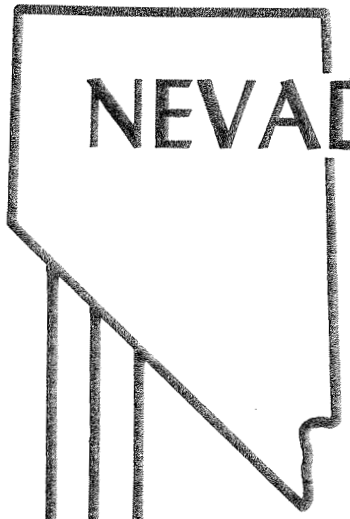
BARITE



NEVADA BUREAU OF MINES

VERNON E. SCHEID, DIRECTOR

REPORT 4

AN INVENTORY OF BARITE OCCURRENCES IN NEVADA

By Robert C. Horton

MACKAY SCHOOL OF MINES
UNIVERSITY OF NEVADA

1963

NEVADA BUREAU OF MINES REPORT 4

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Mackay School of Mines
University of Nevada
Reno, Nevada
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STATE OF NEVADA

Grant Sawyer, Governor

UNIVERSITY OF NEVADA

Charles J. Armstrong, President

MACKAY SCHOOL OF MINES

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NEVADA BUREAU OF MINES

NEVADA MINING ANALYTICAL LABORATORY

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By Robert C. Horton

ABSTRACT

Barite deposits in Nevada are concentrated within a belt 50 to 75 miles wide extending northeast-southwest across the center of the State. This "barite belt" coincides with the Antler orogenic belt.

Fissure vein deposits are found in the southern portion of the belt, while both fissure vein and replacement type deposits occur in the northern portion. The replacement deposits, sometimes referred to as bedded deposits, have been the most productive.

The location, production, development, and geology of 60 mines and prospects in Nevada are given in list form.

INTRODUCTION

Purpose and Scope

This report briefly describes each known occurrence of barite in Nevada and provides a summary of present knowledge based on all available information, published and unpublished, some of which has not been verified by field examination.

It is hoped that the report will stimulate further exploration for barite deposits in the State. Any information on barite occurrences acquired after publication of this report will be placed on file at the Nevada Bureau of Mines, where it will be available for examination. The Bureau and the author will appreciate receiving information about other occurrences of barite in Nevada, as well as additional data or corrections for the occurrences described in this report.

Acknowledgements

Persons and firms interested in barite mining in Nevada have contributed much valuable information to make this publication possible. Donald A. Brobst of the U. S. Geological Survey and A. C. Johnson of the U. S. Bureau of Mines provided geological and location information concerning many of the properties.

ORIGIN AND OCCURRENCE OF BARITE

Barite occurs in fissure veins in all types of rocks and in replacement bodies in reactive rocks, usually limestone or dolomite. Residual deposits formed by the weathering of barite replacement deposits are of importance in Missouri, Tennessee,

Georgia, and other southern States. Residual deposits have not been found in Nevada, but both fissure vein and replacement deposits have been mined.

Most of the barite deposits in Nevada are within a belt some 50 to 75 miles wide extending northeast-southwest across the center of the State, as shown on the index map, plate 1 (foldout inside rear cover).* The "barite belt" coincides with the Antler orogenic belt as described by Roberts and others (1958, p. 2813-2857). Although the significance of this coincidence is not presently known, it is of definite value as a guide to future exploration.

The deposits in the southwestern portion of the belt are generally limited to fissure vein types. The production from this area has not been great, but substantial amounts of barite have been mined and shipped to Southern California. The deposits in the northeastern half of the belt include both fissure vein and replacement type deposits, with the replacement type having been by far the most productive. These deposits were probably formed by barium-rich solutions that originated at depth. In many instances the replacement is so subtle that it is difficult to recognize the difference between the barite and the unreplaced limestone without hefting a specimen to estimate its specific gravity. The absence of both accessory minerals such as pyrite and galena, common in many barite deposits, and of visible alteration affects, has led some observers to conclude that the barite is of sedimentary origin. The term "bedded deposits" has been used in the literature in some instances to avoid the genetic implications of the terms "replacement" and "sedimentary." Detailed geologic mapping may answer the question of origin, but it presently appears that the barite occurs in formations of widely differing ages, suggesting a replacement origin. In addition, the presence of numerous fissure vein deposits suggests that the "bedded deposits" are epigenetic.

MARKETING AND ECONOMICS

Sales of barite increase or decrease in proportion to increases or decreases in oil well-drilling activity. Although there are many uses for barite, the industry depends on the well-drilling market for over 90 percent of its sales. Barite used in drilling muds must usually meet the following requirements: contain a minimum of 92 percent $BaSO_4$ (barite), be free of soluble salts, have a specific gravity of at least 4.2, and 90-95 percent of the material must pass a 325-mesh screen.

Most of the Nevada barite production is used in well drilling in California, with the exception of the barite produced by the Baroid Division, National Lead Company. This company operates the Rossi mine in Elko County and ships much of the mine production to a company-owned chemical plant at Modesto, California.

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* Plate 1 is a greatly reduced copy of Nevada Bureau of Mines Map 6, showing individual occurrences of barite in Nevada.

The Magnet Cove Barium Corp. operates an upgrading and grinding plant at Battle Mountain, Nev. for the production of barite drilling mud. These two companies are the principal producers of barite in the United States as well as in Nevada. There are many smaller barite producers in Nevada, most of whom sell their production to commercial grinding plants in California.

Prices paid for crude barite are generally established by a contract between the producer and the grinding plant. Crude barite was quoted at $16.00 per short ton in California in September, 1962. The small producer must sell directly to a commercial grinding plant or face the usually prohibitive cost of establishing a sales and distribution organization.

Barite is a low-profit bulk commodity and the most important single economic factor is the cost of transportation. Nevada barite cannot compete in the Gulf Coast area with barite imported from North Africa and elsewhere, because of the low cost of ocean transportation as compared to railroad transportation. Mining costs are also important and most barite is mined by surface methods, although some underground mines in Nevada have operated successfully.

Nevada and U. S. production and U. S. consumption and imports of barite, in relation to U. S. oil well-drilling activity from 1945 through 1961 are shown in figure 1.

General references describing the geology, mining, processing, and marketing of barite are:

"Industrial Minerals and Rocks," 1960, American Institute of Mining, Metallurgical, and Petroleum Engineers, New York, N. Y.

"Minerals Facts and Problems," 1960, U. S. Bureau of Mines Bulletin 585.

MINING ACTIVITY

Barite production began in Nevada in 1907 when a small amount of barite was mined at the American Barite mine in Esmeralda County. The Yerington mine in Ormsby County is mentioned as having produced barite in 1909. The Crystal mine in Mineral County was an active producer from 1916 through 1919, and again during the 1920's and early 1930's.

The development of the present Nevada barite industry began during the late 1930's. Nevada barite mines have produced over 1,300,000 short tons of barite with a value in excess of $8,500,000. Most of this production has come from the replacement type deposits in the Battle Mountain-Carlin area of Lander, Eureka, and Elko Counties.

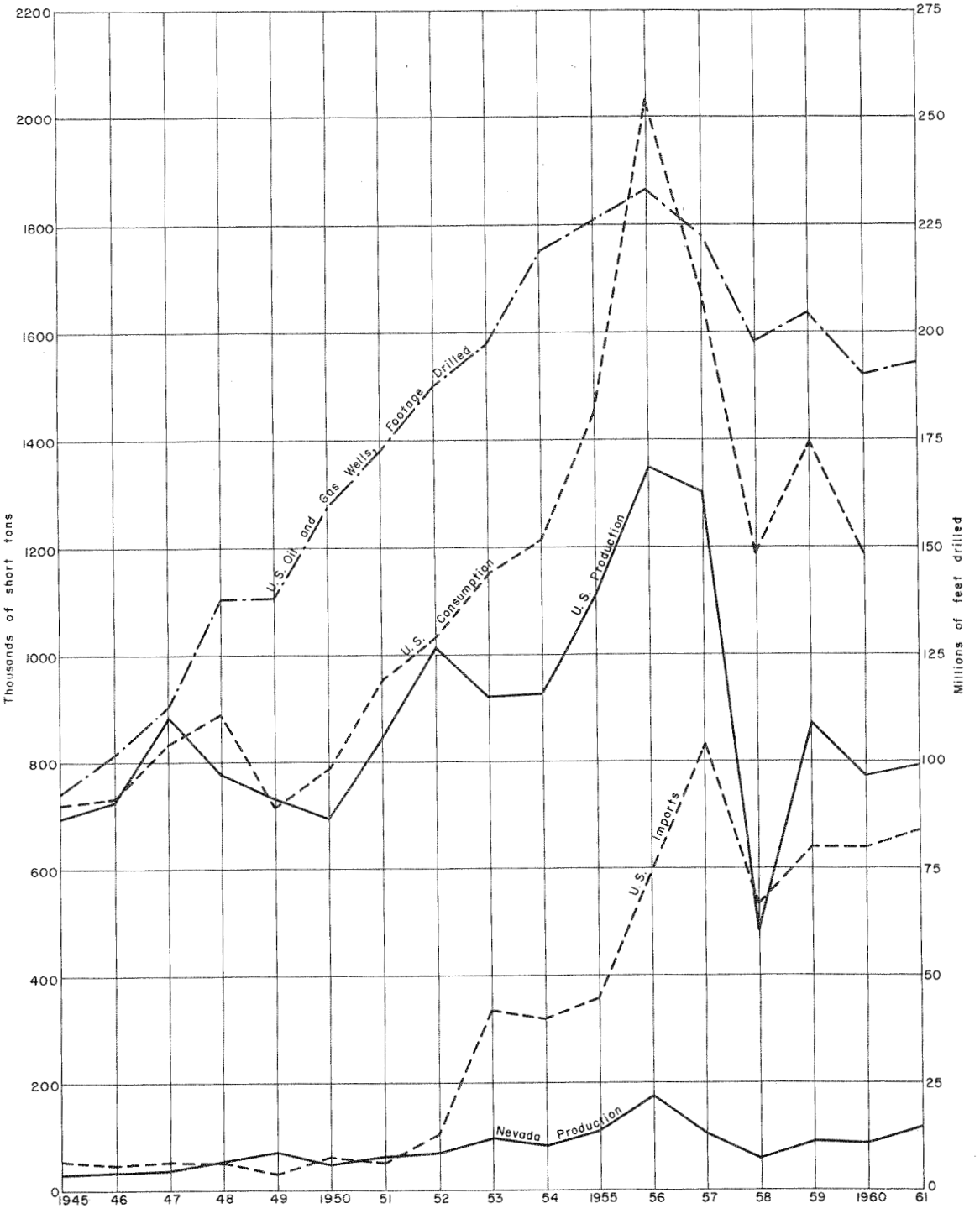

Figure 1. Nevada and U. S. production, U. S. imports, and U. S. consumption of barite, in relation to footage drilled in U. S. oil and gas wells. BW

BARITE OCCURRENCES BY COUNTY

The following list describes the barite occurrences of Nevada by counties. Each mine, prospect, or group is numbered and may be located on plate 1, by means of that number. References are given whenever a mine or prospect has been described in previous literature. Where no references are given the information has been collected through personal observation or by private communication with the most reliable known informants, usually mine owners or operators.

Clark County

1. Lagarto prospect

Location:	S 1/2 sec. 28, NW 1/4 NE 1/4 and N 1/2 NW 1/4 sec. 33, T. 22 S., R. 64 E.
Production:	None.
Development:	Prospect pits and short adit.
Geology:	Narrow vein deposits in Tertiary volcanic rocks.

2. Klinger prospect

Location:	T. 22 S., R. 63 E. (?), 2 miles south of the Basic Magnesium Inc. plant and 2 miles west of Railroad Pass.
Production:	None known.
Development:	Core drilled in 1945, details unknown.
Geology:	Unknown.

3. Goodsprings district

Other names:	Yellow Pine district; Potosi district.
Location:	T. 24 S., R. 58 E. Barite has been observed at four localities in the district: in a prospect pit near the SE corner of sec. 8; in the south drift of the Argentena mine; in a vein near the Keystone dump; and in the Root mine.
Production:	None known.
Development:	Extensive underground workings made while mining zinc, lead, copper, silver, and gold.
Geology:	Vein and replacement type deposits in limestone.
References:	Albritton and others, 1954, p. 66, 91. Hewett, 1931, p. 87.

Elko County

4. Jungo group

Location:	T. 44 N., R. 64 E.
Production:	Unknown.
Development:	Extensive core drilling, details unknown.
Geology:	Unknown.
References:	Eng. Mining Jour., 1957, p. 194.

5. Wildcat Barium mine

Other names:	Sun Creek mine; Hunter mine.
Location:	NE 1/4 sec. 20, T. 44 N., R. 59 E.
Ownership:	E. F. Hunter, Elko, Nevada.
Production:	Over 1,000 tons.
Development:	Small open cut.
Geology:	Coarsely crystalline barite vein in silicified argillite rocks. The vein varies in width from a few feet to 25 feet.

6. 76 Creek prospect

Location:	Approximately SW 1/4 T. 44 N., R. 58 E.
Production:	None.
Development:	Unknown.
Geology:	Reported as a vein type deposit.

7. Prunty prospect

Location:	Approximately S 1/2 T. 44 N., R. 58 E.
Production:	None.
Development:	Unknown.
Geology:	Reported as a vein type deposit.

8. Rytting prospect

Location:	Approximately sec. 21, T. 38 N., R. 65 E.
Production:	None.
Development:	Unknown.
Geology:	Reported as small irregular replacement deposits along a bedding plane in limestone.

9. Anacabe prospect

Location:	T. 39 N., R. 52 E.
Production:	Unknown, probably none.
Development:	Unknown.
Geology:	Reported as a bedded type deposit.

10. Gaylord prospect

Location:	Sec. 9 (?), T. 38 N., R. 52 E.
Production:	None known.
Development:	Unknown.
Geology:	Reported as a bedded type deposit.

11. Joan Laura prospect

Location:	Sec. 9 (?), T. 38 N., R. 52 E.
Production:	None.
Development:	Unknown.
Geology:	Reported as a bedded type deposit.

12. Estabrook mine

Other names:	Jenkins Ranch Lease.
Location:	Sec. 20 (?), T. 38 N., R. 50 E.
Ownership:	Operated by the Estabrook Barite Co.
Production:	Over 10,000 tons.
Development:	Open pit.
Geology:	Unknown.

13. Jones Marvel mine

Location:	Sec. 1, T. 37 N., R. 51 E.
Ownership:	Operated by the Estabrook Barite Co.
Production:	Over 1,000 tons.
Development:	Unknown.
Geology:	Reported as a bedded type deposit.

14. Rossi mine

Location:	Secs. 14, 15, 21, 27, 28, T. 37 N., R. 49 E.
Ownership:	Operated by the Baroid Division, National Lead Co.
Production:	Over 100,000 tons.
Development:	A number of open pits.
Geology:	Replacement type deposit.

15. Big Three prospect

Other names:	Chaliebois Big Four prospect (?).
Location:	Sec. 34, T. 36 N., R. 52 E.
Production:	None.
Development:	Numerous bulldozer cuts.
Geology:	Narrow veins of barite.

16. Heavy Spar prospect

Location:	Sec. 10, T. 35 N., R. 52 E.
Production:	None.
Development:	Four shallow bulldozer cuts.
Geology:	Dark-gray sugary barite in replacement type deposit in silicified chert and shale. The barite is exposed over a width of 10 feet and a length of 330 feet.

17. Pine Mountain mine

Location:	Sec. 35 (?), T. 31 N., R. 52 E.
Production:	About 50 tons in 1931.
Development:	Unknown.
Geology:	Narrow veins of impure barite in limestone.
References:	Gianella, 1940, p. 5, 6.

18. Snow White prospect

Other names:	Dixie claims.
Location:	Sec. 2, T. 30 N., R. 53 E.
Production:	None.
Development:	Unknown.
Geology:	Veinlets of barite in a rhyolite flow breccia.

19. "Unnamed prospect"

Location:	Sec. 2, T. 29 N., R. 53 E.
Production:	Unknown - some small shipments reported.
Development:	Unknown.
Geology:	Barite reported as breccia filling in rocks of upper Paleozoic Age.

20. "Unnamed prospect"

Location:	At intersection of secs. 5, 6, 7, 8, T. 28 N., R. 53 E.
Production:	Unknown - some small shipments reported.
Development:	Unknown.
Geology:	Reported as barite veins in carbonate rocks.

Esmeralda County

21. Barite King and Queen group

Other names:	Bechtel claims.
Location:	Sec. 23, T. 2 N., R. 34 E.
Production:	Estimated 100-500 tons.
Development:	Short adits, stopes, and open cuts.
Geology.	Three- to six-feet-wide barite veins in limestone.

22. American Barite mine

Location:	Sec. 34, T. 1 N., R. 40 E.
Production:	Estimated 1,000+ tons produced during 1907-1919.
Development:	Moderately extensive underground workings and small open cuts.
Geology:	Barite replacement veins and fissure veins in limestone. Galena and pyrite also occur in the vein.
References:	Hewett and others, 1936, p. 150. Burchard, 1907, p. 688. Hill, 1916, p. 250. Stose, 1920, p. 194.

59. Congress prospect

Location:	SW 1/4 sec. 35, T. 3 S., R. 42 E.
Production:	None.
Development:	Several small prospect pits and open cuts.
Geology:	Barite occurs in small pods and lenses along bedding planes and faults in a cherty limestone.

Eureka County

23. Maggie Creek mine

Location:	E 1/2 E 1/2 NE 1/4 sec. 27, T. 34 N., R. 51 E.
Production:	Over 10,000 tons.
Development:	Extensive drifts and stopes and large open cuts.
Geology:	Barite veins in shale.
References:	Gianella, 1940, p. 5. Vanderburg, 1938, p. 64.

24. Alpha prospect

Other names:	Old Whalen mine.
Location:	SW 1/4 sec. 34, T. 25 N., R. 52 E.
Production:	None.
Development:	Extensive underground workings made while mining lead-zinc-copper ores.
Geology:	Barite forms more than half the ore in metalliferous replacement deposits in limestone.
References:	Emmons, 1910, p. 99.

60. Bear mine

Location:	Sec. 19, T. 26 N., R. 53 E.
Ownership:	Unknown.
Production:	Estimated 5,000 tons of 96-98 percent $BaSO_4$ produced during 1948-49.
Development:	Several open pits.
Geology:	Barite occurs in layers up to 6 feet thick replacing Devonian limestone along bedding planes.

Humboldt County

25. Sander's mine

Location:	NW 1/4 sec. 5, SW 1/4 sec. 8, T. 36 N., R. 41 E.
Ownership:	Baroid Division, National Lead Co.
Production:	Over 1,000 tons.
Development:	Unknown.
Geology:	Reported as barite vein type deposit.

26. Tomlinson-Mullinix prospect

Location:	15 miles southwest of Winnemucca, at Clear Creek.
Production:	None known.
Development:	Unknown.
Geology:	Unknown.

Lander County

27. Shelton Baryte No. 1 mine

Location:	SW 1/4 sec. 18, T. 32 N., R. 47 E.
Ownership:	Edith Shelton, Battle Mountain, Nevada.
Production:	Over 10,000 tons.
Development:	Numerous open cuts.
Geology:	Barite replacement bodies in limestone.

28. Argenta mine

Other names:	Barium King mines; Nevada Barite mine.
Location:	SE 1/4 sec. 13, NE 1/4 sec. 24, T. 32 N., R. 46 E., NW 1/4 sec. 19, T. 32 N., R. 47 E.
Production:	Over 100,000 tons.
Ownership:	Milwhite Mud Sales Co.
Development:	Extensive open pits and open cuts.
Geology:	Large barite replacement deposits in limestone.
References:	Gianella, 1940, p. 3. Vanderburg, 1939, p. 54.

29. Small prospect

Location:	SW 1/4 sec. 31, T. 32 N., R. 47 E.
Production:	Unknown.
Development:	Unknown.
Geology:	Reported as a bedded type barite deposit.

30. "Unnamed prospect"

Location:	SW 1/4 sec. 18, T. 31 N., R. 47 E.
Production:	None.
Development:	Unknown.
Geology:	Reported as a bedded type barite deposit.

31. "Unnamed prospect"

Location:	Sec. 10, T. 31 N., R. 42 E., and sec. 6, T. 31 N., R. 43 E.
Production:	None.
Development:	Unknown.
Geology:	Barite-chalcopyrite veins in the Havallah (Permian) Formation.

32. Pleasant View mine

Other names:	Valley View mine; Hilltop Barium mine.
Location:	Sec. 2, T. 30 N., R. 46 E.
Ownership:	Food Machinery and Chemical Corp.
Production:	Over 10,000 tons.
Development:	Open pits.
Geology:	Barite replacement deposits in limestone and shale.
References:	Gianella, 1940, p. 3. Vanderburg, 1939, p. 53.

33. Bateman Canyon mine

Location:	NW 1/4 sec. 5, T. 30 N., R. 46 E.
Ownership:	Clark, Coulter, Fisher, and Miller of Battle Mountain, Nevada. Leased to Food Machinery and Chemical Corp.
Production:	Over 10,000 tons.
Development:	Open cuts and pits.
Geology:	Barite replacement deposits in limestone.
References:	Gianella, 1940, p. 4.

34. Lancaster-Caudle group

Other names:	Lewis Canyon mine.
Location:	SW 1/4 sec. 25, T. 30 N., R. 45 E.
Production:	Unknown.
Development:	Unknown.
Geology:	Vein deposits of barite in shale.
References:	Vanderburg, 1939, p. 54.

35. Starr Grove prospect

Location:	SE 1/4 sec. 36, T. 30 N., R. 45 E.
Production:	Unknown.
Development:	Unknown.
Geology:	Barite replacement deposit in limestone.
References:	Emmons, 1910, p. 126. Gianella, 1940, p. 4. Vanderburg, 1939, p. 54.

36. White Rock mine

Location:	Near center of sec. 7, T. 29 N., R. 47 E.
Ownership:	Paul R. Sloan.
Production:	Over 10,000 tons.
Development:	Unknown.
Geology:	Reported as a bedded type barite deposit.

37. King Gulch prospect

Location:	NE 1/4 sec. 6, T. 28 N., R. 47 E.
Production:	None known.
Development:	Unknown.
Geology:	Reported as a vein type barite deposit.

38. Greystone mine

Other names:	Big 4 mine; Standard Group.
Location:	Secs. 23, 24, 25, 26, T. 28 N., R. 45 E.
Ownership:	George Dyer, W. G. Lee, Lee Hand, and Alvin Layton, Battle Mountain, Nevada; leased to Magnet Cove Barium Corporation.
Production:	Over 100,000 tons.
Geology:	Reported as bedded deposits of barite in chert and shale.
References:	Brobst, 1958, p. 113.

39. Mountain Springs mine

Location:	Secs. 5, 6, T. 28 N., R. 44 E.
Ownership:	Food Machinery and Chemical Corp.
Production:	Over 100,000 tons.
Development:	A number of open pits.
Geology:	Barite replacement deposits in thin-bedded limestone interbedded with chert, siliceous argillite, and argillite of the Pumpernickel (Pennsylvanian) Formation.
References:	Brobst, 1958, p. 113. Ferguson and others, 1951.

40. Bald Mountain prospect

Location:	Sec. 16, T. 25 N., R. 47 E.
Production:	None.
Development:	Unknown.
Geology:	Unknown.

41. Laurent mine

Other names:	Last Choice Group.
Location:	9.5 miles southeast of Austin and 1 mile north of Highway 50, approximately sec. 8, T. 18 N., R. 45 E.
Production:	Unknown, probably small.
Development:	Surface cuts and short adits.
Geology:	Reported as a series of veins in monzonite.
References:	Vanderburg, 1939, p. 79.

Lincoln County

42. Lucky Boy prospect

Location:	At Camp Bradshaw, near Elgin.
Production:	Unknown.
Development:	Unknown.
Geology:	Unknown.

Mineral County

43. Highland Group

Other names:	Eagleville Barite mine.
Location:	T. 14 N., R. 34 E.
Ownership:	Fred Steiner, Sparks, Nevada.
Production:	Over 10,000 tons.
Development:	Three shafts and two adits; total underground workings of 3,500 feet.
Geology:	Reported as fissure veins in andesite porphyry.
References:	Gianella, 1940, p. 2. Vanderburg, 1937, p. 29.

44. Gravity mine

Location:	T. 11 N., R. 30 E.
Production:	None.
Development	Unknown.
Geology:	Barite occurs in lenses in a brecciated rhyolite.

45. Crystal Barite mine

Other names:	Kinkaid (Kinkead) Barite mine.
Location:	Sec. 21, T. 8 N., R. 32 E.
Ownership:	G. A. Peterson and Hymen Werner, Mina, Nev.
Production:	Unknown, estimated at 1,000 tons plus.
Development:	Extensive underground workings developed by shafts.
Geology:	Barite veins in the Excelsior (Middle Triassic) Formation.
References:	Vanderburg, 1937, p. 39. Hill, 1916, p. 250. Stose, 1920, p. 194.

46. Cowden-Knowles prospect

Location:	Sec. 12, T. 6 N., R. 34 E.
Production:	Unknown.
Development:	Unknown.
Geology:	Unknown.

47. Annett group

Location:	Sec. 2 (?), T. 4 N., R. 33 E.
Production:	None.
Development:	Short adit and several small open cuts.
Geology:	Reported as a series of parallel veins averaging 6 feet in width.
References:	Vanderburg, 1937, p. 43.

48. Noquez Barium mines

Other names:	Columbus mine.
Location:	Sec. 23 (?), T. 4 N., R. 34 E.
Ownership:	C. H. Noquez, Basalt, Nevada.
Production:	Over 10,000 tons.
Development:	Large open cut.
Geology:	Unknown.

49. "Candelaria prospects"

Location:	Sec. 2, T. 3 N., R. 35 E.
Ownership:	Unknown.
Production:	Reported as 200 to 2,000 tons.
Development:	Numerous open cuts.
Geology:	Fissure veins in the Candelaria (Lower Triassic) Formation and in felsite dikes.
References:	Page, 1959, p. 60.

50. Little Summit mine

Other names:	Giroux mine.
Location:	Sec. 8 (?), T. 3 N., R. 34 E.
Ownership:	L. D. and R. J. Giroux, Reno, Nev.
Production:	Unknown, estimated as less than 1,000 tons.
Development:	Numerous open cuts.
Geology:	Barite veins in the Palmetto (Ordovician) Formation.
References:	Ross, 1961, p. 78.

51. Little Mountain prospect

Location:	T. 3 N., R. 32 E.
Production:	Unknown.
Development:	Unknown.
Geology:	Unknown.

52. B and L mine

Location:	T. 1 N., R. 33 E.
Production:	Small shipments reported.
Development:	Unknown.
Geology:	Unknown.

Nye County

53. Northumberland prospect

Location:	Sec. 18 (?), T. 13 N., R. 46 E.
Production:	Unknown.
Development:	Unknown.
Geology:	Unknown.

54. Summit Creek mine

Location:	N 1/2 T. 13 N., R. 42 E.
Ownership:	Operated by the Reliable Meat Co., San Francisco, Calif.
Production:	Over 1,000 tons.
Development:	Open cuts and a single crosscut and drift.
Geology:	Barite replacement lens in the Diablo (Permian) Formation.

55. Warm Springs mine

Location:	Sec. 19, T. 4 N., R. 50 E.
Production:	Less than 1,000 tons.
Development:	Small open cuts.
Geology:	Barite replacement veins in limestone.

56. Jumbo mine

Location:	Sec. 34, T. 3 N., R. 47 E.
Ownership:	Chemical and Pigment Company.
Production:	Over 10,000 tons.
Development:	Open pit.
Geology:	Barite replacement deposit in limestone.
References:	Hewett and others, 1936, p. 150, 151.
	Kral, 1951, p. 57.

Ormsby County

57. Yerington mine

Location:	T. 15 N., R. 21 E., in Brunswick Canyon.
Production:	Unknown, but probably less than 1,000 tons.
Development:	Unknown.
Geology:	Unknown.
References:	Overton, 1947, p. 43.
	Stuart, 1909, p. 148.

Pershing County

58. Sugar Loaf prospect

Location:	Approximately T. 32 N., R. 40 E.
Production:	Unknown.
Development:	Unknown.
Geology:	Reported as a vein type barite deposit.

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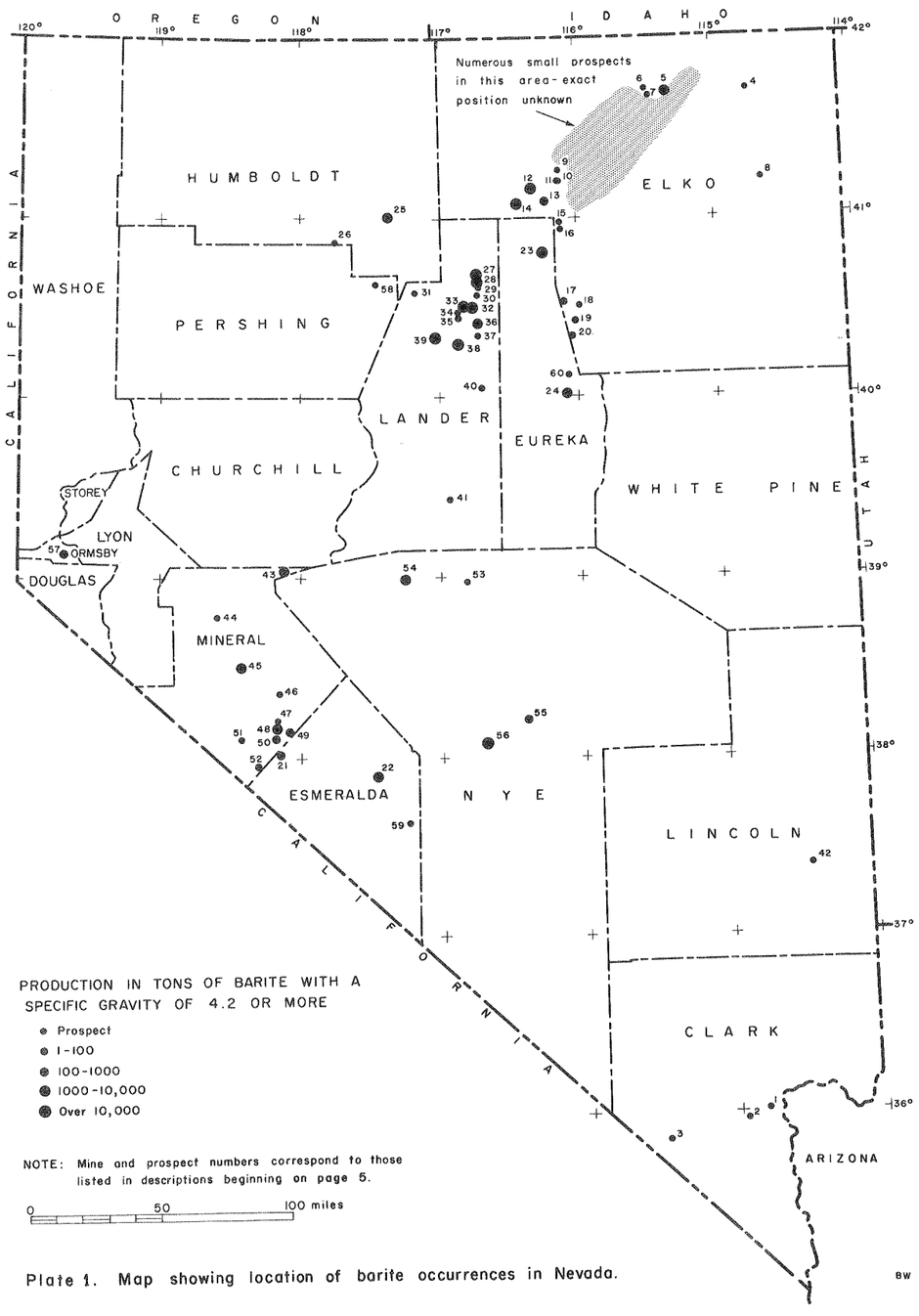

Plate 1. Map showing location of barite occurrences in Nevada.

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The Mackay School of Mines is one of the several colleges of the University of Nevada. The School consists of three divisions: the academic Departments of Instruction, the Nevada Bureau of Mines, and the Nevada Mining Analytical Laboratory. The Mackay School of Mines is thus the State of Nevada's educational research and public service center for the mineral industry.

The Nevada Bureau of Mines and the Nevada Mining Analytical Laboratory serve the public as State agencies to assist in developing Nevada's mineral resources. They identify, analyze, and evaluate minerals, rocks, and ores found in Nevada. They conduct field studies on Nevada geology and mineral deposits, including metallic and industrial minerals as well as oil and gas. They pursue laboratory and library research in mineral beneficiation, extractive metallurgy, and economic problems connected with the mineral industry of Nevada.

For information concerning the mineral resources and mineral industry of Nevada, write to: Director, Nevada Bureau of Mines, University of Nevada, Reno, Nevada.