



Sahtu Land and Water Board

Staff Report

Division: Land and Water Program	Report No. 3
Date Prepared: January 15, 2019	File No. S13A-002 / S13L1-005
Meeting Date: January 23, 2019	

Subject: Husky Oil Operations - Slater River Abandonment Program

1. Purpose/Report Summary

To inform the Board about a Project update made by Husky Oil Operations Ltd. (Husky) to complete downhole well abandonment activities and decommissioning of groundwater wells in the winter of 2018/19. Husky submitted updated Project documents for the 2019 Slater River Abandonment Program to the SLWB on December 6, 2018. These submissions included:

- **Project Description Report** and associated **Maps and Drawings**;
- **Engagement Record** as required by S13X-003 condition 26(1)(q) 1;
- Updated **Waste Management Plan** as required by S13L1-005 Part D condition 2; S13A-002 condition 37; S13L1-006 Part D condition 3; S13X-003 condition 26(1)(l) 1; and
- **Closure and Reclamation Plan** as required by S13X-003 condition 26(1)(o) 3; and S13A-002 condition 65.

The updated Waste Management Plan and Closure and Reclamation Plan require Board approval.

2. Background

- **August 24, 2018** – The Board approved a two-year extension of Permit S13A-002 and two-year renewal of Licence S13L1-005 for the Slater River Drilling Program;
- **October 4, 2018** – The Board received an updated Emergency Response Plan applicable for Husky Oil Operations Ltd. Projects in the Northwest Territories;
- **December 4, 2018** – The Board approved a two-year extension of Permit S13X-003 and Licence S13L1-006 for Site-wide Services to support the drilling program;
- **December 6, 2018** – Husky submitted a [Project Description Report](#), [Engagement Record](#), [updated Waste Management Plan](#), and [Closure and Reclamation Plan](#) for the proposed well abandonment activities to be completed in winter 2018/19;
- **December 13, 2018** - Review packages were sent out electronically to members of the Tulita District Distribution List using the Online Review System with a request for comments by January 4, 2019;
- **January 4, 2019** – Reviewer comments received and deadline;
- **January 11, 2019** - Proponent response deadline and received;
- **January 23, 2019** - Presentation to the Board for decision.

3. Discussion

3.1 Project Overview

The Slater River Drilling Program authorized under Licence S13L1-005 and Permit S13A-002 is moving into decommissioning activities with the plan to complete downhole well abandonment of two vertical wells (Little Bear H-64 and Little Bear N-09) during the winter 2018/19. During the same time period, Husky will also decommission the 12 groundwater monitoring wells associated with Permit S12X-006.

For the abandonment program, no new lands or access will be required. All work will occur within existing land disturbances authorized under existing Permits and Licences. Water use will be less than previous programs and less than the volumes authorized under existing Water Licences. The two wells associated with S13A-002 and S13L1-005 (Little Bear N-09 and Little Bear H-64) are both currently suspended. Husky will be carrying out suspension and abandonment activities necessary to keep its N-09 and H-64 wells in compliance with the Well Suspension and Abandonment Guidelines and Interpretation Notes issued by the Government of Northwest Territories Office of the Regulator of Oil and Gas Operations (OROGO).

The service rig, associated equipment and materials will be mobilized to the site by winter road in January 2019. The N-09 well will be abandoned first, followed by H-64. The well abandonment activities will require 35 operating days with a contingency of up to 5 additional days. This operation will be conducted on a 24-hour basis. Work to abandon the wellbore is scheduled to commence on January 23, 2019 at the N-09 location and will then be transported to the H-64 location. The program is anticipated to be completed at the end of February 2019, at which time the rig and associated equipment will be demobilized from the program area south on the GNWT winter road.

Decommissioning of the groundwater monitoring wells in the Slater River program area will run concurrent with the hydrocarbon well abandonment operations. Husky has twelve groundwater monitoring wells including two bedrock water wells (MW-09 A and B); two shallow groundwater monitoring wells (MW-01A and MW-19B); and eight thermistor wells (MW-01T, MW-04T, MW-09T, MW-11T, MW-12T, MW-16T, MW-17T, MW-19T). The decommissioning operations will take approximately 20 operating days.

The Site Wide Services to support this abandonment and decommissioning activity are authorized under Licence S13L1-006 and Permit S13X-003. These services include staging, access road construction, logistics, security and camp operations. Construction activities and all water use related to the ice road access across the Mackenzie River, ice bridge construction, and establishment of the security staging area and base camp staging area have commenced on December 6, 2018 and are reported weekly in project update reports posted to the registry for S13X-003. There have been two inspections of the activities on December 18, 2018 and January 2, 2019 noting an outstanding job, immaculate site, with all permit conditions being followed.

The full scope of work for the abandonment program will include:

- Mobilizing equipment to the site using the Government of the Northwest Territories (GNWT) winter road;
- Mobilizing personnel via air to Norman Wells;

- Construction of existing winter access road from the intersection of the GNWT highway to the Mackenzie River;
- Construction of 1,400 metre (m) ice bridge across the Mackenzie River to Husky's existing staging area on the west side;
- Use of an all-weather road from the staging area to Quarry M;
- Construction of existing winter access road from Quarry M to N-09 and H-64 wellsites;
- Drawing water from approved and existing water sources licenced under WL S13L1-006;
- Construction of ice pads at existing well sites;
- Operation of a camp and facilities for up to 72 persons;
- Storage of equipment and fuel at the campsite;
- Use of winter airstrips for moving crews and equipment to and from the program area;
- Mobilization of a tank farm and abandonment fluids to the wellsites;
- Mobilization of a Class III service rig and auxiliary equipment to the wellsites;
- Move in and rig up three 400 barrel tanks, wellsite trailers, generators, boilers, pressurized test equipment, flare stack, fluid handling equipment, and light towers;
- Abandon Little Bear H-64 and Little Bear N-09;
- Management of waste including the trucking of produced fluids off site to an approved disposal facility;
- Cut and cap the wellbores;
- Abandon 12 groundwater wells (2 deep, 4 shallow, 6 thermistor);
- Demobilization of equipment; and,
- Reclaim the wellsites (continued through summer 2019).

Water Use

Water use for the project will primarily be required for construction (ice bridge, winter access roads, laydown, storage areas and well sites) and is permitted under existing Water Licence S13L1-006. The estimated volumes of water required for the 2018-19 winter program is as follows:

- Winter access construction – approximately 13,000m³;
- Wellsite ice pad – 2,500 m³ per pad for a total of 5,000m³;
- Base camp and portable wellsite trailers will use potable water from Norman Wells.

Minimal water use will be required for well abandonment. While water use is permitted under Water Licence S13L1-005, treated water will be brought in from Norman Wells. Estimations of well activity water requirements is listed below:

- Little Bear N-09 downhole abandonment – 200 m³
- Little Bear H-64 downhole abandonment – 200 m³
- Groundwater well decommissioning (MW-09 A & B) – 20 m³

Fuel Storage

Fuel storage and handling is permitted under LUP S13X-003 and WL S13L1-006. Husky plans to transport fuel for the program from Norman Wells on an as-needed basis, although a base level of on-site storage will be required to ensure an uninterrupted supply. During winter access and ice bridge construction, equipment will be refueled daily via fuel trucks from Norman Wells. Fuel types including diesel, gasoline and propane are required for access construction, camp operations and well abandonment operations. The bulk of the fuel associated with the program will be stored at the base campsite and mobilized, as required, to the wellsites.

Fuel storage at the base camp will include 1 x 90,000 litre (L) and 1 x 65,000 L tanks, both double walled and with secondary containment.

Fuel storage at the wellsite will consist of 1 x 47,500 L double-walled tank set up to supply the service rig and will be mobilized between sites during abandonment operations. The storage tank will be contained within a lined synthetic berm system of sufficient volume to contain 110% of the total tank volumes.

All large equipment will be fueled with diesel to simplify fuel handling. Propane may be used for heating and thawing and site office/accommodation trailer usage on the leases. Fuel transport and handling will be conducted according to the spill prevention and spill contingency plan. Fuel will not be stored within 100m of the high water mark of any water bodies.

Spill response equipment will be located throughout the program area including dedicated spill kits located near the fuel tanks. Additional spill response materials will be stored at the staging site and the wellsites. In addition, spill response equipment will be maintained on all fuel transfer vehicles. Drip pans will be placed under parked equipment and/or machinery containing non-biodegradable fluids and will also be used to capture minor spills and drips while fueling vehicles. The drip trays will be monitored for fluid levels and replaced as necessary.

All personnel will be made aware of the emergency response plan and the site-specific spill response plan. In the event that a spill occurs, it will be reported to the NT-NU 24-hour Spill Reporting Hotline at (867) 920-8130 or spills@gov.nt.ca. Husky's updated Emergency Response and Spill Contingency Plan applicable to all their NT operations was submitted to the SLWB on October 4, 2018.

Wildlife Monitors

Husky has awarded the contract for wildlife monitoring to the local Norman Wells Renewable Resources Council (NWRRC) and Tulita Renewable Resources Council (TRRC). Wildlife monitors are responsible for:

- Advising workers and supervisors on the location and proximity of dangerous wildlife and any precautions requiring to be implemented;
- Training all personnel in wildlife awareness;
- Issuing, maintaining and tracking wildlife deterrent kits;
- Possession of firearm on-site;
- Managing on site animal presence in a manner conducive to both personnel and wildlife;
- Advising supervisors and work groups on proper lease maintenance as it relates to wildlife management to ensure waste streams are managed properly and wildlife attractants are minimized.

Equipment Demobilization and Clean-up

Lease and access clean-up will take place once the rig and equipment has been moved out and will include:

- the removal of any remaining trash and debris;
- cleanup of any spills on site;
- removal of liners;

- installation of appropriate signage at well centre; and,
- reclamation in-place of the pad and access.

Upon completion of well abandonment, the service rig, associated equipment and remaining consumables will be demobilized south from the project area on the GNWT winter road.

In the event that the GNWT winter road closes before Husky is able to demobilize equipment, consumables and materials, they will be stored at Husky's base camp or staging site until barging season opens in 2019 following spring break-up. Aside from materials and equipment required for the winter 2018/19 program, Husky will be storing certain equipment and materials as required for ongoing maintenance of remaining work sites (all-weather road, base camp, and staging site).

3.2 Process Requirements

Project Update Documents Received: December 6, 2018

Project Update Documents Forwarded for Review: December 13, 2018

Number of Review Agencies: 38

Review Period End Date: January 4, 2019

Proponent Response to Reviewer Comments: January 11, 2019

Board Meeting: January 23, 2019

4. Comments

4.1 Community Consultation and Engagement

Husky began engagement for the proposed well abandonment program in January, 2018. A summary of engagement was submitted with the Permit and Licence renewal applications. Since Board approval of those applications, additional engagement with potentially affected parties and communities took place and the engagement record was updated until the end of November 2018. In November, Husky conducted in-person meetings with Norman Wells Land Corporation, Norman Wells Renewable Resources Council Board, Tulita Renewable Resources Council, Tulita Land Corporation, Tulita District Land Corporation, and Tulita Community to provide details of the final scope of work. An in-person meeting with Fort Norman Metis Land Corporation was not possible; however, Husky committed to be available to discuss any concerns. Husky also met with several local Dene and Metis vendor companies in Norman Wells and Tulita to arrange Husky's sponsored safety course training sessions. These training sessions included:

- Standard First Aid
- Workplace Hazardous Materials Information System (WHMIS)
- H₂S Alive
- Transportation of Dangerous Goods (TDG)
- Husky Procurement Bidders Workshops
- Husky Site Safety Orientation
- Job Shadowing

At the community meetings in November, concerns were raised about:

- the amount of extra traffic that would occur on the GNWT winter road, and associated safety issues;
- the movement of muskox over the ice bridge;

- the status of the all-weather road and Quarry M;

Husky responded that traffic for the well abandonment program would be 30% of what it was like during the drilling program, and that the length of the program is very short in duration. As for safety, Husky will financially support the GNWT road but cannot interfere with Department of Infrastructure contractors. With respect to muskox, Husky will ask all of its employees, contractors and wildlife monitors to be on the lookout for muskox for the duration of the winter program. Husky is planning to keep and maintain the all-weather road, Quarry M, the base camp and staging area as part of ongoing infrastructure to support potential future activity.

In addition, Husky met with GWNT-Lands (March), GNWT-ITI Petroleum Resources (March), Office of the Regulator of Oil and Gas Operations in the NWT (OROGO) (June) and the SLWB (face-to-face in March and ongoing email correspondence) to provide them with informational updates on previous and proposed projects.

There were no reviewer comments related to the Engagement Record. Staff have reviewed the updated Engagement Record and find that it is in accordance with the Board approved Engagement Plan.

4.2 Updated Waste Management Plan

Husky has prepared an updated Waste Management Plan (WMP) which details how waste generated will be safely managed. The management of abandonment program wastes, camp wastes, and hazardous materials are regulated and require implementation of these plans to handle waste in a compliant manner. The goal of waste management is to safely manage waste streams in temporary storage onsite, until waste can be treated onsite or shipped off-site and received at an approved waste management facility for end disposal.

The WMP covers:

- Waste types including characterization of waste and waste management methods;
- Incineration management and ash disposal;
- Sewage and domestic waste water;
- Hazardous waste;
- Non-hazardous and other waste streams;
- Contractor services in regard to onsite waste management; and
- Project emissions information.

Industrial Waste

Industrial waste for both wells is anticipated to consist of fluids and cement returns associated with downhole abandonment operations. All cement returns, dirty hole volume of water, and kill fluid will be collected and disposed of at an approved third-part disposal facility in Alberta via the GNWT winter road.

Incineration

Incineration is another means of reducing the mass and volume of waste, including paper products, domestic rubbish, and kitchen wastes. Burning these waste streams is important to reduce the impact to local wildlife and will eliminate scavenging around the camp. The Slater River project will utilize forced-air fuel fired incinerators to incinerate all combustible garbage and debris generated

by the project. Incineration at the Husky camp is managed under existing LUP S13X-003 and WL S13L1-006. GNWT-ENR requested Husky to clarify how often ash will be sampled to ensure it is not hazardous. Husky will sample the ash once for classification prior to each disposal to ensure that it is directed to the appropriate disposal facility. ENR also requested Husky to clarify the number of incinerators to be used (two, stationed at the main base camp).

Flaring

Downhole abandonment of the Little Bear H-64 and N-09 wells will likely require flaring of gas. Flaring will be required to bleed off any trapped pressure in the wellbore. As the operations being conducted are wellbore abandonments, Husky does not foresee significant volumes of gas having to be sent to the flare. All gas flared from the wells will be sweet gas however; Husky intends to take all necessary precautions and will utilize an H₂S monitoring system.

Sewage and Domestic Wastewater

The only discharge stream that will be released into the natural environment will be waste water treated effluent. Treated liquid effluent is sampled prior to discharge to the environment to ensure that the effluent meets discharge criteria outlined in WL S13L1-006. In their review of the Plan, GNWT-ENR recommended that Husky maximize the distance between any discharge of effluent to land and the nearest surrounding watercourse, which Husky has agreed with.

Solid waste (sludge) is separated from liquid waste, stored in secure, covered containers, which are then transported by vacuum truck via barge and / or road transportation via the GNWT winter road, to designated receiving facilities.

Board staff reviewed the updated Waste Management Plan with consideration of the basic requirements of MVLWB *Guidelines for Developing a Waste Management Plan* (2011) and have the opinion the Plan conforms with the intent of the Guidelines. There were several reviewer comments submitted regarding the Waste Management Plan, described above, which were adequately addressed by the Proponent.

4.3 Closure and Reclamation Plan

Husky has developed an Interim Closure and Reclamation Plan for the Slater River project that covers activities under LUPs S13X-003 and LUP S13A-002. The plan has been developed in accordance with the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* (2013). The project is working towards the Closure Goal: *To return the [project] site and affected areas to viable, and wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities.* Husky plans to carry out its closure and reclamation activities guided by the Board's four closure principles of Physical Stability, Chemical Stability, No Long-Term Active Care, and Future Use. As the project progresses through further monitoring, inspections, and seasonal changes, team members are expected to revise and further develop this plan. As such this document should be considered an interim Closure and Reclamation Plan.

A Final Closure and Reclamation Plan would detail all activities to be undertaken to permanently close the site and may include post-closure monitoring and potential contingency actions. Permanent closure is defined as the final closure of a site with no foreseeable intent by the existing proponent to return to either active exploration or to proceed to mining. Given that Husky is

seeking a Significant Discovery License, components of the Slater River Project are expected to remain open in perpetuity. Consequently, the Closure and Reclamation plan will not include permanent closure activities in this version of the plan. Activities will focus on progressive reclamation and care and maintenance. This latter term is applied to activities that maintain project components in an operable state for the life of the program so that they will be ready for use if future exploration work is resumed. These activities can include stabilization measures and ongoing monitoring.

In the document, “Project components”, or “components,” refers to access roads, bridges, culverts, storage pads, camp pads, quarries, and wellsites related to the Slater River Project. Husky’s activities for this plan fall into four categories as outlined below:

Well Abandonment: Well or part of a well is permanently plugged. Requires both downhole and surface abandonment and is implemented within six years of well suspension.

Stabilization: Implementation of erosion and sediment control measures such as straw wattles and matting, drainage control ditches and settling ponds, rip-rap, armoring, and re-vegetation as required. Infrastructure will remain in use where needed. Stabilization measures will be implemented as part of care and maintenance and reclamation activities which is detailed for each project component in Section 4.0 of the document.

Care and Maintenance: Keeping infrastructure/project components in an operable state for the life of the program as they may be required for future exploration work. Requires ongoing monitoring and maintenance as required and can include installation or repair of rip-rap as well as re-grading or contouring of roads or pad areas.

Reclamation: Return of the previously-used work areas to a natural state or equivalent land use. Implemented when site and/or project components are no longer needed. Reclaimed areas are anticipated to be inspected over the next 3 to 5 years to ensure stability and vegetative growth is satisfactory.

Initial closure and reclamation activities will commence on selected sites from January to September 2019. Between January and March 2019, Husky will execute downhole abandonment of two hydrocarbon exploration wells, two deep-water wells, two shallow-water wells, and eight thermistor wells. Project components will undergo either progressive reclamation or ongoing care and maintenance. Progressive reclamation is anticipated to be a 3 to 5 year process while care and maintenance will be continued over the life of the Slater River Project. Details for each component are outlined in sub-sections 4.4.1 to 4.4.11 of the Plan. A full as-built survey of the project components will be completed in the Summer of 2019 to gather a full representation of the closure and reclamation work Husky has undertaken within the licenced area.

The project components and reclamation activities include:

- Winter Access – stabilization and care and maintenance
- All-weather Staging Area - stabilization and care and maintenance
- All-weather Access – stabilization and care and maintenance
- All-weather Base Camp - stabilization and care and maintenance
- Airstrip, Access and O-41 Well Pad - stabilization and care and maintenance

- Quarry B – reclamation
- Quarry M - stabilization and care and maintenance
- N-09 Wellsite – reclamation
- H-64 Wellsite – reclamation
- Water Wells – reclamation
- Thermistor Wells – reclamation

Progressive Reclamation takes place prior to permanent closure to reclaim components and/or to decommission facilities that no longer serve the project. Project components proposed to undergo progressive reclamation include the surfaces of the wellsites, O-41 storage area, Airstrip, and Quarry B. Progressive reclamation activities to-date have consisted of natural revegetation and component-specific activities. Annual inspection reports are available on the Sahtu Land and Water Board Public Registry and detail progressive reclamation activities to date. Husky will continue to submit updates of their progressive reclamation efforts.

The Closure and Reclamation Plan includes schedules for all well abandonment work to be completed, as well as schedules for care and maintenance and reclamation activities. GNWT-ENR recommended that Husky ensure the monitoring timeline that is projected in the Closure and Reclamation Plan is in accordance with the conditions of Water Licences as well as the Land Use Permits. ENR also recommended Husky include component specific long-term schedules in the Closure and Reclamation Plan to ensure successful completion of progressive reclamation. Husky agreed with these recommendations.

Husky's planned expenditure to be incurred from December 2018 to December 2019 is \$17,339,806.00. Estimates for future inspections and care and maintenance (required through the lifetime of the project) are anticipated to break down as follows:

- \$125,000 - \$150,000 per year for semi-annual site inspections and reporting activities;
- \$300,000 - \$450,000 every 3 to 5 years for care and maintenance requiring heavy equipment. Equipment would need to be barged in and out through the summer months.

Board staff reviewed the Interim Closure and Reclamation Plan with consideration of the basic requirements of MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* (2013) and have the opinion the Plan conforms with the intent of the Guidelines. There were several reviewer comments submitted regarding the Closure and Reclamation Plan, described above, which were adequately addressed by the Proponent. Board staff recommend that an updated Closure and Reclamation Plan be submitted in one year that includes:

- component specific long-term schedules to ensure successful completion of progressive reclamation; and
- any other changes or updates based on work completed.

5. Other Agency Comments

The project update documents were circulated to 38 organizations of the Tulita Region Distribution List requesting a reply by January 4, 2019. Three written responses were received. The following organizations offered comments on the project update reports (see Review Comment Summary Table and attached letter - Attachment 1). A summary of comments are provided below:

- **Environment and Climate Change Canada (ECCC)**- recommended that the Proponent include relevant information regarding species at risk and migratory birds, nests and eggs within the project area, including mitigation strategies available to minimize potential impacts to sensitive species. Husky responded that the potential impacts to environment and wildlife were previously assessed and can be found in the Environmental Protection Plans (EPPs) prepared for LUP S13A-002 and S13X-003. Mitigation measures that address potential threats to species at risk or migratory birds in the project area are described in these EPPs and that these will be adhered to throughout project activities. **ECCC** also recommended that the Proponent establish erosion control measures for all water discharge locations in order to prevent sediment from erosion from entering a fish bearing water body. Husky has an approved erosion and sediment control plan as part of the Environmental Protection Plan previously submitted. Husky has also been working closely with the SLWB and GNWT Lands and Water Inspectors to ensure measures have been implemented on the Slater River program.
- **GNWT-Environment and Natural Resources (ENR)**- made some comments and recommendations on the Waste Management Plan and the Closure and Reclamation Plan which were discussed above in sections 4.2 and 4.3.
- **Sahtu Renewable Resources Board (SRRB)**- recommended that a Final Closure and Reclamation Plan needs to be approved before any work commences. Husky replied that this is an interim plan because as they progress reclamation on specific project components, the Plan may have to be modified depending on how well certain strategies work; all of which will be under the direction and approval of the Inspector and the Board. Board staff agree that the Board can approve an Interim Closure and Reclamation Plan and request revisions on an annual basis to reflect changes or updates.

6. Conclusion

The scope of activities in Permit S13A-002 and Licence S13L1-005 allow for the well abandonment activities proposed for winter 2018/19 at the Slater River Drilling Program site. The Site-wide Services to support this activity are also authorized under Permit S13X-003 and Licence S13L1-006. Husky has submitted an updated Project Description Report that documents all of the proposed activities to be completed. The SRRB noted that “Husky engaged with community and regional organisations in Tuli’t’a and Norman Wells several times in 2018 to discuss the Plan and other issues. Husky responses to questions were acceptable and reasonable”. Husky submitted an updated Waste Management Plan and an Interim Closure and Reclamation Plan. These Plans are complete and thorough and meet the requirements of applicable Board Guideline Documents. Inspections of the operations to date have been positive with no concerns raised. Husky will have wildlife monitors on site throughout the operation to ensure no impacts to wildlife. Husky will continue to monitor the site and follow through with reclamation activities and submission of annual reports and summer site inspection reports as per their Permit and Licence conditions and in accordance with their Interim Closure and Reclamation Plan.

7. Recommendation

Board staff recommend that the Board:

- a) Approve the updated **Waste Management Plan**;
- b) Approve the **Interim Closure and Reclamation Plan** with the direction that the Plan be revised and further developed in one year to include component specific long-term schedules and other changes based on monitoring, inspections, and seasonal changes.
- e) Approve the draft Decision Letter.

8. Reference Material Attached

- 7.1 Review Comment Summary Table and attached letters
- 7.2 Draft Decision Letter

Respectfully submitted,



Bonnie Bergsma
Regulatory Specialist

Executive Director Comments:



Paul Dixon
Executive Director