

CEAA SCREENING FORM - LEVEL I
Department of Indian Affairs and Northern Development

1. Public Registry Required Information

FEAI I.D. Reference Number: *

A number assigned by the Agency; to be inserted here upon receipt of number from Agency

Subject Descriptors: oil and gas; inland waters

Alias Project Title: Anderson Tuk 2 Winter 2001-02 drilling program

Lead DIAND RA and Screening Division: Water Resources

Lead RA Contact: Greg Cook (screener for Water Board) 867-669-2656

Lead RA Trigger Types: CEAA law list; Inuvialuit Final Agreement

Other RA Trigger Types: IFA; NEB drilling approvals; ILA land use permit

EA Start Date: 2001/07/24

EA Type: screening

Physical Activity as identified from Inclusion List: water use; oil and gas activity ref. 5-1b o
Oil and Gas Operations Act

Physical Work Being Assessed: drilling program with camp, access road

Phase of Project / Primary Undertaking: construction and operation (exploration)

Multiple Activities: Yes No Indicate One: Waste disposal

Project Category Code: Point Linear Areal (Circle one)

Geographic Place Name: Tuktoyaktuk

EA Determination: 20-1-a

EA Determination Date: 2001-10-05

Estimated CEAA Follow-up Program termination date: NEB has requested and we have rec
Information from the company in this regard, possibly August 2002. DIAND usually relies o
water licence inspection results.

EA Terminated: no

2. General File Information

File Number: N7-1-1771

Type of Application: new water licence, approval to drill a well, and approval to change con

Present licence/permit/lease number: N7-1-1771; NEB well identification numbers to be ass

Proposed Date of Activity: 2001/10/01

Other RAs or Screening Divisions: YES

If yes, is there an Integrated Screening underway?

NEB is participating in a joint CEEA process with the Water Board, but wants to review the prior to acceptance, so could modify it as required for their purposes. This document refle- comments to date.

Other RA Types of Approval: NEB authorities to drill wells; ILA land use permit

Project File Location: NWT Water Board; DIAND Water Resources Division

DIAND District: North Mackenzie/Inuvik

3. Proponent

Anderson Resources Ltd.

1600, 324 - 8th Avenue S.W.

Calgary AB T2P 2Z5 tel. 403- 232-7294

Type of proponent: industry

4. Project Location

Topographic Map Sheet Number: 107 C

Latitude / Longitude: 69 17' 51" N - 132 56'27" W

Watershed: Husky Lakes, Arctic Ocean

Street Name: -

Surrounding Land Status: on settlement (Inuvialuit) 7-1-a lands, with federal land interspersed in the area

Special Designation: nil

5. Project Description

Anderson Resources Ltd. is planning a winter drilling program of 120 to 140 days on the Tuk Peninsula, between Tuktoyaktuk and the Husky Lakes, on Inuvialuit 7-1-a lands. Two new wells are planned, (of four noted targets) as well as one re-entry (L-09). The latter will only be drilled if the first well (M-18) turns up dry. Final drill locations were confirmed in August, and the appropriate material submitted; these will require NEB approvals. The four potential well sites are: M-18, N-42, B-02/G-02, and L-09. Wells are expected to be within 500 metres of tentatively identified locations. The rig camp is planned for the M -18 site, while a base camp will be established at Can-Mar's camp in Tuktoyaktuk. The rig camp will accommodate up to 90 people associated with the drilling and completion phases.

The company originally planned to use Tiktalik Lake as a primary water source, but this was withdrawn following discussion with EISC, DFO and others. On October 19th, 2001, the company wrote to the Water Board confirming current water sources, and quantities for different activities planned. A chart of all water sources was provided, outlining quantities needed, and use for each source. This letter is appended for reference.

Water (marine) will be withdrawn (subject to testing) from Tuk Harbour for use in construction of access ice roads, while camp, pad and drill water will be withdrawn from local lakes (several selected), as well as Gunghi Creek. Water will be trucked from sources to well sites and roads, and intakes will be screened. Due to the late freeze up this year, the company has obtained permission from the hamlet to withdraw water from a small lake within the community's boundaries, until the harbour is usable as a fresh water source. Total construction water requirements are estimated at 67,500 cu.m. while drilling and camp water needs are estimated to be around 13,000 cu. m in total, or 300l/person/day. The camp will use an Eco Tech treatment system. Waste water (sewage and grey water) from the rig camp will then be trucked to the sewage lagoon/lake Tuktoyaktuk for disposal, (hamlet concurs, subject to setting rates) while drilling fluids/wastes (up to 4500 cu.m.) will be trucked to, and buried, then frozen into a single sump on site (at M -18). A sump will also be constructed at the northern well site along the access to well site N-42. Ice roads will be constructed, likely from mid October 2001 on, from Tuk out to the wells sites and camp, using water trucks spraying water onto snow. Well site pads will be built of ice from fresh water sources, and potentially with gravel for the northern one.

A potassium chloride (KCl) drilling mud system is planned, with disposal of diluted muds into a small sump to be blasted out of frozen ground with small explosive charges. Freeboard will be kept high enough to ensure that drilling fluids are below the active layer of the permafrost, to encourage permafrost to invade liquids and freeze them, ie render immobile. (Permafrost underlies all project site components). Grey water and camp sewage will be trucked back into Tuktoyaktuk to the sewage lagoon near Tuk (under discussion with the Hamlet). Waste water will be stored in the interim in a large 80,000 litre tank at the rig camp. Solid waste will be incinerated at the rig camp. Gas flaring will occur during well testing. Non-combustibles will be hauled out by truck to the Tuk landfill.

Fuel will be stored in tanks at the rig camp, and refilled as required from Tuk . A number of chemicals will also be needed and stored on site. Upon completion, wells and sump will be capped, and all equipment removed or disposed of subject to approvals.

NOTE: NEB has noted that Anderson has applied for additional seismic work here, but no licence . Similarly, the ILA has referred the ice road construction project to the EISC Also, there may be ice road changes based on information they received, but not received here or at the Water Board .

What sources of information did you use?

other government data

historical maps

scientific reports

personal information

CEEA public registry system

contour maps

other, specify :application and project description, plus subsequent updates

Describe any accidents or malfunctions that may occur in connection with the project.

Several accident and/or malfunction scenarios that could result in adverse environmental effects are identified by Anderson:

1. fuel/fluid leaks or spills could contaminate soil and water;
2. wastewater discharges;
3. attraction of wildlife to the drilling sump; and
4. well blowout or gas kick.

6. Description of Environment

Anderson Resources has submitted a description of the environment based on synthesizing information from existing literature, a field reconnaissance, knowledge and experience of professional biologists, and communications with local experts and regulatory agency representatives. A reference of these information sources is provided in a report prepared for Anderson by Inuvialuit Environmental and Geotechnical Inc. entitled, *Project Description for the Proposed Anderson Resources Ltd. Tuk 2 winter Drilling Program.*

The exploration block is located between Tuktoyaktuk on the Arctic coast, and the Husky Lakes, in an upland tundra area (up to 30 m. above seal level) dotted with thermokarst lakes and wetlands. Topography is flat to rolling, with vegetation limited to grasses and shrubs, often on hummocky terrain, with a number of pingos located in the region. Much of this area escaped glaciation during the last continental glaciation period. Soils are ice rich, and contain silts and sands, with Tuk coastal plain sediments composed of late glacial till or glacio-fluvial sands and gravels. The area is underlain by continuous permafrost with considerable variation in the active layer on a

seasonal or annual basis. Area drainage is towards the ocean, and most streams are shallow and freeze to the bottom. Climate is a "low arctic ecoclimate" , with long cold winters and short cool summers. Wildlife is important to this area, and includes such species as caribou, wolverine, polar bear, grizzly, wolf, moose, beaver, muskrat, hare, seal, and several species of waterfowl and smaller birds. Fish species include grayling, lake trout, cisco, whitefish, and even N. pike. Three bird species, identified as being of some level of concern on the COSEWIC list, are identified as: Eskimo curlew (endangered); peregrine falcon (special concern); and short-eared owl (special concern).

Anderson notes that plant communities in the arctic are relatively simple and dominated by a few species. No distinct succession of plant species is observed on the tundra of the Tuktoyaktuk Coastal Plains. The major community type is dwarf shrub-heath, covering about 75% of the vegetative surface. This community is dominated by dwarf birch, smooth willow, crowberry, lingonberry, mosses and lichens. Other tundra communities include tussock tundra, sedge meadows and lake-edge communities. Anderson notes that 11 plant species of national significance may occur in the Mackenzie Delta area, but would likely not be affected due to winter conditions and snow cover.

Description of socio-economic and cultural environment

This eastern edge of the Mackenzie Delta has been occupied by aboriginal peoples for thousands of years, and traditional activities of hunting, trapping, and hunting are still important. Today, wage employment can be found within the government and service industries within the area communities, and recently, many local residents have become involved in the oil and gas exploration resurgence in the region. There are many known archeological and cultural sites in the region as well, and tourism, scientific research, transportation etc are also important.

What sources of information did you use?

- | | |
|---|---|
| <input type="checkbox"/> Historical Maps (expired permits and licences) | <input type="checkbox"/> GIS |
| <input type="checkbox"/> Running Maps (current permits and licences) | <input type="checkbox"/> Indian Land Registry |
| <input type="checkbox"/> Interference Maps (other land dispositions) | <input type="checkbox"/> Land Transition Management Style |
| <input checked="" type="checkbox"/> Public Registry System | <input checked="" type="checkbox"/> Other, eg Project description |

7. **Consultation on Project** Note that the company also undertook its own consultation program, as outlined in the project description

Federal Government

Contact Person:

Date Comments received:

DIAND

Water	<input checked="" type="checkbox"/> B. Reid, M. Wilson	<input checked="" type="checkbox"/> 14/08/01; 27/08/01
Geology	<input type="checkbox"/>	<input type="checkbox"/>
Lands	<input checked="" type="checkbox"/> B. Becker	<input checked="" type="checkbox"/> 13/08/01
Minerals	<input type="checkbox"/>	<input type="checkbox"/>
Ec. Dev.	<input type="checkbox"/>	<input type="checkbox"/>
Env't	<input type="checkbox"/>	<input type="checkbox"/>
I&I	<input type="checkbox"/>	<input type="checkbox"/>
D.M.	<input checked="" type="checkbox"/> R. Cockney	<input type="checkbox"/>
R.M.O.	<input type="checkbox"/>	<input type="checkbox"/>
DFO /CCG	<input checked="" type="checkbox"/> J. Dahl	<input checked="" type="checkbox"/> 15/08/01; 29/08/01
DOE	<input checked="" type="checkbox"/> S. Harbicht	<input checked="" type="checkbox"/> 30/08/01
Health Canada	<input type="checkbox"/>	<input type="checkbox"/>
DOT	<input type="checkbox"/>	<input type="checkbox"/>
NEB	<input checked="" type="checkbox"/> J. Korec	<input checked="" type="checkbox"/> 24/08/01, 02/10/01, 05/10

N.W.T. Government

Ren. Res.	<input checked="" type="checkbox"/> K. Hall	<input checked="" type="checkbox"/> 22/08/01
Health.	<input checked="" type="checkbox"/> D. Fleming	<input type="checkbox"/>
Transport.	<input type="checkbox"/>	<input type="checkbox"/>
Tourism	<input type="checkbox"/>	<input type="checkbox"/>
MACA	<input type="checkbox"/>	<input type="checkbox"/>
EM&PR	<input type="checkbox"/>	<input type="checkbox"/>
PWNHC	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

Aboriginal Groups (additional local consultation is done by EISC)

<input checked="" type="checkbox"/> Inuvialuit EISC	<input checked="" type="checkbox"/> 19/07/01;
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Public/Interested Parties/Other

<input checked="" type="checkbox"/> B. Boos (Oil/gas rep. TAC)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Record of comments attached to screening Form: ?

No, but are on file or in the Project Description

8. Detailed description of environmental and cumulative effects identified in Boxes A and B.(potential impacts before mitigation)

Environmental or cumulative environmental effect	Description
company: -draw down of local water bodies -damage to underlying permafrost and soils	- a large drawdown could impact negatively on fish habitat overwintering fish in connected lakes that may be shallow continuous permafrost underlies the region, and could be damaged by surface activities , such as sump construction containing gravel resulting in un- wanted melting , stumping, ponding , soil compacting , gravel removal etc.
-increased access to areas used for traditional activities	
-temporary alteration/removal of vegetation, wildlife habitat	-clearing of vegetation cover for pads, camp, road access temporarily reduce habitat for local wildlife, and result in loss of vegetation
-water quality impairment	-risk of fuel spills, escaping sump contents with salts, salt water used in road construction could impact local water
-increased noise, and air emissions	-equipment, use of explosives, drills, and trucks coming to work result in temporary but increased noise, air emissions
-entrainment of small fish in pipes	small fish could be sucked into water pipes during winter and streams
-potential for cumulative effects from multiple activities , different companies etc, but mitigable on an individual basis	- with the growth in oil and gas developments, there is a possibility that cumulative effects could become a concern
-potential risk of accidents and malfunctions	-potential risk of spills, gas kicks and blowouts with this t
-potential aspects of the environment could impact on the project	-unexpected weather conditions or climatic changes could impact company activities and planned mitigation .

9. Summary of mitigation measures

from the company : see also the company's project description : summary attached

- Winter drilling and road activity will help minimize overall terrain disturbance and impacts
- In order to minimize impacts of fresh water withdrawals, the company will use salt or brack water consumer - winter access road construction; water will be pre tested for acceptable harmful effects, and water source changed to fresh if electrical conductivity exceeds 1 mS/c have been changed/confirmed with DFO and EISC to alleviate concerns over impacts on har etc.
- All intake hoses used for withdrawal will be equipped with screens to prevent fish from b
- Construction of ice pads under drill rigs will minimize disturbance to underlying soil and pe additional ice layers may effect the freeze thaw cycle. Well casings will be cemented, and s surface where permafrost occurs (eg 380 metres).
- existing road alignments will be used in some areas, while other access roads will be temp constructed of snow and ice. Traffic will be restricted to approved roads, and snow ramps minimize erosion and/or slope de-stabilization.
- a 100 metre buffer will be left between the well site boundary and any water bodies nearb
- Vegetation is sparse, but any clearing required will be done under frozen ground condition areas needed for activities, and disturbance to the organic mat and root systems will be avo permafrost degradation or erosion into water bodies, with winter use of low impact equipm plant communities. Cleared vegetation and snow will be wind rowed within the local surge
- All salt/brackish water will be tested first and used only if conductivity is within safe limits
- Facilities will avoid drainage features, and snow bridges/ice roads will be used, with clean left free of debris. Surface drainage ditches will be reclaimed to their original condition, and notched after use. Any clearings will be re-contoured to restore natural cross drainage patte
- Only one drill waste sump will be used, which will be fenced and bermed to prevent wildl excavated materials and other debris will not be placed into any water body, and will be pu from a water body.
- The company will use the existing Can-Mar site in Tuk as its base camp, thus reducing the out in the drilling areas, limiting the latter to a rig camp. A treatment system ,called Eco Tec sewage and grey water.
- The company will minimize water withdrawal through techniques designed to recover and drilling system is designed to be a low water consumer, thus also reducing the quantity of
- The camp and associated waste disposal sites , as well as drill sump, refuelling etc will be from water. All fuel storage will have secondary containment, and all normal fuel and spill p (several noted), which will be required under an Environmental Protection Plan or licence C
- Sumps will be built if possible on higher ground in impervious materials, but if not found,

be used. A freeboard of 1.5 metres will be maintained, and sump capped prior to the end of operations and will be monitored.

- To reduce odours and attracting nuisance wildlife, camp wastes will be segregated, contained, and incinerated in a forced-air incinerator, and residues disposed of at an approved facility, while waste oils are stored for similar offsite disposal. All drill camp grey water and sewage will be stored in a tank and trucked back into Tuk for disposal to the nearby sewage lagoon/lake (all subject to community consultation) reducing discharge to the environment..

- Local consultation has been undertaken to determine concerns, and possible conflicts with aboriginal communities, etc. A local monitor will be hired, and signs posted on access routes, and community activities. Work will be suspended if archeological sites are discovered.

- The site will be properly restored after the work is done, with the sump fluids being contained in a concrete active layer, followed by backfilling, and covering with previously excavated material, and contouring to promote proper drainage and vegetation regrowth. This will also encourage permafrost penetration, and freezing of liquids.

Additional suggestions from licence application reviewers:

- Additional information should be provided regarding the expected salt content of the produced water, and a description of what effects KCl will have on the freezing point of the drill wastes., and how will sumps be monitored.

- If gravel is excavated for pad use, restoration measures must to mitigate impacts of gravel on local vegetation.

- air quality testing for each well should be submitted, as outlined.

- a proper contingency plan is needed, and equipment must be available to cope with any foreseeable emergencies.

- DOE recommends against the use of a gravel pad for the northern well, and that a proper site survey and soil classification be conducted prior to selecting the M-18 site.

- sump contents should be shown to be non toxic prior to decommissioning, and a program of post-closure monitoring should be implemented to ensure that sump contents do not leach out into the surrounding environment.

- Flaring can have impacts on vegetation, air quality, human health and wildlife..this should be noted as an impact and the company identify mitigation measures, as well include air quality modelling.

- a monitoring program to verify whether affected vegetation was recovering post closure should be encouraged

- DOE commented at length about potential cumulative effects in general and in the region overall due to oil and gas activity, and noted that the company's determination that residual cumulative impacts are predicted to be low in magnitude, and local in extent is open to challenge..a strategy is needed to implement the NWT wide Cumulative Effects Assessment and Management Framework (CEAMF), other CEA prediction will remain subjective.

- DIAND Inspector: a sump characterization (total wastes) must be requested prior to abandonment even if no decant is planned. A toxicity assessment of proposed drilling materials should be undertaken; drill sump materials above ground must be of low permeability to minimize leakage.

- DFO, after many exchanges with the company over use of lakes, drawdown etc, issued a Letter of Advice which essentially noted the following mitigation measures in summary:

-avoid the use of streams and small lakes as water sources; screen water intakes to prevent entrainment of fish; access routes should follow existing trails, winter roads or cut lines where possible; bladed vehicles should use "mushroom shoes or boots" to minimize ground disturbance or erosion; no cutting of crossing approached unless authorized by DFO (ie preference is to use snow ramps); where required only clean snow or ice is to be used on temporary crossings, and winter crossings should not impede water flow and should be V notched or removed prior to spring break up; camps should be set back 100 metres from water bodies if possible; reclamation activities should include bank stabilization and re-vegetation as required, and be completed prior to spring thaw when surface runoff is greatest.; all refuelling and vehicle maintenance activity should be controlled to prevent entry of deleterious substances into water; remove any debris on ice surfaces before spring breakup; all waste sites, fuel caches etc should be set back 100 metres from any water body where feasible; and be bermed or contained to ensure substances do not enter any water body; drill cuttings must be disposed of such that they cannot enter water, and biodegradable additives are recommended; and a spill must plan be in place on site.

- re risk of accidents and malfunctions, NEB has noted the following in response to the company's information on the issue:

NEB: re potential for accidents and malfunctions, adherence to safety procedures, preventative measures, regular equipment inspection and maintenance, and implementation of contingency measures would make accidents and malfunctions unlikely or, should they occur, of a minor, easily remediated nature. Safety procedure such as ice profiling, speed limits, maximum load restrictions, and safety meetings would reduce the chance of incidents occurring. Preventative measures such as double-walled tanks, spill trays, spill-proof refuelling equipment, and spill containment at loadouts. Personnel would be designated to conduct regular testing of waste water treatment equipment and discharges to ensure compliance with NWT guidelines, as well as to monitor for wildlife in the area of the sump.

-Safety measures and equipment, in compliance with NEB requirements and in conformance with industry best practices would allow for control of well pressures. In the event of a gas kick, blowout preventers would be used to circulate the kick out of the well bore. In the very unlikely event of a blowout, Anderson is financially and technically capable of drilling a relief well.

-NEB will also recommend the following condition be included in its Approval to Drill Wells and/or Approval to Alter Condition of a Well (for well re-entry):

Anderson shall implement or cause to be implemented all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in Anderson's application and responses to NEB environmental information requests.

-Delays in access construction can be accommodated within the conservative project schedule. Both electronic and physical ice profiling would be used to ensure safe ice conditions throughout the program, and where necessary, ice would be thickened with water from large water bodies and channels in the area. Anderson would use snow-making machines to lay down a 25 cm layer of snow and compact it to enhance frost penetration under the access road.

-Location of sensitive terrain (high cutbanks, steep slopes, and archaeological sites) were truthed using aerial surveys during program planning and would be avoided. GPS and conventional surveying would be undertaken to

ensure that the sensitive terrain is avoided.

-Snow-making would compensate for lack of snow. Machinery would be strictly confined to the surveyed area to minimize surface disturbance. After the snow has melted, an aerial survey would be undertaken to ensure no previously snow-buried debris was left on the routes or around the camp site. Any waste found would be picked-up for disposal in a landfill.

-If the drilling program cannot be completed due to an early breakup, it would be shut down and the equipment demobilized to avoid creating surface disturbance. Well testing could be conducted the following season.

10. Significance

After taking into account the above mitigation measures, are any of the adverse effects significant?

Yes No

If yes, identify which one(s) and proceed to 11;
proceed to #12

11. Likelihood of Occurrence

Of the identified adverse significant environmental effects in #10 are any likely to occur?

Yes No If yes, which one(s)?

12. CEAA Determination /Recommendation

- Section 20 (1)(a) - Project may proceed as it is not likely to cause significant adverse effects.
- Section 20 (1)(b) - Project may not proceed as it is likely to cause significant adverse effects that cannot be justified.
- Section 20 (1)(c)(i) - Project must be referred to the Minister of Environment as it is a project that is likely to cause significant adverse environmental effects.
- Section 20 (1)(c)(ii) - Project must be referred to the Minister of Environment as it is likely to cause significant adverse environmental effects.
- Section 20 (1)(c)(iii) - Project must be referred to the Minister of Environment as public interest requires a public reference.

13. Consultation on Screening Report

Public consultation on screening report deemed necessary? ___ Yes No

Deadline for comments on screening report _____n/a_____

Public Comments Received on Screening Report ~~Yes~~ No

(Attach Comments to screening file.)

14. Follow-up Program

-None required under CEAA.

Anderson Resources notes that on-going site inspections and monitoring would continually improve operations and ensure compliance with statutory requirements and authorizations. An Inuvialuit Wildlife Monitor and an Environmental Monitor would be assigned to the project. As well, regulatory inspectors for Inuvialuit Land Administration, NEB and NWT Water Board, may inspect the site following the program and, where necessary, require Anderson to remediate residual impacts. Regulators would be notified as incidents occur and as required by terms and conditions of the Land Use Permit, Water Licence and Approval to Drill a Well.

15. Authorization

Prepared By (screener):

Date

Approved By:
Decision Maker (e.g., Regional Manager, engineer, etc.)

Date

16. Water Board Authorization

Greg Cook

Prepared By (screener):

revised Oct. 11

Date

[Signature]

Approved By:

allied

Date

Appendix A: Subject Descriptors

Choose from this list and insert as a "Subject Descriptor"

agriculture
buildings
communications
defence
energy
forestry
industry
inland waters
mining
oceans
oil and gas
parks
transportation

Appendix B: Geographic Place Name

see list provided

APPENDIX C: Screening Checklist and Cumulative Effects Checklist

Table A. Identification of Project Components and Environmental Effects

Identify all components of the project under screening and their potential adverse environmental effects.

Project Components

(✓ check all the items appropriate to this project)

- access road (ice)
- construction
- abandonment/removal
- modification e.g., widening, straightening
- automobile, aircraft or vessel movement
- blasting
- building
- burning (incineration, flaring)
- burying
- channelling
- cut and fill
- cutting of trees or removal of vegetation
- dams and impoundments (sump)
 - construction
 - abandonment/removal
 - modification
- ditch construction
- drainage alteration
- drilling other than geoscientific
- ecological surveys
- excavation:
- explosive storage
- fuel storage
- garbage
 - disposal of hazardous waste
 - disposal of sewage
 - waste generation
- geoscientific sampling
 - trenching
 - diamond drill
 - borehole core sampling
 - bulk soil sampling
- gravel (potentially)
- hydrological testing
- site restoration
 - fertilization
 - grubbing
 - planting/seeding
 - reforestation
 - scarify
 - spraying
- recontouring
- slash and burn
- soil testing
- topsoil, overburden or soil
 - fill
 - disposal
 - removal
 - storage
- stream crossing/bridging
- tunnelling/underground

___other, explain_____

accidents or malfunctions (Check if there is a possibility for malfunctions and accidents with the project). Describe, ___risk of spills, drill/vehicle accidents, unexpected releases fluids or waste water, well blow outs or gas kicks etc_____

effects of environment on project (e.g., beaver dams). Describe, ___severe winter, unexpected weather changes, cold etc_____

Project Effects (potential)

(✓ check all the items appropriate to this project)

Biophysical Environment

1. deposit into surface water
2. deposit into ground water
3. change in surface water flow
4. change in ground water flow
5. change in water temperature
6. change in drainage pattern

7. change in air quality
8. change in air flow
9. micro-climate change
10. ice fog

11. change in ambient noise levels
12. change in slope stability
13. change in soil structure
14. alteration of permafrost regime
15. destabilization/erosion
16. soil compaction

17. loss of access to non-renewable resource
18. depletion of non-renewable resource

19. removal of rare/endangered plant species
20. introduction of species
21. toxin/heavy metal accumulation

22. removal of rare/endangered wildlife species
23. change in wildlife health
24. impact to large mammals
25. impact to small mammals
26. impact to fish
27. impact to birds
28. impact to other wildlife
29. impact in a calving, nesting or spawning area
30. removal of wildlife buffer zone
31. change in wildlife habitat/ecosystem
32. other, explain: disturbance to ground cover, noise

Directly-related Socio-economic and Cultural Environment

33. impact to trappers
34. impact to hunting
35. impact to outfitters
36. recreational or back country use
37. impact to fishing
38. impact to First Nation traditional use
39. impact to community
40. impact to industry
41. impact to community health
42. change in work force economics
43. change in housing or infrastructure
44. change in regional transportation
45. other, explain _____

46. impact to traditional use area
47. impact to historical site or cultural landmark
48. impact to local aesthetics
49. impact to archaeological or historical site
50. other, explain _____

Table B. Identification of Other Resource Uses And Their Environmental Effects

Identify relevant past, current and future (pending applications) physical works and activities and their environmental effects.

Other Resource Uses

(✓ check all the items appropriate to this project)

- agriculture
- forestry
 - commercial
 - domestic
- fishing
- hunting/subsistence
- urbanization
 - commercial / residential (cottages)
 - built structures
 - infrastructure
- mining
 - exploration
 - open pits
 - underground
- quarries (gravel)
- transportation/communications
 - roads / trails
 - channels / canal
 - telephone lines, satellite dishes, cables
 - beacons
- solid waste disposal
- energy project
 - hydro
 - pipeline
 - transmission line
- other water licenses, permits, leases
- land claims
 - selected
 - withdrawn
 - special management
 - heritage sites
 - cultural sites
- other private lands held under tenure
- recreational
- trapping
- mineral processing
- airport
- recreation
- other heritage sites
- other, explain oil/gas exploration; seismic

Effects from other Resource Uses

(✓ check all the items appropriate to the scope of this :

- Biophysical Environment**
1. deposit into surface water
 2. deposit into ground water
 3. change in surface water flow
 4. change in ground water flow
 5. change in water temperature
 6. change in drainage pattern
 7. change in air quality
 8. change in air flow
 9. micro-climate change
 10. ice fog
 11. change in ambient noise levels
 12. change in slope stability
 13. change in soil structure
 14. alteration of permafrost regime
 15. destabilization/erosion
 16. soil compaction
 17. loss of access to non-renewable resource
 18. depletion of non-renewable resource
 19. removal of rare/endangered plant species
 20. introduction of species
 21. toxin/heavy metal accumulation
 22. removal of rare/endangered wildlife species
 23. change in wildlife health
 24. impact to large mammals
 25. impact to small mammals
 26. impact to fish
 27. impact to birds
 28. impact to other wildlife
 29. impact in a calving, nesting or spawning area
 30. removal of wildlife buffer zone
 31. change in wildlife habitat/ecosystem
 32. other, explain: disturbance to ground cover, noise
- Directly-related Socio-economic and Cultural Environment**
33. impact to trappers
 34. impact to hunting
 35. impact to outfitters
 36. recreational or back country use
 37. impact to fishing
 38. impact to First Nation traditional use
 39. impact to community
 40. impact to industry
 41. impact to community health
 42. change in work force or community economics
 43. change in housing or infrastructure
 44. change in regional transportation
 45. other, explain _____
 46. impact to traditional use area
 47. impact to historical site or cultural landmark
 48. impact to local aesthetics
 49. impact to archaeological or historical site
 50. other, explain _____

Cumulative Environmental Effects

Based on a comparison of effects identified in Box A and Box B

Matching
Number(s)

Description of cumulative environmental effects

_____ None were specifically identified. DOE commented at length about potential cumulative effects in general and in the region overall due to oil and gas activity, and noted that the company's determination that residual cumulative impacts are predicted to be low, in magnitude, and local in extent is open to challenge. A strategy is needed to implement the NWT wide Cumulative Effects Assessment and Management Framework (CEAMF), other CEA prediction will remain subjective. The proponent had stated that residual cumulative effects from the project are predicted to be low in magnitude and local in extent. They have initiated discussions regarding cumulative effects assessment with the Inuvialuit Joint Secretariat, and industry representatives, on how best to quantify the cumulative impacts of development within the Mackenzie River delta on a regional scale over a longer time frame. Apparently the EISC and EIRB are cooperating with a consulting firm, Kavik Axys Ltd., to prepare guidelines for quantitative cumulative effects assessment, with workshops planned in later 2001 to help build capacity for cumulative effects assessment of oil and gas activities in the region.
