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PROJECT DESCRIPTION
FOR THE PROPOSED
BURLINGTON RESOURCES CANADA ENERGY LTD.
MACKENZIE DELTA WINTER 2000/2001 SEISMIC PROGRAM

Prepared for:
Burlington Resources Canada Energy Ltd.
Calgary, Alberta

Prepared by:

Inuvialuit Environmental Inc.

Calgary, Alberta and Inuvik, Northwest Territories

September, 2000
Project # 698-00

Schedule III
(Subsection 6(1))

APPLICATION FOR LICENCE, AMENDMENT OF LICENCE, OR RENEWAL OF LICENCE

APPLICATION/LICENCE NO:
(amendment or renewal only)

1. Name and Mailing Address of Applicant

Burlington Resources Canada Energy Ltd.
3700 Bow Valley Square IV
250 – 6th Ave. SW
Calgary, AB T2P 3H7
Attention: Beric Evans

Telephone: 403-260-8340 Fax: 403-234-0957

2. Address of Head office in Canada if incorporated

Same as previous

Telephone: Fax:

3. Location of Undertaking (describe and attach a map, indicating watercourses and location of any proposed waste deposits)

Mackenzie Delta/Richards Island area near the Kendell Island Bird Sanctuary. Watercourse to be crossed is the Middle Channel of the Mackenzie River. All crossings will be during frozen conditions, not requiring permanent structures. No waste deposits will be made as all wastes will be incinerated at camp when possible. All other wastes will be transported to Inuvik for disposal in an approved landfill.

Latitude 69°10'00" N - 69°45'00" N Longitude 134°00'00" W - 135°45'00" W

4. Description of Undertaking (describe and attach plans)

Seismic Program and supporting Mobile Sleigh Camp Facilities for the purpose of seismic exploration. Refer to attached Project Description for additional details.

5. Type of Undertaking

1. Industrial	X	4. Power		6. Conservation	
2. Mining and milling		5. Agriculture		7. Recreation	
3. Municipal					

8. Miscellaneous (describe)

6. Water Use

To obtain water	X	Flood Control	
To cross a watercourse		To divert water	
To modify the bed or bank of a watercourse		To alter the flow of, or store, water	

Other (describe) Grey water disposal

7. Quantity of Water Involved (litres per second, litres per day or cubic metres per year, including both quantity to be used and quality to be returned to source)

Up to 20 m^3/day as supplemental camp water source, for use during ice ramp and access route flooding to be obtained from nearby large lakes and from the Mackenzie River.

SCHEDULE III – *Concluded*

APPLICATION FOR LICENCE, AMENDMENT OF LICENCE, OR RENEWAL OF LICENCE - *Concluded*

8. Waste Deposited (quantity, quality, treatment and disposal)

Approximately 11 m^3/day of waste to be deposited. Electric toilets will be used to dispose of camp sewage. Camp grey water (shower and dish water) will be frozen within temporary snow bermed holding areas and then spread across ground when camp mobilized. All wastewater criteria will be at or below *Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories.*

9. Other Persons or Properties Affected By This Undertaking (give name, mailing address and location; attach list if necessary)

Cabin owners in the vicinity of the camp will be contacted prior to construction. Cabin owners will be determined through regional Hunters and Trappers Committee.

10. Predicted Environmental Impacts of Undertaking and Proposed Mitigation

See attached Project Description.

11. Contractor and Sub-Contractors (names, addresses and functions)

Veritas DGC Land
Attention: Mr. John Bertsch
2700 – 61st Ave. SE
Calgary, AB T2C 4V2
Phone: 403-257-6705

Inuvik Contact:
Mr. Wayne Ross
Phone: 867-777-3493

12. Studies Undertaken to Date (attach list if necessary) See attached project description.

EIA completed by Inuvialuit Environmental Inc.

13. Proposed Time Schedule

See attached Project Description.

Start date January 1, 2001 Completion date April 15, 2001

FOR OFFICE USE ONLY

APPLICATION FEE	Amount:	$ 30.00	Receipt No.:	
WATER USE DEPOSIT	Amount:	$ 30.00	Receipt No.:	

NORTHWEST TERRITORIES WATER BOARD

ONSHORE OIL AND GAS EXPLORATION DRILLING QUESTIONNAIRE

FOR

WATER LICENCE APPLICATIONS

Prepared by:
Department of Indian Affairs and Northern Development
Water Resources Division
August 1999
Version 5.07

Introduction

The purpose of this questionnaire is to solicit supplemental information from an applicant to support their application for a water licence (or renewal). It is anticipated that the completion of this questionnaire will reduce delays arising from the Northwest Territories Water Board having to solicit additional information after an application has already been suhmitted. This information will also be useful during the environmental assessment and screening of your application, which must be undertaken prior to development and approval of a water licence.

The applicant should complete the questionnaire to the best of his/her ability, recognizing that some questions may not be relevant to the project under consideration. For questions that do not relate to his/her operation, the applicant is requested to indicate "N/A" (Not Applicable).

If any questions arise while completing the questionnaire, the applicant may wish to contact the Northwest Territories Water Board at (867) 669-2772. If your question is that of a technical nature please contact the Regulatory Approvals Section of the Water Resources Division, Department of Indian Affairs and Northern Development (INAC), at (867) 669-2651.

Chairman,
Northwest Territories Water Board

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If space is insufficient for any of the responses on this questionnaire, use the back of the sheet or attachments.

List attachments in Appendix 1.

Print or type your responses.

SECTION 1:

PRELIMINARY SITE ASSESSMENT

DATE: September 12, 2000

1.1 APPLICANT

COMPANY NAME: Burlington Resources Canada Energy Ltd.

ADDRESS: 3700 Bow Valley Square IV

250 – 6th Ave. SW

Calgary, AB

T2P 3H7

PROPERTY NAME/EXPLORTION LIC. #: EL393, EL394, EL404

CLOSEST COMMUNITY: Inuvik and Tuktoyaktuk

LATITUDE/LONGITUDE OF WELL CENTRE (Degrees, minutes, seconds): N/A

1.2 PRIMARY COMPANY CONTACT:

NAME: Beric Evans

TITLE: Manager - Geophysics

CONTACT NUMBER: 403-260-8340

ALTERNATE CONTACT NUMBERS: 403-519-6238 (cellular)

1.3 FIELD CONTACT:

NAME (If known): Wayne Ross (Veritas DGC Land)

TITLE (If known): Project Manager

CONTACT NUMBER: Inuvik: 867-777-3493

1.4 INDICATE THE STATUS OF THIS APPLICATION:

NEW APPLICATION [X] RENEWAL [ ]

IF RENEWAL, INCLUDE LICENCE NUMBER: N/A

1.5 SITE HISTORY

INDICATE IF THIS SITE CONTAINS ANY KNOWN:

FORMER WELL SITES	N/A
WASTE DUMPS	N/A
FUEL AND CHEMICAL STORAGE AREAS	N/A
SUMP AREAS	N/A
WASTE WATER DISCHARGE LOCTIONS	N/A

DESCRIBE SITES AND REFERENCE THEM ON THE MAP IN QUESTION 1.6

N/A

1.6 **ATTACH MAPS DRAWN TO SCALE SHOWING LOCATIONS OF EXISITNG AND PROPOSED:**

CAMP FACILITIES,	On map
WELL SITE(S),	N/A
SUMPS,	Each potential camp site is marked and have a grey water lagoon
WATER SOURCES,	Mackenzie River and area lakes
FUEL AND CHEMICAL STORAGE FACILITIES,	Portable
DRILLING MUD STORAGE FACILITIES,	N/A
DRAINAGE CONTROLS,	N/A
TRANSPORATION ROUTES (SEASONAL AND ALL WEATHER)*,	On map
ELEVATION CONTOURS,	On map
LOCATIONS OF WATERBODIES	On map
DRAINAGE PATTERNS FOR WELL AND CAMP SITES.	Temporary snow bermed holding areas used – no drainage

* **Clearly identify crossings over water courses greater than 5 mat ordinary high water mark.**

Refer to attached Project Description, Figure 2.

1.7 DESCRIBE THE PROPOSED OR CURRENT METHOD OF FRESHWATER WITHDRAWAL, THE TYPE AND OPERATING CAPACITY OF THE PUMPS USED AND THE INTAKE SCREEN SIZE.

Proposed delta water truck approx. 2500 – 3000 g tank (11375 L – 13650 L). A 3" Roper or Bowie Pump with an 80-100 g/min (364 L – 455 L) operating capacity. Intake screen size of 6" with ½" holes. Crew will also use a snow melter if or when required. A front end loader would be used to scrape snow from the lakes.

1.8 ESTIMATE MAXIMUM DRAW DOWN AND RECHARGE CAPABILITY OF THE RIVER OR LAKE FROM WHICH FRESH WATER WILL BE DRAWN. QUOTE DRAW DOWN IN CENTIMETRES, OR, STATE PERCENTAGE OF FLOW WITHDRAWN.

Should it be necessary to pump water, it would be pumped from the Mackenzie River or its channel. Draw down on the Mackenzie will be insignificant, or less than 1%. Lakes near camp locations will be identified during pre-survey scouting and maximum withdrawal rates will be determined based on depth of the lake.

1.9

INDICATE IF PERMAFROST IS EXPECTED TO BE ENCOUNTERED UNDER:	X
CAMP FACILITIES	N/A
WELL SITE	X
ACCESS ROUTES	N/A
SUMPS	N/A
OTHER	

1.10

INDICATE ANY POTENTIAL FOR ENCOUNTERING ARTESIAN AQUIFERS OR LOST CIRCULATION WITHIN THE SURFACE HOLE (TO CASING DEPTH)

N/A

1.11

ATTACH A DESCRIPTION OF THE SURFICIAL GEOLOGIC AND HYDRO-GEOLOGIC CONDITIONS IN THE IMMEDIATE VICINITY OF THE WELLSITE

N/A

SECTION 2:

WATER USE AND WASTE DISPOSAL

2.1 OUTLINE ALL WATER USAGE IN THE DRILL PROGRAM, CAMP FACILITIES, AND ROAD CONSTRUCTION. INDICATE THE SOURCE AND VOLUME OF WATER FOR EACH USE.

	Source	Use	Average Volume (m^3/day)
1.	Mackenzie River or	Camp facilities/roads	20 m^3/day
2.	Nearby lakes	Camp facilities/roads	20 m^3/day
3.			
		TOTAL:	20 m^3/day

Note: applicant is currently planning on using a snow melter for most water, with the exception of ice thickening procedures.

2.2 WILL DRILLING WASTES CONTAIN DETRIMENTAL SUBSTANCES INCLUDING, BUT NOT LIMITED TO, OIL BASED OR INVERT MUDS AND HIGH SALINITY FLUIDS?

YES ____ NO ____

IF YES, INDICATE SUBSTANCES:

N/A

2.3 INDICATE THE TOTAL ESTIMATED VOLUME OF DRILLING WASTES

N/A CUBIC METRES

2.4 INDICATE METHODS FOR DISPOSAL OF DRILLING WASTES.

N/A SUMP

N/A DOWN HOLE (REQUIRES NEB APPROVAL)

N/A ON-SITE TREATMENT (PROVIDE PLAN)

N/A OFF-SITE (GIVE LOCATION AND METHOD OF DISPOSAL)

2.5 IF A SUMP IS BEING USED, ATTACH THE FOLLOWING INFORMATION

SCALE DRAWINGS AND DESIGN OF SUMPS. N/A
CAPACTIY IN CUBIC METRES,
BERM EROSION PROTECTION,
SOIL PERMEABILITY AND TYPE
RECYCLING/RECLAIMING WATERS,
SURFACE DRAINAGE CONTROLS,
ABANDONMENT PROCEDURES.

2.6 WILL A CAMP BE PROVIDED?

YES [X] NO [ ]

2.7 IF YES, THEN INDICATE THE CAPACITY AND THE EXPECTED MAXIMUM NUMBER OF PERSONS THAT WILL BE ACCOMMODATED.

CAPACITY	75	PERSONS
MAXIMUM ACCOMMODATED	50	PERSONS

SECTION 3:

CONTINGENCY, ABANDONMENT AND RESTORATION PLANNING

3.1 ATTACH THE PROPOSED OR EXISTING CONTINGENCY PLAN WHICH DESCRIBES COURSE OF ACTION, MITIGATIVE MEASURES AND EQUIPMENT AVAILABLE FOR USE IN THE EVENT OF SYSTEM FAILURES AND SPILLS OF HAZARDOUS MATERIALS (IN COMPLIANCE WITH NWT WATER BOARD GUIDELINES FOR CONTINGENCY PLANNING, 1987).

See attached Project Description.

3.2 ATTACH AN INVENTORY OF HAZARDOUS MATERIALS ON THE PROPERTY (AS DEFINED UNDER TRANSPORTATION OF DANGEROUS GOOD REGULATIONS).

See attached Project Description.

3.3 ATTACH AN OUTLINE OF PLANNED ABANDONMENT AND RESTORATION PROCEDURES.

See attached Project Description.

SECTION 4:

ENVIRONMENTAL ASSESSMENT AND SCREENING

Your application and other project details, such as this questionnaire, will be sent out for review by local aboriginal and public groups as well as territorial and federal government agencies. Their comments regarding the significance of project impacts are considered before a decision is made to allow the project to proceed. Because formal assessment and screening of water licences was only initiated in about 1989, applicants will find that this process may be required even if the project has been built and in operation for several years. However, if your project has been previously screened a further assessment may not be required, or a more limited process may be used. This will depend on individual circumstances, including the stage of the project. Some projects may need a higher level of review or submission of more information before being screened.

4.1 HAS THIS PROJECT EVER UNDERGONE AN INITIAL ENVIRONMENTAL ASSESSMENT, INCLUDING PREVIOUS OWNERS?

YES [X] NO [ ]

IF YES, BY WHOM / WHEN: EA submitted by Inuvialuit Environmental Inc. – see attached Project Description.

4.2 HAS BASELINE DATA BEEN COLLECTED FOR THE MAIN WATER BODIES IN THE AREA?

YES [X] NO [ ]

IF YES, ATTACH DATA.
EA submitted by Inuvialuit Environmental Inc. – see attached Project Description.

4.3 HAS BASELINE DATA BEEN COLLECTED AND EVALUATED WITH RESPECT TO THE BIOPHYSICAL COMPONENTS OF THE ENVIRONMENT POTENTIALLY AFFECTED BY THE PROJECT (WILDLIFE, SOILS, AIR QUALITY).

YES [X] NO [ ]

IF YES, ATTACH DATA.
EA submitted by Inuvialuit Environmental Inc. – see attached Project Description.

4.4 ATTACH A DESCRIPTION OF ALL PROPOSED AND EXISTING ENVIRONMENTAL MONITORING PROGRAMS.
N/A

4.5 HAS A COMMUNITY CONSULTATION PROGRAM BEEN INITIATED?

YES [☑] NO [ ]

IF YES, PROVIDE DETAILS OF THE PROGRAM. See attached Project Description.

SECTION 5:

LIST OF ATTACHMENTS

Reference to Question #	Title	Number of pages
1.6	Maps of Existing and Proposed Facilities	Refer to Project Description.
3.1	Emergency Response Plans	Refer to Project Description.
3.2	Hazardous Materials	Refer to Project Description.
3.3.	Abandonment and Restoration Procedures	Refer to Project Description.
4.2	Baseline Water Data	Refer to Project Description.
4.3	Biophysical Components	Refer to Project Description.
4.5	Community Consultation	Refer to Project Description.

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PROJECT DESCRIPTION
FOR THE PROPOSED
BURLINGTON RESOURCES CANADA ENERGY LTD.
MACKENZIE DELTA WINTER 2000/2001 SEISMIC PROGRAM

Prepared for:

Burlington Resources Canada Energy Ltd.
Calgary, Alberta

Prepared by:

Calgary, Alberta and Inuvik, Northwest Territories

September 2000
Project #698-00

DISCLAIMER

The information and data contained within this report, including without limitation the results of any research and analysis conducted by or for Inuvialuit Environmental Inc. (IEI) pursuant to IEI's engagement, have been set forth to the best of IEI's knowledge, information and belief.

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Cynthia Pyc, M.Sc., P.Biol.
Environmental Biologist

Sept 8, 2000
Date

Alan R. MacDonald, M.E.Des.
Vice President

Sept 8/2000
Date

PROJECT DESCRIPTION
FOR THE PROPOSED
BURLINGTON RESOURCES CANADA ENERGY LTD.
MACKENZIE DELTA WINTER 2000/2001 SEISMIC PROGRAM

Submitted to:

Burlington Resources Canada Energy Ltd.
3700, 250 – 6th Avenue S.W.
Calgary, Alberta
T2P 3H7

DISTRIBUTION:

6 Copies	Scott Colebrook, Vice President, Surface Land, Environment & Safety Burlington Resources Canada Energy Ltd., Calgary, Alberta
30 Copies	Indian and Northern Affairs Canada Inuvik, NT
11 Copies	Environmental Impact Screening Committee Inuvik, NT
25 Copies	NWT Water Board Yellowknife, NT
3 Copies	National Energy Board Calgary, Alberta
4 Copies	Inuvialuit Environmental Inc. Calgary, Alberta Inuvik, NT

EXECUTIVE SUMMARY

Burlington Resources Canada Energy Ltd. (Burlington) is applying to conduct a winter 2000/2001 seismic program in the Mackenzie River Delta region of the Northwest Territories. The project entails the 2D seismic exploration of 445 km of line within approximately 4200 km^2 of land covered by Exploration Licences #393, #394 and #404. The proposed program encompasses portions of land on Richards Island, Langley Island, Kendall Island and Ellice Island, and extends offshore to Beluga Bay. These blocks of land are located on Crown lands within the Inuvialuit Settlement Region (ISR). The proposed seismic program falls under Federal and Territorial regulatory jurisdiction. Pending regulatory approval, the program is scheduled to mobilize in November 2000, with seismic exploration scheduled to commence January 2001.

Inuvialuit Environmental Inc. (IEI) has been commissioned by Burlington to prepare this Project Description for the winter 2000/2001 seismic program. The Project Description has been prepared to meet the requirements of Indian and Northern Affairs Canada (INAC), and fulfill the operating guidelines and procedures of the Environmental Impact Screening Committee (EISC).

The proposed project is located in both upland tundra and lowland delta environments within the Mackenzie River Delta. The topography in the project area is flat to gently rolling, with moderate to steep slopes adjacent to waterbodies. Vegetation in the area is limited mainly to grasses, shrubs and willows up to 1.2 m tall. It is anticipated that minimal to no clearing will be required along seismic lines.

The winter seismic program has been developed with the consideration of minimizing impacts on the environment and land users. However the potential still exists for certain environmental impacts to occur over the course of the program. Potential environmental concerns for the project include temporary alteration of wildlife habitat along seismic lines, noise, and emissions from operations, and increased vehicle traffic levels. Potential impacts include short-term displacement of wildlife, disruptions to traditional land use in the vicinity of the project, and disturbance to permafrost.

Protection measures designed to mitigate the potential environmental impacts are presented in this Project Description and in Table 10. Burlington and its contractors are committed to following these measures in order to minimize the risk of potential environmental impacts and disturbance of culturally and historically significant areas.

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1.0 CONTACT NAMES AND ADDRESSES

Norman Napier
Senior Geologist, Mackenzie Delta Team Leader
Burlington Resources Canada Energy Ltd.
3700, 250 – 6th Avenue S.W.
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Phone: (403) 260-8059
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(Burlington's Project Contact)

Beric Evans
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Fax: (403) 234-0957
Email: Beric_Evans@br-inc.ca

(Burlington's Geophysical and Project Contact)

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Vice President
Surface Land, Environment & Safety
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Calgary, AB T2P 3H7
Phone: (403) 260-8064
Fax: (403) 263-4098

(Burlington's Alternate Project and Environmental Contact)

Brad Johnston
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3700, 250 – 6th Avenue S.W.
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(Burlington's Environmental Contact)

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Fax: (403) 234-0957
Email: Lee_Nehring@br-inc.ca

(Burlington's Contact for Community Affairs)

CONTACT NAMES AND ADDRESS Cont'd

John Bertsch
Manager, Sales and Marketing
Veritas DGC Land
2700 – 61st Avenue S.E.
Calgary, AB T2C 4V2
Phone: (403) 257-6705
Fax: (403) 257-6789

(Burlington's Seismic Contractor – Calgary Contact)

Wayne Ross
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Calgary, AB T2C 4V2
Phone: (403) 818-5015
Inuvik: (867) 777-3493

(Burlington's Seismic Contractor – Inuvik Contact)

Rudy Cockney
District Manager, North Mackenzie District
Indian and Northern Affairs Canada
P.O. Box 2100
Inuvik, NT X0E 0T0
Phone: (867) 777-3361
Fax: (867) 777-2090
Email: cockneyr@inac.gc.ca

(Indian and Northern Affairs Canada Environmental and General Contact)

Cynthia Py
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Calgary, Alberta T2E 6T6
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(Environmental Consultant for Project Description Report)

John Korec
Environmental Assessment Officer
National Energy Board
Exploration and Production
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Calgary, Alberta T2P 0X8
Phone: (403) 292-6614

(National Energy Board – Contact in the Event of a Spill)

2.0 REGULATORY APPROVALS

Burlington Resources Canada Energy Ltd. (Burlington) is applying to conduct a winter 2000/2001 seismic program in the Mackenzie River Delta region of the Northwest Territories. The project is located within Exploration Licences #393, #394, and #404 on Richards Island, Langley Island, Kendall Island and Ellice Island, and extends offshore to Beluga Bay (Figure 1). These blocks of land are located on Crown lands within the Inuvialuit Settlement Region (ISR). The project falls under Federal, and Territorial regulatory jurisdictions. The primary agencies with jurisdiction over the project include Indian and Northern Affairs Canada (INAC), the National Energy Board (NEB), and the Northwest Territories Water Board. Burlington is seeking a Land Use Permit from INAC, a Geophysical Operation Authorization from the NEB, and a Water Licence from the NWT Water Board.

Other agencies with regulatory interest in the approval process include: Fisheries and Oceans Canada (DFO) with reference to potential effects on fish and fish habitat; the Government of the Northwest Territories (GNWT) Resources, Wildlife and Economic Development (RWED), regarding wildlife and associated habitat; the Canadian Wildlife Service (CWS) for migratory birds and operations within Kendall Island Bird Sanctuary, and Environment Canada in regard to pollution prevention. The Environmental Impact Screening Committee (EISC) is responsible for screening all proposed projects on Crown Land and will be responsible for screening projects on private land, should an Inuvialuit organization or beneficiary refer a project to the EISC. When a screening occurs, the EISC's responsibilities are set out in clause 11(13) of the Inuvialuit Final Agreement (IFA), which reads:

> 11(13). On receipt of a project description, the Screening Committee shall expeditiously determine if the proposed development could have a significant negative environmental impact and shall indicate in writing to the governmental authority competent to authorize the development that in its view:
>
> the development will have no such significant negative impact and may proceed without environmental assessment and review under this Agreement;
>
> the development could have significant negative impact and is subject to assessment and review under this Agreement; and
>
> the development proposal has deficiencies of a nature that warrant a termination of its consideration and the submission of another Project Description.

If the EISC determines that the project may have a significant negative impact, the Project Description will be referred to the Environmental Impact Review Board (EIRB) or other equivalent environmental review process for a public assessment and review pursuant to clause 11(24).

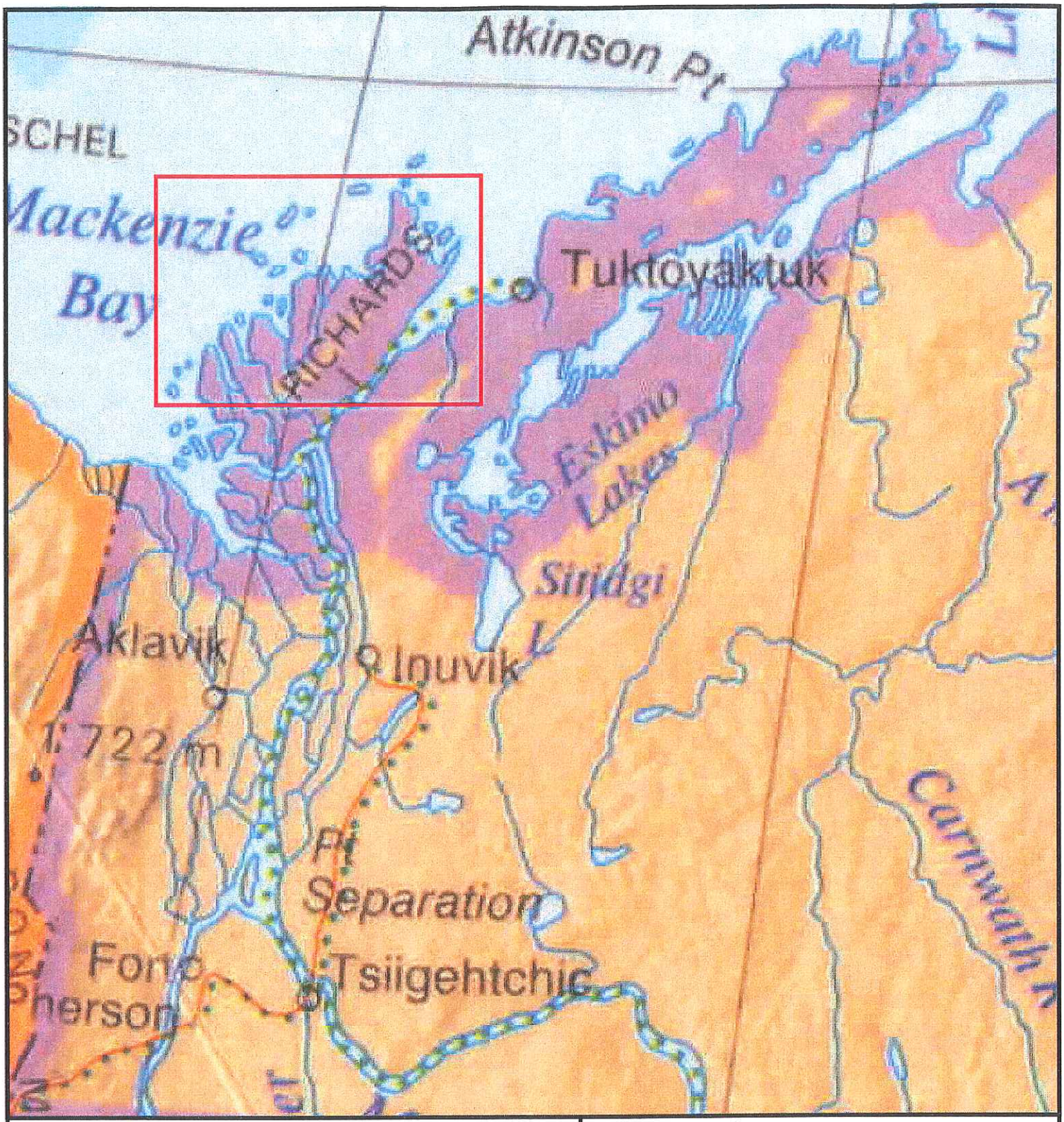
The NEB is the governmental authority competent to authorize the development within the meaning of the IFA. The NEB is also required to conduct an environmental screening of the project pursuant to the *Canadian Environmental Assessment Act* (CEAA), and to consider environmental impacts under its jurisdiction to approve the development under the *Canadian Oil and Gas Operations Act* (COGOA) and applicable regulations.

Regulatory approvals required for this project are summarized in Table 1. Burlington will contact the regulatory agencies listed as appropriate, and will satisfy any requirements they may have in their respective areas of jurisdiction.

TABLE 1

REGULATORY APPROVALS

Agency	Approval Required/*Governing Legislation*	Status
Rudy Cockney District Manager, North Mackenzie District Indian and Northern Affairs Canada P.O. Box 2100 Inuvik, NT X0E 0T0	Land Use Permit *Territorial Land Use Regulations*	Submitted September 13, 2000
Linda Graf Secretary Environmental Impact Screening Committee P.O. Box 2120 Inuvik, NT X0E 0T0	Approval on Project Description/Environmental Protection Plan *Inuvialuit Final Agreement*	Submitted September 13, 2000
Rick Turner Exploration and Production National Energy Board 444 - 7th Avenue SW Calgary, Alberta T2P 0X8	Geophysical Operation Authorization *Canadian Environmental Assessment Act* *Canadian Oil and Gas Operations Act*	Submitted September 13, 2000
Gordon Wray Chairman Northwest Territories Water Board 4920 – 52nd Street P.O. Box 1500 Yellowknife, NT X1A 2R3	Class B Water Licence *NWT Waters Act* *NWT Waters Regulations*	Submitted September 13, 2000
Paul Latour Habitat Biologist, Western Arctic Canadian Wildlife Service 2nd Floor Diamond Plaza 5204 – 50th Avenue P.O. Box 2970 Yellowknife, NT X1A 2R2	Bird Sanctuary Permit *Migratory Birds Convention Act* *Migratory Birds Sanctuary Regulations*	Submitted by September 13, 2000



Inuvialuit Environmental Inc.		**Proposed Burlington Resources Canada Energy Ltd. Project Location**		
Scale 1:1,500,00 0 3km	Legend Proposed Seismic Location Winter Ice Road	698-00	September 2000	Figure 1

3.0 TITLE

Burlington Resources Canada Energy Ltd. Mackenzie Delta Winter 2000/2001 Seismic Program.

4.0 DEVELOPMENT SUMMARY

4.1 Project Scope

The project proposed by Burlington entails the acquisition of 445 km of 2D seismic data within approximately 4200 km^2 of land including portions of Richards, Kendall, Langley and Ellice Islands and extending to the offshore in Beluga Bay (Figure 1). During winter 2000/2001, Burlington plans to shoot up to 27 seismic lines in this area. The lines vary in length from 12 km to 35 km and are spaced at intervals exceeding 1 km (Figure 2). The project will be conducted in two phases. Priority will be given to Phase I, which consists of approximately 350 km of 2D seismic, while phase II is currently planned as a 95 km program. It is anticipated that a minimum of 5 km of seismic can be conducted per day and therefore all lines may not be completed this winter. The results of the seismic program will be used to delineate potential exploratory drill sites and additional exploratory seismic programs.

Veritas DGC Land (Veritas) has been contracted to manage the seismic operations on behalf of Burlington. Veritas will provide the geophysical survey team and equipment required to conduct the seismic program. The seismic crew will be housed in a mobile sleigh camp that will move to predetermined locations as the program progresses (Section 4.3). Seismic operations will commence in January and are anticipated to be complete by late April or May 2001. Mobilization of equipment may begin as early as November, weather and ice access permitting.

Burlington is proposing to use the vibroseis technique as the primary source of seismic input signal into the ground. To allow calculation of refraction statistics, Nodwells carrying vibrators will send source signals into the ground every 50 m along the seismic line. Receivers will be located every 25 m along the lines. Vibroseis will be conducted across lakes with bottom-fast ice only. Personnel will be employed for the duration of the program to determine ice thickness.

When waterbodies that are not frozen to bottom are encountered along the lines, vibrators will be stacked every 50 m on either side of the waterbody to undershoot data. Where waterbodies are too large to obtain data using the stacking method, where lines extend offshore, or where vibroseis methods on land provide poor geophysical data, Burlington is proposing to use the dynamite explosive technique as the source of input signal into the ground. This will entail

drilling shot holes on land, or through the ice and into lakebeds or the seafloor. Various seismic techniques will be employed to mitigate disturbance to fish or fish habitat within waterbodies during the course of the program (Section 4.2.6). The proposed seismic line sets are outlined in Table 2 and illustrated in Figure 2.

TABLE 2

SEISMIC LINE SET DETAILS

Line	Line Length (km)	Line Area (ha)
Phase I		
01-MCK-101	5.289	4.23
01-MCK-102	17.768	14.21
01-MCK-103	12.861	10.29
01-MCK-104	12.37	9.90
01-MCK-105	15.80	12.64
01-MCK-106	17.521	14.02
01-MCK-107	11.449	9.16
01-MCK-108	10.901	8.72
01-MCK-109	9.803	7.84
01-MCK-110	17.322	13.86
01-MCK-111	14.557	11.65
01-MCK-112	35.397	28.32
01-MCK-113	27.921	22.34
01-MCK-114	14.114	11.29
01-MCK-115	13.894	11.12
01-MCK-116	14.014	11.21
01-MCK-117	13.716	10.97
01-MCK-118	13.228	10.58
01-MCK-119	12.616	10.09
01-MCK-120	21.469	17.18
01-MCK-121	22.696	18.16
01-MCK-122	27.533	22.03
01-MCK-123	30.98	24.78
01-MCK-129	16.912	13.53
Subtotal Phase I	**351.332**	**281.07**
Phase II		
01-MCK-101EXT	21.627	17.30
01-MCK-112EXT	10.461	8.37
01-MCK-124	26.306	21.05
01-MCK-125	16.804	13.44
01-MCK-130	19.074	15.26
Subtotal Phase II	**94.272**	**75.42**
TOTAL	**445.604**	**356.48**

BURLINGTON RESOURCES CANADA ENERGY LIMITED

PROPOSED WINTER 2000 / 2001

SEISMIC PROGRAM

- Camp Site / Landing Strip
- Burlington Proposed Seismic - Phase I
- Burlington Proposed Seismic - Phase II
- Access
- Watercourse Crossing > 5m

FIGURE 2

SCALE 1:500,000

Kilometers: 10 0 10 20 30 40 50

Miles: 5 0 5 10 15 20 25 30

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4.2 Seismic Program Description

4.2.1 Line and Access Route Selection

Line locations were based on the interpretation of Burlington's existing seismic and subsurface well data in the delta. Where possible, seismic lines are aligned with existing wells within the project area, in order to reference seismic data with geological data collected from previously drilled wells. Line locations will avoid pingos, archaeological sites and other environmentally sensitive areas in keeping with all regulations. To the extent feasible, the lines will be straight, with offsets or skidding used to avoid these areas. Lines can be shifted by up to 1000 m. Significant changes will be decided upon by the interpreting geophysicists. Setback requirements to be incorporated into the seismic program are summarized in Table 10.

The criteria used for the temporary winter access route selection included:

- utilizing the Inuvik to Tuktoyaktuk winter road as primary access;
- utilizing the Mackenzie River and its associated channels for ice access;
- utilizing seismic lines for access within the project area;
- minimizing disturbance by avoiding areas of steep slopes for access;
- minimizing disturbance by using in-and-out access on the lines so that minimal overland travel is required; and
- minimizing disturbance to sensitive wildlife habitat, soil, hydrological and vegetation areas.

4.2.2 Access Route Construction

Ice roads will be constructed primarily on lakes and river channels found in the vicinity of the project. Surface preparation will consist of clearing snow from the ice. Where lakes and river channels do not access the project area, overland access routes may be required. Construction of overland access routes will consist of snow compaction along the routes chosen. If thickening of access routes is required, water will be withdrawn from the Mackenzie River or a nearby large waterbody and pumped onto the access route. Water withdrawal methods will meet all regulatory guidelines (Section 4.3.3).

Blading may be required over certain stretches of the route, and depressions along the road filled with snow, to smooth the surface. Dozer blades will be equipped with mushroom shoes to elevate the blade, leaving a minimum of 10 cm snow cover on the access routes and thus preventing disturbance to the organic layer. Where wheeled equipment is used, snow will be packed and flooded to minimize ground disturbance. Overland sections will be kept to a

minimum by meandering equipment during operations and utilizing the maximum amount of ice access.

Both electronic and physical ice thickness profiling will be employed during the construction and use of access routes, to evaluate ice conditions for safe travel. Access routes will be selected where slopes are minimal. Where slopes are unavoidable, snow and/or ice ramps will be constructed to prevent erosion and disturbance by equipment. Ice ramps will be constructed using water withdrawn from large, local lakes identified during pre-survey scouting, and the Mackenzie River (Section 4.3.3).

4.2.3 Pre-survey Scouting

Veritas will conduct pre-survey scouting prior to project commencement. This scouting will involve surveying the lines, making location determinations using a Global Positioning Satellite (GPS) system and inserting survey monuments into the ground to mark locations. These monuments will be driven flush with the ground and become public domain. Survey monuments can be used at a later date when survey control is again required, thus negating the need for pre-survey scouting on an annual or project basis.

Pre-survey work should be completed on or before the end of September 2000, in advance of the actual seismic project start date of approximately January 2001. Survey crews using helicopter support will carry out all survey work on foot and use small inflatable crafts in water. No overland vehicle travel is required for the pre-survey scouting portion of the program. Locations to be identified during pre-survey scouting include archaeological sites, pingos, and seismic lines. Survey crews will also be measuring distances across lakes and determining lake depths. This information will be used to determine water availability for withdrawal, fish overwintering capability of waterbodies, and locations of waterbodies that are unlikely to have bottom-fast ice during the course of the program. Pre-survey scouting of lines, access routes and proposed campsites will increase operations effectiveness while mitigating disturbance to areas of ecological concern. Approval to conduct the pre-survey has been given by INAC, which does not require a Land Use Permit (Cockney Pers. Comm.).

4.2.4 Line Production

An initial line survey will be conducted at the beginning of the seismic program, by tracking locations with a Nodwell or equivalent vehicle. Vehicles will be guided using a GPS and will proceed down the line, locating the line and source locations as determined by the geophysicists, and utilizing pre-survey information. Along the lines, receiver points and source locations will

be marked with wooden laths to denote each point and line for the duration of the program. Receiver locations will be positioned along the line at 25 m intervals with energy source points located every 50 m. Seismic line widths will be equal to the width of a Nodwell (approximately 6 m) and shall not exceed 8 m. Wooden laths and flagging will be retrieved as each portion of the program is completed, and used in subsequent sections of the program.

Ice profiling methods will be utilized throughout the program to evaluate the thickness of ice (related to support of the equipment) and to establish whether or not waterbodies are frozen to bottom, thus determining potential fisheries locations along the line. Where waterbodies are frozen to bottom, no year-round fisheries potential will be assumed, and the line will continue over the ice and be completed as designed utilizing vibroseis. Where ice in waterbodies is not bottom-fast and assuming potential year-round fisheries habitat is present, source points will be set back from either side of the waterbody to undershoot the area. Vibroseis will not be conducted on lakes not frozen to bottom. Alternatively, Burlington may choose to use dynamite as the energy source where waterbodies are too large to obtain data using the stacking method, on offshore seismic lines, or where vibroseis methods provide poor geophysical data. These procedures are designed to allow Burlington to achieve the maximum number of source points along the lines while minimizing environmental disturbance (Section 4.2.7).

4.2.5 Line Clearing

Where Burlington's program is situated, little to no line clearing will be required due to a lack of tall trees and shrubs. Bulldozer use is not anticipated, and low pressure wheeled vehicles and tracked units only, will be utilized. The units will be walked over the snow, and vegetation will be driven over, with the impacts related to crushing restricted to the aboveground woody material, leaving the root systems intact. If clearing is required, care will be taken to ensure that there is no organic mat disturbance. Frozen ground conditions, snow cover, low pressure wheeled, and tracked vehicles will minimize impacts to vegetation communities. In the event that lake access is hampered by high banks around lakes (> 1 metre), it will be necessary to construct clean snow or ice ramps for equipment access.

4.2.6 Airstrips

Ice access for ski-equipped airplanes will be created on an as-needed basis at prescribed camp locations for use during crew changes and/or emergency evacuations. If they are required, airstrips will be snow plowed and cleared of above-snow vegetation. Care will be taken during clearing to ensure that there is no organic mat disturbance. Airstrips will be cleared on waterbodies or existing seismic rights-of-way wherever possible.

4.2.7 Energy Source/Shooting

The seismic program will be completed using vibroseis as the primary energy source set at 50 m intervals along all lines. Vibroseis utilizes low ground pressure vibrator units positioned over each of the source points along the line. The vibroseis units themselves are diesel fuelled, track-type vibrators. The tracks minimize pressure on the tundra. Each unit has a metal pad that is extended down to the ground where energy is transmitted by exerting variable pressure on the pads, held against the ground by the weight of the carrying unit. The energy travels in the form of waves and is called the vibroseis signal. The vibroseis signal is input over a period of several seconds. The waves reflect off the various rock layers and return to the surface where they are detected by geophones, which are in turn connected by cables to a recording vehicle.

Where waterbodies are frozen to bottom, no year-round fisheries potential will be assumed, and the line will continue over the ice and be completed as designed utilizing vibroseis. Where ice in waterbodies is not bottom-fast and assuming potential year-round fisheries habitat is present, source points will be set back from either side of the waterbody to undershoot the area. Burlington is proposing to utilize dynamite as a secondary energy source where waterbodies are too large to obtain data using the stacking method, where lines extend offshore, or where vibroseis methods provide poor geophysical data.

Where waterbodies are not frozen to bottom, one of two methods will be employed to place the explosive charges in such as manner as to avoid potential fish habitat disturbance. The first method involves the use of casing surrounding a conventional auger drilling through unfrozen water. Cuttings will be brought to the surface through the casing, where the excess will be removed from the ice, thereby avoiding suspension of cuttings in water during spring melt. The shot hole will be filled with cuttings to seal the charge in the shot hole, below the lake bottom. Excess waste cuttings from shot holes drilled on waterbodies will be collected from the surface and disposed of a minimum of 30 m away from the waterbody. The casing will be removed after the shot is loaded. Charge size will be determined in consultation with the appropriate regulatory bodies.

The second method involves a seismic technology called Vibra-ram to load the charge. The Vibra-ram is inserted into the shot hole once water is reached through conventional auguring, and then utilizes a high frequency hammer / vibration to insert a pipe into the lakebed. The pipe has an explosive charge installed in the end with a plastic drive point located below the charge. Once the charge is inserted to a minimum depth as per setback requirements, the pipe is extracted, leaving the charge and drive point underground. When the pipe is extracted, it creates a small vacuum that causes the lakebed sediments to close back in on the shot hole. Waste cuttings are not produced using the Vibra-ram technology.

Where dynamite is used offshore, a 10 cm wide hole will be drilled using one of the methods described above. Explosives set offshore will be pushed to a minimum depth under the sea floor as specified by DFO. Charge size will be determined in consultation with the appropriate regulatory bodies. Any cuttings brought to the surface through the casing will be removed from the ice, thus avoiding sedimentation and suspension in water during spring melt. Cuttings will be disposed of on land at least 30 m from shoreline. Energy source options related to waterbodies and environmental conditions are outlined in Table 3.

To position the explosive charge in shot holes drilled on land, a 10 cm wide hole will be drilled to a depth of approximately 18 m, a minimum of 50 m setback from a non-frozen waterbody, and a 10 kg charge will be pushed down to the bottom of the hole. Shot holes will be drilled with a combination of air hammer drills and conventional air drills. A small portion of the shot holes are expected to be difficult to drill and may require water to complete. All drilling units will be mounted on Nodwell tracked carriers or the equivalent. Drill hole cuttings will be packed back down the hole to the extent practical, with any remaining cuttings spread out around the hole. The wire lead from the explosive charge will be tied-off onto a lath at surface, and left until shooting. As with vibroseis, drilled holes will be spaced every 50 m.

TABLE 3

ENERGY SOURCE OPTIONS

	Waterbody with Bottom-fast Ice	Waterbody not Frozen to Bottom	
		Small Waterbody (< 400 m width)	Large Waterbody (> 400 m width)
Fish Habitat Assessment	Unsuitable habitat for all life stages in the fall.	Potential habitat for all fish life stages.	Suitable habitat for fish spawning, rearing, and/or feeding.
Seismic Energy Source	Vibroseis or dynamite.	Vibroseis or dynamite undershot on sides of waterbody.	Dynamite.
Waterbody Setback	No setback required.	30 m for vibroseis and 50 m for dynamite.	Minimum depth under lakebed as determined by charge size and in consultation with appropriate regulatory bodies.
Additional Mitigation or Field Work	No debris deposited on ice or in waterbody. No alteration of stream banks or substrate.	Record waterbody location, width and depth. GPS location of source points.	Record waterbody location, width and depth. GPS location of source points.

4.2.8 Laying-out Lines

The primary mode of cable lay-out and retrieval will be line crew personnel supported by tracked units. Depending on weather and availability, the lines may be laid out with the assistance of helicopters. In this instance, helicopters will drop bags of equipment at predetermined locations and the line crews on the ground will unpack the bags of equipment, lay out the equipment and connect all appropriate cables to form a continuous seismic line. Cable and geophones will be layed-out along the side of the tracked line, and geophone strings placed every 25 m.

4.2.9 Recording

The recording unit will be positioned on a Nodwell or similar vehicle, and will travel down the line, hooking up to the cable at the appropriate locations. This unit records information collected by the geophones, which are connected by wire to the recording unit. The unit records information as the vibrator signal is input at each source point. During recording operations for dynamite, the shooter will travel down the line, connect the leads to the detonation unit and detonate the charges for recording. Recording crews should average a minimum of 5 km of progress per day depending upon weather conditions and recording parameters.

4.2.10 Personnel Required

4.2.10.1 Crew Personnel

1 Project Manager
1 Recording Crew Manager
2 Observers
1 Vibrator Technician
1 Mechanic
1 Mechanic helper
1 Administrator
1 Expeditor
1 Equipment Coordinator
4 Vibrator Operators
5 Line bosses
10 Line helpers
1 Fuel driver
Total Crew Personnel: 30

4.2.10.2 Additional Personnel

1 First Aid Attendant/Medic
2 Ice Monitors
1 Wildlife Monitor
1 Environmental Monitor
4 Surveyors
4 Cat Operators
1 Pilot
1 Cook
2 Cook's helpers
1 Camp attendant
1 Front-end loader Operator
1 Fuel truck Operator
1 Engineer
1 Waste truck Operator
Total Additional Personnel: 22

4.2.11 Equipment Required

Equipment will include:

4	Hemi-44 Model 607 track mounted vibrators
1	TVS-60 16 man track personnel carrier
5	Chieftain – 110C track cable geophone units
1	Chieftain – 110C track recorder
1	Chieftain – 110C track charging unit
1	Chieftain – 110C track fuel support unit
1	Chieftain – 110C track vib tech/mechanic unit
1	Chieftain – 110C track Party Manager unit
4	Skidoos
2	additional Foremost - 110C track units for survey and advance crews
1	75-Man Camp sleigh mounted
4	Caterpillars (D7)
1	Loader
5	drills (equipment contingency for dynamite)

Support equipment based out of Inuvik may include:

1	4x4 Truck
1	1-Ton suburban
1	1-Ton crew cab flat deck (Expeditor)
1	Helicopter

4.3 Mobile Sleigh Camp

Seismic operation crews will be housed in a mobile sleigh camp, which will move with the program. The camp will consist of three trains of sleigh-mounted trailers, hauling fuel storage, a snow melter, incinerator, generator, recreation trailer and staging sleigh. D7 Caterpillars will pull the trailers along the line. On sloping terrain, the camp trains can be separated into individual trailers and pulled up slopes using a winch system. This will minimize disturbance on slopes that might result from the use of cats pulling equipment on steep terrain. The sleigh camp will remain in one location on the line for a short period of time, usually less than a few days. Approximately 13 potential locations for the sleigh camp have been identified for Burlington's program, which may be re-used as lines are shot (Figure 2, 3 and 5). The re-use of camp locations where possible will minimize additional disturbance within the project area. Final

camp locations will be identified during pre-survey scouting. No additional clearing is required to accommodate the camp, as it will follow access routes created for seismic lines.

The sleigh camp will consist of three strings of trailer type ski equipped structures. Diagrams of the proposed sleigh camp are found in Appendix B. The following breakdown further details the camp layout:

String A
Trailer 1 – Water Melter and Generator
Trailer 2 – Utility area and washrooms (male/female)
Trailer 3 – 8 Man sleepers
Trailer 4 – 8 Man sleepers
Trailer 5 – 8 Man sleepers (optional)

String B
Trailer 1 – Food Storage and Generator
Trailer 2 – Kitchen
Trailer 3 – Recreation Trailer/First Aid
Trailer 4 – Office/Sleeper
String C
Trailer 1 – Workshop and Generator
Trailer 2 – 8 Man sleepers
Trailer 3 – 8 Man sleepers
Trailer 4 – 8 Man sleepers
Trailer 5 - 8 Man sleepers

4.3.1 Fuel Storage

Fuel storage for the camp will consist of six individual sleighs, each holding two 2000-gallon fuel tanks, and two individual sleighs, each carrying one 500-gallon fuel tank. All tanks will be double walled, enviro-tanks, fitted with a Fuel-Com fuelling system. The Fuel-Com system is an aircraft style, spill-proof fuelling mechanism made of interlocking nozzles and receptacles (Section 10.4). All tanks and fuelling procedures will adhere to safety standards outlined within Veritas' Fuel and Oil Spill Contingency Plan (Appendix C). Spill recovery and fire fighting equipment will be present at all times.

4.3.2 Wastewater Treatment and Disposal

The mobile sleigh camp is equipped with electric toilets that eliminate sewage waste through incineration. The resulting ash is inert and will be spread out on the ground near the camp locations. Grey water that includes only shower water, wash water and kitchen water will be temporarily collected in snow-bermed lagoons. When the camp moves on, the lagoon will be scraped up and spread out over the land as per NWT Water Board Water Licence conditions.

The mobile camp is additionally equipped with an incinerator. Solid refuse will be disposed of by incineration. Any other non-combustible material will be hauled out and disposed of in an approved landfill site. Additionally, Veritas will track all waste produced during operations as part of regular safety reporting procedures.

4.3.3 Water Use

Utility water for the mobile camp will be obtained using a snow melter. Drinking water will be trucked to camp from the nearest community and will travel with the camp and crew. Water that is required for ice access, building snow ramps, and possibly as a supplementary camp source, will be obtained from channels of the Mackenzie River and from nearby lakes or non-frozen streams. Lakes near camp locations will be identified during the pre-survey scouting, and maximum withdrawal rates will be determined based on the depth of the lake. Water withdrawal rates are not expected to exceed 16 m^3 per day throughout the program. The water will be extracted at a point where the seismic line intersects with the waterbody, and intake hoses will be screened with 1.3 cm (0.5") wire mesh to avoid impingement or entrainment of fish.

5.0 ALTERNATIVES

The seismic line sets have been located to maximize the amount and quality of data collected, in reference to existing data from past seismic programs and geological data from exploratory wells in the project area. Alternative locations may not fulfill the geophysical requirements of the program. However, the lay-out of the seismic lines may be adjusted as necessary to mitigate any potential impact identified prior to or during the program operations. This report provides an environmental assessment of the project, and identifies any sensitive or significant features that should be avoided, as well as determining any site-specific mitigative measures where appropriate. Sensitive sites identified during the preparation of this report will be located during the pre-survey scouting and will be placed into a GPS database for reference throughout the program. Alternative energy source methods are outlined in Section 4.2.7 and Table 3.

6.0 CUMULATIVE EFFECTS

Cumulative effects refer to the impacts on the environment that result from the combination of past, existing and imminent projects and activities. Recent activities within the vicinity of the proposed project include seismic exploration from winter 1999/2000, as well as ongoing additional land activities such as trails and campsites. Oil and gas exploration took place in the area during the 1970s and 80s.

Other oil and gas exploration activities will take place in the area adjacent to the Burlington seismic program during the winter 2000/2001 season. AEC West Ltd. (AEC) will be conducting a winter 2D seismic program in Exploration Licence #384 and #385 to the east and southeast of the Burlington project area from January to April 2001 (Figure 3). Burlington and AEC have identified proximal seismic line locations and have altered their lines to occupy the same location. The net benefit of this alteration is a reduction in total line length by approximately 16 km, thus minimizing impacts to the environment that might result from parallel or overlapping lines. Veritas DGC is the seismic contractor for both the Burlington and AEC seismic programs. The use of the same contractor ensures that the projects will be coordinated to minimize impacts caused by simultaneous operation of the projects in a common area.

Petro-Canada will be conducting a winter drilling program and seismic program in Exploration Licence #395 to the west of the Burlington project area (Figure 3). There is no project overlap between Petro-Canada's activities and the proposed Burlington seismic program.

In addition, Chevron is proposing to conduct seismic exploration in the Inuvik 1 and 2 Blocks, south of the Burlington program. The Chevron program does not overlap the Burlington seismic project.

As well, construction and operation of the winter road to Tuktoyaktuk from Inuvik will be ongoing during the seismic program. There will be additional activity on these roads primarily during mobilization and demobilization operations. Traffic at other times is expected to be insignificant and irregular. Previous oil and gas exploration activities, in addition to the currently proposed project are shown in Figure 3. Figure 3 also illustrates future seismic exploration proposed by other oil and gas operators, which may be located in the vicinity of the project.

Traditional land use activities are anticipated to be ongoing during Burlington's project operations. To mitigate cumulative effects on traditional activities in the project vicinity, Burlington and other project proponents are working with local communities and Hunter and Trappers Committees, to identify sensitive areas and times to minimize or avoid activities.

Residual effects from this project are predicted to be low in magnitude and local in extent. If seismic results are positive, future developments within the project vicinity may include exploratory well sites and additional seismic exploration. In a manner similar to the currently proposed project, future development will be planned with consideration of environmental impacts and appropriate mitigative measures.