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Mescal - good  $\text{CaCO}_3$ ,  $\text{SiO}_2$   
Map -

7 Brydon - Office - 279-3541 - 2846 W. Wilton Ave  
Home - 253-1801 2034 W. Windsor  
P.O. Box 3707, 85030

GEOLOGIC REPORT

of the

CUTTER QUARRIES

LIMESTONE PROPERTY

in the

GLOBE DISTRICT

San Carlos Indian Reservation

Gila County, Arizona

by

R. E. Mieritz  
Mining Consultant  
Sun City, Arizona

March 14, 1972

### INTRODUCTION:

As authorized by Mr. Tom Royden, Phoenix, Arizona, the writer, accompanied by Messrs. Royden and Owen Carolan, revisited the Cutter Quarries limestone and quartzite deposits on March 9, 1972. The writer previously visited and examined the property on May 26, 1970. The property covers 640 acres as a lease and located in parts of Sections 4 and 9, T. 2 S., R. 16 E. (unsurveyed) in the San Carlos Indian Reservation, Gila County, Arizona and approximately 10 airline miles, or 16 miles by road via Cutter southeast of Globe, Arizona.

### CONCLUSIONS:

Based on the general examinations (2) completed by the writer and also on the samples taken, the following conclusions are forwarded for your consideration:

- (1) A 40 to 70 foot thick horizon within the 250 foot thick Mescal Limestone formation is the area of interest from the standpoint of lime manufacture. The specific outcropping area (designated on Map No. 2) should contain 1.5 million tons of limestone.
- (2) This "ore" reserve should contain an average 96%+  $\text{CaCO}_3$  and 1.05% silica ( $\text{SiO}_2$ ) as determined by the limited sampling.
- (3) At least 18 holes, approximately 70 to 80 feet deep, should be drilled - preferably diamond drilling to "block out" the good limestone and determine the irregularities of the  $\text{CaCO}_3$  and  $\text{SiO}_2$  content and to aid in mine planning and mine operation.
- (4) Easier access to the property and in particular the area of interest, can be best accomplished by a route from State Highway 77 at a point almost west of the area of interest. An easy grade and approximately a mile and a half of road is anticipated.

### LOCATION and ACCESSIBILITY:

A ten year mineral lease (commencement date January 1, 1969) has been obtained from the San Carlos Indian Council for 640 acres of limestone and quartzite material in parts of Sections 4 and 9, (southern 3/4 of Sec. 4 and northern 1/4 of Sec. 9) in T. 2 S., R. 16 E., G. & S. R. B. and M., Gila County, Arizona..

From Cutter, 9 miles easterly from Globe, travel to the property by Jeep or pickup is south 0.3 mile on old U. S. route 70, thence right, southwest, on a ranch type dirt road for 4.3 miles to a "Y" - this section of road crosses a sandy and gravelly wash several times - thence right at the "Y" for 2.4 miles over a very rocky - Jeep only - road. This point is close to the center of the property of high ridges and steep drainage producing 300 to 400 foot reliefs. This point is 16 miles by road from Globe. The limestone area of interest is approximately 1/2 mile further - up over a high ridge - which must be traversed on foot.



The present route of access is "the long way round". Viewing the area from a distance, it is the opinion of the writer that a very feasible access road route could be located with easy grades and relatively low cost construction. This route would approach the area of interest from the west - a point on State Route 77 - and would require approximately  $1\frac{1}{2}$  miles of road construction. It also appears from a distance that an access road already exists from the State route to a point about a half mile airline from the area of interest. Such a route would materially shorten distance and reduce transportation costs on westward haulage. It is suggested that this proposed route be traversed on foot and flagged from the area of interest to State Route 77.

#### GEOLOGY:

The limestone in the area is that of the Mescal (Devonian) formation which is made up of several members or layers of 40 to 70 foot thicknesses within its 200 to 250 foot overall thickness. These layers vary from light gray to deep brown, from finely crystalline (flint like) to medium crystalline, from high lime content to strongly dolomitic, from moderately soft to extremely hard or tough to fracture and from relatively free of silica to moderately siliceous with abundant chert nodules and bedding seams. No one bedding is completely free of the silica, however, one thin bed (40 to 70 feet thick) does have low silica content. This bed is fine grained to fairly crystalline. There is also a dark gray bed of perhaps a 30 foot thickness which is approximately 100 feet lower stratigraphically than the one of interest but the two beds are separated by a highly siliceous bed or beds.

During the May 1970 visit, the writer took four samples within the Mescal formation, three of which physically appeared to have low silica contents and the fourth sample was from a bedding containing visible silica nodules and seams. This bed lies immediately below the light gray bed of interest. These samples were taken in the area designated by Messrs Royden and Carolan as being the area of low silica content and from which area they obtained the light and dark samples containing the high calcium carbonate.

During the latter visit, the writer took an additional three samples in the area of interest as well as two samples of material approximately  $\frac{1}{3}$  of a mile southeast (#1114) and  $\frac{2}{3}$  of a mile southeast (#1118) representing exposures of lower beds (?) within the Mescal formation. Samples 1115, 16 and 17 were taken in the area of interest with #1115 representing the siliceous bed underlying the good limestone member. The results of all the samples taken are as follows:

	% CaCO <sub>3</sub>	% SiO <sub>2</sub>
<u>Good Limestone Bed</u>		
#1073 - Light gray, medium crystalline, surface chip	95.7	0.47
#1075 - Light gray, medium crystalline, surface chip	99.1	0.33
#1076 - 40' chip, light gray, across dip, cliff face	95.0	1.35
#1116 - Light gray, medium crystalline, surface chip	97.3	1.18
#1117 - Gray, crystalline, fine grained, surface chip	97.6	0.93
<u>Siliceous Underlying Limestone Bed</u>		
#1074 - Dark gray, fine to medium grain, surface chip	69.4	3.37
#1115 - Gray tan, flinty, fine grain, cliff face	61.4	5.56

#### Miscellaneous

#1114 - Light gray, fine grain, flinty, across cliff  
#1118 - Gray, fine grained, flinty, surface

	%	%
	CaCO <sub>3</sub>	SiO <sub>2</sub>
#1114	97.3	0.61
#1118	60.0	5.70

The general strike of the formation is S. 60°E. with a 24°SW dip at the western end and a 36°SW dip at the eastern end. The formation outcrops for approximately 4000 feet along the strike. Due to minor folding and slight displacements, some of the formation has been eroded and thusly exposing the siliceous limestone bedding underlying the high lime - low silica bed. Only a portion of this strike length is thus suitable to mining. In other places along the strike, the bed of interest is overlain by both siliceous and dolomitic beds which require removal.

#### ORE RESERVE:

The area of interest (high lime-low silica) is estimated to be ± 500 feet along the dip, ±800 feet along the strike and an average thickness of 50 feet. Using a factor of 12 cubic feet to the ton, the resulting in place tonnage is approximately 1,660,000 tons. This volume should average 96.04% CaCO<sub>3</sub> and approximately 1.05% SiO<sub>2</sub>.

#### DEVELOPMENT:

Prior to mining, the area of interest must be partially developed by close spaced drilling. The writer strongly suggests 70 to 80 foot deep holes spaced no more than 100 feet apart in both horizontal directions and at least 18 holes as indicated on Map No. 2 (red circles, diagrammatic only). If the results are too erratic, than "fill-in" holes must be drilled.

Core drilling is the most satisfactory type because it provides a visual observation of the material which permits determination of the physical characteristics such as grain size, crystallization, hardness, friability and fractures, etc., as well as, of course, a sample that can be assayed for the lime and silica contents. It is the writers opinion these added attributes are essential and worth the extra cost for the core drilling. Professional supervision and core logging is necessary.

If the physical characteristics of the material to be mined is of no importance and only the lime and silica content are the ruling factors, then air-track drilling with an excellent sample collection system and professionally supervised, is satisfactory.

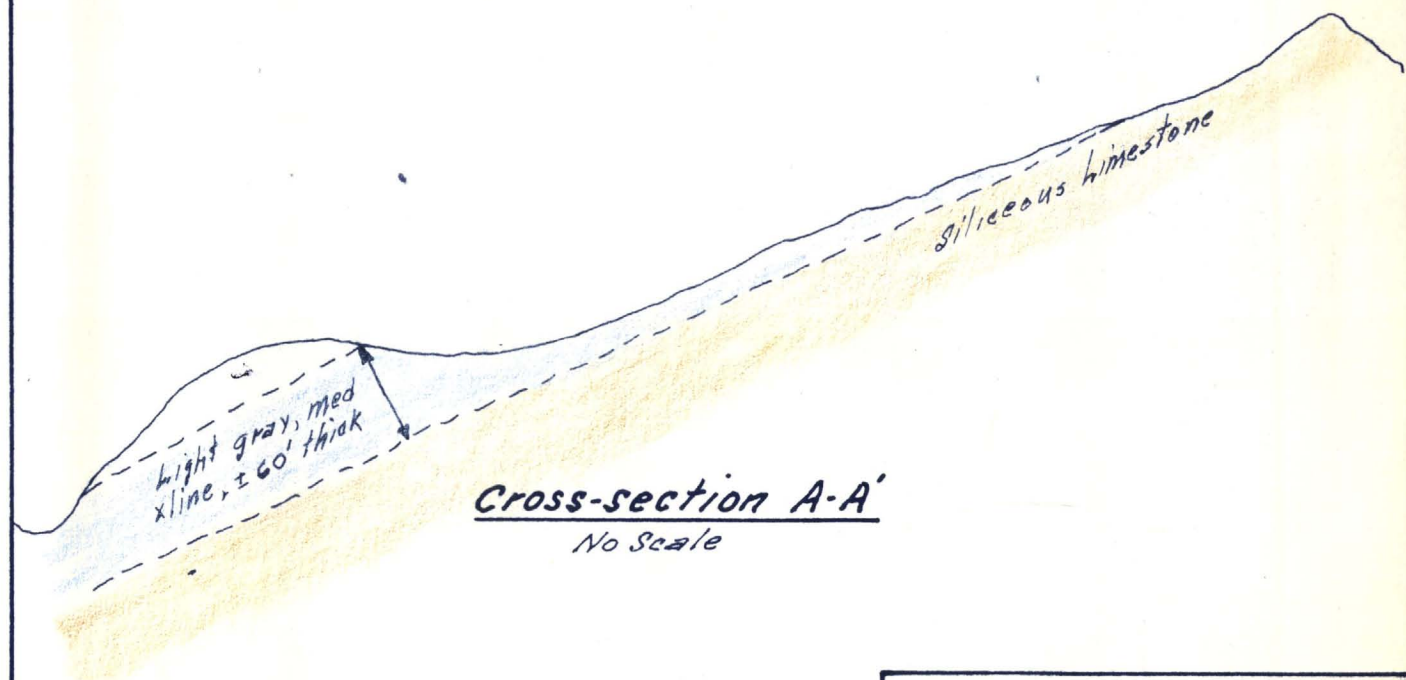
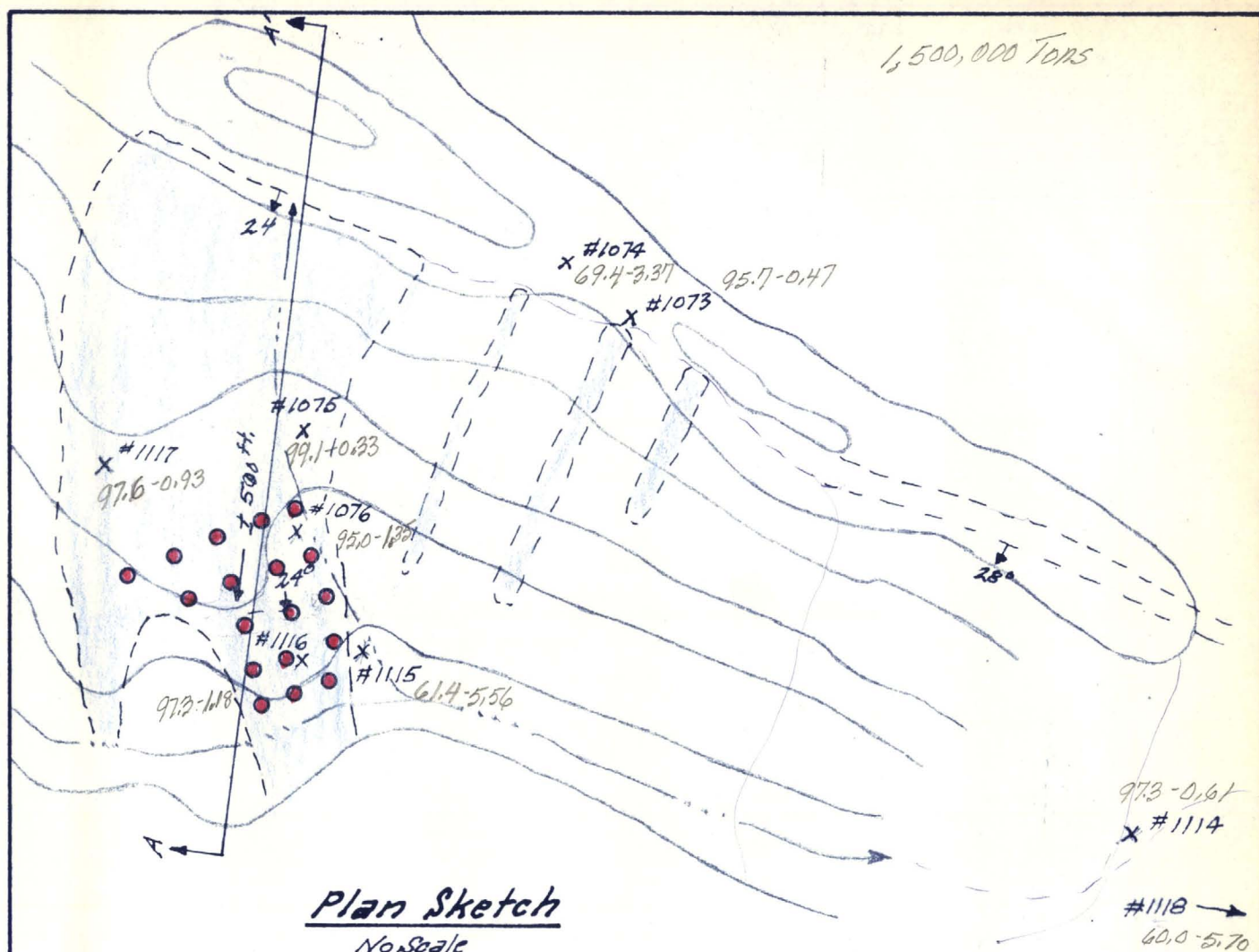
Respectfully submitted,

---

R. E. Mieritz,  
Mining Consultant,  
Mining Engineer and  
Geologist.







CUTTER QUARRIES LIMESTONE  
Globe District  
Gila County, Arizona

No Scale

May, 1970

R. E. Mieritz

June 3, 1970

Home Stake Production Co.  
P. O. Box 7277  
Indian School Station  
Phoenix, Arizona, 85011

Att: Mr. George Freeman

Gentlemen:

Herewith my Geologic Reports of the Cutter Quarries Limestone property, Globe District, Gila County, Arizona and the Queen Creek Limestone property, Superior District, Pinal County, Arizona.

On May 28th, while in the Globe area, and at your request, I contacted Mr. Hoopes, owner-operator, of the Hoopes Lime Plant and Quarry, approximately 4 miles north of U. S. 60-70 on State route 88. I was instructed to use the approach of having a client who was interested in purchasing the Hoopes operation but that the client wished to remain un-identified for the time being.

Mr. Hoopes asked if the client was "the oil people setting up the operation in Tucson?"--since Mr. Jim Girard had visited the operation several weeks ago." "That Mr. Hoopes was, that day, having an appointment with and a visit of a representative of U. S. Lime Co." Mr. Hoopes also stated that "he likes to know who he is dealing with". The net result of the visit and conversation -- information-wise -- was nil. Mr. Hoopes did state "his books were open to a possible serious buyer."

Sincerely yours,

R. E. Mieritz,  
Mining Consultant.



GEOLOGIC REPORT

of the

CUTTER QUARRIES

LIMESTONE PROPERTY

in the

GLOBE DISTRICT

San Carlos Indian Reservation

Gila County, Arizona

by

R. E. Mieritz  
Mining Consultant  
Phoenix, Arizona

June 3, 1970

### INTRODUCTION:

Accompanied by Messrs. Owen Carolan and Tom Royden on May 26, 1970, the writer completed a one day cursory examination of the Cutter Quarries Limestone and Quartzite deposits covering 640 acres as a lease and located in parts of Sections 4 and 9, T. 2 S., R. 16 E. (unsurveyed) in the San Carlos Indian Reservation, Gila County, Arizona and approximately 10 airline miles, or 16 miles by road, via Cutter southeast of Globe, Arizona.

### CONCLUSIONS:

Based on the general examination of the square mile area and the analysis of four character samples taken by the writer, the following conclusions are forwarded for your consideration:

- (1) Only a 40 to 70 foot thick horizon within the 250 foot thick Mescal Limestone formation might be suitable for production of lime because of its low silica content.
- (2) At best, there might be 1.5 million tons of fine to dense, medium crystalline, light gray to medium gray limestone which lies close to the surface for quarrying with a minimum amount of overburden removal.
- (3) The property should only be considered if an "extraneous or supplemental" source of raw material is required.

### LOCATION and ACCESSIBILITY:

A ten year mineral lease (commencement date January 1, 1969) has been obtained from the San Carlos Indian Council for 640 acres of limestone and quartzite material in parts of Sections 4 and 9, (southern  $\frac{3}{4}$  of Sec. 4 and northern  $\frac{1}{4}$  of Sec. 9) in T. 2 S., R. 16 E., G. & S. R. B. & M., Gila County, Arizona.

From Cutter, 9 miles easterly from Globe, travel to the property by Jeep or pickup truck is south 0.3 mile on old U. S. route 70, thence right (southwest) on a ranch type dirt road for 4.3 miles to a "Y" --this stretch of road crosses a sandy and gravelly wash several times -- thence right at the "Y" for 2.4 miles over a very rocky - Jeep only - road. This point is close to the center of the property of high ridges and steep drainage producing 300 to 400 foot reliefs. This point is 16 miles by road from Globe. The limestone area of interest is approximately  $\frac{1}{4}$  mile further - up over a high ridge - which must be traversed on foot.

### GEOLOGY:

The limestone in the area is that of the Mescal (Devonian) formation which is made up of several members or layers of 40 to 70 foot thicknesses within its 200 to 250 foot overall thickness. These layers



vary from light gray to deep brown, from finely crystalline (flint like) to medium crystalline, from high lime content to strongly dolomitic, from moderately soft to extremely hard or tough to fracture and from relatively free of silica to moderately siliceous with abundant chert nodules and bedding seams. No one bedding is completely free of the silica, although one, relatively thin bed (40 to 70 feet thick) does have low silica content. This bed is moderately crystalline. There is also a dark gray bed of perhaps a 30 foot thickness which is approximately 100 feet lower stratigraphically than the one of interest but the two beds are separated by a highly siliceous bed.

Four samples were taken within the Mescal formation from the beddings, three of which physically appeared to have low silica contents and the fourth samples was from a bedding containing visible seams and nodules of silica. This bed lies immediately below the light gray bed of interest. The results of these samples are as follows:

	% CaCO <sub>3</sub>	% SiO <sub>2</sub>
#1073 Light gray, medium crystalline	95.7	0.47
#1074 Dark gray, fine to medium grain	69.4	3.37
#1075 Light gray, medium crystalline	99.1	0.33
#1076 40' chip, light gray, across dip	95.0	1.35

(See sketch Map for sample locations)

The above samples were taken in the area designated by Messrs Carolan and Royden as being the area of low silica content and from which area they obtained the light and dark samples containing the high calcium carbonate and low silica.

The general strike of the formation is S 60°E. with a 24° SW dip at the Western end and a 36° SW dip at the Eastern end. The formation outcrops for approximately 3000 feet along the strike. Of this strike length, only a short 700 to 800 foot length, a 400 foot down dip width and a 50 foot thickness of a light gray, medium crystalline bedding of low silica content which forms a dip slope mound, might be amenable to low cost quarrying with minimum overburden. The balance of the bedding strike length-wise, dips into a ridge and is overlain by both siliceous and dolomitic beds which would require removal.

#### DEVELOPMENT:

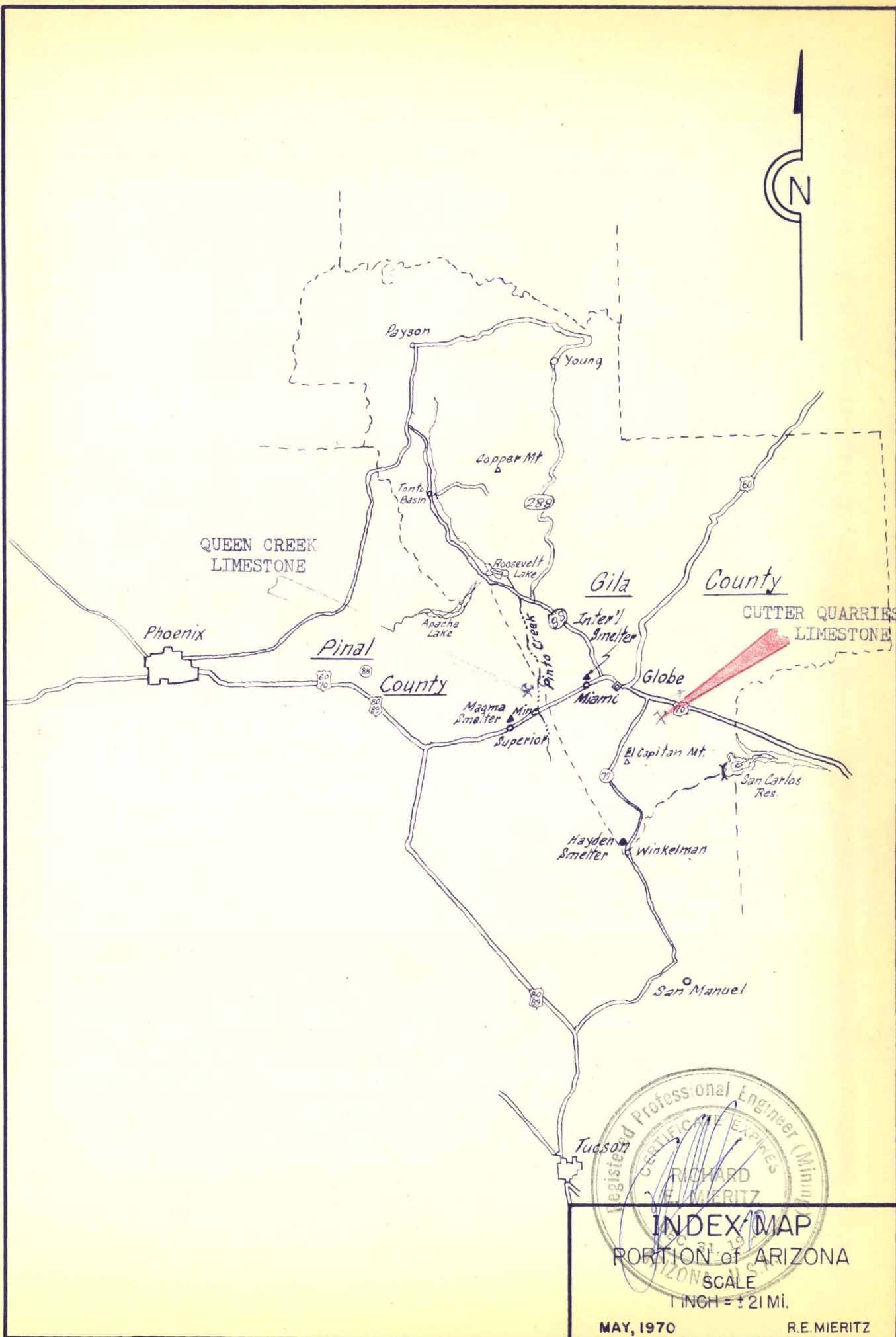
The property is void of development - only outcrops. No exploration of the limestone has been completed.

The suspected low silica content, relatively thin, light gray, medium crystalline bedding must be drilled to ascertain the continuity of the low silica content and the tonnage available.

Respectfully submitted,

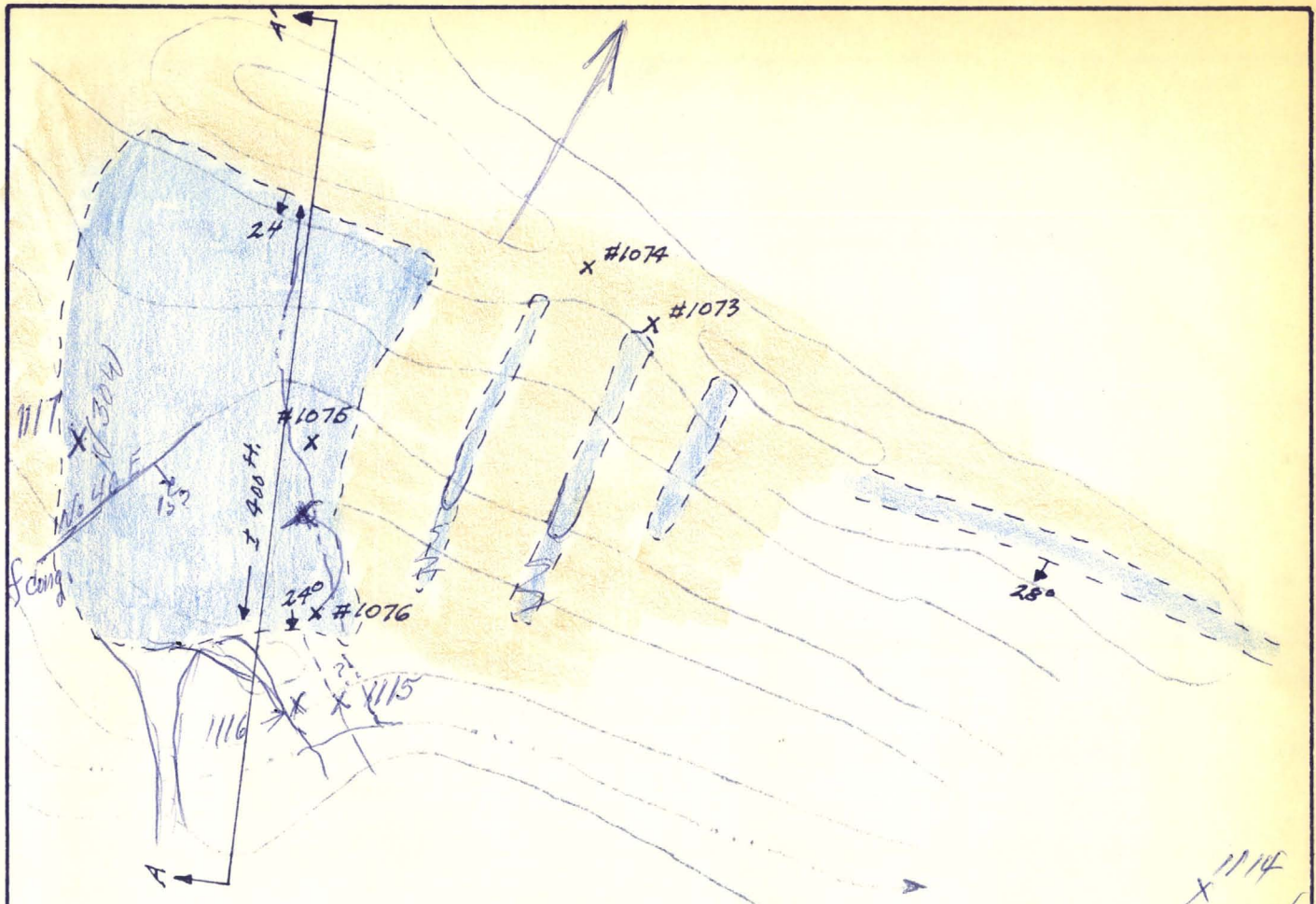
\_\_\_\_\_  
R. E. Mieritz,  
Mining Consultant  
June 3, 1970



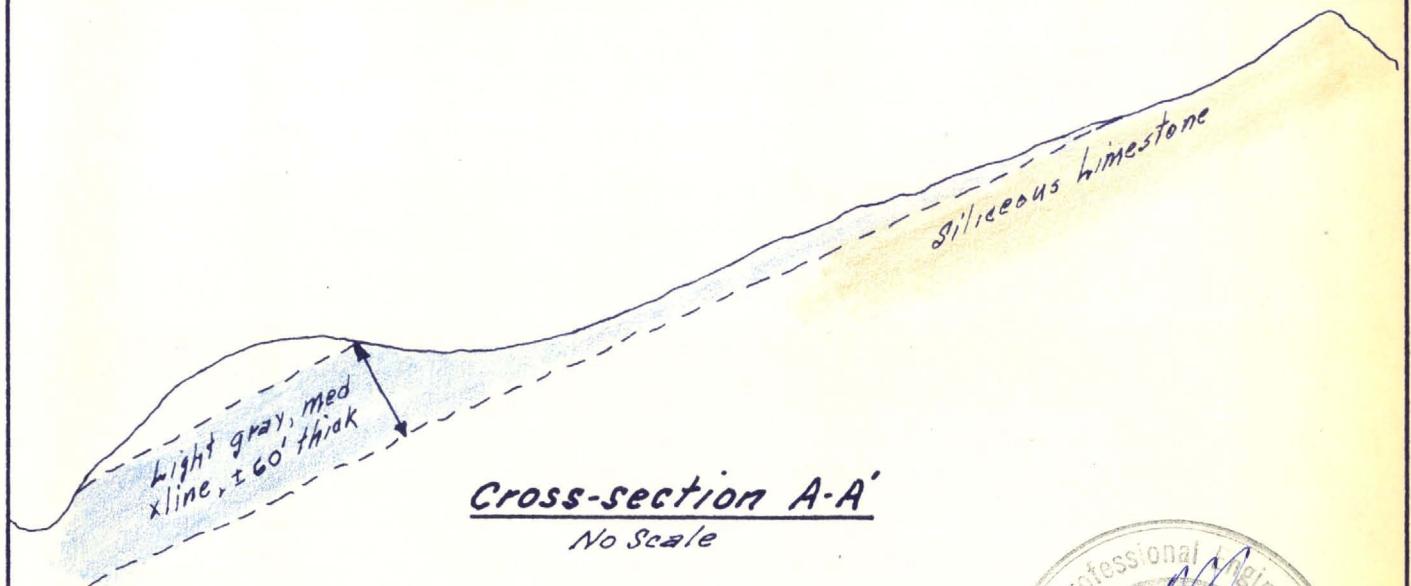


INDEX MAP  
PORTION OF ARIZONA  
SCALE  
1 INCH = 21 MI.

MAY, 1970 R.E. MIERITZ



Plan Sketch  
No Scale



Cross-section A-A'  
No Scale

CUTTER QUARRIES LIMESTONE  
Globe District  
Gila County, Arizona  
No Scale

May, 1970

R. E. Mieritz

MAP No. 2



GEOLOGIC REPORT  
of the  
QUEEN CREEK  
LIMESTONE PROPERTY  
in the  
SUPERIOR DISTRICT  
Pinal County, Arizona

by

R. E. Mieritz  
Mining Consultant  
Phoenix, Arizona

June 3, 1970

## INTRODUCTION:

Accompanied by Mr. E. Dale Penrod, Arizona Sales Manager for Mineral Resources, Inc., on May 27, 1970, the writer completed a cursory field examination of the Queen Creek Limestone property of sixteen, 20 acre placer claims in parts of Sections 17 and 18, T. 1 S., R. 13 E., in Tonto National Forest, Pinal County, Arizona and approximately 4 air-line miles northeast of Superior Arizona, or 6.8 miles by road northeast of Superior or 16 miles west of Miami, Arizona.

## CONCLUSIONS:

Based on the field examination, the general geology of the area and the chemical results of three samples taken by the writer, the following conclusions are forwarded for your consideration:

(1) The limestone formation is mostly the Escabrosa formation of Carboniferous age, varies from fine crystalline to coarse crystalline and even to calcitic rhombohedral crystals up to  $3/4$ " near the formations contact with dacite, is mostly white to very light gray but does have some blue-gray members. Silica as seams or nodules is absent, surface-wise. Two of the three samples, however, suggest dolomitic characteristics.

(2) In excess of 3 million tons of high calcium carbonate, low silica content material should be available through advantageous hill slope quarrying with only a small amount of surface soil removal.

## PROPERTY, LOCATION and ACCESSIBILITY:

The 16 placer claims, 320 acres, are situated in parts of Sections 17 and 18 of T. 1 S., R. 13 E., as approximately shown on the accompanying Map No. 2. Legal descriptions should be obtained from the owners. (outline of property copied from map presented by Mr. Penrod.)

Access to the property on the day of the examination was travel from Miami 14.2 miles west on U. S. 60-70 to the top of the Mesa (truck pullout and mile post 231) just before the descent through Queen Creek Canyon to Superior. This same point is 4 miles by road east of Superior. At this point there is a "Jeep Trail" to the north (a right when coming from Miami) which leads to the property 2.8 miles distant. A short wheelbase, four wheel drive vehicle is necessary for this stretch of trail. Exit from the property can be made with a four wheel drive vehicle utilizing the electric power high line "Jeep Trail" to the Silver King Mine and then the Silver King graveled road to U. S. 60-70 just west of Superior, Arizona, a distance of about 6-7 miles.

## GEOLOGY:

The limestone formation of interest is that of the Escabrosa which is underlain by the Mescal limestone formation, usually quite impure. The general strike of the Escabrosa at the property is northeast N. 40 E. at a  $36^{\circ}$  SE dip at its northeast end and N. 20 E. at a  $45^{\circ}$  SE



dip at its southwest end -- a synclinal trough effect with a gentle dip or rake to the northeast.

The northwest flank, including the Mescal formation, forms a N.10° E. trending hill with a  $\pm 20^\circ$  dip slope to the east and a valley to hill-top relief of approximately 200 feet. The southeast flank is part of the general terrain of the mountain on that side, has a "dip slope" of  $\pm 35^\circ$  with a definite erosional break at the limestone-dacite contact.

Limestone exposed on the property in the area of the "syncline" is, for the most part, white to very light gray, medium to coarsely crystalline, relatively soft to fracture and appears to have a low silica content since silica seams and nodules are non-existent. Sample #1077, however, indicates much magnesium carbonate, consequently we have a transition from a limestone marble to a dolomitic marble -- mostly on the northwest flank. The physical character of the rock in the area of the above sample was fine grained, somewhat more dense and perhaps is quite close to the Escabrosa-Mescal contact.

The southeast synclinal flank is approximately 60 to 70% calcite in fairly large crystals. It is also white in color. This is close to the limestone-dacite contact but has a surface width of approximately 100 feet. The dip here is close to  $55^\circ$  NW. The syncline trough is soil covered, consequently the gradational character from calcite to marble is not observable nor pinpointable. The small northeast trending wash - line of syncline - might denote this position. Some vari-colored marble (pink to tan) is present but appears to be at a minimum.

Three samples were taken by the writer at positions shown on Map No. 2. The chemical results are as follows:

	$\% \text{CaCO}_3$	$\% \text{SiO}_2$
#1077 Fine grained, sugary, white	59.4	0.55
#1078 Coarse grained, calcitic, white	98.7	0.45
#1079 Med. grained, white, Discovery pit, on mesa	81.2	1.90

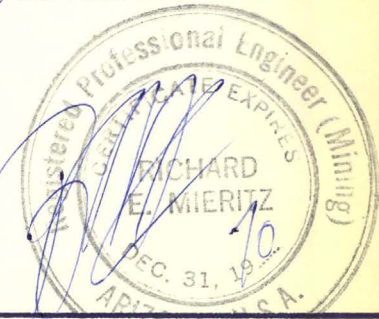
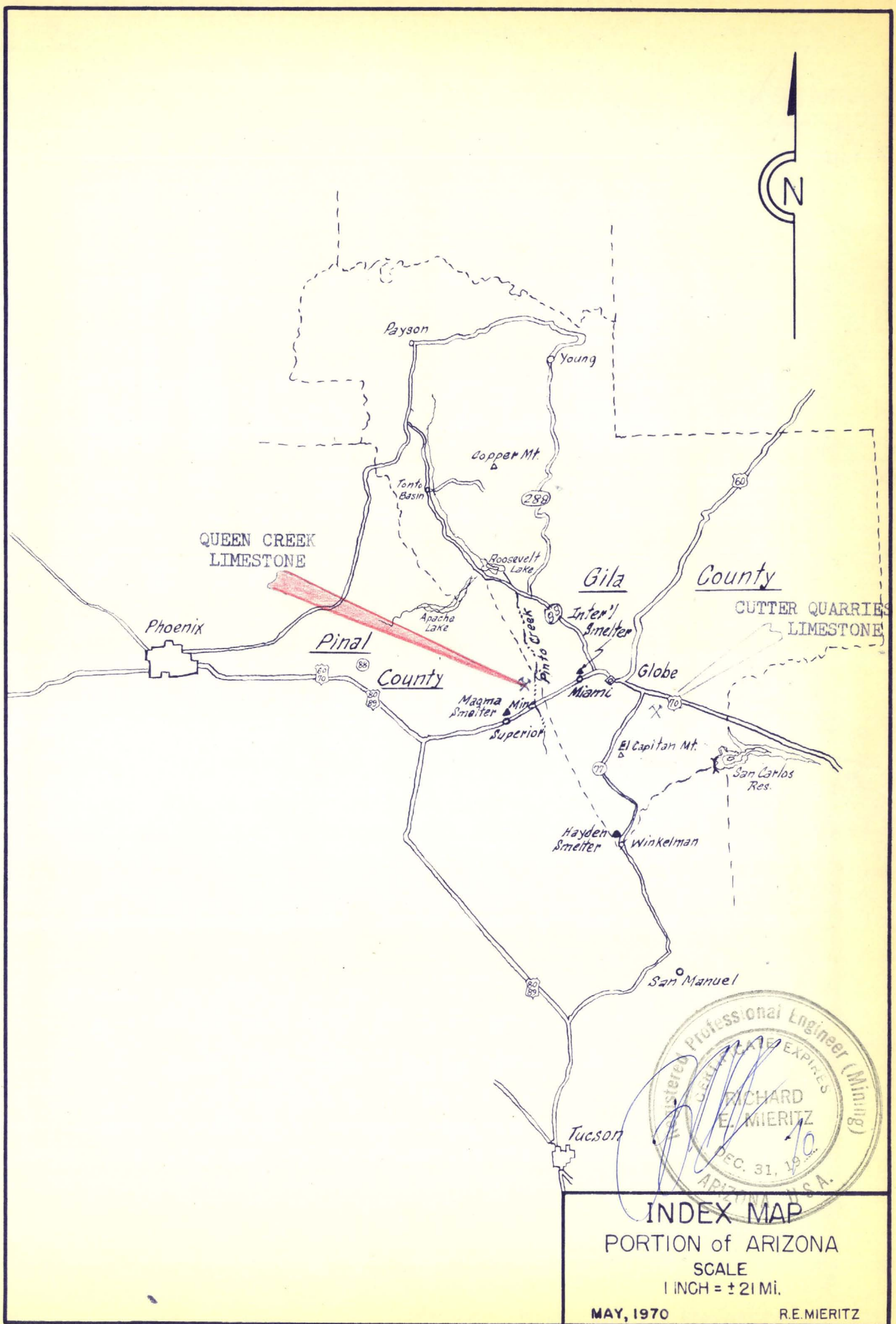
Tonnage-wise, a strike length of 1000 feet, a 600 foot width and normal dip depth of 75 feet would indicate 3.75 million tons of high calcium carbonate, low silica limestone.

#### DEVELOPMENT:

Except for the discovery pits, the property is undeveloped. Surface diamond drilling would be required.

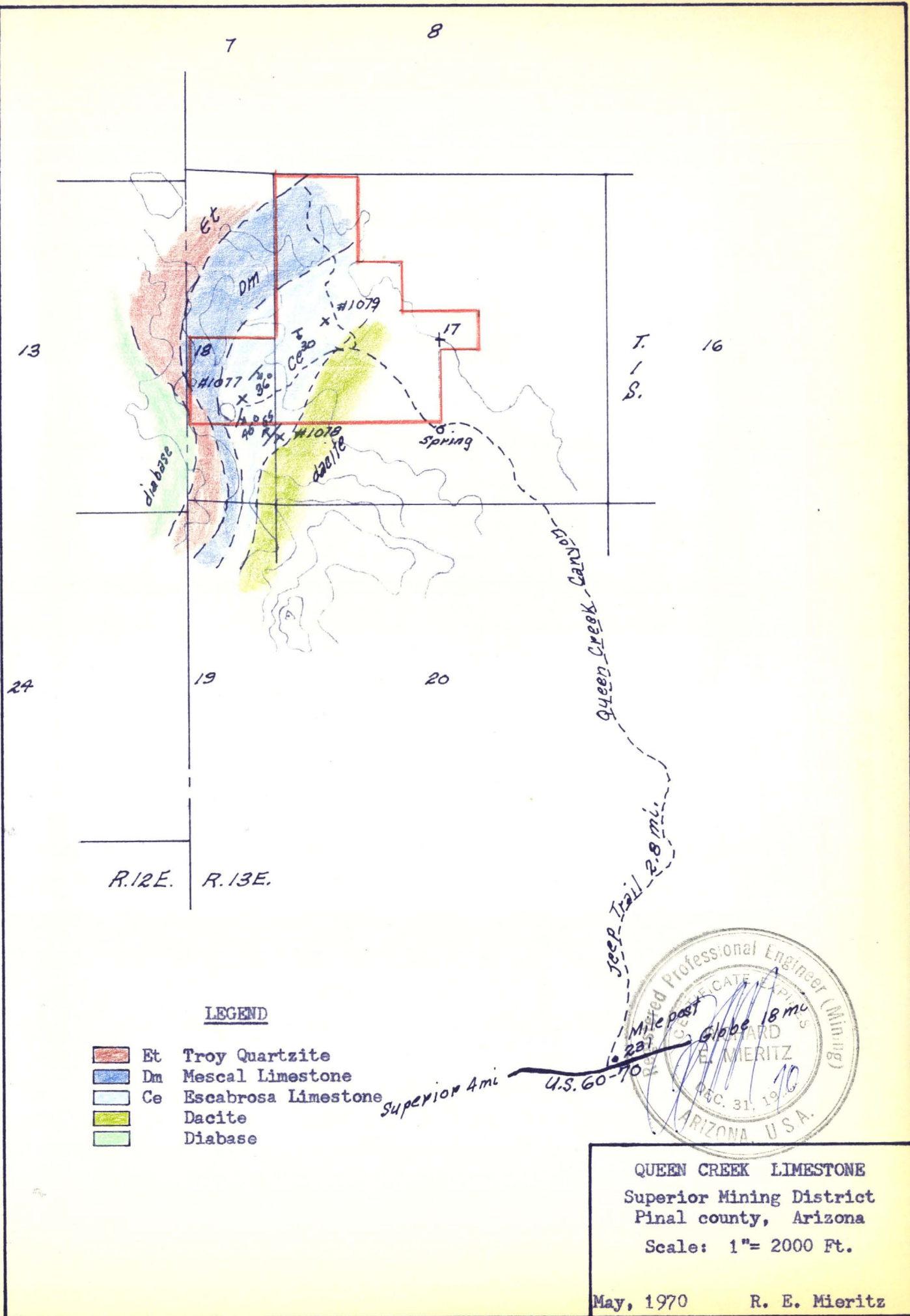
Respectfully submitted,

R. E. Mieritz,  
Mining Consultant  
June 3, 1970



INDEX MAP  
PORTION of ARIZONA  
SCALE  
1 INCH = ± 21 Mi.  
MAY, 1970  
R.E. MIERITZ  
MAP No 1









# ARC LABORATORIES

Division of Arizona Research Consultants, Inc.

9236 NORTH 10TH AVE.

PHOENIX, ARIZONA 85021

943-3573

FOR: Dick Mieritz  
11031 White Mountain Road  
Sun City  
Arizona 85351

DATE 13 Mar 72

LAB No. 11753-7

---

## RESULTS

Sample #	% Silica	% Calcium Carbonate
1114	0.61	97.3
1115	5.56	61.4
1116	1.18	97.3
1117	0.93	97.6
1118	5.70	60.0

Respectfully submitted,  
ARC LABORATORIES

John T. Long, Jr.



1,500,000 tons  
96+% CaCO<sub>3</sub> 1% SiO<sub>2</sub>

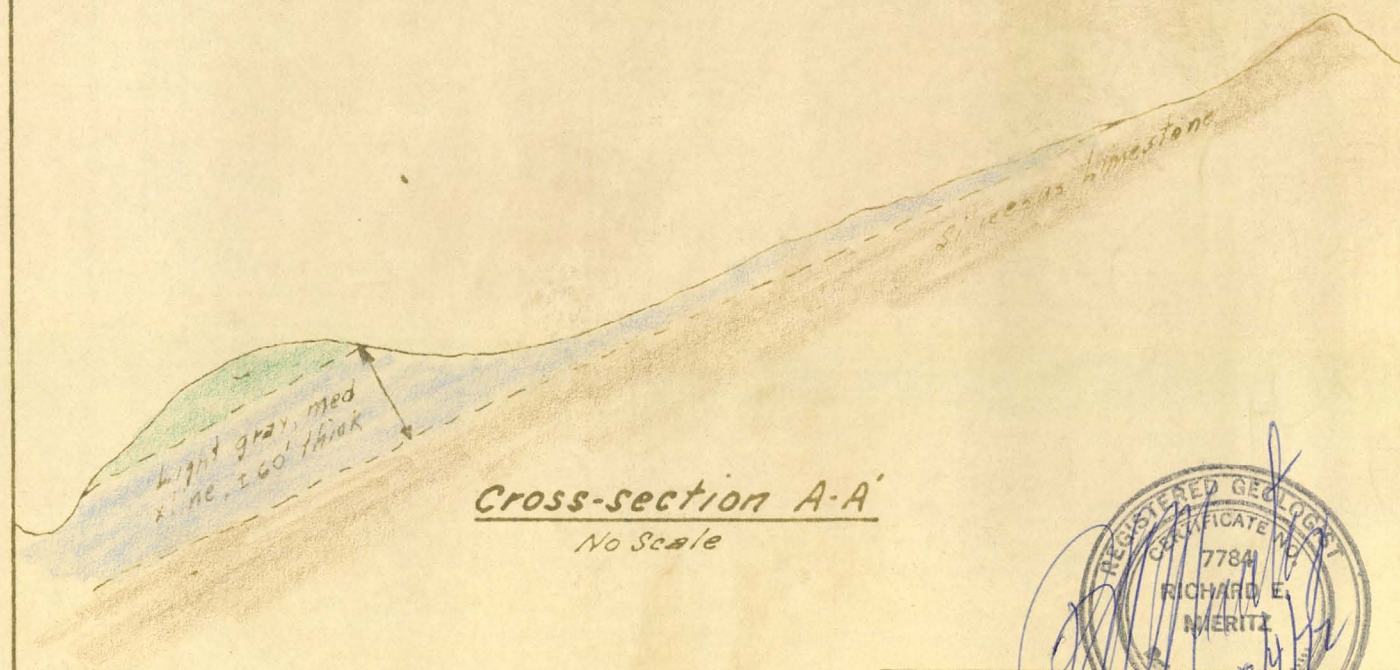


Plan Sketch

No Scale

97.3-0.61  
X #1114

#1118 →  
60.0-5.70



Cross-section A-A'

No Scale



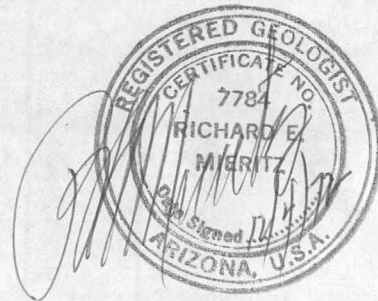
CUTTER QUARRY Limestone  
Globe District  
Gila County, Arizona

No Scale

May, 1970

R. E. Mieritz





February 4, 1970

Mr. Percy Coe  
Coe and Van Loo  
4831 North 11th Street  
Phoenix, Arizona

Dear Percy:

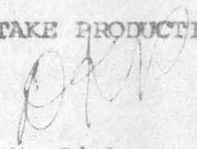
Thank you for sending the report on Cutter Quarries, Inc. limestone deposit.

We are having a survey of all limestone deposits of consequence in the state made by our consulting geologist, Mr. Richard Mieritz. Mr. Mieritz will shortly be in the Globe area and we have asked him to look at this quarry.

Mr. Mieritz will contact Mr. Thomas S. Royden of Royden Construction Company, 2844 West Broadway, Phoenix directly to make arrangements.

Very truly yours,

HOME-STAKE PRODUCTION COMPANY

  
Dennis K. Pickens  
Senior Vice President

DKP:hj

cc: Mr. Richard Mieritz ✓  
Mr. George A. Freeman

NOTE TO R. MIERITZ

Dick: Please notice that Mr. Thomas S. Royden, Royden Construction Company 2844 W. Broadway, Phoenix, telephone: 279-3541 is on the attached report. Flint-Kote recently looked at this quarry, and in a letter to Mr. Royden stated that they were hesitant to go in the business in view of Home-Stake's project.

Please note the back page of the report which gives some analyses.

February 4, 1970

Mr. Percy Coe  
Coe and Van Loo  
4831 North 11th Street  
Phoenix, Arizona

Dear Percy:

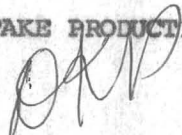
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Dennis K. Pickens  
Senior Vice President

DKP:hj

cc: Mr. Richard Mieritz ✓  
Mr. George A. Freeman

NOTE TO R. MIERITZ

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