Geological Report

on the

Yellow Giant Claim Group,

Banks Island, B.C.,
Skeena Mining Division

NTS 103G/8E
53°22'N, 130°10'W

Energex Minerals, Ltd.,

2300 - 1177 West Hastings Street,
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by

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May, 1996

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0.0 Summary

Much of the background data for this report are taken from a summary report by Livgard (1995).

The Yellow Giant property contains major north-northwest trending belts of strongly deformed and moderately metamorphosed sedimentary rocks dominated by fine clastic rocks and limestone. These were intruded by several pre-deformation plutons of the Coast Range Plutonic along the western edge of that body. Compositions of plutonic rocks range from diorite to quartz monzonite. Some intrusive breccias are present, and some of these host gold mineralization. Some veins and replacement bodies are associated with skarn deposits (mainly in the Discovery and Bob deposits.) It is uncertain how much of the gold and sulfide mineralization was part of the skarn event and how much was introduced or remobilized during strong folding and late faulting.

The area contains several high-grade gold deposits, in which gold values in the order of 0.3-1 oz/ton and locally up to a few oz/ton are mainly associated with veins of quartz-sulfide, and in particular with veins rich in massive sulfide dominated by pyrite with lesser arsenopyrite. The emplacement of the veins was controlled by a few sets of faults and shear zones, which were formed mainly during Tertiary movement associated with large-scale tectonic plate movements along the complex Pacific-North American plate boundary. Most of the veins are lenticular in nature. Some gold occurs with disseminated sulfides in altered plutonic rocks in zones of shearing and faulting (e.g., Kim deposit), but the great majority of gold in that deposit is concentrated in the sulfide-rich veins. These veins occur in several orientations, and some may have been tested inadequately by previous drilling.

A thorough compilation of all useful geological, geophysical, and geochemical information should be made on computerized standard maps. Air-photo coverage is available at a scale of 1:2500. This base was used in this report and will provide an excellent base for all property-scale work. It may be difficult to reconcile some of the previous preliminary surface mapping away from the deposits with more detailed studies.

This compilation should be followed up with detailed geological mapping in areas of economic interest and more widely spaced mapping in areas of little economic interest where such data are not available from the above compilation. In most areas, detailed structural data are lacking, and these should be complied, with particular reference to D1 deformation features (fold axes, axial lineations, major warps in foliation in plutonic rocks) and the distribution and nature of, and extent of deformation in quartz and quartz-sulfide veins. From this study, exploration targets should be prioritized.

Several areas of some economic potential have not been covered by geochemical and/or geophysical surveys (ground I.P. and magnetometer), and some have geochemical and/or geophysical anomalies which have not been explained. Based on the results of the above compilation and geological mapping, some targets will warrant geochemical and/or geophysical examination.

The deposits have been tested by many drill holes during a few different exploration programs and preliminary reserve calculations have been made on the major deposits. Analysis of these data for the Discovery and Kim zones indicates that some holes have a very strong influence on the total tonnage, and that gaps exist in the coverage of some zones, both within the drill pattern and along untested extensions. Well defined exploration targets determined from the above compilation and field work should be tested by diamond-drilling. Some of these holes should test possible extensions of known zones of mineralization, such as at the Discovery and Kim deposits, in order to attempt to double the known reserves. Other holes should fill a few gaps within the blocks for which reserves were estimated and check the regions around a few holes with very wide intersections (and thus a strong influence on the present reserve calculations) in order to check the validity of the present reserve estimates. If the reserves could be doubled in size at the present or higher grade of gold, a feasibility study would be warranted.

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1.0 Introduction

1.1 Purpose

This report was written at the request of William Whittle, Director of Energex Minerals, Ltd. It describes exploration I carried out between May 1 and May 6, 1996 on the Yellow Giant Claim Group, Banks Island, B.C. It is being submitted to fulfill assessment requirements to bring the entire claim group into good standing until June 15, 1998. As part of this procedure, the Yellow Giant 2 claim group, which had lapsed in 1995, was restaked by Mike Patellus of Energex Minerals, Ltd. He accompanied me in this study and was in charge of logistics and expediting.

Most of this report describes work done in and near the Kim, Discovery, Englishman Bay, and India zones. Based on a recommendation by Livgard (1995), this work was undertaken to better understand the geology in and around these deposits with the hope of being able to extend the target zones of the known showings, and to look for others in favorable zones between them. Much of the summary data in this report is taken from Livgard (1995), and the references are those in his report.

1.2 Location and Access

The property is near the west side of Banks Island in Hecate Strait, about 100 km south of Prince Rupert, from which it was reached by helicopter (Figure 1). The island is uninhabited, and has no roads other than short haul roads from tidewater barge landings at Survey Bay and Wreck Bay to the Bob and Tel mineral deposits, respectively. An old mining camp exists on the Discovery showing, and this was our base of operations, from which mapping was done on foot. The camp has deteriorated since its last occupation in 1988, and would need a major overhaul if it were to be used as the base for further work on the claims group.

1.3 Topography and Climate

The property is in a cold rain forest, with an average annual precipitation of 2.4 metres, almost entirely as rainfall, with local snowfalls in winter months, especially at higher elevations. Most of the property is below 50 metres in elevation; the maximum elevation in the northeast corner is 300 metres. Most of the property is low, hummocky coastal plain containing abundant shallow lakes, and is bisected by steep-banked streams. Glaciation from the northeast left abundant fresh bedrock on ridges, and moderately thick deposits in some valleys. Vegetation in flat areas underlain by intrusive rocks is characterized by stunted, coniferous muskeg. Moderately thick coniferous forest dominates areas underlain by sedimentary rocks.

ENERGEX MINERALS LTD.

YELLOW GIANT PROPERTY

SKEENA MINING DIVISION, B.C.

LOCATION MAP

DATE:	SCALE:	FIGURE NO.
DEC., 1994	1:8,000,000	1

1.4 Claim Status

The Yellow Giant property consists of eight contiguous modified grid claims with a total of 120 units and one fractions as listed in Table 1 and shown in Figure 2. The Yellow Giant 9 fraction, which was part of the original claim group, lapsed on May 9, 1996. The recorded owner of the claims is Trader Mines Ltd. (90%) and Falconbridge, Ltd. (10%). Legal proceedings are underway to transfer the titles of the claims to the present ownership, which is Energex Minerals, Ltd (51%), Mountain Minerals, Ltd., (renamed from Trader Resources Ltd., in 1993, 39%) and Falconbridge (10%). All legal claim posts have been surveyed.

Table 1. Claim Status

Name	Units	Record No.	Expiry Date
Yellow Giant 1	15	3887	June 15, 1998
Yellow Giant 2	8	345578	May 15, 1997
Yellow Giant 3	20	3889	June 15, 1998
Yellow Giant 4	16	3890	June 15, 1996
Yellow Giant 5	20	3891	June 15, 1998
Yellow Giant 6	18	3892	June 15, 1998
Yellow Giant 7	15	3893	June 15, 1998
Yellow Giant 8	8	3894	June 15, 1998
Disco Fraction	1	4603	June 18, 1998

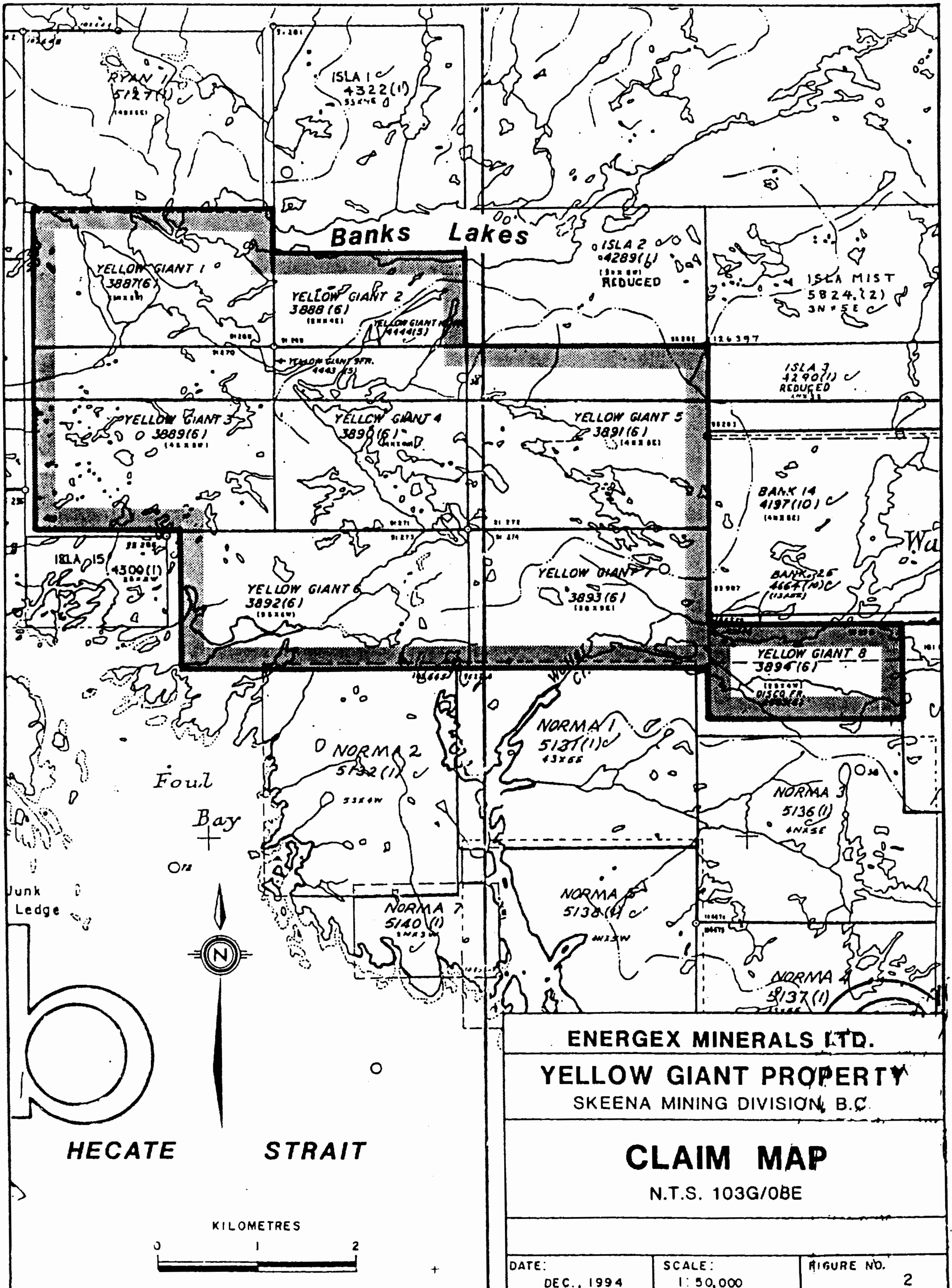
1.5 Previous Work (see Figure 3)

1.5.1 Main Deposits

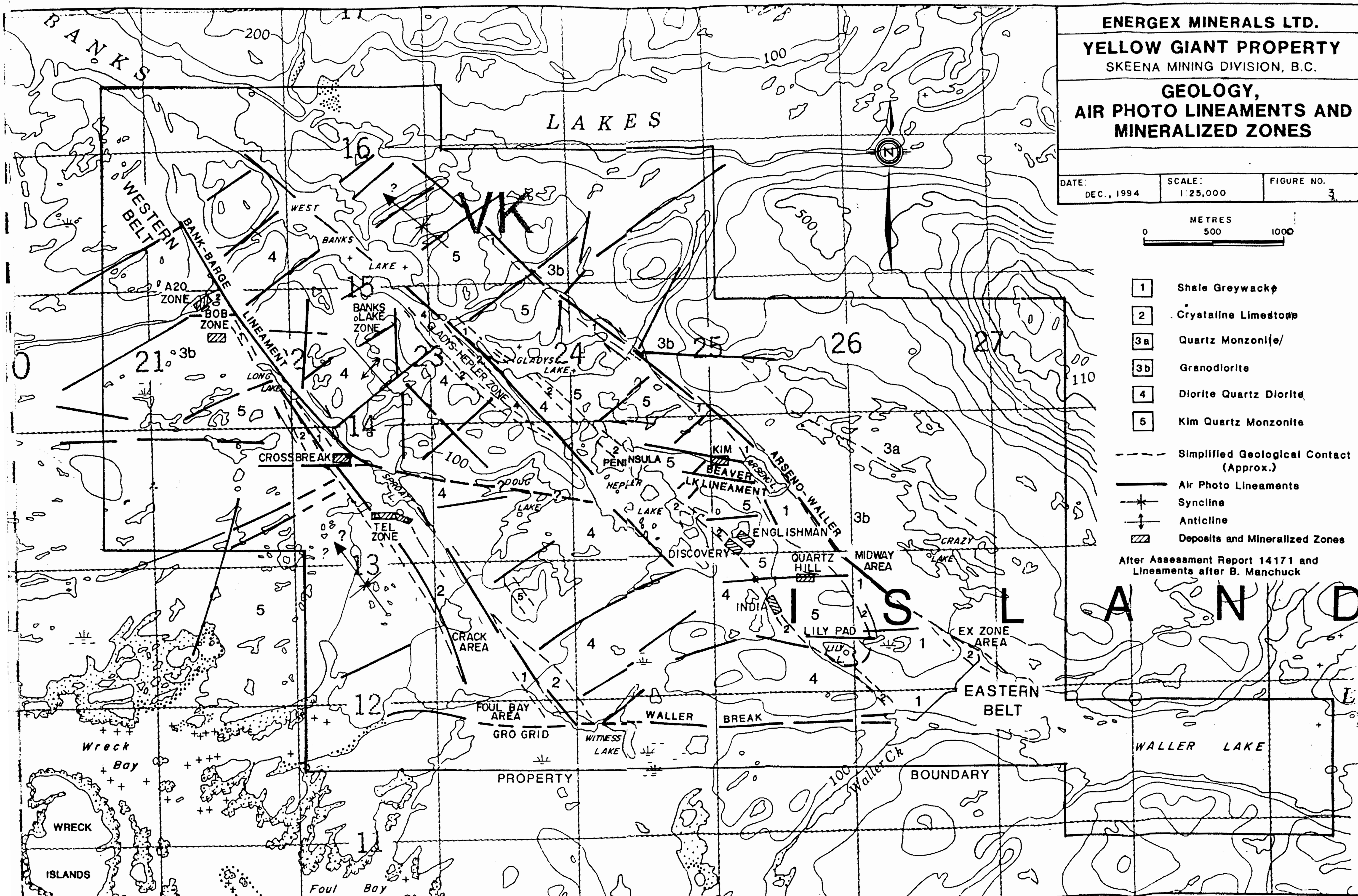
In 1960, the **Discovery** showing was found during prospecting of structural trends and intersecting linear features, and was tested by 11 packsack drill holes. In 1963, geochemical and geophysical (self-potential) surveys were carried out and 14 diamond-drill holes were cored. In 1975 and 1984 limited ground geophysical surveys (self-potential (SP) and electromagnetic (EM) were followed by limited drilling.

In 1963, the **Tel** deposit was found, mapped, and surveyed geochemically and geophysically. Records of this work were lost. Exploration in 1964 included trenching and drilling of 26 packsack drill holes totalling 537 metres. In 1975, sixteen diamond drill holes totalled 998 metres. From 1983-86, work included reconnaissance and detailed geochemical surveys, geological mapping, and 50 diamond drill holes totalling 9,243 metres.

In 1963, the **Kim** zone was discovered, and in 1963 and 1964 it was mapped and trenched, and 63 diamond drill holes totalling 3651 metres were cored. In 1984, the zone was exposed in nine large trenches, the geology was mapped, old drill holes relogged, and 8 deep diamond drill holes totalling 1,323 metres were cored. .



RYAN 1
5127(1)
ISLA 1
4322(1)
Banks Lakes
YELLOW GIANT 1
3887(6)
YELLOW GIANT 2
3888 (6)
ISLA 2
4289(1)
REDUCED
ISLA MIST
5824 (2)
ISLA 3
4290(1)
REDUCED
YELLOW GIANT 3
3889(6)
YELLOW GIANT 4
3890(6)
YELLOW GIANT 5
3891(6)
BANK 14
4197(10)
ISLA 15
4300(1)
YELLOW GIANT 6
3892(6)
YELLOW GIANT 7
3893 (6)
YELLOW GIANT 8
3894(6)
NORMA 1
5131(1)
NORMA 2
5132(1)
NORMA 3
5136(1)
Foul
Bay
Junk
Ledge
NORMA 7
5140 (1)
NORMA 6
5138(1)
NORMA 4
5137(1)
N
HECATE
STRAIT
KILOMETRES
0
1
2
ENERGEX MINERALS LTD.
YELLOW GIANT PROPERTY
SKEENA MINING DIVISION, B.C.
CLAIM MAP
N.T.S. 103G/08E
DATE:
DEC., 1994
SCALE:
1: 50,000
FIGURE NO.
2


ENERGEX MINERALS LTD.
YELLOW GIANT PROPERTY
SKEENA MINING DIVISION, B.C.
GEOLOGY, AIR PHOTO LINEAMENTS AND MINERALIZED ZONES
DATE: DEC., 1994
SCALE: 1:25,000
FIGURE NO. 3
METRES
0 500 1000
1 Shale Greywacke
2 Crystaline Limestone
3a Quartz Monzonite/
3b Granodiorite
4 Diorite Quartz Diorite
5 Kim Quartz Monzonite
Simplified Geological Contact (Approx.)
Air Photo Lineaments
Syncline
Anticline
Deposits and Mineralized Zones
After Assessment Report 14171 and Lineaments after B. Manchuck
BANKS
LAKES
ISLAND
WESTERN BELT
BANK-BARGE LINEAMENT
WEST BANKS LAKE
A20 ZONE
BOB ZONE
BANKS LAKE ZONE
GLADYS-HEPLER ZONE
GLADYS LAKE
VK
LONG LAKE
CROSSBREAK
TEL ZONE
SPROAT L.
DOUG LAKE
PENINSULA
HEPLER LAKE
KIM
BEAVER
ARSENO L.
LK LINEAMENT
ARSENO-WALLER
ENGLISHMAN
DISCOVERY
QUARTZ HILL
MIDWAY AREA
CRAZY LAKE
INDIA
LILY PAD
EX ZONE AREA
EASTERN BELT
CRACK AREA
FOUL BAY AREA
GRO GRID
WITNESS LAKE
WALLER BREAK
WALLER LAKE
Waller Ck
PROPERTY BOUNDARY
Wreck Bay
WRECK ISLANDS
Foul Bay

In 1964, the **Bob** zone was discovered, and geochemical and geophysical (SP) surveys, and geological mapping were carried out. In 1964-65, 15 packsack drill holes totalled 317 metres. In 1975, further geochemical surveys were done and in 1976 four diamond drill holes totalling 426 metres were cored. From June 1977 to March 1978, a decline was excavated a total of 420 metres along a main vein/fault zone to reach a depth of 65 metres below surface. Seven (jack-leg extensional steel?) holes were drilled underground totalling about 100 metres. A program in 1984-85 included backhoe trenching, geological mapping, closely spaced soil sampling, and seven diamond drill holes totalling about 865 metres. In 1987 seven diamond drill holes totalled 1313 metres. In 1984, significant anomalous soil values in gold were found 240 metres to the southeast of the Bob deposit coincident with high response in the 1964 SP survey. Bedrock is the western belt of meta-sedimentary rocks and skarn.

In 1984, most of the Yellow Giant property was covered by aerial magnetic and VLF-EM surveys, and the west and half of the eastern sedimentary belts were geochemically surveyed. A transit land survey established a number of control points and tied in claim posts and many diamond drill holes.

1.5.2 Minor Deposits

The property as a whole has been prospected in considerable detail since 1960. As well as the four main deposits, 20 other showings have been located. Some have been mapped geologically, surveyed, and diamond drilled, and some have received no recorded work.

1.5.2.1 Eastern Belt:

The **Englishman** zone is similar in many respects to the Kim deposit. It is poorly exposed and was located by high-grade float. It contains a few pits and trenches; it was mapped, soil surveyed, and geophysically surveyed (SP). Ten diamond drill holes totalling 1548 metres had poor core recovery (25-65%) and cut a few wide zones of much lower grade than in the pits. The zone is along a major fracture system trending 115°,80°N in the Kim pluton, which was altered intensely along the fracture zone to sericite-chlorite-quartz. The zone has been traced for a strike length of 400 metres; it widens and is open to the west. Minor left-lateral displacement occurred on cross faults oriented at 045°.

In 1960 at **Quartz Hill**, a mass of white quartz 250 x 100 metres was prospected. It contains sparse disseminated pyrite and molybdenite. In 1984, the zone was mapped in detail, several trenches excavated, and three holes drilled. The holes cut zones from 5-10 metres wide containing 1-4% pyrite-sphalerite-galena. Gold assays from surface and core samples are low grade. Near Quartz Hill, the **Cliff Zone** is in a heavily manganese-stained contact zone between garnet-actinolite skarn and hornblende-biotite quartz monzonite of the Kim pluton. It contains lenses up to 20 cm wide with up to 50% pyrite and sphalerite, and gold values of 3-4 g/t. The **Meade** vein gave "moderate" gold values over narrow widths. Geochemical and geophysical surveys located anomalies which have not been examined adequately. Deep overburden overlying the Kim pluton has hampered geological interpretation in the area from Quartz Hill to the Englishman zone.

In 1984, the **Midway** zone was discovered from strong anomalies in the aerial EM survey along a major lineament to the east (Arseno-Waller Lineament), at or near its intersection with the Quartz Hill west-northwest lineament. Soil and ground SP surveys were followed by hand trenching, which revealing low-grade gold mineralization in pyritic quartz veins in siliceous, sericite-chlorite-altered quartz monzonite in contact with meta-greywacke. One kilometre southeast on the same lineament near Waller Lake, the **Ex** zone contains sulfide-bearing skarn in float blocks with low to high gold values. Random packsack drill holes in and around SP anomalies did not locate the source of the mineralization. An east-west fracture at Lily Pond intersects the north end of the Ex zone, and this junction may be the source of the high-grade float boulders. The Ex area is partly swampy and partly covered by dense underbrush, making exploration difficult.

The **India** area, 500 metres southeast of the Discovery zone, contains skarn along the margins of several large marble lenses in contact with the Kim pluton and to a much lesser extent on the contact with the Hepler Lake pluton. A few skarn samples containing abundant pyrrhotite and minor chalcopyrite contain trace values in gold. Soil and SP surveys have outlined anomalous gold zones which have not been tested further.

In the **Banks Lake** zone at the north end of the main eastern linear, prospecting located high-grade gold mineralization in quartz-rich, altered quartz diorite boulders. Trenching exposed a narrow quartz vein with good gold values in selected samples. Five diamond drill holes totalling 278 metres did not find the source.

In 1964, prospecting encountered pyrrhotite-chalcopyrite lenses in skarn and limy argillite at the contact with plutonic rocks in the **Island** showing in Hepler Lake. The aerial EM survey shows a strong anomaly just off the shore of the island. Gold values were low. On **Hepler Peninsula**, soil anomalies and two well defined SP anomalies have not been studied in detail.

A few hundred metres north of the Kim deposit, the **North Kim** zone contains easterly trending quartz veins and veinlets near the contact with the Eastern meta-sedimentary belt. These contain pyrite and an unidentified manganese mineral (assay value of sample was 2.12% MnO_2).

The **Beaver Lake Lineament** is 130 metres south of and parallel to those at the Kim deposit with a similar strike length of 1300 metres. It is cut by similar tension fractures trending 045° as in the Kim Deposit. The zone is in the Kim quartz monzonite. The area is mainly covered by overburden, but a few outcrops are of intense sericite-chlorite alteration. Float boulders containing good gold grades suggest that mineralization is a quartz vein stockwork similar to that at the Kim deposit. (Authour's note: These boulders may have come from the Kim deposit.)

A wide expanse of biotite quartz monzonite around **Gladys Lake** is cut by several east-west lineaments. Erratic high silver values were found in reconnaissance soil samples.

In the early 1960s in the area around **Crazy Lakes**, packsack diamond drill holes sampled quartz stringer zones with scattered good gold values. Results of this work are missing.

Several other anomalies have been indicated by soil sampling along the Eastern belt; these have not been tested further.

1.5.2.2 Western Belt

The **A20** zone is a skarn zone on a marble contact at the collar of the Bob decline 70 metres north of the Bob deposit. Limited data are available; a longitudinal section shows 19 drill holes and a few trenches over an area 90 metres long by 50 metres deep. The most anomalous gold values in separate holes are as follows: 6.8 g/t over 0.61 m, 173 g/t over 0.30 m, 305. G/t over 6.8 m, 394 g/t over 7.3 m and 50 g/t over 14.3 m. It is unclear whether recorded intersections are core lengths or true widths.

The **Cross Break** zone has been mapped, soil surveyed, and trenched. It occurs at the intersection of an east-west fracture with the Bank Barge lineament. Seven drill holes totalling 204 metres intersected generally low gold values. Mineralization consists of gold associated with disseminated arsenopyrite and pyrite in a breccia in strongly folded shale and limestone. Strong geophysical anomalies nearby have not been explained.

The **Crack** zone was explored in 1963-64 with SP geophysical and soil surveys, but records are missing. In 1984 good gold values were found in felsic sills which had been folded with the enclosing meta-sedimentary rocks. Surface samples assayed up to 15.8 g/t gold. One drill hole cut 0.89 g/t gold over an unknown width. This anomaly is reported to have potential.

The **Foul Bay-Gro Grid** zone contains a strong aerial EM anomaly under shallow water near the head of Foul Bay. No sulfides or graphite were noted in rocks along the shoreline which might explain the EM anomaly. The host rocks include highly folded hornfelsed siltstone and minor marble and skarn, which were intruded by granodiorite. Several coincident soil and EM anomalies occur on the Gro Grid, which is covered by thin overburden and dense brush. Float blocks with significant gold were found on the shore of Witness Lake just to the north.

Several other areas of anomalous gold in soils occur along the Western Belt, such as near Long Lake, 800 metres east of the Bob deposit, and northwest of the A20 zone.

1.6 Scope of Present Study

The present study was undertaken in part to fulfill requirements for assessment work to bring all the claims valid until June, 1998, and to begin to carry out the exploration program recommended by Livgard, 1995, so the management of Energex Minerals, Ltd., would be able to direct future exploration purposefully. The area studied includes the sedimentary belts and Kim pluton of the Eastern Belt and the border of the Hepler Lake pluton to the west (Figure 4). Of particular interest was the extension of the limestone-skarn belt from the Discovery deposit southeast to the India deposits and beyond to Waller Lake. The other features of interest in the study include the age relations of the various deformation events with respect to mineralization, and a detailed study of the distribution and orientation of quartz and quartz-sulfide veins in the Kim showing and nearby in the Kim pluton.

As part of the study, available drill holes (stored south of Kim Lake) from the Kim and Discovery zones were examined. Much of the drill core available at this site is from the Tel and Bob deposits, and only a few holes are available from the Discovery and Kim zones. Moreover, only the later set of holes from each of these deposits are labelled properly. Much of the drill core in drill racks is in good condition where air could get in between the boxes. However, in the piles of drill boxes core on the ground, many of the boxes have deteriorated to the point that they cannot be moved. Thus only some parts of some holes could be examined. Of particular interest were the skarn and veins in the Discovery zone and the zone of altered plutonic rocks which hosts the quartz-sulfide veins in the Kim zone.

2.0 Geology

2.1 Regional Geology (after Livgard, 1995)

Banks Island is along the western edge of the Coast Plutonic Complex which is mainly of Jurassic to Cretaceous age. The plutons on Banks Island consist of multi-phase coalescing stocks. Two dates reported are of 120 Ma for the Hepler Lake diorite and 124 Ma for sericite in altered rocks of the Kim pluton in the Kim zone. Carboniferous, marine, meta-sedimentary rocks of the Alexander Terrane form long, narrow, northwest-trending belts which are folded tightly to isoclinally. Linear features are enhanced by glacial scouring, and in much of the property are marked by aligned, soil-filled or bare furrows, streams, lakes, bluffs, and ridges. Many contacts between the sedimentary rocks and plutonic rocks are along northwest-trending linear features. These are loci of right-lateral, strike-slip faults. Other major structural features are second-order northeast-trending fracture zones and east-west faults, which cut the northwest linear features at regular intervals. Offset on these has been interpreted as left-lateral (Lindinger, 1987), or right lateral with offsets of from 200-300 metres (McDougall, 1972). Related to these are third- and fourth-order tensional fractures and subsidiary shear zones. Regional joint sets parallel the prominent structures.

Many of the mineral deposits are centred on or adjacent to intersections of first- and second-order structures (commonly under water or under glacial deposits). In two different types of deposits, skarn deposits on contacts of marble and plutonic rocks and hydrothermally altered shear zones in plutonic rocks, the host rocks have been cut by quartz veins containing variable amounts of massive sulfide dominated by pyrite, commonly with minor arsenopyrite and/or other base metal minerals, and minor native gold.

2.2 Property Geology (see Figure 3, after Livgard, 1995)

Two long belts of Carboniferous(?) marine sedimentary rocks strike northwesterly. The Western Belt lies along the Bank Barge lineament, and varies in width from 30 metres to 1 km. Rock types include pyritic argillaceous quartzite, massive to finely banded marble, siltstone, calcareous siltstone, and pyritic, graphitic shale. Regional metamorphism produced intense deformation and a prominent schistosity mainly parallel to bedding, and contact metamorphism against the plutonic rocks produced hornblende-biotite hornfels in pelitic units and skarn in calcareous units. Skarn contains the main assemblages epidote-quartz, garnet, and actinolite-zoisite-diopside. The Eastern Belt consists of the main body of the Kim pluton and two, narrow, flanking, northwest-trending bands of meta-sedimentary rocks similar to those in the Western Belt. The sedimentary rocks were folded into isoclinal to close folds trending northwest.

Plutonic rocks include Upper Jurassic quartz monzonite, granodiorite, diorite/quartz diorite, and the Kim quartz monzonite. Several areas, most notably the Bob deposit, contain intrusive breccias with small to very large fragments of marble and greywacke in quartz diorite/diorite. Most of the plutonic rocks are variably foliated.

Regional strike-slip faults trend northwest and have a right-lateral offset. Closely associated with these are conjugate northeast- and east-west-trending faults with a dilational character. Associated with these are zones of brecciation. East-west faults are loci for quartz-pyrite vein mineralization, especially where they cut northwest-trending belts of meta-sedimentary rocks and parallel faults.

Some of these deposits also contain minor zones of skarn. The Discovery deposit is a skarn associated with a northwest fault. The Kim and possibly Beaver Lake, Englishman, and a zone northwest of the Kim deposit are west-northwest-trending zones of auriferous, stockwork quartz veins in the Kim pluton. The Crack zone hosts gold in felsite sills.

2.3 Geology from this study

The geology examined in this study is show in Figure 4. Much of this provided more detail geology than shown on existing property maps, and an attempt was made to fill in areas for which data from previous studies was meagre or non-existent. Abundant data were collected on attitudes of foliation, and quartz veins. Minor data was available regarding fold axes and lineations of the major penetrative deformation event (D1). The legend of geological events is shown in Table 1.

Table 2. Legend of Geological Events

Qv	Main stage veins, a few sets, possibly of a few ages quartz-(pyrite-arsenopyrite-sphalerite-galena-native gold)
	Tertiary: faulting (in part overlapping formation of quartz veins)
	Major deformation, steeply northwest plunging fold axes, foliation developed in all rocks
	Early quartz veins, mainly in Unit 1, contorted with S_0 (bedding), possibly of more than one age (small, not shown on map)
	Cretaceous (120-125 Ma) (based on zircon and sericite dates in Units 4, altered Unit 5)
5	Kim Pluton: granodiorite to quartz monzonite, (mainly 10-15% mafic minerals, biotite > hornblende
4	Hepler Lake Pluton: diorite (mainly 35-45% mafic minerals), minor leucocratic late stage dikelets and patches
3	Crazy Lake Pluton: granodiorite to quartz monzonite (east of Arseno Lake-Waller Lake meta-sedimentary belt)
2	Marble: fine to very coarse grained (especially near contacts with plutons)
	2s Skarn - epidote-actinolite-garnet-quartz-calcite, developed on margin of Unit 2 and Kim Pluton, minor on margin of Unit 2 and Hepler Lake Pluton
1	Meta-sedimentary rocks, finely bedded, clastic rocks: light grey to black argillite, meta-siltstone, quartz-mica schist, very tightly folded

2.3.1 Ages of deformation events

In a few localities, the contact of the Kim pluton (Unit 5) against meta-sedimentary rocks of Unit 1 was folded tightly in a style and orientation similar to that of minor folds in the meta-sedimentary rocks during D1. Most minor F1 fold axes and L1 axial lineations on the foliation planes strike northwest parallel to the axis of the meta-sedimentary belts and plunge steeply (70-80° to the northwest). Contacts were folded into F1 folds on the scale of 0.5-2 metres and dikelets a few cm wide of Kim granodiorite near the contact were folded conformably with rocks of Unit 1. Most marble outcrops were folded tightly; the best evidence for this is in coarse, broken blocks in the west end of the long trench south of the Discovery zone.

The foliation in the Kim and Hepler Lake plutons is mainly parallel to the regional northwest trend, but significant variations from this trend are present locally and in a few broader regions, suggesting that during D1, the plutonic rocks were folded openly whereas the meta-sedimentary bands between them were folded tightly. The intensity foliation in the plutonic rocks varies from faint to strong, and in some outcrops it was too vague to be measured; this hampered analysis of its distribution. Of particular interest is the foliation in the Hepler Lake pluton near the Discovery Zone. In several localities it is oriented at a moderate to high angle to the regional trend, suggesting that it was folded tightly. This suggests the possibility that some of the bands of marble in the eastern side of this pluton are in cores of tight folds (synforms). During D1, a set of early quartz veins averaging 1-5 cm thick was folded conformably with the close to isoclinal folds developed in the host meta-sedimentary rocks of Unit 1.

Although most of the quartz and quartz-sulfide veins in the Kim pluton cut the foliation at a high angle indicating that they are later, some quartz veins are warped moderately, and textures suggest that they are cut by a weak foliation, suggesting that they may have been deformed slightly. This would indicate that the deformation history is more complex than shown in Table 1.

2.3.2 Skarn

The main zone of skarn is in the Discovery Zone along the contact of marble of Unit 2 and the Kim pluton (Unit 5). Only minor skarn was developed along the contact of marble and the Hepler Lake pluton (Unit 4). In the India Zone, a relatively continuous band of skarn up to a few metres thick occurs along the border of the marble belt and the Kim pluton. In contrast, the contact with the limestone and Hepler Lake diorite commonly is sharp and contains only minor patches of skarn. Further south towards Waller Lake, only minor skarn was identified on the contact of the limestone with the Hepler Lake pluton. In this region outcrop is sparse and no contacts were seen between the Kim pluton and marble. The presence of only minor skarn on its contact and the general lack of alteration and veining in the Hepler Lake diorite suggest that it was too dry to produce significant skarn or hydrothermal deposits.

At the Discovery Zone, the main quartz-pyrite-arsenopyrite-(sphalerite-galena-native gold) vein occurs near the contact of marble and skarn and is subparallel to the regional foliation in the host rocks and the adjacent Kim pluton. The very lensy nature of this deposit mirrors the pod-like nature of the zone of marble and skarn. The skarn is dominated by three main end-members with abundant intermediate varieties: the end members are actinolite-zoisite-diopside, epidote-quartz, and garnet-(epidote-quartz). Some contain disseminated patches of coarse quartz or calcite, and some contain fine to coarse grained patches of sulfides.

2.3.3 Quartz Veins in and near the Kim Pluton

Numerous quartz veins are present in parts of the Kim pluton, and some of them have been tested, Their orientation varies moderately to strongly, and a study was made of their distribution in order to determine whether they occupy structural patterns which might have significance with respect to the distribution of mineralized zones. The distribution of quartz veins is shown on Figure 4. In the Kim zone, quartz-sulfide veins occur in several orientations, possibly reflecting more than one event. Many veins are at a high angle to the main trend of the zone (about 100°). Veins along this trend dip both to the north and south.

Southeast of the Kim zone as far as Quartz Hill, the Kim pluton contains moderately abundant to locally very abundant quartz veins averaging a few to several cm wide and locally up to 1 metre wide. Most of these are barren. Many occur in a set which strikes northeast and dips gently to moderately to the northwest. This set and parallel joints strongly controls the shape of outcrops in parts of the region. Near the Discovery zone, the strike of this set is more north-south with dips to the west. Also near the Discovery zone and along the northeast side of the Kim pluton, a set of north-northwest-trending veins dips moderately to steeply to the west. In contrast, the Discovery vein dips 50° to the northeast. At Quartz Hill, more than one set of veins is present, and some are up to 2 metres wide. In one outcrop, veins striking northwest and dipping to the southwest are tightly folded and offset a few cm along a later(?) vein dipping to the northeast. The preliminary results of this examination suggests (as recommended by Livgard) that a more detailed analysis be done of the distribution and orientations of quartz veins throughout this region. In the Kim pluton away from this zone, quartz veins are much less abundant.

3.0 Details of Main Zones of Gold Mineralization

3.1 Discovery Deposit (this and previous studies)

The zone is poorly exposed. It occurs between coarse, grey marble to the south and skarn to the northeast. Near the contact with quartz monzonite, the skarn is green and compact, consisting of zoisite-actinolite-quartz. In the core of the skarn, the rock is coarser grained and consist of variations between dark green epidote-quartz skarn and deep red, almandine garnet-rich skarn. Scattered interstitial patches are of medium to coarse grained quartz and/or calcite.

The Discovery pit contains a quartz-sulfide vein up to 1 metre wide trending 135-140° and dipping 50°NE on surface and reported to steepen to 80°NE at depth. Gold is associated with lenses and patches of massive sulfide dominated by pyrite, with less abundant pyrrhotite, arsenopyrite, sphalerite, and chalcopyrite. Drilling has defined a lens of high-grade mineralization, partly surrounded by narrower zones of lower-grade mineralization. The high-grade gold zone is open along strike at depth to the northwest.

A second, smaller, sulfide-bearing, garnet-diopside-epidote skarn occurs to the west along the contact of the marble with quartz diorite of the Hepler pluton. This skarn, with silicate mineralogy similar to that of the Discovery zone, has not been trenched or drilled, and is a lower priority target than the skarn closer to the Kim pluton.

3.2 **Kim Deposit** (this study and previous work)

This is a complex stockwork of sulfide-bearing quartz veins and lenses of massive and more disseminated sulfides in a strongly altered fracture system in biotite quartz monzonite of the Kim pluton. The main zone of alteration trends 108° and on surface is up to 20 metres wide. Much of it is beneath Kim Lake. Drilling shows that alteration ranges from weak sericite-quartz on the margin to a broad zone of intense sericite-quartz-(chlorite-calcite), within which are narrow zones u pt o a few metres wide of high-grade gold mineralization in quartz-pyrite replacement zones. The mineralized zone is widest at surface where it ranges in width from 2 to 15 metres. The abundance of quartz veins varies directly with the intensity of alteration. Sets of weaker fractures strike north-south and west-northwest. Mineralized zones were offset up to 15 metres left-laterally on several, small, northeast-trending faults.

3.3 **Bob Deposit** (from Livgard, 1995)

The deposit is a vein system in a dilational fault (Bob Fault) trending 090°, 75-80°N. Near the surface, the host rock is mainly pelitic meta-sedimentary rocks and skarn. At depth it is a quartz diorite breccia containing numerous stoped blocks of meta-sedimentary rocks and marble skarn, especially along the trace of the Banks Barge linear, 100 metres east of the deposit. The veins are quartz-rich with very coarsely banded, fine and coarse grained pyrite with minor chalcopyrite and trace to minor arsenopyrite, galena, sphalerite, and molybdenum. Total sulfide content over widths of 10 cm ranges from 5-75%. Type 1 veins are characterized by fine grained pyrite with minor chalcopyrite and arsenopyrite, and are most common near the footwall and as brecciated fragments. Assays from the 1987 program range from 0.15-0.30 oz/t gold. Type 2 veins containing medium to very coarse grained pyrite, chalcopyrite, and traces of arsenopyrite are most common in hangingwall faults, alteration zones, and small veins away from the main zone. Locally Type 2 veins cut those of Type 1, and may have formed in part by recrystallization of Type 1 veins. Erratic gold values in Type 2 veins range from 0.2-10 oz/t.

Most of the footwall is sharp and defined by a dark, sulfide-rich mylonite against fresh, unaltered wall rocks. The hangingwall commonly is marked by a zone of bleached and altered diorite at least 1 metre wide.

Thick, high-grade Type 2 veins occur adjacent to angular xenoliths of marble and skarn in dilatent zones along the fault caused by the presence of the xenoliths. The marble xenoliths also would react with the hydrothermal fluids to produce skarn minerals, which could change the composition of the solutions sufficiently to cause deposition of sulfides and gold. Pods of high-grade gold are common where hangingwall veins intersect the main zone.

The nature of the mineralization and associated alteration suggest a deep mesothermal environment of formation. The high Cu / (Pb+Zn) ratio suggests a depth of about 1.5 km and a temperature over 200°C.

The decline was driven mainly in the vein/fault zone and intersected it on two levels. At a lower level, the vein was intersected in two crosscuts and short drill holes. The ground was badly broken and gougy due to faulting, necessitating timbering in places. The size of the mineralized vein on the three levels is as shown in Table 2.

Table 3. **Bob Deposit, Mineralized Vein**

Level	Depth m	Length m	Width m	Gold g/ton	Silver g/ton
1		39	1.0	4.4	
2	50	44	1.7	31.7	97.3
3		35	0.6	7.8	528

3.4 Tel Deposit (from Livgard, 1995)

The stratigraphic sequence in the northwest trending belt of meta-sedimentary rocks which dips 55-80° NE and may be overturned. From northeast to southwest the stratigraphic section is as follows: massive, coarse marble (Unit 2), grey, wispy banded marble (Unit 2a), light brown silty marble (Unit 2d), and light grey medium grained marble. It is cut by many faults and shears with chloritic slickensides, graphite seams, and gouge. Garnet-actinolite skarn is developed variably in all meta-sedimentary units. Gold occurs in banded, quartz-sulfide veins and breccias which crosscut bedding. Sulfides are pyrite, arsenopyrite, sphalerite, chalcopyrite, and minor galena and pyrrhotite. Gold values correlate with total sulfide and particularly with pyrite. The main vein varies in width from a few cm to several metres; and has a lensy nature, with individual lenses averaging 20-100 metres in length and depth. Lenses cross bedding and may be *en echelon* in nature. Abundant post-mineralization faults occur in the hangingwall. The deposit is open to the west and east; to the west the last hole gave a value of 7.2 g/t gold over a width of 1.2 metres.

4.0 Reserves

Previous reserve calculations vary widely, reflecting the relatively sparse distribution of drill holes, the lensy nature of the deposits, and the wide variation in gold values from hole to hole. Some holes (in the Kim zone) were drilled subparallel to some vein directions and thus may have sampled the zone only poorly. Table 2 shows "conservative" estimates by Livgard (1994), which he calculated mainly from diamond drill results and minor surface results, and include dilution factors to convert drill intersections to mining widths and grades. He stated that uncertainties about ground conditions, vein continuity, faults, and drill recovery made it prudent and necessary to accept conservative estimates only. Most earlier estimates were larger and of higher grade than these. Table 3 shows data regarding the numbers of drill holes and dates of drilling upon which the reserves were calculated.

Table 4. **"Conservative" Reserve Estimates** (after Livgard, 1994)

Deposit	Tonnage	Grade	Proposed Mining Method
Tel	75,000	12.1 g/t	underground
Discovery	60,000	15.4 g/t	underground
Kim	72,000	6.5 g/t	open pit (to 25 metres depth)
Bob	50,000	?	underground (?)

Table 5. Summary of Drill Data of Major Deposits

Property	Date	Holes	Type	Metres	
Discovery -	1960	11	PSH	no data	PSH = packsack
	1963	14	DDH	no data	DDH = diamond
	Total	25		1,857	
Tel	1964	26	PSH	537	
	1975	16	DDH	998	
	1983-1986	50	DDH	9,243	
Kim	1963-1964	63	DDH	3,651	
	1984	8	DDH	1,323	
Bob	1964	14	PSH	317	
	1976	4	DDH	426	
	1977-78	7	UG	100	UG = underground
	1984-85	3	DDH	385 (approx)	
	1987	7	DDH	1,313	

5.0 Priority Targets

The following list of priority targets was prepared by Livgard, 1995. The present study was focussed on developing a good geological base and understanding of some of the most important priority areas, with the goal of defining more precisely targets for future exploration.

1) Discovery Zone extensions NW and SE, including western contact of marble-pluton
2) Beaver Lake lineament (strong alteration, soil anomalies)
3) Midway-Ex zone (SP, aerial EM anomalies)
4) Englishman to Quartz Hill (soil, EM, IP)
5) Crack Zone (Au in felsic sills/flows)
6) Cross Break (strong EM)
7) Foul Bay/Gro/Witness Lake - intersection of structures
8) Hepler Peninsula

6.0 Conclusions

1. The Yellow Giant property contains major north-northwest trending belts of strongly deformed and moderately metamorphosed sedimentary rocks dominated by fine clastic rocks and limestone. These were intruded by several pre-deformation plutons of the Coast Range Plutonic along the western edge of that body. Compositions of plutonic rocks range from diorite to quartz monzonite. Some intrusive breccias are present, and some of these host gold mineralization. Some veins and replacement bodies are associated with skarn deposits (mainly in the Discovery and Bob deposits). It is uncertain how much of the gold and sulfide mineralization was part of the skarn event and how much was introduced or remobilized during strong folding and late faulting.

2. The area contains several high-grade gold deposits, in which gold values in the order of 0.3-1 oz/ton and locally up to a few oz/ton are mainly associated with veins of quartz-sulfide, and in particular with veins rich in massive sulfide dominated by pyrite with lesser arsenopyrite. The veins were controlled in their emplacement by a few sets of faults and shear zones, which were formed mainly during Tertiary movement associated with large-scale tectonic plate movements along the complex Pacific-North American plate boundary. Most of the veins are lenticular in nature.

3. Some veins and replacement bodies are associated with skarn deposits (mainly in the Discovery and Bob deposits.) It is uncertain how much of the gold and sulfide mineralization was part of the skarn event and how much was introduced or remobilized during strong folding and late faulting.

4. Some gold occurs with disseminated sulfides in altered plutonic rocks in zones of shearing and faulting (e.g., Kim deposit), but the great majority of gold in that deposit is concentrated in the sulfide-rich veins. These occur in several orientations, some of which may have been tested inadequately by previous drilling.

5. The deposits have been tested by many drill holes during a few different exploration programs and preliminary reserve calculations have been made on the major deposits. Analysis of these data for the Discovery and Kim zones indicates that some holes have a very strong influence on the total tonnage, and that gaps exist in the coverage of some zones, both within the drill pattern and along untested extensions. It would be important to explore such untested extensions in order to attempt to double the known reserves in the property, which would lead to a feasibility study on the property.

7.0 Recommendations

Some of the following recommendations are taken from or expanded on those recommended by Livgard (1995). I am in agreement with the thrust of much of his recommendations.

1. A thorough compilation of all useful geological, geophysical, and geochemical information should be plotted on computerized standard maps. Air-photo coverage is available at a scale of 1:2500. This base was used in this report and will provide an excellent base for all property-scale work. It may be difficult to reconcile some of the previous surface work with the photo-based mapping.

2. This should be followed up with detailed geological mapping in areas of economic interest and more widely spaced mapping in areas of little economic interest where such data are not available from the above compilation. In most areas, detailed structural data are lacking, and these should be complied, with particular reference to D1 deformation features (fold axes, axial lineations, major warps in foliation in plutonic rocks) and the distribution and nature of, and extent of deformation in quartz and quartz-sulfide veins. From this study, exploration targets should be prioritized.

3. Several areas of some economic potential have not been covered by geochemical and/or geophysical surveys (ground I.P. and magnetometer), and some have geochemical and/or geophysical anomalies which have not been explained. Based on the results of the above compilation and geological mapping, some targets will warrant geochemical and/or geophysical examination.

4. Well defined exploration targets from the above compilation and work should be tested by diamond-drilling. Some of these holes should test possible extensions of known zones of mineralization, such as at the Discovery and Kim deposits, in order to attempt to double the known reserves. Other holes should fill a few gaps within the blocks for which reserves were estimated and check the regions around a few holes with very wide intersections (and thus a strong influence on the present reserve calculations) in order to check the validity of the present reserve estimates.

8.0 References

B.C. Department of Mines Minfile # 1036: 021, 024, 035, 026.

Livgard, E., 1995. Summary Report on Yellow Giant Claim Group, prepared for Energex Minerals Ltd.

*McDougall, J.J., 1972. The Relationshhip between Lineaments and Mineral Deposits on Banks Island, B.C. In G.A.C. Symposium on Faults, Fractures, Lineaments, and Related Mineralization in the Canadian Cordillera, February 4-5, 1972.

*Mohan R., Vulimiri, M.S., and Mitchell, J.G.B., 1987. Yellow Giant Project, Banks Island, B.C. Proposed Development and Production on the Kim, Discovery, and Tel Deposits. Unpublished report.

*Shearer, J.T., 1985. Report on the Bob Deposit, Yellow Giant Project, Banks Island, B.C., unpublished report for Trader Resources Corp.

*Shearer, J.T., 1987. Summary Report of Geological, Geophysical, and other studies on the Tel Deposit, Yellow Giant Project, Banks Island from June 1982 to February 1987. B.C. Dept of Mines Assessment Report 15779.

* references from Livgard (1994), original reports were not examined or were examined only briefly.

9.0 Certificate of Engineer

I, **John G. Payne**, do hereby certify that:

1. I graduated from Queen's University, Kingston, Ontario, in 1961 with a B.Sc. degree in Geological Engineering.

2. I graduated from McMaster University, Hamilton, Ontario, in 1966 with a Ph.D. in Geochemistry. My thesis topic was: The Geology and Geochemistry of the Blue Mountain Nepheline Syenite Body, Southern Ontario.

3. I am a Fellow of the Geological Association of Canada, Fellow No. 1677, and have been a member in good standing since 1969.

4. From 1967 to the present, I have been actively engaged as a geologist in mineral exploration, mainly in the North American Cordillera, but also in the South American Cordillera, Southeast Asia, and the Canadian Shield. As well, since 1974, I have been Senior Petrographer with Vancouver Petrographics, Ltd, Langley, B.C. Since 1992 I have been Senior Geologist with Minesat Explorations, Ltd., a company involved in interpretation of satellite imagery.

5. From May 1-May 6, 1996, I examined parts of the Yellow Giant Claim Group in and near the Discovery and Kim deposits with the purpose of determining possible extensions of known mineralized zones.

6. I have no present or planned interest in Energex Minerals, Ltd., or the Yellow Giant Claim Group.

7. This report was prepared at the request of Energex Minerals, Ltd., and may be used by that company in a prospectus or a Statement of Material Facts.

8. I live at 877 Old Lillooet Road, North Vancouver, B.C., V7J 2H6.
   Tel: (604)-986-2928.
   Fax: (604)-983-3318

Dated at Vancouver, May 1996.

John G. Payne, Ph.D.

10.0 Cost Statement

1.	Transportation		
	taxi - Vancouver: home/airport/home		50.00
	air - Vancouver-Prince Rupert-Vancouver (Canadian)		800.00
	air - Prince Rupert-Banks Island-Prince Rupert		
	(Alpen Helicopters) (3.2 hrs @ $ 750 /hr)		2300.00
2.	Expediting (Francois)		
	food, equipment, camp gear 6 days @ $ 200 / day		1200.00
	gst		84.00
3.	Personnel		
	Senior geologist:	6 days field @ 475	
		3 days office @ 475	4275.00
	Logistics Manager	6 days field @ 250	
		1 day office @ 250	1750.00
	gst		421.75
4.	Report preparation		
	printing of maps		30.00
	report		20.00
5.	Costs related to Claim Staking		
	free miners certificate		25.00
	mineral post tax		4.28
	registering of Yellow Giant 2 claim Mineral Title		80.00
Total			**$ 11041.03**

John G. Payne
John G. Payne
May, 1996

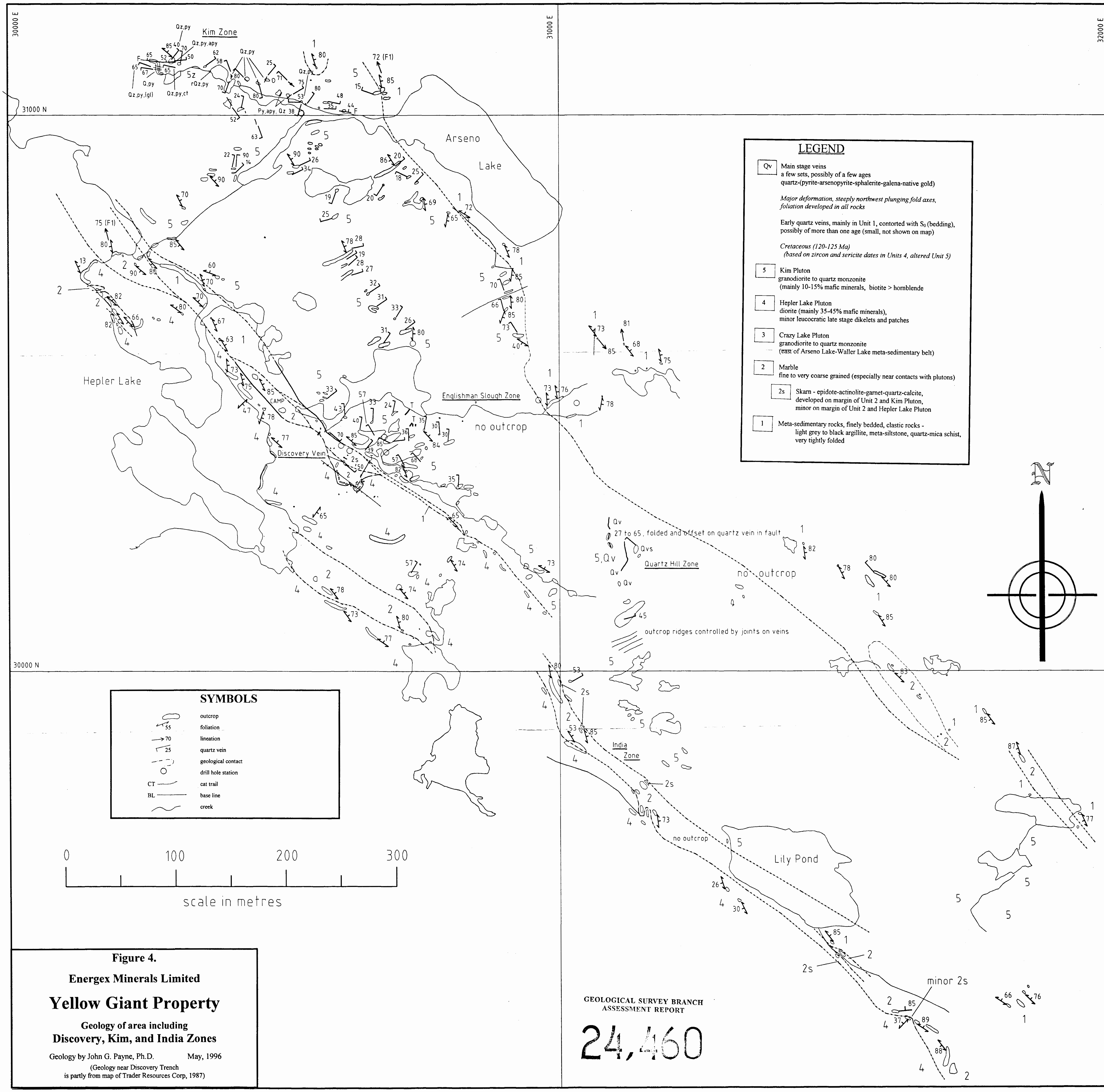


Figure 4.

Energex Minerals Limited

Yellow Giant Property

Geology of area including Discovery, Kim, and India Zones

Geology by John G. Payne, Ph.D. May, 1996

(Geology near Discovery Trench is partly from map of Trader Resources Corp, 1987)

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24,460