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105

COBEQUID IV

433048

EXPLORATION PROGRAM 1977

on parts of 11 E 11 A, B, C and D.

Part 1 of 5

11E/11B 54-D-16(01)

433048

11E/11B 54-D-16(01)

COBEQUID IV

433048

EXPLORATION PROGRAM 1977

on parts of 11 E 11 A, B, C and D.

Part 1 of 5

A REPORT ON

Airborne Geophysics
Geochemistry
Geological Mapping
Diamond Drilling
Ground Geophysics

COBEQUID IV

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MAPS ENCLOSED IN POCKETS

Part 2 ✓

Plates D 25 ✓, D 26 ✓, D 27 ✓ - g
E 25 ✓, E 26 ✓, E 27 ✓,
E 28 ✓ - g

Geological Compilation 1 in = 1/4 mile

Geological Surveys
Whole Rock 1 in = 1/4 mile

Plates D 26 ✓, D 27 ✓, - f
E 25 ✓, E 26 ✓, E 27 ✓ - f

Ground Geophysics

Plate IIIa ✓

EM 16 1 in = 400 feet

Part 3 ✓

Airborne Geophysics

Plates D 25 ✓, D 26 ✓, D 27 ✓ - ma
E 25 ✓, E 26 ✓, E 27 ✓
E 28 ✓ - ma

Magnetics 1 in = 1/4 mile

Plates D 25 ✓, D 26 ✓, D 27 ✓ - mc
E 25 ✓, E 26 ✓, E 27 ✓,
E 28 ✓ - mc

VLF EM (vertical) 1 in = 1/4 mile

Part 4 ✓

Plates D 25 ✓, D 26 ✓, D 27 ✓ - md
E 25 ✓, E 26 ✓, E 27 ✓,
E 28 ✓ - md

VLF EM (horizontal) 1 in = 1/4 mile

Plates D 25 ✓, D 26 ✓, D 27 ✓ - mo
E 25 ✓, E 26 ✓, E 27 ✓,
E 28 ✓ - mo

EM 1 in = 1/4 mile

Part 5 ✓

Radiometric

Plates D 25 ✓, D 26 ✓, D 27 ✓ - mq
E 25 ✓, E 26 ✓, E 27 ✓,
E 28 ✓ - mq

U Contours 1 in = 1/4 mile

Plates D 25 ✓, D 26 ✓, D 27 ✓ - mp
E 25 ✓, E 26 ✓, E 27 ✓
E 28 ✓ - mp

U/K ratios 1 in = 1/4 mile

Plate Ids ✓

Section 96+00 East

mq

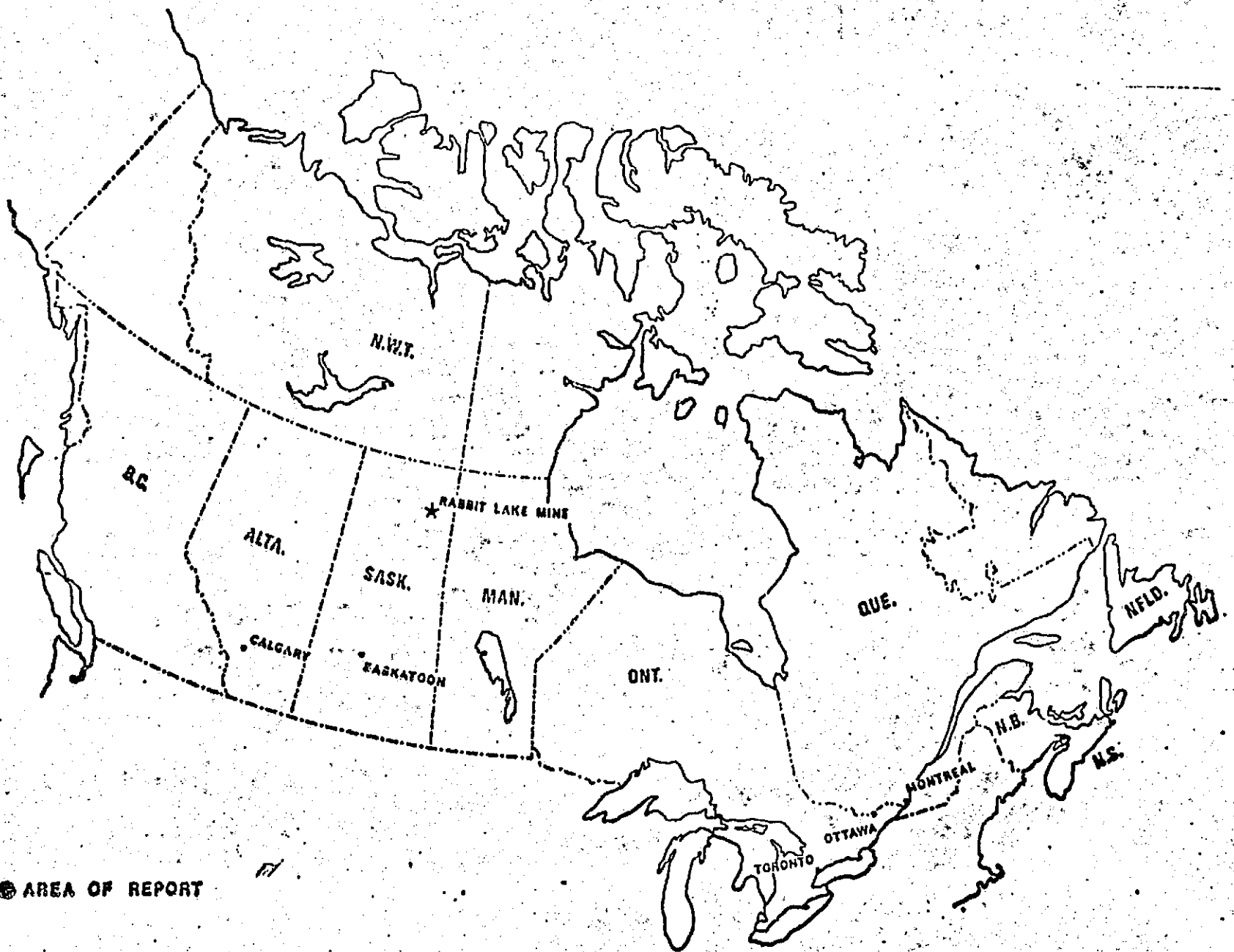
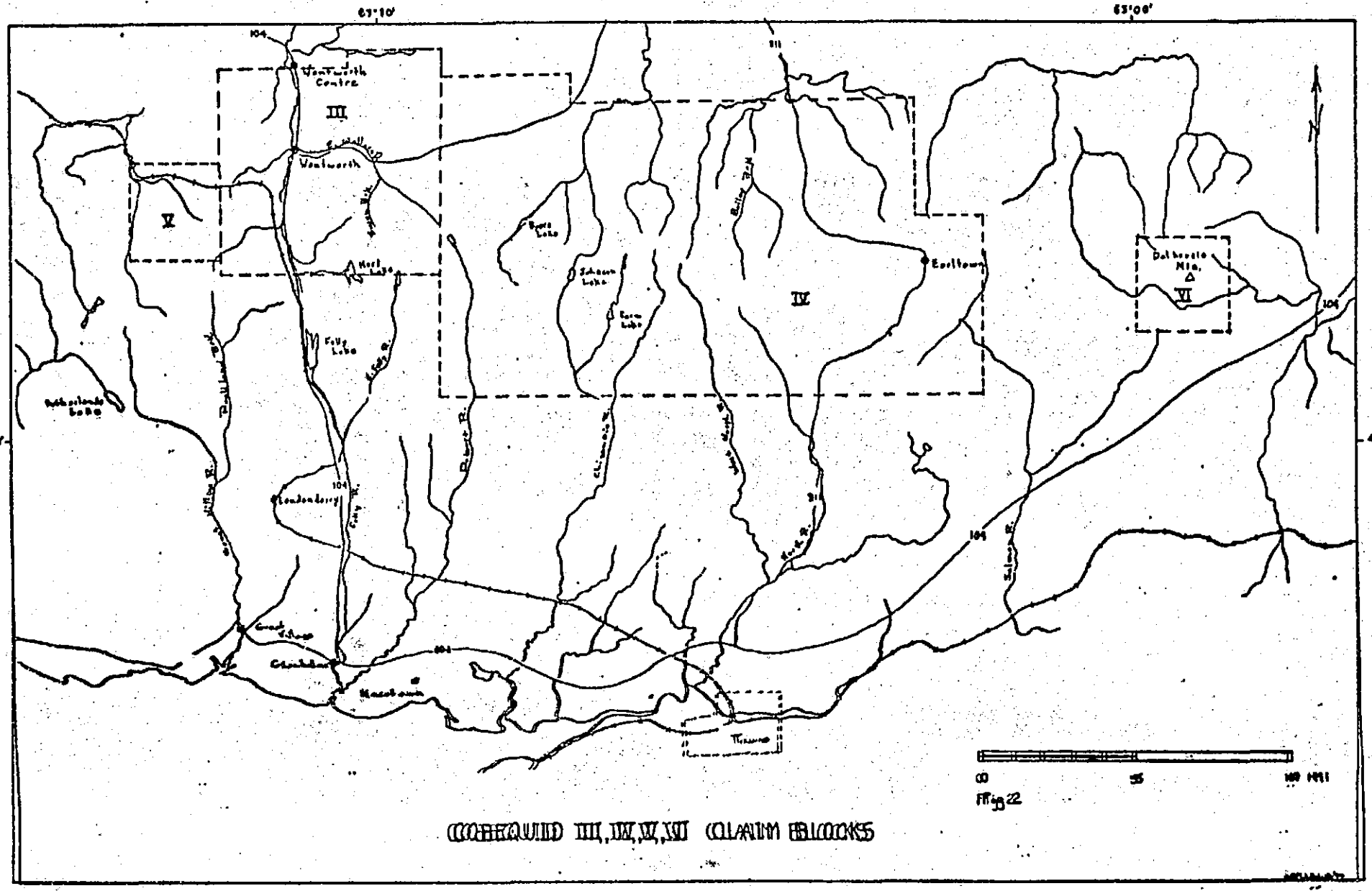

N.W.T.
B.C.
ALTA.
SASK.
MAN.
ONT.
QUE.
NFLD.
N.B.
N.S.
RABBIT LAKE MINE
CALGARY
SASKATOON
TORONTO
OTTAWA
MONTREAL
AREA OF REPORT

FIGURE 1



COBEQUID III, IV, V, VI CLAIM BLOCKS

COBEQUID IV EXPLORATION PROGRAM
1977

I INTRODUCTION

a) Summary

On December 14, 1976, Gulf Minerals acquired 2688 claims centred on Byers Lake, Colchester County, Nova Scotia. This block of land has been referred to as Cobequid IV. Table I lists the claim blocks and exploration licenses held by Gulf.

Early in May 1977, helicopter-borne radiometric, magnetic and electromagnetic surveys were conducted over the property. This was followed by prospecting, geological mapping, geochemistry and ground geophysics. A diamond drilling program was initiated in early November.

On the basis of work carried out in 1977, Gulf Minerals will retain 1854 claims for future work. Land retained for 1978 is listed in Table I.

b) Personnel

For the 1977 field season, Gulf personnel employed on the property were:

K. Carruthers	Junior
M. Cullen	Geologist
M. DeBriske	Geophysicist
N. Downey	Project geologist
W. France	Geophysical operator
J. Halonen	Prospector
C. Hansuld	Junior
J. Harper	Geologist
M. Hollenan	Geologist
W. Lahti	Prospector
T. McDonald	Geologist
J. McNeil	Prospector
P. Nabigon	Prospector
J. Possobon	Junior
A. Seifried	Junior
M. Simpson	Geologist
R. Smith	Prospector
K. Tattrie	Geophysical Operator
P. Titley	Junior
M. Weber	Logging Technician
A. Workman	Geologist
S. Bagnell	Cook
L. Cameron	Cook
P. Cameron	Cook
R. Madore	Cook
E. MacPherson	Cook

Contractors employed on the property included:

St. Lambert Drilling - Valleyfield, P.Q.
Sanders Geophysics - Ottawa, Ontario
Scintrex Limited - Concord, Ontario
M. Smith Linecutting - Bathurst, N. B.
R. B. Allen, Consulting Geologist - Toronto, Ontario
C. Weatherbee, backhoe operator - Wentworth, Nova Scotia

Field crews were under the supervision of Mr. C. R. Burkhart and Mr. G. Pearson of Gulf's Toronto Office.

c) Expenditures

Accounting Code	08205	08136
Land & Lease Acquisition	5196	
Salaries	55044	6812
Travel	6840	3348
Car Allowances	268	177
Business Lunches	5	
Employee Benefits & Other	4655	529
Electricity Consumed		080
Other Fuels & Power	1747	1443
Other Materials & Equipment	334	1616
Office Supplies		95
Periodicals, Book & Maps	12	671
Food	4846	3300
Camping Supplies	976	648
Expendable Tools	133	87
Other Consumable Supplies	517	1367
Retainer and Consulting Agreements		3865
Chemical Analysis Fees	834	12632
Other Personal Services	390	256
Geophysical Parties Contracts	19882	
Drilling Contracts		1800
Geophysical Parties Contracts Airborne	101740	47436
Other Work Contracts	814	45087
Air Charter Fixed Wing	15	192
Air Charter Fixed Wing		11
Postage & Postal Charges	7	
Other Hauling & Delivery Charges	452	321
Telephone	625	567
Other Purchased Services	1184	907
Storage Rentals	1070	705

Other Real Estate Rentals	779	1052
Testing and Measuring Rentals		981
Automotive Equipment Rentals		13230
Other Work Equipment Rentals	587	3718
Operating Privileges		
Other Rentals & Charges	2336	1537
Other Materials & Equipment		113
Other Work Contracts	47	32
Other Purchased Services	59	57
Total	211394	154672

Diamond Drilling Costs

Debert Lake Drill Program

Hole No.	Footage	Costs
DL-1	462	7012.20
DL-2	435	7087.50
DL-3	450	6538.10
DL-4	350	5598.84
Total		26236.64

General Costs

Mobilization	1540.00
Special Work requested	534.00
Camp move	1099.50
Total	3173.50

Total Costs = 29410.14

or 17.33 per foot drilled.

1977	Airborne Geophysical Surveys	101740
	Linecutting	14820
	Geological Mapping & Ground Geophysics	249106
	Diamond Drilling	29410
	Total	395,076

On December 14, 1976, Gulf Minerals acquired uranium exploration Licenses on 2688 claims centred on Byers Lake. A total of $395,076 has been expended by Gulf on the property as of November 30, 1977. We claim 370,800 in assessment work to retain 1854 claims of Cobequid IV.

TABLE I

COBEQUID IV

LAND RETAINED FOR 1978

Reference Map	Exploration License No.	Tracts	Claims
11 E 11 C	1327	31, 32, 33, 34	A-Q
	1328	15, 16, 17, 18, 19	A-Q
	1329	1, 2, 3, 4, 5	A-Q
	1330	6, 7, 8, 9, 10	A-Q
	1331	20, 21, 22, 23, 24	A-Q
11 E 11 A	1334	37, 38, 39, 40	A-Q
	1335	57, 58, 59, 60	A-Q
	1336	61, 62, 63, 64	A-Q
	1337	81, 82, 83, 84	A-Q
	1338	85, 86, 87, 88	A-Q
	1339	105, 106, 107, 108	A-Q
11 E 11 B	1348	26	N, O
		27	N, O, P, Q.
	1350	44, 45, 46, 47	A-Q
		48	J, K, L, M, N, O, P, Q.
	1351	49, 50, 51, 52, 53	A-Q
	1352	68, 69, 70, 71, 72.	A-Q
	1353	73, 74, 75, 76, 77.	A-Q
	1354	92, 93, 94, 95, 96	A-Q
	1355	97, 98, 99, 100, 101	A-Q
	1356	39, 40, 41, 42, 43	A-Q

Cont'd....

Reference Map	Exploration License No.	Tracts	Claims
11 E 11 B	1357	54, 55, 56, 57, 58	A-Q
	1358	63, 64, 65, 66, 67	A-Q
	1359	78, 79, 80, 81, 82.	A-Q
	1360	87, 88, 89, 90, 91	A-Q
	1361	102, 103, 104, 105, 106	A-Q
11 E 11 D	1363	9, 10, 11, 12	A-Q
	1364	13, 14, 15, 16	A-Q

II ROCK GEOCHEMISTRY

a) During the summer of 1977 a limited whole rock sampling program was carried out over the property. Samples were collected from various rock types to determine their bulk composition and the variability of selected trace elements. A total of 61 samples were collected.

X-Ray Assay Laboratories of Toronto carried out major oxide and trace element determinations. Each sample was run for Zr, U, Th, Pb, Zn and Cu. Results are listed in Appendix I.

GEOCHEMICAL SUMMARY

The whole rock data has not been fully evaluated at the present time; however, one feature which is noteable is the good correlation between samples of Silurian rhyolites and those of unfoliated Devonian granites.

The uranium values were consistently low. Only samples B-3066 and B-3010 had detectable quantities of uranium at 10 ppm. Owing to the fact that only the above two samples contained traces of uranium, it suggests that concentrating processes have been active in these areas.

III LINECUTTING

In July and August, Gulf Minerals contracted M. Smith of Bathurst, New Brunswick to cut a control grid within Cobequid IV. Fifty-six point eight (56.8) miles of picket lines and eleven point eight (11.8) miles of base line were cut within the block. The grid extends from the Cobequid III block to Byers Lake. Base Lines were cut east-west with north-south picket lines at 400 ft intervals. The grid is to be used to provide control for geochemical and geophysical surveys and for detailed geological mapping. Its location is shown on the VLF map (1 inch = 400 ft.) accompanying this report. (Plate: IIIa)

IV GEOLOGY

a) Introduction

Geological mapping was conducted by two-man crews consisting of a geologist and a junior assistant or a prospector. All personnel were equipped with a scintrex BGS-1SL scintillometer for measuring radioactivity. Mapping was mainly confined to stream valleys, road cuts and the Swan Brook grid. Air photos at a scale of 4 inches to one mile and 6 inches to one mile were used for control. Results were plotted on 1/4 mile to the inch Dept. of Lands and Forests base maps.

All outcrops shown on the geological compilation maps were examined in the field by Gulf personnel. Geological survey of Canada maps by Fletcher and work by Wallace and Donohoe reported in Nova Scotia Department of Mines publication 77-1 were used as reference for field work and interpretation.

b) General geology

The Cobequid Highlands, comprising the major part of the area under investigation, are composed of meta-sedimentary and igneous rocks.

The oldest rock unit in the area, Map Unit II, is the Bass River complex, composed of highly deformed meta-sedimentary, granitic, and volcanic rocks.

Intrusive into the Bass River complex is foliated, late mid-Devonian hornblende granite (Unit VI).

The Silurian Earltown Sequence is composed of three distinct sub-units. Grey mudstones and siltstones (Unit IVa) underlie the main acidic volcanic sequence (Unit IVb). Further to the east, sedimentary (argillitic) and tuffaceous rocks predominate (Unit IVc). Post Lower Silurian deformation has tilted the volcanic pile to near vertical. Prominent folding is evident in the region of Bailey Brook, most noteably an easterly plunging synform.

Undeformed pink hornblende granite of late Mid-Devonian age (Unit VII) intrudes the Earltown Sequence.

The Devonian River John Group overlies unconformably the Earltown Sequence and is made up of a Lower (Unit VIII) and an Upper (Unit IX) unit. The lower unit consisting mainly of coarse conglomerates and the upper unit consisting of interbedded basalts and sediments appear to be younging to the north.

The southeasterly trending Balmoral Brook Fault displaces both the Silurian and Devonian Sequences.

The Nuttby Sequence (Unit X) of Early Mississippian to Late Devonian age, consists of mainly siltstone, wackes and conglomerates. An east-west trending synform plunging to the east is evident on the McCallum Settlement

Road, The contact with the Earltown is unresolved. Foliated granite intrudes the Nubby sequence in various locals. Two major north-south trending faults were inferred from geophysical data. One fault is located in the area of Debert Lake - Debert River and the East Wallace River and the other is located between the Chiganois River and the West North River.

The former has been tentatively termed the Debert Lake Fault and the latter the Chiganois Fault. Relative movement on the Debert Lake fault is uncertain; however, it appears that on the Chiganois Fault, the more easterly block has been shifted to the south with respect to the western one. Minor east-west faulting was also picked up in the Earltown volcanics from the VLF geophysical maps.

At least two sets of diabase dikes are present. These are possibly Triassic in age.

Lying directly to the north and unconformably overlying the Highlands are the Pennsylvanian Boss Point sediments with possibly minor Pictou (?) Group sediments further to the north. The Boss Point Formation has a shallow dip to the north and possibly represent basement highs or the southern limb of the Claremont syncline which generally plunges to the southwest.

c) Rock Units

In the Cobequid Highlands proper, five major rock units were mapped ??? with two phases of granite (foliated and non-foliated). A brief description of the lithologies follow:

The oldest rock unit, map Unit II is the Bass River Complex, Silurian age and/or older. It is composed of dark green, very fine grained metavolcanics, dark grey to white, fine grained quartzite, dark green to

black, well foliated argillitic metasediment (phyllitic to schistose), well foliated quartz-feldspar-biotite gneiss and fine to coarse grained, pink deformed granite. Minor acidic volcanics are also present.

The Earltown Sequence, Units IV, of Silurian age is made up of three mappable sub-units, briefly described as follows:

a) Located near Wentworth Station is the oldest unit (Unit IVa) in this sequence dated at Middle to Upper Llandoverian age, (Wallace and Donohoe, 1977). This unit consists of dark grey to black, fine grained, well laminated, fossiliferous siltstone to argillite with minor amounts of green conglomerate and greywacke.

b) Overlying Unit IVa are mainly red, pink, green to grey, aphanitic rhyolite, rhyolite agglomerate (possibly denoting bases of flows) and rhyolite porphyry. Banding is evident in places with abundant hematite staining and epidote occurring along fracture surfaces. Minor amounts of rhyolite to dacite tuffs, spherulitic rhyolite, argillite and basalt are also present.

c) This unit is made up of grey-green dacites, pink to grey flow-banded rhyolites with minor concentrations of massive sulphides (pyrite, chalcopyrite), green quartz wacke and fine grained laminated shale and mudstone with interbedded dacitic to rhyolitic tuffs. Toward the northern section, well foliated argillitic metasediments (phyllite) predominate.

Map Unit VI is composed of fine to coarse grained white to pink foliated hornblende granite. Along Shatter Brook, quartz and orthoclase crystals are stretched and aligned along a strong foliation (Cataclasis?).

Map Unit VII consists of non-foliated hornblende granites of Lower Middle Devonian age (Donohoe and Wallace, 1977) which are, for the most part, fine to coarse grained and pink in colour. Numerous dark red aphanitic rhyolitic phases of the granite, are exhibited.

Numerous fine grained, black diabase dikes, some exhibiting good texture and glossy margins are present. More than one generation of diabase must be present as some are deformed while others are relatively fresh. The diabase has been tentatively dated in places as Triassic.

Map Unit VIII is the lower unit of the Devonian River John Group. It is made up mainly of fine grained to aphanitic, black to dark green vesicular to amygdaloidal basalt with calcite and zeolite infillings. Calcite, epidote stringers and traces of disseminated sulphides are evident. The rock is slightly magnetic. It appears to be younging north with individual flows distinguishable in some localities by the presence of red, brecciated (fragmental?) basalt occurring at the interface of two flows. (Diatremes caused by upward moving hydrothermal solutions ?). Interbedded with the basalts are dark grey, red to black, fine grained siltstones, argillites and Mudstones; red, green and grey wackes with abundant volcanic fragments and well bedded, grey conglomerates.

Map Unit IX is the Upper unit of the River John Group and consists of purple to red conglomerates made up of a sandy matrix with fragments of basic volcanics, grey quartzite and rhyolite. The fragments are 0.5 mm - 150 mm in size, poorly sorted and well bedded with numerous carbonate stringers.

The Nuttby Sequence, Map Unit X, of Late Devonian to Early Mississippian age is composed of grey to red, foliated siltstone to argillite; reddish grey, lithic wackes and green to red conglomerates. The conglomerates are made up of a fine to medium grained silty matrix with subrounded to subangular fragments of rhyolite, granite, phyllite and tuff.

Map Unit VIV which is the Pensylvanian Boss Point Formation, is made up of alternating sequences of red, white to green sandstones, grey to red conglomerate, red siltstone and red to grey mudstone, in part calcareous. The sandstones encountered varied from red, greenish-red to white, commonly feldspathic to arkosic with interbedded lenses of grey calcareous conglomerate. Numerous green reduction zones, variable organics, fine laminations and tough cross-bedding and limonitic-specks are also prevalent. Locally, organic trash and plant remains accumulate in the depressions in cross-beds, often with black carbonaceous material (coal). Minor copper (malachite) and radioactivity may also be present. Two distinctive types of conglomerate were encountered. One is gray, with a fine grained sandy calcareous matrix containing variable amounts of calcareous shale fragments. It weathers with a distinctive pitted appearance (clasts weather first). The other type is red in colour with a fine grained sandy matrix containing subrounded to subangular rhyolite, granite, quartzite and basalt fragments 2 mm - 100 mm. It is poorly sorted.

The siltstone and mudstone is red to grey, calcareous in places with numerous calcareous to hematitic concretions containing many local reduction zones.

LEGEND - COBEQUID PROJECT

(after Wallace & Donohoe, 1977)

MESOZOIC	XVIII	Triassic	
PALAEOZOIC	XVII	Permian	
			Pennsylvanian
	XVI		Pictou Group
	XV		Cumberland Group
			Riversdale Group
	XIV		Boss Point Formation - alternating sequences of red to green sandstone, grey to red conglomerate, siltstone and mudstone, in part calcareous (undivided)
	XIII		Clairmont Formation
			Mississippian
	XII		Middleborough Formation
	XI		Windsor Group
	X		Nuttby Sequence - grey to red siltstone to argillite, reddish-grey lithic wackes and green conglomerates.
			Devonian
	IX		River John Group (Upper) - purple to red conglomerates.
	VIII		River John Group (Lower) - black to green basalt, grey, red, to black siltstones, argillites and mudstones; red, grey and green wackes and green conglomerates.
	VII		Non-foliated hornblende - granite
	VI		Foliated hornblende - granite
			Silurian to Devonian
	V		Portapique Parrsboro Succession
	IV		Earltown Sequence (a) dark grey to black siltstone to argillite (b) red, pink, green to grey rhyolite and rhyolite porphyry, agglomerate, rhyolite and dacite tuffs. (c) grey-green dacites, pink to grey rhyolites, green quartz wackes, shale and mudstone with interbedded dacitic to rhyolite tuffs and argillite.

PALAEOZOIC OR OLDER		Silurian or Older
	III	Gran. Gneiss - of Bass River Complex
	II	Bass River Complex - green metavolcanics, grey to white quartzite, dark green to black argillites, quartz-feldspar-biotite gneiss and pink granite.
	I	Mt. Thom Complex

COBEQUID PROJECT

Legend - Lithologic

11 Intrusives

(a) Granite
(b) Diorite, diabase
(c) Gabbro - ultramafic

10 Sediments

(a) argillite shale
(b) quartzite
(c) conglomerate
(d) sandstone
(e) siltstone
(f) mudstone
(g) limestone

9 Pyroclastics & Agglomerates

(Mx) mafic fragments in mafic matrix
(Fx) felsic " " felsic "
(M) mixed

8 Felsic Volcanics (dacites-rhyolites)

(P) pillowed
(T) tuffaceous
(B) brecciated
(PH) porphyritic
(S) sheared or deformed

7 Mafic Volcanics (basalts-andesites)

(P) pillowed
(T) tuffaceous
(B) brecciated
(PH) porphyritic
(S) sheared or deformed

d) STRUCTURE

The southern extreme of Cobequid IV is underlain by highly deformed meta-sedimentary and volcanic rocks of the Bass River Complex. Wallace and Donohoe (1977) have tentatively dated these as Silurian or Pre-Silurian in age, making them the oldest encountered on the property. Compositional banding trends generally E-W with minor folds being recorded in a number of localities. Regional fold geometry was not discerned from the exposures mapped on Cobequid IV.

Foliated granite is known to intrude the Bass River Complex and is exposed on both the Chiganois River and West North River, as well as on Farm Lake Road.

Wallace and Donohoe (1977) cite a late Mid-Devonian date for the deformation of these rocks with a possible correlation of the second folding phase to fold geometries seen in the Pennsylvanian Londonderry Sequence of the southern Cobequids.

Silurian volcanics and interbedded sediments of the Earltown Sequence have been mapped in the eastern property area and also occur along the western boundary. The western exposures are predominantly rhyolitic in nature with some andesite whereas the eastern zone has a higher percentage of sedimentary and tuffaceous volcanic units. Some folding has been mapped in the tuffs and sediments with a synform above the main rhyolitic sequence on Bailey Brook being the largest structure identified. Geometry of the folding is unclear but the axis is trending approximately East-West and plunging to the east.

A large south westerly trending block of Lower River John Group, dated as Devonian (Gillis 1964 in Wallace and Donohoe 1977) transects the Earltown sequence and is known to be in unconformable contact with the volcanics. These rocks are predominantly basaltic flows and interbedded sediments believed to be younging to the north.

The Balmoral Brook fault displaces the Silurian and Devonian sequences of the central property area with the River John Group to the east of the fault consisting of primarily fanglomerate deposits dipping to the north and coarse clastic sediments. Good sections of these Upper River John are exposed on Balmoral Brook and also on the Waugh River.

A second south-easterly trending fault has been proposed based upon interpretation of airborne geophysical data. Magnetic signatures define a movement zone between Farm Lake and the Chiganois River which has been tentatively termed the Chiganois Fault.

Definition of the Chiganois fault on the ground has been inconclusive as a result of overburden.

Devonian undeformed hornblende granite intrudes the volcanic pile in the western property area. Granites of the same granitic complex also intrude the Earltown sequence in the southerly extent of Cobequid III claim block.

The Nuttby Sequence of fine to coarse clastic sediments is known to be Mississippian in age based upon palynological data.

The units of this sequence are exposed south of Farm Lake, in good sections on the Chiganois River, in the Gain Brook area and along the West North River.

A synform has been mapped in Nuttby sediments on the McCallum Settlement Road with an ENE trending axis plunging to the east. A low angle southerly dipping thrust fault cuts this structure in the closure zone but its importance to the overall fold geometry or regional geology is minimal. The fault trace is defined by a topographic lineament for a short distance in the form of a stream valley.

Riversdale Group and possibly Pictou Group sediments of Pennsylvanian age occupy the northern property extremes adjoining the Cobequid Highland proper. Boss Point sediments predominate although in the north eastern property corner some sediments have been tentatively mapped as Pictou Group.

Structure within these bedded sequences is generally north dipping at a relatively low angle (<30°), this being controlled somewhat by the basement rise to the upland and the Claremount Synclinal structure to the north. This major syncline trends generally east-west and plunges to the south west but its axial trace and closure zone is not covered by the Cobequid IV claim group.

The nature of the Carboniferous contact with the highland complex in this area is believed to be unconformable but exposures in a definitive section have not been found. Further to the west, near Westchester, on Caldwell Brook this contact is clearly an unconformity.

Pre-Carboniferous north-south faulting occurred along the northern boundary of the Cobequids in this area but none of those structures appear to be major in extent. Differential movement between fault blocks has juxtaposed overlying phyllite with the Silurian rhyolite sequence in the Baily Brook area as well as in the Six Mile Brook area. Airborne geophysical data indicated the existence of such faulting but ground work has accurately defined movement zones in only a few cases. This is, of course, a result of bedrock exposure being limited to stream valleys and its discontinuous nature in these valleys.

T - 1137

LOGISTIC REPORT

AIRBORNE RADIOMETRIC SURVEY

COBEQUID MOUNTAINS

NOVA SCOTIA

ON BEHALF OF

GULF MINERALS CANADA LIMITED

July, 1977

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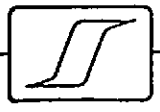
SUMMARY

A helicopter-borne radiometric survey was carried out over the Cobequid Mountains in Northern Nova Scotia. A total of 1,863 line miles were surveyed at a nominal altitude of 150 feet with a nominal interline spacing of 660 feet.

During the survey the following geophysical parameters were measured simultaneously: Uranium, Thorium, Potassium and Total gamma radiation. The data were continuously recorded on analogue charts and magnetic tapes.

A preliminary analysis of the geophysical data in the form of a "Red Ball Map" was presented in the field. The data were edited and corrected. The uranium (in ppm eU) channel and the U/K ratio are presented as computer plotted contour maps.



LOGISTIC REPORT ON AIRBORNE RADIOMETRIC SURVEY OF COBEQUID MOUNTAINS, NOVA SCOTIA ON BEHALF OF GULF MINERALS CANADA LIMITED

1. INTRODUCTION

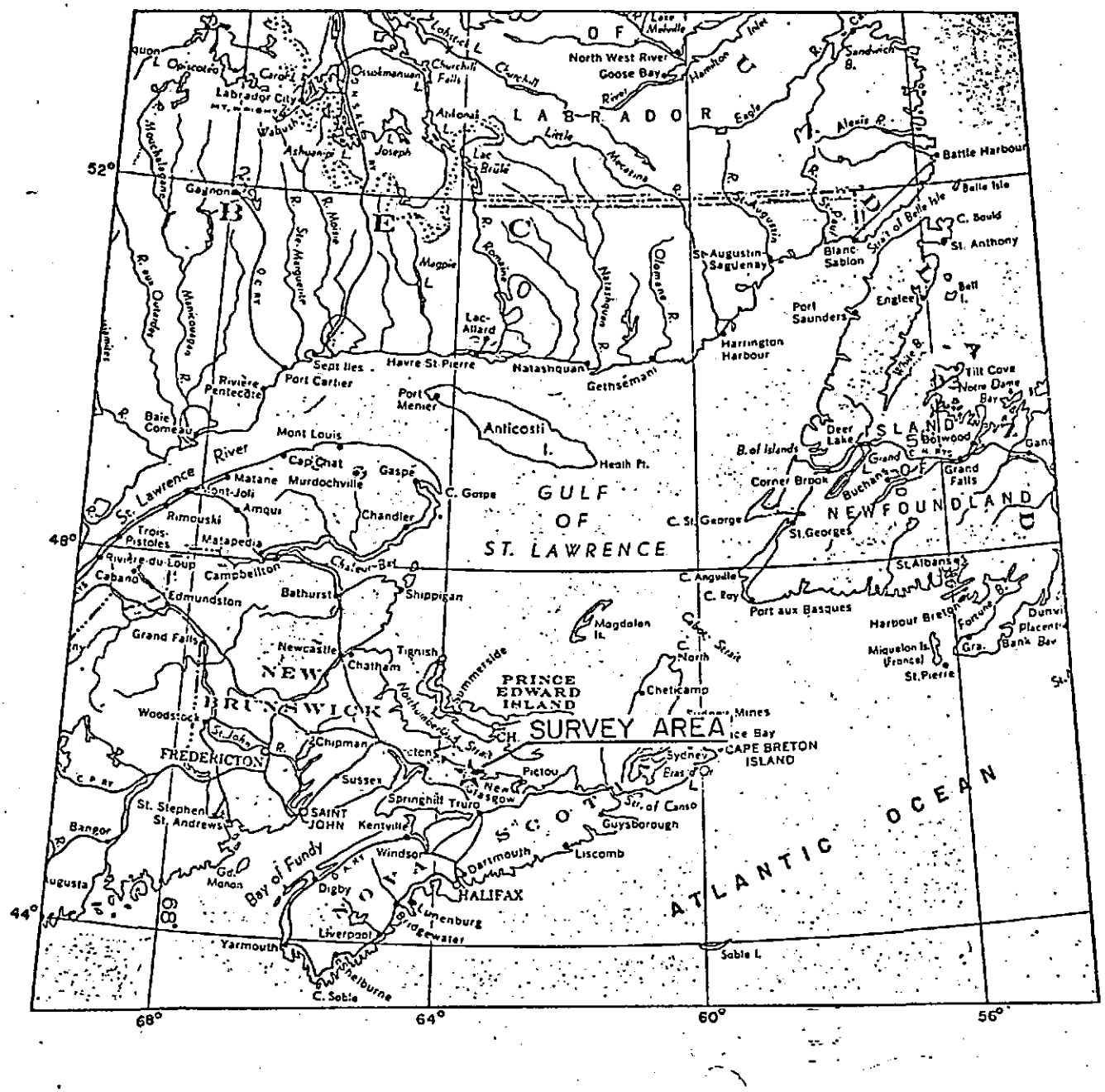
During the period May 11 - May 30, 1977, an airborne radiometric survey was carried out by Scintrex Surveys Limited on behalf of Gulf Minerals Canada Limited in the Cobequid Mountains near Tatamagouche, Nova Scotia. A total of 1,863 line miles were flown. The survey aircraft was an Alouette II helicopter.

Simultaneous measurements of Bismuth 214 (Uranium), Thallium 208 (Thorium), Potassium 40 (Potassium) and total gamma radiation count rates were made. The data were recorded in analogue and digital form. The geophysical instrumentation consisted of a four channel gamma ray spectrometer and gamma ray detector system. Ancillar equipment included an intervalometer, a flight path camera, a radar altimeter, a 7 track digital recording system and a six channel analogue recorder.

A "Red Ball Map" showing radiometric anomalies was compiled in the field. The processed digital data are presented as computer plotted contour maps of Uranium (ppm eU) and the U/K ratios.

2. SURVEY AREA

The survey area is located around longitude 63°25'W, latitude 45° 35'N. The area is situated south of Tatamagouche about 90 miles north of Halifax, Nova Scotia. The survey covered approximately 225 square miles over an area of rugged topography, especially toward the southern end. Figure 1, shows the location of the survey area.



LOCATION MAP

GULF MINERALS CANADA LTD.

COBEQUID MOUNTAINS, NOVA SCOTIA

AIRBORNE RADIOMETRIC SURVEY

SCALE : 1 inch = 120 miles

77 - T1137

FIGURE 1

3. FLYING SPECIFICATIONS

Table I below lists the flying specifications applicable to the present survey.

TABLE I

Terrain clearance	150 feet
Nominal line spacing	660 feet
Flight Direction	North-South
Aircraft ground speed	50 miles per hour.

4. SURVEY EQUIPMENT

A brief description of each instrument utilized on the present survey is given below:

4.1 Geophysical Equipment

4.1.1 Gamma Ray Spectrometer - Scintrex GAD-5

The GAD-5 is a four channel gamma spectrum analyzer providing both analogue and digital data outputs. Each channel can be operated in either differential or integral mode. Threshold energy levels and window widths are individually adjustable for each channel.
For the present survey, the GAD-5 unit was set up to provide three channels of differential mode output with energy windows centered on K^{40} - Potassium (1.461 MeV), Bi^{214} - Uranium (1.764 MeV) and Tl^{208} - Thorium (2.615 MeV) in addition to a broad band integral mode channel operating with a low threshold energy (.3 MeV).

The analogue data output may be corrected for spectral interference and Compton scattering by a stripping procedure. Briefly, a fraction of the thorium count rate is subtracted from the uranium count rate, and both thorium and uranium fractional contributions are subtracted from the potassium window count rate. The three differential channel analogue outputs therefore

represent count rates characteristic solely of gamma activity from, individually, thorium, uranium and potassium (in equilibrium with their daughter products).

The digital unstripped data output was recorded on magnetic tape (incredata) at 1/2 second intervals. Appendix A gives details of the calibration procedures, window settings and stripping ratio adjustments.

4.1.2 Gamma Ray Sensors

The gamma ray detector system consisted of two Scintrex GSA-64 crystal assemblages operating in tandem. Each GSA-64 contains four 6" x 4" crystals giving a volume of 452 cu. in. The total combined sensor volume was 904 cu. in.

The Scintrex GSA-64 sensors use thallium activated sodium iodide crystals coupled to photomultiplier tubes. The crystals are attached to thermally insulated, magetically shielded, shock mounted capsules, which are temperature controlled for spectrum stabilization and long term detector balance.

4.2 Ancillary Equipment

4.2.1 Camera

A Vinten Mark III - 16 mm scientific camera with a Century 5.7 mm wide angle lens was installed in a side rack. Each frame exposure corresponds to one fiducial interval (1 second).

4.2.2 Altimeter

A Bonzer Mark 10 radar altimeter system was employed. This is a direct reading instrument which measures the terrain clearance from 40 feet to 2,000 feet with an accuracy of ±5%.

4.2.3 Scintrex IITC-2 Intervalometer

A Scintrex IITC-2 Intervalometer was utilized. It generates synchronization signals operating the fiducial counters and camera. The unit also provides an on-board communications system for the flight crew.

4.2.4 Analogue Recorder

A six channel analogue recorder was employed. This is a direct writing recorder capable of simultaneously recording 6 channels. Rectilinear traces are achieved by a rugged direct heated stylus writing across a knife edge on heat sensitive paper.

4.2.5 Incre Data Mk II Digital Recording System

The Incre Data unit digitally records data gathered by the on-board survey equipment onto IBM compatible 7 track magnetic tape. The following data were recorded

Fiducial number
Time (Hours, Minutes, Seconds, Tenths of Seconds)
Radiometrics (Th, U, K, BB)
Altimeter

The unit contains a digital clock controlled by a 10 MHz crystal oscillator. This is used to sychronize data recording, fiducial intervals, camera exposures and radiometric counting periods.

The Incre Data unit accepts both analogue and digitally coded data, converting the analogue data (Altimeter) into digital form before recording.

5. SURVEY CREW

The following personnel were employed on the survey:

1. Geophysicist/Party leader - Srikant Kulkarni, M.Sc., responsible for overall supervision of the survey, client liaison, quality control of data, geophysical interpretation and the "Red Ball" map.

2. Operator - Kelly Maidens: operated and maintained the equipment.

3. Navigator - Brian Hind / Eric Sarson: responsible for directing the pilot during the survey along previously selected flight lines.

4. Dataman - Herb Burnett: Responsible for film processing and flight path recovery.

5. Pilot - Jim McLellan
6. Engineer - Frank Kearney

6. FIELD PROCEDURES

6.1 Gamma-ray Spectrometer Calibration at Ottawa

Gamma-ray spectrometer calibration was done at Uplands Airport, Ottawa. Five sources (constructed by the GSC in 1968) each in the form of a slab or pad 25 feet by 25 feet and 18 inches thick, with known composition, were used for calibration. The exact location of the slabs in relation to the airport terminal and concrete apron is shown schematically in Figure 1, Appendix B. These pads are positioned 50 feet apart so that each has a similar environment with respect to the concrete apron and surrounding soil. It is assumed that the influence of one source on another is negligi (Ref: "The calibration of gamma-ray spectrometers for ground and airborne use" - GSC paper 71-17 by Darnley & Grasty). Detailed calibration procedures are given in Appendix B. After obtaining data from these pads, a computer program was used at the GSC in Ottawa to obtain stripping factors: (α, β, γ) and the sensitivities of Uranium and Thorium (in ppm) and Potassium (as a percentage) on the ground.

6.2 Survey Flight and Ground Procedures

The main sequence of events occurring during each survey flight is listed below:

1. Switch-on for warm-up of spectrometer.
2. Calibrate spectrometer and altimeter.
3. Take-off.
4. Survey lines.
5. Land.
6. Calibrate spectrometer.

7. Check data quality.
8. Develop film.
9. Recover flight path.
10. Pick anomalies from the analogue charts.
11. Make a Red Ball Map.

6.3 A flight log was maintained by the operator during each survey flight. The fiducial numbers at the beginning and end of each line were recorded. A summary of flights giving flight numbers with corresponding magnetic tape numbers, dates and line numbers, is presented in Appendix C.

7. DATA RECORDING

7.1 Analogue Chart Record

Data were recorded in analogue form on heat sensitive chart paper. The complete system was time synchronized throughout by the intervalometer. Fiducial marks were recorded on the analogue chart, each mark corresponding to a 1 second interval. Each trace on the chart paper was identified by a label at the beginning of each flight line. Line numbers, flight numbers, tape numbers, dates, area and fiducial numbers are indicated on each trace.

7.2 Magnetic Tape Record

The seven track magnetic tape is a 200 B.P.I., B.C.D. record. Tracks 1, 2, 3 and 4 record the numerical data, tracks 5 and 6 (flags A and B) express "end of line" and "abort line". Track 7 is used for parity check. A complete scan occurs every half second. The data is recorded in blocks of 20 scans (corresponding to 10 fiducials). A header is recorded at the start of each block giving the flight number, mode, line number and area code. Table II shows the various parameters and their appropriate characters in order for the first scan of a block.

TABLE II

MAGNETIC TAPE FORMAT

Parameter		Character
Header:	Flight	1, 2, 3
	Mode 1 = survey flight line	4
	2 = reflight survey line	
	3 = tie line	
	4 = reflight tie line	
	5 = ground test calibration	
	6 = airborne calibration	
	Line	5, 6, 7
	Area	8
Data:	Fiducial	9, 10,11,12
	Time Hours	13, 14
	Min.	15, 16
	Sec. (every .3 and .8 sec.)	17, 18, 19
	Spare	20,21,22,23,24,25
	Range Factor for Channel 4 (0=x0.1, 1=x1, 2=x10)	26,27
	Overflow Channel 1	28
	Channel 1 - Thorium	29,30,31
	Overflow Channel 2	32
	Channel 2 - Uranium	33,34,35
	Overflow Channel 3	36
	Channel 3 - Potassium	37,38,39
	Overflow Channel 4	40
	Channel 4 - Broadband	41,42,43
	Spare	44,45,46,47,48,49 50,51
	Altimeter	52,53,54
	Spare	55 through 78 inclusive.

8. DATA PROCESSING

Processing of the data consisted of the following steps:

8.1 Recovered fiducial points on the flight lines were manually transferred from the 'recovery mosaics' to controlled base maps, supplied by Gulf Minerals.

8.2 The flight path was digitized from the base maps.

8.3 Computer processing of the digital radiometric data was carried out in the following order:

1. Subtraction of the background count rates obtained over lakes and during high altitude flying.
2. Correction for Compton Scattering was based on standard procedures and stripping factors. (α=0.5028, β=0.43[illegible], γ=0.4925;) obtained from calibration at the GSC pads in Ottawa.
3. Normalization of the results to a constant altitude of 150 feet above ground surface.
4. Data shifting by -1.0 second for the instrumental offset.
5. Conversion of data from counts/second into parts per million (ppm) of equivalent Uranium by using sensitivities supplied by Geological Survey of Canada.

Detailed algorithms used for processing of radiometric data are given in Table III.

8.4 The corrected data were then plotted on a Gerber flatbed plotter by Dataplotting Services Ltd.

9. PRESENTATION OF DATA

The data collected during the survey are presented as follows:

9.1 Red Ball Map

Major radiometric anomalies and topographinc features are shown on the "Red Ball Map" which is an overlay to the photomosaic. The horizontal scale is 1" = 1,320 feet. Anomalies are classified into three categories:

Full diamond ◆ category 1 - Anomaly well defined, medium to high amplitude and good U/Th and U/K ratios.

TABLE III

DETAILED ALGORITHMS USED FOR DATA PROCESSING

1. All the numbers were read directly taking into account the overflow bit.
2. The constants given apply to 2 GSA-64's with a GAD-5 spectrometer.

A. DEFINITIONS:

AO = Averaging option 3 was used

Nxy = Count numbers per given sampling interval

- x = Processing step
  - 0 = Raw number
  - 1 = Working number
  - 2 = After background correction
  - 3 = After altitude correction
  - 4 = After stripping
  - 5 = Final value
- Y = Channels BB, Th, U, K.
  - BB = Broadband
  - Th = Thorium
  - U = Uranium
  - K = Potassium
- C = Standard distance above ground for normalization of data (150 feet).

B. HEIGHT ABOVE GROUND = h in ft.

$$h = \frac{ALT\ (X_i - 1) + ALT\ (X_i) + ALT\ (X_{i+1})}{AO = 3}$$

$$N_{1y} = \frac{N_{oy}\ (X_i - 1) + N_{oy}\ (X_i) + N_{oy}\ (X_i + 1)}{3} -$$

Calculations of standard deviation

$$\sigma_{th} = \sqrt{\left(N_{1th} + BG_{th}\right) \times AO}$$

$$\sigma_u = \sqrt{\left(N_{1u} + BG_u\right) \times AO + 0.2528\ \sigma^2_{Th}}$$

$$\sigma_K = \sqrt{\left(N_{1K} + BG_K\right) \times AO + 0.1872\ .\sigma^2_{Th} + 0.2425\ \sigma^2_U}$$

$(N_1\ Th) \times AO \geq 3 \times \sigma_{Th}$
$\times 3$

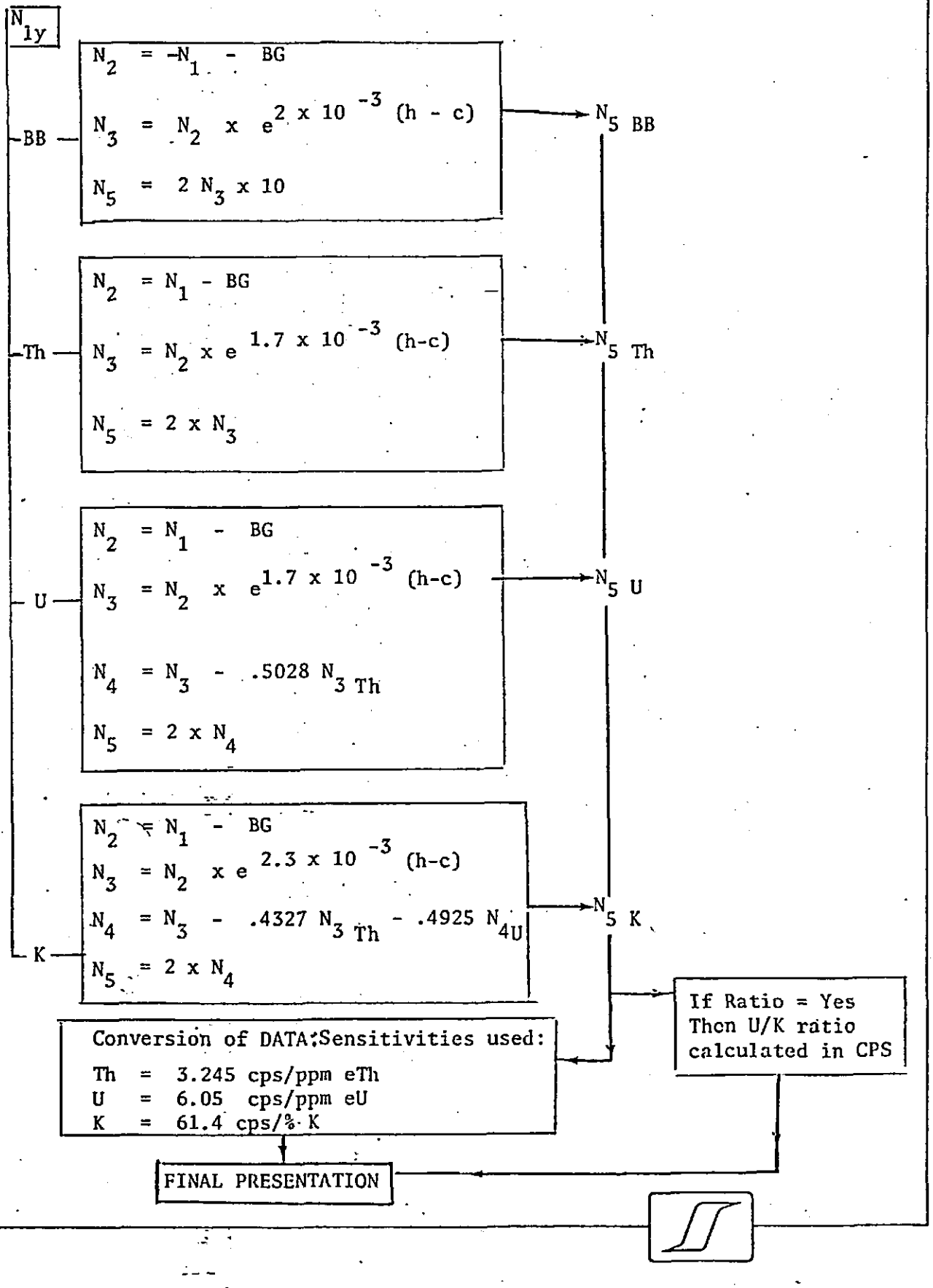
$N_{1u} \times AO \geq 3 \times \sigma_u$

$N_{iK} \times AO \geq 3 \times \sigma_K$

— Simultaneously — TRUE — RATIO = YES

— FALSE — RATIO = NO

C. ALTITUDE CORRECTION AND COMPTON SCATTERING



Half-full diamond ◆ category 2 - Anomaly well defined but medium to small amplitude and poor U/Th and U/K ratios.

Open diamond ◇ category 3 - Anomaly poorly defined.

At each anomaly, the altimeter and traces were studied for identification of spurious responses due to topographic, geologic and atmospheric noise.

9.2 Contour Plans

The Uranium and U/K ratios are presented in contour form. A cubic spline was fitted along each line of data. Linear interpolation was utilized to form a uniform grid with 8 grid cells per inch. By using these grid points contours were drawn on a mylar base by computer. Later they were 'sandwiched' with the flight line base maps and contact prints were made Cronoflex (stable base film).

The uranium count rate was converted into ppm (1 ppm = 6.05 cps). The uranium in ppm has a contour interval of 0.5 ppm. U/K ratios were accepted when the raw U, Th and K readings were statistically significant, they were calculated from processed U, K readings in cps and then contoured at an interval of 0.05.

9.3 Analogue Charts

Analogue charts, labelled and edited for each flight, as described in Section 7.1.

9.4 Magnetic Tapes

7 track 200 BPI magnetic tapes containing the raw data in digital form, as recorded during the survey. The tapes are coded as described in Section 7.2. There are 27 tapes. A listing of the flight number and corresponding tape number is given in Appendix C.

9.4.2 9 Track 800 BPI Magnetic Tapes containing unedited, edited, unprocessed and processed digital data were presented.

Logical Record length = 50 words (100 characters)
Blocksize = 2500 words (5000 characters)
= 50 logical records.

The following is a detailed description of each 9-track tape.

Tape	File	Data
SCIN 01	1	Sheet 13: flight lines
	2	Sheet 13: Unprocessed and processed spectrometer data
	3	Sheet 2-12: flight lines
	4	Sheet 2-12: Lines 2-100 Unprocessed and processed spectrometer data.
SCIN 02	1	Sheet 2-12: lines 101-222 Unprocessed and processed spectrometer data.
SCIN 03	1	Original, raw, unedited data.

The following formats were used for these tapes file:

Flight line	Header Record	word 1-5	Line number
		word 6-9	Flight number
		word 10-12	Number of fids on the line
		word 100	"1"
	Data Record	word 1-6	Fiducial
		word 7-13	X - coordinate (inches)
		word 14-20	Y - coordinate (inches)
		word 100	" " (Blank)

The character "9" in word 100 of a logical record indicates a dummy record (to be ignored).

Data File	Header Record	word 1-5	Line number
		word 6-9	Flight number
		word 100	"1"
	Data Record	word 1-7	Fiducial
		word 8-13	Th (three point average -counts per half sec.
		word 14-19	Ur (" " ")
		word 20-25	K " " "
		word 26-31	BB (" " " ÷ 10)
		word 32-37	Altimeter in feet
		word 38-45	Th - corrected in ppm
		word 46-51	UR - " " "
		word 52-57	K - " " "
		word 58-65	BB " " cps.
		word 66-72	UR/K ratio in cps.
		word 73-79	UR/Th ratio in cps.
		word 80-87	X-coordinate (inches)
		word 88-94	Y-coordinate (inches)
		word 100	" " (blank)

9.5 Film, recovery mosaic, flight mosaic, flight logs and all material utilized on the survey are being handed over to Gulf Minerals with this report. A detailed list of the above items is given in Table IV.

Any questions regarding the survey results should be addressed to Scintrex Limited, 222 Snidercroft Road, Concord, Ontario, Canada L4K 1B5.

Respectfully submitted,

SCINTREX SURVEYS LIMITED

Srikant Kulkarni, M.Sc.,
Geophysicist

REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

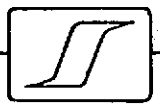
Michael Lewis, M.Sc., P.Eng.,
Manager, Geophysical Surveys Division

Table IV

Data Presentation

After completion of the survey and upon presentation of this report, the following materials were handed over to Gulf Minerals Canada Ltd.

1. Red Ball Map - at a scale of 1" = 1,320, (presented in the field.)
2. Analogue charts.
3. Film - 32 rolls.
4. Mosaics - two sets
5. Flight Logs - 37.
6. Anomaly listing.
7. 9 Track, 800 BPI Edited Magnetic Tape.
8. 7 Track, 200 BPI Raw Magnetic Tapes.
9. Contour plans of Uranium and U/K ratios.



APPENDIX A

The following calibration and operating procedures were employed on the present survey.

Radiometric System

1. The calibration of the gamma ray spectrometer and maintenance of constant temperature in the crystal assemblies are factors governing reliability of the data. To assure the proper performance of the system, the following procedure was followed:

1.1 Detector Balancing (at the beginning of the survey and as required during the duration of the survey).

1.1.1 Allow 3 to 5 hours for the detector temperature to stabilize at the chosen temperature.

1.1.2 Set the instrument up as follows:

Counting time	=	10 seconds
Time constant	=	2 seconds
Channel 1	=	2.21, ΔE = 0.3
Channel 2	=	2.25, ΔE = 0.3
Channel 3	=	2.29, ΔE = 0.3

Meter to Channel 2

Place Cs-137 source in standard position A.

1.1.3 Turn the system on and allow 15 minutes for warm-up.

1.1.4 With Crystal #1 only on, set Fine Gain to Put Cs-137 Peak in CH. 2 (i.e. max reading on meter, CH. 1 & CH. 3 equal & lower than CH. 2). Lock Fine Gain control. Switch on Crystal #2 only (#1 off) & adjust detector balance until Cs-137 Peak is in CH.2. Repeat for each crystal one at a time. Record the final set of readings for CH. 1, CH.2 & CH.3 after locking the balance Control of each crystal.

1.15 Switch all crystals on and set Fine Gain Control until Cs-137 Peak is in CH.2. (Fine Gain Setting will be slightly different than for individual crystals).

1.1.6 Carry out Energy Calibration procedure as outlined in section 1.3.

1.2 Stripping Set-up:

1.2.1 With all the detectors connected to the console, allow the system to warm-up for 15 minutes.

1.2.2 Observe the analogue traces on the recorder while placing TS1 sample near the detectors.

1.2.3 Adjust stripping pot, S_1 (Th/U) so that the sample has no effect on the uranium trace.

1.2.4 Adjust stripping pot, S_3 (Th/K) so that the sample has no effect on the potassium trace.

1.2.5 Place US1 sample near the detector and adjust stripping pot, S_2 (U/K) so that the sample has no effect on the potassium trace.

1.3 Daily checks (at the beginning and end of each flight day):

Place Thorium TS1 sample on ground under centre of one GSA-64.

1.3.1 Turn on the system and allow 15 minutes for warm-up.

1.3.2 Set the window widths (ΔE) of channels 1,2 and 3 at 1.0 and the threshold levels (E) of channel 1 at 8, 4 of channel 2 at 8.6, and of channel 3 at 8.8.

1.3.3 Adjust the Fine Gain control of the console (if necessary) so that the readings of channels 1 and 3 are equal and channel 2 is higher than the other two channels.

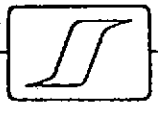
1.3.4 Record the digital readings of the three channels and compare them with the figures obtained during the last detector balancing. Move TSI to ground under centre of other GSA-64 and check that Peak is in CH.2.

1.3.5 If the channel 2 reading is more than 10% less than the detector balancing reading, the detectors should be rebalanced.

1.3.6 Place the Thorium and Uranium samples near the detector and adjust the stripping pots as necessary to eliminate any reaction in the Uranium and Potassium traces.

1.3.7 In between flights, check gain and make sure that the Thorium peak is in the proper position. If the peak has drifted, repeat the calibration procedure.

Should one of the crystals drift more than the others or appear to have poor resolution, action should be taken to rectify the problem through checking the temperature control system and detector balancing.



The following table shows the threshold level used for the measurment of the different channels.

Channel Number	Designation	Level and Width	Control Setting	Calibrated Gamma Energy	Comments
4	BB	E	1.00	0.300 MeV	Threshold Level
3	K	E	4.60	1.38 MeV	Threshold Level
		ΔE	3.00	0.180 MeV	Window Width
		E + ΔE	5.20	1.56 MeV	Upper Level
1	U	E	5.55	1.66 MeV	Threshold Level
		ΔE	4.00	0.240 MeV	Window Width
		E + ΔE	6.35	1.90 MeV	Upper Level
1	Th	E	8.25	2.48 MeV	Threshold Level
		ΔE	5.50	0.330 MeV	Window Level
		E + ΔE	9.35	2.81 MeV	Upper Level

2. Radar Altimeter Calibration

2.1 The radar altimeter output is recorded once every day while flying the aircraft over a body of water. The record is calibrated by reference to a barometric altimeter from 100 feet above water up to 400 feet above water.

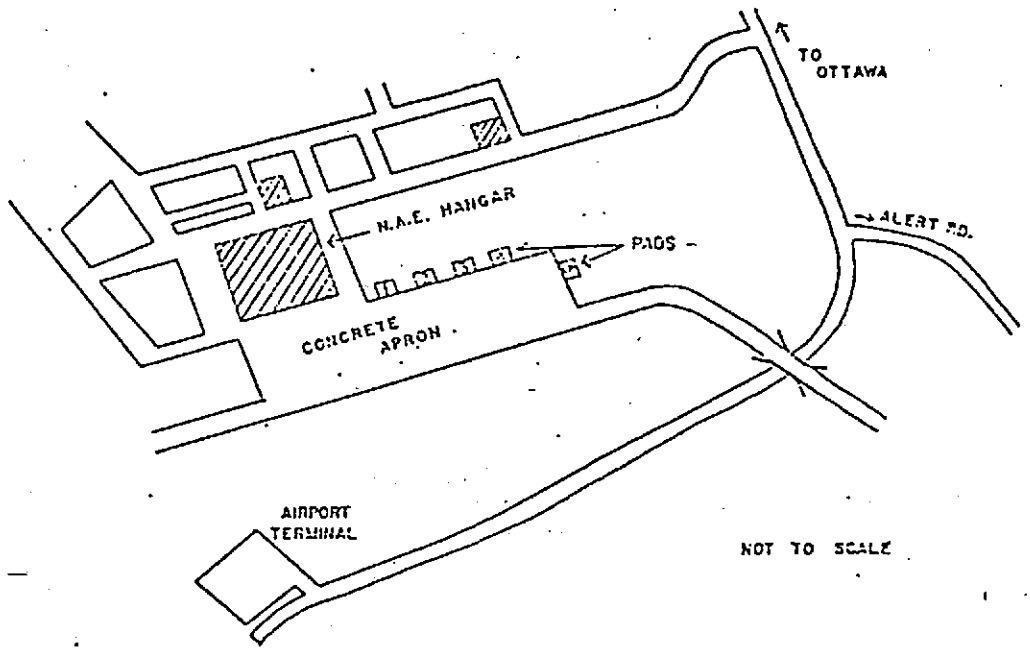
2.2 An electronic calibration of the altimeter is performed daily by activating the SELF TEST button to produce 100', 200', 300', 400' and 500' signals.

APPENDIX B

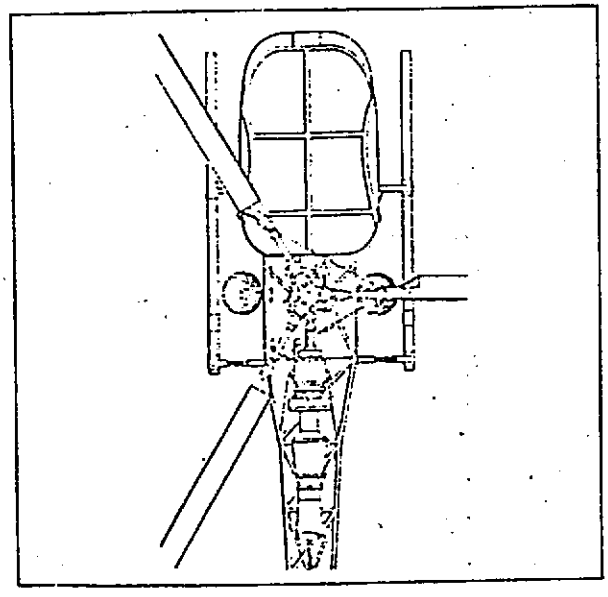
GAMMA-RAY SPECTROMETER CALIBRATION AT OTTAWA

Gamma-ray spectrometer calibration was done at Uplands Airport at Ottawa. Calibration procedure is given below.

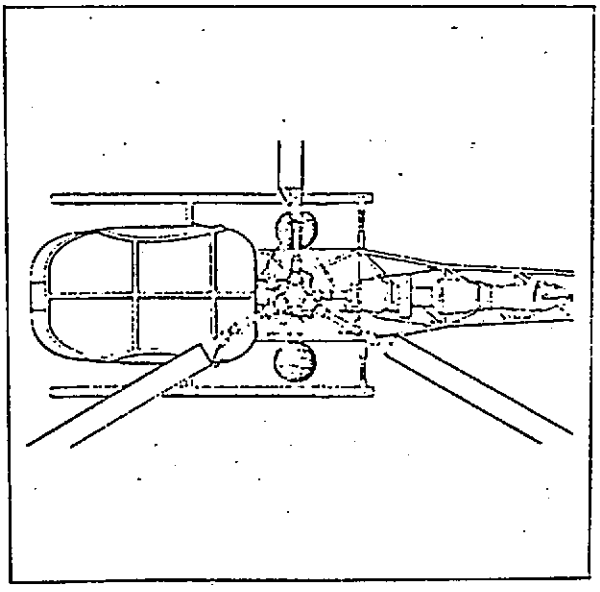
1. Followed the recommended detector balancing and energy calibration procedures as outlined in Appendix A away from the pads. After the calibration, set the windows to survey settings according to the GAD-5 manual.
2. Removed all the calibration samples away from the helicopter. Take the background readings in Thorium, Uranium, Potassium, and Total Count channels with appropriate counting intervals.
3. Land the helicopter on pad #1, such way that sensors were placed equidistant from the center of the pad as shown in position A - Figure 2.
4. Take the readings in Th, U, K, & TC channels with 1 second and 2 seconds counting interval, and note it down.
5. After selecting the appropriate counting time as 10 sec. measured the count rates in Th, U, K and TC channels and note it down.
6. Repeat the procedure and take readings for five times.
7. Change helicopter position to B type in Figure 2, i.e. turn the helicopter in 90°.
8. Repeat steps 4 to 6.
9. Move to pad #2, 3, 4 and follow the same procedure as pad #1.
10. Move to pad #5. Repeat the above procedure, and in case of multiple sensors (i.e. 2 GSA-64 or one GSA-64 and one GSA-77 etc.) disconnect the individual sensor packages at the signal mixer and take the readings as above for individual sensors one by one.
11. After obtaining data from all these pads, a computer program was used at Geological Survey of Canada to obtain stripping factors: α, β, γ and sensitivities of Uranium, Thorium in ppm and Potassium in percentage on the ground.



Map showing location of calibration pads, Uplands Airport, Ottawa.



Position A



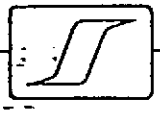
Position B

Figure 2: Positions of sensors at Pad

APPENDIX C

GULF RADIOMETRIC JOB #T 1137

Flight #	Tape #	Date	Remarks : Line #
1	219	May 11/77	Test at Ottawa
5	222	16/77	65 - 60
6	222	May 16/77	2 - 6
7	223	17/77	59 - 50 -
8	223	17/77	Aborted
9	224	18/77	49 - 39
10	225	18/77	38, 37
11	225	May 18/77	36 - 28
12	226	19/77	27 - 14
13	227	19/77	13 - 7, 80 - 84
14	228	19/77	256 - 242
15	229	19/77	241 - 230
16	230	May 20/77	73, 74
18	230	20/77	75 - 79, 89, 90
19	231	21/77	84 - 88, 91, 92
20	232	21/77	93 - 96
21	233	May 23/77	97 - 106
22	234	23/77	107 - 116
23	235	23/77	117 - 126
24	236	23/77	127 - 133
25	237	24/77	134 - 143
26	238	May 24/77	144 - 153
27	239	24/77	154 - 163
28	240	24/77	164 - 173
29	241	25/77	174 - 183
30	242	25/77	184 - 193
31	243	May 25/77	194 - 196
32	243	27/77	197 - 206
33	244	28/77	207 - 220
34	245	28/77	221, 222, 233 & reflights
35	246	28/77	70 - 66 & reflights
36	246	May 28/77	Altimeter calibration
37	247	29/77	73



APPENDIX D

Specification Sheets

i. Scintrex GAD-5
ii. Scintrex GSA Sensors
iii. Vinten 16 mm. Camera
iv. Bonzer - Mark 10 Altimeter
v. Scintrex IITC-2 Intervalometer
vi. Incredata - Digital Recording System

REPORT ON THE HELICOPTER-BORNE GEOPHYSICAL SURVEY ON BEHALF OF GULF MINERALS CANADA LIMITED IN THE COBEQUID AREA, NOVA SCOTIA

by

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Summary

A combined magnetometer, electromagnetic and VLF survey was conducted over the Cobequid area of Nova Scotia. The area lies in the vicinity of Tatamagouche, N.S., to the north of Truro, N.S. The three surveys were flown simultaneously using a Bell 47G3B2 helicopter equipped with a Sander EM3-A, a Sander NPM-5 proton precession magnetometer and a Sander VLF instrument. Survey altitude for the EM and magnetometer was 135 feet and 200 feet for the VLF. Line spacing was 1/8 mile.

The results of the survey are shown in contoured form for the magnetometer data and as normalized profiles for the EM and VLF data. The magnetometer maps clearly outline the boundary of the Cobequid belt and reflect the geology of the region in considerable detail. Strong correlation was found to exist between features outlined by the magnetometer survey and VLF anomalies. In the magnetically quiet region to the north of the Cobequid belt, weak and rather broad anomalies were observed in both the EM and VLF data. These result very likely from graphite bearing beds in Carboniferous sediments. Most of the EM responses in the Cobequid are inductive and appear to result from high concentrations of magnetite. A few other anomalies, however, show a conductive response and should receive further attention.

I

Introduction

A combined helicopter-borne magnetometer, EM and VLF survey was conducted in the Cobequid area of Nova Scotia on behalf of Gulf Minerals Limited in April and May 1977.

Gulf Minerals Limited engaged in an uranium exploration program in this area. The current survey was a part of this program. It was the purpose of the magnetometer survey to delineate the magnetic anomalies and in this way, to gain information concerning the geology of the area. Both the VLF and EM surveys were undertaken in order to locate zones of electrical conductivity which might be of interest in respect to the uranium exploration program.

Access and Topography

The area lies to the north of the town of Truro, N.S., and the helicopter party operated from this town. Access by road is possible throughout. Most of the Cobequid Area consists of wooded hills which are moderately rugged while the area to the north of the Cobequid hills consist of flat lying farm land.

Geology

The geology of the Cobequid Area is not well described in the published literature. Recent work by provincial and federal government geologists better defined the geology of the area, however, we have, as yet, no access to the result of this work.

For this reason, we limit ourselves to a description of the Cobequid Area as an assembly of volcanic, intrusive and sedimentary rocks which have been part of the Appalachian orogenic belt. The east-west trending Cobequid belt extends into the survey area for a width of approximately 8 1/2 miles in the north-south direction. Both to the north and south are Paleozoic sediments of Carboniferous age.

It was considered likely that uranium deposits occur in association with carbonaceous material occurring in fault zones or strata, and for that reason the electrical surveys are expected to give information valuable in the location of possible uranium deposits. Considerable amounts of carbonaceous material occur in the Carboniferous of the area, and in fact some coal production existed to the south of the Cobequid mountains.

Zones of high electrical conductivity exist in the Cobequid and whether these are associated with graphite or with conductive shear zones remains to be determined.

Technical Data

The survey was conducted along lines 12° to the west of north and at a distance of 1/8 mile from each other. The aircraft flew at an elevation of 200 feet above the ground. This elevation was well maintained, however, in very rough parts of the terrain, some deviation from this distance was unavoidable. The electromagnetic bird and the magnetometer are both suspended 65 feet below the aircraft, while the VLF instrument was located outside of the aircraft but at the same level.

A mosaic, produced from National Air Photo Library aerial photographs, was used for navigation. Flight path recovery was facilitated by the use of 16mm photography.

Instrumentation

The instrumentation used in this survey is owned and operated by Sander Geophysics. The majority of the equipment is designed and manufactured by this Company.

The helicopter was equipped with a Sander EM3-A instrument, a Sander NPM-5 proton precession magnetometer, a Sander VLF instrument, a 16mm tracking camera and a Honeywell radar altimeter. Recordings were accomplished in analogue form on a Century 444 Recorder and in digital form on a Sander ADR II digital cassette recorder.

Electromagnetic System

The electromagnetic instrument used for the survey was a type Sander EM3-A. This system utilizes 2 co-axial coils separated by a distance of 23 feet, one of these coils being the transmitter, the other the receiver. The axis of the coil system was positioned in the direction of flight. The electromagnetic system was carried inside a boom suspended 65 feet below the aircraft. The same boom contained the electronic instruments for both the transmitter and the receiver. The system was operated on a frequency of 4 KHz. The built-in filter has a time constant of 1.4 seconds. The EM system contains provisions to test the response of the amplifiers

and of the total system and to calibrate the sensitivity of the instrument in flight.

A strain sensor was used to detect variations of the strain on the supporting structure of the electromagnetic system. These changes in strain are caused by varying flight conditions and result in small changes of the recorded in-phase signal. The information gained from the strain sensor is useful in recognizing the cause of such in-phase changes and enhances the sensitivity of the instrumentation.

Theory of Operation

The easiest way to understand the function of an EM instrument of the type used in this survey is to consider the EM instrument as a loosely coupled transformer; the primary being the transmitting coil and the secondary the receiving coil. The earth contributes a portion of the coupling medium between the two coils. The efficiency of coupling and hence the strength of the signal across the secondary coil depends on the electric and magnetic properties of the earth. If this system is operated at a height of 100 to 200 feet above the ground, the variation in signal strength due to variations in the properties of the earth, can be of the order of tens of parts per million of the total signal received. The phase of the signal also can vary to the extent that the strength of the signal received 90° out-of-phase with the transmitted strength. Hence the output from the system is presented as

V

two channels - IN-PHASE and (90°) OUT-OF-PHASE, and the unit of measurement is parts per million (ppm) of the primary field.

The signal which would be received if the system were suspended in free space (in practice the signal received when flying more than 500 feet above the ground) is compensated so that only variations from this level are measured. There are limits to the detectability of anomalies due to the ambient noise present when the instrument is flown in rough air. This noise is primarily due to mechanical changes in the towed structure, the bird, caused by the stresses due to air turbulence and change in acceleration.

Mechanical noise influences the in-phase portion of the instrumentation more than the out-of-phase portion. Noise conditions during the survey were such that an anomaly of two parts per million can be detected on the out-of-phase trace and an anomaly of four parts per million can be detected on the in-phase trace. In many cases the mechnical noise can be recognized by referring to the strain gauge information and, accordingly, will not be mistaken for a true signal.

Magnetometer

The magnetometer survey was conducted with a Sander NPM-5 proton precession magnetometer. This instrument records the total magnetic field to a resolution of 0.1 gamma, and an accuracy matching this resolution. Every measurement lasted 1 second and was recorded digitally at this interval.

The sensor and preamplifier of the magnetometer are built into the EM survey boom and the survey plane is the same as the one used for the EM survey.

Diurnal variations were recorded with a Sander NPM-6 ground station magnetometer consisting of a proton precession magnetometer and a digital cassette recorder. Magnetic measurements were taken every 15 seconds and the digital record of these ground station readings was used to correct the in-flight data. This procedure was made possible by the use of very accurate electronic clocks incorporated in the survey system and in the ground station. These clocks were checked and correlated at frequent intervals.

VLF Instrument

The VLF Instrument consisted of two small tuned coils, one with its axis in the direction of flight, which was also the direction of the main magnetic VLF vector, and one with its axis in the vertical direction. Signals from both coils were rectified. In the case of the vertical coil, the in-phase and out-of-phase components (with respect to the horizontal coil) were recorded.

In order to compensate the VLF information for movements of the aircraft, a vertically stable gyro was carried in the aircraft. Variations from the vertical direction, both in the direction of flight and at right angle to the direction of flight were recorded from this vertical gyro and this information was used to correct the variations in the VLF recording. In this way a stablized platform was simulated by the computer program.

Data Processing

The following section of this report concerns itself with data processing in general. Many of the steps carried out for data processing are identical in the production of the EM, VLF and the magnetometer maps.

All data processing was accomplished using two Texas Instrument 980A Computers and a Gerber Flat Bed Table driven by one of the computers. The following is a description of the digital and manual data processing employed.

Data were recorded in analogue and digital form. The analogue records represent the following traces:

VLF In-Phase
VLF Out-of-Phase
EM In-Phase
EM Out-of-Phase
Magnetometer a. 0 - 100 gammas
b. 100 - 1000 gammas
c. 1000 - 10000 gammas
Each in steps of 10 digital units.
Radar Altimeter
Strain Gauge
Camera Fiducials

Identical data were recorded on digital cassette with the following format and channel numbers:

00	Magnetometer 4BCD digits	07,24	EM Out-of-Phase
01	Camera	10,21	Strain Gauge
02	Time (seconds)	11	VLF Horizontal
03	Time (hours)	13	VLF In-Phase
04	Magnetometer	14	VLF Out-of-Phase
05,22	Altimeter	15	Gyro Pitch
06,23	EM In-Phase	16	Gyro Roll

The flight path was recorded with a 16mm camera. This camera is synchronized with the analogue and digital records by a fiducial code printed on the film and on both recording media.

VIII

All fiducial marks were transferred on stable base maps provided by Gulf Minerals. Digitizing was accomplished by the use of a digitizing machine with a resolution of .1 mm. In this way, the coordinates of fiducial marks with their respective numbers and the line numbers were entered into the computer system. A second data stream was created by converting the field recordings into IBM compatible tapes. By using an identical code for line numbers, it was then possible to correlate the geophysical data with the flight path. All maps were merged to one large master sheet covering the entire area, with the exception of a small separate area to the east.

Production of Magnetometer Maps

The magnetic maps were produced by using a cubic spline function to interpolate data between flight lines. This function was defined by utilizing the actual flight data and forming cubic splines across the lines. Data values were created for each intersection point of a square grid, with a spacing of .1 inch. These data were then contoured by computer to an interval of 10 gammas.

In carrying out corrections heavy reliance was placed on the quiet area in the north of the survey area. The production of the map was a rather difficult one because the dynamic range of the survey is so large, having very quiet areas in the north and extremely strong anomalies to the south.

IX

VLF Survey

The VLF profile maps were produced by computer by determining a proper correction function relating the output of the vertical gyro and the vertical in-phase VLF data. This function was determined experimentally. Data were plotted along the flight lines by removing whatever DC bias might exist. This was done by determining a constant value to be removed from each line. VLF data were represented on two maps, one giving the vertical component in-phase and out-of-phase profiles, the second one giving the strength of the field. Proper corrections were applied to both functions to normalize the data for an average day and average flight conditions. The map giving the total field strength is a good indication of location and relative size of the anomalies. The noise level on this map is lower than on the vertical component map since the coil is in a maximum coupled position to the electromagnetic field. However, using only the total field map, it is not possible to obtain phase relationships. Therefore, the entire information concerning the anomalies should be obtained by comparing both the vertical component curves and the maximum coupled curves.

Electromagnetic Survey

The electromagnetic data were plotted as observed. No corrections for the distance from the detector to ground were applied since these corrections can introduce a disturbing element into the data, and since the EM anomalies are generally of a broad nature, variations with the height of the aircraft are quite

X

small. Since the electromagnetic instrument is subject to a certain amount of drift, a computer function was developed which eliminated this very low frequency drift. The correction is a first order curve obtained by least squares approximation from the data. One curve was obtained for each flight line.

Results

The results of the survey are shown on 11 maps for the three methods, one magnetometer map, one EM map, one VLF vertical component map, one VLF total VLF field map.

We will discuss the magnetic map first because this method relates most directly to the geology of the area and might very well be the most useful one of the three geophysical surveys for this project.

Very large variations are shown on the magnetometer maps. In general the area to the north of Cobequid formation is considerably quieter and the contact between the Cobequid and younger sediments is clearly outlined on the magnetometer map by the disappearance of strong magnetic anomalies. Some evidence exists that the Cobequid extends at moderate depth for some distance under the undeformed Paleozoic showing wider moderate anomalies which, however, are considerably stronger than the anomalies generally found in the area underlain by the undeformed Paleozoic rocks. These broader anomalies do not seem to show a general change in depth, but rather a sudden one; indicating block faulting at the contact between the Cobequid and younger sedimentary rock.

Faulting is also indicated by the shape of the contact, which seems to extend in steps to the north rather than occurring along a straight line.

Within the Cobequid certain divisions are noticeable. Some of these indicate clearly areas of less magnetic activity and are due to parts of this region which contain either sediments or volcanic rocks, in which magnetite is not an important constituent. The most striking example of this is apparent just north of the village of Nuttby. The strongest magnetic trends bear southeast in direction. Certain less continuous trends are subparallel to the flight line direction. These might result from intrusives or, in some cases, clearly delineate faults. We believe that a great deal of the interior structure of the Cobequid formation is expressed by the magnetic data. It is necessary to compare known results of geological mapping with the magnetometer data in order to classify individual units.

VLF

Two maps are submitted to indicate the VLF results. One of these describes the changes in magnitude of the total field, the other one shows the magnitude of the vertical component of the total field, both in-phase and out-of-phase. Most anomalies occur in the Cobequid formation and particularly in southern parts of the Cobequid formation. General correlation exists between the boundaries of zones of differing magnetic styles and VLF anomalies. These contacts might contain altered basic rocks, graphite or shear zones.

The correspondence between the magnetometer maps and the VLF anomalies are rather striking.

Directions indicated by the VLF trends are either east-west, north-east or north-west. The electromagnetic field from the transmitter lies in the direction of the flight lines. It would be difficult to observe anomalies parallel to the flight line.

Generally, it appears that VLF anomalies occur more frequently in the magnetically less active part of the area than in regions of strong magnetic anomalies.

VLF anomalies in the northern portion of the area are underlain by Carboniferous sediments and indicate fairly wide trends. This information is identical to the information given by the electromagnetic survey. Because of the width of these trends, anomalies are not clearly defined but are represented by elongate "crossovers" in the vertical components and broad, but rather weak peaks, in the total field.

VLF anomalies also are created by cultural installations, particularly power lines and railroads. An attempt was made to disregard these anomalies during interpretation, however where the cause of the anomaly is doubtful, the disturbance was shown as an anomaly. For this reason, some of these VLF anomalies as well as the electromagnetic anomalies might be reflected on the maps.

EM Anomalies

The majority of the EM anomalies occur in the Carboniferous rocks, indicating broad trends. These are very likely caused by beds containing carbonaceous material, either coal or graphite. These electrical trends might be useful in delineating the carbonaceous material in the Carboniferous formation, or outlining the contact. Very few anomalies occur in the Cobequid. Most of the electrical anomalies in the Cobequid occur in the vicinity of magnetic anomalies. It is recommended to investigate these anomalies in order to determine their cause.

Electromagnetic anomalies of positive sign, that is ones showing an increase in the field strength, can be created by magnetic material in the ground. Since these anomalies indicate the presence of magnetite, which is clearly shown on the magnetic maps and of no particular interest to exploration in this area, positive electromagnetic anomalies were not considered in the interpretation.

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VII GROUND VLF SURVEY

During the 1977 field season Gulf personnel conducted a ground very low frequency electromagnetic survey over the Swan Brook grid in the Cobequid IV block. A Ronka EM-16 was used for the survey. The survey used Cutler Main (NAA at 17800 hertz) as a transmitter station.

This survey was comprised of readings taken at one-hundred foot grid stations located on lines spaced four-hundred feet apart for a total of 35.6 line miles of readings. The purpose of the survey was to locate conductive zones, be they; shears, or faults, and with or without graphite or other metalliferous sulphides. Great numbers of these conductive zones have been indicated by an airborne survey carried out by Sanders Geophysical in the spring of 1977. It is our intention to verify the sensitivity and accuracy of that survey within the area of our present search for subsequent core drilling programs.

The instrument readings have been plotted to form Rich Hand Crossovers. This may be interpreted as follows: a conductor exists whenever the in-phase signal (solid marking) and of negative slope (Cartesian system) crosses the out-of-phase signal, (dashed line) - or even more accurately, the conductor exists at the point of greatest inflection of the in-phase signal (positive slope) immediately prior to that crossover.

Conclusions to date:

(i) the ground survey does verify certain of the airborne conductors, both as to intensity and position,

(ii) the nature of the conductors are unknown at present due to overburden masking, however, a drilling program is anticipated in the near future.

COBEQUID PROJECT

DL ZONE

VIII Diamond Drilling

Early in November, 1977, St. Lambert Drilling Company of Valleyfield, Quebec completed four holes for a total of 1297 feet of BQ drilling. The holes were located on line 96+00 east of the Swan Brook grid system, (see location map, Fig. 4) between 24+00 south and 33+00 south. The drill program was designed to investigate a V.L.F. EM conductor and to provide stratigraphic information in the area. All core is stored at the Swan Brook core shack.

Diamond Drill hole DL-1 was located on line 96+00 east at 24+00 south. The hole was drilled on an azimuth of 180° at -45° to a final depth of 462 feet.

A diabase dyke was intersected at the top of the first hole. It was intruded into a weakly altered, trachytic, porphyritic rhyolite which is exposed between 36' and 166.5' in the hole. Below this is 88' of moderately to highly kaolinized, strongly fractured rhyolite. This alteration zone gradually fades into a rhyolite similar to the upper zone although some strong kaolinization may persist locally. At 305.5' - 330.5' is a mottled dark red and olive green rhyolite. It is underlain by 34.5' of dark green, aphanitic, porphyritic "hybrid rhyolite". From 364.5' to 401.5' is 37' of diabase. Beneath it is 25.5' of conglomerate. It is composed of pebbles up to 1 cm. in size. The matrix is fine to coarse sand. Some preferred orientation of pebbles at 45° to the core axis is found locally. The base of the hole, from 427' to 462', is cut by a hybrid intrusive. It is dark green, medium grained, locally porphyritic and weakly altered. No anomalous radioactivity was present in this hole.

Diamond drill hole DL-2 was located on line 96+00E at 27+00S and was drilled on an azimuth of 180° at -45° to a final depth of 435 feet.

This hole intersected intensely tectonically brecciated, trachytic rhyolite between 45' and 120'. This zone is strongly kaolinized. It is underlain by 21.5' of brick red, porphyritic, moderately brecciated and kaolinized rhyolite. The zone from 141.5' to 146' consists of diabase, siliceous sediment and a second diabase dyke. The zone from 146' to 176' is conglomerate overlying a 13.5' siltstone unit. The zone from 176' to 280' is composed of numerous diabase dykes and porphyritic intrusives, and several rhyolitic horizons which may themselves be intrusive. From 280' to 366' is a succession of conglomerate, sandstone and siltstone. The base of the hole, from 366' to 435' is cut by a fragmental intrusive. Radioactivity above background was absent from this hole.

Diamond drill hole DL-3 was located on line 96+00E at 29+80S and was drilled on an azimuth of 180° at -45° to a final depth of 450 feet.

The upper 90' of this hole is sediment consisting of sandstone, conglomerate and siltstone beds. Below this is a porphyritic, siliceous flow followed by rhyolite at 163.5'. The contact zone may be gradational but a foliated mafic intrusive cuts this region in the hole. The section from 215.5' to 403' is composed of two rhyolite horizons which grade into each other at about 280'. These units are porphyritic and flow laminated locally. The lower unit contains fragments of acid composition. The zone from 403' to 423' is dark red rhyolite with dark green alteration bands. These bands dip at 45° to the core axis. The lower 27' of the hole is mafic intrusive. The rock is diabasic, porphyritic and becomes glomero-porphyritic at the base of the hole. No anomalous radioactivity was noted.

Diamond drill hole DL-4 was located on line 96+00E at 33+00S and was drilled on an azimuth of 180° at -45° to a final depth of 350 feet.

The upper 273' of this hole consists of a porphyritic rhyolite. In texture and composition, it resembles quartz-feldspar porphyry. It is dark pink near surface, becoming grey with depth. At 273.5' it is underlain by 8.5' of hybrid agglomerate. The rock is medium to coarse grained and consists of 3-7 mm. spherulitic appearing growths set in a porphyritic matrix. Beneath this is 33' of trachytic, porphyritic rhyolite and 34' of what may be mafic flow. It carries rounded fragments up to 1 cm. in size. It is locally flow laminated. No anomalous radioactivity was measured in the hole.

Summary of Drilling

The drilling started in a rhyolitic flow sequence, proceded through a 150-175 foot thick sedimentary sequence, dipping 50° - 70° N, underlying the volcanics into a lower volcanic succession of rhyolite flows and possibly acid intrusives.

The upper and lower contacts between sediments and volcanics intersect the surface at about 28+75S and 30+75S respectively. The uppermost volcanic sequence intersected in DL-1 and DL-2 consists of trachytic frequently porphyritic rhyolites. The lowermost sequence intersected in DL-3 and DL-4 consists of siliceous, probably rhyolitic flow rocks resembling quartz-feldspar porphyry and are somewhat granitic textured.

Zones of low resistivity were found in holes DL-1 and DL-2 which resulted from shears and were probably the cause of the VLF EM conductor.

SUMMARY OF DRILLING

TABLE II

Hole	Section	Location	Bearing	Dip	Footage (feet)	Date Started	Date Completed
DL-1	L96+00E	L96+00E 24+00S	180°	-45°	462	Nov. 9	Nov. 17
DL-2	L96+00E	L96+00E 27+00S	180°	-45°	435	Nov. 18	Nov. 22
DL-3	L96+00E	L96+00E 29+80S	180°	-45°	450	Nov. 23	Nov. 25
DL-4	L96+00E	L96+00E 33+00S	180°	-45°	350	Nov. 26	Nov. 29

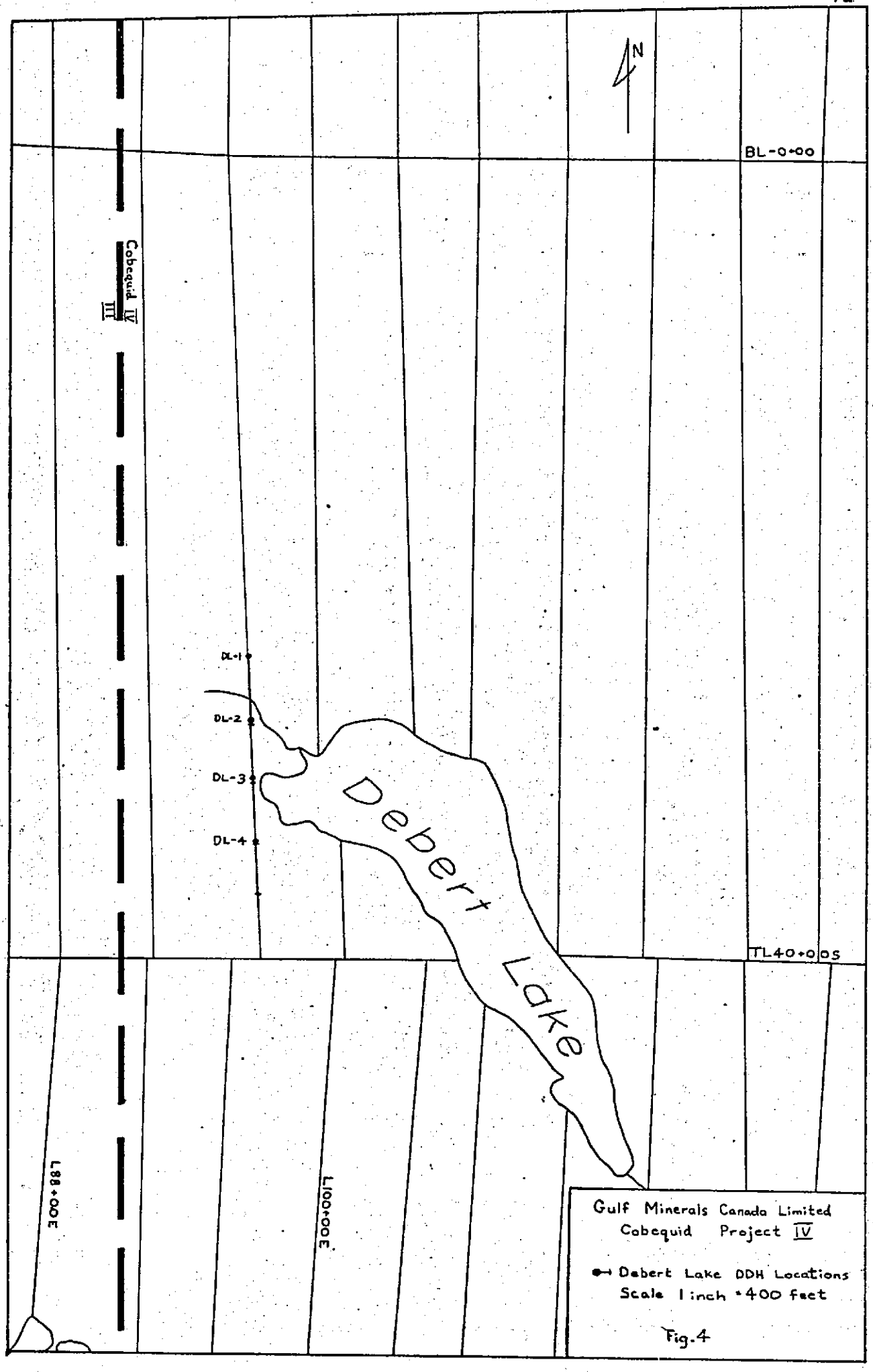
N
BL-0+00
Cobequid III IV
DL-1
DL-2
DL-3
DL-4
Debert Lake
TL40+00S
L88+00E
L100+00E
Gulf Minerals Canada Limited
Cobequid Project IV
Debert Lake DDH Locations
Scale 1 inch = 400 feet

Fig.4

IX SUMMARY & CONCLUSIONS

Work carried out by Gulf Minerals during 1977 has shown that local zones of uranium enrichment are present in the Cobequid uplands. Extensive drilling is required to establish the potential of these zones for containing economic mineralization. Detailed surface work is required to locate areas where uranium enrichment has taken place and to evaluate airborne geophysical anomalies.

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Fletcher, H. (1905) "Wentworth Sheet, W° 62: Cumberland and Colchester Counties" Geological Survey of Canada, Ottawa.

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APPENDIX I Assays

Whole Rock

WHOLE ROCK ANALYSIS

Plate Number	Sample Number	SiO_2	Al_2O_3 Zr	CaO U	MgO Th	Na_2O Pb	K_2O Zn	FeO Cu	MnO	TiO	P_2O_5	Wt.% PPM
	(field name)											
E25-f	B-3001 Calc-alkaline dacite (granite)	71.64	14.75 160	2.23 0	0.71 0	4.05 40	3.28 40	2.89 40	0.06	0.33	0.04	
E25-f	B-3002 Tholeiitic Dacite (granite)	71.47	14.42 330	2.47 0	0.93 0	3.96 20	2.60 120	3.43 10	0.08	0.58	0.07	
E25-f	B-3003 Altered (granite)	74.96	13.26 240	1.18 0	0.40 0	4.13 20	4.43 20	1.25 0	0.03	0.34	0.03	
E25-f	B-3004 Altered (granite)	75.89	13.38 120	0.60 0	0.14 20	3.94 60	5.10 30	0.75 0	0.02	0.18	0.01	
E25-f	B-3005 Calc-alkaline rhyolite (rhyolite)	75.90	13.24 150	0.33 0	0.43 10	4.28 50	3.74 40	1.74 0	0.03	0.27	0.03	
E25-f	B-3006 Altered (rhyolite)	72.98	14.51 170	3.98 0	0.25 30	4.69 70	0.92 30	2.30 0	0.06	0.28	0.03	
E25-f	B-3007 Altered (rhyolite)	77.67	11.99 170	0.23 0	0.05 40	3.36 130	5.21 30	1.34 0	0.02	0.13	0.00	
E25-f	B-3008 Altered (rhyolite)	77.90	11.78 150	0.26 0	0.09 10	3.25 130	5.26 20	1.29 0	0.01	0.14	0.00	
E25-f	B-3009 Calc-alkaline dacite (granite)	74.92	12.24 260	1.94 0	0.60 40	3.72 50	3.61 50	2.54 10	0.04	0.35	0.03	
E25-f	B-3010 Altered (granite)	71.87	13.94 360	1.03 10	0.36 50	3.68 60	5.65 90	2.94 0	0.07	0.41	0.04	

E25-f	B-3011 Altered (granite)	71.46	14.24 370	1.11 0	0.37 0	3.70 10	5.67 60	2.92 20	0.07	0.40	0.04
E26-f	B-3012 Altered (granite)	73.06	13.70 410	0.79 0	0.24 20	3.65 30	5.86 30	2.23 30	0.05	0.40	0.02
E26-f	B-3013 Altered (granite)	77.63	12.08 180	0.27 0	0.01 0	3.64 10	5.12 20	1.10 20	0.02	0.13	0.00
E26-f	B-3014 Altered (granite)	77.61	12.06 200	0.28 0	0.10 20	3.45 20	5.13 40	1.22 0	0.02	0.13	0.01
E26-f	B-3015 Altered (granite)	77.71	11.93 190	0.31 0	0.04 20	3.55 90	5.13 40	1.19 0	0.02	0.13	0.00
E26-f	B-3016 Altered (granite)	77.68	11.94 170	0.30 0	0.07 40	3.46 40	5.10 40	1.29 0	0.03	0.13	0.00
E26-f	B-3017 Altered (granite)	74.60	13.22 330	0.74 0	0.11 10	4.01 0	5.16 30	1.89 20	0.03	0.24	0.01
E26-f	B-3018 Altered (granite)	74.51	13.00 300	0.54 0	0.13 20	3.57 40	5.78 30	2.14 0	0.05	0.26	0.01
E26-f	B-3019 Altered (granite)	75.64	12.50 230	0.51 0	0.08 30	3.75 50	5.51 60	1.78 30	0.04	0.19	0.01
E26-f	B-3020 Altered (granite)	75.82	12.28 310	0.49 0	0.06 10	3.44 20	5.63 50	1.99 0	0.04	0.25	0.01
E26-f	B-3021 Tholeiitic Basalt (basalt)	46.87	13.39 460	9.37 0	4.77 0	3.48 60	1.00 180	15.69 30	0.27	4.37	0.81
E26-f	B-3022 Tholeiitic Basalt (basalt)	51.51	12.44 420	6.39 0	4.21 20	4.01 0	0.25 150	16.19 10	0.27	4.22	0.51

E26-f	B-3023 Alkali Basalt (basalt)	44.94	14.56 220	10.55 0	6.11 0	2.76 180	0.63 190	16.47 40	0.24	3.42	0.32
E26-f	B-3024 Tholeiitic Basalt (basalt)	49.31	15.62 240	9.79 0	5.98 0	2.62 0	0.41 110	12.82 40	0.27	2.98	0.20
E26-f	B-3025 Altered (rhyolite)	74.72	13.22 560	0.67 0	0.17 10	1.49 10	7.01 60	2.39 0	0.02	0.31	0.01
E26-f	B-3026 Altered (rhyolite)	76.90	12.66 520	0.36 0	0.19 0	2.01 70	5.51 110	2.03 30	0.01	0.31	0.02
E26-f	B-3027 Altered (rhyolite)	78.87	10.55 1020	0.18 0	0.25 0	0.62 50	6.44 190	2.80 30	0.05	0.23	0.00
E26-f	B-3028 Altered (rhyolite)	81.12	10.25 1210	0.20 0	0.08 0	0.42 30	4.81 50	2.79 20	0.06	0.27	0.00
E26-f	B-3029 Altered (rhyolite)	76.45	12.53 210	0.59 0	0.10 30	3.23 60	5.47 50	1.39 0	0.03	0.20	0.01
E26-f	B-3030 Altered (rhyolite)	78.54	11.99 110	0.57 0	0.14 10	3.24 40	4.17 30	1.15 0	0.05	0.14	0.01
E26-f	B-3031 Altered (granite)	74.18	13.62 190	1.77 0	0.36 30	3.30 30	4.34 20	2.09 0	0.05	0.28	0.03
E26-f	B-3032 Tholeiitic Dacite (granite)	66.58	16.08 400	3.27 0	1.20 0	4.20 0	2.98 70	4.76 30	0.13	0.72	0.09
E26-f	B-3033 Altered (rhyolite)	67.70	14.30 260	2.04 0	1.93 0	3.32 0	4.30 110	5.30 50	0.17	0.85	0.09
E26-f	B-3034 Calc-alkaline Rhyolite (granite)	75.23	13.35 150	0.46 0	0.38 10	4.23 0	4.21 20	1.81 0	0.06	0.25	0.02

E26-f	B-3035 Altered (rhyolite)	74.38	11.48 1600	0.93 0	0.17 20	3.72 10	3.87 60	4.87 0	0.08	0.51	0.01
E26-f	B-3036 Altered (rhyolite)	78.86	10.29 1240	0.28 0	0.06 30	2.74 50	4.16 60	3.29 0	0.05	0.25	0.01
D26-f	B-3037 Altered (rhyolite)	77.32	12.67 100	0.95 0	0.22 0	4.27 50	3.28 30	1.17 0	0.02	0.09	0.01
D27-f	B-3038 Altered (rhyolite)	77.28	13.00 100	0.60 0	0.12 10	4.59 60	3.14 30	1.14 0	0.03	0.10	0.01
D27-f	B-3039 Altered (rhyolite porphyry)	75.40	13.42 170	0.95 0	0.29 0	4.79 50	3.01 60	1.84 0	0.07	0.21	0.02
D27-f	B-3040 Altered (rhyolite porphyry)	76.87	13.10 70	0.44 0	0.10 10	4.27 70	3.92 40	1.17 0	0.04	0.08	0.01
E26-f	B-3041 Altered (rhyolite)	78.76	11.91 170	0.94 0	0.54 10	4.41 80	1.70 80	1.47 10	0.05	0.21	0.02
E26-f	B-3042 Altered (rhyolite)	78.44	11.86 180	0.69 0	0.48 0	3.54 20	2.85 50	1.84 10	0.06	0.22	0.02
E25-f	B-3060 Altered (rhyolite)	78.71	10.65 220	0.37 0	0.53 10	2.62 80	4.66 240	2.15 0	0.06	0.24	0.01
E25-f	B-3061 Altered (rhyolite)	79.98	10.75 280	0.56 0	0.06 20	1.37 370	5.61 130	1.48 0	0.02	0.17	0.01
E25-f	B-3062 Tholeiitic Andesite (rhyolite)	68.70	12.45 410	3.31 0	2.03 20	3.91 40	2.15 160	6.09 0	0.11	1.15	0.11

E25-f	B-3063 Altered (rhyolite)	78.92	11.20 220	0.54 0	0.14 50	2.76 110	4.93 190	1.41 0	0.03	0.07	0.00
E25-f	B-3064 Tholeiitic Andesite (granite)	57.55	13.54 320	6.31 0	4.18 30	3.46 130	2.70 200	10.02 30	0.20	1.92	0.11
E25-f	B-3065 Altered (rhyolite)	77.76	12.16 210	0.63 0	0.14 2	3.08 60	4.76 40	1.34 0	0.02	0.10	0.01
E25-f	B-3066 Altered (granite)	76.88	11.88 390	0.34 10	0.03 30	3.77 20	4.94 160	1.96 0	0.03	0.17	0.00
E25-f	B-3067 Altered (granite)	76.71	12.17 370	0.25 0	0.13 20	3.53 30	5.31 20	1.67 30	0.02	0.21	0.00
E25-f	B-3068 Altered (granite)	70.05	14.80 600	1.12 0	0.23 20	5.09 50	4.86 70	3.39 10	0.08	0.36	0.03
E25-f	B-3069 Altered (Granite)	65.19	14.91 870	2.63 0	0.68 0	4.31 450	5.03 190	6.13 0	0.15	0.86	0.11
E25-f	B-3070 Altered (Quartzite)	95.15	2.47 110	0.15 0	0.27 0	0.14 20	1.11 20	0.60 0	0.01	0.08	0.01
E25-f	B-3071 Calc-alkaline dacite (rhyolite)	70.74	14.48 180	3.02 0	0.80 30	4.71 30	2.58 60	3.05 0	0.08	0.48	0.06
E25-f	B-3072 Calc-alkaline rhyolite (granite)	73.31	13.80 260	1.38 0	0.45 20	4.53 0	4.07 70	1.89 0	0.09	0.44	0.04
E25-f	B-3073 Altered (granite)	68.32	14.06 400	1.87 0	0.86 10	3.69 0	5.66 50	4.49 20	0.10	0.83	0.13

E25-f	B-3074 Altered (granite)	72.30	14.14 280	1.53 0	0.36 30	3.82 100	5.39 90	2.06 0	0.05	0.31	0.04
E25-f	B-3075 Altered (granite)	74.07	13.35 310	0.75 0	0.17 40	3.83 50	5.27 80	2.22 0	0.07	0.24	0.02
E25-f	B-3076 Altered (granite)	74.46	13.24 270	0.69 0	0.18 60	3.69 90	5.44 70	1.98 0	0.08	0.23	0.02
E25-f	B-3077 Tholeiitic Dacite (granite)	7042	14.82 310	2.72 0	0.81 10	3.66 10	2.91 50	3.91 10	0.10	0.59	0.07
E27-f	B-3078 Altered (rhyolite)	69.67	12.71 470	2.23 0	0.73 20	3.30 40	4.20 120	6.14 0	0.12	0.81	0.09
E27-f	B-3079 Altered (rhyolite)	70.40	12.83 450	2.00 0	0.68 0	3.67 30	4.04 90	5.39 10	0.10	0.82	0.07

APPENDIX II Diamond Drill Hole Logs

DL 1-4

Gulf Minerals Canada Limited
DIAMOND DRILL RECORD

D.D.H. NO. DL-1
SHEET 1 OF 6

PROPERTY Cobequid
LATITUDE 24+00S
LONGITUDE L 96E
ELEVATION

BEARING—TRUE 180° AZ
DIP -45°
FINAL DEPTH 462'
CORE SIZE BQ

DATE STARTED 9 November 1977
DATE COMPLETED 17 November 1977
DRILLED BY St. Lambert
LOGGED BY A. Workman

DATE: 19 November 1977 SIGNED

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
0 -	22		Overburden				ACID DIP TEST
22 -	36		Diabase	Dark to very dark green, fine grained, moderately chloritized and			100' -45°
	(14)			possibly serpentinized. Strongly epidotized fractures are common.			300' -48°
				The intrusive is frequently micro-faulted at various angles and amounts			462' -47°
				of displacement are unknown (e.g. 25.5'). It is weakly to moderately			
				magnetic and the basal zone contains abundant rhyolite xenoliths,			
				1 - 1.5 cm in size, from 32' - 36'.			
				29 - 30.5': in this zone the diabase is intruded by a felsic, possibly			
				granitic, pink, equigranular, medium grained dyke. The			
				contacts are indistinct and some feldspar-flooding of the			
				mafic rock has occurred. It contains numerous magnetic			
				diabase xenoliths up to 3 cm in size.			
36 -	166.5		Rhyolite	Dark pink to reddish pink becoming greyer and darker hued with depth.			
	(130.5)		-trachytic?	Minor orange alteration zones are found locally. The rock is aphanitic			
				and porphyritic. Quartz-eyes, probably quartz phenocrysts, are roundish			
				and 1 - 2 mm in size. These quartz growths are frequently surrounded			
				by thin, light pink to orange reaction rims, indicating transport			
				after formation. Flow laminations are uncommon but are found locally			
				to consist of alternating 1-3 mm grey and pink bands which frequently			
				wrap around quartz phenocrysts. Flow banding cuts the core axis at			
				50° - 70°. Near diabase dykes, the rhyolite (which may be trachytic			
				in composition) is a deeper red hue and is frequently strongly			
				fractured in these zones. Typically, the fractures are moderately to			
				strongly epidotized. Weak chloritization of fractures adjacent to			
				diabase is common. Some fractures are filled with quartz and white			
				carbonate.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-1

SHEET 2 OF 6

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
36 -	166.5 (130.5)		Rhyolite	continued... No primary brecciation is apparent in the upper hole but several zones occur below 115'. As a whole, the rock is relatively fresh near surface but at 127.5' some degree of kaolinization of feldspar may be present. The degree of alteration increases with depth. Some silification and hematization is also widespread in this zone. Numerous diabase dykes are present. They are typically dark green, fine to medium grained, moderately chloritized and possibly serpentinized. They are equigranular, and weakly to locally moderately magnetic.			
				36 - 43': moderately to strongly laminated zone. Flow banding cuts the core axis at 65° - 70°, and the zone is cut off at 43' by diabase.	42'	flow lamination	65° to the C/A
				43 - 51': Diabase			
				53.5 - 54.5': orange altered rhyolite - finely fractured, possibly weakly kaolinized, silicified.			
				57 - 80': Diabase			
				80 - 94': vaguely laminated zone - dark greyish red to dark greyish pink - flow banding cuts the core axis at 45° - 50° 83.5 - 84.5': Diabase	90'	flow lamination	50° to the C/A
				94 - 100': Diabase - contains an intensely fractured and epidotized rhyolite xenolith at 94.5 - 95'			
				100 - 106': reddish pink rhyolite, porphyritic: quartz eyes have reddish reaction rims giving zone its colour - actually a grey rhyolite zone is well laminated at 106 - 107'.	106'	flow lamination	50° to the C/A
				107 - 110': grey rhyolite			
				110 - 112': reddish-pink zone			
				112 - 122.5': rhyolite is greyish to greyish-pink, locally porphyritic with 1-3 mm quartz eyes, and possibly coarsely laminated locally. Intense tectonic brecciation occurs at 118 to 119' and 120 to 121'.			
				122.5 - 127.5': Diabase: lower contact is highly altered and fractured - small fault is located at 127' cutting the core axis at 70° with 2" displacement.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-1

SHEET 3 OF 6

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
36	- 166.5		Rhyolite	continued...			
	(130.5)			127.5 - 147.5': light pinkish grey, aphanitic, porphyritic locally with some intensely tectonically brecciated rock locally. Some degree of clay alteration (kaolinization) of feldspar is present. Fractures are chloritized or epidotized.			
				147.5 - 166.5': Diabase - fractures are epidotized, chloritized and hematized.			
166.5	- 254.5		Alteration	Reddish-pink to reddish-brown to grey, aphanitic and finely fractured.			
	(88.0)		Zone	At edges of the zone, the alteration consists primarily of epidotization, chlorite development and irregular hematization along fractures. The rhyolite itself may also be weakly hematized in the more reddish zones. The centre section of the zone is more intensely fractured and in addition to the other alteration, the rhyolite is moderately and possibly strongly kaolinized. Degree of clay alteration may vary according to feldspar content, the more strongly altered zones being trachytic in composition. The rhyolite is also commonly porphyritic; quartz-eyes and occasional feldspar phenocrysts are present. Several diabase dykes cut this zone. They are typically fine to medium grained and moderately to strongly chloritized.			
				166.5 - 174.5': alteration is fracture controlled - epidote and hematite.			
				174.5 - 176': Diabase			
				176 - 186': pink to reddish rhyolite, moderately to strongly kaolinized, weakly to moderately hematized locally weakly porphyritic - 1-2 mm. quartz. phenocrysts locally.			
				186 - 192.5': Diabase			
				192 - 221.5': pink rhyolite near diabase contact, becoming greyer with depth - the zone is intensely tectonically brecciated, weakly silicified, hematized, kaolinized and epidotized. Fracturing frequently becomes mylonitic.			
				221.5 - 225.5': Diabase - very highly chloritized and contains abundant altered rhyolite xenoliths. Intrusive contacts are intensely altered.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-1

SHEET 4 OF 6

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
166.5	- 254.5 (88)		Alteration zone	continued...			
				225.5 - 230': rhyolite is highly fractured and altered			
				230 - 252': rhyolite is mylonitic, intensely kaolinized, and hematized locally. It is porphyritic and abundant breccia is present in several quartz carbonate filled fracture zones. Numerous diabase dykes are present.			
				233 - 234.5: Diabase - highly chloritized.			
				237 - 238': Diabase			
				239 - 242': very mafic zone - possibly near a diabase contact.			
				252 - 254.5': rhyolite becomes less intensely fractured. Several diabase stringers are present and 4" - 6" zones of moderate hematization surround them. The zone is porphyritic 1-2 mm quartz phenocrysts are common.			
254.5	- 305.5 (51)		Rhyolite -trachyte?	Dark red to dark reddish-brown becoming reddish green at base, aphanitic and porphyritic. The rock is flow laminated locally at varying angles to the core axis. Frequently the bands wrap around the 1-2 mm. quartz phenocrysts. Generally the zone is not intensely fractured and only weakly to moderately hematized. Numerous diabase dykes are found. They are dark green and fine to medium grained, and are usually weakly magnetic.			
				254.5 - 257': dark red, porphyritic, few fractures, highly hematized locally.			
				257 - 272': Diabase - possibly mafic gabbro - dark green with olive-green mottling, fine to medium grained, and the pyroxene crystals may be weakly uralitized. The rock is weakly magnetic locally and contacts are moderately chloritized. Contains some rhyolite xenoliths up to 10" in size (e.g. 269'-270')			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-1

SHEET 5 OF 6

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
254.5	- 305.5 (51)		Rhyolite	continued.....			
				272 - 298': Dark red to dark reddish brown, porphyritic, finely to coarsely laminated locally. Phenocrysts of quartz and possibly feldspar are present. Few fractures. After 287.5' the rock becomes more strongly porphyritic and more irregularly altered. Some weak hematization and kaolinization is present. 296.5 - 297.5': possible chloritized fault zone	272.5	flow lam.	45° to the C/A
					291	flow lam.	75° to the C/A
				298 - 299.5': Diabase			
				299.5 - 305.5': Rhyolite becomes reddish green and then greenish at lower boundary.			
305.5	- 330.5 (24.5)		Mottled Rhyolite	Dark red with irregular hazy light olive green patches, aphanitic and porphyritic with 1-2 mm. phenocrysts of quartz and feldspar common. Olive green patches probably reflect some form of irregular alteration. These zones increase in occurrence and size towards 330'. Several dark green, fine grained diabase dykes cut this zone.			
				305.5 - 309': Diabase - numerous quartz filled fractures.			
				309 - 310': Rhyolite			
				310 - 311': Diabase			
				311 - 313': Rhyolite			
				313 - 315': Diabase			
				315 - 330.5': Rhyolite			
330.5	- 364.5 (34.5)		Hybrid Rhyolite	Dark green, aphanitic and very hard. Some minor rusty red zones appear in the lower half of the zone. Some olive green "alteration" patches persist from the 305' to 330' zone to 336'. This zone is moderately prophyritic. Quartz phenocrysts 1-2 mm. in size are fairly common. Some feldspar phenocrysts of similar size may be present below 345'. These phenocrysts are hazy in outline and dark pink in colour. The base of this zone becomes fragmental with 1-2 cm. fragments of varying composition. The rock is indistinctly laminated locally at about 60° to the core axis			
				360 - 364.5': this zone may be diabase or possibly an altered zone as the result of the lower diabase dyke. Numerous epidotized zones cut at 50° to the core axis.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-1

SHEET 6 OF 6

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
364.5	- 401.5 (37)		Diabase	Dark green, fine to medium grained, moderately chloritized at contacts; numerous lighter green zones are located throughout the dyke - possibly spotty epidotization. The intrusive contains some rhyolite fragments, (e.g. 391' - 391.5' and 392' - 393').			
401.5	- 427 (25.5)		Conglomerate	Light to dark grey-green, fine to very fine grained with pebbles and granules up to 1 cm. in size. These larger fragments are well rounded and an abundance of red, possibly volcanic, types is common. A number of the pebbles are weakly epidotized. The matrix is fine sand and silt. Locally, the zone is foliated and some pebbles are oriented along the laminations. Dip averages 45° to the core axis. Some alteration occurs locally. Moderate hematization is present at 417' - 417.5' and a strongly epidotized zone is located at 425'.	423'	foliation 45° to the C/A	
427	- 462 (35)		Hybrid Intrusive	Dark green becoming very dark green, medium grained becoming finer grained with depth. The upper zone 427' - 428' is highly chloritized and resembles an intrusive contact. The zone, 428' - 432' is porphyritic and the rock remains more vaguely porphyritic to 440'. Numerous epidote-filled fractures are found in this unit and towards the base of the hole, alteration consists of spotty epidotization and weak chloritization. This causes the core to appear mottled light green on dark green ground mass. Minor chalcopyrite is found locally as a fine dissemination.			
462				END OF HOLE			

Gulf Minerals Canada Limited
DIAMOND DRILL RECORD

D.D.H. NO. DL-2
SHEET 1 OF 4

PROPERTY COBEQUID
LATITUDE 27+00S
LONGITUDE L. 96+00E
ELEVATION

BEARING—TRUE 180° AZ.
DIP -45°
FINAL DEPTH 435'
CORE SIZE BQ

DATE STARTED November 18, 1977
DATE COMPLETED November 22, 1977
DRILLED BY St. Lambert
LOGGED BY A. Workman

DATE: November 25, 1977 SIGNED

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
0	- 45		Overburden				ACID DIP TESTS
	(0)						100' -44°
							300' -44°
45	- 120		Rhyolite	Dark pink to pinkish red becoming greenish red locally and aphanitic.			435' -45°
	(75)		trachytic	This zone is predominately intensely tectonically brecciated and it is			
				moderately kaolinized. Clay alteration of feldspar is stronger in the			
				zone 104-120'. Below 120' the rock is frequently mylonitic and very			
				finely brecciated. Fragments are angular and up to 2 cm. in size. The			
				matrix to the fragments is very fine breccia and silica cement, which is			78-80': core ground and
				weakly epidotized and chloritized. Chlorite is common near diabase			lost.
				intrusives. These dykes are common in the unit and are dark green, fine			91-94.5:core ground and
				grained, weakly magnetic and chloritized.			lost
				70.5-76' - Diabase - strongly to moderately chloritized.			
				97.5-103.5' - Diabase - contains rhyolite fragment at 99-100'.			
				108.5-115' - Diabase - contacts are intensely chloritized and ground -			
				rhyolite fragments at 110-111' and 112.5'-144'.			
120	- 141.5		Rhyolite	Brick red, aphanitic and porphyritic with 1-2 mm. quartz and feldspar			
	(21.5)			phenocrysts. The zone is highly brecciated and fractured. The rock is			
				moderately to strongly hematized and in the zone 120-132.5', it is			
				strongly kaolinized. Alteration decreases in intensity with depth.			
				Few diabase dykes are present.			
				132'-136.5' - diabase - moderately chloritized			
				136.5-139' - rhyolite mixed with diabase			
141.5	- 142.5		Diabase	Dark green, intensely chloritized.			
	(1)						
142.5	- 144		Siliceous	Dark pink, aphanitic and finely fractured. Numerous epidote stringers			
	(3.5)		Sediment	along fracture networks.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-2

SHEET 2 OF 4

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
144	- 146 (2)		Diabase	Dark green, intensely chloritized, some uralitization of pyroxene crystals.			
146	- 162.5 (16.5)		Conglomerate	Light grey and pink, with a fine sandy matrix surrounding 1-4 cm. pebbles of varying composition. The pebbles are rounded and a red variety is common, (possibly hematized volcanic). Some fragments are epidotized. A foliation is present and dips 35° on the core axis. Elongated pebbles foliated minerals are weakly chloritized.	161'	foliat-ion	35° to the c/a
162.5	- 176 (13.5)		Siltstone	Brick red, and pale green to greenish-pink, fine to very fine grained and moderately hematized. In darker red zones, hematization may be quite strong. Some epidotization of fractures occurs and spotty epidote alteration gives the core a mottled appearance locally. Some micro-faulting is present at 168' dipping 60° to the core axis. A diabase is present at 166'-168'. An alteration zone of unknown type is located at 174-176'.			
176	- 178 (2)		Diabase	Strongly chloritized.			
178	- 180 (2)		Rhyolite Flow Breccia (?)	Orange altered zone - moderately kaolinized. Rock appears to consist of rounded fragments in a thinly laminated matrix. Fragments are 1-1.5 cm in size. Foliation dips 30° on the core axis. Some epidotization of fractures has occurred. 178.5-179 - diabase			
180	- 191.5 (11.5)		Rhyolite (?)	Pink with black mottling, fine grained to aphanitic. Black mottling may be chloritized amygdules. Rock becomes more strongly mottled and becomes medium grained towards the base of the unit. At the base, the texture is granitic.			
191.5	- 195.5 (4)		Porphrytic Intrusive	Pink to reddish-pink, aphanitic and porphyrtic with 1-2 mm. quartz eyes. A fragmental zone is present at the contact. Mafic fragments, 1-5 mm, in size are present in this zone.			
195.5	- 218.5 (23)		Diabase	Dark green, fine grained and weakly to moderately chloritized. At 200' the rock is weakly laminated and more highly chloritized. Some spotty epidote alteration is also present.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-2

SHEET 3 OF 4

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
				196.5-197' - xenolith of altered, mafic, porphyritic medium grained rock			
				200-217.5' - amygdaloidal zone: dark green with light green to white mottling, fine to medium grained (locally). Mottling is the result of chlorite and white carbonate filling amygdules. They are up to 1.5 cm. in size. Some are elongated along a weak foliation, which cuts the core axis at 80°. The rock is moderately to strongly chloritized. Mottling is weaker and less distinct below 210'. The rock may become porphyrtic at 213.5'.			
				217.5-218.5 - dark green, fine grained ophitic texture.			
218.5	- 232 (13.5)		(?)	Dark pink to pinkish-red mottled with dark grey hazy patches, fine grained to aphanitic.			
232	- 269 (37)		Porphyritic Intrusive	Dark green with white to pale pink 1-5 mm. feldspar phenocrysts. Composition is probably diabasic. Contact zones are non-porphyritic. The rock is foliated locally at 40° to the core axis:	233'	folia-tion	40° to the c/a
				232'-234' - foliated - porphyritic			
				263'-269' - foliated - non-porphyr			
				Numerous epidotized fracture zones are present and the rock is moderately chloritized overall.			
269	- 273 (4)		(?)	Pale green to greenish orange alteration zone. The rock is well laminated and highly brecciated, silicified and epidotized. Fracture planes are weakly chloritized and hematized.			
273	- 280 (7)		(?)	Brick red with some dark green banding, aphanitic, well laminated at 45° to the core axis at the upper boundary. Grey-green bands increase in number and thickness towards the base. Some light green and orange alteration bands occur at 275.5 and 276.5'. A conglomerate xenolith or fragment (boulder) is located at 279'-279.5'.			
280	- 323 (43)		Conglomerate Sandstone & Siltstone	Conglomerate matrix is light grey with dark green and red pebbles and granules up to 3 cm. in size. The matrix is slightly epidotized.			
				Siltstone and sandstone are alternating light grey and yellow or pink in colour. Some fine red grains may be seen in the sandstone. Banding cuts the core axis at 45-60°.			
				280'-282' - conglomerate			
				282-288.5' - diabase			
				288.5-290' - siltstone and sandstone			
				290-292' - conglomerate	290'	folia-tion	45° to the c/a

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-2

SHEET 4 OF 4

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
				292-293' - diabase - several conglomerate xenoliths			
				293-294.5' - conglomerate - very mafic matrix			
				294.5-296' - sandstone and siltstone			
				296'-300' - diabase			
				300'-304.5' - alternating 1-2 cm. bands of siltstone and fine sandstone.			
				304.5-306.5' - fine conglomerate and conglomeratic sandstone	305	folia-	60° to the c/a
				309'-311' - alteration zone - medium grey, fine to aphanitic, laminated chloritized - abundant 1-2 mm. pyrite cubes.		tion	
				311'-319' - diabase			
				319-319.5 - siltstone and sandstone			
				319.5-323 - fine sandstone and silty - sandstone			
323	- 340.5		Diabase	Dark green with light green mottling, fine to medium grained. Amygdal-			
	(17.5)			oidal - amygdules are epidotized to produce the mottling. The rock is			
				moderately epidotized and chloritized overall.			
340.5	- 366		Sandstone &	Dark brick red becoming dark green at 353'. Greenish rock has minor			
	(25.5)		Siltstone	orange altered bands. The rock is foliated or thinly banded throughout			
				at 50-60° to the core axis. The red zones are moderately hematized.	348'	foliat-	50° to the c/a
				Minor conglomerate occurs locally (361.5-363) and pebbles up to 1.5 cm		ion	
				are present. Numberous quartz veins also are found at 344'-345',			
				346-347', 347.5-347.6' and 348-348.5'. They are typically surrounded	360'	foliat-	60° to the c/a
				by orange or green alteration halos.		ion	
				363-366' - contact zone - dark green with light green mottling, strongly chloritized.			
366	- 435'		Fragmental	Pale green-grey with darker mottling becoming pink with dark green			
	(69)		Intrusive	mottling. Fine grained to aphanitic. Flow(?) laminated in the upper			
			flow?	zone is non-laminated in the pinkish zone. Fragments are stretched			
				along the foliation and are moderately to strongly chloritized. Abun-			
				dant pyrite is found finely disseminated in the rock locally.			
				366-406' - pale green-grey, dark green mottling, aphanitic	405'	Flow lam-	40° to the c/a
				406-435' - increasingly pink coloured and grain size increasing - becomes granitic textured		ination	
				410-420' - diabase - 1-5 mm amygdules.			
				435' END OF HOLE			

Gulf Minerals Canada Limited
DIAMOND DRILL RECORD

D.D.H. NO. DL-3
SHEET 1 OF 3

PROPERTY COBEQUID
LATITUDE 29+80S.
LONGITUDE L. 96+00E.
ELEVATION

BEARING—TRUE 180° AZ.
DIP -45°
FINAL DEPTH 450'
CORE SIZE BQ

DATE STARTED November 23, 1977
DATE COMPLETED November 25, 1977
DRILLED BY St. Lambert
LOGGED BY A. Workman

DATE: November 29, 1977 SIGNED

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
0	- 17		Overburden	Blocky, bouldery sand: casing reamed from 15-17'.			ACID DIP TESTS
	(0)						100': -45°
17	- 33		Sandstone	Light grey-green, fine grained with some granules up to 2 mm. in size.			300': -44°
	(16)			Composition of the grains is variable as indicated by different colour-			450': -42°
				ation - green, grey and red. The unit becomes pink and cherty at 31.5'.			
33	- 44.5		Conglomerate	Light to medium grey becoming beige coloured with light green and pink			
	(11.5)			rounded pebbles up to 3 cm. in size. The matrix is typically fine sand.			
				Colour difference between grey and beige sections may indicate different			
				beds as break is quite sharp at . The "contact" is chloritized			
				and possibly weakly heamtized.			
44.5	- 67.5		Mafic Intru-	Dark green with light green alteration zones locally and some black			
	(23)		sive	chloritized amygdules throughout the unit, particularly at 52'-55'. The			
				rock is fine grained and overall is weakly chloritized. Alteration may			
				be strong locally. Some epidote alteration is present in strongly			
				amygdaloidal zones. Some sedimentary rock xenoliths are located at			
				57-58' and 63'.			
67.5	- 77		Fine Sand-	Light green and pink, fine to very fine grained. The unit is thinly			
	(9.5)		stone & Silt-	foliated or bedded at 75° to the core axis. It is frequently irregular,			
			stone	rippley and convolute. Beds are commonly graded, micro-faulted and some	69'	foliat-	75° to the c/a
				load casts or flame structures may be observed locally. Minor amounts of		ion of	
				fine conglomerate are found within some beds.		bedding	
				70.25'-71.25': chloritized mafic intrusive			
77	- 84		Mafic	Dark green, fine grained, moderately chloritized with abundant finely			
	(7)		Intrusive	disseminated pyrite.			
84	- 90		Siltstone??	Dark green to dark grey-green, fine grained to aphanitic. Some pink			
	(6)			fragments or pebbles (?) up to 2 cm. in size. Laminated locally. Some			
				round quartz grains (phenocrysts?) up to 2 mm. in size may be observed			
				in the zone.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-3

SHEET 2 OF 3

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
90	- 120.5		Porphyritic	Light to medium grey becoming grey-green with depth. Red mottling is			
	(30.5)		Siliceous	common and may reflect feldspathic or weakly hematized zones. The rock			
			Flow ?	is fine grained to aphanitic. Rounded quartz phenocrysts, 1-2 mm. in			
				size are found throughout the unit. The rock is weakly epotized locally.			
120.5	- 163.5		Mafic	Medium to dark green, aphanitic and well foliated. Wispy, indistinct			
	(43)		Intrusive	light and dark green bands curving around elongated, 1-5 mm. pink, felsic			
			(foliated)	patches make up the laminations. Numerous pink and light green, round			
				xenoliths up to 3 cm. in size dot the unit. The foliation generally			
				wraps around these fragments. The rock becomes more massive and less			
				foliated below 135'. The unit is weakly to moderately chloritized, and			
				some 6" epidotized patches occur locally. Minor finely disseminated			
				pyrite blebs may be present over short intervals.			
163.5	- 215.5		Rhyolite	Greyish-pink, aphanitic and porphyritic locally. Round, 1-2 mm. quartz			
	(52)			phenocrysts and 1-3 mm. pink, euhedral feldspar phenocrysts are located			
				throughout the zone but can be observed best near the upper contact.			
				The rock is strongly tectonically brecciated locally and is highly			
				silicified. Matrix to the breccia fragments is strongly epidotized.			
				Some zones in this unit appear more mafic in composition. Chloritized	184'	flow	40° to the c/a
				mafics are concentrated along a weakly developed foliation, (eg. 183').		foliat-	
				Flow foliation is very poorly developed and vaguely outlined. The rock		ion	
				becomes weakly amygdaloidal at 180'. Chloritized 1-5 mm. amygdules are			
				elongated along the foliation. Finely disseminated pyrite and chalco-			
				pyrite is common locally.			
215.5	- 280		Rhyolite	A dark reddish-brown unit which grades into the upper unit (163.5-215.5')			
	(64.5)			without apparent contact. It is aphanitic and porphyritic. Quartz			
				phenocrysts up to 3 mm. in size are common and fine cream coloured speck-			
				les probably indicate kaolinized feldspar crystals. Some zones may be			
				spherulitic, but individual grains are very hazy and indistinct. The			
				rock is non-brecciated, generally non-fractured and very massive.			
				Alteration, if present may consist of weak to moderate hematization and			
				silicification. The rock carries a 1.5 cm. rounded sediment (?) fragment	268'	flow	45° to the c/a
				at 265'. Below 250' some vague flow lamination can be observed to cut		laminat-	
				the core axis at 45°. This unit grades down into the next rock formation.		ion	

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-3

SHEET 3 OF 3

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
280	- 403		Rhyolite	Reddish-brown to pink locally, aphanitic and porphyritic. Feldspar			
	(123)			phenocrysts are 1-2 mm. in size and they are epidotized and/or kaolinized.			
				In addition, 1-3 mm. quartz phenocrysts are common. Chloritized, 1-2			
				mm. amygdules are found throughout the unit. The rock is vaguely			
				laminated at 50°-60° to the core axis. Abundant narrow epidotized seams			
				locally follow the laminations. Some flow breccia(?) is located in a			
				zone below 310' and consists of rounded, 1.5 cm. fragments very close			
				in composition to the matrix rock. This zone is poorly laminated.			
				Below 330', the fragments increase in number and diversity of rock			
				type. They are olive green, dark green and red in colour. At 348',	348'	flow	40° to the c/a
				the flow lamination is very fine but moderately well developed. In		laminat-	
				this zone, the rock is non-porphyritic and very deep red coloured.		ion	
				Below 355', there are few fragments and the rock is weakly amygdaloidal			
				locally. Throughout the zone, numerous diabase dykes occur. They are			
				located at: 280.5' -281' - strongly chloritized.			
				282' -285.5'			
				305' -308'			
				311.5-312.5'	400'	flow	35° to the c/a
				359.5'-363'.5		laminat-	
				Chalcopyrite and pyrite with minor graphite occurs locally as a fine		ion	
				dissemination or as plates along the foliation planes. Size of			
				individual grains is seldom more than 1-2 mm.			
403	- 423		Rhyolite	Deep red with dark green banding, aphanitic and porphyritic. The bands			
	(20)			are of varying width and they reflect some form of alteration. Kaolini-	415'	flow	45° to the c/a
				zed and/or epidotized, 1-2 mm. feldspar phenocrysts are common. The		laminat-	
				rock is strongly epidotized and weakly hematized. Epidotized zones are		ion	
				usually surrounded by dark pinkish-red halos. The banding dips at 45°	418'	flow	50° to the c/a
				to the core axis.		laminat-	
						ion	
423	- 450		Mafic	Dark green, fine to medium grained and generally finer at the base of the			
	(27)		Intrusive	hole. The rock is weakly porphyritic with some 1-2 mm. light green			
				saussauritized feldspar phenocrysts.			
				423'- 425.5' - contact zone - abundant 1-2 cm. volcanic fragments in a			
				dark green fine rock.			
				442' - rock becomes glomeroporphyritic - 1-2 cm. saussauritized feldspar			
				phenocrysts in a fine grained moderately chloritized matrix.			
				450' END OF HOLE			

Gulf Minerals Canada Limited
DIAMOND DRILL RECORD

D.D.H. NO. DL-4
SHEET 1 OF 2

PROPERTY Cobequid
LATITUDE 33+00S
LONGITUDE L96+00E
ELEVATION

BEARING—TRUE 180° Az
DIP -45°
FINAL DEPTH 350'
CORE SIZE BQ

DATE STARTED 26 November 1977
DATE COMPLETED 29 November 1977
DRILLED BY St. Lambert
LOGGED BY A. Workman

DATE: 3 December 1977 SIGNED

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
0 -	34		Overburden	Blocky, bouldery sand.			ACID DIP TESTS
							100' - 38°
34 -	197		Quartz-	Dark pink to reddish-pink with orange and white mottling grading			350' - 41°
	(163)		Feldspar	to greyish-pink at 70' and grey below 73'. The rock is aphanitic			
			porphyry Flow-	and porphyritic. The mottling represents 1-2 mm. quartz phenocrysts			
			Rhyolite ?	and 1-3 mm. euhedral feldspar phenocrysts. Some quartz phenocrysts			
				are surrounded by thin, orange coloured reaction halos. The rock is			
				generally equigranular and locally may approach a granitic texture.			
				The unit is generally massive but some epidotized fractures occur			
				locally. Abundant finely disseminated pyrite and minor chalcopyrite			
				are found throughout the rock. Numerous dark green, fine to medium			
				grained diabase dykes cut this unit. They are typically, weakly			
				magnetic and moderately chloritized. Where many diabase dykes are			
				present, the flow rocks are more intensely fractured and silicified.			
				80.5' - 81.5': Diabase			
				92.5 - 95': Diabase - includes volcanic xenolith from 93' to 93.5'			
				148.5' - 167': Diabase - a volcanic xenolith is located at			
				151 - 151.5 and the zone 152.5 and 153.5,			
				is a very dark grey-green intrusive within the diabase.			
				- the diabase is surrounded by a pink alteration halo			
				in the porphyry.			
				186' - 195': Diabase			
197 -	273.5		Quartz-	Medium to dark grey, aphanitic and porphyritic. Quartz and feldspar	202	Flow	60° to C/A
	(176.5)		Feldspar	phenocrysts are up to 3 mm. in size and overall texture is similar		banding	
			Porphyry Flow	to the upper unit. The rock is weakly to moderately laminated by			
			Rhyolite	flowage and some dark pink banding occurs locally. From 204' -			
				215', the rock is fragmental. Blocks up to 3 cm. in size are common.			
				They are round to sub-round in outline.			

DIAMOND DRILL RECORD—CONTINUATION SHEET

D.D.H. NO. DL-4

SHEET 2 OF 2

DEPTH FEET	F'TAGE CORED	F'TAGE REC'D	FORMATION	DESCRIPTION	DEPTH	BED'G & FOLIA	REMARKS SAMPLES ETC.
				240': unit becomes paler coloured and slighly pinker			
				255': rock is medium grey, and moderately to strongly chloritized abundant finely disseminated pyrite and minor chalcopyrite are found in this zone.			
273.5	282 (8.5)		Hybrid Agglomerate	Medium green mottling on a dark green and white background. The mottling consists of mafic growths, possibly spherulites, which occurs as 3-7 mm. individual round balls set in a medium to coarse grained, moderately chloritized, porphyritic matrix. Quartz and feldspar phenocrysts up to 3 mm. in size are common. Minor disseminated pyrite is common locally as intergranular blebs.			
282	315 (33)		Rhyolite -trachytic	Dark pink and brick red with some light pink mottling, aphanitic. The rock is highly feldspathic and probably trachytic, and the mottling is due to 1-2 mm. feldspar phenocrysts. The unit is highly fractured, silicified and chloritized. Chlorite is found on fracture surfaces.			
315	316 (1)		Diabase	Dark green, fine grained, moderately chloritized.			
316	350 (34)		Mafic flow	Dark green, fine to medium grained and carrying rounded fragments up to 1 cm. in size. The rock is locally laminated at 50° to the core axis. The unit is finely fractured. The wider fractures are quartz-carbonate filled. Abundant finely disseminated pyrite and minor chalcopyrite occur along the laminations and throughout the rock. Weak to moderate chloritization is widespread.	338.5	flow lamination	50° to the C/A.
350				END OF HOLE			

APPENDIX III Downhole Logs

DL 1-3

COBEQUID IV

Note: Downhole log for DDH - DL -4 absent from report.
Not able to run due to cave in hole.

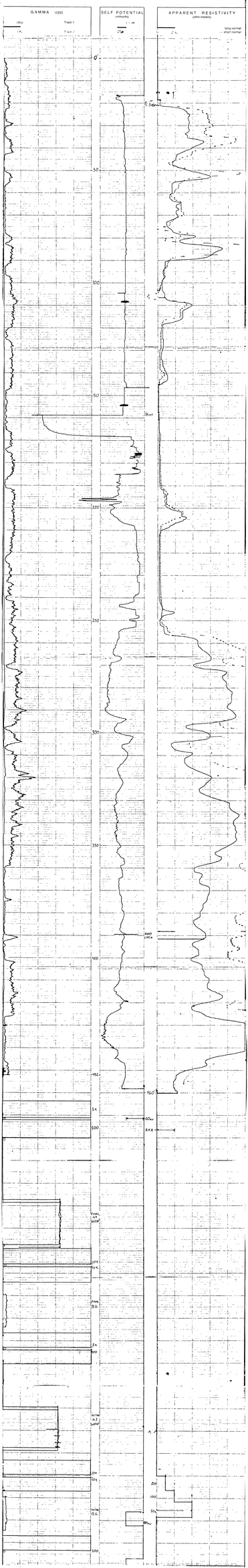
433 048

GULF MINERALS
COBEQUID
HEH A, B, C + D

Gulf Minerals Canada Limited

HOLE NO. DL-1	GAMMA LOG (Total Count)	ELECTRIC LOG
PROJECT Cobequid	Date Dy 17 Mo 11 Yr 77	Date Dy 17 Mo 11 Yr 77
PROVINCE Nova Scotia	Logged depth 7 1/2 ft	Logged depth 1460 ft
Bearing 180°	Logging speed 10 ft/min	Logging speed 20 ft/min
Dip 45°	Crystal size 1 in	Probe size (dia) 1 in
Casing depth 32 ft	Time constant 1 sec	Borehole medium MUD
Total depth 80.5 ft	Probe No 12-8-232	Res. between grids 25 Ω
Surface elev 46.2 ft	Detector No 9523	Normal spacings 16 & 32"
Coordinates 2.4 N 0.5 E	Track 1 RMM 207	
	Track 2 RMM 207	Truck No Eastern Projects
GAMMA FACTORS	Track 1 0000.5.0	Logged By G. Forget
Detector K factor 16.1	Track 2 0000.5.2	Logger's Comments
Instrument dead time 16 μsec		
Calibration standard (cps) 16.6 K	Fm 6.2 K	
Fixed factor 1	1 F.O.	
Casing factor 1	1 F.O.	

REMARKS correlated by



Gulf Minerals Canada Limited

HOLE NO.	DL-2
PROJECT	Cobequid
PROVINCE	North Sudbury
Bearing	180
Dip	45
Casing depth	42 ft
Total depth	435 ft
Surface elev	
Coordinates	27 00 S 96 00 E

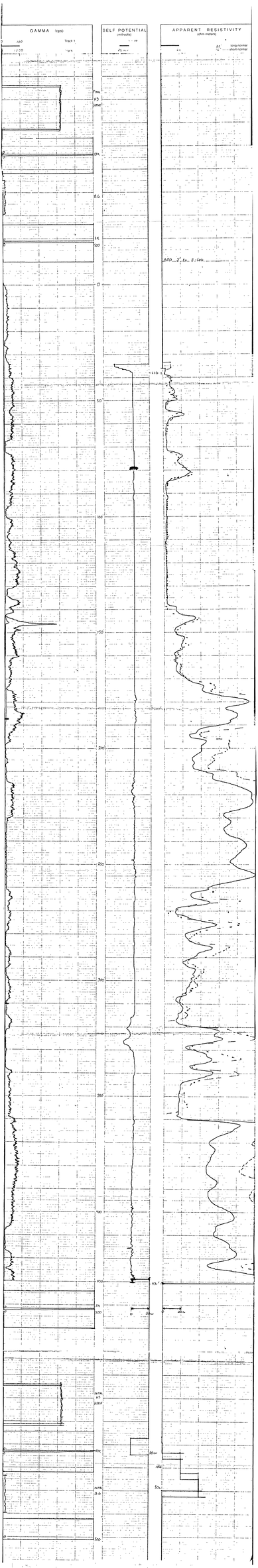
GAMMA FACTORS	Track 1	Track 2
Detector K factor	0000 / 50	0000 / 52
Instrument dead time	16 0 μ sec	16 1 μ sec
Calibration standard (cps)	6 4K	6 4K
Fluid factor		1 630
Casing factor		1 360

GAMMA LOG (Total Count)	
Date	Dy 22 Mo 11 Y 79
Logged depth	430 ft
Logging speed	10 ft/min
Crystal size	3/4 in x 1 in
Time constant	1 sec
Probe No	5470
Detector No	12-8-232
Track 1 RMM	207 " 125
Track 2 RMM	207 " 131

ELECTRIC LOG	
Date	Dy 22 Mo 11 Y 79
Logged depth	435 ft
Logging speed	20 ft/min
Probe size (dia)	1.5 in
Borehole medium	MUD
Res. between grids	2500 ft
Normal spacings	16 & 32

Truck No EASTERN PAD
Logged By G FORGET
Logger's Comments PARADE OFFSHORE OF 3'(6 m) ∴ ADD 3' to E 600.

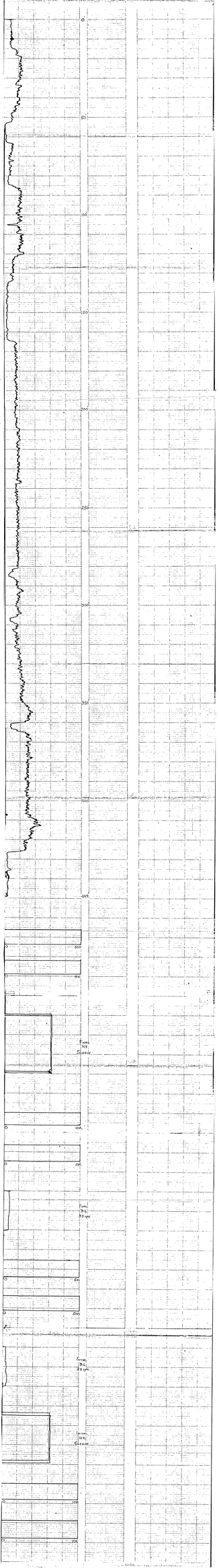
REMARKS correlated by



Gulf Minerals Canada Limited

HOLE NO. DL-8	**GAMMA LOG** (Total Count)	**ELECTRIC LOG**	
PROJECT Cobcomb	Date 12 27 Mo 10 Yr 1	Date Dy Mo Yr	
PROVINCE Nova Scotia	Logged depth 6 4 7 ft	Logged depth	
Bearing 1 8 0	Logging speed 10 ft/min	Logging speed	
Dip 0 0	Crystal size 3 in x 1 in	Probe size (dia)	
Casing depth 2 0 ft	Time constant 1 sec	Borehole medium	
Total depth 4 5 0 ft	Probe No. 5 4 7	Res. between grids	
Surface elev.	Detector No. 1 2 8 - 2 3 2	Normal spacings	
Coordinates 2 5 - 8 0 5	Track 1 RMM 2 0 7 ± 1 2 5		
1 6 - 0 0 6	Track 2 RMM 2 0 7 ± 1 5 1	Truck No. Central Transport	
GAMMA FACTORS	Track 1	Track 2	Logged By Mark T. Wood
Detector & factor	0 0 0 0 1 5 0	0 0 0 0 1 5 2	Logger's Comments
Instrument dead time	16.1 μsec	16.1 μsec	Open Hole Log - No Radio!
Calibration standard (cps)	6.2 K	6.8 K	Filing mobile - no normal P.P.
Fluid factor		1 0 5 0	
Casing factor			

REMARKS correlated by



4330148 215

4330148 COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D.

Part 2 of 5

11E/11B 54-D-16(01)

433048

11E/11B 54-D-16(01)

433048 COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D.

Part 2 of 5

ILLUSTRATIONS

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Appendix III	Downhole Logs a) DL 1-3	

MAPS ENCLOSED IN POCKETS

Part 2

Plates D 25, D 26, D 27 - g E 25, E 26, E 27, E 28 - g	Geological Compilation 1 in = 1/4 mile
	Geological Surveys
Plates D 26, D 27, - f E 25, E 26, E 27 - f	Whole Rock 1 in = 1/4 mile
	Ground Geophysics
Plate IIIa	EM 16 1 in = 400 feet
Part 3	Airborne Geophysics
Plates D 25, D 26, D 27 - ma E 25, E 26, E 27 E 28 - ma	Magnetics 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mc E 25, E 26, E 27, E 28 - mc	VLF EM (vertical) 1 in = 1/4 mile
Part 4	
Plates D 25, D 26, D 27 - md E 25, E 26, E 27, E 28 - md	VLF EM (horizontal) 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mo E 25, E 26, E 27, E 28 - mo	EM 1 in = 1/4 mile
Part 5	Radiometric
Plates D 25, D 26, D 27 - mq E 25, E 26, E 27, E 28 - mq	U Contours 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mp E 25, E 26, E 27, E 28 - mp	U/K ratios 1 in = 1/4 mile
Plate Ids	Section 96+00 East

11/E-11WEST

63°30'00" 29' E 1,240,000 28' E 1,245,000 26' E 1,275,000 25' E 1,280,000 24' E 1,285,000 23' 63°22'30"

45°45'00"

N 16,625,000

44'

N 16,620,000

43'

N 16,615,000

N 16,610,000

42'

N 16,605,000

41'

N 16,600,000

N 16,595,000

39'

N 16,590,000

N 16,585,000 38'

45°37'30"

WALLACE GRANT

WALLACE HIGHLANDS

BAYHEAD

WEST TATAMAGOUCHE

MATTATALL LAKE

ANNANDALE

Dewar River

Dobson Creek

Gouzhore Brook

Flemming Brook

Millard Creek

Blockhouse Brook

Mattatall Brook

Lake Mattatall

Long Lake

Donaldson Mill Brook

Black Brook

Smith Brook

McLeod Brook

COUNTY COLCHESTER

COUNTY CUMBERLAND

No Outcrop

XIV

VIII

IVb

IVc

Note : For legend and symbols see plates : E-25g, E-26g

21 22 23 24 25 26 27 28 29

C D E F

45°30'

64°00' 63°00'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOLOGICAL COMPILATION

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D-25g
NOV. 1977	1 IN. = 1/4 MI.		NTS. 11E/11 PT.

To accompany "Cobequid III & IV Report" Dec. 1977

11/E-11 West

63°22'30" 22' E 1,290,000 21' E 1,295,000 20' E 1,300,000 19' E 1,305,000 18' E 1,310,000 17' E 1,315,000 16' 63°15'00"

45°45'00"

N 16,625,000

44'

N 16,620,000

43'

N 16,615,000

42'

N 16,610,000

41'

N 16,605,000

40'

N 16,600,000

39'

N 16,595,000

38'

N 16,590,000

37'

N 16,585,000

45°37'30"

TATAMAGOUCHE BAY

Barachois Harbour

SANDVILLE

BAYHEAD

Millard Creek

Dobson Ck

BLOCKHOUSE POINT

HYDROGRAPHIC "BLOCK I"

HYDROGRAPHIC "MID IS"

TOPOGRAPHIC "POST 89"

TOPOGRAPHIC "POST 88"

Brook

Blockhouse Brook

Smelt Brook

Brook

Mattatall Brook

Donalds Brook

French River

TATAMAGOUCHE

PROVINCIAL PICNIC PARK

TOPOGRAPHIC "POST 77"

Tatamagouche River

BEACON HILL

TOPOGRAPHIC "POST 90"

WEST NEW ANNAN

TOPOGRAPHIC "POST 91"

CENTRAL NEW ANNAN

OLIVER

BAILEY BROOK

Gravel Pit

No Outcrop

XIV

IVc

C1042 C1043 C1044 C1045 C1046 C1047 C1048 C1049 C1050 C1051 C1052 C1053 C1054 C1055 C1056 C1057 C1058 C1059 C1060 C1061 C1062 C1063 C1064 C1065 C1066 C1067 C1068 C1069 C1070 C1071 C1072 C1073 C1074 C1075 C1076 C1077 C1078 C1079 C1080 C1081 C1082 C1083 C1084 C1085

Note : For legend and symbols see plates : E-25g, E-26g

21 22 23 24 25 26 27 28 29

C D E F

45°30'

64°00' 63°00'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOLOGICAL COMPILATION

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D-26g
NOV. 1977	1 IN. = 1/4 MI.		N.T.S. 11E/11 PT.

To accompany "Cobequid IV Report" Dec. 1977

11/E-11EAST

Barachois Harbour

HYDROGRAPHIC POST NO. 2

Brule Harbour

HYDROGRAPHIC SOIL POST

Cemetery

BRULE

PICTOU COLCHESTER

C-1054 C-1053 C-1052 C-1051 C-1059 C-1058 C-1057 C-1055 C-1056

C-1050

Kennedy Lake

DENMARK

COUNTY COUNTY

RIVER JOHN ROAD

Biz Brook

Waugh River

Block River

TOPOGRAPHIC ROCK POST NO. 80

WAUGH RIVER

Yellow Brook

THE FALLS

XIV

BALMORAL MILLS

Pit

No Outcrop

IX

MCBEAN CORNER

Gravel Pit

IVc

8Ph 8Ph, 10d 8Ph 8Ph, 10d(?) 8Ph 10d,a 10d 10d

TOPOGRAPHIC ROCK POST NO. 81

10,(7T?)

63°15'00" 14' 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00" 44' 43' 42' 41' 40' 39' 38' 45°37'30"

Note : For legend and symbols see plates : E-25g, E-26g

21 22 23 24 25 26 27 28 29

C D E F

64°00' 63°00' 45°30'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOLOGICAL COMPILATION

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D-27g
NOV. 1977	1 IN. = 1/4 MI.		NTS. 11E/11 PT.

To accompany "Cobequid IV Report" Dec. 1977

II/E – IIWEST

63°30'00" — 63°22'30" — 45°37'30" — 45°30'00"

E 1,265,000 — E 1,280,000 — E 1,285,000

N 16,580,000 — N 16,575,000 — N 16,570,000 — N 16,565,000 — N 16,560,000 — N 16,555,000 — N 16,550,000 — N 16,545,000 — N 16,540,000

63°30'00" — 29' — 28' — 27' — 26' — 25' — 24' — 23' — 63°22'30"

45°30'00"

XIV — IVb — IVc — VIII — VII — VI — II

COUNTY / COUNTY — CUMBERLAND / COLCHESTER

Fast Wallace River — Byers Brook — Debert River — East Folly River — Pine Brook — Totten Brook

Swan Brook — Juniper Lake — Indian Lake — Big Snare Lake — Trout Lake — Little Snare Lake — Rory Pond — Totten Lake — Little Totten Lake — Debert Lake — Byers Lake — Whirleywaugh Lake — Round Lake — Long Lake — Shatter Lake — Irvine Lake — Rocky Lake — Johnston Lake — Musquash Lake — Guyon Lake — Moose Lake — Cook Lake — Clark Lake — Chain Lakes — Frog Lake

No Outcrop

Note: For legend see plate: E-26g

SYMBOLS

- Geological contact (definite, indefinite)
- Bedding (horizontal, vertical, inclined, overturned)
- Schistosity, Gneissosity, Foliation (vertical, inclined, dip unknown)
- Fault (definite, indefinite)
- Anticline, Syncline (with plunge)
- Outcrop, area of outcrop
- Diamond drill hole
- Lineation (trend and plunge)

KEY

21 22 23 24 25 26 27 28 29

C
D
E
F

45° 30'

64° 00' — 63° 00'

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOLOGICAL COMPILATION

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E-25g
NOV. 1977	1 IN. = 1/4 MI.		N.T.S. 11E/11 PT.

To accompany "Cobequid III & IV Report" Dec. 1977

63° 22' 30" — 22' — 21' — 20' — 19' — 18' — 17' — 16' — 63° 15' 00"

45° 37' 30" — 37' — 36' — 35' — 34' — 33' — 32' — 31' — 45° 30' 00"

N 16,580,000 — N 16,575,000 — N 16,570,000 — N 16,565,000 — N 16,560,000 — N 16,555,000 — N 16,550,000 — N 16,545,000 — N 16,540,000

EAST NEW ANNAN

French Brook — Munroe Brook — Sutherland Brook — Brook — Brook — Cavanagh Brook — Portar River Brook — River — West Branch of River — North River — Whippey Lake — Clear Lake — Black Lake — Little Lake — Johnston Lake — Farm Lake — Gain Brook — Chiganois

Gravel Pit — GP. — No Outcrop

VIII — IVc — IVb — VII — II — X — VI

LEGEND

MESOZOIC	XVIII	TRIASSIC	VII	Non-foliated Granite
PALAEOZOIC	XVII	PERMIAN	VI	Foliated Granite
		PENNSYLVANIAN		SILURIAN to DEVONIAN
	XVI	Pictou Group	V	Portapique Parrsboro Succession
	XV	Cumberland Group	IV	Earlton Sequence (a,b,c)
		Riversdale Group		SILURIAN or OLDER
	XIV	Boss Point Formation	III	Granite Gneiss - Bass River Complex
	XIII	Clairmont Formation	II	Bass River Complex
		MISSISSIPPIAN	I	Mt. Thom Complex
	XII	Middleborough Formation		
	XI	Windsor Group		
	X	Nuttby Sequence		
		DEVONIAN		
	IX	River John Group (Upper)		
	VIII	River John Group (Lower)		

LEGEND - LITHOLOGIC

11 — Intrusives : (a) granite (b) diorite, diabase (c) gabbro, ultramafic

10 — Sediments : (a) argillite, shale (b) quartzite (c) conglomerate (d) sandstone (e) siltstone (f) mudstone (g) limestone

9 — Pyroclastics – Aglomerates (Mx) mafic fragments in mafic matrix (Fx) felsic fragments in felsic matrix (M) mixed

8 — Felsic Volcanics : dacites - rhyolites

7 — Mafic Volcanics : basalts andesites (P) pillowed (T) tuffaceous (B) brecciated (Ph) porphyritic (S) sheared - deformed

Note: For symbols see plate: E-25g

21 22 23 24 25 26 27 28 29 — C D E F — 45° 30' — 64° 00' — 63° 00' — KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOLOGICAL COMPILATION

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E 26-g
NOV 1977	1 IN. = 1/4 MI.		NTS. 11E/11 PT.

To accompany "Cobequid IX Report" Dec. 1977

II/E-11EAST

63°15'00" 14' 13' 12' 10' 09' 08' 63°07'30"

45°37'30" N 16,580,000 37' N 16,575,000 36' N 16,570,000 35' N 16,565,000 34' N 16,560,000 33' N 16,555,000 32' N 16,550,000 31' N 16,540,000 45°30'00"

IVc IVb VIII X VI

NORTH EARLTOWN EARLTOWN

SPIDELL HILL NUTTBY MOUNTAIN NUTTBY

Balmoral Brook Wrahy River Vamey Brook Bailey's Brook Ferguson Brook McDonald Brook McKay's Mill Brook Earltown Lake McGill Brook Middle River North River

Gravel Pit Microwave Tower Radio Tower Fire Tower Geodetic Nuttby

TOPOGRAPHIC POST No 84 TOPOGRAPHIC POST No 83

No Outcrop

Note : For legend and symbols see plates : E-25g, E-26g

21 22 23 24 25 26 27 28 29

C D E F 45°30' 64°00' 63°00'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOLOGICAL COMPILATION

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E-27g
NOV. 1977	1 IN. = 1/4 MI.		N.T.S. 11E/11 PT.

To accompany "Cobequid IV Report" Dec. 1977

II/E-11EAST

63°07'30" 07' 06' 05' 04' 03' 02' 01' 63°00'00"

45°37'30" 37' 36' 35' 34' 33' 32' 31' 45°30'00"

THE BIORACHAN

LOGANVILLE

SOUTH LOGANVILLE

Brook

John River

Branch

West

MacKays

No Outcrop

IVc

PICTOU COLCHESTER

COUNTY COUNTY

MacKay Lake

MacIntosh Lake

Earltown Lake

Whites

Gully Lake

Gully Brook

Salmon River

Juniper Brook

Ross Brook

Steele Run

Matheson Brook

UPPER KEMPTOWN

Note : For legend and symbols see plates : E-25g, E-26g

KEY

21 22 23 24 25 26 27 28 29

C D E F

45°30'

64°00' 63°00'

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOLOGICAL COMPILATION

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E-28g
NOV. 1977	1IN. = 1/4 MI.		NTS. 11E/11 PT.

To accompany "Cobequid IV Report" Dec. 1977

11/E-11West

63°22 30 — 21 — E 299 000 — 20' — E 300 000 — 19' — E 309 000 — 18 — E 310 000 17 — 16 E 315 000 — 63°15 00"

45°45'00"

N 16 625,000

44'

N 16 620 000

43'

N 16 615 000

42'

N 16 610 000

41'

N 16 605 000

40'

N 16,600 000

39'

N 16,595 000

38

N 16,590,000

N 16 585 000

45° 37' 30"

63°22 30" — 22 — 21' — 20' — 19' — 18' — 17' — 16' — 63°15'00"

TATAMAGOUCHE BAY

Dobson Ck

BAYHEAD

Millard Creek

Brook

Blockhouse

Brook

Smelt

Brook

Mattatall

Brook

Donaldson River

French River

TOPOGRAPHIC POST 89

TOPOGRAPH POST 88

TOPOGRAPHIC "POST 90"

TOPOGRAPHIC POST 77

TATAMAGOUCHE

OLIVER

WEST NEW ANNAN

CENTRAL NEW ANNAN

BEACON HILL

SANDVILLE

Barachois

Harbour

HYDROGRAPHIC MH 15

PROVINCIAL PICNIC PARK

Tatamagouche River

BROOK

BAILEY

B 3037,100,0,0,50,30,0

Gravel Pit

C1045 C1046 C1047 C1048 C1049

C1077 C1078 C1073 C1079 C1075 C1076 C1074

C1061 C1062 C1063 C1066 C1067 C1060 C 064 C1065 C1068

C1080 C1081 C 1085 C1084 C1082 C 1083

6 — 311 — 246

LEGEND

□ Well Water Location – Sample No., Value Shown – U ppb x 10 < 5 not posted

o Whole Rock Location – Sample No., Value Shown – Zr, U, Th, Pb, Zn, Cu in ppm

21 22 23 24 25 26 27 28 29

C D E F

45° 30'

64°00' — 63°00'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOCHEMICAL SURVEY

(SAMPLE LOCATION AND VALUES)

433048

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D 26-f
NOV 1977	1 IN = 1/4 MI.		N.T.S. 11E/11 PT.

To accompany "Cobequid IV Report" Dec. 1977

11/E-11EAST

63°15'00" 14' 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00"

Barachois Harbour

HYDROGRAPHIC POST NO 2

Brule Harbour

HYDROGRAPHIC SOIL POST

Cemetery

BRULE

PICTOU COLCHESTER

C-1054 QC-1053 C 1052 QC-1051

C-1059 QC 1058 C-1055 QC 1057 C-1056

COUNTY COUNTY

Kennedy Lake

C 1050

DENMARK

RIVER JOHN ROAD

Biz

Brook

Waugh

River

Black

TOPOGRAPHIC ROCK POST NO 80

WAUGH RIVER

Yellow

River

Brook

THE FALLS

BALMORAL MILLS

MCBEAN CORNER

Gravel Pit

B.3038,100,0,10,60,30,0

B 3039,170,0,0,50,60,0

B 3040,70,0,10,70,40,0

TOPOGRAPHIC ROCK POST NO 81

45°37'30"

63°15'00" 14' 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00" 44' 43' 42' 41' 40' 39' 38' 45°37'30"

21 22 23 24 25 26 27 28 29

C D E F

45°30'

64°00' 63°00'

KEY

LEGEND

□ Well Water Location - Sample No., Value Shown - U ppb x 10 < 5 not posted

○ Whole Rock Location - Sample No., Value Shown - Zr, U, Th, Pb, Zn, Cu in ppm

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOCHEMICAL SURVEY

(SAMPLE LOCATION AND VALUES)

NOVA SCOTIA

DATE	SCALE	DRAWN BY	PLATE D 27-f
NOV 1977	1 IN = 1/4 MI.		NTS 11E/11 PT

To accompany "Cobequid IV Report" Dec 1977

11/E - 11WEST

63°30'00" — E 1,265,000 — 63°22'30" — E 1,285,000 — 45°37'30"

N 16,580,000 — N 16,575,000 — N 16,570,000 — N 16,565,000 — N 16,560,000 — N 16,555,000 — N 16,550,000 — N 16,545,000 — N 16,540,000

45°30'00"

COUNTY
COUNTY
CUMBERLAND
COLCHESTER

East Wallace River

B3050,200,0,10,40,50,10
B3104,1060,180,10,40,50,10
B3101,190,0,10,30,120,80
B3103,180,0,0,20,170,0
B3047,390,0,10,20,50,0
& B3102,340,0,10,30,30,20
B3046,190,0,0,10,80,0
B3045,240,0,0,0,70,30
B3043,250,0,10,0,50,30
B3048,390,0,30,70,50,0
& B3049,210,0,10,0,30,30

Swan Brook
Juniper Lake
Indian Lake
Trout Lake
Big Snare Lake
Little Snare Lake
Rory Pond
Depert Lake
Byers Lake
East Folly River
Totten Lake
Totten Brook
Pine Brook
Little Totten Lake
Deberl River
Shatter Brook
Frog Lake

288
285
287
286

B3060,220,0,10,80,240,0
B3061,280,0,20,370,130,0
B3062,410,0,20,40,160,0
B3063,220,0,50,110,190,0
B3064,320,0,30,130,200,30
B3073,400,0,10,0,50,20
B3074,280,0,30,100,90,0
B3075,310,0,40,50,80,0
B3076,270,0,60,90,70,0
B3065,210,0,20,60,40,0
B3066,390,10,30,20,160,0
B3067,370,0,20,30,20,30
B3068,600,0,20,50,70,10
B3069,870,0,0,450,190,0
B3070,110,0,0,20,20,0
B3071,180,0,30,30,60,0
B3072,260,0,20,0,70,0
B3077,310,0,10,10,50,10
B3001,160,0,0,40,40,40
B3002,330,0,0,20,120,10
B3003,240,0,0,20,20,0
B3004,120,0,20,60,30,0
B3005,150,0,10,50,40,0
B3006,170,0,30,70,30,0
B3007,170,0,40,130,30,0
B3008,150,0,10,130,20,0
B3009,260,0,40,50,50,10
B3010,360,10,50,60,90,0
B3011,370,0,0,10,60,20

Byers Brook
Whirleywaugh Lake
Round Lake
Long Lake
Shatter Lake
Irvine Lake
Rocky Lake
Johnston Lake
Musquash Lake
Guyon Lake
Moose Lake
Cook Lake
Clark Lake
Chain Lakes

63°30'00" — 29' — 28 — 27 — 26' — 25 — 24 — 23' — 63°22'30"

LEGEND

□ Well Water Location – Sample No., Value Shown – U ppb x 10 < 5 not posted

o Whole Rock Location – Sample No., Value Shown – Zr, U, Th, Pb, Zn, Cu in ppm

KEY

21 22 23 24 25 26 27 28 29
C
D
E
F
45°30'
64°00' — 63°00'

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOCHEMICAL SURVEY

(SAMPLE LOCATION AND VALUES)

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E 25-f
NOV 1977	1 IN = 1/4 MI		NTS 11E/11 PT

To accompany "Cobequid III & IV Report" Dec 1977

11/E-11 WEST

63° 22' 30" — 22 — E 1,290,000 — 21 — E 1,295,000 — 20 — E 1,300,000 — 19 — 1,305,000 — 18 — E 1,310,000 — 17 — 1,315,000 — 16 — 63° 15' 00"

45° 37' 30"

N 16,580,000

N 6,575,000

N 16,570,000

N 6,565,000

N 16,560,000

N 16,555,000

N 16,550,000

N 6,545,000

N 16,540,000

45° 30' 00"

37 — 36 — 35 — 34 — 33 — 32 — 31

EAST NEW ANNAN

Gravel Pit

GP

Gravel Pit

B 3041,170,0,10,80,80,10

B 3042,180,0,0,20,50,10

B.3021,460,0,0,60,180,30

B 3022,420,0,20,0,150,10

B 3023,220,0,0,180,190,40

B 3024,240,0,0,0,110,40

B 3025,560,0,10,10,60,0

B 3026,520,0,0,70,110,30

B 3027,1020,0,0,50,190,30

B 3020,310,0,10,20,50,0

B.3019,230,0,30,50,60,30

B 3018,300,0,20,40,30,0

B 3017,330,0,10,0,30,20

B 3016,170,0,40,40,40,0

B 3015,190,0,20,90,40,0

B 3014,200,0,20,20,40,0

B 3013,180,0,0,10,20,20

B 3012,410,0,20,30,30,30

B 3028,1210,0,0,30,50,20

B 3029,210,0,30,60,50,0

B 3035,1600,0,20,10,60,0

B 3036,1240,0,30,50,60,0

B 3030,110,0,10,40,50,0

B 3034,150,0,10,0,20,0

B 3033,260,0,0,0,110,50

B 3031,190,0,30,30,20,0

B 3032,400,0,0,0,70,30

338 339 340 341 342 343 347 347 280 281 282

C 1169 C 1170 C 117 C 72 C 73 C 68

Sutherland Brook

Munroe Brook

French Brook

Porter Brook

River

Whippey Lake

Clear Lake

Black Lake

Little Lake

Johnston Lake

Farm Lake

Gain Brook

Chiganois River

West Branch of Cavanagh River

North River

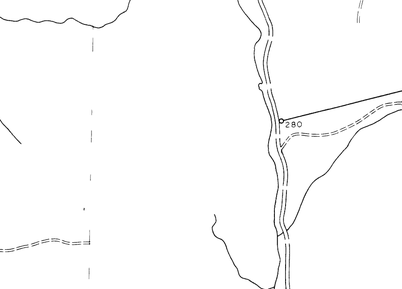
Cavanagh Brook

A

LEGEND

□ Well Water Location - Sample No., Value Shown - U ppb x 10 < 5 not posted

○ Whole Rock Location - Sample No., Value Shown - Zr, U, Th, Pb, Zn, Cu in ppm



KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOCHEMICAL SURVEY

(SAMPLE LOCATION AND VALUES)

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E 26-f
NOV 1977	1 IN. = 1/4 MI.		NTS. 11E/11 PT

To accompany "Cobequid IV Report" Dec. 1977

11/E-11EAST

63°15'00" E 320 000 | 14 | E 325 000 | 13 | E 330 000 | 12 | E 335 000 | 11 | E 340 000 | 10 | E 345,000 | 09 | 08 | E 35[illegible] | 63°07'30"

45°37 30

N 16,580,000

N 16,575,000

N 16,570,000

N 16,565,000

N 16,560,000

N 16,555,000

N 16,550,000

N 16,545,000

N 16,540 000

45°30 00

37 | 36 | 35 | 34 | 33 | 32 | 31

SPIDELL HILL

NORTH EARLTOWN

EARLTOWN

NUTTBY MOUNTAIN

NUTTBY

Balmoral Brook

Waugh River

Gravel Pit

Vamey Brook

Brook

Baileys Brook

Ferguson Brook

McDonald Brook

McKays Mill Brook

Earltown Lake

McGill Brook

Middle River

North River

311

326

TOPOGRAPHIC "POST 82"

TOPOGRAPHIC POST NO 83

B3079,450,0,0,30,90,10

B3078,470,0,20,40,120,0

GEODETIC NUTTBY

Microwave Tower

Radio Tower

Fire Tower

344 345 346 348 253 285 286 288 289 365 368

1 2 3 6 8

63°15'00" 14' 13 12 10' 09' 08' 63°07'30"

45°30 00'

LEGEND

□ Well Water Location - Sample No., Value Shown - U ppb x 10 < 5 not posted

○ Whole Rock Location - Sample No., Value Shown - Zr, U, Th, Pb, Zn, Cu in ppm

21 22 23 24 25 26 27 28 29

C D E F

45° 30'

64°00' 63°00'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

GEOCHEMICAL SURVEY

(SAMPLE LOCATION AND VALUES)

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E 27-f
NOV 1977	1IN = 1/4 MI		NTS. 11E/11PT

To accompany "Cobequid IV Report" Dec. 1977

63°28' 27' 26' 63°25'

45°37'30"

37'

36'

35'

45°34'

L - 80 + 00 E

L - 100 + 00 E

L - 120 + 00 E

L - 140 + 00 E

L - 160 + 00 E

L - 180 + 00 E

TL - 72 + 00 N

TL - 30 + 00 N

BL - 0 + 00

TL - 40 + 00 S

TL - 80 + 00 S

TL - 120 + 00 S

Debert Lake

Big Snare Lake

Little Snare Lake

63°28' 27' 26' 63°25'

45°34'

LEGEND

Instrument: Ronka EM-16

Station: NAA Cutler Maine

Operators: Various

In-Phase x——x

Out-of-Phase •——•

EM Conductor --- ---

Profile Scale 1 inch = 40%

Right Wave Crossover

-20%

0

+20%

63°34'00" 63°22'00"

45°37'30"

45°34'00"

1 2 3 4

KEY

433048 54-D 16 01

Gulf Minerals Canada Limited

COBEQUID PROJECT

ELECTROMAGNETIC SURVEY

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: III a
OCTOBER 1977	1 INCH = 400 FEET		N.T.S. 11E/11 PT.

To accompany "Cobequid III & IV Report" Dec 1977

345

4330048

4330048 COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D

Part 3 of 5

11E/11B 54-D-16(01)

1433048

433048 COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D

Part 3 of 5

11E/11B 54-D-16(01)

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MAPS ENCLOSED IN POCKETS

Part 2

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	Geological Surveys
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	Ground Geophysics
Plate IIIa	EM 16 1 in = 400 feet
Part 3	Airborne Geophysics
Plates D 25, D 26, D 27 - ma E 25, E 26, E 27 E 28 - ma	Magnetics 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mc E 25, E 26, E 27, E 28 - mc	VLF EM (vertical) 1 in = 1/4 mile
Part 4	
Plates D 25, D 26, D 27 - md E 25, E 26, E 27, E 28 - md	VLF EM (horizontal) 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mo E 25, E 26, E 27, E 28 - mo	EM 1 in = 1/4 mile
Part 5	Radiometric
Plates D 25, D 26, D 27 - mq E 25, E 26, E 27, E 28 - mq	U Contours 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mp E 25, E 26, E 27, E 28 - mp	U/K ratios 1 in = 1/4 mile
Plate Ids	Section 96+00 East

11/E-11WEST

63°30'00" 29' E 1,260 000 28' E 1 265 000 27' E 1,270 000 26' E 1 275 000 25' E 1 280,000 24' E 1285 000 23' 63°22'30"

45°45'00"

N 16 625 000

44'

N 16 620,000

43'

N 16,615 000

42'

N 16,610,000

41'

N 16 605 000

40'

N 16 600,000

39'

N 16 590,000

38'

N 16,585,000

45°37'30"

63°30'00" 70 29' 80 28' 85 27' 26 95 100 25' 105 24' 110 23' 115 63°22'30"

WALLACE GRANT

WALLACE HIGHLANDS

BAYHEAD

WEST TATAMAGOUCHE

MATTATALL LAKE

ANNANDALE

River

Dewar

Dobson Creek

Brook

Gouzhore

Flemming

Millard Creek

Blockhouse Brook

Mattatall

Lake

Long Lake

Donaldson Mill Brook

Black Brook

South Brook

COUNTY

CUMBERLAND COLCHESTER

AUTOMATED MAGNETOMETER MAP

250 GAMMAS
50 GAMMAS
10 GAMMAS
H MAGNETIC HIGH
L MAGNETIC LOW
FLIGHT LINES

KEY

45°30'

64°00' 63°00'

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE MAGNETOMETER SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D 25-ma
MAY 1977	1 IN = 1/4 MI		NTS. 11E/11W

To accompany "Cobequid III & IV Report" Dec 1977

11/E-11West

63°22'30" 22' E 290 000 21' E 295,000 20' E 300,000 19' E 305 000 18' E 310,000 17' E 315,000 16' 63°15'00"

45°45'00"

N 16,625,000

44'

N 16,620,000

43'

N 16 615,000

42'

N 16,610,000

41'

N 16,605,000

40'

N 16,600,000

39'

N 16,595,000

38'

N 16,590,000

T-4

N 16,585,000

45°37'30"

Dobson Ck.

TATAMAGOUCHE BAY

Barachois Harbour

SANDVILLE

BAYHEAD

Millard Creek

BLOCKHOUSE POINT

HYDROGRAPHIC "BLOCK I"

HYDROGRAPHIC "MID 15"

TOPOGRAPHIC "POST 89"

Brook

TOPOGRAPH C "POST 88"

Blockhouse Brook

Smelt Brook

Brook

Mattagall Brook

Donaldson River

French River

TATAMAGOUCHE

BEACON HILL

OLIVER

WEST NEW ANNAN

CENTRAL NEW ANNAN

TOPOGRAPHIC "POST 90"

TOPOGRAPHIC "POST 87"

TOPOGRAPHIC "POST 77"

PROVINCIAL PICNIC PARK

Tatamagouche River

6 8 311 246

C1044 C1045 C1046 C1047 C1042 C104 C1049

C1051 C1052 C1053 C1054 C1055 C1056 C1057 C1058 C1059 C1060 C1061 C1062 C1063 C1064 C1065 C1066 C1067 C1068 C1069 C1070 C1071 C1072 C1073 C1074 C1075 C1076 C1077 C1078 C1079 C1080 C1081 C1082 C1083 C1084 C1085

55750 55800 55850 55900 55950 56000

63°22'30" 22' 120 125 21' 130 20' 135 19' 140 18' 145 150 17' 155 16' 160 63°15'00"

1433048

AUTOMATED MAGNETOMETER MAP

250 GAMMAS
50 GAMMAS
10 GAMMAS
H MAGNETIC HIGH
L MAGNETIC LOW
FLIGHT LINES

KEY

64°00' 63°00' 45°30'

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE MAGNETOMETER SURVEY

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NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D26-ma
MAY 1977	1 IN = 1/4 MI.		NTS. 11E/11 W

To accompany "Cobequid IV Report" Dec. 1977

11/E-11EAST

Barachois Harbour

HYDROGRAPHIC POST NO 2

Brule Harbour

HYDROGRAPHIC SOIL POST

Cemetery

BRULE

PICTOU COLCHESTER

C-1053
C-1054
C-1052
C-1051
C-1059
C-1058
C-1055
C-1057
C-1056

Kennedy Lake

C 1050

COUNTY COUNTY

DENMARK

RIVER JOHN ROAD

Waugh

Biz

Brook

River

Block

TOPOGRAPHIC ROCK POST NO 80

WAUGH RIVER

Yellow

River

Brook

THE FALLS

BALMORAL MILLS

MCBEAN CORNER

Gravel Pit

T-4

T-4

TOPOGRAPHIC ROCK POST NO 81

45°45'00"
45°37'30"
63°15'00
63°07'30"

14 13' 12' 11' 10' 09' 08'

44' 43' 42' 41' 40' 39' 38'

165 170 175 180 185 190 195 200 205

55900 55850 55800 55750 55700 55650 55600 55550 55500 55450 55400 55350 55300 55250 55200 55150 55100 55050 55000 54950 54900 54850 54800 54750 54700 54650 54600 54550 54500 54450 54400 54350 54300 54250 54200 54150 54100 54050 54000 53950 53900 53850 53800 53750 53700 53650 53600 53550 53500 53450 53400 53350 53300 53250 53200 53150 53100 53050 53000 52950 52900 52850 52800 52750 52700 52650 52600 52550 52500 52450 52400 52350 52300 52250 52200 52150 52100 52050 52000 51950 51900 51850 51800 51750 51700 51650 51600 51550 51500 51450 51400 51350 51300 51250 51200 51150 51100 51050 51000 50950 50900 50850 50800 50750 50700 50650 50600 50550 50500 50450 50400 50350 50300 50250 50200 50150 50100 50050 50000 49950 49900 49850 49800 49750 49700 49650 49600 49550 49500 49450 49400 49350 49300 49250 49200 49150 49100 49050 49000 48950 48900 48850 48800 48750 48700 48650 48600 48550 48500 48450 48400 48350 48300 48250 48200 48150 48100 48050 48000 47950 47900 47850 47800 47750 47700 47650 47600 47550 47500 47450 47400 47350 47300 47250 47200 47150 47100 47050 47000 46950 46900 46850 46800 46750 46700 46650 46600 46550 46500 46450 46400 46350 46300 46250 46200 46150 46100 46050 46000 45950 45900 45850 45800 45750 45700 45650 45600 45550 45500 45450 45400 45350 45300 45250 45200 45150 45100 45050 45000 44950 44900 44850 44800 44750 44700 44650 44600 44550 44500 44450 44400 44350 44300 44250 44200 44150 44100 44050 44000 43950 43900 43850 43800 43750 43700 43650 43600 43550 43500 43450 43400 43350 43300 43250 43200 43150 43100 43050 43000 42950 42900 42850 42800 42750 42700 42650 42600 42550 42500 42450 42400 42350 42300 42250 42200 42150 42100 42050 42000 41950 41900 41850 41800 41750 41700 41650 41600 41550 41500 41450 41400 41350 41300 41250 41200 41150 41100 41050 41000 40950 40900 40850 40800 40750 40700 40650 40600 40550 40500 40450 40400 40350 40300 40250 40200 40150 40100 40050 40000 39950 39900 39850 39800 39750 39700 39650 39600 39550 39500 39450 39400 39350 39300 39250 39200 39150 39100 39050 39000 38950 38900 38850 38800 38750 38700 38650 38600 38550 38500 38450 38400 38350 38300 38250 38200 38150 38100 38050 38000 37950 37900 37850 37800 37750 37700 37650 37600 37550 37500 37450 37400 37350 37300 37250 37200 37150 37100 37050 37000 36950 36900 36850 36800 36750 36700 36650 36600 36550 36500 36450 36400 36350 36300 36250 36200 36150 36100 36050 36000 35950 35900 35850 35800 35750 35700 35650 35600 35550 35500 35450 35400 35350 35300 35250 35200 35150 35100 35050 35000 34950 34900 34850 34800 34750 34700 34650 34600 34550 34500 34450 34400 34350 34300 34250 34200 34150 34100 34050 34000 33950 33900 33850 33800 33750 33700 33650 33600 33550 33500 33450 33400 33350 33300 33250 33200 33150 33100 33050 33000 32950 32900 32850 32800 32750 32700 32650 32600 32550 32500 32450 32400 32350 32300 32250 32200 32150 32100 32050 32000 31950 31900 31850 31800 31750 31700 31650 31600 31550 31500 31450 31400 31350 31300 31250 31200 31150 31100 31050 31000 30950 30900 30850 30800 30750 30700 30650 30600 30550 30500 30450 30400 30350 30300 30250 30200 30150 30100 30050 30000 29950 29900 29850 29800 29750 29700 29650 29600 29550 29500 29450 29400 29350 29300 29250 29200 29150 29100 29050 29000 28950 28900 28850 28800 28750 28700 28650 28600 28550 28500 28450 28400 28350 28300 28250 28200 28150 28100 28050 28000 27950 27900 27850 27800 27750 27700 27650 27600 27550 27500 27450 27400 27350 27300 27250 27200 27150 27100 27050 27000 26950 26900 26850 26800 26750 26700 26650 26600 26550 26500 26450 26400 26350 26300 26250 26200 26150 26100 26050 26000 25950 25900 25850 25800 25750 25700 25650 25600 25550 25500 25450 25400 25350 25300 25250 25200 25150 25100 25050 25000 24950 24900 24850 24800 24750 24700 24650 24600 24550 24500 24450 24400 24350 24300 24250 24200 24150 24100 24050 24000 23950 23900 23850 23800 23750 23700 23650 23600 23550 23500 23450 23400 23350 23300 23250 23200 23150 23100 23050 23000 22950 22900 22850 22800 22750 22700 22650 22600 22550 22500 22450 22400 22350 22300 22250 22200 22150 22100 22050 22000 21950 21900 21850 21800 21750 21700 21650 21600 21550 21500 21450 21400 21350 21300 21250 21200 21150 21100 21050 21000 20950 20900 20850 20800 20750 20700 20650 20600 20550 20500 20450 20400 20350 20300 20250 20200 20150 20100 20050 20000 19950 19900 19850 19800 19750 19700 19650 19600 19550 19500 19450 19400 19350 19300 19250 19200 19150 19100 19050 19000 18950 18900 18850 18800 18750 18700 18650 18600 18550 18500 18450 18400 18350 18300 18250 18200 18150 18100 18050 18000 17950 17900 17850 17800 17750 17700 17650 17600 17550 17500 17450 17400 17350 17300 17250 17200 17150 17100 17050 17000 16950 16900 16850 16800 16750 16700 16650 16600 16550 16500 16450 16400 16350 16300 16250 16200 16150 16100 16050 16000 15950 15900 15850 15800 15750 15700 15650 15600 15550 15500 15450 15400 15350 15300 15250 15200 15150 15100 15050 15000 14950 14900 14850 14800 14750 14700 14650 14600 14550 14500 14450 14400 14350 14300 14250 14200 14150 14100 14050 14000 13950 13900 13850 13800 13750 13700 13650 13600 13550 13500 13450 13400 13350 13300 13250 13200 13150 13100 13050 13000 12950 12900 12850 12800 12750 12700 12650 12600 12550 12500 12450 12400 12350 12300 12250 12200 12150 12100 12050 12000 11950 11900 11850 11800 11750 11700 11650 11600 11550 11500 11450 11400 11350 11300 11250 11200 11150 11100 11050 11000 10950 10900 10850 10800 10750 10700 10650 10600 10550 10500 10450 10400 10350 10300 10250 10200 10150 10100 10050 10000 9950 9900 9850 9800 9750 9700 9650 9600 9550 9500 9450 9400 9350 9300 9250 9200 9150 9100 9050 9000 8950 8900 8850 8800 8750 8700 8650 8600 8550 8500 8450 8400 8350 8300 8250 8200 8150 8100 8050 8000 7950 7900 7850 7800 7750 7700 7650 7600 7550 7500 7450 7400 7350 7300 7250 7200 7150 7100 7050 7000 6950 6900 6850 6800 6750 6700 6650 6600 6550 6500 6450 6400 6350 6300 6250 6200 6150 6100 6050 6000 5950 5900 5850 5800 5750 5700 5650 5600 5550 5500 5450 5400 5350 5300 5250 5200 5150 5100 5050 5000 4950 4900 4850 4800 4750 4700 4650 4600 4550 4500 4450 4400 4350 4300 4250 4200 4150 4100 4050 4000 3950 3900 3850 3800 3750 3700 3650 3600 3550 3500 3450 3400 3350 3300 3250 3200 3150 3100 3050 3000 2950 2900 2850 2800 2750 2700 2650 2600 2550 2500 2450 2400 2350 2300 2250 2200 2150 2100 2050 2000 1950 1900 1850 1800 1750 1700 1650 1600 1550 1500 1450 1400 1350 1300 1250 1200 1150 1100 1050 1000 950 900 850 800 750 700 650 600 550 500 450 400 350 300 250 200 150 100 50

AUTOMATED MAGNETOMETER MAP

- 250 GAMMAS
- 50 GAMMAS
- 10 GAMMAS
- H MAGNETIC HIGH
- L MAGNETIC LOW
- FLIGHT LINES

KEY

45°30'
64°00'
63°00'

1433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE MAGNETOMETER SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D27-ma
MAY 1977	1 IN = 1/4 MI.		NTS. 11E/11E

To accompany "Cobequid IV Report" Dec 1977

11/E - 11WEST

63° 30' 00" 45° 37' 30" E 1,265,000 E 1,285,000 63°22'30"

N 16,580,000 N 16,575,000 N 16,570,000 N 16,565,000 N 16,560,000 N 16,555,000 N 16,550,000 N 16,545,000 N 16,540,000

45°30'00" 63°30'00" 63°22'30"

Trout Lake
Rory Pond
East Folly River
Totten Lake
Pine Brook
Little Totten Lake
Totten Brook
Wrinkleywaught Lake
Shoulder Lake
Wigdell Lake
Oak Lake
Clark Lake
Pinkney Lake

AUTOMATED MAGNETOMETER MAP

- 250 GAMMAS
- 50 GAMMAS
- 10 GAMMAS
- H MAGNETIC HIGH
- L MAGNETIC LOW
- FLIGHT LINES

KEY (45°30' / 64°00' / 63°00')

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE MAGNETOMETER SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E25-ma
MAY 1977	1 IN. = 1/4 MI.		NTS. 11E/11W

- To accompany "Cobequid III & IV Report" Dec 1977

11/E-11 WEST

63° 22' 30" — 22' — E 1,290,000 — 21' — E 1,295,000 — 20' — E 1,300,000 — 19' — E 1,305,000 — 18' — E 1,310,000 — 17' — E 1,315,000 — 16' — 63° 15' 00"

45° 37' 30"

N16,580,000

N16,575,000

N16 570,000

N16,565,000

N16,560 000

N16,555 000

N16,550,000

N16,545,000

N16,540,000

45° 30 00"

EAST NEW ANNAN

Wentworth Lake

Lake

Lake

II/E-11EAST

AUTOMATED MAGNETOMETER MAP

250 GAMMAS
50 GAMMAS
10 GAMMAS
H MAGNETIC HIGH
L MAGNETIC LOW
FLIGHT LINES

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE MAGNETOMETER SURVEY

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To accompany "Cobequid IV Report" Dec 1977

433048

11/E-11EAST

63°07'30" 07' 06' 05' 04' 03' 02' 01' 63°00'00"

45°37'30" 37' 36' 35' 34' 33' 32' 31' 45°30'00"

LOGANVILLE

THE BIORACHAN

SOUTH LOGANVILLE

UPPER KEMPTOWN

PICTOU COLCHESTER COUNTY

COUNTY COUNTY

John River

West Branch

MacKay Lake

MacIntosh Lake

Gully Lake

Salmon Brook

Gully Brook

Juniper Brook

Ross Brook

Steele Run

Matheson Brook

Beaver Dam Brook

Beaver Lake

Hardscrabble Lake

Hardscrabble Brook

Beaver Brook

Beaver Dam Lake

Beaver Dam Brook

Beaver Brook

Beaver Lake

Beaver Dam

11/E-11WEST

63°30'00" 45°45'00" 63°22'30"

WALLACE GRANT

WALLACE HIGHLANDS

WEST TATAMAGOUCHE

BAYHEAD

MATTATALL LAKE

ANNANDALE

Dewar River

Dobson Creek

Gouzhore Brook

Flemming Brook

Millard Creek

Blockhouse Brook

Mattatall Brook

Lake Mattatall

Long Lake

Donaldson Mill Brook

Block Brook

Smith Brook

Mcleod Brook

COUNTY / COUNTY

CUMBERLAND / COLCHESTER

N 16 625 000 · N 16 620 000 · N 16,615 ,000 · N 16,610 ,000 · N 16 605 000 · N 16 600,000 · N 16 595,000 · N 16 590,000 · N 16,585,000

E 1 260 000 · E 1 265 000 · E 1,270 000 · E 1 275 000 · E 1 280 000 · E 1 285 000

45°37'30"

VLF VERTICAL COMPONENT

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

50 / 25 / 0 PERCENTAGE OF MEAN TOTAL FIELD

KEY

64°00' 63°00' 45°30'

1433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

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DATE:	SCALE:	DRAWN BY:	PLATE: D 25-mc
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11/E-11West

63°22'30" 22 E 290 000 21 E 295 000 20' E 300 000 19' E 305 000 18' E 310 000 17' 16' E 315 000 63°15'00"

45°45'00"

N 16 625,000

44'

N 16 620,000

43'

N 16 615,000

42'

N 16,610,000

41'

N 16,605,000

40'

N 16,600,000

39'

N 16 595,000

38'

N 16,590,000

T-4

N 16,585,000

45°37'30"

Dobson Ck

TATAMAGOUCHE BAY

Barachois Harb'our

SANDVILLE

BAYHEAD

Millard Creek

BLOCKHOUSE POINT

HYDROGRAPHIC "BLOCK I"

HYDROGRAPHIC "MIDIS"

TOPOGRAPHIC "POST 89"

TOPOGRAPHIC "POST 88"

Brook

Blockhouse

Brook

Smelt

TATAMAGOUCHE

PROVINCIAL PICNIC PARK

TOPOGRAPHIC "POST 77"

Brook

Tatamagouche River

Mattatall

Brook

Donaldson

River

BEACON HILL

French

TOPOGRAPHIC "POST 90"

OLIVER

WEST NEW ANNAN

TOPOGRAPHIC "POST 9"

Gravel Pit

CENTRAL NEW ANNAN

BAILEY

C1046 C1045 C 0445 C1047 C1042 C104 C1049 C1061 C1062 C1063 C1060 C1066 C1067 C1064 C1065 C1068 C1077 C1078 C1073 C1079 C1075 C1076 C1074 C1081 C1084 C1085 C1082 C1083

63°22'30" 22 120 125 21' 130 20' 135 19' 140 18' 145 150 17' 155 16' 160 63°15'00"

45°37'30"

433048

VLF VERTICAL COMPONENT

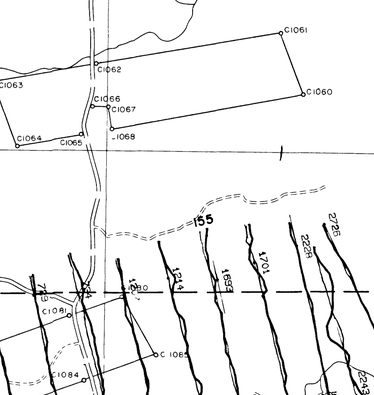
IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

50
25 PERCENTAGE OF MEAN TOTAL FIELD
0



KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

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NOVA SCOTIA

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To accompany "Cobequid IV Report" Dec 1977

11/E-11EAST

63°15'00" 14' 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00"

Barachois Harbour

HYDROGRAPHIC POST NO. 2

Brule Harbour

Cemetery

BRULE

HYDROGRAPHIC SOIL POST

PICTOU COLCHESTER COUNTY

C-1053
C-1054
C-1052
C-1051
C-1059
C 1058
C-1055
C 1057
C-1056

Kennedy Lake

C 1050

DENMARK

RIVER JOHN ROAD

Waugh

Biz

Brook

River

Block

TOPOGRAPHIC ROCK POST NO 80

WAUGH RIVER

Yellow

THE FALLS

BALMORAL MILLS

MCBEAN CORNER

Gravel Pit

T-4

TOPOGRAPHIC ROCK POST NO 81

45°37'30"

63°15'00 165 170 175 180 185 190 195 200 205 63°07'30"

45°45'00" 44' 43' 42' 41' 40' 39' 38' 45°37'30"

1433048

VLF VERTICAL COMPONENT

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

50
25
0
PERCENTAGE OF MEAN TOTAL FIELD

64°00' 63°00' 45°30'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE	SCALE:	DRAWN BY:	PLATE: D27-mc
MAY 1977	1 IN. = 1/4 MI.		NTS. 11E/11E

To accompany "Cobequid IV Report" Dec 1977

11/E – 11WEST

63° 30' 00" — 63°22'30" — 45°37'30" — 45° 30' 00"

E 1,265,000 — E 1,280,000 — E 1,285,000

N 16,580,000 — N 16,575,000 — N 16,570,000 — N 16,565,000 — N 16,560,000 — N 16,555,000 — N 16,550,000 — N 16,545,000 — N 16,540,000

63°30'00" — 29' — 28' — 27' — 26' — 25' — 24' — 23' — 63°22'30"

45°30'00"

COUNTY
COUNTY
CUMBERLAND
COLCHESTER

Fast
Wallace
River
Swan Brook
Juniper Lake
Indian Lake
Trout Lake
Little Snake Lake
Rory Pond
Debert River
Big Snake Lake
Debert
East Folly River
Totten Lake
Totten
Pine Brook
Little Totten Lake
Lorne
Byers
Lake
Eyer Lake
Whitley Waugh Lake
Round Lake
Long Lake
Shattens Lake
Irwin Lake
Rocky Lake
Wasquash Lake
Johnston Lake
Guyon Lake
Moose Lake
Cook Lake
Shattens
Brook
Clark Lake
Chain Lakes
Frog Lake

F 1 1433048

VLF VERTICAL COMPONENT

IN PHASE
OUT OF PHASE
FLIGHT LINE
ANOMALY

50
25 PERCENTAGE OF MEAN TOTAL FIELD
0

KEY

64°00' — 63°00' — 45°30'

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E 25-mc
MAY 1977	1 IN. = 1/4 MI.		NTS. 11E/11W

To accompany "Cobequid III & IV Report" Dec 1977

11/E-11 WEST

63° 22' 30" — 63° 15' 00" — 45° 37' 30" — 45° 30' 00"

E 1 295 000 — E 1 300 000 — E 1 305 000 — E 1 310 000 — E 1 315 000

N16,580 000 — N16,575 000 — N16 570,000 — N 6,565,000 — N16,560 000 — N16,555 ,000 — N16,550,000 — N16,545,000 — N16,540,000

French Brook — Munroe Brook — Sutherland Brook — EAST NEW ANNAN — Brook — Porter Brook — River — Clear Lake — Whitney Lake — Black Lake — Little Lake — Johnston Lake — West River — Gardner Brook — Farmers Lake — North River — Chiganois River — Gaum Brook — Gravel Pit

M433048

VLF VERTICAL COMPONENT

IN PHASE
OUT OF PHASE
FLIGHT LINE
ANOMALY

50
25 PERCENTAGE OF MEAN TOTAL FIELD
0

KEY

64°00' — 63°00' — 45°30'

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E 26-mc
MAY 1977	1 IN = 1/4 MI.		NTS. 11E/11W

To accompany "Cobequid IV Report" Dec 1977

II/E-11EAST

63°15'00" E 320 000 | 14' | E 325 000 | 13' | E 330 000 | 12' | E 335 000 | 11' | E 340 000 | 10' | E 345 000 | 09' | 08' | E 350 000 | 63°07'30"

45°37'30" | N 16,580,000 | 37' | N 16,575,000 | 36' | N 16,570,000 | 35' | N 16,565,000 | 34' | N 16,560,000 | 33' | N 16,555,000 | 32' | N 16,550,000 | 31' | N 16,545,000 | N 16,540,000 | 45°30'00"

SPIDELL HILL

NORTH EARLTOWN

EARLTOWN

NUTTBY MOUNTAIN

Microwave Tower
Radio Tower
Fire Tower
GEODETIC NUTTBY 1968

TOPOGRAPHIC POST 83

Gravel Pit

Earltown Lake

Balmoral Brook

McDonald Brook

McCain Brook

Ferguson Brook

Wright River

Middle River

North River

Bailey Brook

Emery Brook

Nicholls Brook

Brook

VLF VERTICAL COMPONENT

IN PHASE
OUT OF PHASE
FLIGHT LINE
ANOMALY

50
25
0
PERCENTAGE OF MEAN TOTAL FIELD

64°00' | 63°00' | 45°30'

KEY

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

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11/E-11EAST

63°07'30" 07' 06' 05' 04' 03' 02' 01' 63°00'00"

45°37'30" 37' 36' 35' 34' 33' 32' 31' 45°30'00"

THE BIORACHAN

LOGANVILLE

SOUTH LOGANVILLE

UPPER KEMPTOWN

Brook

John River Branch

West

PICTOU COLCHESTER COUNTY COUNTY

MacKay Mill

MacKay Lake

MacIntosh Lake

Earltown Lake

Whites Brook

Gully Lake

Gully Brook

Salmon River

Juniper Brook

Ross Brook

Matheson Brook

Steele Run

210 215 205 200

1433048

VLF VERTICAL COMPONENT

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

50 25 0 PERCENTAGE OF MEAN TOTAL FIELD

64°00' 63°00' 45°30'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE	SCALE	DRAWN BY	PLATE E 28-mc
MAY 1977	1 IN = 1/4 MI.		NTS. 11E/11 PT

To accompany "Cobequid IV Report" Dec 1977

405

433048

COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D.

Part 4 of 5

11E/11B 54-D-16(01)

433048

COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D.

Part 4 of 5

11E/11B 54-D-16(01)

ILLUSTRATIONS

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Appendix III	Downhole Logs a) DL 1-5	

MAPS ENCLOSED IN POCKETS

Part 2

Plates D 25, D 26, D 27 - g
E 25, E 26, E 27,
E 28 - g
Geological Compilation 1 in = 1/4 mile

Geological Surveys

Plates D 26, D 27, - f
E 25, E 26, E 27 - f
Whole Rock 1 in = 1/4 mile

Ground Geophysics

Plate IIIa
EM 16 1 in = 400 feet

Part 3

Airborne Geophysics

Plates D 25, D 26, D 27 - ma
E 25, E 26, E 27
E 28 - ma
Magnetics 1 in = 1/4 mile

Plates D 25, D 26, D 27 - mc
E 25, E 26, E 27,
E 28 - mc
VLF EM (vertical) 1 in = 1/4 mile

Part 4

Plates D 25, D 26, D 27 - md
E 25, E 26, E 27,
E 28 - md
VLF EM (horizontal) 1 in = 1/4 mile

Plates D 25, D 26, D 27 - mo
E 25, E 26, E 27,
E 28 - mo
EM 1 in = 1/4 mile

Part 5

Radiometric

Plates D 25, D 26, D 27 - mq
E 25, E 26, E 27,
E 28 - mq
U Contours 1 in = 1/4 mile

Plates D 25, D 26, D 27 - mp
E 25, E 26, E 27,
E 28 - mp
U/K ratios 1 in = 1/4 mile

Plate Ids
Section 96+00 East

11/E-11WEST

63°30'00" 45°45'00" 63°22'30" 45°45'00"

29' E 1,260 000 28' E 1,265 000 27' E 1,270,000 26' E 1,275 000 25' E 1,280,000 24' E 1,285,000 23'

N 16,625 000 N 16,620,000 N 16,615,000 N 16,610,000 N 16,605,000 N 16,600,000 N 16,595,000 N 16,590,000 N 16,585,000

44' 43' 42' 41' 40' 39' 38'

WALLACE GRANT

WALLACE HIGHLANDS

BAYHEAD

WEST TATAMAGOUCHE

MATTATALL LAKE

ANNANDALE

CUMBERLAND COUNTY
COLCHESTER COUNTY

Dewar River
Dobson Creek
Gouzhore Brook
Flemming Brook
Millard Creek
Blockhouse Brook
Mattatall Brook
Mattatall Lake
Long Lake
Donaldson Brook
Mill Brook
Black Brook
Smith Brook
McLeod Brook

6

301 199 300 302 303 305 304 193 192 191 190 189 C 1088 C 1089 C 1087 C 1090 C 1091 C 1086 C-1072 276 277 278 332 275 279 337 333 334 336 335 312 315 314 313 328 330 331 274 273 325 324 323 322 320 271 268 269 270 264 266 241 373 341 337 317 324 328 336 290

80 85 95 100 105 110 115 120

T-4

70 80 85 95 100 105 110 115

63°30'00" 29' 28' 27' 26' 25' 24' 23' 63°22'30"

45°37'30"

433048

VLF HORIZONTAL COMPONENT

TOTAL FIELD

FLIGHT LINE

100
50 PERCENTAGE OF MEAN TOTAL FIELD
0

45°30'
64°00' 63°00'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

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To accompany "Cobequid III & IV Report" Dec 1977

11/E-11West

63°22'30" 22 E 290 000 21 E 1 295 000 20' E 1,300,000 19' E 1 305,000 18' E 1,310,000 17' 16' E1,315,000 63°15'00"

45°45'00"

N 16 , 625,000

44'

N 16 , 620, 000

43'

N 16 , 615 , 000

42'

N 16, 610 , 000

41'

N 16, 605, 000

N 16, 600, 000

40'

N 16, 595, 000

39'

N 16, 590, 000

T-4

38'

N 16, 585, 000

45° 37' 30"

63°22'30" 22' 120 125 21' 130 20' 135 19' 140 18' 145 150 17' 155 16' 160 63°15'00"

Dobson Ck

TATAMAGOUCHE BAY

Barachois Harbour

SANDVILLE

BAYHEAD

Millard Creek

BLOCKHOUSE POINT

HYDROGRAPHIC "BLOCK I"

HYDROGRAPHIC "MUD 15"

TOPOGRAPHIC "POST 89"

TOPOGRAPHIC "POST 88"

Brook

Blockhouse Brook

Smelt Brook

Brook

Mattatall Brook

Donaldson River

French River

TATAMAGOUCHE

BEACON HILL

OLIVER

WEST NEW ANNAN

CENTRAL NEW ANNAN

TOPOGRAPHIC "POST 90"

TOPOGRAPHIC "POST 91"

TOPOGRAPHIC "POST 77"

PROVINCIAL PICNIC PARK

Tatamagouche River

Gravel Pit

BAILEY

6

246

311

C1046 C1045 C1044 C1047 C1042 C1041 C1049

C1077 C1078 C1073 C1079 C1075 C1076 C1074 C1061 C1062 C1063 C1066 C1067 C1060 C1064 C1065 C1068 C1081 C1084 C1083 C1082 C1085

VLF HORIZONTAL COMPONENT

TOTAL FIELD

FLIGHT LINE

100
50 PERCENTAGE OF MEAN TOTAL FIELD
0

45° 30'

64°00' 63°00'

KEY

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

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11/E-11EAST

63°15'00" 14 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00" 45°45'00"

Barachois Harbour

HYDROGRAPHIC POST NO 2

Brule Harbour

Cemetery

BRULE

HYDROGRAPHIC SOIL POST

PICTOU - COLCHESTER COUNTY

C-1053 C-1054 C-1052 C-1051 C-1059 C-1058 C-1055 C-1057 C-1056

C-1050

Kennedy Lake

DENMARK

RIVER JOHN ROAD

Brook

Waugh

River

Black

TOPOGRAPHIC ROCK POST NO 80

WAUGH RIVER

Yellow

Brook

THE FALLS

BALMORAL MILLS

MCBEAN CORNER

T-4

Gravel Pit

TOPOGRAPHIC ROCK POST NO 81

45°37'30" 45°37'30"

63°15'00 165 170 175 13' 180 12' 185 11' 190 10' 195 200 09' 08' 63°07'30"

433048

VLF HORIZONTAL COMPONENT

TOTAL FIELD

FLIGHT LINE

100

50 PERCENTAGE OF MEAN TOTAL FIELD

0

64°00' 45°30' 63°00'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

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NOVA SCOTIA

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To accompany "Cobequid IV Report" Dec 1977

11/E - 11WEST

63° 30' 00" — 45° 37' 30" — 63° 22' 30" — 45° 30' 00"

E 1,265,000 — E 1,280,000 — E 1,285,000

N 16,580,000 — N 16,575,000 — N 16,570,000 — N 16,565,000 — N 16,560,000 — N 16,555,000 — N 16,550,000 — N 16,545,000 — N 16,540,000

37' — 36' — 35' — 34' — 33' — 32' — 31'

Fos Wallace River

COUNTY
COUNTY
CUMBERLAND
COLCHESTER

Swan Brook
Juniper Lake
Linden Lake
Trout Lake
Eg Shaped Lake
Little Snare Lake
Rory Pond
Depot Lake
Byers Lake
Irvine Lake
Rocky Lake
Whirleywaugh Lake
Round Lake
Long Lake
Shatteny Lake
Johnston Lake
Muisquash Lake
Guyon Lake
Moose Lake
Cook Lake
Clark Lake
Chair Lakes
Frog Lake
Totten Lake
Little Totten Lake
Pine Brook
Totten Brook
East Folly River
Desert Brook
Shattenny Brook
Byers Brook

63° 30' 00" — 29' — 28' — 27' — 26' — 25' — 24' — 23' — 63° 22' 30"

45° 30' 00"

1433048

VLF HORIZONTAL COMPONENT

TOTAL FIELD
FLIGHT LINE

100
50 PERCENTAGE OF MEAN TOTAL FIELD
0

64° 00' — 63° 00' — 45° 30'

KEY

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

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II/E-II WEST

63° 22' 30" 22' E 1,290,000 125 21 E 1,295,000 130 20' E 1,300,000 135 19' E 1,305,000 140 18' 145 E 1,310,000 150 17' E 1,315,000 155 16' 160 63° 15' 00"

45° 37' 30"

N16,580,000

37'

N16,575,000

36'

N16 570,000

35'

N16,565,000

34'

N16,560,000

33'

N16,555,000

32'

N16,550,000

31'

N16,545,000

N16,540,000

45° 30' 00"

63° 22' 30" 22' 21' 20' 19' 18' 17' 16' 63° 15' 00"

Sutherland Brook

French River

Porter Brook

Munroe Brook

Clear Lake

Whidden Lake

Black Lake

Little Lake

Johnston Lake

Farm Lake

Gravel Pit

Gravel Pit

EAST NEW ANNAN

West Branch

Cavanagh Brook

Gain Brook

Chigamoo

River

North

433048

VLF HORIZONTAL COMPONENT

TOTAL FIELD

FLIGHT LINE

100
50 PERCENTAGE OF MEAN TOTAL FIELD
0

KEY

45° 30'

64° 00' 63° 00'

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

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II/E-IIEAST

63°15'00" E 320,000 | 14' | E 325 000 | 13' | E 330,000 | 12' | E 335 000 | 11' | E 340,000 | 10' | E 345,000 | 09' | 08' | E 350 000 | 63°07'30"

45°37'30" N 16,580,000 37' N 16,575,000 36' N 16,570,000 35' N 16,565,000 34' N 16,560,000 33' N 16,555,000 32' N 16,550,000 31' N 16,545,000 45°30'00"

NORTH EARLTOWN

EARLTOWN

NUTTBY MOUNTAIN

SPIDELL HILL

McKay Hill

McKays Hill

Balmoral Brook

Ferguson Brook

McDonald Brook

McGill Brook

Earltown Lake

Amey Brook

Baileys Brook

Weigh River

Middle River

North River

Gravel Pit

Microwave Tower
Radio Tower
Fire Tower
GEODETIC "NUTTBY"

TOPOGRAPHIC "POST 82"

TOPOGRAPHIC "POST 83"

311 326

150 155 160 165 170 175 180 185 190 195 200 205

63°15'00" 14' 13' 12' 11' 10' 09' 08' 63°07'30" 45°30'00"

VLF HORIZONTAL COMPONENT

TOTAL FIELD

FLIGHT LINE

100
50 PERCENTAGE OF MEAN TOTAL FIELD
0

64°00' 45°30' 63°00'

KEY

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

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To accompany "Cobequid IX Report" Dec 1977

11/E-11EAST

63°07'30" 07' 06' 05' 04' 03' 02' 01' 63°00'00"

45°37'30" 37' 36' 35' 34' 33' 32' 31' 45°30'00"

THE BIORACHAN

LOGANVILLE

SOUTH LOGANVILLE

UPPER KEMPTOWN

PICTOU COLCHESTER COUNTY

COUNTY COUNTY

Brook

John River Branch

West Branch

MacKay Lake

MacIntosh Lake

Earltown Lake

Gully Lake

Gully Brook

Salmon River

Juniper Brook

Ross Brook

Steele Run

Matheson Brook

Whites Brook

MacKay Brook

210 215 205 200

VLF HORIZONTAL COMPONENT

TOTAL FIELD

FLIGHT LINE

100 50 0 PERCENTAGE OF MEAN TOTAL FIELD

KEY

64°00' 63°00' 45°30'

1433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE VLF SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

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To accompany "Cobequid IV Report" Dec 1977

11/E-11WEST

63°30'00" 29' E 1 260 000 28' E 1 265 000 27' E 1,270,000 26' E 1 275 000 25' E 1,280,000 24' E 1,285,000 23' 63°22'30"

45°45'00"

N 16,625 000

44'

N 16,620,000

43'

N 16,615 ,000

N 16,610 ,000

42'

N 16,605,000

41'

N 16,600,000

40'

N 16,595,000

39'

N 16,590,000

T-4

N 16,585,000 38'

45°37'30"

63°30'00" 70 29' 80 28' 85 27' 95 26' 100 25' 105 24' 110 23' 115 63°22'30"

WALLACE GRANT

WALLACE HIGHLANDS

BAYHEAD

WEST TATAMAGOUCHE

MATTATALL LAKE

ANNANDALE

COUNTY

COUNTY

CUMBERLAND

COLCHESTER

Dewar River

Dobson Creek

Brook

Gouzhore Brook

Fleming Brook

Millard Creek

Blockhouse Brook

Mattatall

Mattatall Brook

Lake

Long Lake

Donaldson Mill Brook

Black Brook

Smith Brook

McLeod Brook

6

EM PROFILE MAP

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

400 ppm

200 ppm

0 ppm

45°30'

64°00' 63°00'

KEY

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE EM SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

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To accompany "Cobequid III & IV Report" Dec 1977

11/E-11West

63°22'30" 22 E 290 000 21 E 1,295,000 20' E 1,300,000 19' E 1,305,000 18' E 1,310,000 17' E 1,315,000 16' 63°15'00"

45°45'00"

N 16,625,000

44'

N 16,620,000

43'

N 16 615,000

42'

N 16,610,000

41'

N 16,605,000

40'

N 16,600,000

39'

N 16,595,000

38'

N 16,590,000

T-4

N 16,585,000

45°37'30"

63°22'30" 22' 120 125 21' 130 20' 135 19' 140 18' 145 150 17' 155 16' 160 63°15'00"

Dobson Ck

TATAMAGOUCHE BAY

Barachois Harbour

SANDVILLE

BAYHEAD

Millard Creek

BLOCKHOUSE POINT

HYDROGRAPHIC "BLOCK 1"

HYDROGRAPHIC "MUD 15"

TOPOGRAPHIC "POST 89"

Brook

TOPOGRAPHIC "POST 88"

Blockhouse Brook

Smelt Brook

TATAMAGOUCHE

PROVINCIAL PICNIC PARK

TOPOGRAPHIC "POST 77"

Tatamagouche River

Mattatall Brook

Donalds River

French River

BEACON HILL

OLIVER

TOPOGRAPHIC "POST 90"

WEST NEW ANNAN

TOPOGRAPHIC "POST 91"

CENTRAL NEW ANNAN

BAILEY BROOK

C1042 C1043 C1044 C1045 C1046 C1047 C1048 C1049 C1060 C1061 C1062 C1063 C1064 C1065 C1066 C1067 C1068 C1071 C1072 C1073 C1074 C1075 C1076 C1078 C1079 C1080 C1081 C1082 C1083 C1084 C1085

246 311 6 6

EM PROFILE MAP

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

400 ppm

200ppm

0 ppm

64°00' 45°30' 63°00'

KEY

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE EM SURVEY

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To accompany "Cobequid IV Report" Dec 1977

11/E-11EAST

Barachois Harbour

HYDROGRAPHIC POST NO 2

Brule Harbour

HYDROGRAPHIC SOIL POST

Cemetery

BRULE

PICTOU COLCHESTER

C-1053
C-1054
C-1052
C-1051
C-1059
C-1058
C-1057
C-1055
C-1056

Kennedy Lake

C 1050

DENMARK

COUNTY COUNTY

RIVER JOHN ROAD

Biz

Brook

Waugh

River

Block

TOPOGRAPHIC ROCK POST NO 80

WAUGH RIVER

Yellow

Brook

THE FALLS

BALMORAL MILLS

MCBEAN CORNER

Gravel Pit

TOPOGRAPHIC ROCK POST NO 81

63°15'00" 14 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00" 44' 43' 42' 41' 40' 39' 38' 45°37'30"

T-4

165 170 175 180 185 190 195 200 205

EM PROFILE MAP

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

400 ppm

200 ppm

0 ppm

64°00' 63°00' 45°30'

KEY

1433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE EM SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: D27-mo
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To accompany "Cobequid IV Report" Dec 1977

63°30'00" E 1,265,000 63°22'30"
45°37'30" N 16,580,000 45°37'30"

Fast Wallace River
COLCHESTER COUNTY
CUMBERLAND COUNTY
Swan Brook
Juniper Lake
Snook Lake
Trout Lake
Little Snook Lake
Rory Pond
Debert Lake
Debert River
Byers Brook
Byers Lake
Whiteyvaughn Lake
Round Lake
Long Lake
Shatter Lake
Irvine Lake
Rocky Lake
Johnston Lake
Musquash Lake
Guyon Lake
Moose Lake
Cook Lake
Clark Lake
Chain Lakes
Frog Lake
East Folly River
Totten Lake
Pine Brook
Little Totten Lake
Totten Brook

N 16,575,000
N 16,570,000
N 16,565,000
N 16,560,000
N 16,555,000
N 16,550,000
N 16,545,000
N 16,540,000

63°30'00" 29' 28' 27' 26' 25' 24' 23' 63°22'30"
45°30'00"

EM PROFILE MAP

IN PHASE
OUT OF PHASE
FLIGHT LINE
ANOMALY

400 ppm
200 ppm
0 ppm

KEY
64°00' 63°00' 45°30'

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE EM SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

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DATE:	SCALE:	DRAWN BY:	PLATE: E 25-mo
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To accompany "Cobequid III & IV Report" Dec 1977

11/E-11 WEST

63° 22' 30" E 1,295,000 E 1,300,000 E 1,305,000 E 1,310,000 E 1,315,000 63° 15' 00"

45° 37' 30" N 16,580,000 N 16,575,000 N 16,570,000 N 16,565,000 N 16,560,000 N 16,555,000 N 16,550,000 N 16,545,000 N 16,540,000 45° 30' 00"

French Brook
Porter River
Munroe Brook
Sutherland Brook
Clear Lake
Whippoey Lake
Black Lake
Little Lake
Johnston Lake
Farm Lake
Chigonois
Gain
EAST NEW ANNAN
West Branch of Logueney Brook
Gravel Pit
Gravel Pit
Gravel Pit
Pier
North

EM PROFILE MAP

IN PHASE
OUT OF PHASE
FLIGHT LINE
ANOMALY

400 ppm
200 ppm
0 ppm

KEY

64° 00' 63° 00' 45° 30'

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE EM SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E26-mo
MAY 1977	1 IN. = 1/4 MI.		NTS. 11E/11W

To accompany "Cobequid IV Report" Dec 1977

II/E-IIEAST

63°15'00" E: 320,000 — 14' — E: 325 000 — 13' — E: 330,000 — 12' — E: 335 000 — 11' — E: 340 000 — 10' — E: 345,000 — 09' — 08' — E: 350 000 — 63°07'30"

45°37'30"

N 16,580,000

N 16,575,000

N 16,570,000

N 16,565,000

N 16,560,000

N 16,555,000

N 16,550,000

N 16,545,000

N 16,540,000

45°30'00"

SPIDELL HILL

NORTH EARLTOWN

EARLTOWN

NUTTBY MOUNTAIN

Balmoral Brook

Wagarth River

Bailey Brook

Bailey Brook

Ferguson Brook

McDonald Brook

McKays Brook

Middle River

North River

McGill Brook

Earltown Lake

Gravel Pit

TOPOGRAPHIC POST 83

Microwave Tower
Radio Tower
Fire Tower

GEODETIC NUTTBY 286 289

EM PROFILE MAP

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

400 ppm
200 ppm
0 ppm

KEY

64°00' — 63°00' — 45°30'

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE EM SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E27-mo
MAY 1977	1 IN. = 1/4 MI.		NTS. 11E/11 PT

To accompany "Cobequid IV Report" Dec 1977

II/E-IIEAST

THE BIORACHAN

LOGANVILLE

SOUTH LOGANVILLE

UPPER KEMPTOWN

PICTOU COLCHESTER COUNTY COUNTY

MacKay Lake

MacIntosh Lake

Earltown Lake

Gully Lake

Brook

River

West

Salmon

Gully

Juniper

Ross

Steele

Matheson

Run

EM PROFILE MAP

IN PHASE

OUT OF PHASE

FLIGHT LINE

ANOMALY

400 ppm

200 ppm

0 ppm

KEY

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE EM SURVEY

FLOWN AND COMPILED BY SANDER GEOPHYSICS LTD.

NOVA SCOTIA

DATE	SCALE	DRAWN BY	PLATE E28-mo
MAY 1977	1 IN = 1/4 MI.		NTS. IIE/11 PT.

To accompany "Cobequid IV Report" Dec 1977

5 of 5

4330048

COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D.

Part 5 of 5

11E/11B 54-D-16(01)

COBEQUID IV

EXPLORATION PROGRAM 1977

ON PARTS OF 11 E 11 A, B, C and D.

Part 5 of 5

ILLUSTRATIONS

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MAPS ENCLOSED IN POCKETS

Part 2

Plates D 25, D 26, D 27 - g E 25, E 26, E 27, E 28 - g	Geological Compilation 1 in = 1/4 mile
	Geological Surveys
Plates D 26, D 27, - f E 25, E 26, E 27 - f	Whole Rock 1 in = 1/4 mile
	Ground Geophysics
Plate IIIa	EM 16 1 in = 400 feet
Part 3	Airborne Geophysics
Plates D 25, D 26, D 27 - ma E 25, E 26, E 27 E 28 - ma	Magnetics 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mc E 25, E 26, E 27, E 28 - mc	VLF EM (vertical) 1 in = 1/4 mile
Part 4	
Plates D 25, D 26, D 27 - md E 25, E 26, E 27, E 28 - md	VLF EM (horizontal) 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mo E 25, E 26, E 27, E 28 - mo	EM 1 in = 1/4 mile
Part 5 ✓	Radiometric
Plates D 25, D 26, D 27 - mq E 25, E 26, E 27, E 28 - mq	U Contours 1 in = 1/4 mile
Plates D 25, D 26, D 27 - mp E 25, E 26, E 27, E 28 - mp	U/K ratios 1 in = 1/4 mile
Plate Ids ✓	Section 96+00 East

11/E-11WEST

WALLACE GRANT

WALLACE HIGHLANDS

WEST TATAMAGOUCHE

BAYHEAD

MATTATALL LAKE

ANNANDALE

CUMBERLAND COUNTY
COLCHESTER COUNTY

Dewar River
Dobson Creek
Brook
Gouzhore
Flemming Brook
Millard Creek
Blockhouse Brook
Mattatall
Brook
Lake
Long Lake
Donaldson Brook
Mill Brook
Black Brook
McLeod Brook
Brook

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——>20
CONTROL POINT ° 2498
UNCONTROLLED POINT x 2723
MEAN FLIGHT LINE SPACING 660 FEET
MEAN TERRAIN CLEARANCE 150 FEET
0, 2·00, 4·00 p.p.m. eU
0·50, 1·00, 1·50 p.p.m. eU
URANIUM WINDOW 1·66 - 1·90 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

64°00' 63°00' 45°30'

CR 433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
URANIUM CONTOURS

NOVA SCOTIA

DATE	SCALE	DRAWN BY	PLATE: D25-mq
MAY - 1977	1 IN. = 1/4 MI.		NTS. 11E/11W

To accompany "Cobequid III & IV Report" Dec 1977

11/E-11West

63°22'30" 22 E 290 000 21 E 295,000 20' E 300 000 19' E 305 000 18' E 310 000 17' 16' E 315 000 63°15'00"

45°45'00"

N 16 , 625 , 000

44'

N 16 , 620 , 000

43'

N 16 615 , 000

42'

N 16 , 610 , 000

41'

N 16 605 , 000

N 16 , 600 , 000

40'

N 16 , 595 , 000

39'

N 16 , 590 , 000

38'

N 16 , 585 , 000

45°37'30"

63°22'30" 22 21 20' 19' 18' 17' 16' 63°15'00"

Dobson Ck

TATAMAGOUCHE BAY

Barachois

SANDVILLE

Harbour

BAYHEAD

Millard Creek

BLOCKHOUSE POINT

HYDROGRAPHIC "BLOCK I"

HYDROGRAPHIC "MID 15"

TOPOGRAPHIC "POST 89"

TOPOGRAPH.C "POST 88"

Brook

Blockhouse

Brook

Smelt

Brook

TATAMAGOUCHE

PROVINCIAL PICNIC PARK

TOPOGRAPHIC "POST 77"

Tatamagouche River

Mottatall

Brook

Donaldson

River

French

River

246

BEACON HILL

TOPOGRAPHIC "POST 90"

OLIVER BROOK

BAKEY

WEST NEW ANNAN

TOPOGRAPHIC "POST 87"

CENTRAL NEW ANNAN

Gravel Pit

SCINTREX : GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ----------> 20
CONTROL POINT ---------- • 2498
UNCONTROLLED POINT ---------- x 2723
MEAN FLIGHT LINE SPACING ---------- 660 FEET
MEAN TERRAIN CLEARANCE ---------- 150 FEET
0, 2·00, 4·00 p.p.m eU ---------- ~
0·50, 1·00, 1·50 p.p.m. eU ---------- ~
URANIUM WINDOW ---------- 1·66 - 1·90 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

45°30'

64°00' 63°00'

KEY

TM 433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY

URANIUM CONTOURS

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE D26-mq
MAY - 1977	1 IN. = 1/4 MI.		NTS. 11E/11W

To accompany 'Cobequid IV Report' Dec 1977

11/E-11EAST

63°15'00" 14 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00" 45°45'00"

Barachois Harbour

HYDROGRAPHIC POST NO 2

Brule Harbour

Cemetery

BRULE

HYDROGRAPHIC SOIL POST

PICTOU COLCHESTER

44' 44'

C-1053
C-1054
C-1052
C-1051
C-1059
C 1058
C-1055
C 1057
C-1056

Kennedy Lake

C 1050

43' 43'

COUNTY COUNTY

DENMARK

42' 42'

RIVER JOHN ROAD

Biz

Brook

Waugh

41' 41'

River

Block

TOPOGRAPHIC ROCK POST NO 80

WAUGH RIVER

40' 40'

Yellow

River

THE FALLS

BALMORAL MILLS

Pt.

Brook

MCBEAN CORNER

Gravel Pit

39' 39'

38' 38'

45°37'30" 45°37'30"

63°15'00" 14 13' 12' 11' 10' 09' 08' 63°07'30"

TOPOGRAPHIC ROCK POST NO 81

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——→ 20
CONTROL POINT ° 2498
UNCONTROLLED POINT x 2723
MEAN FLIGHT LINE SPACING 660 FEET
MEAN TERRAIN CLEARANCE 150 FEET
0, 2.00, 4.00 p.p.m. eU
0.50, 1.00, 1.50 p.p.m. eU
URANIUM WINDOW 1.66 - 1.90 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

64°00' 63°00' 45°30'

KEY

1433048

Gulf Minerals Canada Limited

COLEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
URANIUM CONTOURS

NOVA SCOTIA

DATE	SCALE	DRAWN BY:	PLATE: D27-mg
MAY - 1977	1 IN = 1/4 MI.		NTS. 11E/11PT

To accompany "Cobequid IV Report" Dec 1977

11/E – 11WEST

E 1,265 000 | E 1,280,000 | E 1,285,000 | 63°22'30"

45° 37' 30"

N 16,580,000 | N 16,575,000 | N 16,570,000 | N 16,565,000 | N 16,560,000 | N 16,555,000 | N 16,550,000 | N 16,545,000 | N 16,540,000

37' | 36' | 35' | 34' | 33' | 32' | 31'

45°30 00

63°30'00" | 29' | 28' | 27' | 26' | 25' | 24' | 23' | 63°22'30"

COUNTY | COLCHESTER | CUMBERLAND | COUNTY

Swan Brook | Juniper Lake | Indian Lake | Trout Lake | Little Snare Lake | Rory Pond | Big Snare Lake | Snare River | Shatter Lake | Debec River | Cook Lake | Clark Lake | Moose Lake | Rocky Lake | Irwine Lake | Musquash Lake | Johnston Lake | Whirleywaugh Lake | Round Lake | Long Lake | Gelson Lake | Chain Lakes | Eel Lake | Totten Lake | East Folly River | Folly River | Pine Brook | Little Totten Lake | Totten Brook

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

- FLIGHT LINE, NUMBER AND DIRECTION ——○——> 20
- CONTROL POINT ° 2498
- UNCONTROLLED POINT × 2723
- MEAN FLIGHT LINE SPACING 660 FEET
- MEAN TERRAIN CLEARANCE 150 FEET
- 0, 2·00, 4·00 p.p.m. eU
- 0·50, 1·00, 1·50 p.p.m. eU
- URANIUM WINDOW 1·66 – 1·90 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

45°30'

64°00' | 63°00'

MM 433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY

URANIUM CONTOURS

NOVA SCOTIA

DATE	SCALE	DRAWN BY	PLATE E 25-mq
MAY – 1977	1 IN. = 1/4 MI		NTS. 11E/11W

To accompany "Cobequid III & IV Report" Dec 1977

11/E-11 WEST

63° 22' 30" — 22 — 21 — 20' — 19' — 18' — 17' — 16' — 63° 15' 00"

45° 37' 30" — 37 — 36' — 35' — 34' — 33' — 32' — 31' — 45° 30' 00"

N16,580 000 — N16,575,000 — N16 570,000 — N16,560 000 — N 6,565,000 — N16,555 000 — N16,550,000 — N16,545,000 — N16,540,000

E 1,290 000 — E 1,305 000 — E 1,310 000 — E 1,315 000

Murdoch Brook — Sutherland Brook — Whipper Lake — Clean Lake — Black Lake — Little Lake — Johnston Lake — Farm Lake — Gaul River — Brady Brook — Cavanagh — Gravel Pit — EAST NEW ANNAT

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——→ 20
CONTROL POINT ° 2498
UNCONTROLLED POINT × 2723
MEAN FLIGHT LINE SPACING 660 FEET
MEAN TERRAIN CLEARANCE 150 FEET
0, 2·00, 4·00 p.p.m. eU
0·50, 1·00, 1·50 p.p.m. eU
URANIUM WINDOW 1·66 - 1·90 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

64°00' — 63°00' — 45°30'

KEY

11/433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
URANIUM CONTOURS

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E26-mq
MAY - 1977	1 IN. = 1/4 MI		NTS. 11E/11W

To accompany "Cobequid IV Report" Dec 1977

II/E-IIEAST

63°15'00" E: 320 000 | 14 | E: 325 000 | 13' | E: 330,000 | 12 | E: 335 000 | 11 | E: 340 000 | 10' | E: 345 000 | 09' | 08' | E: 350 000 | 63°07'30"

45°37'30"

N 16,580,000

37'

N 16,575,000

36'

N 16,570,000

35

N 16,565,000

34

N 16,560,000

33'

N 16,555,000

32

N 16,550,000

31'

N 16,545,000

45°30'00"

N 16,540,000

SPIDELL HILL

NORTH EARLTOWN

EARLTOWN

NUTTBY MOUNTAIN

Earltown Lake

Gravel Pit

Microwave Tower

Radio Tower

Fire Tower

TOPOGRAPHIC "POST NO 8"

TOPOGRAPHIC "POST NO 8A"

Vanet Brook

Middle River

Boyles Brook

Ferguson Brook

McGill Brook

North River

Big Brook

Mill Brook

Black Brook

Beaver Brook

163

165

165A

166

167

168

169

170

171

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173

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213

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——————> 20
CONTROL POINT • 2498
UNCONTROLLED POINT x 2723
MEAN FLIGHT LINE SPACING 660 FEET
MEAN TERRAIN CLEARANCE 150 FEET
0, 2·00, 4·00 p.p.m. eU ~~~~~
0·50, 1·00, 1·50 p.p.m. eU ~~~~~
URANIUM WINDOW 1·66 – 1·90 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

45°30'

64°00' 63°00'

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
URANIUM CONTOURS

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E27-mq
MAY – 1977	1 IN = 1/4 MI		NTS. 11E/11PT

To accompany "Cobequid IV Report" Dec. 1977

EM 433048

11/E-11EAST

63°07'30" 07' 06' 05' 04' 03' 02' 01' 63°00'00"

45°37'30" 37' 36' 35' 34' 33' 32' 31' 45°30'00"

THE BIORACHAN

LOGANVILLE

SOUTH LOGANVILLE

PICTOU COLCHESTER COUNTY COUNTY

UPPER KEMPTOWN

Brook / Mill / MacKays / Brook / John / River / Branch / West / MacKay Lake / MacIntosh Lake / Earltown Lake / White's / Gully Lake / Gully / Brook / Salmon / River / Juniper / Brook / Ross / Brook / Matheson / Brook / Steele / Run

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION 20
CONTROL POINT ..... ° 2498
UNCONTROLLED POINT ..... × 2723
MEAN FLIGHT LINE SPACING ..... 660 FEET
MEAN TERRAIN CLEARANCE ..... 150 FEET
0, 2·00, 4·00 p.p.m. eU .....
0·50, 1·00, 1·50 p.p.m. eU .....
URANIUM WINDOW ..... 1·66 - 1·90 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

KEY

64°00' 63°00' 45°30'

77-T1137

1433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
URANIUM CONTOURS

NOVA SCOTIA

DATE	SCALE	DRAWN BY	PLATE E28-mq
MAY - 1977	1 IN = 1/4 MI		NTS 11E/11 PT

To accompany "Cobequid IV Report" Dec. 1977

11/E-11WEST

63°30'00" 45°45'00" 63°22'30"

29 28 27 26 25 24 23

E 265 000 E 270 000 E 275 000 E 280 000 E 285 000

N 16,625 000 N 16,620,000 N 16,615 000 N 16,610,000 N 16,605,000 N 16 600,000 N 16,595,000 N 16,590,000 N 16 585,000

45°45'00" 44' 43' 42' 41' 40' 39' 38' 45°37'30"

WALLACE GRANT

WALLACE HIGHLANDS

BAYHEAD

WEST TATAMAGOUCHE

MATTATALL LAKE

AMHERSTDALE

Dewar River

Dobson Creek

Gouzhore Brook

Flemming Brook

Millard Creek

Blockhouse Brook

Mattatall Brook

Lake Mattatall

Long Lake

Black Brook

Shinimicas Brook

Mill Brook

COUNTY CUMBERLAND COLCHESTER

6

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——————> 20
CONTROL POINT • 2498
UNCONTROLLED POINT x 2723
MEAN FLIGHT LINE SPACING 660 FEET
MEAN TERRAIN CLEARANCE 150 FEET
0, 0·25, 0·50 URANIUM/POTASSIUM (c.p.s.) RATIO
0·05, 0·10, 0·15, 0·20 URANIUM/POTASSIUM (c.p.s.) RATIO
URANIUM WINDOW 1·66 – 1·90 MeV
POTASSIUM WINDOW 1·38 – 1·56 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

64°00' 63°00' 45°30'

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
U/K RATIO
(CONTOURS)

NOVA SCOTIA

DATE	SCALE	DRAWN BY:	PLATE D25-mp
MAY - 1977	1 IN. = 1/4 MI.		NTS. 11E/11W

To accompany "Cobequid III & IV Report" Dec 1977

PM 433048

11/E-11West

63°22'30" 22 21 20' 19' 18' 17' 16 63°15'00"

45°45'00"

Dobson Ck

TATAMAGOUCHE BAY

Barachois Harbour

SANDVILLE

BAYHEAD

Millard Creek

BLOCKHOUSE POINT

HYDROGRAPH "BLOCK 1"

HYDROGRAPHIC "MUD 15"

TOPOGRAPHIC "POST 89"

Brook

TOPOGRAPHIC "POST 88"

Blockhouse Brook

Smelt Brook

TATAMAGOUCHE

PROVINCIAL PICNIC PARK

TOPOGRAPHIC POST 77

Tatamagouche River

Mattarall Brook

Donaldson Brook

French River

OLIVER

BEACON HILL

TOPOGRAPHIC "POST 90"

WEST NEW ANNAN

CENTRAL NEW ANNAN

Gravel Pit

N 16,625,000 N 16,620,000 N 16,615,000 N 16,610,000 N 16,605,000 N 16,600,000 N 16,595,000 N 16,590,000 N 16,585,000

44' 43' 42' 41' 40' 39' 38'

45°37'30"

63°22'30" 22 21 20' 19' 18' 17' 16 63°15'00"

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ----------> 20
CONTROL POINT ---------- ° 2498
UNCONTROLLED POINT ---------- x 2723
MEAN FLIGHT LINE SPACING ---------- 660 FEET
MEAN TERRAIN CLEARANCE ---------- 150 FEET
0, 0·25, 0·50 URANIUM/POTASSIUM (c.p.s) RATIO ----------
0·05, 0·10, 0·15, 0·20 URANIUM/POTASSIUM (c.p.s.) RATIO ----------
URANIUM WINDOW ---------- 1·66 – 1·90 MeV
POTASSIUM WINDOW ---------- 1·38 – 1·56 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

64°00' 63°00' 45°30'

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY

U/K RATIO

(CONTOURS)

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY	PLATE D26-mp
MAY - 1977	1 IN. = 1/4 MI.		NTS. 11E/11W

To accompany "Cobequid IV Report" Dec 1977

11/E-11EAST

63°15'00" 14 13' 12' 11' 10' 09' 08' 63°07'30"

45°45'00" 45°45'00"

44' 44'

43' 43'

42' 42'

41' 41'

40' 40'

39' 39'

38 38'

45°37'30" 45°37'30"

Barachois Harbour

HYDROGRAPHIC POST NO 2

Brule Harbour

Cemetery

BRULE

HYDROGRAPHIC SOIL POST

PICTOU COLCHESTER

C-1053

C-1054

C-1052

C-1051

C-1059

C-1058

C-1057

C-1055

C-1056

Kennedy Lake

C 1050

COUNTY COUNTY

DENMARK

RIVER JOHN ROAD

Biz

Brook

Waugh

River

Block

TOPOGRAPHIC ROCK POST NO 80

WAUGH RIVER

Yellow

Brook

THE FALLS

BALMORAL MILLS

MCBEAN CORNER

Gravel Pit

TOPOGRAPHIC ROCK POST NO 81

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION	→ 20
CONTROL POINT	° 2498
UNCONTROLLED POINT	x 2723
MEAN FLIGHT LINE SPACING	660 FEET
MEAN TERRAIN CLEARANCE	150 FEET
0, 0·25, 0·50 URANIUM/POTASSIUM (c.p.s.) RATIO	~
0·05, 0·10, 0·15, 0·20 URANIUM/POTASSIUM (c.p.s.) RATIO	~
URANIUM WINDOW	1·66 – 1·90 MeV
POTASSIUM WINDOW	1·38 – 1·56 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

64°00' 63°00' 45°30'

KEY

433048

Gulf Minerals Canada Limited

COLEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY

U/K RATIO

(CONTOURS)

NOVA SCOTIA

DATE:	SCALE	DRAWN BY:	PLATE D27-mp
MAY – 1977	1 IN. = 1/4 MI.		NTS. 11E / 11 PT

To accompany "Colequid IV Report" Dec. 1977

II/E - IIWEST

E 1,265,000 E 1,280,000 E 1,285,000

63°22'30"

45°37'30"

N 16,580,000 N 16,575,000 N 16,570,000 N 16,565,000 N 16,560,000 N 16,555,000 N 16,550,000 N 16,545,000 N 16,540,000

37' 36' 35' 34' 33' 32' 31'

45°30'00"

63°30'00" 29' 28' 27' 26' 25' 24' 23' 63°22'30"

Wallace Lake

Cumberland - Colchester County

Swan Brook

Juniper Lake

Indian Lake

Little Snare Lake

Rory Pond

East Folly River

Totten Lake

Pine Brook

Little Totten Lake

Totten Brook

Whiteywash

Rowkes Lake

Long Lake

Shatter Lake

Irvine Lake

Johnston Lake

Masquash Lake

Gwyon Lake

Moose River

Cook Lake

Shatter Lake

Chain Lakes

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——> 20
CONTROL POINT ° 2498
UNCONTROLLED POINT x 2723
MEAN FLIGHT LINE SPACING 660 FEET
MEAN TERRAIN CLEARANCE 150 FEET
0, 0·25, 0·50 URANIUM/POTASSIUM (c.p.s.) RATIO
0·05, 0·10, 0·15, 0·20 URANIUM/POTASSIUM (c.p.s.) RATIO
URANIUM WINDOW 1·66 - 1·90 MeV
POTASSIUM WINDOW 1·38 - 1·56 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

45°30'

64°00' 63°00'

PM 433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
U/K RATIO
(CONTOURS)

NOVA SCOTIA

DATE:	SCALE	DRAWN BY:	PLATE: E 25-mp
MAY - 1977	1 IN = 1/4 MI.		NTS. 11E/11W

To accompany "Cobequid III & IV Report" Dec. 1977

11/E-11 WEST

63° 22' 30" — 22 — E 1 290 000 — 21 — E 1 295,000 — 20' — E 1 300 000 — 19' — E 1,305 000 — 18 — E 1,310,000 — 17' — E 1,315,000 — 16' — 63° 15' 00"

45° 37' 30"

N16, 580 000

37'

N16 575 000

36'

N16 570,000

35'

N 6,565,000

34'

N16,560 000

33'

N16,555 000

32'

N 16,550,000

31'

N16,545,000

N16,540 000

45° 30 00"

East New Annan

Sutherland Brook

Wentworth Brook

North Brook River

Whipper Lake

Clear Lake

Block Lake

Little Lake

Johnston Lake

Farm Lake

Gaspereau River

Waughs River

Gravel Pit

Gravel Pit

Gravel Pit

II/E-IIEAST

63°15'00" E 320 000 | 14' | E 325 000 | 13' | E 330 000 | 12' | E 335 000 | 11' | E 340 000 | 10' | E 345 000 | 09' | 08' | E 350,000 | 63°07'30"

45°37'30" | N 16,580,000 | 37' | N 16,575,000 | 36' | N 16 570 000 | 35 | N 16,565,000 | 34 | N 16,560,000 | 33' | N 16,555,000 | N 16,550,000 | 32 | N 16,545,000 | 31' | N 16,540,000 | 45°30'00"

NORTH EARLTOWN

EARLTOWN

NUTTBY MOUNTAIN

SPIDELL HILL

Hardwood Brook

Baker Brook

Ferguson Brook

McDonald Brook

Middle River

North River

Earltown Lake

Gravel Pit

Microwave Tower

Radio Tower

Fire Tower

TOPOGRAPHIC POST NO 83

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——————> 20
CONTROL POINT ° 2498
UNCONTROLLED POINT × 2723
MEAN FLIGHT LINE SPACING 660 FEET
MEAN TERRAIN CLEARANCE 150 FEET
0, 0·25, 0·50 URANIUM/POTASSIUM (c.p.s.) RATIO ~~~~
0·05, 0·10, 0·15, 0·20 URANIUM/POTASSIUM (c.p.s.) RATIO ~~~~
URANIUM WINDOW 1·66 – 1·90 MeV
POTASSIUM WINDOW 1·38 – 1·56 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

64°00' | 63°00' | 45°30'

433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
U/K RATIO
(CONTOURS)

NOVA SCOTIA

DATE:	SCALE:	DRAWN BY:	PLATE: E27-mp
MAY – 1977	1 IN = 1/4 MI.		NTS. 11E/11 PT

To accompany "Cobequid IV Report" Dec. 1977

11/E-11EAST

63°07'30" 07' 06' 05' 04' 03' 02' 01' 63°00'00"

45°37'30" 37' 36' 35' 34' 33' 32' 31' 45°30'00"

THE BIORACHAN

LOGANVILLE

SOUTH LOGANVILLE

UPPER KEMPTOWN

PICTOU COLCHESTER COUNTY

Brook

John River

West Branch

MacIntosh Lake

MacKay Lake

Gully Lake

Gully Brook

Salmon River

Juniper Brook

Ross Brook

Matheson Brook

Steele Run

Mill

MacKays

Keltown Lake

Whites

SCINTREX: GAD-5 SPECTROMETER WITH TWO GSA-64 SENSORS (904 in³)

LEGEND

FLIGHT LINE, NUMBER AND DIRECTION ——————→ 20
CONTROL POINT ° 2498
UNCONTROLLED POINT × 2723
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MEAN TERRAIN CLEARANCE 150 FEET
0, 0·25, 0·50 URANIUM/POTASSIUM (c.p.s.) RATIO ~~~
0·05, 0·10, 0·15, 0·20 URANIUM/POTASSIUM (c p.s.) RATIO ~~~
URANIUM WINDOW 1·66 – 1·90 MeV
POTASSIUM WINDOW 1·38 – 1·56 MeV

DATA CORRECTED FOR COMPTON SCATTERING, SIGNAL VARIATION DUE TO ALTITUDE, AND BACKGROUND.

Flown and Computer Compiled by
SCINTREX LIMITED
1977

77-T1137

KEY

64°00' 63°00' 45°30'

1433048

Gulf Minerals Canada Limited

COBEQUID PROJECT

AIRBORNE SPECTROMETER SURVEY
U/K RATIO
(CONTOURS)

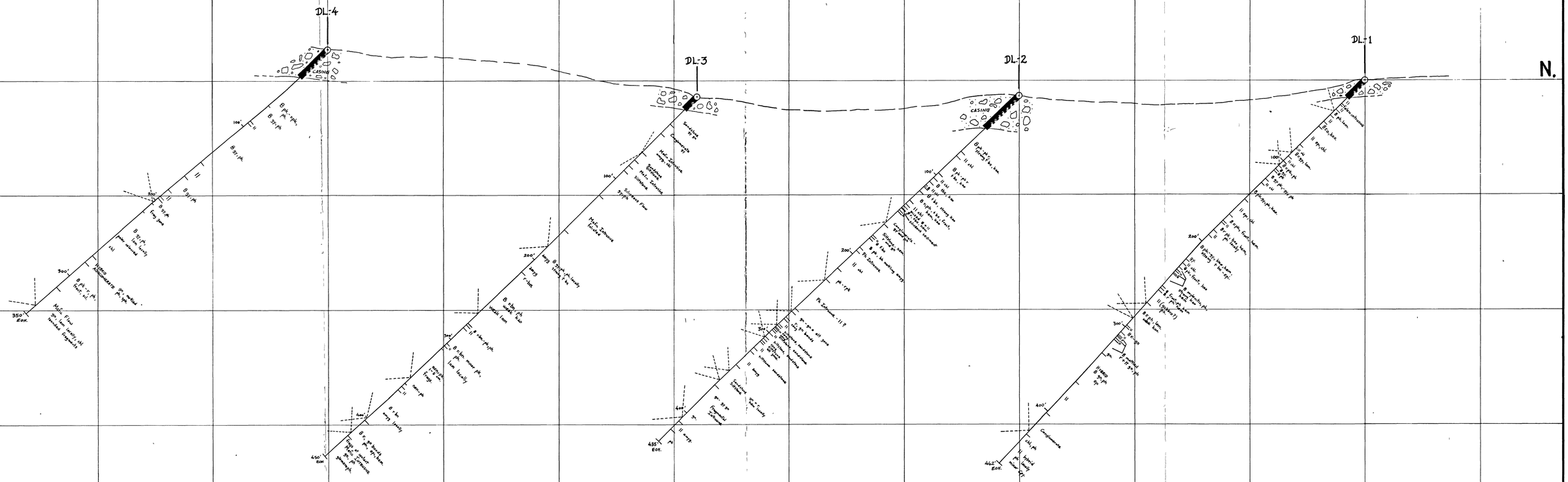
NOVA SCOTIA

DATE	SCALE	DRAWN BY	PLATE E28-mp
MAY – 1977	1 IN = 1/4 MI		NTS 11E/11 PT

To accompany "Cobequid IV Report" Dec. 1977

S.

N.



1433048

GULF MINERALS CANADA LTD.
COBEQUID PROJECT

area: IV | zone: DL.

DDH. No. DL-1 to DL-4

Section: 9600 E.

60 40 20 0 50 100
SCALE: 1 inch = 40 ft.

Date: 4 December Drawn By A. Workman Plate IIa