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DALLAS TEXAS 75248
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January 29, 1988

Grant E. Atkinson
1332 West First Place
Mesa, Arizona 85201
602-9690312

Mr. Al Fielding
2122 Cardinal Lane
Fort Worth, Texas 76111

OPAL & MARKUP GOLD, SILVER - BASE METALS PROPERTIES, CHITINA AREA, SOUTH CENTRAL ALASKA

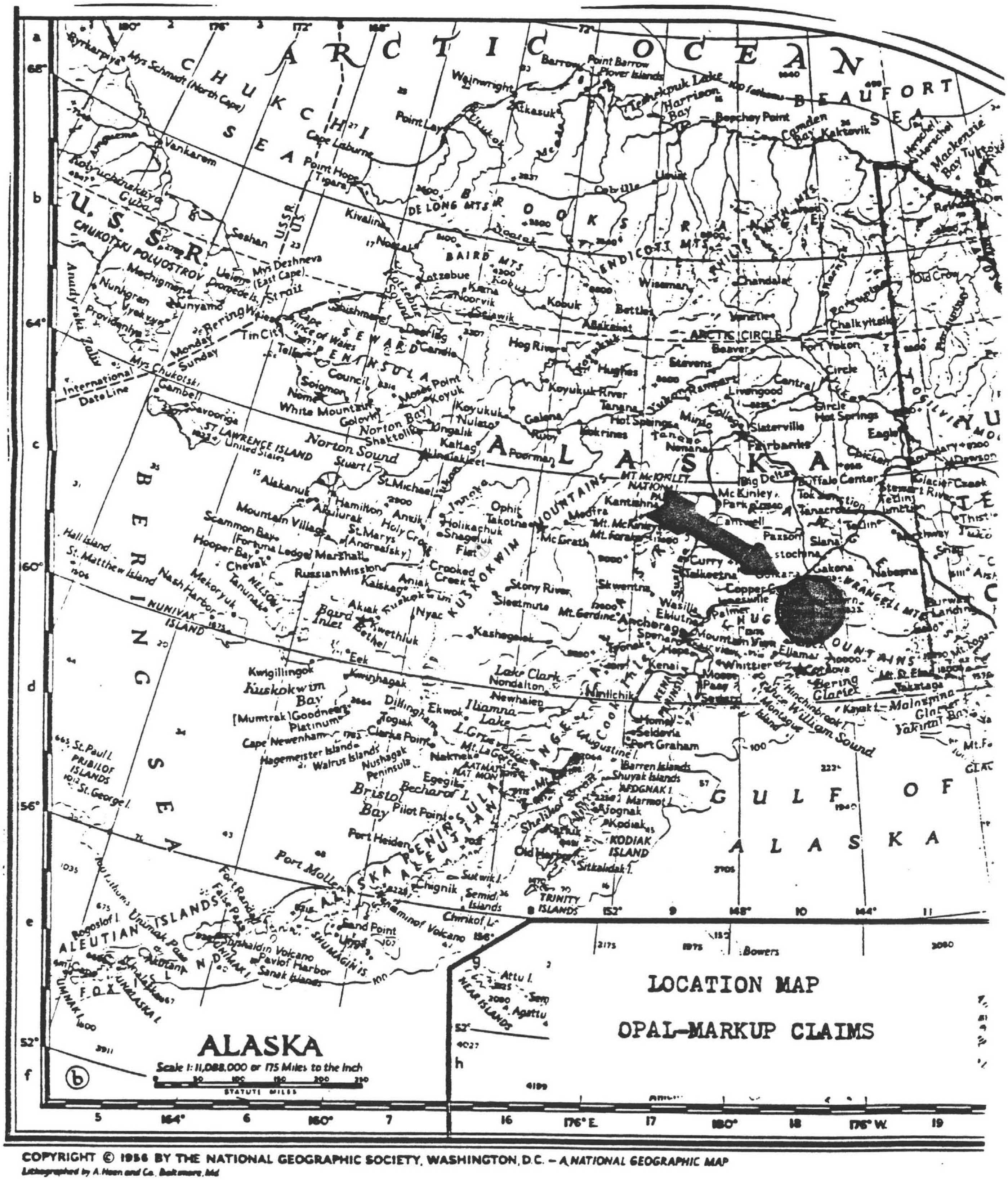
Dear Mr. Fielding:

This report presents an evaluation of the gold, silver and base metals potential of the Opal and Markup mining claim group located in the Chugach Mountains of South Central Alaska, about six miles west of Chitina and 120 miles north of Valdez. The purpose of the evaluation was to determine the potential for economic occurrence of these metals based in information and data developed by several investigators from outcropping high grade veins in granites and metamorphic country rocks, core hole drillings and surface mappings. This study re-evaluates these data and results and offers interpretation of ore deposit paragenesis, economic potential of the gold and other values, and recommends additional studies that should delineate both small and large volume ore objectives. This re-evaluation presents an up-date and over-view applying new concepts that have been developed in gold technology within the past two years.

Indicated are important small volume high grade gold reserves in shallow veins and the potential for a large volume of reserves disseminated gold occurring within an altered granite boxwork.

Authorization: Verbal authorization to undertake this study was received by telephone at the Dallas offices of Minerals Associates from Mr. Fielding on January 13, 1988. Minerals Associates was retained by payment dated January 14, 1988 on an arms-length client-consultant relationship and Minerals Associates and its principal have no interest in the subject mining properties or have any relationship to the owners.

Location: The Opal and Markup claims lie six miles west of Chitina townsite within the Liberty Creek drainage system, a tributary of the Copper River. The claims are situated within Sections 35 and 36, Township 3 South, Range 4 East and Sections 1, 2, 11 and 12, Township 4 South, Range 4 East, Valdez C-2 quadrangle. Chitina lies south of Copper Center which is served by Highway No. 1 which connects Anchorage points southeastward. Highway No. 4 connects the major oil export port and pipeline terminus at Valdez with Copper Center. The property access road departs westward at the Chitina Airport, four miles north of the town. The airport



COPYRIGHT © 1956 BY THE NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON, D.C. – A NATIONAL GEOGRAPHIC MAP
Lithographed by A. Hoen and Co., Baltimore, Md.

MINERALS ASSOCIATES, INCORPORATED

at Chitina is served by several contract air carriers, connecting with Valdez, Glennallen, Cordova, Northway and others.

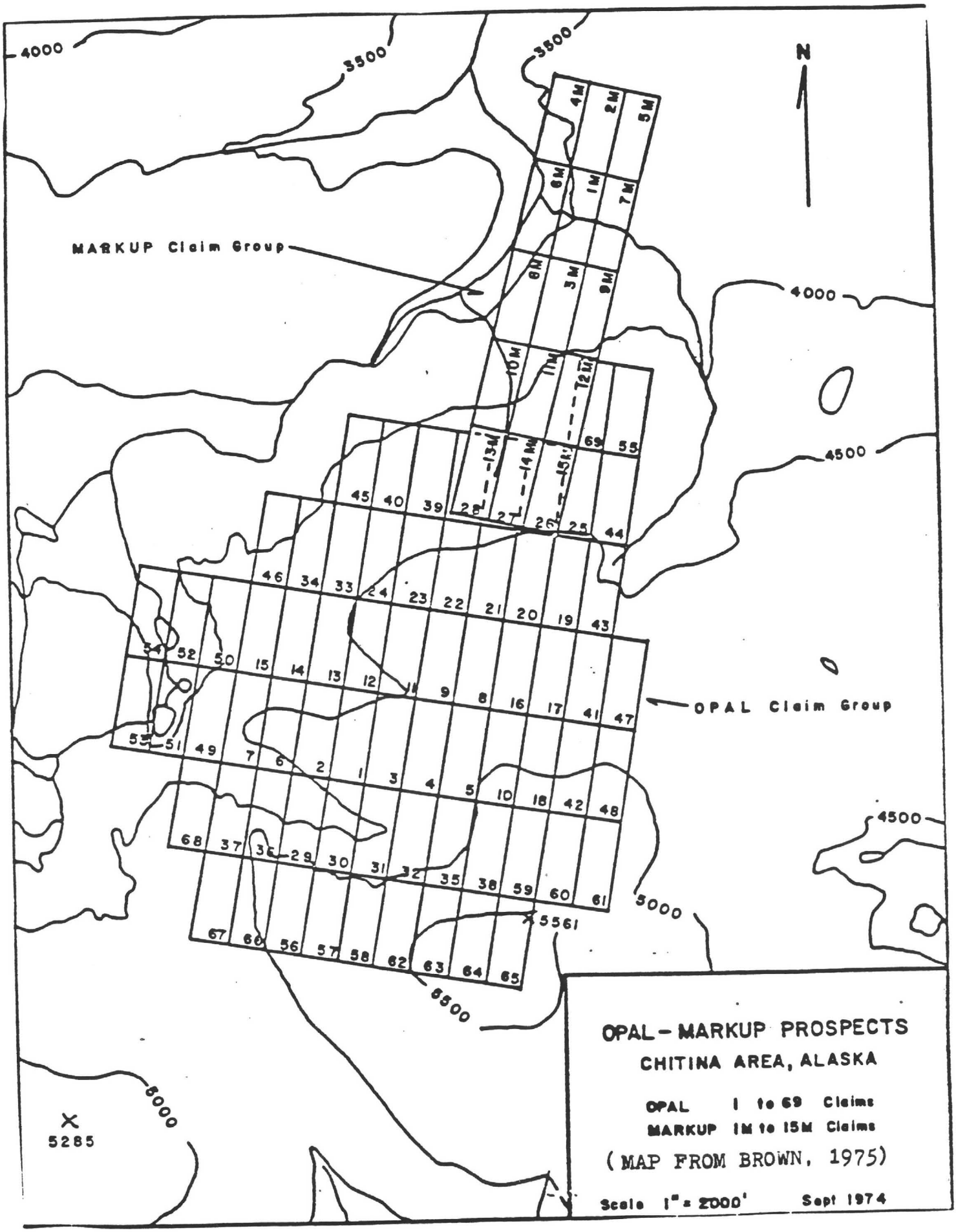
Ownership: The properties comprise two contiguous groups of standard lode mining claims: the Opal group of 69 and the Markup group of 15, or a total of 84 (20.66 acre each)lodes totalling approximately 1,500 acres. Overlapping of three claims results in the 1,500 acres total claimed area. Claimed also is a 5.438 acre Mill Site plus 0.143 acre access road (5.581 total acres) on the Edgerton Cut-Off (Chitina Road) in Section 26, Township 3 South, Range 5 East. The Mill Site lies on the edge of the Copper River and contains an abandoned Highway Department gravel pit that has been proposed for tailings discharge. The Mill Site lies approximately five miles from Chitina. All claims are unpatented.

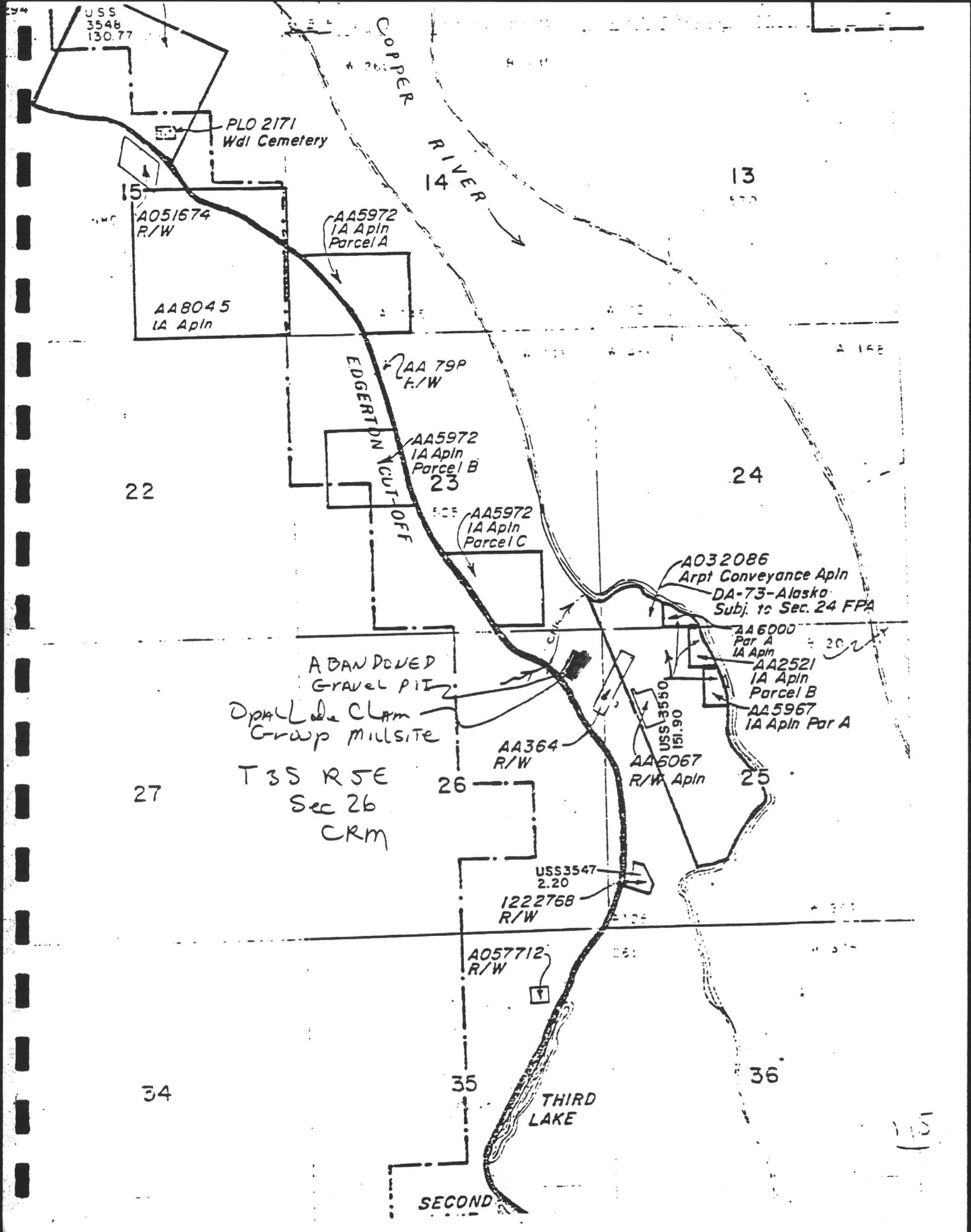
The lode mining claims were located by John James Brennan in 1965. Notices of annual labor assessment for the period 1967 through 1987 were not available in Dallas for inspection by Minerals Associates. However, documents and correspondence from the State of Alaska and the U.S. Department of the Interior, Bureau of Land Management as late as 1987 recognize the existance of the Opal-Markup Groups and have reference to installing a mill for ore processing on said claims. Work performed on the claims, assays, mapping, coring, sampling, access road construction, and exploration work by dozer should satify Annual Assessment requirements of the Bureau of Land Management. Comminco Alaska Exploration, a Division of Cominco American Incorporated optioned the properties in 1985 and released the claims with no report of ownership conflict, over-staking or right of access.

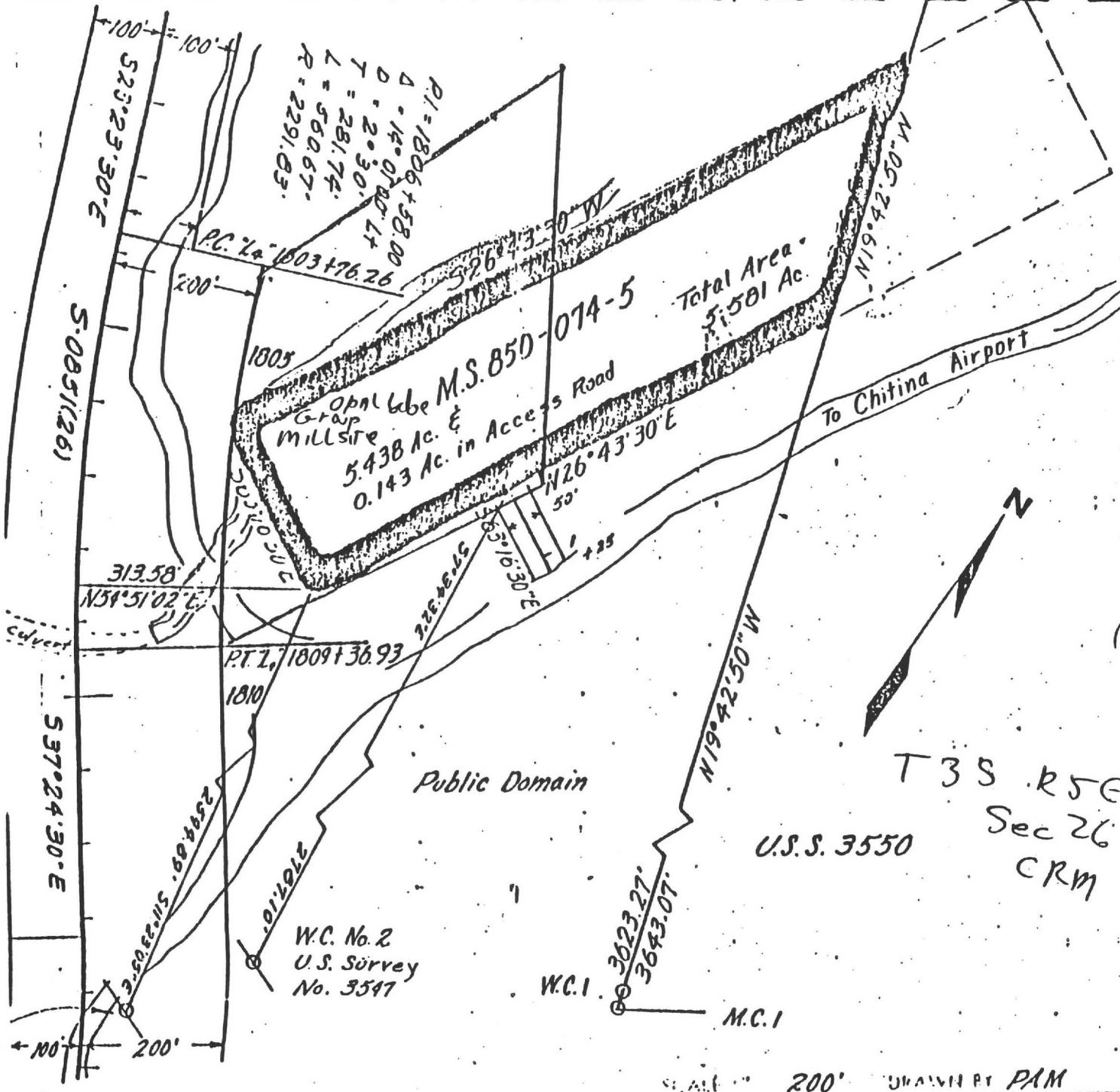
History: The properties lie on the west flank of major mining areas at McCarthy and Nebesana. The latter has been reported as one of the richest gold mines in Alaska.

John James "Jim" Brennan, then a geologist for the Alaska State Highway Department discovered the properties and located the claims in 1965. He filed locations along with a partner who together began a sampling regimen of the high grade areas and mapped three mineralized "zones" containing gold.

The Brennan discovery was evaluated by Pan American Petroleum in July, 1966. The Markup extensions to the Opal veins were located at this time. A large number of samples collected by Brennan were studied by Dr. S.A. Williams of the University of Alaska and a petrographic evaluation report was prepared. Einar C. Erickson prepares report on these studies in late 1970. During 1967 Brennan constructs nine mile long access road to properties. In 1971 Brennan was engaged in oil and gas leasing activities on the North Slope of Alaska at Prudhoe Bay.


N
4000
3500
3500
4000
4500
4500
3000
6000
6500
MARKUP Claim Group
OPAL Claim Group
4M
2M
5M
6M
1M
7M
8M
3M
9M
10M
11M
12M
13M
14M
15M
5561
5285
OPAL - MARKUP PROSPECTS
CHITINA AREA, ALASKA
OPAL 1 to 69 Claims
MARKUP 1M to 15M Claims
(MAP FROM BROWN, 1975)
Scale 1" = 2000'
Sept 1974


USS 3548 130.77
PLO 2171 Wdl Cemetery
COPPER RIVER
14
13
15
A051674 R/W
AA5972 IA Apln Parcel A
AA8045 IA Apln
AA 79P R/W
EDGERTON CUT-OFF
AA5972 IA Apln Parcel B
23
22
24
AA5972 IA Apln Parcel C
A032086 Arpt Conveyance Apln
DA-73-Alaska Subj. to Sec. 24 FPA
AA6000 Par A IA Apln
AA2521 IA Apln Parcel B
AA5967 IA Apln Par A
A BANDONED Gravel PIT
Opal Lake Clam Group millsite
USS 3550 151.90
AA364 R/W
AA6067 R/W Apln
T 3S R 5E Sec 26 CRM
27
26
25
USS3547 2.20
1222768 R/W
A057712 R/W
34
35
36
THIRD LAKE
SECOND


100'
100'
S23°23'30"E
S-0851(26)
S37°24'30"E
P.C. 2a 1803+76.26
200'
1805
S26°43'30"W
Total Area
5.581 Ac.
Gravel Pit
M.S. 850-074-5
Millsite
5.438 Ac. &
0.143 Ac. in Access Road
N19°42'50"W
To Chitina Airport
N26°43'30"E
313.58'
N54°51'02"E
Culvert
P.T. 2, 1809+36.93
1810
Public Domain
N19°42'50"W
T 3 S R 5 E
Sec 26
CRM
U.S.S. 3550
W.C. No. 2
U.S. Survey
No. 3547
W.C. 1
M.C. 1
3623.27'
3643.07'
100'
200'
N
Tom W Young
SURVEY OF HIGHWAY PROJECT NO S-0851(2
SHOWN ON THIS MAP THAT THE SURVEY
JECT WAS MADE UNDER MY SUPERVISION
AUTHORITY, THAT THIS PARCEL WAS SURVEYED
THE SURVEY OF THIS HIGHWAY PROJECT, WHIC
CONDUCTED IN 1965, AND THAT SUCH SURVE
ACCURATELY REPRESENTED UPON THIS PLA
APPLICANT'S CERTIFICAT
THIS IS TO CERTIFY THAT Tom W. Young
WHO SUBSCRIBED THE STATEMENT HEREON IS
PERSON EMPLOYED BY THE UNDERSIGNED A
TO SUPERVISE THE PREPARATION OF THIS M
WHICH HAS BEEN ADOPTED BY THE APPLICANT
APPROXIMATE FINAL LOCATION OF THE PROJE
BY, SHOWN; AND THAT THIS MAP IS FILED AS
THE COMPLETE APPLICATION, AND IN ORDER T
APPLICANT MAY OBTAIN THE BENEFITS OF TH
OF AUGUST 27, 1958 72 STAT 885, 23 U.S.C. 3
I FURTHER CERTIFY THAT THE RIGHT-OF-WAY
DESCRIBED IS DESIRED FOR ALASKA HIGHWAY
NO S-0851(26)
MANAGER, ALASKA DEPT OF
ATTEST D. Ted Johnson
STATE OF ALASK
DEPARTMENT OF HIGHW
RIGHT OF WAY PLAT
SHOWING
MATERIAL SOURCE
FOR
S-0851(26) South Centra
DATE 10/
10/2/70
SCALE 200' DRAWN BY PAM

In 1972, Tiger Mining with Mr. Al Fielding as president began a pilot mining program on high grade ore and installed a pilot mill on the Mill Site on the Edgerton Cut-Off near Chitina. Many samples were taken for analysis of the three ore zones with no formal mapping. The pilot plant products were examined by several investigators and some concentrates were sold. Brennan continued with the North Slope activities until 1975 when De Oro Mines of Anchorage optioned the properties for one year. De Oro engaged A. B.& S. Inc, and Associates to evaluate the properties and to drill seven core holes to 600' depth to test the several mineralized zones. This work is reported in a 63 page evaluation (Brown, 1975).

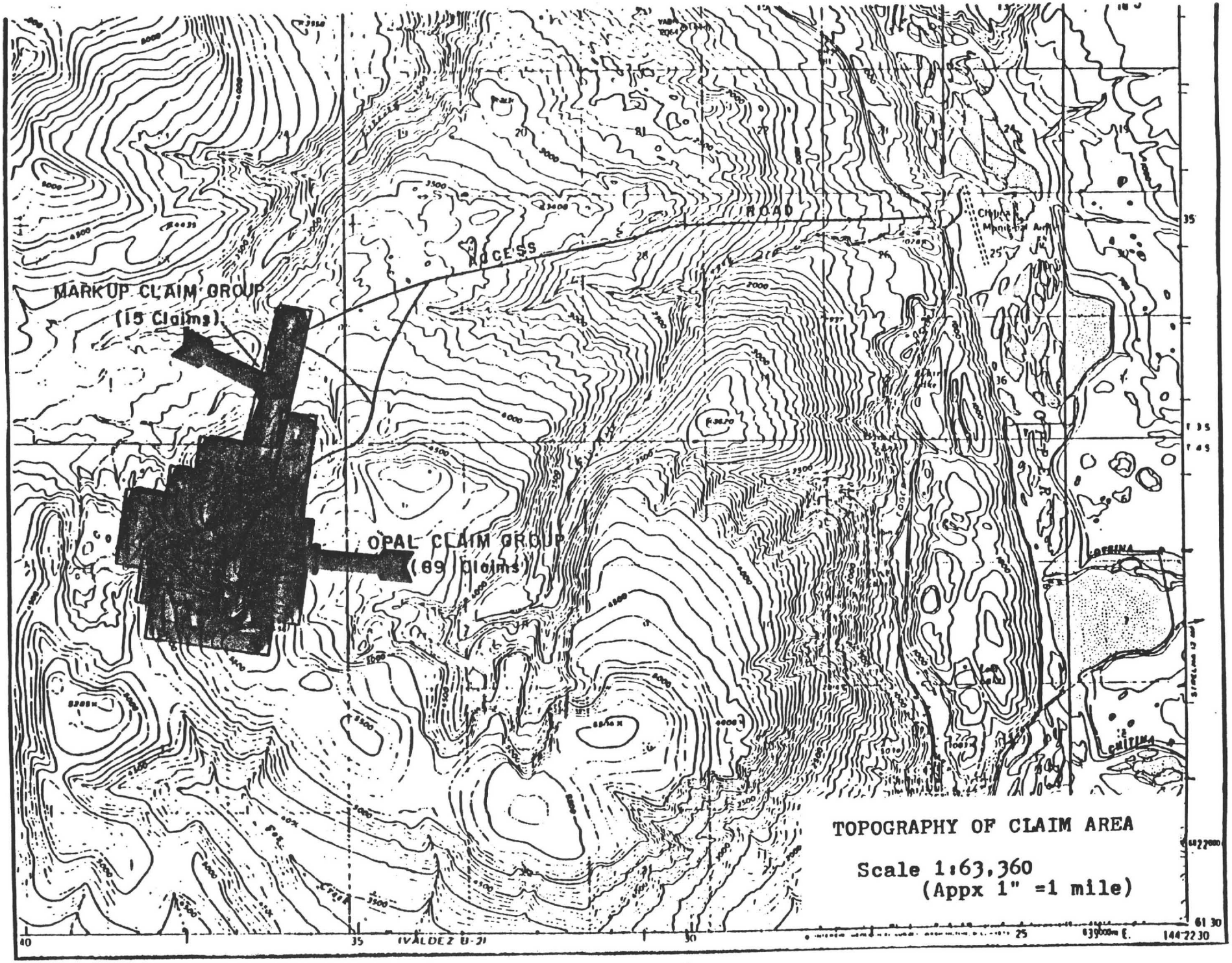
From 1976 to 1978, Brennan worked in Texas as a geologist for an oil company and activity on the property was confined to minor sampling and analyses by several independent geologists.

In 1985 Cominco Alaska Exploration optioned the properties and conducted field reconnaissance and sampling. The option was not exercised due to prior committments with another property.

In early 1987, Al Fielding renewed the option to produce the property and to acquire the claim groups. At this same time Mr. Fielding approached Minerals Associates with the data and documents on the properties to determine what would be required to further evaluate the high grade gold areas.

During the past few years Minerals Associates has evaluated placer gold properties on Coal Creek of the Yukon River, gold as placer and lode on the Seward Peninsula, and major barite deposits in Alaska. Placer gold properties in the Yukon of Canada were studied on the border near Chitina. Properties having similar geological settings were evaluated in El Choco and Tolima, Colombia, South America. A mine was evaluated near Puerto Berrio, Colombia that was essentially identical to the subject properties. These studies were conducted for separate and independent clients. Three of the properties are currently being mined as a result of the evaluations.

<u>Evaluation and Observations</u>: The evaluation, observations and opinions presented herein are based entirely data and information supplied by Mr. Al Fielding. These data and information sources are listed in the attached bibliography. As requested Mr. Fielding supplied Minerals Associates a large collection of rocks and ore minerals that were obtained on his last trip to the properties in 1987. The former was quite voluminous, about four inches of reports, letters, assay reports and maps. Some few items of correspondence were not dated as indicated in the bibliography that is attached. All reports of significance were duly certified and dated. Many


MARKUP CLAIM GROUP
(15 Claims)
ACCESS
ROAD
OPAL CLAIM GROUP
(69 Claims)
LOBRINA
CHITINA
VALDEZ B-2
TOPOGRAPHY OF CLAIM AREA
Scale 1:63,360
(Appx 1" =1 mile)

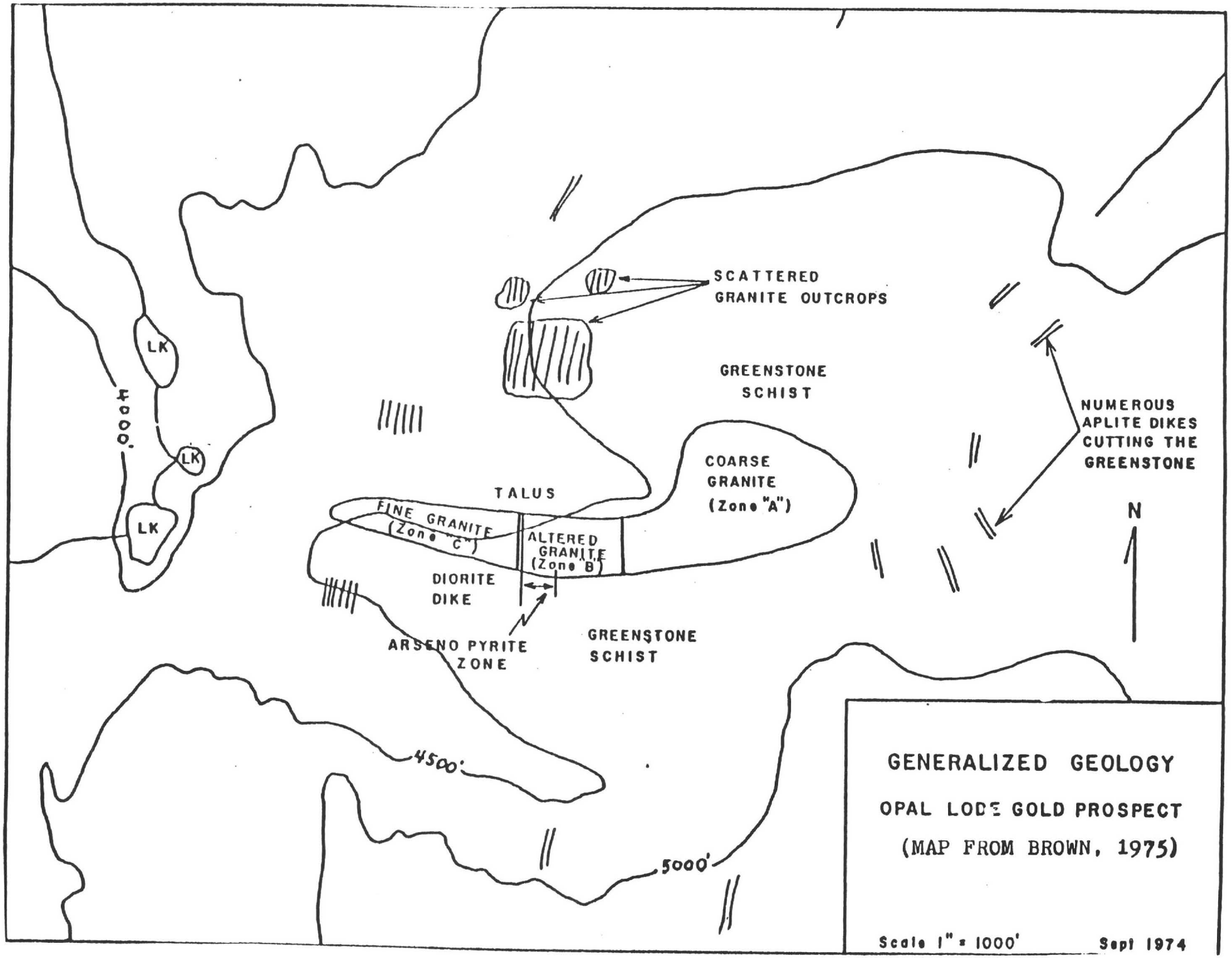
assay reports are identified only by sample number and lack reference to sample site, person sampling or property name. However, all of these appear from the results to be taken from the very high grade portion of the properties and can be classified as "grab samples". It was apparent that some of the assay sheet results have become separated from the identifying report. No spurious data was indicated, and no grab-sample information was considered essential to this evaluation and results. The rock and mineral suite comprised approximately 65 pounds, with samples ranging from hand-size to 20-pounds. Lacking were specimens of greenstone and some granite mentioned in Williams (1970).

The 84 claims totalling 1,500 acres are located (staked) on a North 10° East strike, the same strike as the veining of the mineralization. This correctly from a mining standpoint controls 15,000 feet of potential vein strike. The claims are 11 wide or 6,600' which is more than adequate to control the eventuality of a disseminated gold ore deposit. Therefore the claims adequately cover all obvious mineralization and thoroughly cover any possibility of a large buried deposit.

The properties lie in an elevated basin at 4,300' elevation. The basin is rimmed by the Chugach Mountains on the west and the Wrangell Mountains to the east. The mountains are rugged and reach above 16,000'. The Copper River drains the basin as a result of rapid glacier melt in the Spring the river carries large volumes of debris and silt. In the area of the properties the mountains are lower in elevation and rounded, perhaps reflecting the local geology. The northern latitude of the properties (61.3 N) allows about 120 days of working time for the surface. Daylight varies from 5 hours in winter to about 24 in mid-summer. The area is forested with commercial varieties of timber. Permafrost does not appear to be a problem in the area; however permafrost seldom interferes with a mining operation.

Geology: The area has not been studied in any detail and current mapping indicates the basin to be essentially underlain with "greenstones" of Permian age. Some sources regard the greenstones as lava flows deposited in marine conditions with interbedded slates and graywackes. Only a small specimen of the greenstone-graywacke was available to Minerals Associates and it could not be determined if the material was pyroclastic or submarine in origin. However, Brown (1975) reports this sequence to cap the area of the properties. The identification of this capping rock is not essential to the economic evaluation of the properties.

The immediate area of the properties appears to be folded along an east-west axis. Folding is accompanied by major fault trends in the same direction. This movement has been assigned to the Jurassic.


SCATTERED
GRANITE OUTCROPS
GREENSTONE
SCHIST
NUMEROUS
APLITE DIKES
CUTTING THE
GREENSTONE
COARSE
GRANITE
(Zone "A")
TALUS
FINE GRANITE
(Zone "C")
ALTERED
GRANITE
(Zone "B")
DIORITE
DIKE
ARSENO PYRITE
ZONE
GREENSTONE
SCHIST
LK
LK
LK
4000'
4500'
5000'
N
GENERALIZED GEOLOGY
OPAL LODE GOLD PROSPECT
(MAP FROM BROWN, 1975)
Scale 1" = 1000'
Sept 1974

Brennan (1971) and Williams (1970), as reported by Erickson (1970), describe a Tertiary acid (with silica) intrusive of fine to coarse grained granite encroaching the greenstone country rock along with significant metamorphism, silicification of the greenstone cap rocks, some dike formation and skarn minerals along the contact. The latter is considered important to the classification of the deposit contained on the properties.

In the excellent work of Dr. Williams (1970) he describes the granite as "tonalite", or quartz diorite composed of plagioclase and quartz with only very low amounts of potash feldspar. The plagioclase is oligoclase with numerous dark minerals, biotite and hornblende, etc. The dark minerals are essential to the identification. This appears correct based on the samples available. The samples presented to Minerals Associates of the granite are best described as highly altered, low in sericite and potassium content. Potassic alteration is essential to major ore development. This has not been found in the samples submitted or in the previous studies. Indications are good that this can be established by further field studies.

The Opal claim group completely cover the east-west trend of the intrusive granite. The greenstone cap remains intact over the granite except where Liberty Creek erosion and glacial action have exposed the intrusive core, forming a peak on the east end and a steep east-west ridge. Greenstone talus covers much of the hill slope. A second granite occurs between the main granite mass and the capping greenstone. This is described as fine grained and appears to be a chilled contact between the two or part of the skarn system. The sample of this rock available to Minerals Associates was not large enough for positive identification. Brennan (1971) describes dioritic light gray dikes porphyritic in texture cutting granites and country rock up to several miles from and surrounding the properties. He describes numerous numerous apilite dikes cutting the greenstone cap to the east of the Opal pit and one diorite dike cuts the altered granite exposed in the pit.

Extensive dozer work has been performed on the known high grade gold zones. This work has exposed a series of quartz veins in three contiguous granite zones identified by Brennan as "A", "B", and "C". Granite "A" is coarse grained, Granite "B" is described as altered, and Granite "C" is fine grained. The granites are identified from east to west. These zones strike north-south. Granite "A" represents the main intrusive stock and is exposed for more than 2500'. The face of this exposure shows 300' width of numerous vertically dipping quartz veins containing galena and gold. Granite "B" contains the altered zone described previously.

About 800' of this zone is exposed in the pit. The zone contains numerous quartz veins and 250' width of arsenopyrite mineralization in quartz with abundent free gold. Brennan (1971) and Erickson (1970) describe the Buzzard vein system of vertical quartz, galena and gold on the exposed face of the granite in the pit. Granite "C" is exposed for 1500' westward to the point of the granite ridge high. This granite contains numerous quartz veins with arsenopyrite and gold but is heavily covered with talus. Strike of these veins averages North 4° West and dip is 67° West. The Buzzard vein strikes North 27° East and dip 70° West.

The contact with the "A" and "B" zones is a 24" wide quartz vein. The vein pinches and splits into as many as six branches but contains high values gold, galena (lead sulfide) and sphalerite (zinc sulfide) Arsenopyrite (arsenic-iron sulfide) is a major constituent. The gold values appear high in the smaller vein widths and samples examined by Minerals Associates indicate that the gold occurs as free crystals along with the galena. Several specimens submitted for this study contained large crystalline gold.

The "B" granite zone shows at least two separate mineralization periods. These two periods possibly exist in the other zones as well. One period injected quartz and mineralization into the granite continuing into the greenstone cap. The second epoch produced the Buzzard vein which thins upward and contains significant amounts of galena, arsenopyrite and sphalerite. Brown (1975) describes this mineralization as "parallel and thin vein contacts". This description strongly suggests a boxwork mineralization. This same description applies to the "A-B" zones. In each case the smaller veins contain the higher gold values. Granite "C" has not been studied in any detail because of covering debris. It contains veining and mineralization comprising gold and arsenopyrite as with the previous zone.

Gold has been the important economic mineral of the properties. Most of the sampling has been "grab samples" without the benefit of reference mapping. Values reported by Brown (1975), Brennan (1970-1987), and Erickson (1970) indicate an range of 0.04 to 10.06 oz/ton ($18.00 to $4,527/ton) in the quartz system. The gold is always higher with the arsenopyrite zone. Values are present with copper as chalcopyrite, lead and zinc. The latter are insignificant when compared with the gold. Several hundred sample assays are available for study but these can not be combined for an average ore tenor based on A.I.M.E. criteria for ore reserves.

Silver is reported in many of the assays. Specimens examined by Minerals Associates of the ore mineral suite indicated a small volume of "steel gray galena" associated with the larger crystalline galena and sphalerite. Silver is normally associated with this mineral and should be a by-product of the ore.

The deposit appears with this study to be related to a massive intrusion of tonalite granite (low potassium content) which has intruded basaltic lava flows, which had earlier been metamorphosed into greenstone or graywacke. Mineralization in the form of quartz veining, native gold, chalcopyrite, sphalerite galena and arsenopyrite were injected into the folded granitic mass. The granite mass appears as a cupola or domal in shape and should extend latterly and to great depth. Much of the granite appears to be covered by the capping greenstone. This opinion is supported by the fact that the overlying cap rock is mineralized with the same mineral suite. The intrusive should be easily mapped by magnetometer since it contains adequate magnetite.

Mineralization with this deposit is expected to be "zoned". This is not to be confused this "zones" described by Brennan. Zoned in the technical concept describes a deposit that has a core or center which often is barren of minerals. Concentric zones of up to 2,000 wide surround the core that contain zones of selective mineral concentration; e.g. a gold halo, a separate zone or halo of silver, lead and zinc. Many zones contain copper in economic volumes and these represent some of the largests mines in the world. Usually these deposits are delineated by geochemical prospecting using as indicators, mercury, molybdenum or tungsten. Some geochemicals work has been completed on the properties, but this has been limited to the pit area. This concept was overlooked in the Dominican Republic Mina Vieja and it was mined as a series of gold bearing quartz veins for 100 years before the major silver-copper-gold halo was found by mining.

The absence of supergene (mineralization enrichment by water perculation) minerals at the pit area suggests that this zone may have been removed locally by erosion or glacial action. This zone could be buried under the cap rock. These zones are often located by geophysics such as Induced Polarization or radiometric methods.

Core Drilling: In 1975 A. B. & S. consultants (Brown 1975) drilled seven core holes in the "A, B, & C" zones of Brennan. These were angled holes and reached as deep as 631'. The holes were designed to test only depth, thickness and extent of the quartz vein systems and to develop high grade gold objectives. Samples wereassayed only on the quartz vein swarms, fault zones and obvious alteration zones. The samples descriptions describe numerous quartz veins in granite, most of which were thin. Gold was encountered in most veins, the granite and greenstone where cut with veins or fractures.

Follow-up assay work by this same firm on Drill Hole No. S-105 using hot aqua regia extraction and fire assays indicated anomalous quantities of copper and palladium (0.455 gm/m.ton Pd). This was reported in the first 100 feet of the hole. This report requires validation and further field sampling. Recent studies by the U.S.G.S. and private industry are resulting in the discovery of previously unknown platinum and palladium minerals in ultra mafic (low in silica) rocks in Alaska and California. Minerals Associates is currently evaluating such an occurrence for a client with properties in Califirnia. The granites described by Brennan and Brown (Williams) fit this criteria. The copper values reported in this surface sample from hole S-105 adds support to the zoned deposit concept presented herein.

Opinions and Recommendations: The data presented to Minerals Associates strongly suggests that the Opal- Markup claims contain a granitic boxwork, a large mass of altered granite that contains a network of small to large quartz veins. The vein system is three dimensional and is often accompanied by massive blocky quartz veins that abruptly terminate and split within the boxwork. These small veins carry gold, which at the surface contain high grade values. Overlooked by past investigators have been the hair-line quartz fracture fillings that appear also to contain gold values. The area of investigation to date has been limited to the pit area and the high grade gold contained in the larger quartz veins. At least 4000' of the granite has been exposed in the pit over 500' of width. This volume should provide adequate reserves of gold rocks averaging 0.50 oz/ton to justify small scale mining to be considered (125 ton/day). This would be essentially high-grading while the deposit could be further explored.

The deposit appears to be highly zoned. Zones or halos of commercial copper, lead-zinc, silver, along with a disseminated gold zone are to be anticipated. Development of the non-gold values may depend on the accociated gold content.

The property should be mapped on a grid basis and reference points established. Future sampling should be tied to this reference grid. The area should be flown by aerial magnetometer and anomalous areas evaluated on the ground by a hand-held instrument. The Space Lab photographic scenes should be purchased for the area and interpreted by a qualified expert. The latter information should be essential to determining faulting, structure and rock types. Samples should be composited and tested for geochemical anomalies for the deposit type described herein.

The deposit closely resembles a commercial gold-silver and base metal mine evaluated and designed by Minerals Associates in the Republic of Colombia, South America. The mineral suite, including to arsenopyrite are identical. This mine at present is a large openpit and theyfrequently find large pods of high grade gold - always associated with the quartz.

The mineral suite was evaluated and should respond to conventional gravity metallurgy. Jigs, tables and conventional flotation should be adequate for 90% recovery of values. The concentrate will contain a high value of arsenic unless fractional flotation is considered. The ore could be pre-concentrated at the mine and re-treated for arsenic diminution at another site.

Samples of the ore and contry rock, along with copies of the drill logs, assays and literature are on file at the Dallas office of Minerals Associates. An estimate is being submitted separately of the cost of the suggested exploration program. You should consider this program because the result could be the development of a multi-million ton reserve of commercial gold that could be open pit mined.

Yours truly,

Arthur D. Thompson, P.E.
Texas No. 19961
Kentucky No. 12397
Virginia No. 013970

Average Monthly and Annual Precipitation

Station	Years of Record	Elevation	Jan. R	Jan. S	Feb. R	Feb. S	Mar. R	Mar. S	Apr. R	Apr. S	May R	May S	Jun. R	Jun. S	Jul. R	Jul. S	Aug. R	Aug. S	Sep. R	Sep. S	Oct. R	Oct. S	Nov. R	Nov. S	Dec. R	Dec. S	Annl. R	Annl. S.
Glennallen	5	1456	.29	5.6	.77	6.9	.23	2.9	.11	1.6	0.60	0.3	1.44	0	1.51	0	1.17	0	1.02	1.5	0.57	06.6	0.57	09.9	0.63	05.5	08.91	41.0
Copper Center	12	1036	.55	6.4	.51	4.3	.26	2.9	.22	1.2	0.40	0.1	0.89	0	1.53	0	1.20	.3	1.28	0.6	0.89	07.0	0.86	08.4	0.60	08.1	09.19	39.3
Tsina Lodge	1½	1650	1.57	24.9	1.42	14.9	1.88	18.2	.81		1.39	0	1.35	0	1.00	0	1.82	0	6.59	0	6.48	24.7	2.91	45.1	0.61	23.0	27.84	
Tonsina	5	1500	.45	6.7	1.72	10.2	.63	6.2	.52	5.2	0.65	3.1	1.39	0	1.93	0	0.69	0	1.01	T	1.84	15.2	2.29	15.1	1.21	06.3	14.53	69.0
McCarthy	5	1380	.67	9.1	.43	6.0	.61	7.8	.15	1.0	0.62	0.6	1.40	0	2.28	0	2.34	0	2.59	2.6	2.71	17.1	1.12	13.2	0.87	13.0	15.79	70.4
* Chitina	23	572	.99	13.4	.94	8.0	.39	4.8	.25	0.8	0.38	0.2	0.70	0	1.30	0	1.39	T	1.66	0.3	1.20	04.0	1.53	11.1	1.47	09.6	12.10	52.2
Kenny Lake	6	1400	1.23	-	1.14	-	.57	-	.97	-	0.31	-	1.45	-	1.51	-	1.29	-	1.39	-	1.86	-	1.70	-	2.34	-	15.76	-
Slana	12	2200	.95	11.6	1.22	15.2	.86	6.6	.77	7.0	1.61	4.2	2.23	0	2.70	0	1.97	T	2.71	4.6	0.92	06.8	0.75	09.1	0.82	06.6	17.51	73.7
Chistochina	3	1900	.16	1.5	.27	2.7	.39	3.9	T	0	0.16	0	1.07	0	2.60	0	1.82	0	2.40	1.9	1.51	09.8	0.26	02.8	0.92	09.7	11.56	32.3
Gulkana	30	1572	.58	7.5	.47	5.8	.36	4.8	.19	1.8	0.60	0.5	1.36	T	1.91	0	1.64	0	1.69	1.1	0.91	07.7	0.73	08.7	0.80	09.0	11.24	47.0
McKinley Park	30	2015	.83	12.4	.69	11.7	.37	7.7	.47	6.4	0.68	2.3	1.93	0.1	2.59	0	2.81	T	1.54	2.0	0.98	11.7	0.75	10.8	0.65	11.9	14.29	77.0

Adapted from NOAA, National Weather Service Data.

Average Monthly Maximum and Minimum Temperatures

Village	Years of Record	Elevation	Jan max	Jan min	Feb max	Feb min	March max	March min	April max	April min	May max	May min	June max	June min	July max	July min	August max	August min	Sept max	Sept min	Oct max	Oct min	Nov max	Nov min	Dec max	Dec min	Annual max	Annual min
Glennallen	5	1456	-3	-23	19	-8	32	0	43	17	56	28	68	40	69	42	65	37	55	26	35	12	17	-4	3	-20	38	12
Copper Center	12	1036	0	-22	15	-9	28	-1	42	15	58	30	67	39	69	43	63	40	54	30	38	19	14	-5	4	-14	38	14
Tsina	1½	1650	4	-17	12	-10	20	0	32	5	48	29	57	36	71	42	64	42	50	33	36	32	22	2	10	-10		
Tonsina	5	1500	1	-23	18	-7	32	1	43	18	54	29	67	41	70	44	65	39	58	31	38	17	19	-4	0	-21	39	14
McCarthy	5	1380	-7	-26	20	-5	32	4	43	17	57	31	68	38	71	41	66	32	56	32	39	19	17	-1	5	-14	39	14
* Chitina	23	572	3	-14	17	-3	30	3	45	23	57	34	66	44	68	47	64	44	56	36	39	22	18	3	6	-11	39	19
Kenny Lake	6	1400	5	-18	19	-7	30	-1	44	19	54	27	67	36	72	40	67	37	58	31	39	18	15	-7	5	-19	40	13
Slana	12	2200	6	-12	18	-2	27	3	42	18	56	30	68	41	69	44	66	39	56	32	37	16	17	0	9	-6	39	17
Chistochina	3	19	-2	-19	11	-15	29	2	43	23	61	32	69	42	70	45	66	39	52	29	36	18	19	3	4	-11	39	16
Gulkana	30	1572	1	-17	14	-6	27	0	41	18	55	32	66	42	68	46	64	42	53	33	36	18	14	-1	3	-13	37	16
McKinley Park	30	2015	10	-7	17	-3	24	2	38	17	52	31	64	40	66	44	61	40	50	32	34	18	19	2	10	-6	37	18

Adapted from NOAA, National Weather Service Data

GOLD 35 ¢ PER OZ
WHEN THESE ASSAYS
WERE MADE

March 21, 1970

J. J. Brennan, Geologist
5006 Cambridge
Anchorage, Alaska 99503

Ph: (907) 277-1147

Mr. A. M. Fielding
[illegible]22 Cardinal Lane
[illegible]t Worth, Texas 76111

Dear Al:

[illegible]e are some small typical samples of the different rock types at the Opal and Markup [illegible]rospects. These might be of some aid in your going over the report.

[illegible]ples enclosed herewith:

[illegible]1 #104: Zone "A" vein, 1968 (5202) (large vein 10' east of A-B contact) Banded qtz/galena/some arsenopyrite

Au @ $60/TON

oz/ton au/ac	Value/ton:
2.66/0.94	$162.00 ±

Au @ 450/oz · Ag @ $5.75/oz ADT
$ 1201/TON

[illegible]1 #88-102 Zone "A" vein, 1968 (5221) (main vein at A-B contact, bottom of exposure) Banded qtz/galena vein - some arsenopyrite

oz/ton au/ac	Value/ton (gold/silver only):
8.10/0.52	$325.00± (Also 0.55% lead)

ADT
$ 3648/TON

[illegible] #112 Zone "A: vein ("main vein" at A-B contact, bottom of exposure) 1965 [illegible]. Banded qtz/galena vein

oz/ton au/ac	Value/ton:
2.66/0.94	$108.00±

ADT
$ 1201/TON

[illegible]1 #57-A Zone "B" (Arsenopyrite Zone) 1965 (17675) (Arsenopyrite zone - on surface) Arsenopyrite/qtz/some granite

oz/ton au/ac	Value/ton (gold/silver only):
5.08/2.94	$200.00± (Also: pb 0.3%, sn 0.3% ZN, cu 0.1%, fe 10 % +)

$ 2301/TON ADT

[illegible]1 #B-6 Zone "B" (Arsenopyrite Zone) 1969 (35385) (Drozer Trench "B") qtz/sulpides/some granite

oz/ton au/ac	Value/ton:
0.954/0.198	$38.00 ±

$ 430/TON ADT

OZ PER TON OF ROCK

. A. M. Fielding
e Two

: #C-1 Zone "B: (Arsenopyrite Zone) 1969 (36388) (Wall-Dozer Trench "C")
qtz/sulphides/some granite

Au @ $450/oz, Ag @ $5/oz
$409/TON ADT

oz/ton	Value/Ton:
au/ag	$37.00 ±
0.903/0.533	

l #C-2 Zone "B" (Arsenopyrite Zone) 1969 (36389) (Wall-Dozer Trench "C")
qtz/sulphides/some granite

$9783/TON ADT

oz/ton	Value/ton:
Au/ag	$875.00 ±
21.7/3.56	

l #C-2A Zone "B" (Arsenopyrite Zone) 1969 (0422) (Floor-Dozer Trench "C")
Decomposed material in floor of Dozer Trench 5' below original ground surface

$4495/TON

oz/ton	Value/ton:
au/ag	$402.00±
9.95/3.57	

Oal Zone "B" (Arsenopyrite Zone) Example: mixture of qtz/sulphides/granite

al Zone "B" Example: altered granite with augen or "balls"

al Zone "B" (Arsenopyrite Zone) Example: typical qtz crystal - occurs in pockets

al #123 Zone "B"
(Buzzard vein system) 1968 (5204) (Buzzard veins - middle of exposure) qtz/galena veins, some arsenopyrite

oz/ton	Value/ton (gold/silver only):
au/ag	$67.00 ±
1.46/4.00	(Note: also 5.2% pb)

$677/TON ADT

al Zone "B" Magnetite
(exposed on surface) Example

arkup Creek Prospect: Markup #4
(Mineralized vein zone) (29101) Banded qtz/galena/sulphide vein

oz/ton	Value/ton (gold/silver only):
au/ag	$36.00 ±
0.83/5.57	

(Also: pb 2-5%
zn 1-2%
cu 0.2%)

$401/TON ADT

hank you for your consideration of these samples.

incerely,

John J. Brennan

GOLD WAS 35 oz for 1g

OPAL ZONE "A" VEIN
SAMPLE RESULTS

LABORATORY REPORT

LOCATION	DESCRIPTION	SAMPLE#	oz/ton au	oz/ton ag	V/T	SPECTROANALYSIS major 10%	minor 1%-10%	trace .001-1%
OPAL ZONE "A" COUNTRY ROCK								
Opal Zone "A" Country rock	greenstone/ minor pyrite	14 '66 (17665)						
Opal zone 'a' Country rock	greenstone/ pegmatite qtz veins, some epidotized rock	516-A'65 (17683)						

QTZ VEINS - FACE OF OPAL ZONE "A" (samples from various qtz-galena veins running vertically down the granite face across the 300' width adjacent to the altered granite of zone "B" then narrow and bifurcate at the top of the exposed face, and widen at the base to as much as 36" before disappearing beneath the talus)

Opal zone "A" vein qtz/some galena	vein qtz/ some galena	513-a '65 (17681)	0.40	0.90	$15.17			see photo
Opal Zone A' (face)	vein qtz/ some galena and arsen-opyrite	76306 '67'	10.06	3.1	$357.60			
Opal zone A (face)	vein qtz/ some galena and arsen-opyrite	7-65 (17659)	0.48	1.12	$18.25			see photo
Opal zone a(face)	vein qtz/ galena streaks	66-24 (18855)	0.80	0.70	$27.91			
Opal zone A(face)	vein qtz/ galena s streaks	66-25 (18856)	0.64	tr	$22.40			
Opal Zone A(face)	vein qtz/ small galena bands	opal 106 (18839) '66	1.20	0.66	$42.86			

LOCATION	DESCRIPTION	SAMPLE#	oz/ton au/	ag	V/T	SPECTROANALYSIS major 10%	minor 1%-10%	trace .001.1%
Opal zone "A"face	vein qtz/ some galena	opal #2 (18842) '66	0.62	0.46	$23.30			
Opal zone "A"(face)	vein qtz/ small galena bands	Pan Am #2	0.60	0.25	$21.30			
Opal zone "A" vein in Geo's trench	qtz-galena Arsenopy-rite vein	67-31 (76360)	0.580	1.6	$23.25			
Face Opal Zone "A"	qtz vein with fine galena bands	67-35 (76364)	2.11	0.7	$75.11			
Face Opal zone "A"	vein qtz with fine galena bands	67-38 (76367)	3.445	1.3	$122.811			
Face Opal Zone "A"	vein qtz with fine galena bands	67-41 (76369)	2.055	0.6	$73.00			
Face Opal zone "A"	qtz-galena vein	67-43 (76371)	10.53	3.5	$374.85			
Face Opal zone "A"	vein qtz with arsen-opyrite and galena	67-42 (76370)	2.28	0.8	$81.24			
face opal A-B contact top	banded qtz/gal-ena vein	68-114 (5211)	0.70	0.34	$28.75			
face opala A-B contact (middle)	banded qtz/ galena vein	68-113 (5220)	4.88	2.06	$199.67			
face opal A-B contact (bottom)	Banded qtz/ galena vein	68-102 (5221)	8.10	0.52	$325.12			

LOCATION	DESCRIPTION	SAMPLE#	oz/ton au/	ag	V/T	SPECTROANALYSIS major 10%	minor 1%-10%	trace .001-.1%
face a-b contact (Bottom)	Banded qtz/ galena, vein	68-100 (5222)	1.16	0.78	$48.22			
face A-B contact Bottom	Banded qtz/ galena, vein	68-114 (5226)	2.66	0.92	$108.87			
Face A-B contact (bottom) 10E contact	banded qtz/ galena vein	68-104 (5202)	4.02	1.32	$162.90			
face 20 E of A-B contact	granite/ vein qtz	68-101 (5215)	3.30	1.32	$134.90			
face 180' E. of A-B contact (top)	Granite/ qtz veins	68-109 (5203)	0.94	0.16	$38.24			
face 180' E. of A-B contact (middle)	granite/ qtz veins	68-111 (5206)	1.18	0.62	$48.67			
face 180' E. of A-B contact (3/4 to top)	granite/ qtz veins	68-110 (5223)	0.86	0.46	$35.41			
face 30'E. of A-B contact	granite/qtz galena veins	68-112 (5214)	1.54	1.06	$63.70			
face,200' E. of A-B contact (top)	granite/qtz veins	68-108 (5201)	182	0.66	$74.45			
face 230' E. of A-B contact (top)	granite/qtz veins	68-107 (5217)	0.24	0.26	$10.17			
face 300' E. of A-B contact	granite/qtz	68-105 (5218)	0.02	0.06	$0.53			

LOCATION	DESCRIPTION	SAMPLE #	oz/ton au/	ag	V/T	SPECTROANALYSIS major 10%+	minor 1%-10%	trace .001.1%
face, 350' E. of A-B contact (top)	granite/qtz	68A-106 (5216)	0.12	0.14	$5.14			
on top, back from face above zone "A"	qtz vein in granite	G-200 (68) (36325)	1.27	0.55	$52.01			lead 0.12% zinc 0.07%
on top, back from face above Zone "A"	qtz vein/ some gal-ena-in granite	g-upper-camp 68' (36326)	2.19	0.71	$89.17			pb0.24% zn0.14%
on top back from face above zone "A"	rusty qtz vein in granite	G-upper camp #2 (68) (36327)	0.60	0.10	$24.22			pb0.007% zn0.02%
on top, back from face above zone "A"	qtz vein in granite	G-100 (68) (36328)	6.34	1.06	$255.80			pb0.08% zn0.005%

MARKUP CREEK MINERALIZED ZONE

Markup-Opal &
Magnet Hill Prospects

LABORATORY REPORT

Compiled by
J.J. Brennan
11-9-66

LOCATION	DESCRIPTION	SAMPLE#	oz/ton Au	oz/ton Ag	V/T	SPECTROANALYSIS major 10%+	minor 1%-10%	trace .001-1%
Markup Creek	Banded pyrite, chalcopyrite voggy qtz, & arsenopyrite	(field No) B-1 '64 (29101) lab no.	0.83	5.57	$36.117			
Markup Creek	Banded sulphides and qtz	#-A '65 (17656) (17827)	0.42	6.96	$23.80	si fe	pb2-5% zn1-2% ca na	cu0.2% li
Markup Creek	Banded qtz & Sulphides	Pan Am #4 (1966)	0.77	1.8	$29.29			
Markup Creek	Banded Qtz and sulphides	Markup #4 (18840) '66	0.50	2.60	$20.90			
Markup Creek Head #2	Qtz veins with minor pyrite & some schistose Country rock	66-11	0.30	0.60	$12.10	Silicon calcium magnesium	iron al ba titanium na	pb0.3% zn0.3% cu0.01 lithium
Markup Creek Qtz. vein	qtz with a few small galena streaks	p.a. Markup 4-A (18841) '66	0.04	0.20	$1.66			
Markup Creek	Opalized zone with scattered sulphides	521-A '65 (17685)	0.04	--	$1.40	si		fe li na ti al
Markup Creek Veins	Banded pyrite, chalcopyrite voggy qtz & Arsenopyrite	68-1 note: being assayed 9-15-68	0.758	2.86	$36.62			

MINERALS ASSOCIATES, INCORPORATED

900 LADDER TRAIL
SIGNAL MOUNTAIN, TN 37377
615-886-2251

7912 FALLMEADOW LANE
DALLAS, TEXAS 75248
214-239-0507

ARTHUR D. THOMPSON--CONSULTANT

Mr. Thompson has fifteen years of responsible consulting experience advising clients on a wide range of petroleum, mining and management projects, both domestic and foreign. For 7½ years he was General Manager of Southern Union Production Comapny's Mineral Division, headquartered in Dallas, which included management as president of two South American affiliates engaged in mineral and petroleum exploration and development, including mining operations for gold, copper and mercury. He was responsible for management of domestic exploration offices in Denver, Colorado and Kingman, Arizona, which were actively engaged in exploration for oxide and porphyry copper in Arizona and New Mexico; gold, silver and base metals in the San Juan Mountains of Colorado; and uranium, coal, sulfur and potash in the western states. For a short time an exploration office was located in Adelaide, Australia engaged in developments in silver and zinc. His activities have resulted in the discovery of the U.S.'s largest potash mine, a gold-silver telluride mine in Colorado, a tactite copper deposit in New Mexico, substantial Frash sulfur reserves in Texas, and a large mercury district, the largest in South America.

Mr. Thompson's experience in foreign operations include corporation installations, accounting and auditing procedures, controls and regulations related to petroleum or mining activities, and labour regimen. He is fluent in Spanish and his 11 years activities in Colombia, Ecuador, Peru, Honduras, Panama, Costa Rica, El Salvador, Mexico and the Dominican Republic have allowed him to list among his close friends many of the influential persons in the regulatory agencies of these countries. He has maintained consulting offices in Bogota, Medellin and Manizales, Colombia for several years. During the past two years his detailed geological studies and well completion techniques have resulted in the successful completion of 54 Mississippian Weir sand oil wells in six oil pools of the Eastern Kentucky Big Sandy Field. In addition, two successful Big Six Silurian gas wells were completed in the Royalton Pool, and two successful gas wells were completed in the Devonian shale within the same field. No dry holes were encountered in these projects for clients. During 1980 and 1984, he was engaged by clients for major projects in Tennessee and Kentucky involving primary and secondary (by water flood) production of petroleum; coal mine evaluation and design, investment feasibility studies; and gold lode and placer mine evaluations-mill design in California, Colorado, Costa Rica, Honduras and Colombia. Recently he was engaged in evaluation of lands off-setting the Pueblo Viejo gold mine in the Dominican Republic for national interests.

Previous to Southern Union, he was engaged as an independent consultant to the chemical and mining industries and provided engineering and geological services to several major oil companies, including Southern Union. Prior to this, he served as technical manager of Delhi-Taylor Oil Company's (one of the Clint Murchison companies) Special Projects Division and was primarily engaged in mineral exploration and development following discovery and sale of a major domestic ore deposit. Activities with Delhi included exploration for potassium, uranium, sulfur, beryllium and limestone. He participated in the research, pilot plant design and final patenting of a process to produce potassium nitrate from sylvite. With Delhi he was responsible for engineering and economic studies, property acquisition and sale, and directing metallurgical studies conducted by consulting laboratories. He managed joint venture programs in exploration with a major Peruvian Company, designed and supervised small mine and mill facilities, established market outlets for mine products, and negotiated sale of domestic and foreign assets.

Recent clients include major petroleum and coal companies, independent oil operators, individual investors and trusts, banks and investment banking institutions, mining companies, and tax shelter counselors. Consulting activities include management of exploration programs, feasibility study preparation; ore reserve valuations, evaluation of properties for bank loan or investment purposes, property acquisition and negotiation for clients, coordination of corporate and exploration activities in Central, South and North America, and originating projects for select clients. For four years he has been associate consultant in mining and petroleum for Terrapet, Ltd., a highly respected consulting firm in petroleum located in Dallas. His consulting practice has allowed him to visit and study the majority of coal and gold districts of North, Central and South America.

Mr. Thompson received a B.S. Degree in Chemical Engineering from the Virginia Polytechnic Institute and a degree in Arts with honors from Old Dominion University. He is a member of the AIME, the Dallas Chapter of the Society of Mining Engineers, the Dallas Geological Society, the Colorado and New Mexico State Mining Associations, the Texas Society of Professional Engineers, the Colombian (South American) Mining Association, the Chattanooga Engineers Club, and has sat on the Advisory Board for Advanced Study in Geology, University of Texas at Arlington. He continues to advise PhD aspirants at Arlington and El Paso regarding thesis subjects. He has been a registered professional engineer licensed to practice in Texas since 1961, in Kentucky since 1980 and in Virginia since 1983. He and his firm are listed in the E & MJ Directory of Mines, Operators, Consultants and Buyers, The Keystone Coal Manual, and the Rocky Mountain Energy Directory as an international consultant in petroleum and mining. Minerals Associates

was formed as a consulting firm in Texas in May 1975, with Mr. Thompson as president. An area consulting office has been maintained in the Chattanooga area of Tennessee at Signal Mountain for eight years. This office provides consulting services to the oil and gas industry in Kentucky and Tennessee. The Signal Mountain office is staffed by a landman, masters geologist, mine foreman-coal, and technical assistant-masters in finance. An office handling South and Central American projects has been maintained in Bogota, Colombia for the past fourteen years. Complete computer facilities have been installed at Dallas and Signal Mountain.

ADT 7/87

In September, 1987 Mr. Thompson was named to the Board of Directors of Geophysics International of Dallas, Texas.

MINERALS ASSOCIATES, INCORPORATED

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PAST AND CURRENT ENGINEERING PROJECTS

1. SULFUR: Supervised and conducted laboratory research leading to the design of a 50 t/d solvent extraction pilot plant for low-grade sulfur ores, assisted in reactor design and operations, developed testing procedures, prepared engineering drafts of the two patents that were later issued, authored two engineering-technical papers on process which were published in international mining journals.

2. POTASH: Prepared engineering and economic feasibility studies for a major mining company for a proposed solution mining extraction of a Utah potash deposit, phase equilibrium studies for KCl-NaCl-MgCl, designed and supervised testing program in the laboratories of the Colorado School of Mines Research Institute. Mine in operation.

3. HUMUS: Designed and supervised the construction of a fertilizer blending plant in Texas having as a base a captive deposit of humus. Conducted evaluations of reserves and ore genesis of humus deposit.

4. LIMESTONE: Discovered, located claims, conducted exploration drillings, and evaluations of a major portland cement rock deposit in Utah, design and feasibility calculations related to personal ownership and the eventual sale of deposit to a major oil company.

5. POTASSIUM NITRATE: Participated with another engineer in the design, process revision, construction and operations of a 100 t/d pilot plant for the conversion of sylvite (KCl) to potassium nitrate using concentrated nitric acid with by-product nitrogen tetroxide. Provided initial engineering drafts of three patents that were issued, prosecuted patent preparations with patent attorneys in Washington and New York, provided engineering and chemical input that resulted in revolutionary redesign of process into one vessel, personally conducted materials of design testing program that resulted in successful containment of reaction. Provided design of distillation-reaction tower trays using cobalt alloys, coordinated laboratory research, market evaluations and participated in eventual sale of process and patents.

6. PLACER GOLD/PLATINUM: Supervised laboratory testing at the Colorado School Of Mines to develop physical separation method for concentrate containing placer gold and platinum from the Choco of Colombia.

7. POTASH: Supervised the metallurgical testing for optimum flotation parameters for potash from Utah deposit at Colorado School of Mines.

8. TITANIUM: Assisted in the metallurgical testing and evaluation at Hazen Research Institute of a new discovery of titanium mineral.

9. POTASH: Originated and tested spectrographic analytical methods for complex potash ores, including sampling methods, methods accepted by AAOAC and published.

10. ACETALDEHYDE: Originated based on literature search and designed a low pressure process for the conversion of low percentages of acetylene in refinery tail gases to acetaldehyde, designed and tested successful laboratory scale pilot plant.

11. PLACER GOLD: Designed and supervised construction of gravity separation mills up to 500 t/d for remote areas of Colombia, Honduras and Costa Rica. Designed two washing plants for placer gold in Colombia and Dominican Republic. Supervised the laboratory testing of ores and gravels at the Colorado School of Mines and others. Published in Spanish"Geology of Gold Gravels in Northern Dominican Republic."

12. GOLD/SILVER: Designed cyanidation mill for lode gold and silver for large installation in Antioquia, Colombia. Designed mine entries on four levels, geological mapping four concession area, prosecution of concession applications and mine management for four years. Mine continues in operation after 14 years.

13. SCHLEELITE: Designed gravity, jigging and table mill for scheelite with side circuits for sulfide flotation in Nevada.

14. SCHLEELITE: Managed as senior consultant and coordinator of mining, engineering and marketing consultants for a major investment firm having operations in California and Nevada in tungsten, gold and silver, and coal in West Virginia. Managed their mines in Nevada and Utah (uranium scramming operation). Examined every tungsten district in Nevada and California.

15. URANIUM: Managed metallurgical testing of a unique uranium ore in the facilities of Hazen Research Institute, coordinated research and several consultants. Located and maintained 700 claims for project in Arizona.

16. TANTALUM/COLUMBIUM: Developed a megascopic method to determine high percentages of columbium and tantalum in African ores for a major New York mining consulting firm.

17. GOLD TELLURIDE: Based on geological mapping, literature search and geochemical sampling, discovered a small commercial deposit of petsite, gold telluride, near Lake City, Colorado. Designed small flotation mill and managed mine for four years until sold. Discovered a primary bertrandite (beryllium) deposit in Colorado based on use of berylometer and chemical associations.

18. GOLD: Commissioned by the Central Bank of the Dominican Republic to evaluate conflict areas of the gold concessions and major operational mine of New York Honduras Rosario (the largest gold mine in the free world). Sampling and field mapping and assisted their technical laboratories and Bureau of Standards in gold analytical methods.

19. COAL: Evaluation of a large coal tipple in Tennessee for acquisition by a major oil shale company seeking diversification. Economic pro formas prepared for installation and proposed preparation plant-unit train installation.

20. COAL: Provided expert witness testimony in Federal Court on valuation of 30,000 acres of coal lands in Tennessee.

21. MERCURY: Discovery of the largest mercury deposit in South America based on field studies. Located major mine, designed six level entry, elutriation plant, mine and mill equipment and sale of product. Negotiation with Colombian authorities for concessions, foreign investments and repatriation of profits.

22. POTASH: Prepared engineering design and economics regarding a proposed pipeline transport of potash (soluble potassium chloride) product as opposed to a $7 million rail spur.

23. PLACER GOLD: Prosecution at the Colorado School of Mines a study to determine the source of metallic mercury in a Honduran gold placer mine.

24. COAL: Preparation of coal reserve estimates, feasibility of acquisition, transportation and port facility studies for the Maturin and Carare Coal Mines, the largest privately held coal properties in South America.

25. COAL: Bank loan feasibility, reserve study and capital investment evaluation for $6 million deep mine operation, preparation plant, tipple and coal unit train facility located in Central Tennessee.

26. BANK LOANS: Provided technical evaluations for bank loan feasibily, property inspections for a major New Mexico bank in all mining, and oil-gas considerations. Projects involved major coal lands, noble and base metals, oil and gas in Western states.

27. COAL: Prepared evaluation study in Spanish of the Rio Man-Bijao coal deposits of Colombia, river barge transport study and market analysis. Evaluation based on personally collected samples and mapping in very remote area.

28. PETROLEUM: Design of nine petroleum water flood projects in eastern Kentucky for separate clients.

29. INTERNATIONAL: Assisted in the direct negotiation with the president of Mexico for rights to construct a crude oil pipeline from Baja California to Yuma, Arizona.

30. INTERNATIONAL: Prepared evaluation for the Colombian Government of the Islas de los Monjes off-shore area which was in conflict with Venezuela at that time for oil rights.

31. COAL: Evaluation of a number of privately held Central Colombian metallurgical coal mines and deposits for exploitation to foreign markets.

32. GOLD: Rediscovered famous Berlin lode gold mines, Antioquia, Colombia, designed mine with four levels, stamp mills, cyanidation plant, and managed mine for four years.

33. GOLD/SILVER: Purchased and operated famous Coqueta lode gold mine, including Pipinta lode, Pascualito and Opirama gold placers in Caldas State, Colombia. Designed mine openings, installed top slicing and stopes, designed stamp mill with tables and cyclones. Designed heap leaching circuit and personally managed mine and sales for six years. Sale of concentrates to European markets.

34. GOLD: Evaluations of two major gold-silver districts in Sonora and Chihuahua, Mexico, including operating small mines.

35. GOLD: Evaluation of numerous gold properties in three gold districts of Costa Rica for separate clients.

36. COPPER: Leased and evaluated two large skarn copper-base metal properties in Tolima, Colombia, one mine remains in operation.

37. CHROMIUM, NICKEL, ASBESTOS: Evaluations of these mines in Colombia.

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RECENT PROJECTS IN COAL

INTERNATIONAL

1. Norte De Santander, Colombia: Detailed evaluation, reserve estimates for 5 metallurgical coal seams, investment analysis, audit of P & L statements in Spanish, pro forma, cost and profit analysis, engineering evaluations of proposed truck, rail-narrow gage and ocean transport, on-site inspections, negotiations for acquisition of operating mines and 247,000 acres of coal concessions covering the Marurin Coal Company, the largest privately held coal properties in South America for a West Coast company. Evaluations of their mines, coke ovens and product line. Coordination of independent study conducted on-site by Kaiser Engineers. Testimony in US Federal Court and language translation of procedings regarding litigation by owner in lease contracts and options to purchase and exploit.

2. Santander, Colombia: Similar study as above for same client. Study involved the operating Carare Steam Coal mine of 12 concessions, new washing and preparation plant and market analysis. Negotiations with their labour union and design of new mine entries.

3. Santander & Cesar States, Colombia: Evaluations and coal reserve projections based on drilling programs of the San Vicente De Chucuri Coal Concessions and the "Jagua" Coal property for the owners. Geological correlations prepared for unmapped area for 6 seams.

4. Antioquia, Colombia: Detailed engineering and geological study of the Rio Man and Rio Bijao Coal concession areas, approximately 90,000 acres each of virgin unmapped coals with at least 15 seams. Prepared river barge transport study and conducted extensive field sampling program.

5. El Choco, Colombia: Prepared first technical description of a newly discovered coal deposit in the Choco jungle of Colombia, feasibility study regarding the possibility of strip mining of thick coal, belt transport and construction of a new port facility on the Pacific coast in an area having 500"/yr annual rainfall.

6. Central Colombia: Evaluations made of a majority of the operating privately held properties in Boyaca, Cundinamarca, El Valle, Caldas, Tolima and Risaralda states for various clients.

7. Honduras: Examination and evaluation of a brown coal deposit for captive use in a proposed portland cement plant for an indepdent oil company.

8. Undesignated: Translation and rewriting of Spanish version of company private report covering a major new coal discovery by a major Latin American engineering firm.

UNITED STATES

1. West Virginia: Evaluation of 16,000 acres leases and fee land, operating mine of 20,000 tons/mo. Pocahontas No. 3 seam, 12 total seams examined, 2 unit train and 2 preparation plant facilities, for acquisition by client. Prepared report for bank loan of $7 million including cash flow pro formas, program of operations, management review and recommendations for current and future operations, mining plan. Assisted in negotiation.

2. Alabama: Reserve estimations, investment feasibility, selection and purchase of equipment, personnel selection, weekly contact and reporting, accounting and payroll payments, management of investor interests in the Bluff seam. Mine now mined-out.

3. Colorado: Evaluation of the cash value of a major royalty interest in a mine operated by Westmoreland in Gunnison County.

4. Colorado: Evaluation of the feasibility of reopening of an old mime in El Paso County for an oil company in Dallas.

5. Colorado: Evaluation and net worth valuation of a producing deep mine in Rio Blanco County for bank loan purposes for a major banking institution in New Mexico.

6. Georgia: Overview study of 12,000 acres of coal mineral rights that were later acquired by an English investing group. Properties under development for strip mining and exporting coal from the Dade seam.

7. Kentucky: Overview, mine design, mine development schedule for $2.3 million for personal tax shelter investment in 1200 acres of Hazard No. 8 seam in Leslie County.

8. Kentucky: Management of exploration drilling program, face-up trenching, reserve calculations for 750 acres of Lily seam, Clay County, that was purchased in fee simple by an investment group. Evaluations of oil & gas made on same property later.

9. Kentucky: Review of 365 acres Peach Orchard seams in Magoffin County, formal report on reserves, mine facilities, cost projections, and feasibility for acquisition by a New York investment underwriter.

10. Kentucky: Exploration and report describing reserves in 7 seams on 500 acres near Artemus, Knox County for an independent oil operator.

11. Kentucky: Evaluation of a major operating mine for acquisition in Breathitt County.

12. Kentucky: Evaluation of 240 acres of strippable coal reserves in Butler County, report for investor consideration.

13. Utah: Preparation of an offering report describing reserves and potential of properties adjoining the Swisher Mine in Carbon County.

14. Utah: Evaluations of major coal sections in the Thompson-Cisco area of Grand County for a major New Mexico Bank.

15. Utah: Calculation of in-place value of 7 sections that offset operating mines of US Steel and Kaiser in Sunnyside area, Emery County for Bank loan purposes.

16. Wyoming: Evaluation report, field study on coal potential for two state sections near Hanna.

17. Wyoming: Evaluation of state leases in the Meeteese coal field, Park County for 5 commercial seams. Properties under development.

18. Virginia: Evaluation of 290 acres of Kelly seam, Wise County, preparation of technical report used in $2.7 million tax shelter offering.

19. Virginia: Evaluation of 3000 acres Norton No. 8 seam, Wise County, computation of reserves, mine layout to include 5 producing gas wells within deep mine, conferences with state authorities on pillow dimensions. Report demonstrates $3.2 million mine development schedule for tax shelter purposes. Frequent mine inspection trips and reports to investors.

20. Tennessee: Coal reserve study, recommendation and supervision of exploration drillings in Jellico, Blue Gem and Swamp Angel seams, Scott and Campbell Counties involving feasibility for purchase of $11 million "Ketchen Lumber Coal Lands", 25,000 acres of undeveloped reserves for a major East Coast firm. Report describes 7 economic seams and three operating mines on leased portions.

21. Tennessee: Acquisition feasibility and valuation study for bank loan purposes of 32,000 acre Warton tract, Hamilton, Rhea and Bledsoe Counties. Field mapping of Nelson, Sewanee, Richland, Lantana, and Morgan Springs seams.

22. Tennessee: Valuation study of coal reserves and surface, presented in Federal Court testimony as an expert witness on 24,000 acre Gardner tract, Rhea and Bledsoe Counties. Eight coal seams evaluated based on drill data.

23. Tennessee: Design of two deep mines and one strip mine, based on 70 drill holes, in the Dade and Aetna seams on 29,000 acres of coal leases for an independent coal company having international ownership. Prepared bank loan feasibility study of reserves, mine and washing plant.

24. Tennessee: Over-view report on reserves-management of a deep mine, washing plant, tipple and coal yard with unit train facility for $6 million bank loan consideration for independent coal operator.

25. Tennessee: Study of coal reserves, mine installations, cost analysis, income pro forma, projections for incremental income and tax consequences from expansion of a major drag line operation in Scott and Campbell Counties. Seams mined were River Gem, Blue Gem, Swamp Angel and Jellico. Later evaluation of operating costs for train tipple acquisition financed by major oil shale company.

26. Tennessee: Management of exploration, reserve computation, strip mine design, supervision of mine installation-permitting of 300 acres Sewanee seam coal, Grundy County. Design of IRS accepted mine development expenditure schedule for $2.3 million tax shelter program. Direct mine management for three years.

27. Tennessee: Preparation of a regional coal study and review of coal reserves available in the Southern Tennessee Coal Field south of the Crossville-Ozone fault system that could be transported by existing river barge facilities. Study prepared for a client that acquired major coal holdings in the study area.

28. Tennessee: Study of a five county regional coal potential for and English client seeking metallurgical coal for export.

29. Tennessee: Operations pro forma, income projections for 6000 acre Fentress County coal property in the Wilder seam.

30. Tennessee: Screen property submittals, selected and negotiated lease on 1500 acres coal lands in Campbell County for investment group. Designed strip mine, mine development expenditure schedule and managed contract miner.

31. Tennessee: Designed and supervised drilling program for reserve confirmation on 200 acre permit in Nelson seam, Marion County. Drilling confirmed suspected faulting and error in seam designation by previous operator.

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...agement
ENGINEERING: Underground Mine, ... Mine, Mine Drainage Treatment, ...tion of environmental controls; Mine ...ace Facilities, Preparation Plant, Process Plant
...EARCH/LABORATORY: Process Testing, ...eral beneficiation, smelting; ... Research, type—Supervision only; ...chanics, type—Supervision only
...CIALIZE IN: Mine mineral venture and ...mine expansion feasibility studies and econ... evaluations, mine, mine plant and ...rgical process plant design and con... supervision, project cost control, ...planning, production efficiency analysis, ...operative mine studies.
...st 1976
...D. Michaelson, Mining & Met. Engr., ...E/AIME, MMSA, AMC, SIGMA XI
...Mine Cons. Financial Assoc., UMA, ...AIME, Atomic Ind. Forum, IMCB, AMC
...ip L. Merritt, Cons. Geol. Assoc., GSA, SEG, AIME, MSA, SIGMA XI, MMSA, UGA
...R. Porter, Cons. Metal. Assoc., AIME, ...AM Soc. Metal
...ish Spadoon, Cons. Metal. Assoc., SME/AIME, MMSA, AMC
...ward T. Dwyer, Cons. Mining Engr. Assoc., ...E/AIME, AIF, UMA, AMC

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...NSULTING SERVICE: Coal Mining, Under... Coal Mining, Surface Coal Prepara... Coal Transportation, Port Facilities, ...ity, Appraisals, Financing, Feasibility ...es (complete), Computer Applications, ...er Distribution, Coal Combustion, Mining, ...nderground, Concentrating, Smelting & Refining
...GN ENGINEERING: Underground Mine, ... Plant, Electric Generation Facilities, ...Loading/Unloading, Power Distribution ...cilities, Mine Drainage Treatment, Mine ...urface Facilities, Pipelines, Pelletizing Facili... Preparation Plant, Process Plant
...1950 Empl 70
...ald Lednesky, Principal
...e McEwen, Principal
...ay Hess, Principal

...EST FOUNDATION CORPORATION
...S. Rosalie Ave.
...Louisville, IL 61857
...Tel 309-687-0066
FIELDS: Coal
CONTRACTING: Drilled piers, pile driving, ...k construction, Preparation Plant Con... ...ction, Port & Terminal Construction
...1969 Empl 75
...Jerome A. Green, Pres.
...James E. Gates, Vice Pres.
...Frantzen, Chief Engr.

...W. MILLER & ASSOCIATES,
First Floor Miller Bldg.
814 Virginia St. E.
...Charleston, WV 25301
...el 304-343-6188, 304-343-61...
FIELDS: Coal; Specialized ma... Sand or Gravel
CONSULTING SERVICE: Geol... ...gen, Coal Mining, Underground ...Surface; Coal Mining, Auger; ...gen, Coal Exploration; Coal T... Port Facilities, Efficiency/ ...Studies, Ecology, Appraisals, Financing, Feasibility Studies ...Economic Evaluations, Market ...agement/Opr. Research, Land R... Mine Drainage Treatment, Coal C... Mining, Underground, Mining, ... Quarry; Mining, Dredger & Plac... ...ressing
CONTRACTING: Exploration (... Exploration Drilling, Ground Tes... Shaft Sinking, Tunneling, Stripp... Preparation Plant Construction; Mine & Plant Management, Complete Turnkey Design & Construction, Mine Drainage Treatment; Land Reclamation; Process Plant Construction
DESIGN ENGINEERING: Underground Mine; Coke Plant, R.R. Loading/Unloading; Surface Mine; Mine Drainage Treatment, Mine Surface Facilities, Land Reclamation, Auger Mine, Preparation Plant
RESEARCH/LABORATORY: Coal Sampling
OTHER ACTIVITY: Specialized utilization work in power plant, steel plant and synthetic liquid fuels plants.
SPECIALIZE IN: Charleston, W. Va.; Synthetic liquid fuels corp (coal-oil mix), coal to methanol to gasoline.
Est 1963 Empl 25
J. W. Miller, Chm. Bd (Miller Group)
D. S. Miller, V. Pres (Miller Group)
B. Knapp, Treas (Miller Group)
P. V. Mancini, Consult
M. L. Berger, Jr., Consult
D. E. Artom, Pres.-Miller Construction Co.
G. J. Miller, Vice Pres
OTHER OFFICES: Miller Management Co., Inc., 1st Fl., Miller Bldg., 814 2nd St., East, Charleston, WV 25301 Tel. 304-343-4168. Miller Construction Co., 1st Fl., Miller Bldg.; 814 2nd St., East, Charleston, WV 25301, Tel. 304-343-4168

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CARL MILLER COMPANY
817 No. 30th St.
Port Smith, AR 72901
Tel 501-783-1144
FIELDS: Coal
CONTRACTING: Prefab steel buildings, general construction, only. Complete Turnkey Design & Construction
Est 1962 Empl 10
Carl R. Miller, Pres.

MINCOMP CORPORATION
5660 S. Syracuse Ct.
Englewood, CO 80111
Tel 303-779-3063
FIELDS: Coal, Petroleum, Geothermal; Nonmetallics, Metals
SCIENTIFIC DATA PROCESSING: Data Base Management, Mapping, Digitizing
CONSULTING SERVICE: Geological, Geophysical, Exploration, Coal Exploration; Efficiency/ Productivity Studies, Feasibility Studies (complete), Economic Evaluations, Computer Applications
SPECIALIZE IN: Computer applications for exploration (minerals & petroleum)
Est 1970 Empl 20
Edwin P. Blanch, Pres
Ronald D. V. Uchida, Gen. Mgr.
Dr. James Krell, Senior Systems Analyst
Thomas Ives, Data Center Supervisor

MINE WATER TESTING
Grundy, VA 24614
Tel 703-935-7181
FIELDS: Coal
CONTRACTING: Mine Drainage Treatment
CONSULTING SERVICE: Mine Drainage Treatment

programs, mineralogical, chemical & physical analysis, ...and processing & flow sheet development, process equipment evaluation, industrial waste & scrap utilization, preliminary engineering and cost estimates, instrumentation & process control, plant sampling programs, water & effluent technology, plant & process optimization, environmental impact studies.
RESEARCH/LABORATORY: Assaying/Chemical Analysis, Process Testing, Mineralogic/Petrographic Analysis
Est 1975
Bruce P. McCloskey, Pres.

MINERAL SAMPLERS, INC.
P.O. Box 946
Riverton, WY 82501
Tel 307-856-6024
FIELDS: Uranium; C... Gravel
TOOL RENTAL (BADGERALL ...
Sidewall sampling (Borehole)
SPECIALIZE IN: Sidewall sampler tool design & manufacture
Est 1974 Empl 2
Doug Chalkers, Pres., AIME

MINERAL SERVICES, INCORPORATED
1376 West Third St.
Room 711 Morton Bldg.
Cleveland, OH 44113
Tel 216-621-0806
FIELDS: Metals, Coal; Reclaiming of metals & metal oxides; Nonmetallics, Stone, Sand or Gravel
CONSULTING SERVICE: Geological, Geophysical; Exploration, Coal Mining, Surface, Coal Preparation, Coal Exploration, Coal Transportation, Port Facilities, Terminals Planning; Efficiency/ Productivity Studies; Ecology; Coal Analysis, Feasibility Studies (complete); Economic Evaluations, Market Studies; Computer Applications, Management/ Opr. Research, Electrical Generation; Power Distribution, Land Reclamation; Mine Drainage Treatment, Coal Combustion; Mining, Underground; Mining, Open Pit & Quarry; Mining, Dredger & Placer; Concentrating, Smelting & Refining
CONTRACTING: Exploration (all phases); (L) Maintenance Services.; Mine & Plant Management
DESIGN ENGINEERING: Underground Mine; Electric Generation Facilities, R.R. Loading/ Unloading; Surface Mine, Power Distribution Facilities, Tidewater River Lake Dock Facilities, Mine Drainage Treatment, Mine Surface Facilities, Pipelines; Land Reclamation; Pelletizing Facilities, Preparation Plant, Process Plant
OTHER ACTIVITY: Supervise metallurgical and beneficiation research program, maintenance consulting, computerized maintenance scheduling services, industrial engineering.
SPECIALIZE IN: Consulting services, explora... ...ing

by analysis; technical/economic modeling systems.
SPECIALIZE IN: Management consulting and technical services.
Est 1978 Empl 10
Alfred Weiss, Pres., AIME, SME of AIME, APCOM, NY Mining Club
Blake E. Guernsey, Vice Pres., AIME, SME of AIME, APCOM, NY Mining Club
Derek J. Oxley, Vice Pres.-Process Technology, AIME, SME of AIME, Fellow Brit. London IMMC
Barry G. Amery, Vice Pres.-Information Systems Technology, AIME, SME of AIME, IMMC
OTHER OFFICES: 10400 West Colfax, Suite 450, Lakewood, CO 80215, Tel. 303-232-0094; Mineral Exploration Research Institute (Affiliation), P.O. Box 6079, Station "A", Montreal, Quebec, Canada H3C 3A7, Tel. 514-344-6091

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FIELDS: Coal, Petroleum, Metals
CONSULTING SERVICE: Geological, Exploration, Coal Mining, Underground, Coal Mining, Surface, Coal Exploration, Appraisals; Financing, Feasibility Studies (complete); Economic Evaluations, Management/ Opr. Research, Land Reclamation, Mining, Underground, Mining, Open Pit & Quarry; Mining, Dredger & Placer, Concentrating
CONTRACTING: Exploration (all phases); Exploration Drilling, Tunneling, Stripping; Mine & Plant Management
DESIGN ENGINEERING: Underground Mine, Surface Mine, Mine Surface Facilities; Land Reclamation
SPECIALIZE IN: Management of exploration, mine design and development, economic feasibility, investment economics; Tennessee, Kentucky, Utah, Colorado & Wyoming, coal, Utah & New Mexico, uranium, Nevada, tungsten mine and mill, Kentucky and Tennessee oil & gas, water flood design, financing, California, South and Central America vein & placer gold, coal, Gold in Spanish
Est 1972 Empl 18
Arthur D. Thompson, Pres. (Dallas), AIME, BGS, Canadian Mining Assn., TSPE, CMA, SIGMA
Dr. J. H. Lopez, Assoc. (Houston), ABEMPET, CMA
Grady C. Mullican, Assoc. (Tenn.), Landman
Mark Latter, Assoc. (Calif.), AIME
Charles Caldwell, Mine Manager (Tenn.), Mine Operations
OTHER OFFICES: Minerals Associates, 600 Ladder Trail, Signal Mt., TN 37377, Tel. 615-886-2251; Minerals Associates, P.O. Box 115, Monteagle, TN 37356, Tel. 615-924-6404; Newton Management Corp., P.O. Box 636, Chattanooga, TN 37401, Tel. 615-886-4041; Minerals Associates, Apartado Aereo 7363, Medellin, Colombia, Tel. 281570

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CONTRACTING: Exploration (all phases); Ground Geophysics; Exploration Drilling; Airborne (photo) Topo Mapping
SPECIALIZE IN: Base and precious metals, uranium, coal, oil, and gas. Exploration specialists for metals endowed in the western USA.
Est 1980
David Bateman, Geologist, MGA, SEG, MMSA
Michael Schuler, Geologist, SEG
John Erturk, Geologist, SEG
Kent Hudson, Geol. Engr., AADG
John Ford, Geophys. Engr
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SINCE THE PUBLICATION OF THE KEYSTONE MANUAL, MR. STEVE BURTON, MASTER OF SCIENCE IN GEOLOGY HAS BEEN ADDED TO THE STAFF AT SIGNAL MOUNTAIN FOR OIL & GAS PROJECTS &

MR. RICARDO VILLASENOR, BS IN GEOLOGY (TEXAS) HAS JOINED THE STAFF IN DALLAS FOR PROJECTS IN HARD ROCK AND LATIN AMERICA 2/83

IN JULY, 1985, MR. ROBERT R. NORMAN, FORMER CHIEF GEOLOGIST FOR BUTTES RESOURCES, INC. RETURNED AS ASSOCIATE CONSULTANT IN GEOLOGY:

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801 259 6181

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Tel 201-839-[illegible]
FIELDS: Coal; Metals; Nonmetallics
CONSULTING SERVICE: Resource evaluation & guidance, geochemical & geophysical

RESEARCH/LABORATORY: Assaying/Chemical Analysis, Process Testing; Process Research; Coal Sampling; Mineralogic/Petrographic Analysis
OTHER ACTIVITY: Ore reserve analysis & estimation by geostatistics; computer based mine planning & design; investment opportun...

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Jack Larson, Exec VP
J F Boros, VP Treas
J P Johnson, VP Opers
J D Upchurch, VP Eng
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R E Causey, VP
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Jerry Pierce, VP
Gary Winter, Dist Landman
Dave Kouns, Dist Geologist
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Sam K Gary, VP Land Mgr
Raymond C Avansino Jr, Secy/Ty
Roger E Hildahl, Treas
Robert E Slovak, Controller

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Oil Company/Oil & Gas/Royalty
Harry O Berg

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Gayle Lewis Manry, VP
Fred Hobson, VP

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John W Oly, Sr VP
Charles E Titus, VP Special Projects
Frank Nowak, VP Geology
Eugene R Manthey, VP Land

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David P Cullen, VP/Law
Douglas L Sloan, VP/Human Resources Admins
Ted F Freers, VP/Energy Products
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Ben B Ruehr, VP

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c/d DE GREIFF Y CIA. ABOGADOS
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BOGOTA, COLOMBIA
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5/83

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Floyd H Miller, Partner
Chris L Christensen, Partner
Lois Tate, Ofc Mgr

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Pipeline & Roustabout Svs
Ralph W Miller, Pres
Jeneane E Miller, Secty/Treas
[illegible] VP

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Virginia L Babcock, VP

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George H Temple, Sr VP Eng Oper
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Lee J Benjamin, VP/Treas Newtex Management
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Dr Jose H Lopez, Associate

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REFERENCES

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Mr. Dean Fellows-Partner
Dr. Richard Kinehart-Partner

BUTTES RESOURCES, INCORPORATED
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Mineral Division
P.O. Box 1300
Moab, Utah 84532
Mr. Robert Norman-Manager

FIRST REPUBLICBANK CORPN.
(Successor To Republic & First Banks)
First International Building
Dallas, Texas 75201
Mr. Eldon Howard-Mang. Fin. Acctg.

L. J. BENJAMIN & CO., INC.
(Financial Planning Specialists/
Stock Broker-Dealer, Memb. Nat. Assn.
Security Dealers)
449 South Oyster Bay Road
Plainview, N.Y. 11803
Mr. Leo J. Benjamin-President

FINANCIAL MANAGEMENT CORPN.
1806 Highmeadow Cove, Suite A
Carrollton, Texas 75006
Mr. Floyd Smith-Principal

GEM MINING CO., INC.
(Independent Coal Mines-Owners)
P.O. Box 480
Jellico, Tennessee 37762
Mr. Joe Don Cox- Owner

CARBONES DEL CARARE LTDA.
CARBONES DE MATURIN LTDA.
(Largest Indep. Coal Operator in
Colombia, South America)
c/d Sr. Rafael Nunez D. S.S-M.
Piso 5, Carrera 15 No. 37-15
Bogota, Colombia, South America
Dr. Rafael Nunez Y Cia.
Principal & Owner

OIL OPERATIONS, INCORPORATED
(Independent Oil Operator)
P.O. Box 227
Salyersville, Kentucky 41465
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