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PRINTED: 08/07/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: HAIGLER LIMESTONE

ALTERNATE NAMES:

COCHISE COUNTY MILS NUMBER: 793

LOCATION: TOWNSHIP 16 S RANGE 23 E SECTION 15 QUARTER ALL
LATITUDE: N 32DEG 02MIN 32SEC LONGITUDE: W 109DEG 59MIN 13SEC
TOPO MAP NAME: COCHISE - 7.5 MIN

CURRENT STATUS: EXP PROSPECT

COMMODITY:

CALCIUM LIMSTONE
STONE LIMESTONE

BIBLIOGRAPHY:

ADMMR HAIGLER LIMESTONE FILE
GEO FILE - MIERITZ, RICHARD, 1970
BAIN, GEORGE W., 1963, MARBLE OCCURRENCES IN
THE DRAGOON PASS AREA, IN GEOL FILE

11/27/91

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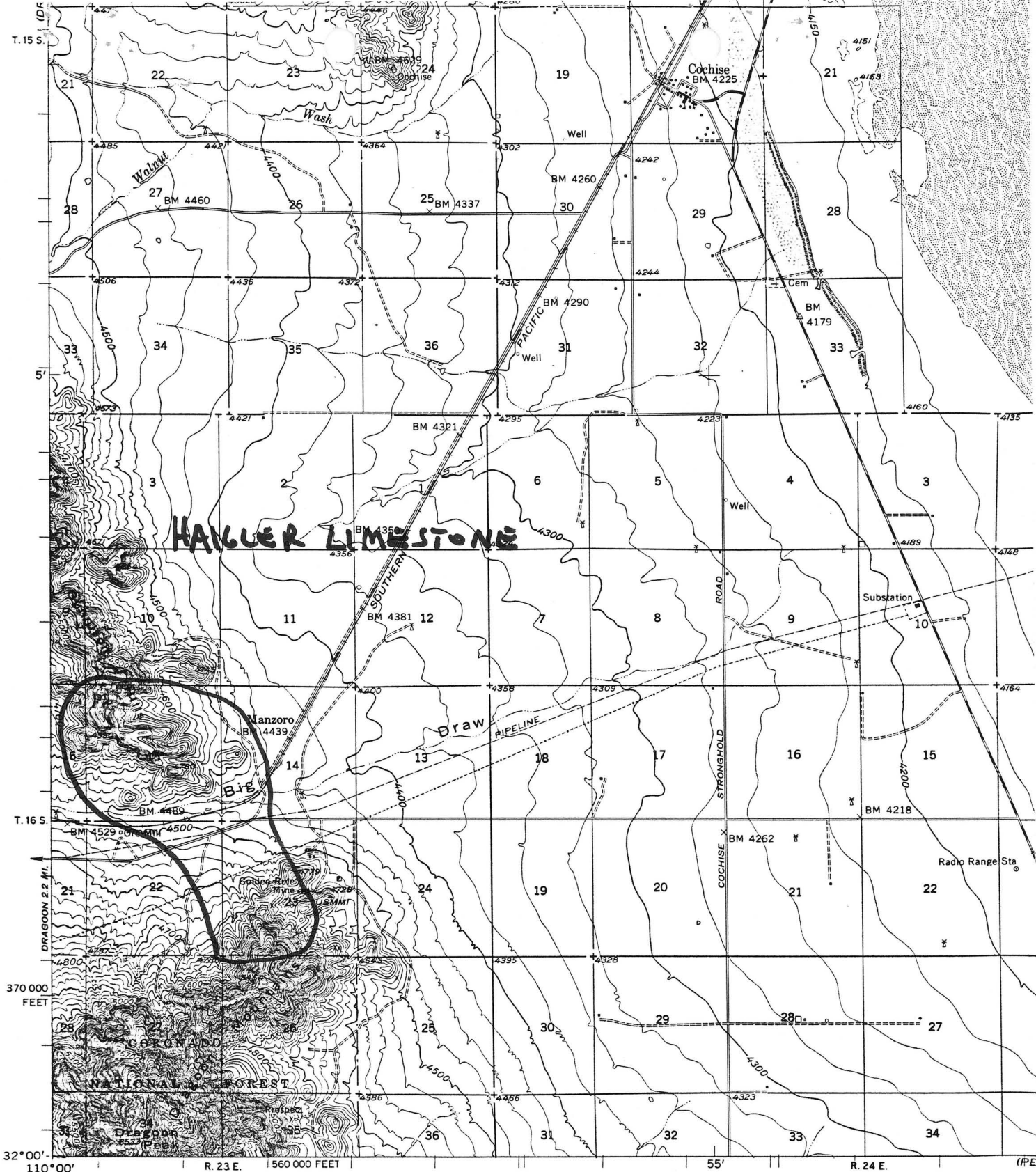
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COMMODITY:

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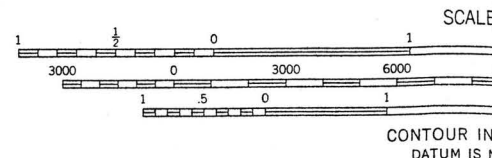
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THE DRAGON PASS AREA, IN GEOL FILE



Mapped, edited, and published by the Geological Survey
 Control by USGS and USC&GS
 Topography by planetable surveys 1940-1941
 Culture revised 1958
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Arizona coordinate system, east zone
 1000-meter Universal Transverse Mercator grid ticks,
 zone 12, shown in blue

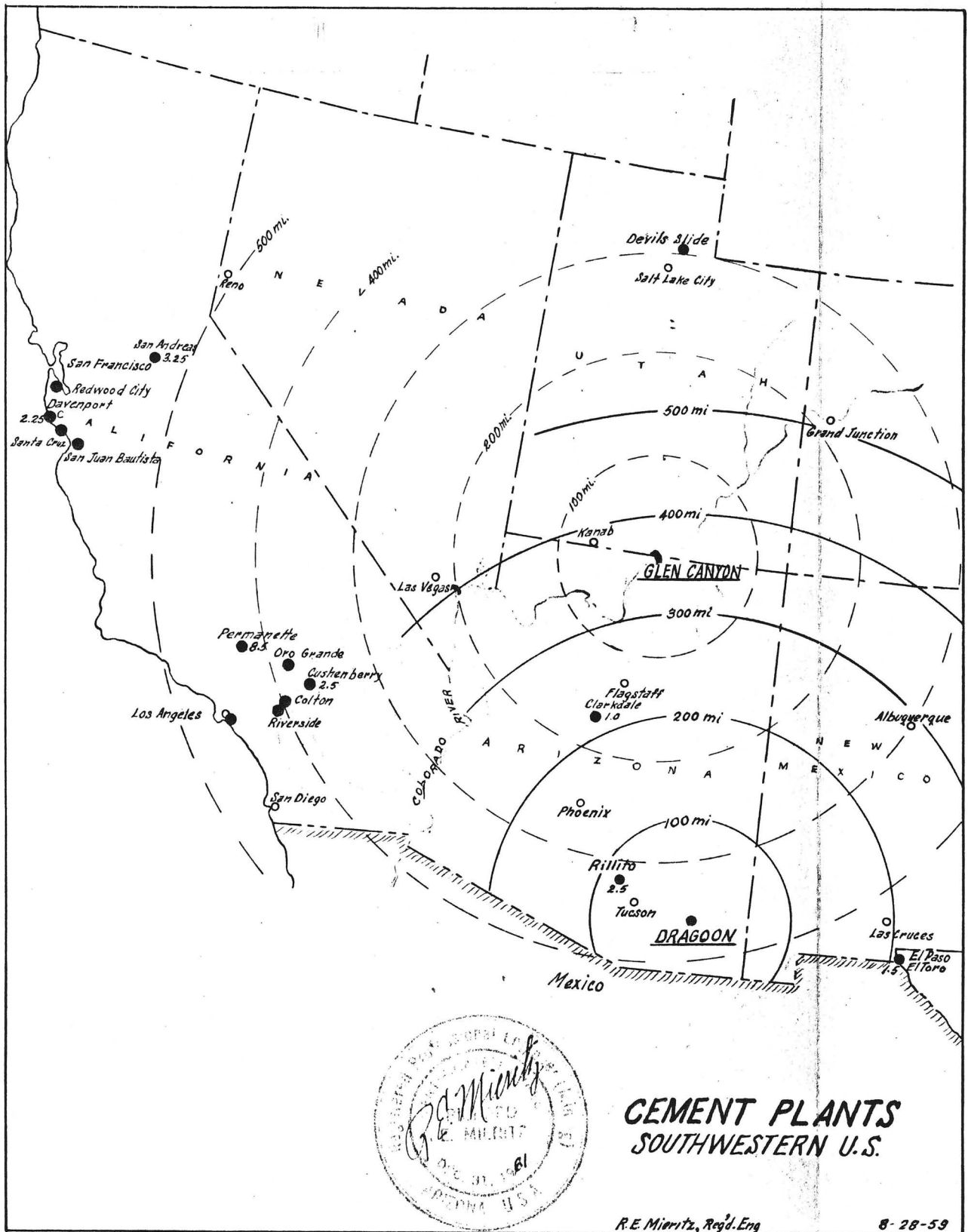
TRUE NORTH
 MAGNETIC NORTH
 13°
 APPROXIMATE MEAN
 DECLINATION, 1958



FOR SALE BY U. S. GEOLOGICAL SURVEY, D
 A FOLDER DESCRIBING TOPOGRAPHIC MA

T16S R23E Sec 15
 COCHISE 15

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ALTNAME1				ALTNAME2					
ALTNAME3				ALTNAME4					
ALTNAME5				ALTNAME6					
CURSTAT		MNAME					NLATDEG	NLATMIN	
EXP PROSPECT		COCHISE - 7.5 MIN					32	02	
NLATSEC	WLONGDEG	WLONGMIN	WLONGSEC	TOWN	RANGE	SECTION	QUARTER	COM1	
32	109	59	13	16 S	23 E	15	ALL	CA	
MODI1		COM2	MODI2	COM3	MODI3		COM4	MODI4	
LIMSTONE		STN	LIMSTONE						
COM5	MODI5		COM6	MODI6		COM7	MODI7		
BIB1									
ADMMR HAIGLER LIMESTONE FILE									
BIB2									
GEO FILE - MIERITZ, RICHARD, 1970									
BIB3									
BAIN, GEORGE W.,1963, MARBLE OCCURRENCES IN									
BIB4									
THE DRAGOON PASS AREA, IN GEOL FILE									



CEMENT PLANTS SOUTHWESTERN U.S.

R.E. Mianitz, Regd. Eng.

8-28-59

PLATE 1

Richard E. Mieritz
MINING CONSULTANT

September 1, 1959

AN
INFORMATIVE REPORT
on the
HAIGLER LIMESTONE DEPOSIT
in the
DRAGOON AREA
COCHISE COUNTY, ARIZONA
by

Richard E. Mieritz
Registered Consulting Engineer
Phoenix, Arizona

INTRODUCTION

This brief report has been prepared to acquaint the reader with such data and information relating to the feasibility of producing and marketing portland cement in Arizona by utilizing the local available raw materials, particularly when the raw materials are of excellent purity, have sufficient quantity and have the necessary facilities adjacent to the property.

CONCLUSIONS

Even though Arizona has two operating cement plants, (Rillito and Clarkdale, both related to American Cement) which produce or will produce an aggregate of 3.5 million barrels cement annually, there is ample justification and need for more and better quality cement production in the State.

The Haigler Limestone and Clay deposits herein described possess all the necessary quantities and qualities required of excellent cement manufacture as well as having the required facilities of water, natural gas, power and transportation within very easy reach of the property.

Limestone, 95% CaCO_3 , of light to white character with less than 1% MgO is available from the property in quantity in excess of 200 million tons while the reserves of the clay deposit exceed 100 million tons which has the proper distribution of the necessary minerals to produce an excellent cement product.

ARIZONA'S CEMENT PRODUCTION & MARKET

Arizona Portland Cement plant at Rillito produces 2.5 million barrels cement annually from a lime deposit containing 75 to 80% CaCO_3 and its newly constructed Clarkdale plant will produce one million barrels from smelter slag and a poor grade local limestone.

Much cement is being shipped into the State from California, New Mexico and Texas.

The unusual, increasing but steady growth of Arizona has made great demands on the construction materials industry and such demands should continue for a long period of time. Further demands will be made on the industry by the proposed National Highway construction program.

A "market" report prepared by any of the well recognized specialists, I am sure, will substantiate the writers statements

as to the potential market for the product. A third cement plant in Arizona is amply justified.

Haiglers Limestone deposit has been examined by and reported upon by several Engineers of cement manufacture prominence as well as Engineers of Mines; - Messrs O. L. McCain, S. Rordan, Cement Chemists, Christie Mitchell and J. Fred Johnson, Mining Engineers, Jack Sayre, etc. All who have experienced a visit to the property acclaim their highest regard for the deposits, their purity, the extensiveness and conveniences.

PROPERTY & OWNERSHIP

The entire property consists of one Limestone-Shale deposit and one clay deposit for a total of 2520 acres, 1260 acres as six 160 acre placer claims, one 80 acre claim, one 40 acre claim and nine 20 acre State leases cover the limestone-shale deposit whereas six 160 acre placer claims cover the clay deposit.

All placer claims are in good legal order with the necessary annual assessment work up to date. These claims are held by right of location and were staked prior to the Minerals Leasing Act of August 13, 1954. The State Leases are all valid and do not expire until the year 1975 or later.

Owners of the property and Leases are Mr. A. C. Haigler, etal, Phoenix, Arizona.

LOCATION and FACILITIES

The Limestone-Shale deposit is three miles east of Dragoon which in turn is 65 miles southeasterly from Tucson and 20 miles southwesterly from Wilcox, both towns being on the major U. S. Highway connecting one town with the other. Dragoon itself is on the old portion of State Highway 86, a gravel road but well maintained. (See attached Maps.)

The Tucson-ElPaso Branch of the Southern Pacific Railroad passes through the property.

ElPaso Gas and Electric Companys' 24 and 30 inch natural gas lines from Texas to California pass through the property as does a 66,000 volt REA transmission line.

Culinary water is available at Dragoon but a larger water supply could be developed further east towards Sulphur Springs Valley. Good flows of water in this area have been encountered at a 300 to 400 foot depth by the agricultural developers.

Local and long distance telephone service through the Benson, Arizona exchange is available from all points in the Dragoon area.

GEOLOGY

Except for a small area of Quaternary sand and gravel in the gap between the Gunnison Hills and the Dragoon Mountains the Carboniferous sediments outcrop abundantly over the entire property. In Particular, the Escabrosa Limestone member is almost 100% pure and is credited with a thickness of some 330 feet but apparently is much thicker in this area.

Portions of the Escabrosa limestone member have been marblized but such conditions are localized near the contact with the Cretaceous igneous intrusions exhibited in the area.

LIMESTONE DEPOSIT

The Limestone member is exceptionally free of alteration and silicification as indicated by the analysis of the samples and is also relatively free of any other detriments to cement manufacture such as magnesium, iron etc. The analysis of several samples is separately provided in the appendix of this report.

Much of the limestone can be classified as "white" as contrasted to the "gray" which is most commonly produced. This characteristic will provide a superior product which can command a higher market price.

One quarter mile north of the railroad in Section 15, limestone outcrops above the valley gravels and rises quite rapidly exposing approximately 400 vertical feet of limestone which dips 25 to 30 degrees to the north.

Tonnage-wise, there is little doubt that sufficient material exists within the property limits to provide a plant with raw materials for many years. The exposures alone on three quarters of Section 15, closest to the railroad, contain some 200,000,000 tons of limestone or approximately one billion barrels of cement. This volume only considers that portion exposed above the valley gravels. Four vertical diamond drill holes near the gravel limits penetrated and bottomed in limestone. Total depths of the holes varied from 120 to 150 feet and the character of the limestone intersected was similar to that exposed on the surface within the property limits. (see map for location of drill holes.)

CLAY DEPOSIT

The clay property included in the "unitization" is in Sulphur Springs Valley, adjacent to the Railroad and nine miles distant over a well maintained road, thus transportation of the material to the cement plant site can either be by truck or railroad.

This property has been established and partially developed as a suitable admixture clay deposit by six wide spaced "2 inch" diameter auger holes to a depth of 12 feet. This development indicates ample clay for any requirements demanded by the plant capacity and its suitability would be determined in any and all tests of the total aggregate in cement production. The occurrence of this material lies in an ancient dry lake in Sulphur Springs Valley. (See attached Map) (See Sample data Sheet)

SHALE DEPOSIT

Shale beds of varying thicknesses are exposed in various places within the property. Principal occurrences are on the eastern edge of the property in Section 14. and the ground is covered by State Leases. (See assay data sheet for results of two shale samples.)

MINING

Low cost mining can be accomplished very easily for the limestone, shale and clay products. Little to no stripping of over-burden would be required. Mining of the limestone can be accomplished by a shovel-truck operation with very short hauls, $\frac{1}{2}$ to 1 mile, mining of the shale and clay can be accomplished by front end loader-truck operation with very short hauls, $\frac{1}{2}$ to 1 mile for the shale and nine miles for the clay. All mining for many years to come would be north and above the present gravel contact and all loads for the limestone and shale would have favorable down-grades.

The limestone is of fine grained character, being fractured sufficiently to permit good fragmentation by inexpensive blasting methods.

Respectfully submitted,

R. E. Mieritz, Reg'd. Eng.
Phoenix, Arizona

September 1, 1959



SAMPLE ASSAY DATA

Sample Descriptions	CaO	Ignition	Total	SiO ₂	R ₂ O ₃ Fe, Al.	MgO
	%	Loss %	%	%	%	%
<u>LIMESTONE SAMPLES</u>						
Surface, State Lease, Sec. 16	53.48	41.11	94.59	3.48	1.10	0.81
Outcrop, Main Hill, NW edge, Sec. 15.	51.08	40.65	91.73	6.08	0.16	0.68
Outcrop, Main Hill, South Center, Sec. 15	54.60	42.24	96.84	2.30	0.80	0.36
Outcrop, SE part Main Hill, Sec. 15	54.66	42.35	97.01	2.68	0.30	0.36
Marble Quarry, Sec. 22	53.76	41.82	95.58	2.90	0.90	0.47
Shaft Dump. Sec. 15	53.75	42.05	95.80	2.80	0.80	0.66
South Claim, Sec. 23	52.64	40.17	92.81	5.44	0.96	0.20
Composite, Pieces from various parts of property	55.64	43.35	98.99	0.68	0.23	0.06
<u>SHALE SAMPLES</u>						
Tunnel # 1, Sec. 14	SO ₃ 0.00 19.21	17.35	Alk'ds Chlor. 1.10	41.70	18.52	1.98
Tunnel # 2, Sec. 14	0.00 40.65	33.70	0.10	19.06	5.02	1.63
<u>CLAY SAMPLE</u>						
Sample from clay deposit	0.58 9.07	15.75	8.75	43.90	19.90	1.95

AN
INFORMATIVE REPORT
on the
HAIGLER LIMESTONE DEPOSIT
in the
DRAGOON AREA
COCHISE COUNTY, ARIZONA
by

Richard E. Mieritz
Registered
CONSULTING MINING ENGINEER
Phoenix, Arizona

January 23, 1961

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Sample Assay Data Sheet

Plate 1-Cement Plants
Plate 2-Regional Geology
Plate 3-General Surface Map
Plate 4-General Surface Map-Includes section.

Composite Drill Log, Hole 1
Composite Drill Log, Hole 2
Composite Drill Log, Hole 3
Composite Drill Log, Hole 4
Composite Drill Log, Hole 5

INTRODUCTION

At the request of Mr. A. L. Goodmon, Trustee of the Haigler Trust, the following report has been prepared to acquaint the reader with such data and information relating to the feasibility of producing and marketing portland cement in Arizona by utilizing the local available raw materials from the property known as Haiglers Limestone located near Dagoon, Arizona where the raw materials are of excellent purity, exhibit sufficient quantity and have the necessary utility facilities on the property. (See Map or Plate I, Cement Plants).

CONCLUSIONS

The writer having visited the property on several occasions and examined same, concludes the following:

(1)- The Haigler Limestone and Clay deposits herein described possess all the necessary quantities and qualities required for excellent manufacture of cement as well as having the required facilities of water, natural gas, power and transportation within easy reach of the property.

(2)- Limestone, 95% CaCO_3 or better, of light to white character with approximately 1% MgO is available from the property in quantity in excess of 100 million tons while the reserves of the clay deposit exceed 50 million tons and which has the proper distribution of the necessary minerals to produce an excellent cement.

(3)- A "market" report prepared by any of the well recognized specialists in that field, I am sure, will substan-

iate the writers statements as to the potential market for the product. A third cement plant in Arizona is amply justified.

(4)- Haiglers Limestone deposit has been examined and reported upon by several Engineers of cement manufacture prominence as well as Engineers of Mines; - Messrs O. L. McCain, S. Rordan, Cement Chemists, Christie Mitchell and J. Fred Johnson, Mining Engineers, Jack Sayre, etc. All whom have experienced a visit to the property acclaim their highest regard for the deposits, their purity, the extensiveness and conveniences.

ARIZONA'S CEMENT PRODUCTION & MARKET

Although Arizona has two producing cement plants, Rillito and Clarkdale, both related to American Cement, produce an aggregate of 3.5 million barrels cement annually, there is ample justification and need for more and better quality cement production in the State.

Much cement is being shipped into the State from California, New Mexico and Texas.

The unusual, increasing but steady growth of Arizona has made great demands on the construction materials industry and such demands should continue for a long period of time. Further demands will be made on the industry by the proposed National Highway construction program, Bureau of Reclamation dams, etc.

PROPERTY & OWNERSHIP

The entire property consists of one Limestone-shale de-

posit and one Clay deposit with a total of 2460 acres, 1500 acres as eight 160 acre placer claims, one 40 acre claim and nine 20 acre State Leases cover the Limestone-Shale deposit whereas six 160 acre placer claims cover the Clay deposit.

All placer claims are in good legal order with the necessary annual assesment work up to date. These claims are held by right of location and were staked prior to the Minerals Leasing Act of August 13, 1954. The State Leases are all valid and do not expire until the year 1975 or later.

Owners of the property and Leases are Haiglers Trust, etal, Phoenix, Arizona.

LOCATION and FACILITIES

The Limestone-Shale deposit is three miles east of Dragoon which is 65 miles southeasterly from Tucson and 20 miles southwesterly from Willcox, both towns being on the major U. S. Highway 86 connecting one town with the other. Dragoon itself is on the old portion of State Highway 86, a gravel road but well maintained. (See Plate 3, General Surface Map)

The Tucson-ElPaso Branch of the Southern Pacific Railroad passes through the middle of the property.

El Paso Gas and Electric Companys 24 and 36 inch natural gas lines from Texas to California pass through the property as does a 66,000 volt REA transmission line.

Culinary water is available at Dragoon but a larger water supply could be developed further east towards Sulphur Springs Valley. Good flows of water in this area have been encountered at a 300 to 400 foot depth by the agricultural developers.

Local and long distance telephone service through the Benson

exchange is available from all points in the Dragoon area.

GEOLOGY

Except for a small area of Quaternary sand and gravel in the gap between the Gunnison Hills and the Dragoon Mountains the Carboniferous Sediments outcrop abundantly over the entire property. In particular, the Escabroas Limestone member is almost 100% pure and is credited with a thickness of some 330 feet but apparently is much thicker in this area.

Portions of the Escabrosa limestone member have been marblized but such conditions are localized near the contact with the Cretaceous igneous intrusions exhibited in the area.

LIMESTONE DEPOSIT

The Limestone member is exceptionally free of alteration and silicification as indicated by the analysis of samples and is also relatively free of any other detriments to cement manufacture such as magnesium, iron, etc. The analysis of several samples are separately provided in the Sample Assay Data tabulation following the report.

Much of the limestone when ground to a "fine" state can be classified as "White" as contrasted to the "gray" which is most commonly produced, even though the rock is a blue-gray in its natural state. This characteristic will provide a superior product which can command a higher price market-wise.

One quarter mile north of the railroad in Section 15 and about a similar distance south of the railroad in Section 23, limestone outcrops above the valley gravels and rises quite

rapidly exposing approximately 400 vertical feet of limestone which, in Sec. 15 the dips are 25-30° NE and in Sec. 23 the dips are 15-20° to the South or SSW.

DIAMOND DRILLING

As part of the annual assesment work for several years, five diamond drill holes were drilled. The locations of these holes are shown on Plate 4, General Surface Map.

The location of Drill Hole 1 was chosen by the writer in 1957. Location of subsequent drill holes was left to the judgement of the Sierra Drilling Co. Such locations are not prone to be advantageous to providing information that would benefit the property as a whole, particularly holes 2, 4, and 5. The information obtained from these holes is too local.

Overall core recovery for the five drill holes is not particularly impressive for the type rock that was penetrated. A review of the core shows much grinding has occurred during the drilling operation. The fractured nature of the rock no doubt "blocked" the core barrel quite frequently, requiring short runs, however, drilling operation no doubt continued after the "blocking" occurred, thus, much grinding of the core and only fair recovery. Drill runs are not adequately marked in the core boxes, thus one does not know what depths are represented by the core recovered.

The recovered core for each hole is stored in standard cardboard core boxes and located in Mr. Haiglers garage at 1211 North 1st Street, Phoenix.

To provide some information on the analysis of the lime-

stone at depth, two samples were prepared from Drill Holes 1 and 4. The sample from hole 1 was prepared by splitting the core from depths 50-60 feet and 110-120 feet, combining this material as one composite and assaying. A similar sample from depths 50-60 feet and 120-130 feet in hole 4, combining same as a composite and assaying both samples for CaO , Ignition Loss, MgO , R_2O_3 and SiO_2 . Results of the analyses are indicated on the respective drill logs. The writer suspects that both holes, were they continued in depth another 50 to 100 feet, they would intersect the Cretaceous Granite exposed in the area to the west and the formation which has caused the uplift of the limestone. The increase in silica content thus indicates this thought.

All drill holes were geologically logged by the writer as well as such physical information as hole size, casing, core recovery, etc. Drill logs are included in this report.

Although this sampling represents only a small portion of the core obtained, the writer believes the results to be indicative of the material available particularly so since there is little content variance indicated by the analysis of the surface samples which were taken at wide spaced locations in Sections 15, 16, and 23, the analysis of which are tabulated under Sample Assay Data following the written portion of this report.

RAW MATERIAL SUPPLY

The two major raw materials for cement manufacture are in close proximity and in abundant supply.

Tonnage-wise, there is little doubt that sufficient material exists within the property limits to provide a plant with raw materials for many years. The exposures alone on three quarters of Section 15 contain some 26,000,000 tons of limestone or approximately 60,000,000 barrels of cement. This volume considers only that portion exposed above the valley gravels.

To indicate a minimum potential of limestone within the Haigler property, the writer has calculated the volume of limestone available above an elevation of 4600 feet. This elevation was chosen because it closely approximates the alluvium outline, all material above this contour being exposed limestone.

For support of a tonnage figure, each 50 foot contour at and above the 4600 elevation was successively planimetered to determine the area of concern. The average end method, horizontally, was then used to determine the volume between contours, the summation of which provides a figure of 26,000,000 tons for Sections 14, 15 and 16 and 19,000,000 tons for Section 23 of the property or a total of 45,000,000 tons. This tonnage represents a 108 year supply for a 1,000,000 barrel per year plant. Further, each foot of depth vertically below the 4600 foot elevation for Sections 14, 15, 16 and 23 represents 266,000 tons or 26,600,000 tons for a 100 foot depth.

Combining these tonnage figures provides 71,600,000 tons of limestone which would produce 2,000,000 barrels of cement for 70 years.

SHALE DEPOSIT

Shale beds of varying thicknesses are exposed in several

places within the property. Principal occurrences are on the eastern edge of the property in Section 14 and this ground is covered by State Leases. (See assay data sheet for results of two shale samples.)

CLAY DEPOSIT

The clay property included in the "unitization" is in Sulphur Springs Valley, adjacent to the Railroad and nine miles distant over a well maintained road, thus, transportation of the material to the cement plant site (Section 157) can be either by truck or railroad.

This property has been established and partially developed as a suitable admixture clay deposit by six wide spaced "2 inch" diameter auger holes to a depth of 12 feet, also by two diamond drill holes to 60 foot depths. The development indicates ample clay reserves for any requirements demanded by the cement plant capacity and its suitability would be determined in any and all tests of the total aggregate in cement production. The occurrence of this material lies in an ancient dry lake in Sulphur Springs Valley. (See Plate 3, General Surface Map and Sample Data Sheet.)

MINING

Low cost mining can be accomplished easily for the limestone, shale and clay materials. Little to no stripping of over-burden would be required. Mining of the limestone can be accomplished by a shovel-truck operation with very short hauls, $\frac{1}{2}$ to 1 mile for the limestone; mining of the shale and clay can be accomplished by front end loader-truck combination with

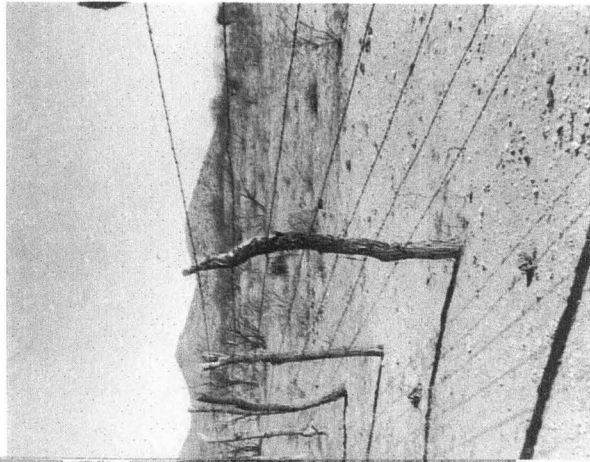
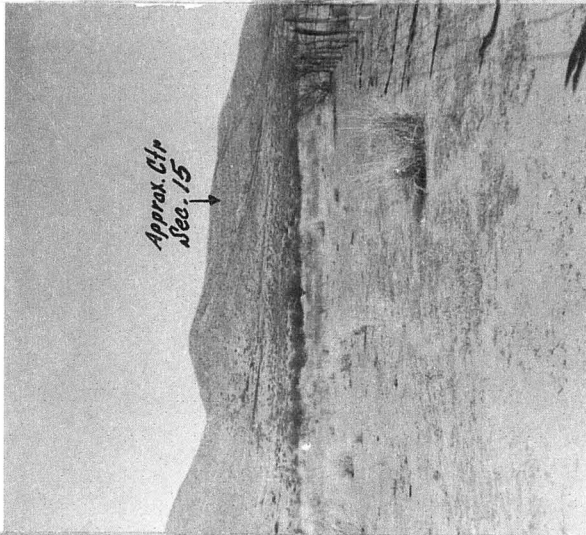
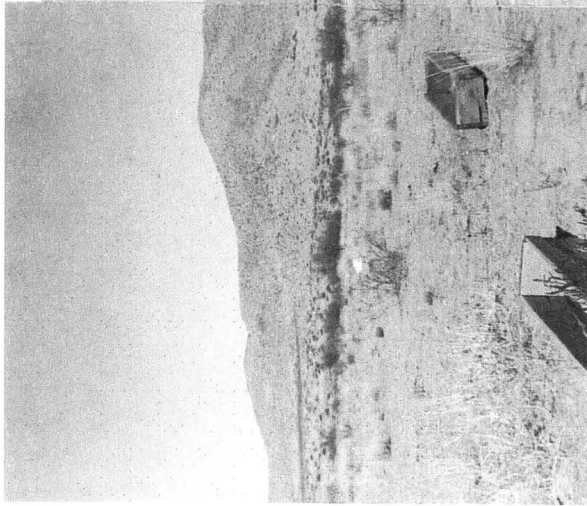
very short hauls, $\frac{1}{2}$ to 1 mile for the shale and nine miles for the clay. All mining for many years to come would be north and above the present gravel contact and all loads for the limestone and shale would have favorable down grades.

The limestone is of medium to fine grained in character, being fractured sufficiently to permit good fragmentation by inexpensive blasting methods. Little secondary blasting would be required.

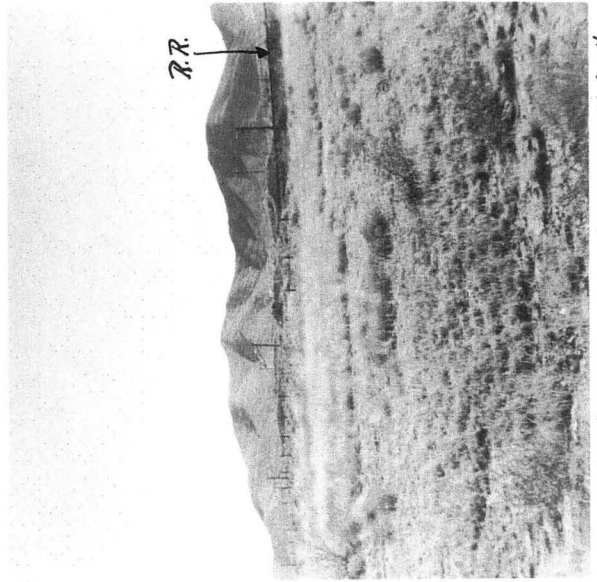
Respectfully submitted,

R. E. Mieritz, Reg'd. Eng.
Phoenix, Arizona

January 23, 1961



Looking NE. from near Windmill near R.R.



Looking SE. toward Sec. 23 - from near Windmill

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 5

COMPANY: Haiglers Trust MINE: Haiglers Limestone CLAIM: Limestone Nº 5 DISTRICT: Cochise
 COUNTY: Cochise STATE: Arizona TWS: 16 S. RGE: 23 E. SEC: 23 N.S. E.W.
 BEARING: Vertical ANGLE: 90° ELEVATION: 4695 FT. T.D.: 80 FT. DATE STARTED: DATE COMP:

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: ———		CORE			MINERAL-IZATION	ASSAYS %		
				CASING: — —	SIZE	RUNS	REC%					
5			Limestone - mostly blue-gray, some tan. Little iron. Some calcite seams & vugs. Core has been extremely groundup - many pebbles - poor job of drilling. Total core recovery was 10 ft of core for 80 ft of drilling or 12% recovery. There were no footage marks in core box to indicate drill runs.		AX							
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15												
20												
25												
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35												
40												
45												
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90	4600		Hole drilled by Sierra Drilling Corp, Mesa, Ariz.									
95												
100												
105												
110												
115												
120												
125												
130												
135												
140												
145												
150			Hole logged by: R.E. Mieritz, Reg'd Eng. Phoenix, Ariz. Jan, 1961									
155												
160												
165												
170												
175												
180												
185												
190												
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290												
295												
300												

20
40
80

No. #2

0 BX

5 4.0

10 } 5.0

15 }

20 } 10.0

25 }

30 }

35 }

40 } 9.8

45 } 4.2

50 9.6

55 }

60 }

65 } 10.0

70 }

75 }

80 }

85 }

90 }

95 }

100 }

105 }

110 }

115 }

120 }

125 }

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195 }

200 }

Blue gray - calcite seams & frags. some
yellow - limonite

28 - 1' shale - some specks lim aft py. some magenta

32 shale - reddish brown - horizontal fine gr.

fine grain

42 - 48 shale

Broken ground.

Dense blue-gray lim.

Little calcite, little lim.

No. 5

10 feet core for 80 feet of cutting AX size -
many marbles. - Blue gray mostly - some tan -
fine to med grained chert-like. Little Fe (yell.)
some calcite frags. seams.

#5 located 500 feet N of #4 & 15' lower -
making 140 feet lower than bottom of #4.

Hole # 4. 140 ft depth -			200 feet north of # 2 - 25' lower in elevation. Dip 25' to 100' low collar of 4 in bottom of # 2 hole.
0		BX Blue lime	30° dip at 2' Strongly fac. throughout
5	3.2		
10	3.5		calcite lugs at 10' Fe stain
15	4.8		22° dip at 15 at wh-blue contact.
18	1.5		
25	2.2		
30	2.9		Light tan to br - thin strings of shale at 30'
35	3.8		speckled Fe 5 to 10 mm.
40	4.5		tan to br 36 to 38 marked slightly
43	1.6		17° @ 37'
45	2.0		shale strings @ 38' speckles him after 40'
50	3.3		calcite lug at 42' blue gray lime @ 42'
55	4.6		
60	4.0		3 to 4 mm lime 1/2 to 1" shale same calcite strings
65	5.8		basically solid
75	5.3		blue-gray lime
79	3.9	AX	
85	5.8		@ 82 - 4" shale & mud near. Red
90	4.0		blue gray lime - small conc brown gray 90-130
95	4.0		shaly fracture - dips about 40° small lugs
100	4.0		calcite & some small water concs
105	4.0		finer grain in some places
110	3.5		
115	3.5		
120	5.0		
125	4.8		
130	4.8		
135	4.0		blue gray - light Fe of limonite
140	4.0		with calcite seams or rings.

[illegible]

ARC LABORATORIES

Division of Arizona Research Consultants, Inc.

9236 NORTH 10TH AVE.

PHOENIX 21, ARIZONA

WINDSOR 3-3573

RESULTS

SAMPLE NO.	YOUR SMP. NO.	CaO	CaCO ₃	SiO ₂	Total
11884	1127	50.0%	89.3%	7.25%	97.0
11885	1128	49.2%	87.8%	10.2%	98.0
11886	1129	38.2%	68.2%	23.3%	98.5
11887	1131	51.9%	92.6%	5.42%	98.0
11888	1132	46.6%	83.2%	8.31%	91.5

July 19, 1972

AFFILIATIONS

TRUESDAIL LABORATORIES, INC.

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.

VALLEY LABORATORIES, INC.

American Association for the Advancement of Science, American Chemical Society, American Institute of Mining, Metallurgical and Petroleum Engineers, Association of Official Racing Chemists, American Society of Agronomy, American Society for Testing Materials, American Water Works Association, Soil Science Society of America, Western Society of Soil Science, American Oil Chemists Society, American Concrete Institute

AN INFORMATIVE REPORT

of the

LIGIER MARBLE PROPERTY

near

DRAGOON, COCHISE COUNTY, ARIZONA

by

Richard E. Mieritz, P. E.
Consulting Engineer
Phoenix, Arizona

March 5, 1958

INTRODUCTION

This report has been prepared by the writer as an informative survey of the Ligier Marble Deposit located near Dragoon, Cochise County, Arizona. Quality-wise, volume-wise and accessibility-wise this property is very attractive as a substantial producer of fine quality marble for many years to come.

The writer personally examined the area and the property and the information contained herein is the fact finding result of that investigation.

AIM & SCOPE OF POSSIBLE PRODUCER

The Ligier Marble property is one that can not be satisfactorily operated on a small custom basis but is one that merits and warrants large scale production by a well financed organization with quarry and mass production "know-how". Such a corporation must be willing to purchase the property and must be financially able to equip an operation with the necessary quarry and processing equipment to produce upwards of 600 cubic feet daily of finished material. The corporation must also be well organized with a marketing force for distribution of the final product.

These are not simple tasks.

LOCATION & FACILITIES

A location of a property and facilities available to an operation are major factors which contribute to or distract from a property potential when reviewed by an interested party.

The Ligier Marble property is located three miles east of Dragoon, Cochise County, Arizona. Dragoon is a small railroad-rancher community on the Southern Pacific Railroad servicing El Paso, Texas to the east and Tucson, Phoenix and California to the west. This railroad crosses the northern portion of 40 acres on which the present small processing plant is located. A rail siding is available at Dragoon.

Another ideal situation is represented by the fact that the Sulphur Springs Valley Electric Corporation has a 4400 volt transmission line which passes through the same 40 acre process plant site.

A third ideal feature is the very close proximity (1000 feet at most) of the Southern Pacific's gas lines which could

be tapped if the need for this service arose.

Culinary water is presently available at Dragoon. The small limited water demand required for quarrying and processing could be hauled or piped from Dragoon or a supply developed near the property by drilling a 300 to 600 foot well. A pipeline from Dragoon to the property would be gravity flow.

Travel from the property by truck or auto to the west is over six miles of well maintained graveled road which joins paved State Hiway 86 at Texas Canyon whence to Tucson for 60 odd miles. Easterly, travel is over six miles of well maintained graveled road to the north-south paved U. S. Highway 666 which passes through Wilcox and Douglas, Arizona.

Although the property has an elevation range of 4500 to 5000 feet, it is amenable to all year operation. Freezing winter temperatures will not interfere with operation except perhaps on occasion. Because of its elevation, summer temperatures would not be excessive as is the case in nearby desert valleys.

PROPERTY

The Ligier Marble property contains in excess of 2000 acres of State Leases, Federal Leases, private leases and privately owned parcels. A legality check was made by the writer and all appear in good order. A legal description of the parcels follow. (See included map).

<u>Federal Leases</u>	<u>Acres</u>
<u>T. 16. S., R. 23 E.</u>	
Section 9 - NE/4	160
Section 26 - Complete Section	640
Section 27 - N/2 and SE/4	480
Section 28 - SE/4 and S/2, S/2, SW/4	200
Section 33 - W/2, NE/4; NE/4, SW/4; and W/2, SE/4	200
Section 35 - N/2, N/2, NW/4	40
 <u>T. 17 S., R. 23 E.</u>	
Section 28 - W/2, NE/4	80
 <u>State Leases</u>	
<u>T. 16 S., R. 23 E.</u>	
Section 10 - W/2, SE/4 and NE/4, NW/4	120
 <u>Private Lease</u>	
<u>T. 16 S., R. 23 E.</u>	
Section 33 - Legal description not known	160
 <u>Commercial Purchase</u>	
<u>T. 16 S., R. 23 E.</u>	
Section 22 - NE/4, NW/4- Process Plant Site	40
 Total Acreage	2120

A second property owner in the area is A. C. Haigler, et al, who have some 1300 acres of limestone which is being considered as cement material. Production of a very white cement has been proven using material from this property.

PRODUCTION & DEVELOPMENT

Mr. Ligier attempted to operate the property as a producer of slab, block etc, however, the last few years his production has been limited to several colored Terrazzo products among which are white, pink, cream, tan and green. Each color is neatly sacked and shipped to market.

Production of large dimension blocks, table and counter tops, building facing etc. was hampered by a financial condition which did not permit expansion through equipment purchases. Moreover, most of his production was custom work which required his personal attention and lack of experienced quarry labor added to his grief. Thus, his unavoidable neglected attention to the marketing of the product soon brought failure of the "one" man operation.

The present Terrazzo production provides a comfortable income to Mr. Ligier. Through operation on this scale he eliminates all "headaches" of refined quarrying, breakage, polishing, etc.

Several small quarries have been opened on the property from which the various colored material has been obtained to produce the Terrazzo. Coloring of the marble is attributed to varying amounts of iron oxide. The bulk of the marble material is of a pure white color.

GEOLOGY

General geology of the area is relatively simple. The Carboniferous Redwall and related limestones have been gently uplifted by the underlying Cretaceous igneous rocks of granite and monzonite.

The Dragoon mountains and the smaller Gunnison hills to the north are the result of this uplifting and subsequent erosion. This gentle uplift has not caused excessive stresses and the resulting fractures. Lack of fractures permits quarrying of large size blocks and slabs and would keep waste to a minimum. Elevation-wise, a 2000 foot thickness of the Carboniferous sediments is exposed.

Purity of the Carboniferous limestone exposed in this area is indicated by the following analysis of samples taken

at random locations within the limits of Haiglers cement property. These samples were analysed to determine the quality of the limestone as a raw material for manufacturing cement. The analysis do however indicate the purity of the material.

Sample	CaO	Ignition loss, CO ₂	Total	SiO ₂	Fe, Al R ₂ O ₃	MgO
Sec. 16-outcrop	53.48	41.11	94.59	3.48	1.10	0.81
Sec. 15-NW/4	51.08	40.65	91.73	6.08	0.16	0.68
Sec. 15-Center	54.60	42.24	96.84	2.30	0.80	0.36
Sec. 15-SE/4	54.66	42.35	97.01	2.68	0.30	0.36
Sec. 22-Marble	53.76	41.82	95.58	2.90	0.90	0.47
Sec. 14- Dump	53.75	42.05	97.80	2.80	0.80	0.66
Sec. 23-N/2	52.64	40.17	92.81	5.44	0.96	0.20
Composite	55.64	43.35	98.99	0.68	0.23	0.06

MARBLE QUALITY

The Carboniferous limestone exposed in this area is relatively free of foreign minerals which would tend towards discoloration of the normally white limestone. Where such scattered localizations do occur, marble products having hues of pink, tan, cream, etc are to be expected. These areas are the exceptions and are currently being quarried by Ligier for his Terrazzo production which he sells for \$24.00 per ton.

The white marble, which ofcourse is the most important, is wide spread and can be quarried in large size blocks for block or slab production. A fine grained even textured metamorphosed crystallization makes this marble very receptive to a high polish.

Inspection of the white marble using a 10 power glass shows minute grains of limestone which through metamorphism have intergrown with each other to form a compact homogenous mass. A fresh broken face will show the fracture to break through the grains, rather than around them. This feature thus exposes many small grain faces which reflect light and brings about the "sparkly" or "sugary" effect common to good marble.

The marble is not porous, consequently any polished surface will be void of pits.

Since metamorphism has taken place, much of the original bedding has been destroyed, and converted the marble to a massive appearing formation. Planes of weakness may be present along the original bedding planes but distinguishing such features must be left to the experienced quarry man. Original bedding planes are in some instances crudely identified by discoloration.

A normal breaking of the marble by an impact blow produces fractures of concave contours.

Lack of intense cross-bed fracturing of the formation will reduce the amount of waste resulting from large block production. Where such fracturing does occur, it may be used to great advantage in quarrying practice.

All these salient features tend to make this marble equal to or better than the well known Italian white marble according to the experts in the marble field.

RESERVES

To attempt an estimate of reserves would be fool-hardy, however, to present some idea as to the potential, the writer believes that a 2 to 4,000,000 cubic foot yearly production of a marketable product could be maintained for a forty year period or longer. Each acre of property is potential.

MARKETING

Because of its equal to the Italian marble, the market for this marble becomes universal in scope. Marble used in Arizona and New Mexico building construction must be imported from the States of California or Virginia. That which is brought in from California is of mediocre grade.

CONCLUSIONS

Although not an expert of building stone, the writer believes the Ligier Marble property has a potential of excellent grade marble which must be developed and produced by a corporation well versed in marble quarry production know-how and that this potential is of long life which would provide adequate profit and return of capital investment for the producer.

The operator must also be familiar with the marketing of the product but with the present trend and interest in marble for the building industry and the decorative industry, the marketing should be less difficult.

Respectfully submitted,

Richard E. Mieritz
Richard E. Mieritz, P.E.
Consulting Engineer
Phoenix, Arizona

March 5, 1958



*221 23rd Avenue
Phoenix
Arthur Goodman*

*Douglas Block -
Patto Canyon Whiffles
Sec-13-14-15-16-17-18
36 Davis 8-9-10-11
T. 15-12E*

INFORMATIVE REPORT
on the
HAIGLER LIMESTONE DEPOSIT²⁴
and
LIGIER MARBLE DEPOSIT
in the
DRAGON AREA ⁽¹²⁾
COCHISE COUNTY, ARIZONA²⁴

by

Registered Richard E. Mieritz⁹
Consulting Engineer
Phoenix, Arizona

February, 1958

INTRODUCTION

^{brief} This report has been prepared to ^{present} acquaint the reader with ~~facts~~ factual data and ~~figures~~ relating to the feasibility and necessity of expanding cement production in the State of Arizona ~~and neighboring States~~ ^{for Arizona and neighboring} State ~~markets~~.

^{general} Only ~~facts and figures of greater importance are herein included, more detailed~~ MARKET GROWTH ^{information being available if visible} ~~desired.~~

The ^{visible} increasing growth and popularity of the Southwest area of the United States as a manufacturing center and a permanent likeable livable ~~pbode~~ has consistantly, these past few years, made successively larger demands on the supplies of building and construction materials. One of the materials now in great demand is cement. Further demands will be made on this material as our ~~National~~ Highway construction program gets under way and still further demands ~~within a year or so~~ when the much talked about and welcomed Glen Canyon Dam starts to become a reality. The estimated cement demands for the dam are 10 million barrels annually over a five year period. ^{As second material in new} ~~indemand is marble - chips & slabs.~~

Year round ^{pleasant} ~~wonderful~~ climatic conditions in Arizona, Southeastern California and ~~the Western half of~~ New Mexico has in the last few years attracted many people ~~who were~~ desirous of more econci~~cal~~, comfortable and leisure living. Industry has also continued the trend with its several ^{and small parts} electronic ^{area of} plants etc. What once was ~~pre-~~ ~~marily~~ an agricultural ~~area~~ is now giving way to the many industries ~~which are~~ being moved to the area and the people, -- employee resources. ^{Much more industry is anticipated.} Those persons in the know on ~~growth~~ matters of city growth take a very optimistic view of the future for many years to come. ^{All these conditions point to a continued growth requiring increased demands for construction materials - in particular - cement.} ^{Present Supply.}

The State of Arizona has but one cement plant with an annual production of 2½ million barrels ~~the~~ The location of cement plants

currently supplying the required demand in the State of Arizona are indicated on the included map. Shipments coming into the State ^{from both east & west} are visible on the trains and highways.

Another cement plant in Arizona is definitely a "must" and promises to be a profitable venture for the organization with sufficient foresight for the industry and its potentials.

~~#####
the requirements of the stone cement raw materials,#####~~

~~#####~~ Arizona geology does not exhibit widespread sedimentary formations applicable to the manufacture of cement. Cement plant locations are therefore limited. Moreover, the lack of fuel, power and transportation facilities place still further restrictions on the plant location because of the excessive expenditure to bring the facilities to the location. It is therefore a rare occasion ~~when~~ ^{when} the required facilities are available on the property ^{which could} ~~supplying~~ the raw materials for cement manufacture ^{and still more rare} particularly when the property enhances an excellent grade of such raw material. ^{This report concerns a rare, namely, Haiglers} ~~as does the Haigler Limestone, which this report is~~ ^{Shale, Haiglers Limestone-Marble properties.} ~~limestone property.~~ of prime concern.

Acknowledgments

PROPERTY and OWNERSHIP

Two mineral properties of concern have been "unitized" as one package because of their adjacent position and close relationship of their end products. Haiglers Limestone-Shale acreage bears the major importance while Ligiers Marble-Limestone acreage has secondary importance to the manufacture of cement but in its own light of ^{it carries} Marble production ~~it has~~ prime importance.

Both properties are held by Placer Claim right of location, having been claimed prior to the ~~Minerals Leasing~~ ^{be} Minerals Leasing Act of August 13, 1954, and by State or Government Leases. All claims to ownership are valid, and can ^{be} readily checked legalwise. ^{The writer has completed a preliminary but thorough search.}

The owners are Mr. A. C. Haigler, Phoenix, Arizona, and Mr. B. Ligier, Dagoon, Arizona. ~~Mr. Charles G. Storie, P.O. Box 123~~

~~San Bernardino, California currently enjoys the option on these~~
~~and has been responsible for maintenance~~
~~properties and is responsible for utilization, much time, effort,~~
~~and expenses have been assumed by Mr. Storie in this operation.~~

~~Each factual data and information herein contained has been~~
~~considerable factual data and information herein contained has been~~
~~provided by many acquainted with the properties~~
~~provided by Mr. Storie. The writer has personally checked the data~~
by a physical examination of the properties ~~#####~~ and can
therefore vouch for ~~its~~ ^{the} validity.

~~Haigler Limestone-Shale acreage comprises the legally described~~
~~Placer Claims and State Leases.~~

An addendum between maps 1 and 2 provide the legal descriptions of the Haigler Limestone-Shale acreage (2220 acres) and Ligiers Marble-Limestone acreage (2000) acres). The properties are also indicated on ~~###~~ Map 2, ~~succeeding these~~ pages.

LOCATION and FACILITIES

The limestone-shale-marble deposits lie two miles east of Dragoon which in turn is sixty-five miles southeasterly from Tucson and twenty-five miles southwesterly of Wilcox, both towns being on ~~###~~ ^{15 + 1000} major U. S. highways connecting one town with the other. the old portion of - ~~admitted map out~~ Dragoon itself is on State Highway 86, well maintained, however. ^(see map)

The Tucson-El Paso Branch of the Southern Pacific Railroad passes through the property.

El Paso Gas and Electric Company's ^{and #410} #24 and 30 inch natural gas lines from Texas to California pass through the property as does a 66,000 volt R. E. A. transmission line.

Culinary water is presently available at Dragoon ^{but} and a larger water supply could be developed ^{further east towards} Sulphur Springs Valley, ^{water has been} ~~a short~~ ^{in the area} Good flows of water have been encountered at a 300-400 foot depth by ~~the agricultural developers.~~

Local and long distance telephone service through the Benson exchange is available from all points in the Dragoon area.

Ample labor would become available from, Benson, Wilcox and Dragoon.

It is apparent that no large expenditures for facilities would be required for establishment of this ^{Cement Plant} enterprise of a cement ~~plant~~ on this deposit.

GEOLOGY

Except for a small area of Quaternary sand and gravel in the gap between the Gunnison Hills and the Dragoon Mountains, ^{both} ~~both~~ properties ^{is situated} enhance the Carboniferous sediments which outcrop abundantly over much of the property. In particular, the Escabrosa limestone is almost of 100% purity, and is credited with a thickness of some 330 feet but apparently is much thicker in this area.

Portions of the Escabrosa limestone member of the Carboniferous sediments have been marblized. This is ^{specifically} ~~particularly~~ true ~~for~~ ^{for} the western portion of the Ligier property which is currently under ^{for its terrazzo and slab products} production by Mr. Ligier.

LIMESTONE DEPOSIT

The limestone member is exceptionally free from alteration and silicification and as indicated by the analysis of the samples taken ^{also} is relatively free of any other detriments to cement manufacture such as magnesium, ~~iron~~ ^{sulphates} etc. The analysis of samples is separately provided in the appendix of this report.

One quarter mile north of the railroad ^{in section 15,} ~~the~~ limestone outcrops above the valley gravels and rises quite rapidly exposing approximately 400 vertical feet of limestone which dips 30 to 35 degrees to the north.

Tonnage-wise, there is little doubt that sufficient material exists within the property limits to provide a plant for many years.

The exposures alone on three quarters of section 15, closest to the railroad, contain some 400,000,000 tons or approximately ^{2,000,000,000} ~~1,000,000,000~~ ^{1 billion} exposed

barrels of cement. This volume considers only that portion ^{from} ~~above~~ the valley gravels. One drill hole ~~#####~~ near the gravel limits ^{and 1/4 mile south of the section center,} penetrated the limestone for 120 feet.

^(See map for location) 120 feet of limestone the character of which was similar to that exposed on the surface within the property limits.

Much of the limestone can be classified as "white" as contrasted to the "gray" which is most commonly produced. This characteristic will provide a superior product which can command a higher price.

200 values

CLAY
~~SHALE~~ DEPOSIT

The clay property included in the "unitization" is in the Sulphur Springs Valley, adjacent to the Railroad and nine miles ^{over a well maintained} by road from the Limestone property.

This ~~deposit~~ ^{property} has been established and partially developed as a suitable admixture clay deposit by ^{six} wide spaced 2" ~~four~~ diameter auger holes to a depth of 12 feet. ~~The~~ developement indicates ample clay for any requirements demanded by the plant capacity and its suitability would be determined in any and all tests of the total aggregate in cement production. The occurrence of this material lies in an ancient dry lake in Sulphur Springs Valley. (See Map)

MARBLE DEPOSIT

Ligiers' marble deposit contains white and varied colored marble of exceptional quality, being compared with the finest from Italy and is so written up in some of the Trade Journals. Lack of funds prevents Mr. Ligier from expanding his present limited operation of terrazo.

With proper equipment and quarry knowledge, production of this property for its marble promises to be a very profitable venture. A rough estimate of \$300,000 for the necessary equipment and operating capital would be required to put the property on ~~###~~ a handsomely paying basis. The market is nation-wide.

Mr. Ligier has many inquires for products of various sizes for home and office construction and furniture applications. All in all, a nice industry could be available here.

This property also contains much limestone ~~at~~ the purity of which should compare favorably with that of the material on Haiglers property. It is estimated that a

Shale also occurs within the limestone deposit and as indicated by the three shale-clay samples.

MINING

expensive
No mining problem ^{would be} is involved and the operation can be completed by the cheapest method possible. To illustrate the simplicity and from quarry to portation ~~##~~ the plant can be by conveyor system since the most logical place ^{ment} for the plant is the southwest corner of Section 15. *All mining for many years to come would be above the gravel contact.*
The limestone is ~~not of massive~~ ^{of fine grained} character, being fractured sufficiently to permit good fragmentation by inexpensive blasting methods, consequently bearing a direct relation to an inexpensive production.

ESTIMATED COSTS AND PROFITS

The writer does not profess to be absolutely right on the following presentation of the cost and profit figures ^{because such cost figures are somewhat difficult to obtain} but they ^{would} be indicative of same.

A most recent construction cost figure as provided by one of the leading manufacturers of such equipment indicates that a ~~2~~ million and a half barrel annual capacity plant ~~#####~~ can be estimated at \$5.80 a barrel, or approximately \$9,000,000 for its construction and installation. It was also indicated this figure could be shaded because of the purity of the limestone with which we are concerned. A larger capacity plant would reduce the cost per barrel since a two and a half million barrel capacity would approach \$9,000,000.

Operating costs are ^{will be lower costs for} extremely difficult to obtain but indications are that \$2.50 per barrel for mining, treatment, overhead, interest ^{royalty and it is thought to be low} etc. is well above an operating cost for this property. *Since a mining cost should not exceed 20 cents a barrel.*

Current price for a barrel of cement FOB is \$4.50, consequently
A profit of \$2.00 per barrel is indicated. ^{such} Since the This possible profit could possibly return the capital investment within a three year period.

One needs only to review Moodys Index on Cement plants to realize the earning capacities of this industry.

Plant Location

16 " " " " agree. for sub of cont. Nov. 8. 1935 13 135 - Page 416 Ser 16-T-15-5 R. 24-5

St. Vincent Land Co. Feb. 11, 1956 B. 140 Page 591 - *given to garden*
Bill Patch Land & Water Co. Discussion Re 'Lease & Purchase Feb 11, 1956. B. 140 P 592

c.c. H. Notice of Default July 12, 1956 B 149 P. 484 Sunday Spring Claim
see sec 16-T-15-S

" " " " July 12, 1956 B 149 P. 486 R 24-E. see 25-T-21-S

Herbert H. Cox Agreement Dec. 23, 1957 B180 P490 See agreement 3-4-5
B68

(8.) $\text{Book } 135 - 140 \cdot \frac{2}{149} - \frac{2}{180}$

335 - Agreement - 4th Nov. 1955 - Single-will - same - Cox - \$50,000.00 - All surviving
any claims ^{all} State & fed claims (Writs claims) 16 Forrester #7 - First Claim
to be paid out of profits. 10/2.504
22

#13 - agreement to buy ~~all~~ more daisies @ \$50.00 each. - all Sec 15
(box - stone)

416 - Purchase of clay clams - \$10,000.00 pd. by profits 11-4-55
 Mtd to assessment (Kaiser)

591 - Offer to purchase - 11-16-55 Stone Highline Co. - to Bill Patch land and water
Calif. - \$40,000 Co. 40,000 Highline undisclosed to Stone - E/2 Sec 16 - 15 & 24
all of property. N/2 Sec 23 - 16 & 23.

596. Ltr to - 11-29-55 to Ligin. advising Ligin of sale - introducing Patch to Ligin

484 - notices of default. 4-1-56 ~~steno to do~~ / Hargler to - steno $\frac{1}{2}$ dof, portion of prop.
486 - Invoice - continue of Bishop.

490 - Argument ^{to show} higher property not less than \$500,000 Wright 6/35th.
8-10-56 -

Laguer

Ligier

Not much time to talk last nite -
deliver Property free and clear?

Good legal descriptions?

No commitments on property - we don't want to interfere.

Acres -

any State leases.

any Federal leases.

How much ^{will you take} are we ~~End~~ talking about - Purchase price? - ~~5 figures - 6 or what~~

down -

Payout

D. G. Ligier

J 96 - 2571
gariger

Benson



MINE _____ LOCATION _____ LEVEL _____
GEOLOGY BY _____ SURVEY _____ SCALE _____ DATE _____

Limestone Composites

CaO	Ignition loss	Total	SiO ₂	Fe-Oxide	MgO	Al ₂ O ₃	SO ₃	
53.48	41.11	94.59	3.48	1.10	0.81			#4 Normal limestone west of Glenview.
51.08	40.65	91.73	6.08	0.16	0.08			#5 New edge main hill.
54.60	42.24	96.84	2.30	0.80	0.36			#6 South Center main hill.
54.16	42.35	97.01	2.68	0.30	0.36			#7 S.E. Part of main body.
53.76	44.82	95.88	2.90	0.90	0.47			#11 Marble Quarry.
53.75	42.05	97.80	2.80	0.80	0.66			#12 Soft clay comp.
52.64	40.17	92.81	5.44	0.96	0.20			#13 South Quarry.
55.44	43.35	98.99	.68	.23	.06	.06		#14 Random Composite
19.21	17.25		44.70	18.52	1.98	1.10	0.0	#8 - Shale #1 Tunnel.
40.65	23.70		19.06	5.02	1.63	0.10	0.0	#9 - " #2 Tunnel.
9.07	15.75		43.90	19.90	1.95	8.75	0.58	#10 - clay slick.

\$-750,000 -

20% cash -

80% stock -

60,000 down

will supply Stanford
rept. \$10,000

Limestone Marble

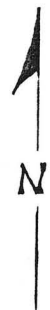
5000 - \$4.00 to mine - sell
\$20.00 - 15" x 30"

Turnage - 10.5 cubic ft
sell \$2400

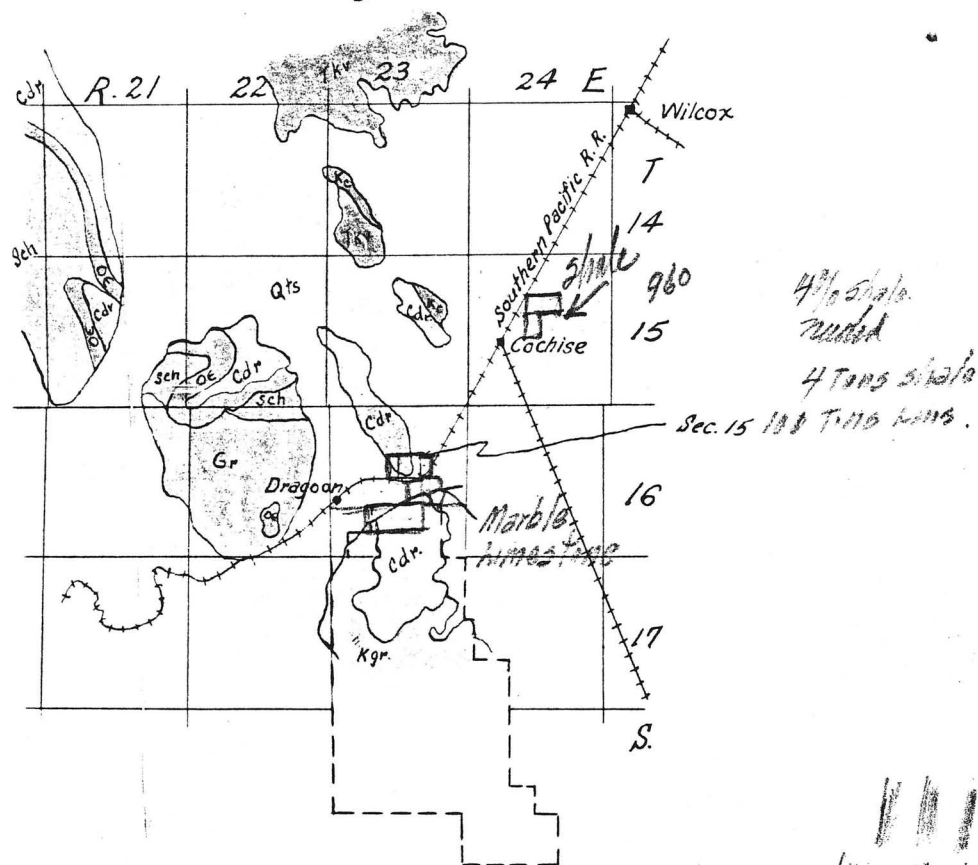
Charles G. Storie

Turner 7-5155

San Bernardino, Calif



Cochise County, Arizona



LEGEND

Sedimentary Rocks

- Qts - Quaternary Sand, gravel, conglomerate.
- Kc - Cretaceous-Shale, Sandstone, Limestone.
- Cdr - Carboniferous-Redwall & related Limestones.
- OE - Ordovician-Abrigo & related Limestones.
- Sch - Arkean Schist.

Igneous Rocks

- Tkv - Tertiary volcanic rocks
- Kgr - Cretaceous Granite, monzonite, etc.
- Gr - Pre-Cambrian Granite.

NOTE

The geological information has been traced from the Geologic Map of the State of Arizona, prepared by the Arizona Bureau of Mines in cooperation with U.S. Geol. Sur.

Scale - 1" = 8 mi.

July, 1957

R.E. Mieritz

D. L. Ligin - Ruth 1 - Golden Rule - 172 - 509 to 515 ✓ hole

Black Horse 10-16-23 95-241 ✓
1 242 ✓
2 243 ✓
3 244 ✓

Papease 92-588 ✓

Squaw 92-589 ✓

Pudding 1 " " 7-409
2 7-410

Chiricahua 48-79 ✓

Karasa 48-80 ✓

Puite 80 ✓

Cocapah 48-81 ✓

Papago - 48-81 ✓

Aztec 48-76 ✓

Tanto - 3 1/2 miles N.E. Payson 75-39 ✓

Picnic #1 4 miles N.W. Payson 74-308 ✓ hole
309 ✓

242 M - Lignin - 80 - 1-23-55 1-22-74 102 SE4
539-N Anglin 60 - 12-9-55 12-8-75 (N4 5N4; 52 5N4NW4) 14
4-20-56 Transp.
1,832 - Anglin 120 - 7-14-56 7-13-76 (E2NE4, NE4SE4) 16
259 N - Anglin
Anglin 120
Anglin 120

N

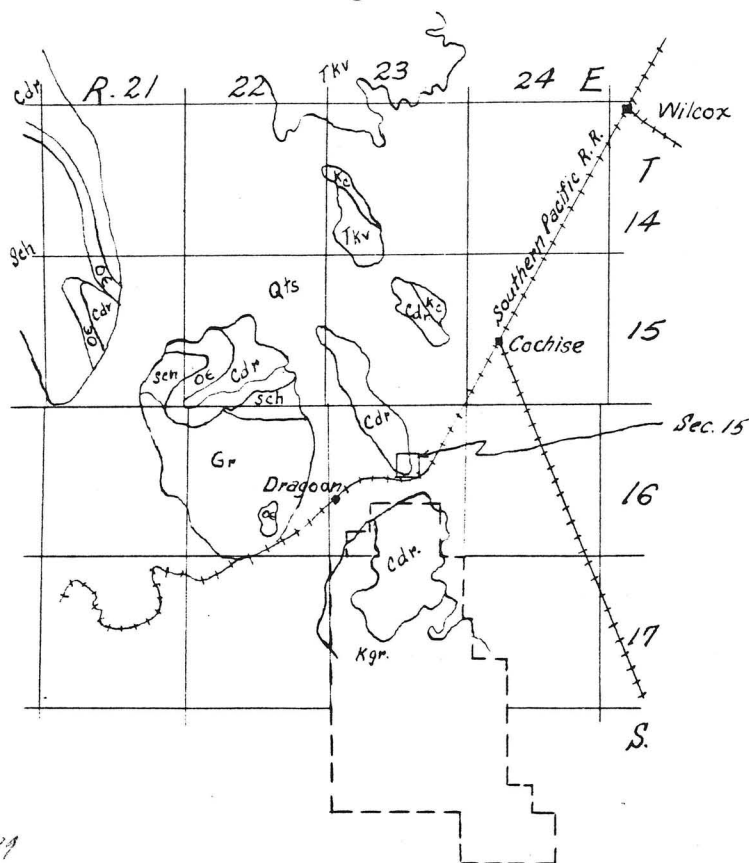
Handwritten: *side 2*
 Summary Claims - 1234 - 134 Pg. 172, 73, 74, 75

Handwritten: *10/2 9.50/2 23-*
 Building Stone Claim No. 1.
 NE/4 23 - 136 Pg. 320

Cochise County, Arizona

Handwritten: *Clay Claim No. 1.*
 NE/4 16 - 128 - 247 Pg.
 No. 2 - SE/4 - 16 - 128 - Pg. 248
 No. 3 - NW/4 - 15 - 127 - Pg. 450
 No. 4 - SW/4 15 - 127 - Pg. 451
 No. 5 - SE/4 9 - 151 - Pg. 325
 No. 6 - SW/4 10 - 151 - 326

Handwritten: *Limestone claim No. 1.*
 SW/4 - Sec 15, - 128 - Pg. 249
 Limestone claim No. 2
 SE/4 Sec 15 128 Pg. 250
 Limestone claim No. 3
 NE/4 Sec 15 252
 No. 4 - NW/4 - 15 - 252
 No. 5 - SW/4 - 23 - 128 - 253 - *ap.*
 No. 7 - NW/4 23 - 134 - 176
 No. 8 - SW/4 14 - 134 - 177
 SW/4



LEGEND

- Sedimentary Rocks
- Qts - Quaternary Sand, gravel, conglomerate.
 - Kc - Cretaceous-Shale, Sandstone, Limestone.
 - Cdr - Carboniferous-Redwall & related Limestones.
 - OE - Ordovician-Abrigo & related Limestones.
 - Sch - Archean Schist.
- Igneous Rocks
- Tkv - Tertiary volcanic rocks
 - Kgr - Cretaceous Granite, monzonite, etc.
 - Gr - Pre-Cambrian Granite.

NOTE

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Scale - 1" = 8 mi.

July, 1957

R.E. Mieritz

PUT IT IN WRITING

MEMORANDUM

January 2 1973

From

To

Leon Adams

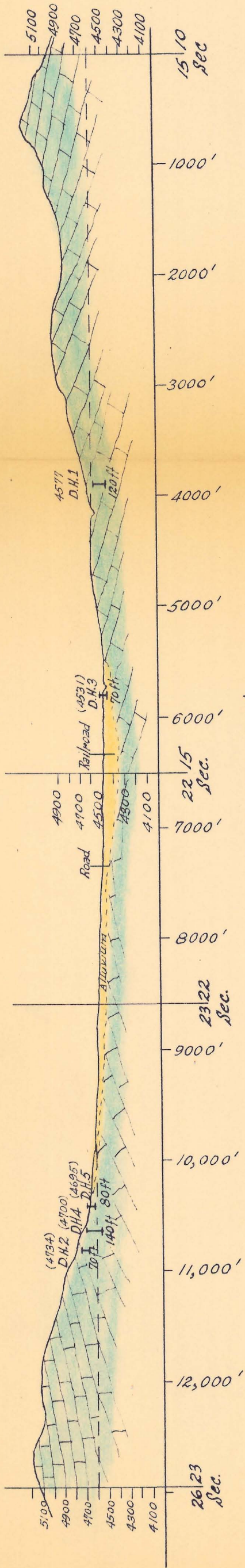
<u>SiO₂</u>	<u>CaO</u>	<u>Fe₂O₃</u>	<u>Total</u>	<u>SiO₂</u>	<u>Al₂O₃</u>	<u>MgO</u>	<u>Alk'ds - Chlor</u>
0.25	13.4	19.8	33.15	43.3	18.1	1.54	Na Pot
							1.15 0.48

Adams sample - surface

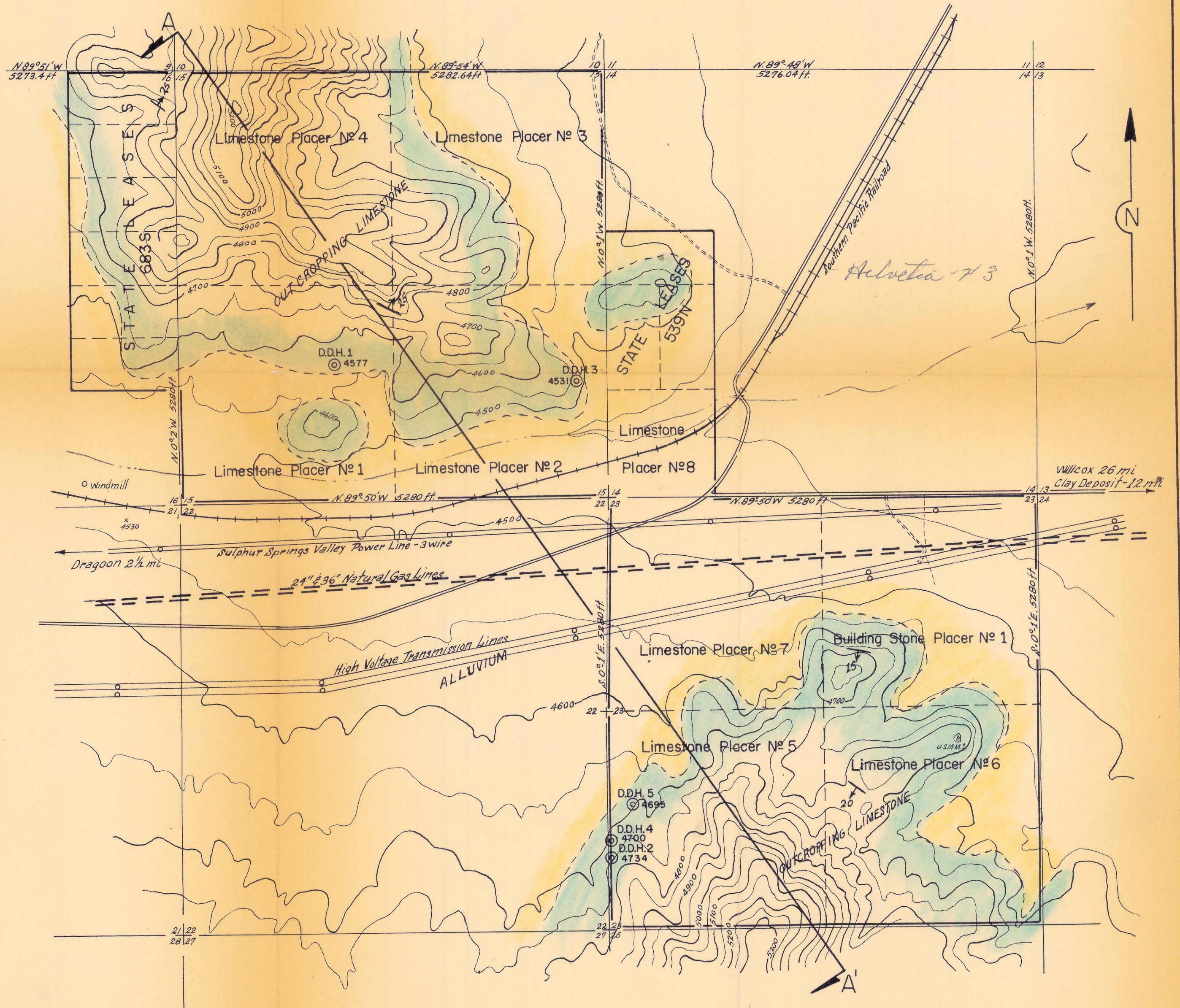
clay in 10/2 Sec. 16, T. 15S. R. 24E. Co. 1152

CMU

0.58	9.07	15.75	24.82	43.90	19.90	1.95	8.75
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SECTION A-A'
Hor. & Vert. Scale: 1"=1000'
DRILL HOLES PROJECTED TO SECTION



GENERAL SURFACE MAP
HAIGLER'S LIMESTONE
COCHISE MINING DIST.
DRAGON AREA, ARIZ.
COCHISE COUNTY
SCALE: 1"=1000'



JAN., 1961
PHOENIX, ARIZONA

R.E. MIERITZ
REG'D ENG.