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November 20, 2003

Your file - Votre référence

File: S03A-007/S03L1-015
Our file - Notre référence
File: 900-SLWB-Apache Canada-
Lac Maunoir Drilling Program
C-34/L-80

Ms. Edna Tobac
Land Technician
Sahtu Land and Water Board
P.O. Box 1
Fort Good Hope, NT
X0E 0H0
Fax: (867) 598-2325

Re: Land Use Permit Application - S03A-007, Water Licence Application - S03L1-015. Apache Canada Limited. Proposed Lac Maunoir Drilling Program

Dear Ms. Tobac,

The Water Resources Division has reviewed the aforementioned Land Use Permit and Water Licence Application. We offer the following comments:

- Apache should ensure that all stream crossings are constructed using clean ice and snow and be removed prior to spring break-up.
- Apache is proposing the use of 11 waterbodies in this project. Water is required for access construction, lease construction, and daily operations. Apache should follow all Department of Fisheries and Oceans protocols for water withdrawal.
- Apache is proposing to dispose of their camp wastes (sewage) in a sump. Will any treatment be applied to this sewage prior to entering the sump? Modern wastewater treatment systems are capable of treating sewage and producing effluent that is acceptable for discharge to the environment.
- Apache states that the C-34 lease will not involve the clearing of vegetation and that an ice pad will be constructed. This method of construction should only result in minimal disturbance to the site. However, the construction of the L-80 lease will involve the stripping of topsoil and clearing of vegetation at the site. What are the reasons for Apache not constructing the L-80 lease in a similar fashion as the C-34 lease?

Canada

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- The C-34 lease is situated on a hill and there is a 10-15% slope away from the well centre. Apache must ensure that spill containment measures are in place to prevent the migration of spills which may occur at the wellsite. Containment berms should be constructed to on the downgradient side of the lease to contain spills should an unanticipated release occur.
- Apache is proposing to drill two wells, C-34 and L-80. These wells are within 15 km of each other. At the C-34 lease, a remote sump is proposed whereas at the L-80 lease a sump adjacent to the wellsite is proposed. To ensure the least amount of disturbance occurs to the environment, one sump should be used to contain the drilling waste for both wells.
- It states within the project description that the drilling waste will be analysed upon completion of the well and will be mixed, buried and covered if it meets the requirements of the Alberta Energy and Utility Board's G-50 Drilling Waste Management Guidelines. The sump will be covered with sufficient material to allow for settling. Apache is required to meet all Sahtu Land and Water Board Guidelines and licence requirements for characterization of the drilling waste prior to closure. In addition, if settling does occur, Apache should be required to perform mitigative work as necessary to ensure the stability of the sump.
- What is Apache's plan to monitor the sump post-closure? Water Resources Division suggests that, at a minimum, Apache be required to install thermistors to monitor the temperature of the sump to ensure that freezeback of the drilling waste has occurred. Electromagnetic induction surveys of the sump area are also useful to monitor for the migration of waste. Monitoring should be performed for a length of time as deemed appropriate by the Sahtu Land and Water Board.
- In the Emergency Response Plan, Section 8.2 describes the roles and responsibilities of the various government agencies that may be involved if a spill occurs during the project. Indian and Northern Affairs Canada is not listed, however, for spills in the Sahtu Region, this agency may be the lead for spills associated with this project. INAC would be required to investigate should a serious spill occur, and for all spills INAC could provide technical advice to the proponent and identify areas of risk that might be affected by a spill.
- In the Emergency Response Plan, Apache states that any oil spill (not otherwise reportable) which is greater than 0.15 m³ (1 barrel) in size must be reported. This is incorrect. Reporting requirements vary and are dependent upon the lead agency for the spill. All spills of oil are immediately reportable to the NWT/Nunavut 24 hour spill line (867) 920-8130 unless the proponent falls under a spill reporting protocol specific to a lead agency/agencies. If this is the case, then the proponent may report spills as per that specific protocol.

- Using the RECLAIM Model for Oil and Gas developments, I have estimated that the total cost for the abandonment and restoration of the project site and associated facilities to be approximately \$550,000.00. I have attached the estimate for your review and consideration. Recently, similar projects in the Inuvialuit Settlement Region have been requested security deposits in that range by the Northwest Territories Water Board.

If you have any questions, feel free to contact Mr. Robert Jenkins at (867) 669-2574 or myself at (867) 669-2650.

Sincerely,



David Milburn
Manager
Water Resources Division
Indian and Northern Affairs Canada

cc. Meighan Wilson
Shannon Pagotto

RECLAIM ESTIMATE - Apache Canada Ltd. S03L1-015/S03A-007**Drill Site Area**

grout top 200 m of hole, cement - 100 m³ (2 wells)

grout top 200 m of hole, labour - 120 hours (4 people, three - ten hour days)

decant water from sump - 2700 m³ (sump dimensions are 30m x 30m and 30m x 60m, assume 1m deep water)

place geotextile over cuttings - 2700 m² (sump dimensions are 30m x 30m and 30m x 60m)

doze soil over cuttings - 13500 m³ (estimate - sump dimensions are 30m x 30m and 30m x 60m, assume 5m depth)

sampling of drilling muds - 4 sampling periods (2 per sump)

remove refuse and waste, bury in sump - 200 m³ (estimate - 100 m³ per wellsite)

collect and ship hazardous waste - 1 event

remove fuel tanks - 152 km (2 tanks, to be removed 76km each - to closest community - Colville Lake)

excavate and treat contaminated soil - 200 m³ (estimate - 100 m³ per wellsite)

contour drill pad and perimeter - 14400 m³ (one drill pad is an ice pad, the other drill pad is 120m x 120m and estimate 1m depth)

re-establish drainage patterns - 1000 m³ (estimate - 1000m³ per wellsite involving the clearing of vegetation)

spread organic soil from stockpile - 1000m³ (estimate)

vegetate drill pad area - 1.44 ha (as per project description)

visual site inspection - 1 event

remove steel buildings (salvage) - 400 m² (estimate - 200 m² per wellsite)

Camp Area

remove refuse and waste, bury in landfill/sump - 200 m³ (estimate - 100m³ per camp)

excavate and treat contaminated soil - 200 m³ (estimate - 100 m³ per camp)

contour camp area and perimeter - 0 m³ (minor clearing of vegetation only, no stripping of topsoil)

re-establish drainage patterns - 1000 m³ (estimate - no clearing anticipated but drainage patterns may still need to be reestablished)

vegetate camp area - 0 ha (minimal clearing only)

doze soil over camp sump - 2400 m³ (estimate - assume both camp sumps are 20m x 20m x 3m deep)

remove steel buildings (salvage) - 400m² (estimate - 200 m² per camp)

winter road - 76km (as per project description)

access by air - 2 events

access by road - mobilize 20 workers

demobilize equipment - 20 pieces @ 76 km each

accommodation - one month for 20 workers

engineering/project management - 3%

contingency - 10%

Cost Codes Used

g - grouting

gst - geotextile, filter cloth

ds - doze overburden/soil piles

ws - water sampling

sb2 - excavate, load, long haul, up to 1500m, dump

mhr - mobilize heavy equipment, road access

csr - contaminated soils, remediate on site

sb1 - excavate, load, short haul (<500m), dump

sb4 - excavate, load, long haul (up to 1500m), dump, spread and compact

vhf - vegetation, hydroseed, flat

vi - visual site inspection

brs2 - buildings, remove and salvage steel

wr - winter road

mm< - mobilize workers (20 workers or less)

accm - one month accommodation (worker)

Oil Gas Reclaim Project: Apache S03L1-015

11/21/2003

1 Oil & Gas Reclamation Site 1 Activity # 1

DATE

| ACTIVITY/MATERIAL | UNITS | QUANTITY | COST CODE | UNIT COST | COST |
|--|-----------|----------|-----------|-----------|-----------|
| DRILL SITE AREA | | | | | |
| grout top 200 m of hole, cement | m3 | 100 | gl | 180 | \$18,000 |
| grout top 200 m of hole, labour | hrs | 120 | #N/A | 35 | \$4,200 |
| decant water from sump | m3 | 2700 | #N/A | 1 | \$1,000 |
| place geotextile over cuttings | m2 | 2700 | gsth | 1.8 | \$4,860 |
| doze soil over cuttings | m3 | 13500 | dsh | 2.83 | \$38,205 |
| Sampling of Drilling muds | | 4 | wsh | 8000 | \$32,000 |
| remove refuse & waste, bury in sump | m3 | 200 | sb2l | 3.61 | \$722 |
| collect & ship hazardous waste | allowance | 1 | #N/A | 5000 | \$5,000 |
| remove fuel tanks | km | 152 | mherl | 2.55 | \$388 |
| excavate and treat contaminated soil | m3 | 200 | csrh | 110 | \$22,000 |
| contour drill pad and perimeter | m3 | 14400 | sb1l | 2.91 | \$41,904 |
| re-establish drainage patterns | m3 | 1000 | sb1l | 2.91 | \$2,910 |
| rip rap in drainage channels | m3 | | #N/A | 0 | \$0 |
| spread organic soil from stockpile | m3 | 1000 | sb4h | 8.14 | \$8,140 |
| vegetate drill pad area | ha | 1.44 | vhfh | 4500 | \$6,480 |
| visual site inspection | | 1 | vil | 3200 | \$3,200 |
| Remove Steel Buildings (Salvage) | m2 | 400 | brs2h | 75 | \$30,000 |
| other | | | #N/A | 0 | \$0 |
| remove wooden buildings | m2 | | #N/A | 0 | \$0 |
| access road, scarify and remove culverts | m2 | | #N/A | 0 | \$0 |
| remove gas plant equipment | each | | #N/A | 0 | \$0 |
| remove steel buildings | m2 | | #N/A | 0 | \$0 |
| CAMP AREA | | | | | |
| remove refuse & waste, bury in landfill/sump | m3 | 200 | sb2h | 5.43 | \$1,086 |
| collect & ship hazardous waste | allowance | | #N/A | | \$0 |
| remove fuel tanks | m2 | | #N/A | 0 | \$0 |
| excavate and treat contaminated soil | m3 | 200 | sb4h | 8.14 | \$1,628 |
| contour camp area and perimeter | m3 | 0 | sb1l | 2.91 | \$0 |
| re-establish drainage patterns | m3 | 1000 | sb1l | 2.91 | \$2,910 |
| rip rap in drainage channels | m3 | | #N/A | 0 | \$0 |
| spread organic soil from stockpile | m3 | | #N/A | 0 | \$0 |
| vegetate camp area | m2 | 0 | vhfh | 4500 | \$0 |
| doze soil over camp sump | | 2400 | dsh | 2.83 | \$6,792 |
| Remove Steel Buildings (Salvage) | | 400 | brs2h | 75 | \$30,000 |
| winter road | km | 76 | wrh | 2400 | \$182,400 |
| MOB/DEMOB/ACCESS | | | | | |
| access by air | each | 2 | #N/A | 5000 | \$10,000 |
| access by road | km | 20 | mm<l | 175 | \$3,500 |
| mobilize/demobilize equipment | km | 1520 | mherl | 2.55 | \$3,876 |
| mobilize/demobilize equipment | km | 20 | accmh | 1800 | \$36,000 |
| mobilize/demobilize equipment | km | | #N/A | 0 | \$0 |
| mobilize misc. supplies | each | | #N/A | 0 | \$0 |
| other | | | #N/A | 0 | \$0 |

1 Oil & Gas Reclamation Site 1 Activity # 1

DATE

| ACTIVITY/MATERIAL | UNITS | QUANTITY | COST CODE | UNIT COST | COST |
|-------------------|--------------------------------|----------|-----------|-----------|-----------|
| other | | | #N/A | 0 | \$0 |
| other | | | #N/A | 0 | \$0 |
| SUB-TOTAL | | | | | \$497,201 |
| | Engineering/Project Management | | 3.00% | | \$14,916 |
| | Contingency | | 10.00% | | \$49,720 |
| TOTAL | | | | | \$561,837 |

COMMENTS:

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