

**N.E.B. Authorization # 9229-N46-2E
Sahtu Land & Water Board Land Use Permit # S00B-003**

Report Date: January 8th, 2002

Work Period: February 12th to March 30th, 2001

**FINAL REPORT
for
MACKAY AREA
Tertiary Creek Prospect
Block EL - 397
Northwest Territories**

LOCATION:

Latitude: 64° 19' to 64° 31' Longitude: 125° 45' to 126° 15'

**Block Operator:
Northrock Resources Ltd.**

**Project Operator:
Northrock Resources Ltd.
3500, 700 - 2 Street S.W.
Calgary, AB
T2P 2W2**

**Acquisition Contractor:
Trace Explorations Ltd.**

**Project Supervisor:
NBK Oilfield Services Ltd.
on behalf of Northrock Resources Ltd.**

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ENCLOSURES

FINAL SEISMIC SHOTPOINT BASE MAP

FINAL ACCESS PLAN & LINE WIDTH DATA SHEET

INTERPRETED NORMAL POLARITY SEISMIC SECTIONS FOR LINES:

2001-TERT-003
2001-TERT-004
2001-TERT-005
2001-TERT-006
2001-TERT-007

INTERPRETIVE SEISMIC MAPS:

- Cretaceous Radioactive Shale Time Structure
- Devonian Hume Time Structure
- Pre-Cambrian Time Structure
- Radioactive Shale to Hume Isochron
- Hume to Pre-Cambrian Basement Isochron

1. INTRODUCTION

The MacKay project site is known 'in-house' at Northrock Resources Ltd. as Tertiary Creek 2001. This program is located in the Mackenzie River Valley of Northwest Territories. The project area is south of the community of Tulita (Fort Norman).

The Tertiary Creek 2001 Seismic program was conducted in the winter of 2000-2001. Trace Explorations Ltd. handled the compilation of Sahtu Land and Water Board and NEB applications and Northern EnviroSearch conducted and completed the environmental study portion. Trace Explorations Ltd. conducted the dynamite geophysical field acquisition. All the parties were working on behalf of Northrock Resources Ltd.. Northrock Resources Ltd. acted as the operator and the geophysical survey was for the exclusive use of Northrock Resources Ltd. and partners.

The work period was from February 12th, 2001 to March 30th, 2001, and employed, at any one time, between 30 and 50 people involved in all phases of the operation.

Mr. Bill Busby, of Trace Explorations Ltd., was the Base Manager. He was situated in the base camp in Norman Wells. Mr. Randy Dohlman, of Mercedes Surveys, handled the hookup of GPS units on the bulldozers prior to directing the establishment of line locations and line clearing operations. Mr. Craig Bryant, of Phillips Seismic Surveys, assisted with establishment of the access, line locations, line clearing operations, surveyed lines and monitoring slashing operations. Mr. Steve Goacher, of Trace Explorations Ltd., was the Project Manager, who co-ordinated the dynamite seismic operations.

In order to acquire seismic data in this extremely difficult terrain an heli-portable operation was necessitated at a cost in excess of \$75,000 per km. All phases of the seismic operations were based from one camp located nearly 30kms from the centre of the approved program, at the base of a steep incline leading up to the Flintstone Plateau, just off Stewart Lake, at Lat. 64 20 and Long -125 19. All field personnel were transported daily to and from the job site, via helicopters from this campsite.

This project was submitted for Land Use approval to the SAHTU Land and Water Board on November 27th, 2000 and approval was granted on January 10th, 2001. Application to the National Energy Board was submitted on November 10th, 2000 and granted on January 1st, 2001.

2. WEATHER & TERRAIN

Weather conditions for this program were in the temperature range of -45° to $+10^{\circ}$ Celsius throughout the course of the operations. Most of the working conditions were from -25° to around 0° . Working up on the higher elevations of the Flint Stone Range provided relatively milder conditions due to the wind flow over this area. Down in the lower terrain areas the temperature was between 5° to 15° degrees cooler. Due to the temperature differences between camp and the work site weather days were encountered as a result of fog and wind conditions hanging over the Flint Stone range and project area. Below -40° temperatures shut down the operations because the A-Star helicopter operation limits.

This project area was primarily on the higher ground on the southwestern plateau off the Flint Stone Range. Surface conditions in the areas off the shoulder of the Flint Stone Range consisted of spruce timber and fairly flat terrain given the fact the program worked around the steep ravine areas. NO VEHICULAR OPERATIONS were conducted in the areas above the tree line as specified by environmental concerns learned from previous projects.

3. LOGISTICS & SUMMARY

The Base Staff in Norman Wells arranged personnel movements, purchased fuel, foods and other essential supplies to ensure ongoing operations of the field crews. Personnel in transit through Norman Wells stayed primarily at the Trace Base Camp facilities in Norman Wells – if no room was available local hotels were utilized.

Canadian North Airlines was used to transport personnel, equipment and supplies from the south.

Local fixed wing support, for chartering local personnel and handling of emergencies, was primarily provided by North-Wright Airways Ltd. of Norman Wells. Aircraft utilized were a Cessna 172, a Cessna 206 and a Cessna Caravan. All fixed wing aircraft were on wheels as the old Forestry airstrip was cleared helping the local interests, as well, with access into this area.

Norman Wells Claimant Corporation Ltd. provided rotary wing support for scouting, personnel transfer, critical supplies, possible medical evacuations (if required) and general operations. Helicopter utilized in this heli-operation were a Bell 206, a Bell 206 Long Ranger, an A-Star 350B and a Bell 212.

All snow machines were sourced from the local community. MacKay Range Contracting provided 8 machines to the Trace Explorations operations and 2 machines directly controlled by the monitors. Willow Lake Slashing provided 7 machines for their slashing operations.

Some personnel came from the south (i.e. Calgary – point of hire). However, the local component of Northwest Territory's residents comprised of approximately 64% of worker days. Time off periods were determined by self-requests given that replacement personnel were available.

Daily fuel consumption averaged approximately 3850 litres of diesel and 215 litres of gasoline. Fuel and lubricants were purchased from a supplier in Norman Wells. Aviation fuel was purchased in barrels and supplied by Norman Wells Claimant Corporation Ltd..

Upon completion of the operations all equipment was moved back to Norman Wells.

4. SAFETY, HEALTH & ENVIRONMENT

Environmental concerns were addressed in a report provided by Northern EnviroSearch Ltd.. While specific concerns were addressed about working above the treeline the program was structured this year to avoid any vehicular operations in the areas above treeline. In the view of the present operator, Northrock Resources Ltd., all pertinent issues were addressed in the Traditional Knowledge Study meetings and the Access and Benefits package Agreements.

Environmental monitoring was onsite once the camp moved onto the access road into Stewart Lake until the camp exited the program area at the Mackenzie River. Environmental Monitoring Reports were submitted daily and distributed to the Project Manager (daily), Steve Deschene (weekly) and Tullita District Lands. Reports were reviewed with the monitors and corrective actions were taken when required. Follow-up was initiated to ensure standards and quality were maintained.

A fully equipped survival shelter supplied by Weatherhaven Ltd, was available on the job site and supplied with all necessary First Aid supplies. A field radio, satellite telephone and/or mobile radio telephone were available to communicate with the crew and the outside. A snow machine and body sleigh with jump pack and oxygen were available 24 hours a day for any difficult field emergency. The helicopters were stationed full time, it took pressure off any emergency due to the quickness of time to be on site. A paramedic was at the worksite during all facets of the operations.

Field operations were inspected by Mr. Rick Turner, of the National Energy Board based in Calgary, and several times by Mr. Steve Deschene, Resource Management Officer III, of Indian and Northern Affairs Canada based in Norman Wells.

Copies of all safety meetings, audits, etc. were forwarded to the National Energy Board and to Northrock Resources Ltd.

5. LINE CLEARING OPERATIONS

All lines were cat cut to an average of less than 6.0 metre width; the reason for this was to overcome the deep snow conditions and the potential drifting problems due to the windy nature of the Flint Stone Range. This was essential to the overall data quality and worker safety on this program. Hand slashing was utilized to go through ravines in order to minimize any environmental damage due to steep terrain eroding.

The program largely consisted of new cut line. All of the cat cut was windrowed to either side of the lines with breaks to allow wildlife access and to eliminate a continuous fire fuse. The debris was bucked and slashed.

All slashers had snow machines and were transferred by helicopter back and forth to the camp depending upon their location of work.

Creek crossings were constructed of man-made snow fills other than on the access into the project. All crossings were removed before the crew left the area.

6. SURVEYING OPERATIONS

Mr. Lorne Kelly, of Mercedes Surveys located in Alberta, was the Survey Manager providing quality control and supplied equipment to the crew on this project. Mr. Lorne Kelly, of Mercedes Surveys, was the Project Surveyor in the field responsible for the line locations and survey. Mr. Randy Dohman, of Mercedes Surveys, was the catpush handling the day-to-day field operations of establishing the line locations physically in the field. Mr. Craig Bryant, of Phillips Surveys, was the catpush who assisted in handling the establishment of access from Stewart Lake, assisted with the day-to-day field operations including the supervision of slashing and helped with the GPS survey. Mr. Lorne Kelly, of Mercedes Surveys, was the head surveyor responsible for the GPS survey on the prospect.

A chaining crew placed flagging at the station intervals and identified the shotpoints. Shotpoint and geophone intervals were established by using a surveyor's steel chain. Chaining notes were prepared every evening for the field operations and a final copy forwarded to the client at the completion. A survey crew recorded the point locations by GPS. A Novatel GPS system was used to establish the control and survey the locations of lines and access. Control was based upon Geodetic Survey of Canada benchmarks.

All survey work was performed in the metric system.

7. DRILLING OPERATIONS

Hertz Drilling Inc., of Carstairs Alberta, provided all 7 hell-drill units. Mr. Reg Zebedee was the Operations Manager who provided the detailed logistics and equipment for the operations. Mr. Wayne Fox was the drillpush on site. Mr. Bob Zebedee was the drill mechanic on site stationed at the KP 160 remote site, by the Enbridge station on the main Winter Road. The drill shop could not be brought to camp as the access road was not sufficient for semi-trailer units. In addition to the above mentioned personnel the drilling crew consisted of 14 personnel.

Explosives was supplied by Western Explosives of Calgary.

The hell-rigs were driven on a flat bed loader from Carstairs to KP 160, then flown with a Bell 212 helicopter from KP 160 to the program area.

The hell-rigs average 4.6 shotpoints per rig per day, excluding one weather day and two mob / demob days.

Two of the seven hell-rigs were experimentally mounted on FN-60 Nodwells to evaluate if production could be increased. No advantage was realized by this method; the hell-rigs were the superior approach in this terrain.

8. RECORDING OPERATIONS

Instruments	Sercel SN388
Number of Traces	240 channels
Geophone Type	Sensor SM-4
Geophone Frequency	10 Hz
Geophone Array	6 geophones over 20 metres (spacing)
Sample Rate	2 milliseconds
Record Length	4 seconds
Anti-Alias Filter (high cut)	½ Nyquist
Low Cut Filter	out
Preamplifier Gain	12 db
Receiver Interval (group interval)	20 metres
Source Interval (shot point)	160 metres (line 7 was 200 metres)
Extra Source Points	3 (line 7 was 4)
Fold	1500% (line 7 was 1000%)
Spread	2400m – 20m - X – 20m– 2400m
Roll in	120 traces live
Source	Dynamite
Number of Shotholes	Single hole
Shothole Depth	15 meters
Shothole Charge Size	3 kilograms

The recording crew removed all flagging, lath and survey markers upon completion of their operations on the project.

Recording personnel were based at the camp situated at Stewart Lake. All recording operations were hell-portable including the recorder.

9. DATES OF OPERATIONS

Camp Mobilized	February 12 th , 2001
Camp Demobilized	March 30 th , 2001
Line Clearing Commenced	February 23 rd , 2001
Line Clearing Demobilized	March 8 th , 2001
Slashing Mobilized	February 26 th , 2001
Slashing Demobilized	March 12 th , 2001
Surveying Commenced	March 13 th , 2001
Surveying Demobilized	March 21 st , 2001
Experimental Nodwell Heli-Drills Commenced	March 2 nd , 2001
Experimental Nodwell Heli-Drills Demobilized	March 13 th , 2001
Heli-Drills Commenced	March 2 nd , 2001
Heli-Drills Demobilized	March 13 th , 2001
Recording Mobilized	March 14 th , 2001
Recording Demobilized	March 25 th , 2001

10. RECORDING PRODUCTION SUMMARY

Total Kilometers Surveyed	41.52
Number of Shotpoints	291
Number of Stations	2081
Number of Recording Days	10 days excluding weather day
Kilometers Recorded per Day	4.152
Days Mobilized / Demobilized	2 days
Days Lost Due to Weather	1 day
Days Lost Due to Equipment Failure	none

11. RECORDING PRODUCTION

DATE	LINE NUMBER	NUMBER OF SHOTS	KILOMETERS	HOURS	COMMENTS
Mar. 14 th				13.0	Mob/Safety and orientation
Mar. 15 th	TERT-006			11.5	3.16 kms layout
Mar. 16 th	TERT-006			11.5	Slung recorder to line 6 5.56 kms layout line 6 and 1.78 kms layout line 5
Mar. 17 th	TERT-006	63	8.72	12.5	
Mar. 18 th	TERT-005			12.5	6.38 kms layout line 5
Mar. 19 th	TERT-005	69	9.76	12.5	1.6 kms layout line 5 and 2.4 kms layout line 3
Mar. 20 th	TERT-003			13.0	7.32 kms layout line 3
Mar. 21 st	TERT-003	68	9.72	13.0	1.2 kms layout line 4
Mar. 22 nd	TERT-004			8.0	Weather day
Mar. 23 rd	TERT-004	48	6.34	12.5	5.14 kms layout line 4
Mar. 24 th	TERT-007	44	7.0	12.5	7.0 kms layout line 7
Mar. 25 th				12.5	Pickup and equipment flown to camp
Mar. 26 th					Demob

12. PERSONNEL

Recording	1	Project Manager
	1	Field Clerk (stationed in Norman Wells)
	1	Instrument Technician
	1	Observer
	2	Shooters
	2	Trouble Shooters
	17	Line Crew Helpers
	1	Mechanic
	1	Camp Water Hauler
	1	Fire Camp Cat Operator
Camp	1	Cook
	1	Cook's Helper
	2	Camp Staff
Fuel Supply	1	Delta III Fuel Hauler
Medic	1	Paramedic
Surveying	1	Catpush Manager
	1	Catpush
	2	Surveyor
	1	Head Chainer
	1	Survey Helper
Line Clearing	1	Cat Foreman
	4	Cat Operators
Slashing	8	Hand Cutters
Monitors	2	Monitors
Base Camp Norman Wells	1	Base Manager
	1	Expediter / Technical Support
	1	Supply Driver
	1	Cook
	1	Camp Staff
TOTAL PERSONNEL		

13. EQUIPMENT

Helicopters	1	A-Star 350B
	1	Bell 212
	1	Bell 206 long ranger
	1	Bell 206
Recording	1	Hell Recorder Unit
	2	Shooters Snow Machines
	2	Trouble Shooters Snow Machines
Camp	4	Camp Cats
	1	4x4 FN 250 Mechanic Unit
	1	Delta III Supply / Fuel Unit
	1	Party Manager Snow Machine
Medic	1	Paramedic Snow Machine
	1	Paramedic Body Sleigh
Surveying	2	Survey Snow Machines
	2	Chaining Snow Machines
Monitors	2	Monitor Snow Machines
Line Clearing	4	Cats
	1	Delta II Supply / Fuel Unit/Cat Foreman Unit
Slashing	7	Snow Machines
Camp	1	FN 110 Nodwell Water Truck
Base Camp Norman Wells	1	1 - 4X4 Pickup
	1	4X4 1- ton truck

14. SEISMIC PROCESSING

The seismic data was processed by Mr. David Sherwood, of Eclipse Seismic Data Processors, Calgary, Alberta, using Paradigm software.

Deconvolution of the data was carried out by using a Time variant surface consistent minimum phase operator, followed by a Time variant zero phase decon, to whiten the bandwidth.

The data was corrected with both the weathering and elevation statics, to a seismic datum of 1100m ASL, using a replacement velocity of 3000 m/sec.

Due to the complex nature of the observed structures, the data was migrated pre-stack, using a Kirchoff algorithm.

No post stack noise attenuation was applied to the data, however a 500ms AGC was required to image the data below the over thrust.

For a detailed processing sequence refer to the side labels on the accompanying sections.

15. SEISMIC INTERPRETATION

The program was designed to detail a multi-stage structural complex, initially identified on the 1999 GSC regional Aeromagnetic program, and validated by the earlier Northrock 2000 2D Vibroseis seismic program.

The data was tied to the previous survey, which had been interpreted using synthetic seismograms created from the Little Bear wells, and the Tate J-65 and B-30 wells, and extrapolated into the project area using the digitally scanned N.E.B. public file data available from Lynx Information systems. The key seismic reflectors of the Cretaceous Radioactive shale marker and the Devonian Hume platform, were interpreted from this method. The eroded Pre-Cambrian Basement was interpreted from thickness calculations from a selection of wells throughout the Mackenzie Basin, and is highlighted by an angular unconformity at the top of the Mackenzie Mountains Supergroup, as defined by Don Cook and Bernie Maclean of the GSC.

Three key time structure maps were produced from the Cretaceous Radioactive shale marker, the Devonian Hume platform, and the Pre-Cambrian Unconformity. There was also two isochron maps produced. The first from the Cretaceous Radioactive Shale to the Devonian Hume, to produce an approximate isopach of the Imperial Shale; and the second from the Devonian Hume to the Pre-Cambrian Basement to produce an approximate isopach of the Devonian/Ordovician carbonate section. These are included with the report.

The data has defined a structural complex, with closure at the Devonian Nahanni/Hume level, which should be tested as part of the remaining EL-397 work commitment.

Mercedes Surveys Line Width Data Sheets

9229 - v 16 - 55 11

PROSPECT:

TERTIARY CREEK SPRING 2001

	BOL	EOL	KM LAKE	WIDTH	HA	KM NEW CUT	WIDTH	HA	KM HANDCUT	WIDTH	HA	KM EXISTING	WIDTH	HA	DETOUR	WIDTH	HA	TOTAL KM
TERT-003	101	586			0.00	8.90	5.5	4.90	0.8	1.3	0.10			0.00			0.00	9.70
TERT-004	101	418			0.00	6.34	5.5	3.49			0.00			0.00			0.00	6.34
TERT-005	101	589			0.00	9.32	5.3	4.94	0.44	1.3	0.06			0.00			0.00	9.76
TERT-006	101	537			0.00	7.84	4.88	3.83	0.88	1.35	0.12			0.00			0.00	8.72
TERT-007	101	451			0.00	7.00	5.63	3.94			0.00			0.00			0.00	7.00
TOTAL			0.00		0.00	39.40		21.09	2.12	0	0.28	0.00		0.00	0.00	0	0.00	41.52
TOTAL KM						41.52												
TOTAL HA						21.37												

	KM LAKE	WIDTH	HA	KM NEW CUT	WIDTH	HA	KM HANDCUT	WIDTH	HA	KM EXISTING	WIDTH	HA	DETOUR	WIDTH	HA	TOTAL KM
ACCESS from Winter Road			0.00			0.00			0.00	170.35	8	136.28				
Less Existing Northrock Access										35.82	8	28.66				
Total New Access										134.53		107.62				
Overcut										2.3	8	1.84				
Campsites										6		6.60				
Airstrip												7.68				
Helipads												11.16				
31X.36 ha																
TOTAL	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	142.83		134.30				
TOTAL KM										142.83						
TOTAL HA												134.30				

TOTAL LINE PLUS ACCESS KM	184.35
TOTAL LINE PLUS ACCESS HA	155.67