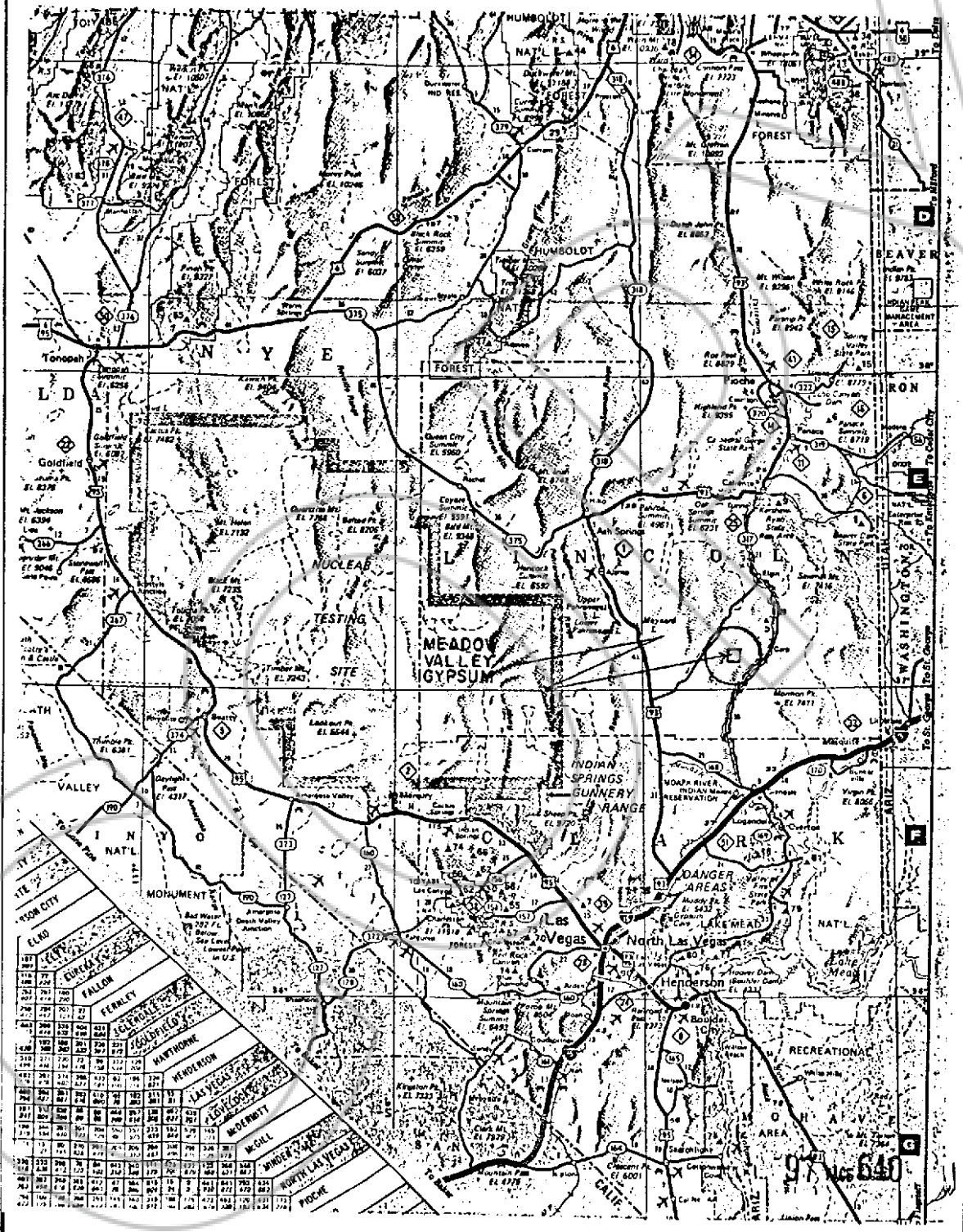
Lincoln County



REPORT ON THE MEADOW VALLEY GYPSUM DEPOSIT

INTRODUCTION:

The examination of the Meadow Valley gypsum deposit, upon which this report is based, was made at the request of Mr. Les Thrasher of Meadow Valley Gypsum Company, Las Vegas, Nevada. The study was conducted dur ing the first week of October, 1990. Two days were spent on the property, October 4 & 5th. The study was undertaken primarily for the purpose of investigating and analyzing the extent, future development possibilities and general geologic relations to the deposit within the holdings.

The program of work as originally outlined entailed the following items:

1. General geologic map outlining the gypsum deposit.
2. Projection of additional reserves.
3. Propose location for drill holes.
4. Some sampling.
5. Recommendations for future development.

A map has been prepared to graphically illustrate the attitude, delineation of outcrop, geological features and where the better quality gypsum is situated.

LOCATION:

The Meadow Valley gypsum deposit is located in an unknown mining district near the Union Pacific Railroad, 2½ miles north of the Galt siding in Lincoln County, Nevada. More specifically the property is in unsurveyed Sections 27, 28, 33 & 34; unsurveyed

LOCATION (continued):

Township 10 South; Range 66 East, M.D.M. The claims have been professionally surveyed by The Owens Surveying Outfit of Mesquite, Nevada. The property is at an elevation of 2,800 feet.

Access is via a county and private road of Union Pacific. The road follows the Union Pacific Railroad for approximately 30 miles north of Moapa, Nevada. The last 1⅓ miles can only be reached by foot. Several alternatives exists for building a road into the deposit.

CLIMATE:

The low elevation combined with the southern latitude and the desert conditions which prevail, tends to produce intense heat in the summer. During the months between November and May the climate is most enjoyable. The annual precipitation is approximately 10" per year. The climate should not interfere with a year around operation.

Some caution should be taken for possible flash flooding.

PHYSICAL FEATURES:

The distance to a railroad siding is at Galt, 2½ miles due south of the property. The nearest major supply point is Las Vegas, Nevada, 75 miles to the south. There is a small stream of water in the Meadow Valley wash adjacent to the railroad. It is most likely water would have to be developed. Several wells exist along the railroad right-of-way. Power would have to be generated on site.

The topography is formed by low angle dipping sedimentary red sand stone and limestone beds that dip to the west. The area

PHYSICAL FEATURES (continued):

becomes precipitous to the west of the property. Since the holdings are located east of this no steep grades are encountered after getting out of Meadow Valley wash. The wash has formed a small cliff like barrier that makes any type of land vehicle useless in trying to reach the property.

OWNERSHIP:

Inasmuch as this examination of the Meadow Valley Gypsum property was made for the principal owner of the Company, a review of the ownership shall not be included. A claim map can be provided to accompany this report.

HISTORY:

There has been no known activity on the holdings. Other than doing validation work for yearly assessment no production records or history is available.

GEOLOGY:

The general geology of the property is characterized by sedimentary rocks, ranging from middle to upper Permian age. Their structure is a low angle dip of the sedimentary beds that range from 20 to 35 degrees striking to the northeast. Some displacement has occurred near the gypsum.

The sediments consist of alternating limestone and sand stone. The beds around the gypsum consist of a red brecciated mud-stone that underlays the gypsum, this bed is striking N.30° E., and dips 25° to the west. The upper beds that overlay the gypsum consist of red sandstone and shale that is capped by a light grey limestone. The dip is much the same as the lower beds. The strike is more

GEOLOGY(continued):

are frequently found in close association and the other mineral gypsite that is a dissolved sulfate that forms a porous aggregate of gypsum containing considerable impurities. The gypsite is used mainly for a cheap source of gypsum in the agriculture industry.

RESERVES:

It is very difficult without detailed measurements and sampling to confirm an accurate estimate of reserves. For the purpose of this report the reserve calculations should not be considered as a proven estimate and should be interpreted as probable.

The specific gravity of gypsum is dihydrate 2.2 to 2.4, Anhydrite is a little denser and ranges from 2.7 to 3.0. A figure of 16 Cu feet per ton has been selected to calculate a guesstimate on the reserves. The pure gyp is approximately 14 Cu Ft/Ton, 16 Cu Ft/Ton is used allowing for weathered gyp. The total area of exposed gypsum including interbedded limestone and gypsite is:

LENGTH 3,500 Ft. WIDTH 1,500 Ft. THICKNESS 700 Ft.

$$\frac{3,500 \times 1,500 \times 700}{16} = 229,687,500 \text{ TONS}$$

What is classified as cement grade or + 90% gypsum is contained in three mounds near the center of the deposit. These are graphically illustrated on the enclosed map. They are calculated as follows:

MOUND NO. 1

LENGTH 700 Ft. WIDTH 650 Ft. THICKNESS 40 Ft.

$$\frac{700 \times 650 \times 40}{16} = 1,137,500 \text{ TONS}$$

GEOLOGY(continued):

easterly than the lower beds.

Without further study the gypsum deposit appears to be a shelf evaporite deposit. It indicates deposition in, or at the margin of, shallow shelf seas covering broad areas of slow, uniform subsidence. Shelf evaporites, because of their wide distribution and the shallow depths at which they may be encountered, include many of the commercially exploited deposits of gypsum.

The gypsum varys in thickness from 20 to 80 feet with variable interbedded platy limestone that has been enveloped within the deposit on the north and south ends. The center of the deposit has mounds of good quality gyp. These mounds were formed by erosion. The interbedded limestone ranges in thickness from 2 feet to 20 feet with no general attitude. The beds have been tilted, folded and warped forming a unconformity that would make it difficult to mine where these beds are enveloped in the gypsum.

The tilted and folded limestone, the brecciated mudstone at the base of the deposit and the change in strike on the cap rock indicates the upper beds have shifted to the west exposing the present deposit and tilting the interbedded limestone. This also indicates the deposit could continue down dip under the cap rock to the west. This would be the area to explore for additional reserves.

Underlying the gypsum is a dense bed of pink gypsite that has stringers of anhydrite. Because of the cover it is difficult to determine the thickness of this unit.

The gypsum minerals observed were dihydrate form of calcium sulfate ($Ca\ SO_4 \cdot 2H_2O$) anhydrite the anhydrouse form ($Ca\ SO_4$) which

RESERVES(continued):

MOUND NO. 2

LENGTH 300 Ft. WIDTH 300 Ft. THICKNESS 40 Ft.

$\frac{300 \times 300 \times 40}{16}$ = 225,000 TONS

MOUND NO. 3

LENGTH 300 Ft. WIDTH 200 Ft. THICKNESS 40 Ft.

$\frac{800 \times 200 \times 40}{16}$ = 400,000 TONS

TOTAL GOOD QUALITY GYPSUM 1,762,500 TONS

If a selective mining program were to be used, additional reserves could be mined from the areas that have the interbedded limestone.

It is most probable high quality gyp can be found where it dips under the red beds to the west.

SAMPLING:

No attempt was made to do a major sampling program. It was obvious the contaminated gypsite does not warrant sampling at this time.

Four samples were taken, two were taken from the mounds of high quality gyp and two were taken on marginal quality gypsum. One was taken on the north end and one was taken on the south end.

When better access to the property is available it would certainly warrant some drilling and trenching to further evaluate the quality.

The samples are being run for calcium sulfate. When calcium sulfate is pure it has the following composition:

SAMPLING(continued):

	LIME (CaCO)	SULFUR TRIOXIDE (SO_3)	COMBINED WATER (H_2O)
DIHYDRATE	32.6%	46.5%	20.9%
ANHYDRITE	41.2%	58.8%	---

RECOMMENDATIONS:

The following recommendations as to future development procedures are submitted in there order of relative importance. This order of work is flexible and is subject to change through subsequent developments as well as through any difficulties of operating conditions which may arise.

1. Determine most feasible access and obtain the necessary permits.
2. Build a minimal access road for drilling, sampling and testing.
3. Drill a minimum of six holes on cap rock west of deposit.
4. Drill mounds of exposed gypsum.

The results of the above recommended program will act as guide for future development of the property. Any projection of costs and recommendations beyond this point would be speculative until additional data would be obtained from the program outlined above.

CONCLUSIONS:

From the foregoing, it can be stated that with the amount of known exposed gypsum, favorable geological conditions for additional reserves, nearness to railroad and market certainly warrants

CONCLUSIONS(continued):

additional investment to further develop the deposit.

Respectfully submitted,

E. M. Garmick
Consulting Geologist
(801) 277-2282

EMG/bg

October 26, 1990

Attachments (3)

Geological Map
Location Map
Photos of property

097215

FILED AND RECORDED AT REQUEST OF
Les Thrasher
August 14, 1991
AT 55 MINUTES PAST 1 O'CLOCK
P.M. IN BOOK 97 OF OFFICIAL
RECORDS, PAGE 640 LINCOLN
COUNTY, NEVADA.
YURIKO SETZER
COUNTY RECORDER
By Rhonda Zehner, Deputy