on actual costs incurred for equipment and services. Depending on the complexity of the abandonment, location and age of the well, Elm recommends adding 10-25% contingency to the estimates attached.
2. This estimate does not contain any lease clean up costs other than back filling around the wellhead after it has been cut off. If requested Elm's Reclamation Division will perform a site assessment that will be used to determine a cost estimate for surface reclamation. A preferential price to do the site assessment will be given if done in conjunction with the downhole abandonment.
3. Elm does not accept any liability for the well, lease, facility and or property it is working on. Elm acts as an independent consultant, providing mainly consulting and supervision services, with some specialized equipment included.
4. Elm will accept liability for the proper placement of bridge plugs and / or cement plugs that we set, however we do not accept liability for any unforeseen or unmentioned down hole problems. This would include failure of the casing to pressure test, collapsed casing, stuck pipe, tubing or rods, scale and or wax build up, surface casing vent flows, gas migration etc.
5. Elm does accept the responsibility of Prime Contractor for sites that have an agreement assigning the Prime Contractor Status.
6. The cost estimate included services and third party costs as listed, if other services are required they will be billed as per our cost schedule. The client will be informed of any costs to be incurred outside of this summary prior to the work being done. These services usually include: disposal costs, stuck and towing or cat work for access, rental and / or trucking of work strings, trucking of tubing, rods, and / or well heads, sour service, required safety equipment and extra charges associated working in hot or cold temperatures.

Elm's objective is to offer the safest and most efficient abandonment while saving the operator both time and money. We feel that by working with you on this project, we can achieve our goals and maintain the high level of professionalism that is reflected in the end product.

STRATEGIC OIL & GAS LTD. c/o ALVAREZ & MARSAL CANADA INC

STRATEGIC ET AL CAMERON

C-16 60-10N 117-30W

Wellbore Abandonment

June 28, 2021

CONTACTS:

Engineering:	Ken Nikiforuk	Cell	403 804-2510
Field Consultant:	To be determined	Cell	
Production Foreman:	To be determined	Cell	
Construction:	To be determined	Cell	
Facilities :	Kurt Hewitt	Cell	780 830-8303
Director, A&M:	Duncan MacRae	403 538-7514	Cell [REDACTED]

ATTACHMENTS:

OBJECTIVES:

To abandon the Sulphur Point and cut and cap the wellbore

SAFETY:

SOG Completions safety guidelines given in the "Employee Safety Manual", the "Contractor's HSE Pamphlet" and the "SOG Cameron Hills HSE Assurance plan" will be followed during all completion activities. Discuss the contents of the Contractor's HSE Pamphlet with the rig crew plus all service company personnel prior to the commencing work. Conduct a service rig safety inspection. Fill out the "Service Rig Safety Inspection" sheets; discuss and remedy all unsatisfactory comments and document when follow-up is completed on the daily reports. **Safety meetings are to be held with all on site personnel prior to each event. The wellsite supervisor must notify all personnel of potential hazards and ensure workers are aware of the responsibilities and duties in accordance with the SOG and OROGO regulations and that all workers comply with these regulations. A record of all safety meeting minutes and hazard assessments should be kept on site and submitted along with the daily reports to the Calgary Office at the end of the job. All service companies supplying materials will review Material Safety Data Sheets at the safety meetings and keep the MSDS papers posted on site.**

Contact the lead operator 48 hours prior to moving on to the lease. If this is an existing lease with production equipment, one of the operators should provide site-specific safety concerns and isolate the production equipment as required.

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UWI: 300C166010117300

OROGO Well ID: 2001

AFE: to be determined

WORKING INTEREST: 88%

ELEVATIONS: KB: 758.8 m
GL: 754.2 m

TD: 1454.0 mKB

TVD: 1454.0 mKB

PBTD: 1409.0 mKB (WR bridge plug)

DEVIATION: Vertical wellbore.

SURFACE CASING: 219.1 mm, 35.72 kg/m, J-55, ST&C. Landed @ 430.0 m KB. Cemented with 32.0 tonnes 0:1:0 'G' + 2.0% CaCl₂. 0.5 m³ of good cement returns to surface.

PRODUCTION CASING: 139.7 mm, 20.83 kg/m, J-55, ST&C. Landed at 1454.0 mKB. Cemented with 28.5 tonnes Thixlite + 1.0% SMS followed by 3.5 tonnes Expandomix LWL + 0.1% CFL-3 + 0.2% LTR + 0.2% SPC-II. 5 m³ good cement returns.

TUBULAR DATA:

	<u>Casing</u>	<u>Tubing</u>
Size (mm)	139.7	73.0
Weight (kg/m)	20.83	9.67
Grade	J-55	J-55
Connections	LT&C	EUE
Drift I.D. (mm)	127.30	59.61
Collapse (kPa)	21510	52950
Burst (kPa)	29440	50060
Capacity (m ³ /m)	0.012729	0.003019

PRODUCTION TUBING: see attached wellbore schematic dated March 26, 2005

PERFORATIONS:

Sulphur Point	1418.5 to 1420.0 mKB (suspended)
WR Plug	coe at 1417.5 mKB
Sulphur Point	1411.5 to 1416.0 mKB (suspended)
WR Plug	coe at 1409.0 mKB
Sulphur Point	1400.5 to 1405.0 mKB

H2S: 2.1% - from completion report dated March 21, 2005

RESERVOIR PRESSURE: unknown (assume 10,000 kPa)

MAX FLARE VOLUME: 2.7 e3m³ – 1.5 times hole volume at 10,000 kPa

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- 1 Contact the on shift Area Foreman – to be determined - 48 hours prior to moving rig to location.
- 2 Hold and record a safety and procedural meeting with all personnel on location. Review and confirm safety certificates of all workers. Job hazard analysis is to be performed on all critical tasks. Complete a site specific ERP form and review it at the safety meeting if required.
- 3 A sweep of the wellsite shall be performed to confirm the presence or absence of LEL and H2S.
- 4 MIRU service rig complete with pump, tank and Class III BOP's. Rig up all equipment to SOG and OROGO requirements. RU P-tank, safety services and an air trailer. Conduct a walk around lease inspection and hazard assessment. Ensure all necessary safety equipment is strategically positioned on site and tested to ensure proper operating condition prior to commencing the zonal abandonment operations. Document all controls initiated to mitigate identified hazards.
- 5 Read and record SITP and SICP.
- 6 Conduct a 10 minute bubble test on the surface casing vent using the procedure found in OROGO's Well Suspension and Abandonment Guidelines section 4B. Ensure that the wellhead and SCV piping is not in a frozen state. Check and monitor LEL and H2S levels at wellhead and investigate for evidence of gas migration at surface. Report the results on the daily report and the AER form "Surface Casing Vent Flow FAC-38". Ensure that the vent stays open and clear of obstructions throughout all operations and note any subsequent flows on the daily report. **Contact Ken Nikiforuk with the results of the bubble test.**
- 7 Tie in circulating lines with a return line tied into P-tank. Properly stake surface lines and pressure test lines and manifold to 1,400 kPa (low) and 14,000 kPa (high) and hold each for 10 minutes.
- 8 The reservoir is underpressured (less than 10 kPa/m) so fresh water will suffice to kill the well. Ensure there is at least 1.5 times hole volume on location prior to commencing kill operations.
- 9 Bleed off tubing to P-tank.
- 10 Pressure test the tubing to 7000 kPa for ten minutes.
- 11 Bleed off casing to P-tank.
- 12 Pressure test the casing to 7000 kPa for ten minutes.
- 13 Install the working spool and BOP's 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 1400 kPa and 21 MPa for 10 minutes each. Install a ported tubing pup and stabbing valve through the BOP's on the BOP test stump. Pressure test the pipe rams and stabbing valve to 1400 kPa and 21 MPa for 10 minutes each. Pressure test the annular preventer to low of 1400 kPa and high of 7000 kPa.
- 14 Conduct an accumulator function test as per the attached procedure from the WSBOP manual.

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- 15 Ensure the well is dead and remove wellhead top section.
- 16 Install a 73.0 mm landing pup with an open stabbing valve. Strip the BOP's 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 for 1400 kPa and 21 MPa for 10 minutes each.
- 17 BOP drills will be performed at the start of wellbore operations and then weekly if required and are to be recorded on the daily reports. BOP equipment will be function tested at least once daily and any equipment found defective will be made serviceable before operations are resumed.
- 18 MIRU slickline unit. Conduct a walk around lease inspection and hazard assessment. Ensure all necessary safety equipment is strategically positioned on site and tested to ensure proper operating condition prior to commencing the plug recovery operations. Document all controls initiated to mitigate identified hazards.
- 19 Note there may be trapped pressure underneath the G-packoff plug. There is a potential for the retrieving tools and plug to slingshot up the wellbore when the plug is unseated.
- 20 RIH with retrieving tool to the G-Packoff plug at 97 mKB.
- 21 Pressure up the tubing to 9000 kPa with fresh water.
- 22 Unset the G packoff and allow the wellbore to equalize.
- 23 Pull the G-packoff plug and retrieving tool into the lubricator.
- 24 Close the blind rams and bleed off to the P-tank.
- 25 T\Open blind rams and top up the tubing with fresh water.
- 26 RIH with retrieving tool and retrieve the PX plug from the XN nipple at 1397.0 mKB.
- 27 Rig out and release slickline.
- 28 Unset the packer (right hand release). Note tubing was landed with 4000 daN compression. Allow 15 minutes for the elements to relax.
- 29 Pull and stand the 73.0 mm tubing. Inspect the 73.0 mm tubing on the way out of the hole. Lay down any red, blue or green joints.
- 30 Pick up and RIH with 139.7 mm permanent bridge plug on 73.0 mm tubing. Position and land the BP at 1390 mKB. Refer to Computalog's Perforating Log dated March 20, 2005. Ensure the BP is not set within 2 meters of a casing collar. Collars located at 1354.1, 1367.7, 1381.1 and 1394.5 mKB.
- 31 Fill the tubing with fresh water and pressure up to 14,000 kPa to set the bridge plug.

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- 32 Fill the annulus with fresh water.
- 33 Pressure test the bridge plug to 7000 kPa for 15 minutes.
- 34 Rotate to release off of the setting tool.
- 35 Establish circulation with fresh water. An entire hole volume shall be used (17.7 m3).
- 36 Batch mix 0.5 m3 Class G cement slurry and pump down tubing to set as a balanced plug. See attached cementing procedure.
- 37 Displace with 4.14 m3 fresh water.
- 38 Slowly pull out and lay down two joints of tubing while rotating pipe.
- 39 Reverse circulate fresh water at least two tubing volumes or until returns are clean.
- 40 Pull and lay down tubing. Prior to pulling the last joint out of the hole, circulate over to fresh water.
- 41 MIRU electric line truck.
- 42 Perform cement bond log from PBTD to surface. Ensure data is transferred for evaluation communications allow. Evaluation results to be forwarded to Ken Nikiforuk and OROGO as soon as they are available.
- 43 Depending on the results of the cement bond log evaluation, the decision will be made to go forward with cut and cap operations (proceed to step 60) or to perform remedial cementing operations (proceed to step 44).
- 44 Correlate all perforating operations to the recently performed cement bond log. Pick up and RIH with 101.6 mm ERHSC perf guns loaded with 39 gram charges spaced at 17 spm and 60 degree phasing. Position and perforate 1.0 meters at a depth to be determined. POOH and inspect guns to ensure all shots fired.
- 45 Rig out electric line.
- 46 Pick up and RIH with 139.7 mm cement retainer on 73.0 mm tubing.
- 47 Set cement retainer at a depth to be determined.
- 48 Sting out of retainer and pressure test to 7000 kPa for fifteen minutes.
- 49 Sting back in to retainer and establish feed rate.
- 50 Based on the feed rate, the cement blend and volumes will be determined.

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- 51 Sting out of retainer.
- 52 MIRU cement pumper. Rig up all equipment to SOG and OROGO requirements. RU P-tank, safety services and an air trailer. Conduct a walk around lease inspection and hazard assessment. Document all controls initiated to mitigate identified hazards.
- 53 Establish circulation between tubing and casing.
- 54 Batch mix a to be determined volume of a to be determined cement blend.
- 55 Circulate a to be determined volume of cement down the tubing and sting back in to retainer.
- 56 Squeeze a to be determined volume of cement into the formation and sting out of retainer.
- 57 Slowly pull and lay down two joints of the 73.0 mm tubing while rotating and ensure 15 lineal meters of cement has been circulated on top of the cement retainer.
- 58 Reverse circulate fresh water at least two tubing volumes or until returns are clean.
- 59 Pull and lay down tubing. Prior to pulling the last joint out of the hole, circulate over to fresh water.
- 60 Ensure the well is dead and remove BOP's.
- 61 Install wellhead. Ensure that bull plugs and needle valves are installed where required and the wellhead valves have been chained and locked.
- 62 Rig out service rig. Ensure lease is clean and free of debris.
- 63 MIRU NuWave Industries and cut and cap wellbore as per attached procedure. Ensure pictures are taken.
- 64 Install abandoned well sign as per attached OROGO specifications.
- 65 Ensure lease is clean and free of debris.

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Upon completion of field work the Wellsite Supervisor shall complete the following:

- Prepare a complete set of downhole and wellhead diagrams showing all serial numbers, pressure ratings, sizes, setting depths, etc.
- A complete lease clean-up shall be conducted. All garbage shall be picked up from the lease, all surplus material shall be transferred to proper storage locations and all rental equipment shall be returned.
- Ensure a sign has been installed.
- Ensure that all field-generated PO.'s MT's etc. are filled out vendor's name and address, a brief description of the work performed and a rough estimate of the final expected costs involved.

MORNING REPORTS: All morning reports are to be e-mailed to the following:

Ken Nikiforuk at kanikiforuk@icloud.com
Kurt Hewitt at kurtw.hewitt@gmail.com
Duncan MacRae at dmacrae@alvarezandmarsal.com
OROGO at orogo@gov.nt.ca

FIELD TICKETS/INVOICES:

Field tickets are to be completed in detail with the **Well Location, AFE Number, Codes** and details of the service work. **Tickets are to be signed by the on site representative. These tickets and all invoices must be made out to Strategic Oil & Gas Ltd. c/o Alvarez & Marsal Canada INC**

Invoices are to be mailed to:

STRATEGIC OIL & GAS LTD. C/O ALVAREZ & MARSAL CANADA INC
#1110, 250 – 6th Avenue SW
Calgary, AB
T2P 3H7

ATTENTION: KEN NIKIFORUK

Prepared By: Ken Nikiforuk
Operations Consultant: _____ Date _____

Approved By: Duncan MacRae
Director, Alvarez & Marsal: _____ Date _____