

**Great Bear Petroleum Operating LLC
Alcor #1**

WELL SPECIFIC

Vertical Completion Program V4

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Objective of Operation

The goal of this procedure is to test the Shublik formation in the Alcor #1 well with the goal of establishing reservoir parameters in order to optimize a program of horizontal wells within the Shublik formation. Additional zones may be tested in the Alcor #1 with the same scope. The zone will be tested by pumping a diagnostic fracture injection test, and monitoring the fall-off data using electronic memory pressure gauges in a vertical pilot hole through the Shublik.

Health – Safety – Environmental – Quality

- HES' safety regulations are to be adhered to at all times by all personnel on location – no exceptions.
- Zero accidents.
- Zero environmental incidents.
- Perform daily safety meetings with crews and pre-job JSAs.
- Make daily HSEQ inspections.
- Minimum of four near misses to be documented per month of completion operations.
- Ensure that all vendors follow correct billing instructions.
- Ensure that all costs are captured in a timely manner.

General Information

Single Vertical 10,812 ft MD / 10,802 ft TVD [10,665 ft MD at Landing Collar]

Legals: T7N-R14E-Sec. 5, 2769 ft FSL, 549' FEL

Location: North Slope, AK

GL: 164 ft KB = 23 ft

Wellhead - WoodGroup 11", 10K X 7-1/16", 10K Tubing Head Adapter [7-1/16, 10K Frac Valves]

Completion Fluid – 9.8 ppg NaCl with 6.6 gpt Aldacide G

Tubulars

<u>Depth</u>	<u>Type</u>	<u>Specifications</u>	<u>Burst</u>	<u>Collapse</u>	<u>ID/Drift</u>
0-2,491'	Surface	9 ^{5/8"} , 40#, L-80, BTC	5,750 psi	3,090 psi	8.835"/8.679"
0-8,311'	Intermediate	7", 29#, P-110, BTC	11,220 psi	8,510 psi	6.184"/6.059"
7,983-10,753'	Prod. Liner	4 ^{1/2"} , 13.5#, P-110, Hydro 521	12,410 psi	10,690 psi	3.920"/3.795"

Vertical Completions Procedure

The well was left with an 11", 10K X 7-1/16", 10K adapter flange, with two 7-1/16", 10K frac valves on top. Isolating the top frac valve will be a 7-1/16", 10K night cap with a 1/2" NPT port with a 1/2" threaded 10K needle valve and 10K pressure gauge. The wellbore should be full of 9.8 ppg NaCl with 6.6 gpt Aldacide G additive. The described wellhead assembly was successfully tested to 8000 psi on 8.12.12.

- 1) MU flow line to 2 ^{1/16} flow tee below 7 1/16-in swab valve, 10K wing valves.
 - a) Install 2"-1502 to 2 ^{1/16}, 10K flange. Install 2" chicksans and 2" 1502 iron to surface where pressure can be applied to test the casing.
- 2) Ensure that 7-1/16", 10K swab valve is closed to isolate the Otis tree cap. Pressure test casing to 5600 psi with cement pump. Monitor and chart pressure for 30 minutes.
- 3) RIH with perforating guns (2-3/4" guns, 25 gram millennium charges, 15' of guns loaded at 2 spf and 60 degree phasing). Correlate at short joint (7509 ft) as well as gamma readings off of shooting gamma. Ensure the hole is full of 9.8 ppg NaCl, apply 500 psi surface pressure with cement pump. Perforation depth is 10,605 – 10,620 ft
 - a) Fire shots after depth correlation and observe wellhead pressure. If wellhead pressure is increasing then POOH with Eline, if wellhead pressure is decreasing then continue monitoring for 30 minutes. The maximum swell on the 3-3/8" guns is 3.605".
- 4) POOH with spent perf guns. Confirm charges shot at surface. Remove lubricator, ND 9-1/2" Otis tree cap, NU tapped 7-1/16", 5K night cap with 10K needle valve and 10K pressure gauge. RDMO Eline and crane.
- 5) Ensure 400 bbl upright has a minimum of 300 bbl 9.8 ppg NaCl with 6.6 gpt Aldacide G for DFIT (estimated volume = 150 bbls).
- 6) MIRU pumping equipment (HT 2000, RCM) to collect digital rate and pressure pumping data.
 - a) MU flowlines on flow tee below swab valve. Double check that swab valve is closed. Install 1502 wing half connection to 2-1/16", 10K flange. Install 2" chicksans and 2" 1502 iron to surface where the gauges will be installed.
 - b) Install EMR gauges as per acceptable G-function rig up guidelines shown in the attached DFIT proposal. Make-up and PT flowlines to 8,000 psi [Max Pressure for DFIT 5,700 psi].
 - c) Pump DFIT following attached DFIT pumping schedule. SD pumps, shut in valves downstream to gauges and monitor fall-off data for 1 hour.
 - d) Ensure vac truck is on location for fluid containment when breaking down lines.
- 7) Mobilize wellhead heater to prevent freezing as necessary.
- 8) RDMO pumping equipment.
- 9) MIRU flow back equipment to prepare for flow test.
- 10) Pull pressure fall-off data from gauges on a daily basis and email to Donald.kundert@halliburton.com, dylan.garrett@halliburton.com, and brian.ennis@halliburton.com. Service the gauges (replace batteries, memory cards) on a weekly basis until, at a minimum closure has occurred.
- 11) Once the DFIT has been confirmed complete then the gauges should be permanently pulled.

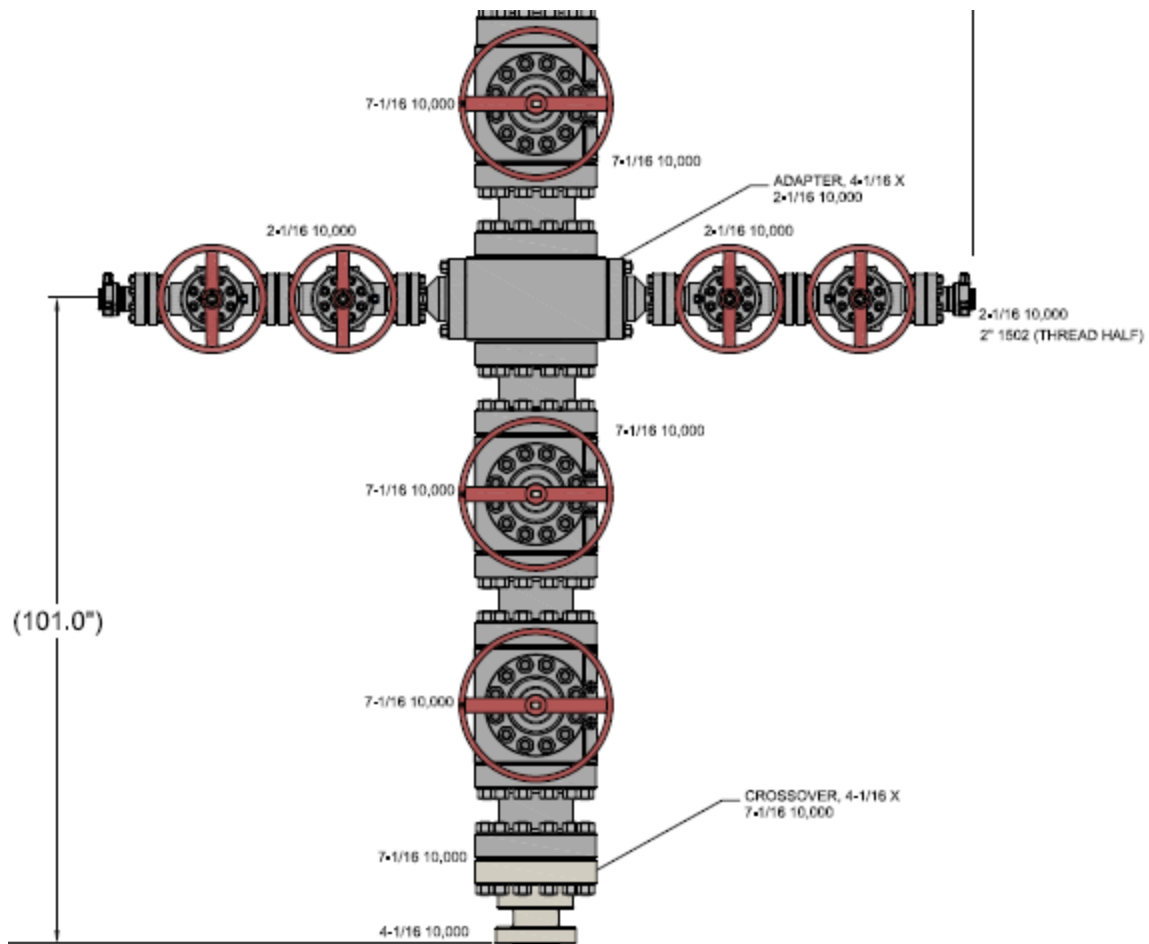
- 12) Flow back well at max 1 bpm / 60 bph / 1440 bpd. Adjust choke as necessary as keep rate constant. Continue to flow well as per further instructions.
 - a) Email daily production reports to dylan.garrett@halliburton.com. Reports should be sent out before or at 8AM MST.
 - b) Report the total load recovered along with fluid type.
 - c) Continue to flow well until **Brian Ennis** determines that enough formation fluid has been recovered. If the well dies before formation fluid is recovered at surface, follow the **Contingency Plan** Immediately.
- 13) MIRU Eline and Slickline to begin operations for HRZ DFIT.
- 14) RIH with 3.7" gauge ring (Eline lubricator drift = 4.89", 4.5" csg drift = 3.795") from surface to PBTD (10,665 ft MD at landing collar). Confirm depth and POOH.
- 15) RIH with Cast Iron Bridge Plug and set no more than 50 ft above the top Shublik perf, POOH. RIH with Slickline and dump bail 30 ft of cement above CIBP. POOH and RD Slickline. Allow 24 hrs to let the cement set.
- 16) MIRU coil tubing unit. RIH to CIBP, confirm depth. Roll hole with 9.8 NaCl to clear all formation fluid out of the hole. Continue pumping and POOH.
- 17) RDMO coil unit and flow back crews.
- 18) MIRU Eline. RIH with 3.7" gauge ring from surface to 100 ft below perf depth (9,250 ft MD) and POOH.
- 19) RIH with perforating guns (2-3/4" guns, 25 gram millennium charges, 15' of guns loaded at 2 spf and 60 degree phasing). Correlate at short joint (7509 ft) as well as gamma readings off of shooting gamma. Ensure the hole is full of 9.8 ppg NaCl, apply 500 psi surface pressure with cement pump. Perforation depth is 9,135 – 9,150 ft.
 - a) Fire shots after depth correlation and observe wellhead pressure. If wellhead pressure is increasing then POOH with Eline, if wellhead pressure is decreasing then continue monitoring for 30 minutes. The maximum swell on the 3-3/8" guns is 3.605".
- 20) POOH with spent perf guns. Confirm charges shot at surface. Remove lubricator, ND 9-1/2" Otis tree cap, NU tapped 7-1/16", 5K night cap with 10K needle valve and 10K pressure gauge. RDMO Eline and crane.
- 21) Ensure 400 bbl upright has a minimum of 300 bbl 9.8 ppg NaCl with 6.6 gpt Aldacide G for DFIT (estimated volume = 150 bbls).
- 22) MIRU pumping equipment (HT 2000, RCM) to collect digital rate and pressure pumping data.
 - a) MU flowlines on flow tee below swab valve. Double check that swab valve is closed. Install 1502 wing half to 2-1/16", 10K flange. Install 2" chucks and 2" 1502 iron to surface where the gauges will be installed.
 - b) Install EMR gauges as per acceptable G-function rig up guidelines shown in the attached DFIT proposal. Make-up and PT flowlines to 8,000 psi [Max Pressure for DFIT 5,700 psi].
 - c) Pump DFIT following attached DFIT pumping schedule. SD pumps, shut in valves downstream to gauges and monitor fall-off data for 1 hour.
 - d) Ensure vac truck is on location for fluid containment when breaking down lines.
- 23) Mobilize wellhead heater to prevent freezing as necessary.
- 24) RDMO pumping equipment.

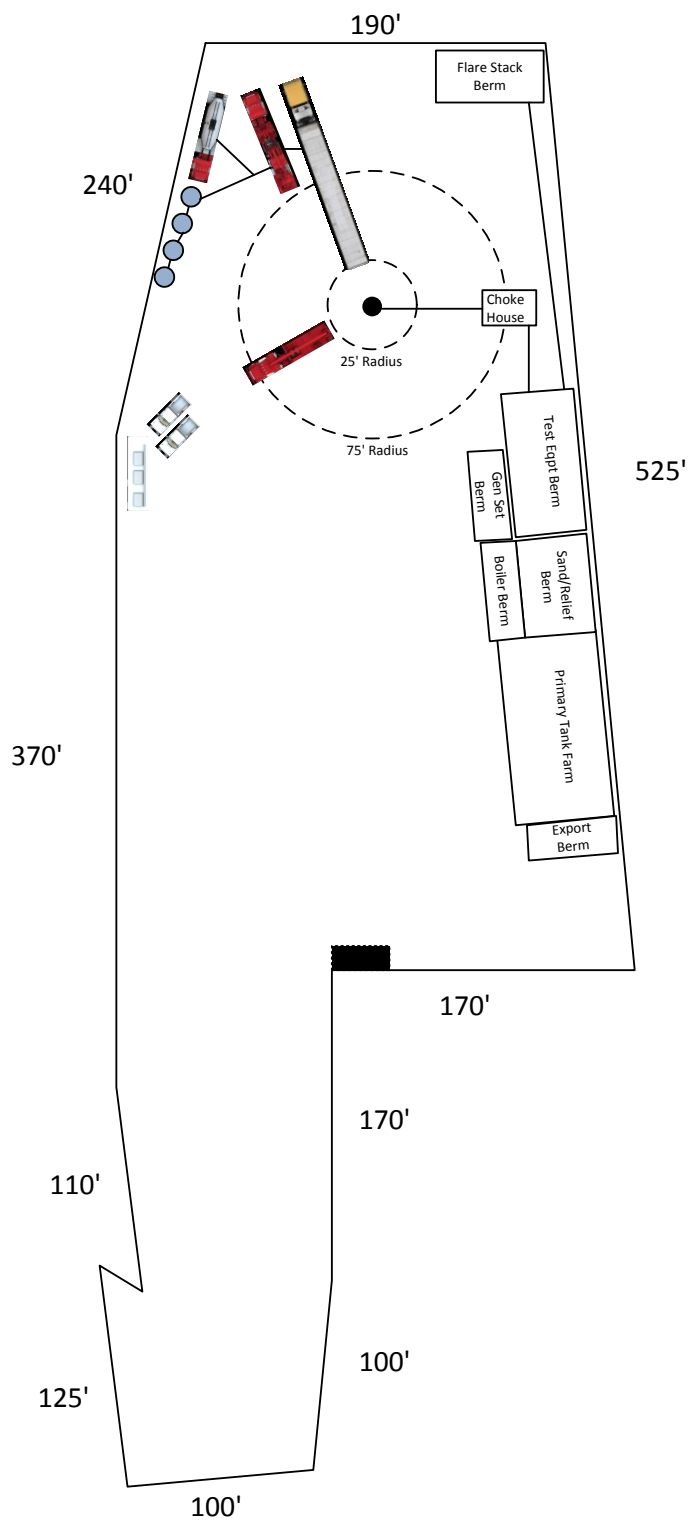
- 25) Pull pressure fall-off data from gauges on a daily basis and email to Donald.kundert@halliburton.com, dylan.garrett@halliburton.com, and brian.ennis@halliburton.com. Service the gauges (replace batteries, memory cards) on a weekly basis until, at a minimum closure has occurred.
- 26) Once the DFIT has been confirmed complete then the gauges should be permanently pulled.
- 27) RDMO and hand Alcor over to drilling operations.

Contingency Plan

The purpose of the contingency plan is to provide the steps forward should the well stop flowing prior to seeing formation fluid at surface. A coil unit will pump nitrogen to lighten the hydrostatic load. Once the amount of formation fluid specified by O&G is recovered, operations can continue as planned.

- 1) MIRU coil tubing unit with nitrogen.
- 2) RIH at 60 ft/min. While tripping into the hole, pump nitrogen at 300 scf/min. Monitor flowback while pumping.
- 3) Once the adequate amount of formation fluid is recovered, roll the hole with 9.8 ppg fluid.
- 4) RDMO coil and flowback crews.
- 5) MIRU Eline and RIH with 3.7" gauge ring (Eline lubricator drift = 4.89", 4.5" csg drift = 3.795") from surface to PBTD (10,665 ft MD at landing collar). Confirm depth and POOH.
- 6) RIH with Cast Iron Bridge Plug and set no more than 50 ft above the top Shublik perf, POOH. RIH with Slickline and dump bail 30 ft of cement above CIBP. POOH and RD Slickline. Allow 24 hrs to let the cement set.
- 7) RIH with 3.7" gauge ring from surface to 100 ft below perf depth (9,250 ft MD) and POOH.
- 8) Continue the procedure beginning with step 19.












Aclor #1 Completions Scenario

Drawn by: Dylan Garrett – Halliburton Project Management

Scale: 1" = 100'

	400 bbls Upright Tank
	Observation Trailer
	HT 2000 Pump Truck
	Transport Pickup
	Wireline
	Nitrogen
	Coil Tubing Unit