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Principal Deposits of Strategic and Critical Minerals in Nevada

By N. T. Lowe, Russell G. Raney, and John R. Norberg



UNITED STATES DEPARTMENT OF THE INTERIOR
Donald Paul Hodel, Secretary

BUREAU OF MINES
Robert C. Horton, Director

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

| | | | |
|-------------------|-------------------------|--------------------|--------------------------|
| cm | centimeter | m ³ /h | cubic meter per hour |
| g | gram | mi ² | square mile |
| g/t | gram per metric ton | oz | ounce |
| gal/min | gallon per minute | ppm | parts per million |
| gal/ton | gallon per short ton | t | metric ton |
| ha | hectare | t/a | metric ton per year |
| kg | kilogram | t/d | metric ton per day |
| kg/t | kilogram per metric ton | t/h | metric ton per hour |
| km | kilometer | t/month | metric ton per month |
| km ² | square kilometer | t/wk | metric ton per week |
| kV | kilovolt | ton | short ton |
| kW | kilowatt | ton/h | short ton per hour |
| kW·h | kilowatt hour | ton/yr | short ton per year |
| L/s | liter per second | tr oz | troy ounce |
| L/t | liter per metric ton | tr oz/ton | troy ounce per short ton |
| lb | pound | wt % | weight percent |
| MW | megawatt | yd ³ | cubic yard |
| m | meter | yd ³ /a | cubic yard per year |
| m ² | square meter | yd ³ /d | cubic yard per day |
| m ³ | cubic meter | yd ³ /h | cubic yard per hour |
| m ³ /d | cubic meter per day | yr | year |



PRINCIPAL DEPOSITS OF STRATEGIC AND CRITICAL MINERALS IN NEVADA

By N. T. Lowe,¹ Russell G. Raney,² and John R. Norberg³

ABSTRACT

This Bureau of Mines publication presents salient deposit information in abstract form on 119 principal mineral deposits in the State of Nevada. Commodity coverage addresses 17 critical and strategic commodities that appear to have commercial production potential in the State. The core of the deposits described is taken from those properties evaluated under the Bureau of Mines Minerals Availability Program (MAP); additional deposits are included to provide a more complete coverage. Institutional and infrastructural factors affecting mineral development are also discussed.

¹Physical scientist.

²Geologist.

³Supervisory physical scientist.

Western Field Operations Center, Bureau of Mines, Spokane, WA.

INTRODUCTION

About a decade ago, the Bureau of Mines embarked upon an ambitious program to systematically assess mineral supplies available to the U.S. economy. The Minerals Availability Program (MAP), formally established in 1974 (727),⁴ provides current appraisals of nonfuel mineral supplies for consideration in the development of U.S. minerals policies. Results of these appraisals are published on a commodity basis in a series of availability reports that describe the supply of a commodity from domestic or foreign sources in terms of tonnage-price relationships.

The keystones of MAP appraisals are deposit-specific evaluations conducted by geologists and engineers of the Bureau's Field Operations Centers and by contractors. The deposit evaluations examine in detail the geologic, engineering, and economic factors that determine the viability of individual deposits. Deposit data are obtained from many sources, including published and unpublished Bureau reports, records, and files; U.S. Geological Survey (USGS) Bulletins, Professional Papers, and other reports; technical and professional journals; State and other Federal agency publications; proprietary company reports; data generated during field examinations; and information obtained from knowledgeable individuals.

The Bureau's purpose in publishing this prototype

report is to present, in a single volume, nonproprietary data on 119 selected principal deposits of strategic and critical minerals in the State of Nevada. The easy-to-read format provides locational, geological, and operational data for selected deposits along with discussions of institutional and infrastructural factors affecting mineral development in the State.

Much of the deposit-specific data were derived from MAP deposit evaluations that have been conducted over the past 10 yr. Additional deposit data, as well as information on transportation, water, electricity, natural gas, and taxes were gathered from recent newspapers and journals and from interviews with company and State officials. Data on mineral production and mining history were obtained from Bureau and Nevada Bureau of Mines publications. It is anticipated that the information contained in this publication will be of benefit to geologists, mining engineers, prospectors, mining companies, suppliers of mining and milling equipment, and others directly involved in the State's mineral industry. It is also anticipated that the data will be equally as valuable to city, county, and State planners, transportation and utilities commissions, local tax advisory boards, and other public and private organizations that develop policies affecting mining and mineral development in Nevada.

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The authors wish to thank the State of Nevada, Division of Environmental Protection and Nevada Division of Mine Inspection, for their assistance and information. In addition, the authors wish to thank the Nevada Department of Transportation for graciously allowing the use of State highway base maps in this publication.

Special gratitude is extended to the entire staff of the

Nevada Bureau of Mines and Geology. Particular thanks is given to J. H. Schilling, director; K. Papke, assistant director; H. F. Bonham, Jr., geologist; and J. Tingley, mining geologist, for their assistance in selecting the deposits included in this report, as well as providing supplemental deposit data.

ORGANIZATION OF REPORT

This publication is organized into two principal sections: an introductory statewide section followed by a site-specific deposit section.

The introductory section presents background information on the minerals industry of Nevada, a description of some existing infrastructure-institutional factors that affect commercial development of Nevada's mineral deposits, and a commodity review.

The infrastructure subsection contains brief discussions and maps of the transportation (highway and railroad) and utility (electricity, natural gas, and water) networks in the State. It also contains general information on milling or beneficiation facilities, and permitting and taxation procedures and policies with respect to mineral development in Nevada.

The commodity review consists of narrative, tabular,

and map data that are intended to give a statewide overview of principal commodities associated with the deposits described. In addition to a brief narrative, each review contains data abstracted from the Bureau's Minerals Industry Location System (MILS). Production data were obtained from the Bureau's Minerals Yearbooks and Mineral Commodity Summaries, and from other published or publicly available sources (728-729). The reviews also include a listing of selected principal deposits in the State. (Most of the principal deposits are described in greater detail in the deposit abstract section.) The reserve-resource estimates are from published sources and, where necessary, have been converted to the International System of Units (SI) equivalents for ease of comparison. The column headed "Size" reflects the authors' professional judgment of the total resource contained in the deposit. The terms "small," "medium," and "large" are based primarily on the size categories published by the USGS (236); definitions of the terms are provided for each commodity. The associated loca-

⁴Italic numbers in parentheses refer to items in the list of references preceding the appendixes.

tion map shows the principal deposits along with other occurrences of the commodity.

The largest section of the publication is the deposit abstract section. It is composed of a series of single-page summaries of information pertaining to 119 selected mineral properties in Nevada. The summaries or abstracts are arranged alphabetically by the property's primary name. They are intended to report deposit information available through 1984; undoubtedly, the status, ownership, and some other data may have changed during the period between manuscript completion and report publication.

Each abstract is composed of the following six main subject areas:

1. Deposit name and commodity.
2. Location and ownership.
3. Geology.
4. Development.
5. Published reserves and/or resources.
6. References.

Within each subject area there are several individual data elements. Not all data elements, however, are reported for each deposit; proprietary data have been omitted and some information has yet to be determined or is not presently available. SI measurements are used throughout the deposit abstracts except for published reserves and/or resources. Reserve-resource data are reported in terms and units of

the cited publication. (It is incumbent upon the reader to evaluate the reserve-resource data in the light of his or her own knowledge, experience, and assessment of the source's credibility.) In contrast, published reserve-resource data in the commodity reviews have been converted by the author's into SI measurements for comparison purposes. The reference section includes bibliographic references for the deposit, the USGS 1:250,000 quadrangle and largest scale map on which the deposit is located, and the Bureau's file reference or sequence number. The sequence number is a 10-digit number that is unique to the deposit and allows rapid retrieval of relevant data from the MAP data base. Two other file references, the Mine Safety and Health Administration (MSHA) number (Mid number), which is assigned by MSHA to active properties, and the USGS Mineral Resources Data System (MRDS), are also included. The MRDS is the former USGS Computerized Resources Information Bank (CRIB).

An extensive, but not exhaustive, reference section follows the deposit abstracts. The intent of the reference section is to provide the reader with additional sources of information about the deposits described in the main body of the report. Although an individual reference may not specifically mention the deposit, the reference contains geological, mining, metallurgical, economic, or other data pertinent to the deposit.

COMMODITY AND DEPOSIT SELECTION

This publication is in a sense a directory of principal strategic and critical mineral deposits in the State of Nevada. Deposit and commodity coverage mainly reflects the Bureau's work conducted under MAP. The MAP is concerned with a continuing assessment of the geologic, engineering, and economic availability of mineral supplies for the U.S. economy. Although the Bureau's ultimate objective is to incorporate all nonfuel mineral commodities into MAP, current MAP studies cover only the following strategic or critical commodities:

| | | |
|------------------|-------------------|-----------------|
| <i>Aluminum</i> | <i>Graphite</i> | Potash |
| <i>Antimony</i> | <i>Iron</i> | Rare Earths |
| <i>Asbestos</i> | <i>Lead</i> | <i>Silver</i> |
| <i>Barite</i> | <i>Lithium</i> | Sulfur |
| <i>Beryllium</i> | <i>Magnesium</i> | Tin |
| Chromium | <i>Manganese</i> | Titanium |
| Cobalt | <i>Mercury</i> | Thorium |
| Columbium- | <i>Molybdenum</i> | <i>Tungsten</i> |
| Tantalum | Nickel | <i>Zinc</i> |
| <i>Copper</i> | Phosphate | Zirconium- |
| <i>Fluorspar</i> | Platinum | Hafnium |
| <i>Gold</i> | | |

All of these commodities, with exception of hafnium, reportedly occur in Nevada. Based on current knowledge, however, only those commodities in italics appear to have potential commercial production opportunities; this publication focuses on deposits whose principal commodity is one of the 17 commodities so indicated.

Under MAP, the Bureau has evaluated nearly 100 deposits in Nevada. Most were found to have identified reserves or resources; it is these deposits that form the core of the deposit abstract section in this report. Descriptions of other properties that appear to have commercial potential and which have yet to be evaluated under MAP, are also included to provide a more complete commodity coverage.

Final deposit selection was made after consultation with individuals and agencies familiar with the Nevada mining industry. In addition to hosting one of the commodities listed (as a principal commodity), deposit selection was based on one or more of the following criteria:

1. The deposit has been evaluated under MAP.
2. Information on substantial reserves or resources has been published for the deposit.
3. The deposit is a producing or past producing mine with known production potential.
4. The deposit is a nonproducing property with a known production potential based on proprietary and/or public exploration and economic data.
5. Sufficient nonproprietary geological and operational data exist to permit completion of a deposit abstract.

Figure 1 and table 1 show the locations and names of the 167 principal deposits selected for this report; deposit abstracts have been prepared for 119 of the principal deposits.

Table 2 shows the distribution (by commodity) of principal deposits and properties with deposit abstracts for each county.

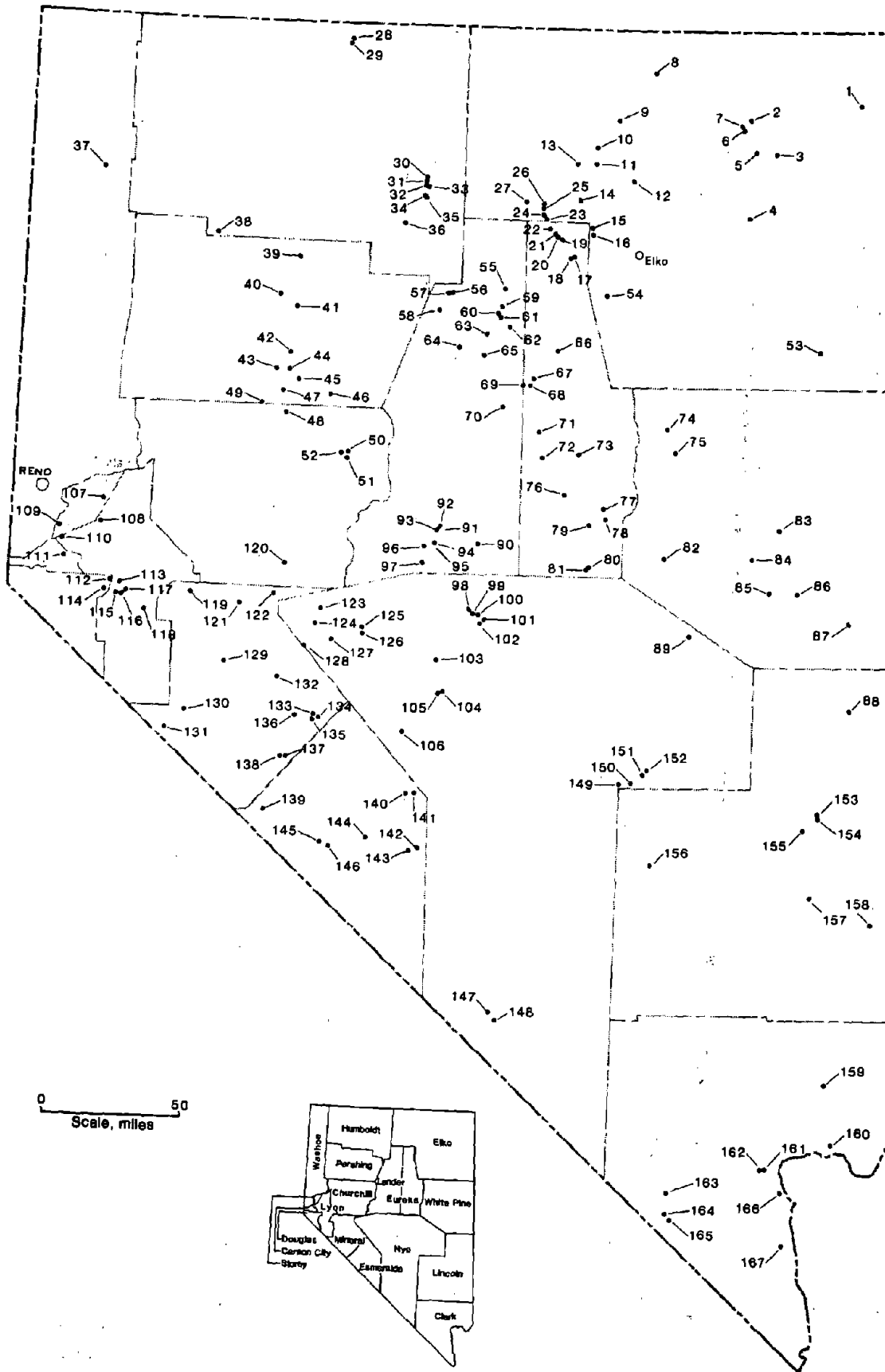


Figure 1.—Location of selected principal deposits in Nevada.

Table 1. — Selected principal deposit index
(Refer to figure 1)

| Map No. | Deposit name | (1) | Map No. | Deposit name | (1) | Deposit name | (1) | Map No. | Deposit name | (1) | Map No. |
|---------|---|-------------------|---------|---------------------------------------|-------------------|---|-------------------|---------|--------------------------------|-------------------|---------|
| 1.. | Indian Springs ² | W | 84. | Robinson district ² | Cu | Alligator Ridge ² | Au | 75 | Indian Springs ² | W | 1 |
| 2.. | Jungle ² | BaSO ₄ | 85. | Ward ² | Pb-Zn | Ann ² | BaSO ₄ | 101 | Ivanhoe | Au | 27 |
| 3.. | Easy Miner ² | BaSO ₄ | 86. | Taylor ² | Ag | Ann Mason ² | Cu | 115 | Jungle ² | BaSO ₄ | 2 |
| 4.. | Wells | W | 87. | Mount Wheeler ² | Be | Antimony King ² | Sb | 92 | Kay ² | BaSO ₄ | 99 |
| 5.. | Snoose ² | BaSO ₄ | 88. | Atlanta ² | Au | Argenta ² | BaSO ₄ | 55 | Lakes ² | BaSO ₄ | 14 |
| 6.. | Big Ledge ² | BaSO ₄ | 89. | White Pine ² | CaF ₂ | Argentena | Pb-Zn | 165 | Lewis | Au | 38 |
| 7.. | Stormy Creek ² | BaSO ₄ | 90. | Linka ² | W | Atlanta ² | Au | 88 | Linka ² | W | 90 |
| 8.. | Garnet-Tennessee Mountain ² | W | 91. | Dry Canyon | Au | Aurora ² | Au | 131 | Lucerne | Au | 110 |
| 9.. | Mesona | Au | 92. | Antimony King ² | Sb | B & B ² | Hg | 139 | Maggie Creek ² | Au | 18 |
| 10. | Enfield Bell ² | Au | 93. | Dry Canyon ² | Sb | B & C Springs ² | Mo | 127 | Mammoth ² | CaF ₂ | 152 |
| 11. | Gance Creek | Au | 94. | Bray-Beulah ² | Sb | Bald Mountain ² | Au | 74 | Manhattan ² | Au | 105 |
| 12. | Q-Bar | BaSO ₄ | 95. | Hard Luck-Pradler ² | Sb | Bald Mountain | BaSO ₄ | 70 | McArthur ² | Cu | 113 |
| 13. | Dexter | Au | 96. | Reeds Canyon | BaSO ₄ | Basic, Inc. ² | MgO | 124 | McDermitt ² | Hg | 28 |
| 14. | Lakes ² | BaSO ₄ | 97. | Victorine-Kingston | Au | Battle Mountain | Cu | 56 | McGill Tailings ² | Cu | 83 |
| 15. | Fish Creek ² | BaSO ₄ | 98. | P & S ² | BaSO ₄ | Copper Basin ² | Au | 56 | Mesona | Au | 9 |
| 16. | Heavy Spar ² | BaSO ₄ | 99. | Kay ² | BaSO ₄ | Battle Mountain | Au | 56 | Miller | BaSO ₄ | 59 |
| 17. | Gold Quarry ² | Au | 100 | Northumberland ² | Au | Copper Canyon ² | Au | 56 | Minnesota ² | Fe | 112 |
| 18. | Maggie Creek ² | Au | 101 | Ann ² | BaSO ₄ | Bear ² | Cu | 117 | Modarelli ² | Fe | 66 |
| 19. | Carlin ² | Au | 102 | East Northumber- land ² | BaSO ₄ | Bell Mountain ² | Au | 120 | Mohawk | Ag | 145 |
| 20. | Bullion Monarch ² | Au | 103 | Round Mountain ² | Au | Big Ledge ² | BaSO ₄ | 6 | Montana Mountains ² | Li | 29 |
| 21. | Blue Star ² | Au | 104 | White Caps ² | Sb | Bison ² | CaF ₂ | 79 | Monte Cristo | W | 82 |
| 22. | Goldstrike ² | Au | 105 | Manhattan ² | Au | Bloody Canyon ² | Sb | 41 | Mount Hope ² | Mo | 73 |
| 23. | Bootstrap ² | Au | 106 | Nevada Moly ² | Mo | Blue Star ² | Au | 21 | Mount Wheeler ² | Be | 87 |
| 24. | Dee ² | Au | 107 | Gooseberry ² | Ag | Bootstrap ² | Au | 23 | Mountain Springs ² | BaSO ₄ | 64 |
| 25. | Queen Lode ² | BaSO ₄ | 108 | Dayton ² | Fe | Borealite ² | Au | 130 | Mountain View | Pb-Zn | 76 |
| 26. | Rossi ² | BaSO ₄ | 109 | Gold Hill | Au | Boulder City ² | Mn | 166 | Nevada Moly ² | Mo | 106 |
| 27. | Ivanhoe | Au | 110 | Lucerne | Au | Boyd | Al | 157 | Nevada Scheelite ² | W | 122 |
| 28. | McDermitt ² | Hg | 111 | Carson River ² | Hg | Gray-Beulah ² | Sb | 94 | New Potosi | Sb | 138 |
| 29. | Montana Mountains ² | Li | 112 | Minnesota ² | Fe | Buckhorn ² | Au | 67 | Northumberland ² | Au | 100 |
| 30. | Getchell ² | Au | 113 | McArthur ² | Cu | Buckingham ² | Mo | 57 | Nyco ² | CaF ₂ | 150 |
| 31. | Tonopah ² | W | 114 | Buckskin | Au | Buckskin | Au | 114 | Overton ² | W | 159 |
| 32. | Riley Extension | W | 115 | Ann Mason ² | Cu | Buena Vista ² | Fe | 48 | P & S ² | BaSO ₄ | 98 |
| 33. | Riley | W | 116 | Yerington ² | Cu | Bullion Monarch ² | Au | 20 | Pan American ² | Pb-Zn | 155 |
| 34. | Granite Creek | W | 117 | Bear ² | Cu | C-M Alunite ² | Al | 158 | Parasite Peak | Au | 128 |
| 35. | Pinson ² | Au | 118 | Pumpkin Hollow ² | Fe | Calico Hills ² | Fe | 119 | Phelps-Stokes ² | Fe | 123 |
| 36. | Preble ² | Au | 119 | Calico Hills ² | Fe | Candelaria ² | Ag | 137 | Pilot Mountain | Hg | 135 |
| 37. | Hog Ranch | Au | 120 | Bell Mountain ² | Au | Carlin ² | Au | 19 | Pine Nut | Mo | 136 |
| 38. | Lewis | Au | 121 | Rawhide | Au | Carson River ² | Hg | 111 | Pinson ² | Au | 35 |
| 39. | Springer ² | W | 122 | Nevada Scheelite ² | W | Caselton ² | Pb-Zn | 153 | Piute ² | Fe | 49 |
| 40. | Florida Canyon | Au | 123 | Phelps-Stokes ² | Fe | Chicago Lode | CaF ₂ | 126 | Pleasant View | BaSO ₄ | 60 |
| 41. | Bloody Canyon ² | Sb | 124 | Basic, Inc. ² | MgO | Cortez | Au | 69 | Potosi | Pb-Zn | 163 |
| 42. | Rochester ² | Ag | 125 | Union Canyon | CaF ₂ | Crowell ² | CaF ₂ | 147 | Preble ² | Au | 36 |
| 43. | Sutherland ² | Sb | 126 | Chicago Lode | CaF ₂ | Dayton ² | Fe | 106 | Prince ² | Pb-Zn | 154 |
| 44. | Relief Canyon ² | Au | 127 | B & C Springs ² | Mo | Dee ² | Au | 24 | Pumpkin Hollow ² | Fe | 118 |
| 45. | Hollywood ² | Sb | 128 | Paradise Peak | Au | Desert Scheelite | W | 134 | Q-Bar | BaSO ₄ | 12 |
| 46. | Fencemaker ² | Sb | 129 | Hawthorne | Al | Dexter | Au | 13 | Queen Lode ² | BaSO ₄ | 25 |
| 47. | Dodge-Ford ² | Fe | 130 | Borealite ² | Au | Dodge-Ford ² | Fe | 47 | Rain ² | Au | 54 |
| 48. | Buena Vista ² | Fe | 131 | Aurora ² | Au | Drumm | Sb | 51 | Rainbow ² | CaF ₂ | 149 |
| 49. | Piute ² | Fe | 132 | Santa Fe ² | Au | Dry Canyon | Au | 91 | Rawhide | Au | 121 |
| 50. | Hoyt | Sb | 133 | Gunmetal ² | W | Dry Canyon ² | Sb | 93 | Reeds Canyon | BaSO ₄ | 96 |
| 51. | Drumm | Sb | 134 | Desert Scheelite | W | East Northumber- land ² | BaSO ₄ | 102 | Relief Canyon ² | Au | 44 |
| 52. | IHX | Sb | 135 | Pilot Mountain district. | Hg | Easy Miner ² | BaSO ₄ | 3 | Ridge 7129 ² | Zn | 81 |
| 53. | Victoria ² | Cu | 136 | Pine Nut | Mo | Eldorado Canyon | Au | 167 | Riley | W | 33 |
| 54. | Rain ² | Au | 137 | Candelaria ² | Ag | Emerson ² | W | 156 | Riley Extension | W | 32 |
| 55. | Argenta ² | BaSO ₄ | 138 | New Potosi | Sb | Enfield Bell ² | Au | 10 | Robinson district ² | Cu | 84 |
| 56. | Battle Mountain Copper Basin ² | Cu | 139 | B & B ² | Hg | Fannie Ryan ² | Mn | 181 | Rochester ² | Ag | 42 |
| 57. | Buckingham ² | Mo | 140 | Tonopah Hasbrouck ² | Au | Fencemaker ² | Sb | 46 | Rossi ² | BaSO ₄ | 26 |
| 58. | Battle Mountain Copper Canyon ² | Au | 141 | Goldfield ² | Au | Fire Creek | Au | 62 | Round Mountain ² | Au | 103 |
| 59. | Miller | BaSO ₄ | 142 | Goldfield district | Al | Fish Creek ² | BaSO ₄ | 15 | Ruby Hill ² | Pb-Zn | 77 |
| 60. | Pleasant View | BaSO ₄ | 143 | Silver Peak ² | Li | Florida Canyon | Au | 40 | Santa Fe ² | Au | 132 |
| 61. | Slaven Canyon | BaSO ₄ | 144 | Mohawk | Ag | Gance Creek | Au | 11 | Silver Peak ² | Li | 144 |
| 62. | Fire Creek | Au | 145 | Sixteen-to-One ² | Ag | Garnet-Tennessee Mountain ² | W | 8 | Sixteen-to-One ² | Ag | 148 |
| 63. | Hilltop | Au | 146 | Sixteen-to-One ² | Ag | Gatchell ² | Au | 30 | Slaven Canyon | BaSO ₄ | 61 |
| 64. | Mountain Springs ² | BaSO ₄ | 147 | Crowell ² | CaF ₂ | Gibellini ² | Mn | 80 | Snoose ² | BaSO ₄ | 5 |
| 65. | Graystone ² | BaSO ₄ | 148 | Sterling ² | Au | Gold Bar | Au | 72 | Springer ² | W | 39 |
| 66. | Modarelli ² | Fe | 149 | Rainbow ² | CaF ₂ | Gold Hill | Au | 109 | Sterling ² | Au | 148 |
| 67. | Buckhorn ² | Au | 150 | Nyco ² | CaF ₂ | Gold Quarry ² | Au | 17 | Stormy Creek ² | BaSO ₄ | 7 |
| 68. | Horse Canyon ² | Au | 151 | Horseshoe | CaF ₂ | Goldfield ² | Au | 142 | Taylor ² | Ag | 86 |
| 69. | Cortez | Au | 152 | Mammoth ² | CaF ₂ | Goldfield district | Al | 143 | Three Kids ² | Mn | 162 |
| 70. | Bald Mountain | BaSO ₄ | 153 | Caselton ² | Pb-Zn | Goldstrike ² | Au | 22 | Tonkin Springs ² | Au | 71 |
| 71. | Tonkin Springs ² | Au | 154. | Prince ² | Pb-Zn | Gooseberry ² | Ag | 107 | Tonopah ² | W | 31 |
| 72. | Gold Bar | Au | 155 | Pan American ² | Pb-Zn | Granite Creek | W | 34 | Tonopah Divide ² | Au | 141 |
| 73. | Mount Hope ² | Mo | 156 | Emerson ² | W | Graystone ² | BaSO ₄ | 85 | Tonopah Hasbrouck ² | Au | 140 |
| 74. | Bald Mountain ² | Au | 157 | Boyd | Al | Gunmetal ² | W | 133 | Union Canyon | CaF ₂ | 125 |
| 75. | Alligator Ridge ² | Au | 158 | C-M Alunite ² | Al | Hard Luck-Pradler ² | Sb | 95 | Victoria ² | Cu | 53 |
| 76. | Mountain View | Pb-Zn | 159 | Overton ² | MgO | Hawthorne | Al | 129 | Victorine-Kingston | Au | 87 |
| 77. | Ruby Hill ² | Pb-Zn | 160 | Virgin River ² | Mn | Heavy Spar ² | BaSO ₄ | 16 | Virgin River ² | Mn | 160 |
| 78. | Windfall ² | Au | 161 | Fannie Ryan ² | Mn | Hilltop | Au | 83 | Ward ² | Pb-Zn | 85 |
| 79. | Bison ² | CaF ₂ | 162 | Three Kids ² | Mn | Hog Ranch | Au | 37 | Wells | W | 4 |
| 80. | Gibellini ² | Mn | 163 | Potosi | Pb-Zn | Hollywood ² | Sb | 45 | White Caps ² | Sb | 104 |
| 81. | Ridge 7129 ² | Zn | 164 | Yellow Pine | Pb-Zn | Horse Canyon ² | Au | 98 | White Pine ² | CaF ₂ | 89 |
| 82. | Monte Cristo | W | 165 | Argentena | Pb-Zn | Horseshoe | CaF ₂ | 151 | Windfall ² | Au | 76 |
| 83. | McGill Tailings ² | Cu | 166 | Boulder City ² | Mn | Hoyt | Sb | 50 | Yellow Pine | Pb-Zn | 184 |
| | | | 167 | Eldorado Canyon | Au | IHX | Sb | 52 | Yerington ² | Cu | 118 |

¹Primary commodity.

²Deposit abstract in report.

Table 2. — Distribution of principal deposits of selected commodities in Nevada, by county

| County | Aluminum | | Antimony | | Barite | | Beryllium | | Copper | | Fluorspar | | Gold | | Iron ore | | Lead-zinc | | |
|--------------|----------|----------|-----------|----------|-----------|-----------|-----------|----------|------------|----------|-----------|----------|-----------|-----------|------------|------------|-----------|----------|--|
| | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | |
| Carson City | | | | | | | | | | | | | | | | | | | |
| Churchill | | | 3 | | | | | | | | | | 1 | 1 | 1 | 1 | | | |
| Clark | | | | | | | | | | | | | 1 | | | | | 3 | |
| Douglas | | | | | | | | | | | | | 1 | | 1 | | | | |
| Elko | | | | | 11 | 10 | | | 1 | 1 | | | 8 | 4 | | | | | |
| Esmeralda | 1 | | | | | | | | | | | | 3 | 3 | | | | | |
| Eureka | | | | | | | | | | | 1 | 1 | 12 | 10 | 1 | 1 | 3 | 2 | |
| Humboldt | | | | | | | | | | | | | 4 | 3 | | | | | |
| Lander | | | 4 | 4 | 8 | 3 | | | 1 | 1 | | | 5 | 1 | | | | | |
| Lincoln | 2 | 1 | | | | | | | | | | | 1 | 1 | | | 3 | 3 | |
| Lyon | | | | | | | | | 4 | 4 | | | 1 | | 2 | 2 | | | |
| Mineral | 1 | | 1 | | 4 | 4 | | | | | | | 4 | 3 | 1 | 1 | | | |
| Nye | | | 1 | 1 | 4 | 4 | | | | | | 8 | 5 | 5 | 4 | 1 | 1 | | |
| Pershing | | | 4 | 4 | | | | | | | | | 2 | 1 | 2 | 2 | | | |
| Storey | | | | | | | | | | | | | 1 | | | | | | |
| Washoe | | | | | | | | | | | | | 1 | | | | | | |
| White Pine | | | | | | | 1 | 1 | 2 | 2 | | | 2 | 2 | | | 1 | 1 | |
| Total | 4 | 1 | 13 | 9 | 23 | 17 | 1 | 1 | 8 | 8 | 9 | 6 | 52 | 33 | 9 | 9 | 10 | 6 | |
| | Lithium | | Magnesium | | Manganese | | Mercury | | Molybdenum | | Silver | | Tungsten | | Total | | | | |
| | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Dep | Abs | Deposit | Abstract | | | |
| Carson City | | | | | | | 1 | 1 | | | | | | | 1 | 1 | | | |
| Churchill | | | | | | | | | | | | | | | 5 | 2 | | | |
| Clark | | | 1 | 1 | 4 | 4 | | | | | | | | | 9 | 5 | | | |
| Douglas | | | | | | | | | | | | | | | 2 | 1 | | | |
| Elko | | | | | | | | | | | | | 3 | 2 | 23 | 17 | | | |
| Esmeralda | 1 | 1 | | | | | 1 | 1 | | | 2 | 1 | | | 8 | 6 | | | |
| Eureka | | | | | 1 | 1 | | | 1 | 1 | | | | | 19 | 16 | | | |
| Humboldt | 1 | 1 | | | | | 1 | 1 | | | | | 4 | 1 | 10 | 6 | | | |
| Lander | | | | | | | | | 1 | 1 | | | 1 | 1 | 20 | 11 | | | |
| Lincoln | | | | | | | | | | | | | 1 | 1 | 7 | 6 | | | |
| Lyon | | | | | | | | | | | | | | | 7 | 6 | | | |
| Mineral | | | | | | | 1 | | 1 | | 1 | 1 | 3 | 2 | 13 | 7 | | | |
| Nye | | | 1 | 1 | | | | | 2 | 2 | | | | | 22 | 18 | | | |
| Pershing | | | | | | | | | | | 1 | 1 | 1 | 1 | 10 | 9 | | | |
| Storey | | | | | | | | | | | 1 | 1 | | | 2 | 1 | | | |
| Washoe | | | | | | | | | | | | | 1 | | 1 | | | | |
| White Pine | | | | | | | | | | | 1 | 1 | 1 | | 8 | 7 | | | |
| Total | 2 | 2 | 2 | 2 | 5 | 5 | 4 | 3 | 5 | 4 | 6 | 5 | 14 | 8 | 167 | 119 | | | |

NOTE: — No entry in a column indicates that no principal deposits were identified or no abstract was prepared.

SUMMARY OF MINING ACTIVITIES IN NEVADA (30, 382, 728)

Mining has long occupied an important place in the history and economy of Nevada. Through television and movies, millions of Americans are aware, albeit vaguely, of the fabulous wealth created from mining of the State's gold and silver deposits during the late 19th and early 20th century. Some people may also be aware that Nevada achieved statehood in 1864 in part because of the Union's need of precious metals to finance the Civil War. Few people outside the mining community, however, are aware that mining continues as a major contributor to the State's economy. Although only ranked 13th nationally in the value of nonfuel mineral production, Nevada led the nation in 1982 in the output of gold, barite, mercury, and magnesite. In addition, it was second in mine production of diatomite and lithium minerals, and third in output of fluorspar, molybdenum, and tungsten concentrates.

The first mining in Nevada was conducted by Indians in search of turquoise and salt. Franciscan monks and their Mexican converts worked gold placers, silver lodes, and turquoise deposits in Clark County prior to the 1840's. Evidence indicates that Mexicans also mined in the San Antonio mining district in about 1854, and French trappers

from Canada journeyed as far south as Nye County, perhaps in search of gold or silver, prior to the 1860's. The late 1850's, however, is generally accepted as the beginning of Nevada's mining industry with the discovery of the Potosi Mine in the Goodsprings district, Clark County (1855 or 1857), and the Comstock Lode in Storey County (1859). These discoveries stimulated numerous other discoveries throughout the State, and both the economy and the population increased rapidly.

Over the next two decades, output from the State's mines, particularly those of the Comstock Lode, grew and reached a peak in about 1878. In the 1880's, mineral production began a precipitous decline that continued into the 20th century. Recovery began in the early 1900's with the discovery and subsequent production of silver and gold from ore bodies in the Tonopah, Goldfield, Rochester, and other mining districts. About the same time, significant copper production from the Ely and Yerington districts, and zinc production from the Goodsprings district began. The value of mineral production rose to a peak during World War I, but after the war, metal prices fell and output once again declined.

During the 1930's, in response to increased gold and silver prices and increased demand for base metals, output again increased from Nevada's mines. In spite of periodic setbacks, production generally continued to expand through World War II and into the postwar period. Output reached a peak in 1956 when constant dollar value of mineral production for the State was nearly \$202⁵ million. In 1957, output slumped 30% when copper prices fell, lead and zinc demand declined, and the Federal Government curtailed the tungsten purchasing program. Since bottoming in 1958 when constant dollar value of mineral production was slightly over \$103⁵ million, the constant dollar value of production of nonfuel minerals has grown to nearly \$254⁵ million in 1982.

Although Nevada periodically was among the leading States in domestic production of tungsten, manganese, gold, barite, and mercury, it was the mining, milling, and smelting of copper ores that dominated the State's mineral industry from the mid-1930's to mid-1970's. During a two-decade period, from 1955 to 1974, annual copper production accounted for over 50% of the State's total value of non-fuel mineral output. The only exception during these 20 yr occurred in 1967 when a protracted industry-wide strike resulted in a substantial reduction in copper production. In spite of the strike, the value of copper ore mined in 1967 amounted to nearly \$39 million or about 43% of the State's total mineral production.

Nevada's copper output peaked in 1970 when the ore mined yielded nearly 97,000 t of copper valued at over \$123 million or about two-thirds of the State's total mineral production. Mine output slowly decreased through the early and mid-1970's; in 1978, it plummeted when the three leading companies ceased operations citing poor market conditions and environmental restrictions as causes. Copper

output has increased modestly since the 1979 low point; however, production data are withheld from publication at the request of the producers to safeguard proprietary company data.

Nevada is currently experiencing a modern day "gold rush," and gold has replaced copper as the most important commodity mined in the State. In 1983, for the fourth consecutive year, Nevada led the Nation in primary gold production in which mines yielded more than 47% of the gold produced domestically.

The resurgence of gold mining stems from two unrelated factors. First was the discovery in the early 1960's of low-grade, near-surface, disseminated, micrometer-sized gold resources in northeastern Eureka County. The discovery was followed by development of and subsequent production from the Carlin Mine in 1965 and the Cortez Mine in 1969. Second was the dramatic increase in domestic gold prices caused by the establishment of the two-tier pricing system in March 1968, which created an open market price for gold that could fluctuate with supply and demand, and by the removal of restrictions on private ownership of gold in December 1974.

As a result of these two actions, the price of gold rose from \$1.13/g (\$35/tr oz) in 1967 to over \$19.29/g (\$600/tr oz) in 1980, and provided the economic incentive for domestic producers to explore and develop deposits. As a consequence, Nevada has seen a large increase in gold exploration activities over the past decade, which has resulted in the development of many new mines, either currently operating or projected to come on-stream in the next few years. The outlook is for Nevada's mines to yield more than a million ounces annually by the mid-1980's if the present trend continues.

INFRASTRUCTURAL AND INSTITUTIONAL FACTORS AFFECTING MINING ACTIVITIES IN NEVADA

UTILITIES

Electricity

Nevada is served by a mix of investor-owned and publicly owned electric utility systems. Figure 2 displays the distribution of major electrical transmission lines, principal substations, and in-state generating facilities. Figure 3 illustrates the certificated service areas as designated by the Nevada Public Service Commission for the State's larger distribution systems. Several smaller systems occur throughout the State but are not shown on figure 3.

According to the Public Service Commission, utilities having a certificated service area have exclusive rights to market electricity in the area. The utilities also have an obligation to provide power to all new consumers. Service in the uncertificated areas is somewhat competitive with any utility having the right to market electricity subject to granting of a certificate by the Public Service Commission.

As of December 1983, all principal utilities had in-

dicated electrical supplies were generally adequate for new or expanded mining and mineral processing facilities. However, large consumers should expect up to a 2-yr lead time for planning, permitting, and construction of new power lines and ancillary facilities. In addition, mining consumers would be required to pay the total installation cost of facilities serving their operations prior to the beginning of construction. In late 1982, the cost of a 10-MW substation was estimated at about \$450,000, any three-phase line at approximately \$19,000/km (\$30,000/mi), and a 138-kV transmission line at \$50,000/km (\$80,000/mi). Although recovery of construction capital is generally incorporated into rate schedules, some isolated mining operations have installed diesel-powered plants for generating electricity rather than incur the large capital expenditure required for construction of transmission facilities.

Table 3 presents representative industrial power rates for the principal utilities in Nevada.

Natural Gas (689)

Natural gas is supplied to Nevada by two main transmission lines. One line enters the State from the north

⁵1972 constant dollar, gross national product basis.

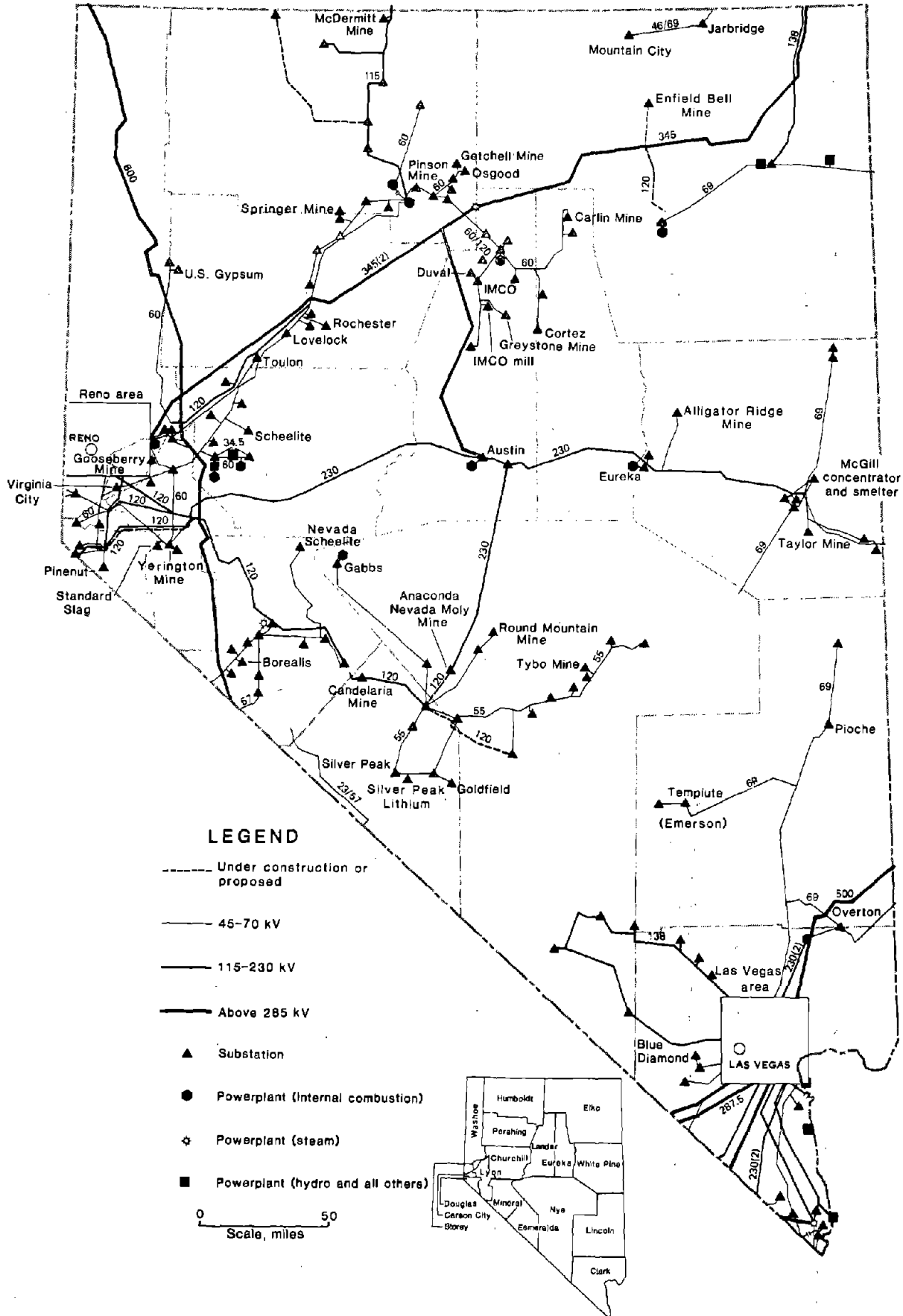


Figure 2.—Major electrical transmission lines, principal substations, and in-state generating facilities in Nevada.

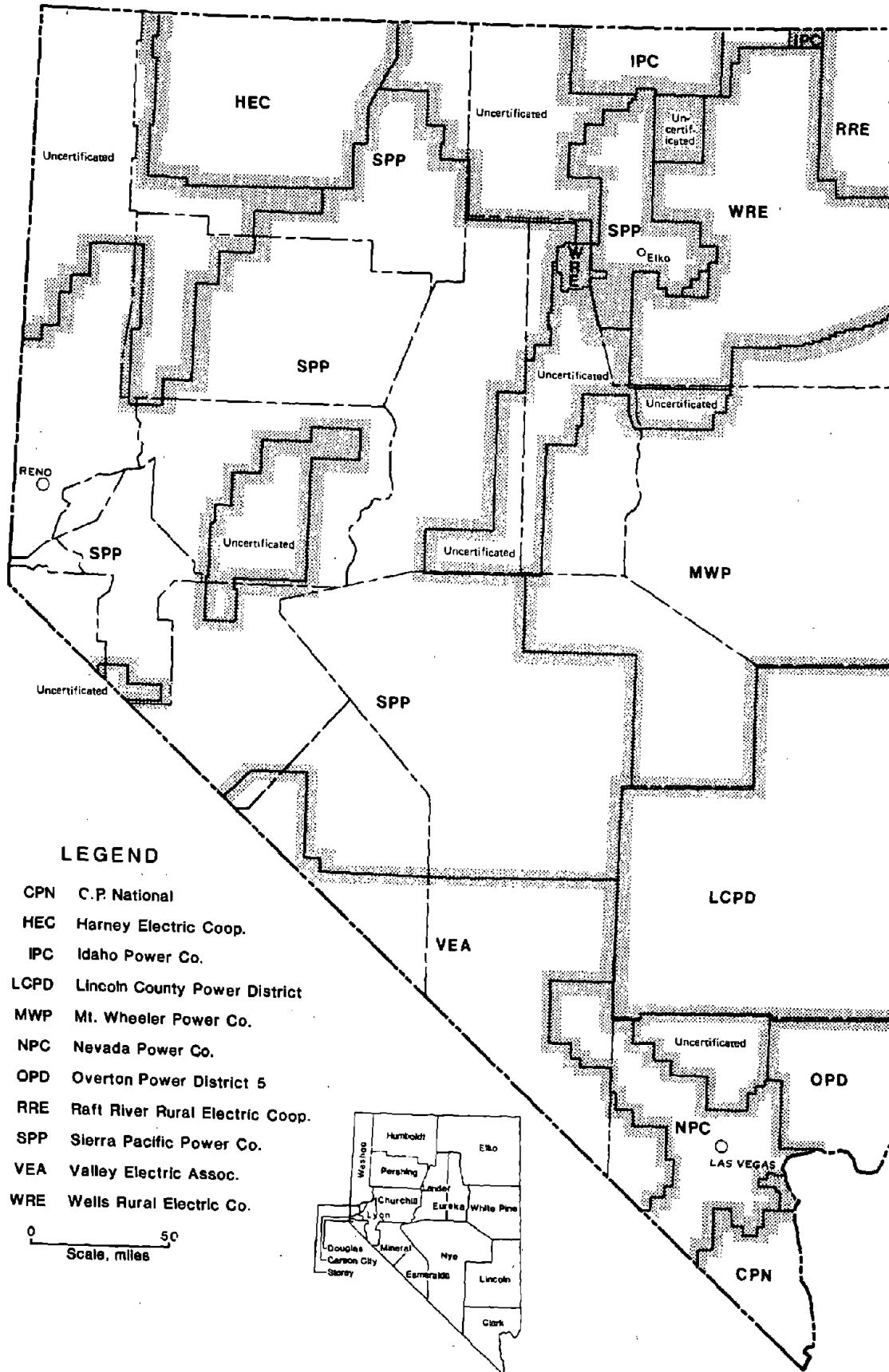


Figure 3.—Major certified electricity service areas in Nevada.

Table 3. — Representative industrial electrical power rates in Nevada, December 1983

| Utility | Customer monthly meter charge | Demand charge per kW/month | Energy charge per kW-h used |
|--|-------------------------------|----------------------------|-----------------------------|
| C. P. National | \$5.30 | NAP | \$0.05132 |
| Harney Electric Cooperative, Inc. | 150.00 | \$5.00 | .039 |
| Idaho Power Co. ¹ | NAP | 2.50 | .1557 |
| Lincoln County Power District 1 | 86.40 | 1.35 | .0099 |
| Mt. Wheeler Power Company | 2.60 | 2.75 | {2.0537 3.0453 |
| Nevada Power Co. | 3.50 | 2.90 | .0441 |
| Overton Power District 5 | NAP | 1.10 | {4.030 5.024 |
| Raft River Rural Electric Cooperative | NAP | 4.75 | {.025 .024 |
| Sierra Pacific Power Co. | NAP | {5.18 74.48} | .05217 |
| Valley Electric Association, Inc. ⁸ | NAP | 8.176 | .028 |
| Wells Rural Electric Co. | 50.00 | 4.00 | .035 |

NAP Not applicable.

¹Idaho Power Co. has made an application to the State of Nevada requesting a 57% increase in the energy charge.

²1st 50,000 kW-h.

³Over 50,000 kW-h.

⁴1st 100 kW-h.

⁵Over 100 kW-h.

⁶1st 1,000 kW; 1,000-kW minimum.

⁷Over 1,000 kW.

⁸Only single-phase power available.

and after crossing the Idaho-Nevada State line in Elko County, runs directly to the Reno-Sparks area. The line has main laterals serving gas to Winnemucca, Battle Mountain, and Elko; to Fernley, Fallon, and Gabbs; to the Fort Churchill area; to Yerington; and to the Carson City and Minden areas. The second transmission line supplies gas from the southwest States. It enters the southernmost tip of the State and terminates in the Las Vegas area after passing north through Searchlight and Henderson. Short laterals extend to the Davis Dam, Blue Diamond gypsum mine and plant (a short distance west of Las Vegas), and Glendale areas. Figure 4 shows the natural gas transmission network in Nevada.

The Southwest Gas Corp. (Southwest) is the intrastate supplier of gas and owns all main transmission and lateral lines. Southwest furnishes gas to the Sierra Pacific Power (SPP) and C. P. National (CPN) public utility companies for distribution. Sierra Pacific resells the gas in its service territory that essentially consists of the Reno, Sparks, and Verdi municipalities (106). C. P. National distributes gas at retail in the city of Henderson, located south of Las Vegas. Southwest's Northern and Southern Divisions distribute gas to all other communities served by natural gas in the State. Cities and towns served by the Northern Division include Elko, Carlin, Battle Mountain, Winnemucca, Lovelock, Fernley, Fallon, Wadsworth, Dayton, Silver Springs, Garnerville, Silver City, Minden, Incline Village, and Stateline. The Southern Division retail sales include customers in the Las Vegas, North Las Vegas, and Boulder City areas.

Southwest's extensive Nevada pipeline network was built as a result of potential revenues to be gained from the use of natural gas for firing steam electric generators and in mining and metal refining operations (106). In response to a rapid rise in gas rates, a major defection of large-volume industrial and powerplant customers occurred between 1980 and 1982. Those customers who could, switched from gas

to residual oil for their fuel needs. Due primarily to this decline of industrial customers within the Southwest system, natural gas supplies are, and will be, readily available in the foreseeable future for existing and new industrial customers.

Water (384, 459, 682, 684)

Nevada is the most arid State in the Union averaging slightly less than 23 cm of precipitation annually. Precipitation will vary from about 7.5 cm in the most arid valley to 100 to 150 cm in certain mountainous areas. About 84% of Nevada's land area lies within the Great Basin section of the Basin and Range province. The Great Basin area is characterized by drainage flows into enclosed basins rather than the sea. Water supplying these intermontane basins is principally from storm runoff and snowmelt occurring mostly during the spring and early summer months. Except for times of high flow when ephemeral lakes or playas may be formed, most mountain streams terminate prior to reaching the basin floors. The annual evaporation rate is high within the State, ranging from about 1 m in the north-eastern part of the State to as high as 2 m in the southernmost part. Nevada has few large streams or rivers. Unlike those in other States, these streams decrease in size and increase in dissolved mineral content as they flow. Nevada has several large lakes, but these are generally peripheral to the central portion of the State's land mass.

Nevada mining operations rely heavily on ground water as a source of water. The water supply is usually developed by a well, often several, drilled into deep saturated sediments filling the intermontane basins. Though often containing immense quantities of water built up and stored over centuries, the average annual water recharge is relatively small. If water usage is not kept at or below the rate of recharge, shortages will result. Prolonged ground water consumption greater than annual recharge would result in long-term problems for all users. It has been estimated that, even in the largest of Nevada's basins, the annual recharge does not greatly exceed 61.7 million m³, and in perhaps half the valleys, recharge is less than 18.5 million. Table 4 presents a summary of Nevada water resources (682).

There are other factors besides the limited supply that affect the supply and availability of water in Nevada for development. These include water quality, low yield, temperature, ground water movement, and water rights. In some basins or portions thereof, water may be highly mineralized or contain substantial amounts of undesirable dissolved salts. Generally, water resources for mining are developed on the edges of basins where water is usually of higher quality compared with that contained in the central portions of the basin. Some basins known to have moderate-to-large yields will have areas of low yield, which results in wells with high drawdown rates. Though usually not a great problem for mine and mill consumption, above normal water temperatures occur in many areas of the State.

Problems also arise in developing water resources in basins that are closed topographically but are not closed hydraulically. As a result of water moving from one basin to another beneath topographic divides, water development and consumption in one basin can have broad unexpected effects in adjacent basins. Problems with water availability due to infringement of water rights occur throughout the State. The problems are exacerbated by the largely unknown and little understood hydraulic systems, par-

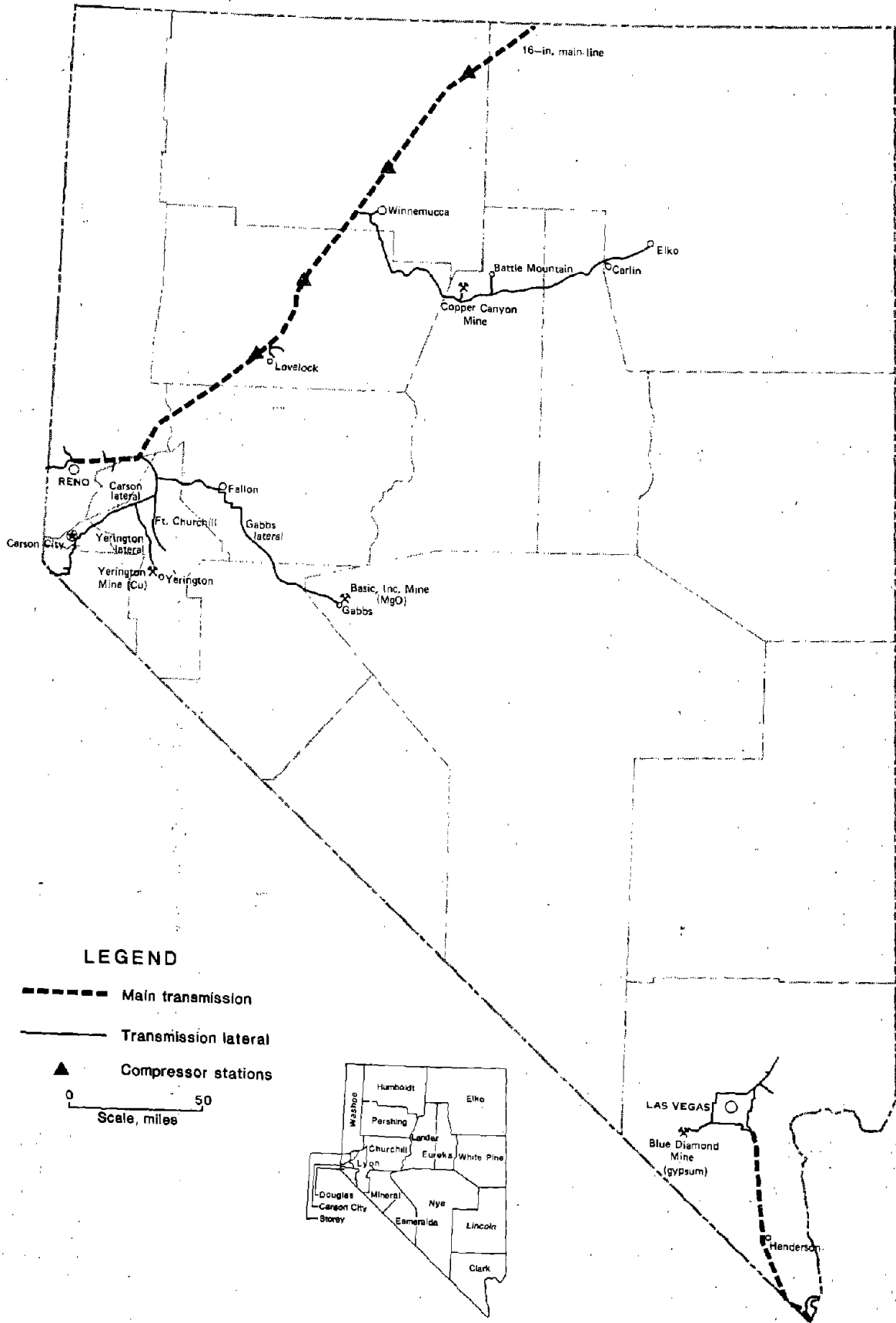


Figure 4.—Natural gas distribution system in Nevada.

Table 4. — Nevada water summary (682)

| | 10 ⁹ m ³ | 10 ⁶ acre ft |
|--|--------------------------------|-------------------------|
| Estimated annual average precipitation | 67 | 54 |
| Surface water: | | |
| Estimated runoff from mountains | 3.9 | 3.2 |
| Estimated inflow crossing State line (excluding Colorado River) | 1.6 | 1.3 |
| Colorado River | 12 | 9.7 |
| Estimated outflow crossing State line (excluding Colorado River) ¹ | .9 | .7 |
| Colorado River | 12 | 9.4 |
| Surface water storage capacity (excluding State's portion of Mead, Mohave, Tahoe, and Topaz) | 31 | 25 |
| Lake Mead | 36.6 | 29.7 |
| Lake Mohave | 2.25 | 1.82 |
| Lake Tahoe | 151 | 122 |
| Topaz Lake | .0733 | .0594 |
| Ground water (budget for valley-fill reservoirs): ² | | |
| Estimated inflow | 2 | 2 |
| Estimated outflow | 2 | 2 |
| Recharge from precipitation | 2.7 | 2.2 |
| Perennial yield of valley-fill reservoirs | 2.1 | 1.7 |
| Stored in upper 100 ft of saturated valley fill | 310 | 250 |
| Estimated transitional storage reserve | 100 | 84 |
| Estimated outflow crossing State line | .19 | .15 |
| Estimated inflow crossing State line | .004 | .003 |

¹Includes 1970 flow to Lake Mead from Las Vegas Wash.

²Water underground in a given valley.

ticularly those outside of the larger municipality and agricultural areas. Difficulties specifically occur as a result of not fully understanding the interaction between surface waters and ground water. The surface waters have long been appropriated, and as ground water is continually developed and utilized, surface water sources, with their attached legal prior use rights, may be adversely impacted.

In an arid State such as Nevada where water supplies are scarce and valuable, it has been necessary for the State government to strictly control and regulate its use. The State office that exercises authority over water use is the Division of Water Resources (DWR) of the State Department of Conservation and Natural Resources. The State Engineer is the executive head of DWR and administers the appropriation of public waters. The Division of Water Resources operates under a complex set of laws that have been developed over the past 100 yr of Nevada water usage.

For water planning and management purposes, the State of Nevada has been divided into 14 major hydrographic regions (fig. 5) of which all but two lie within the Great Basin. In turn, the hydrographic regions are further subdivided into 255 hydrographic areas. Nevada State law authorizes the State Engineer to designate ground water basins, to establish preferred uses of water within the basins, and to limit withdrawal in these areas.

As State policy, withdrawal of ground water is generally limited to that naturally recharged to the ground water basin. Additionally, Nevada Revised Statute (NRS) 533.035 states that "beneficial use shall be the basis, measure, and the limit of the right to the use of water." These guidelines result in the State Engineer assigning "designated" status to hydrographic areas where ground water resources are being depleted. By the end of 1983 there were 86 hydrographic areas throughout the State that have been so designated. In the interest of public welfare, NRS 534.120 authorizes and directs the State Engineer to declare preferred uses within these basins. Preferred uses are limited

to domestic, municipal, quasimunicipal, mining, industrial, irrigation, and stock-watering uses. After preferred uses have been established for a designated basin, the State Engineer is required to appropriate the scarce water supplies in the best interest of the public when acting on water permit applications. In 1983, the State Engineer's office stated that domestic and municipal uses had the highest preferred order of use; mining had the next highest priority, above irrigation. The reason given for mining's high priority is its relatively short consumptive lifespan and importance in securing water for mine development in areas where water demand approaches and exceeds the available supply.

To gain water rights for mining and milling use, a company must submit an application for a permit to appropriate to the State Engineer. By State statute, the State Engineer is required to approve an application if there is unappropriated water at the requested source of supply and where the applicant's use does not tend to impair the value of existing rights or otherwise be detrimental to the public interest. An approved application—a permit—grants the applicant the right to appropriate a designated amount of water, from a particular source, for a defined purpose, and for use at a defined location.

Major mine development has encountered water availability problems in the past and no doubt will face increasing difficulties in the future as it competes with other users for scarce supplies. To date, mining has been accommodated for its water needs; however, the State is required to protect the existing rights of water users and to promote the general welfare of the State. As a result, some mine developments have been required to obtain water from relatively distant locations.

TRANSPORTATION

The Nevada highway and rail transportation systems were developed under the influences of supply and demand. State highways initially were developed along frontier trails. Once much more extensive, railroads in the State were built to carry Nevada ores from mines to distant smelters. In many cases they were replaced by highways in response to social pressures for road connections between towns. Many rail lines have been abandoned.

Rail (686, 732)

Nevada is served by two major railroads with transcontinental connections, the Southern Pacific and the Union Pacific. The Union Pacific more than doubled its rail length within the State after merging with the Western Pacific Railroad Co. in 1983. Nevada is also served by two intrastate railroads: the Nevada Northern and the U.S. Gypsum. The Nevada Northern is a short-line carrier that suspended operations in December 1983. The U.S. Gypsum is a private line with less than 10 km of track.

Nevada's rail system is comprised of 2,421 km of rail lines consisting of 2,002 km of mainline and 419 km of branchline. Figure 6 shows Nevada's rail system. Table 5 summarizes the State rail system by carrier.

Nevada Northern Railway Co.—The Nevada Northern is a wholly owned subsidiary of the Kennecott Copper Corp. The line runs in a general north-south direction and traverses portions of Elko and White Pine Counties. At Cobre (Shafter), the Nevada Northern connects with the

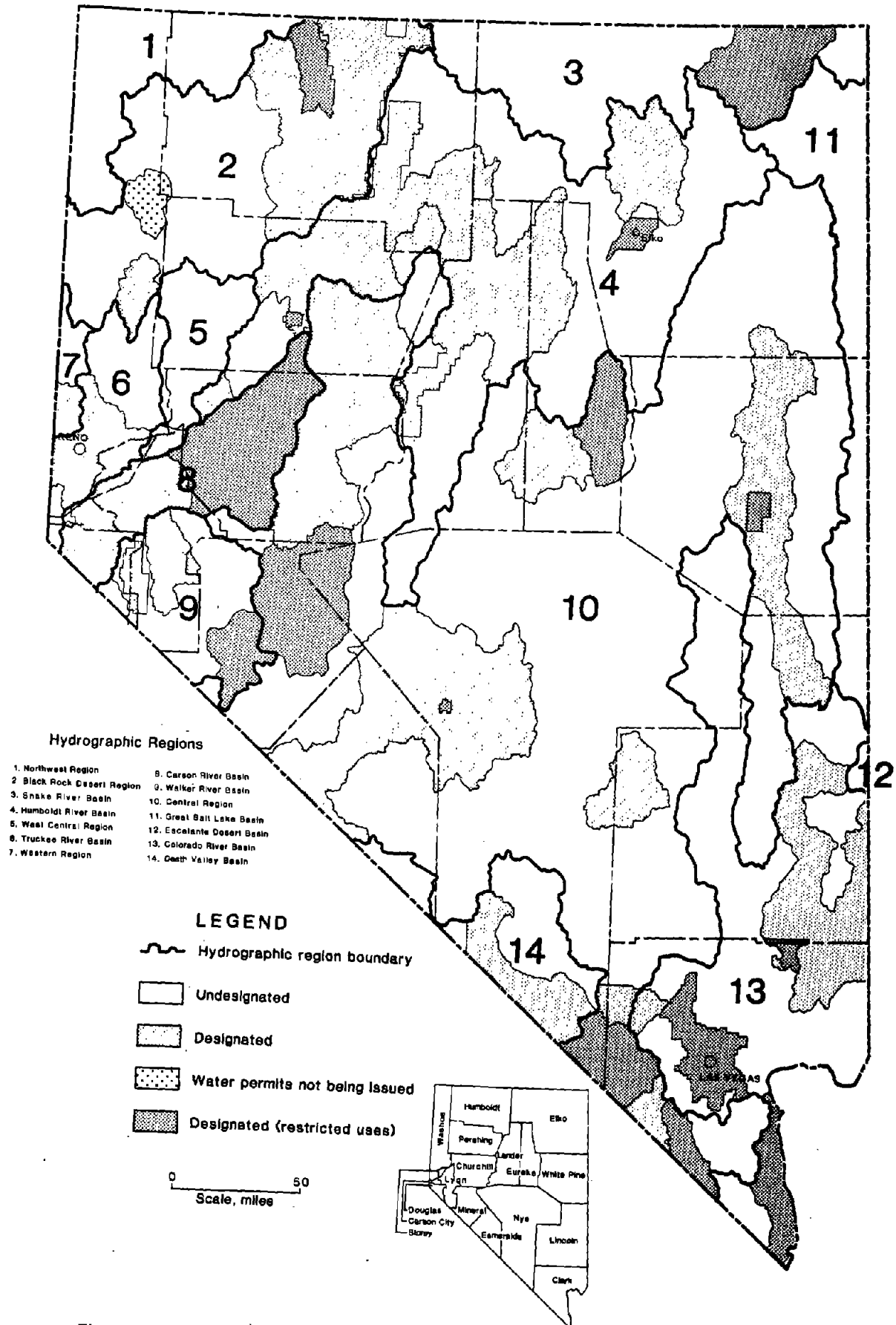


Figure 5.—Hydrographic regions and designated ground water recharge areas of Nevada.

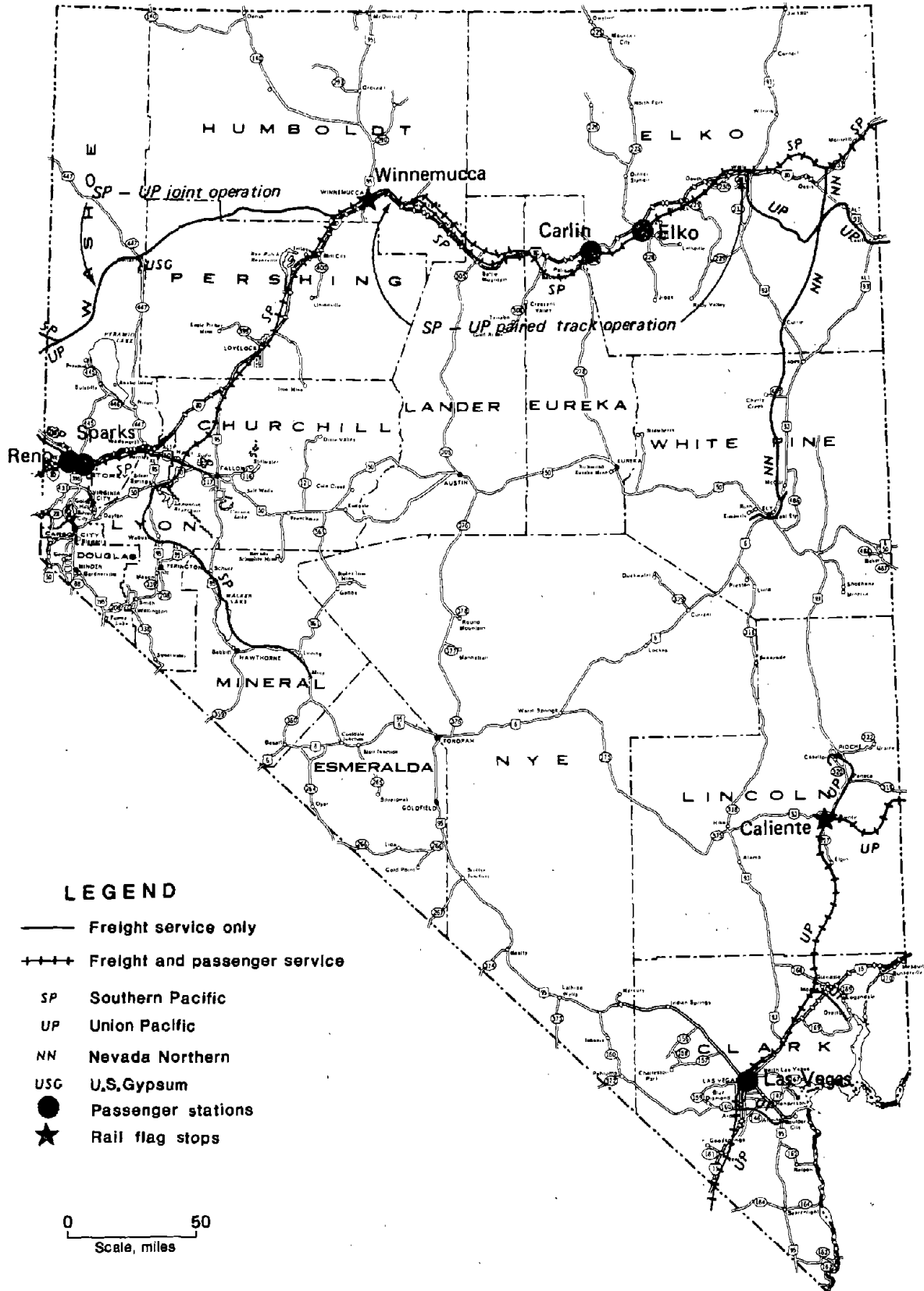


Figure 6.—Rail network of Nevada. (Base map, courtesy Nevada Department of Transportation.)

Table 5. — Rail carriers and rillage, kilometers

| Carrier | Mainline | Branchline | Total | pct |
|-------------------------------------|----------|------------|---------|-------|
| Nevada Northern Railway Co. | 238.2 | 18.8 | 257.0 | 10.6 |
| Southern Pacific Transportation Co. | 723.5 | 234.2 | 957.7 | 39.6 |
| Union Pacific Railroad Co. | 1,030.5 | 165.9 | 1,196.4 | 49.4 |
| U.S. Gypsum | 9.7 | 0 | 9.7 | .4 |
| Total | 2,001.9 | 418.9 | 2,420.8 | 100.0 |

mainline of the Southern Pacific; further south it connects with the Union Pacific (formerly Western Pacific) track. The mainline extends south to Kennecott Copper Corp. inactive copper mines in the Robinson mining district. Two branchlines of the Nevada Northern connect the mainline to Kennecott's concentrator and smelter at McGill. After cessation of copper mining at the Ruth in 1976, the rail line has experienced limited use. The rail line was not abandoned but has suspended operations. Kennecott filed for abandonment in 1984. Notice of suspensions of operations are filed with the State for 6-month periods at a time.

Southern Pacific Transportation Co.—The Southern Pacific Transportation Co. is the largest of the Southern Pacific Co. subsidiaries. The company has broad financial interests including transportation, communications, and land management and development. Southern Pacific's involvement in transportation includes rail, truck, piggyback, and pipeline systems.

The Southern Pacific rail system links markets in 12 States in the west and southwest, and handles transcontinental shipments through the rail centers of New Orleans, Tatumcari (NM), Ogden, St. Louis, and Memphis. International rail shipments within Southern Pacific's system move through the U.S. Gulf and Pacific coasts and along the Mexican border.

In Nevada, the Southern Pacific offers direct mainline service to major markets in Oregon, California, Utah, Arizona, and New Mexico. Additionally, through-service is offered to points in the Pacific Northwest, Midwest, and Eastern United States. Extending east-west across northern Nevada, the Southern Pacific operates between Ogden, UT, and Roseville, CA. Connections in the Southern Pacific's Nevada rail system are made with the Union Pacific Railroad Co. (former Western Pacific) at Winnemucca and the Nevada Northern Railway Co. at Cobre (686).

The Southern Pacific has two branchlines in Nevada, both of which leave the mainline at Hazen, about 70 km east of Reno. One branch, the Mina, runs in a southerly direction from Hazen for about 210 km to Mina. The other branch, the Fallon, runs easterly about 25 km to Fallon.

Union Pacific Railroad Co.—The Union Pacific Railroad Co. transports diverse products and is a part of intermodal traffic in the States of California, Colorado, Idaho, Iowa, Kansas, Missouri, Montana, Nebraska, Nevada, Oregon, Utah, Washington, and Wyoming. After the 1983 merger with the Western Pacific Railroad Co., the Union Pacific added about 723 km of track (688 km of mainline) in northern Nevada to its existing 473 km northeast-southwest track system (including 342 km of mainline) in southern Nevada.

The Union Pacific rail line runs west from Salt Lake City, enters northern Nevada, and parallels the Southern Pacific's track in a cooperative paired track arrangement between a point near Wells to Winnemucca. Connections with the Nevada Northern and the Southern Pacific are at Shafter and Winnemucca, respectively. One branchline

operated in the company's northern Nevada system runs 53 km (35 km of Nevada rillage) from a connection point with the mainline at Reno Junction in northeastern California to the northern Reno area.

In southern Nevada, the Union Pacific passes through Las Vegas, and has about 343 km of mainline track, and about 130 km of branchline. The mainline connects major cities and towns of southern Nevada with direct lines southwest to Los Angeles and northeast to the Salt Lake City, Provo, and Ogden areas. From this hub area, direct lines exist west to San Francisco; northwest to Portland, Tacoma, and Seattle; and east where many connections exist for rail haulage to Gulf Coast ports.

Union Pacific's four branchlines in southern Nevada are the Pioche, Prince, Mead Lake, and Boulder City. Several major spurs connect the branchlines to industrial areas and military installations. The Pioche Branch, about 52 km in length, connects the Union Pacific mainline at Caliente and terminates to the north near Pioche. The Prince Branch connects with the Pioche Branch and extends 14 km west to the Caselton and Prince Mines in the Pioche mining district. The Mead Lake and Boulder City branches connect the mainline with the Nevada towns of Overton, Henderson, and Boulder City.

U.S. Gypsum.—The U.S. Gypsum Co. operates a 10-km-long private railroad from its Empire plant in Washoe County to a connection point with the Union Pacific Railroad at Gerlach, NV. Company practice in 1982 was to ship outbound finished products using five to eight cars. Two or three cars were used to haul inbound raw materials (686).

Road

Nevada's highway and road system is key to the mining industry's successful development of the State's mineral wealth. The system serves the seventh largest State in the Union, containing about 288,200 km² (110,500 mi²) of land. The States stretches about 780 km (485 miles) north-south and about 505 km (315 miles) east-west. Federal and State highways serve interstate and intrastate movements, respectively. The county road system serves intracounty movement not served by the State system.

Nevada is traversed east to west by interstate highways I-80 and I-15. Interstate 80 traverses northern Nevada directly connecting its cities and communities including Elko, Battle Mountain, Winnemucca, and Reno to Sacramento and San Francisco to the west, and Salt Lake City to the east. Interstate 15 passes through Las Vegas providing direct connections to Los Angeles and the Salt Lake City area. Interstate highways comprise about 875 km of the State's approximately 88,100 km (1980) of roads, highways, and streets (687). State and county rural highways and roads make up about 77,700 km. Figures 7 and 8 show the State's road and highway system and the approximate haul distances between major points. Figure 9 shows the relative accessibility of intrastate routes when planning for transport of heavy "overweight" mine or mill equipment loads.

Generally, intrastate movement of mine products is by truck. Commonly, movement of ores and concentrates over the State road and highway system is by contract carrier. Long-distance interstate movement of mine or mill products, characterized by large bulk and low general value, is most often by rail after products are trucked to railheads. High unit value products such as mercury and gold may be trucked for long distances. However, gold doré-bullion is

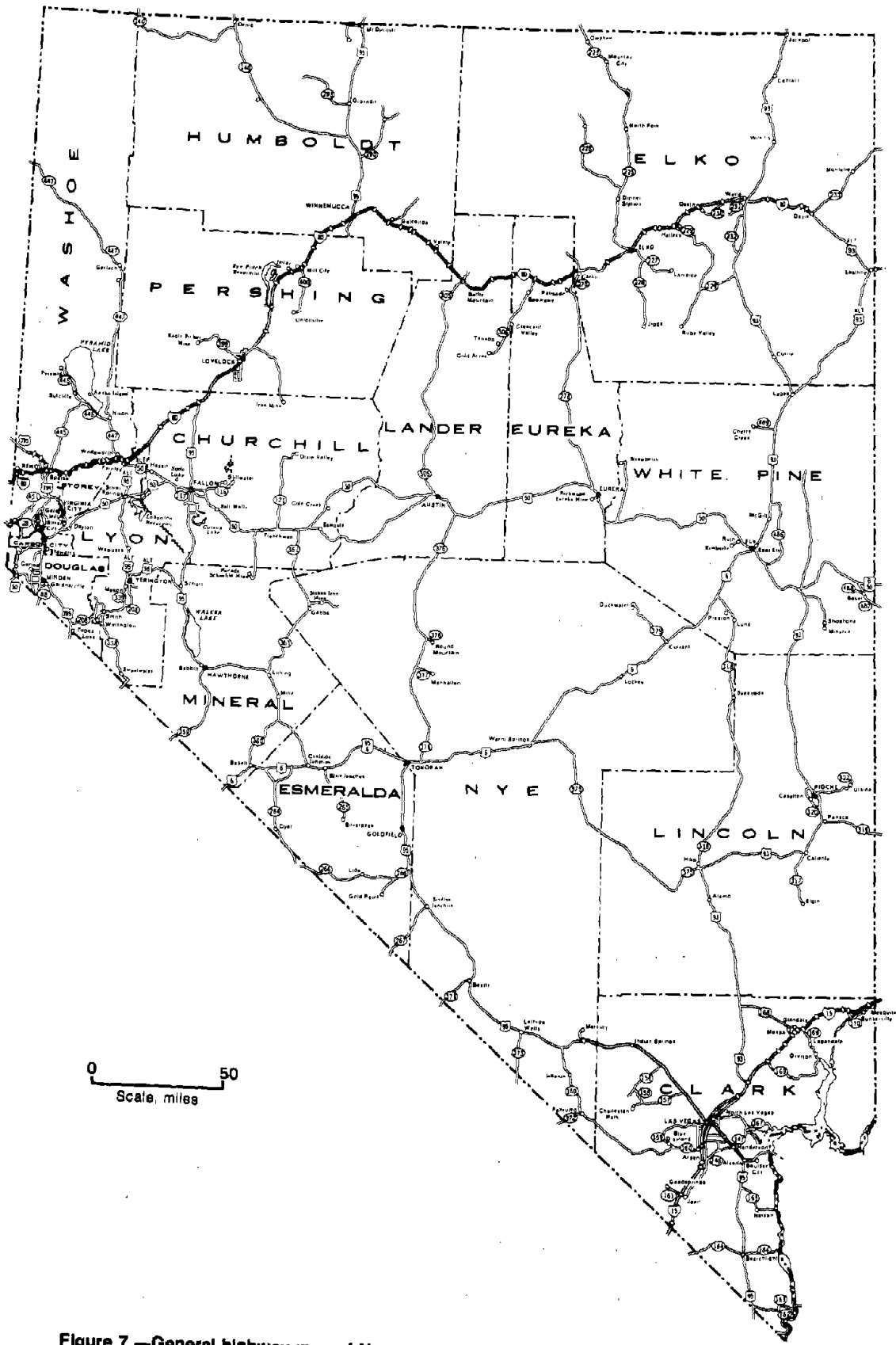


Figure 7.—General highway map of Nevada. (Courtesy Nevada Department of Transportation.)

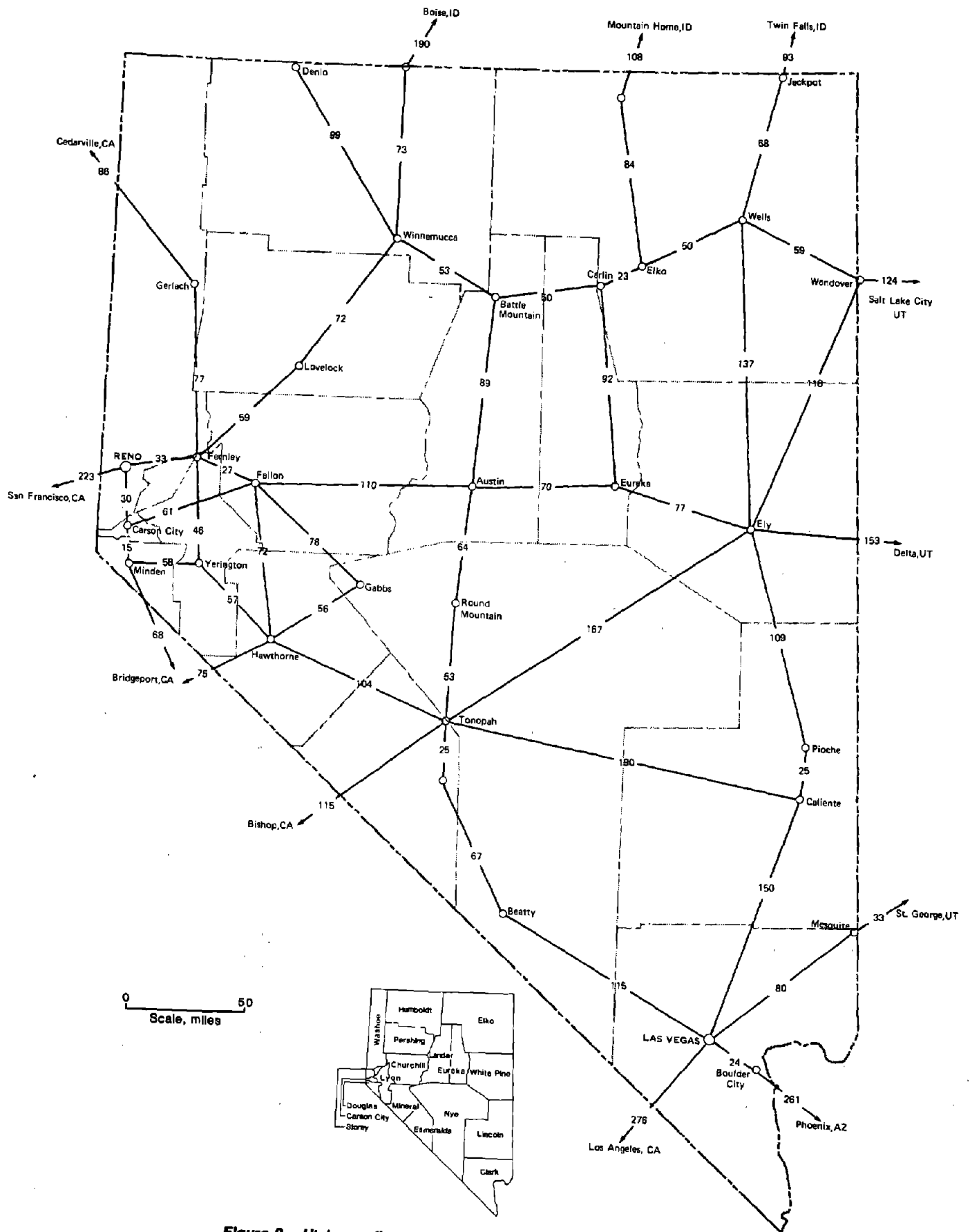


Figure 8.—Highway distances between principal Nevada communities.

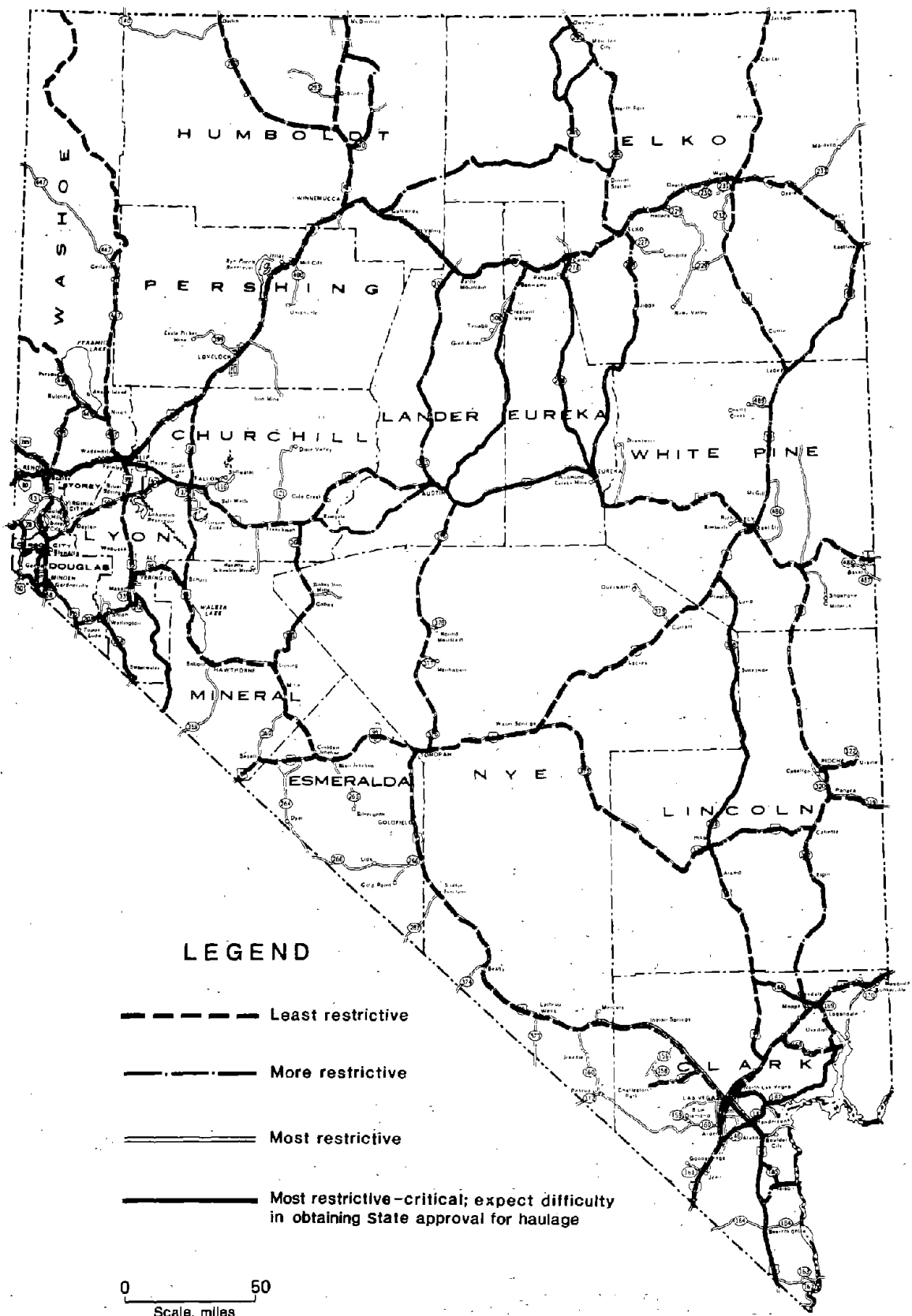


Figure 9.—Highway accessibility for transporting nonreducible loads above legal weight limits.
(Base map, courtesy Nevada Department of Transportation.)

often transported to refineries by air from the State's major gold mines.

Because transportation can be a significant element in overall resource exploitation, mine operators attempt to keep their mine-to-mill or mine-to-market transportation costs as low as possible. Efforts have been made to persuade the State to increase the legal maximum weight limitations on State and county roads, or to grant special permits or waivers for continuous haulage of overweight loads. Because of potentially increased damage to road surfaces, State policy has not yielded in this area. However, the State does grant permits for single or one-way haulage of nonreducible overweight loads, such as might be encountered when delivering heavy mine and mill equipment to a minesite. In Nevada, approval to haul such loads is difficult to get during the spring months when the frost is thawing, and during periods when the subgrade lacks stability because of high moisture content.

REGULATION AND TAXATION

Mining is critically important to Nevada. Mining and mineral exploration are particularly vital to the economies of numerous small towns and cities, some of which are almost completely dependent upon the mining industry. The influence on the economies of the State's large cities is more indirect. The mining industry contributes substantially to the State's economy through jobs, taxes, freight revenues, and the support of satellite industries. Nevada mining regulations and taxation are generally favorable to the mineral industry (107) as the State recognizes the importance of a prosperous and stable mineral industry.

Mining Regulations

Most regulation governing development of Nevada mineral resources occurs at the State level: "Air quality control may be regulated at the county or municipal levels; solid waste management may be regulated at the county level; and zoning and special uses are regulated at the municipal level" (731).

A major portion of Nevada mining law deals with claim location, millsites, tunnel rights, claim disposition, partnerships, and licensing of equipment operators. The most restrictive State laws relate to mining safety and health, and air and water quality control. The State has adopted all mandatory Federal health and safety standards as published by MSHA, and the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor. The State Inspector of Mines, Division of Mine Inspection, State of Nevada Department of Industrial Relations is responsible for insuring industry compliance with mine safety regulations.

By State statute all water supply sources within the State, whether surface or underground, belong to the public, and their usage is regulated by the Division of Water Resources. Federal and State air and water quality laws are administered by the Nevada Division of Environmental Protection. The State air and water quality laws are generally no more stringent than Federal laws.

Nevada has no State clearinghouse or one-stop permit agency that serves to consolidate the permitting process within the State. Table 6 outlines State and Federal permits (and agency contacts) required during planning, development, and construction. The table is based on

Nevada Bureau of Mines and Geology Special Publication L-6, *State and Federal Permits Required in Nevada Before Mining or Milling Can Begin* (rev. 1981), available from Nevada Bureau of Mines and Geology, Reno, NV 89557. The publication contains data compiled by the Nevada Department of Minerals (formerly State Division of Mineral Resources) on when permits are required, maximum and minimum times to obtain permits, permit costs, requirements for public notice, and other information required by the granting agency. Communication with the Nevada Department of Minerals (400 West King Street, Suite 106, Carson City, NV 89710, (702) 855-5050), is recommended for information regarding changes or additions to regulations and permitting procedures related to mining.

Similar information is available and explained in greater detail in *Permit Requirements for Development of Energy and Other Selected Natural Resources for the State of Nevada*, 1981, prepared for Four Corners Regional Commission and the U.S. Geological Survey (731). This document, available for several western States, is obtainable from U.S. Geological Survey, Environmental Affairs Office, 760 National Center, Reston, VA 22092.

Taxation (18)

Principal taxes paid by Nevada mining operations are taxes on net proceeds, property taxes on mine and mill equipment and improvements, and sales tax paid when purchasing equipment and supplies. Other taxes are levied on patented mine claims, and on oil-gas-geothermal leases.

The net-proceeds-of-mines tax is imposed on net earnings resulting from the sale of the product of the mining operation. The Nevada Department of Taxation is directed by State statute to determine the net proceeds of a mining operation from detailed financial data the mining company is required to submit. The net proceeds, which are subject to taxation, are based on gross yield or value of the product less allowable deductions for operating expenses. These deductions include, but are not limited to, actual costs for the following:

1. Extracting ore from the mines.
2. Transporting the mine product to the place of reduction, refining, or sale.
3. Reduction, refining, and sale.
4. Marketing and delivering the product and the conversion of the product into money.
5. Maintenance and repair of equipment and facilities.
6. Fire insurance.
7. Depreciation of the original capitalized cost of machinery, facilities, etc.
8. Mine development work.
9. Royalties.

The tax rate imposed upon the net proceeds earned from mining is equal to the ad valorem (property tax) rate set by the county assessor for other property within the same respective taxing jurisdiction.

Mining companies are also subject to a property tax assessed on mine and mill improvements and equipment. Property appraisal is conducted by the State Department of Taxation and is subject to the local jurisdiction tax rate set by the county assessor. Nevada's statutes limit the rate of the ad valorem property tax to a maximum of \$3.64 for each \$100 assessed valuation. Assessed value is set at 35% of the statutorily defined taxable value of the property. In turn, taxable value is based on the cost appraisal approach where value is determined by establishing the replacement

Table 6.—Permits required in Nevada before initiation of mining or milling (200)

| <u>Requirement</u> | <u>Granting agency or agency to contact</u> |
|---|---|
| State: | |
| Permit to construct campsite | Nevada Division of Health, Bureau of Consumer Health Protection Services 505 East King St., Carson City, NV 89710 (702) 885-4750 |
| Endangered wildlife | Nevada Department of Wildlife P.O. Box 10678 1100 Valley Road, Reno, NV 89520 (702) 784-6214 |
| Endangered plants | Nevada Division of Forestry, Dept. of Conservation and Natural Resources 201 South Fall St., Carson City, NV 89710 (702) 885-4350 |
| Air quality permit to construct | Nevada Division of Environmental Protection 201 South Fall St., Carson City, NV 89710 (702) 885-4670 |
| Nevada water pollution control permit | Do. |
| Authorization for disposal of solid wastes | Do. |
| Air quality permit to operate | Do. |
| Hazardous waste | Do. |
| Permit to appropriate the public waters | Nevada Division of Water Resources 201 South Fall St., Carson City, NV 89710 (702) 885-4380 |
| Permit to construct tailings dam | Do. |
| Opening and closing mines | State Inspector of Mines 1380 S. Curry St., Carson City, NV 89710 (702) 885-5243 |
| Historic preservation | Nevada Division of Historic Preservation and Archaeology 201 South Fall St., Carson City, NV 89710 (702) 885-5138 |
| Federal: | |
| Use of BLM-administered land | Bureau of Land Management—State Office Division of Mineral Resources 300 Booth St., P.O. Box 1200, Reno, NV 89520 (702) 784-5676 |
| Use of BLM-administered land under wilderness review | Do. |
| Temporary use of BLM-administered land | Do. |
| Prevention of significant deterioration | Environmental Protection Agency Division of New Source Section, Air Management 215 Fremont St., San Francisco, CA 94105 (415) 974-8110 |
| Right of way for transmission corridor | Bureau of Land Management Branch of Appraisal 300 Booth St., P.O. Box 1200, Reno, NV 89520 (702) 784-5474 |
| Road access (ROW) | Do. |
| Purchase, transport, or storage of explosives | Bureau of Alcohol, Tobacco, and Firearms 350 South Center St., Reno, NV 89501 (702) 784-5251 |
| Flora and fauna | U.S. Forest Service 1200 Franklin Way, Sparks, NV 89431 (702) 784-5331 |
| Notification of commencement of operation | Mine Safety and Health Administration 3680 Grant Drive, Reno, NV 89509 (702) 784-5892 |
| Patenting mining claims | Bureau of Land Management 300 Booth St., P.O. Box 1200, Reno, NV 89520 (702) 784-5751 |
| City and County: General plan, building permit, special-use permit, zoning change, business license. | Contact respective city or county government affected by a proposed operation for information on what permits may be required. |

costs, minus straight-line depreciation. The average Nevada ad valorem taxation per \$100 of assessed value, as of August 1983, was \$2.12. Current State statute limits annual growth in ad valorem revenue derived from old property in the aggregate to 4.5% without a vote of the people.

The third principal tax affecting mining companies is the sales and use tax. In 1981, the sales tax was increased statewide from 3.5% to 5.75%. Only Washoe County has a higher rate of 6%, imposed in November 1982.

For a comparative study of mine tax impact in Nevada and six western States, see reference 107.

MINERAL PROCESSING FACILITIES

Milling Facilities

Nevada beneficiation facilities are shown in figure 10 and listed in tables 7 and 8. Although the State has significant processing facilities for such commodities as diatomite, gypsum, limestone, salt, and colemanite, the facilities shown and listed are limited to those that process any of the 17 commodities designated in the introduction of this report. The State hosts primary beneficiation facilities for

the processing of ores of antimony, barium, copper, gold, silver, lead-zinc, magnesium, mercury, molybdenum, tungsten, and lithium brines.

Much of the data given in figure 10 and tables 7 and 8 are from the directories of active Nevada mine operations compiled and published annually by the Division of Mine Inspection, Department of Industrial Relations, State of Nevada (683, 685, 688). Mill capacity and type of operation data were derived from journals, newspapers, and personal communication with the owners and operators. The figure and tables are not intended to be comprehensive; rather, the data are intended to show the 1983-84 status of strategic mineral process development within the State.

Over the past several years there has existed an excess of in-state milling capacity for copper, tungsten, and lead-zinc. This continuing trend through 1983 and into 1984 was caused, at least in part, by low commodity prices and related foreign competition. In 1983, the outward signs of a similar demise appeared for barite with many mines and/or mills producing at much reduced levels and some operations closing. Fluctuating market conditions tend to have a major impact on in-state lithium (lithium carbonate as the product), mercury, and molybdenum production because each of these commodities are produced by a single, "large" operation. Mill production from Nevada's lithium and mercury properties has been relatively stable in recent years; however, molybdenum (concentrate) production has fluctuated and at the end of 1983, following an 8-month shut-down, output remained less than capacity.

Activity in the State's precious metal industry has been robust in the past several years. Several milling facilities have operated at rates exceeding design capacity. Mill conversions from other commodity products to gold production have occurred. Expansion of existing gold processing facilities to greater capacities and the use of multiple processes are common. The precious metal industry, gold especially, is by far the largest segment of Nevada's current mining industry. Of the 389 large and small Nevada mining operations active in 1983, gold and silver operations comprised about 57%.

Smelting and Refining

Nevada hosts one smelting and one processing facility that have been available for custom processing of copper and tungsten concentrates. The Kennecott smelter at McGill processed copper concentrates prior to its closure in

June 1983. Kennametal, Inc., Nevada Division, is solely dependent on custom tungsten concentrates for its operation located a short distance north of Fallon.

The Kennecott smelter, colocated with the company's 19,500 t/d (21,500 ton/d) flotation concentrator, has the capacity to produce 45,000 t/a (50,000 ton/yr) of blister copper. It has operated on an intermittent basis after the company's nearby Ruth Mine closed in 1978. Since then, the smelter has survived on stockpiled copper concentrates, and on custom concentrates processed for other copper companies or from Kennecott's other operations. The smelter closed because of the inability to obtain adequate concentrates. Kennecott plans to continue maintenance of the facilities in the event domestic copper industry conditions improve.

The Kennametal processing plant buys tungsten concentrates on the world market. As of early 1984, domestic concentrates were not being offered, and the plant's supply sources were from foreign suppliers only. The company purchased concentrates meeting normal tungsten specifications with 60% WO₃. Minimum amount accepted per shipment is 450 t (500 ton). Sulfur content above 1.5% is penalized (734).

Smelting facilities are common to Nevada's numerous gold operations. The facilities are captive and seldom consider smelting outside concentrates. Dore product is sent generally to east and west coast companies for refining.

Figure 11 shows and lists principal smelting and refining processing facilities in the immediate area significant to Nevada. The figure does not include the Battle Mountain area barite grinding facilities (fig. 10). Facilities listed in the figure either currently buy, or have in the past, bought custom concentrates. The figure lists a much smaller number of copper, lead, and zinc smelting-refining facilities than would have been included 15 yr ago. The closing of smelting and refinery facilities has added significantly to the distances companies, especially the smaller operations, must ship their concentrates for treatment (734). Even Nevada's largest operations, such as Anaconda Company's Nevada Moly Mine,⁶ may have to ship concentrates great distances for smelting. As an example, the molybdenum concentrates from the molybdenum-copper mine have been shipped to roasting facilities in Iowa, Pennsylvania, Canada, and Europe.

⁶Nevada Moly Mine indefinitely suspended operations in January 1985 because of poor market conditions.

Table 7.—Numerical index of selected beneficiation facilities in Nevada

(Refer to figure 10)

| Map No. | Name | Commodity ¹ | Map No. | Name | Commodity ¹ | Map No. | Name | Commodity ¹ |
|---------|---|------------------------|---------|---|------------------------|---------|--|------------------------|
| 1.. | McDermitt | Hg | 42. | Springer | W | 88. | Red Rock | Au |
| 2.. | Oxbow Tungsten | W | 43. | Lewis | Au | 89. | Aden | Au |
| 3.. | Dry Creek | BaSO ₄ | 44. | Global | Au | 90. | Potosi | Au |
| 4.. | Stormy Creek | BaSO ₄ | 45. | Imlay Canyon | Au | 91. | Candelaria | Ag |
| 5.. | Wells | W | 46. | Nevada Packard | Ag | 92. | Argentum | Au |
| 6.. | Enfield Bell (Jerritt Canyon) | Au | 47. | Oreana | Ag | 93. | G & S | Au |
| 7.. | Dexter | Au | 48. | F. M. Wright | Au | 94. | Northumberland | Au |
| 8.. | Esmeralda | Au | 49. | Relief Canyon | Au | 95. | East Northumberland | BaSO ₄ |
| 9.. | Getchell | Au | 50. | Gold Hill | Au | 96. | Round Mountain | Au |
| 10. | Pinson | Au | 51. | Bernice Canyon | Sb | 97. | Manhattan (Arizona Hillside Mining Co.) | Au |
| 11. | Rossi | BaSO ₄ | 52. | Tungsten Mountain | W | 98. | Manhattan (Tenneco) | Au |
| 12. | Dee | Au | 53. | New Pass | Au | 99. | Nevada Moly | Mo |
| 13. | Bootstrap | Au | 54. | Allen | BaSO ₄ | 100 | Tonopah West (Miller's) | Ag |
| 14. | Goldstrike | Au | 55. | Austin Resources | Ag | 101 | Boss | Au |
| 15. | Bullion Monarch (Universal Gas of Montana) | Au | 56. | Bullion Monarch (Monarch Mining) | Ag | 102 | Jumbo | BaSO ₄ |
| 16. | Carlin | Au | 57. | Bauer | Ag | 103 | Tonopah Divide | Au |
| 17. | Eisenmann | BaSO ₄ | 58. | Precious Metals (Brazos, Imperial-Klondike) | Au | 104 | Silver Peak | Li |
| 18. | Patsy Ann | BaSO ₄ | 59. | Victorine (Surnich) | Au | 105 | Sixteen-to-One | Ag |
| 19. | Gold Quarry | Au | 60. | Silver Center-Wonder | Au | 106 | Goldfield Tailings (Blackhawk) | Au |
| 20. | Maggie Creek | Au | 61. | Anchor Cox Canyon | Au | 107 | Goldfield (Trafalgar) | Au |
| 21. | Nevada Barth | Fe | 62. | Kennametal | W | 108 | Goldfield (Southern Pacific, Noranda, P.G. & U.) | Au |
| 22. | Dunphy | BaSO ₄ | 63. | Fallon | BaSO ₄ | 109 | Spicer Mining Co., Inc. | Au |
| 23. | Argenta | BaSO ₄ | 64. | John Young (Wheeler) | W | 110 | Montgomery Shoshone | Au |
| 24. | Dresser | BaSO ₄ | 65. | Fisk | W | 111 | Sterling | Au |
| 25. | Battle Mountain Grinding (IMCO) | BaSO ₄ | 66. | Nevada Pacific | Au | 112 | Victoria | Cu |
| 26. | Battle Mountain Copper Basin | Cu | 67. | Gooseberry | Ag | 113 | Bald Mountain | Au |
| 27. | Battle Mountain Copper Canyon Precipitation plant | Cu | 68. | American Flat | Au | 114 | Alligator Ridge | Au |
| 28. | Battle Mountain Copper Canyon | Au | 69. | Haywood-Santiago | Au | 115 | Windfall | Au |
| 29. | Independence | Ag | 70. | Bennetts | Au | 116 | McGill Smelter | Cu |
| 30. | Bateman Canyon | BaSO ₄ | 71. | Donovan | Au | 117 | McGill Concentrator | Cu |
| 31. | Fire Creek | Au | 72. | DeLaMare | Au | 118 | Sunshine Puritan | Cu |
| 32. | Major Barite | Au | 73. | Buckskin | Au | 119 | Ward | Pb-Zn |
| 33. | Grey Eagle | Au | 74. | Veta Grande | Au | 120 | Taylor | Ag |
| 34. | Buckhorn | Au | 75. | Bell Mountain | Au | 121 | Atlanta | Au |
| 35. | Cortez leach | Au | 76. | Nevada Scheelite | W | 122 | Research Silver (Silver Horn) | Au |
| 36. | Cortez | Au | 77. | Paymaster | Au | 123 | Pioche | Au |
| 37. | Greystone | BaSO ₄ | 78. | Ione Placer | Au | 124 | Casleton | Pb-Zn |
| 38. | Mountain Springs (IMCO) | BaSO ₄ | 79. | Luning | MgO | 125 | Emerson | W |
| 39. | Mountain Springs (FMC) | BaSO ₄ | 80. | Nevada Works | MgO | 126 | Mockingbird | Au |
| 40. | Jupiter | Au | 81. | Paradise Peak | Au | 127 | Continental | Au |
| 41. | Fortune Cookie | Au | 82. | Santa Fe | Au | 128 | Oro De Mojave | Cu |
| | | | 83. | Kinhead | BaSO ₄ | 129 | Jetco | Au |
| | | | 84. | Borealls | Au | | | |
| | | | 85. | Aurora | Au | | | |
| | | | 86. | Ashby | Au | | | |
| | | | 87. | New Boston | Au | | | |

¹Principal commodity.

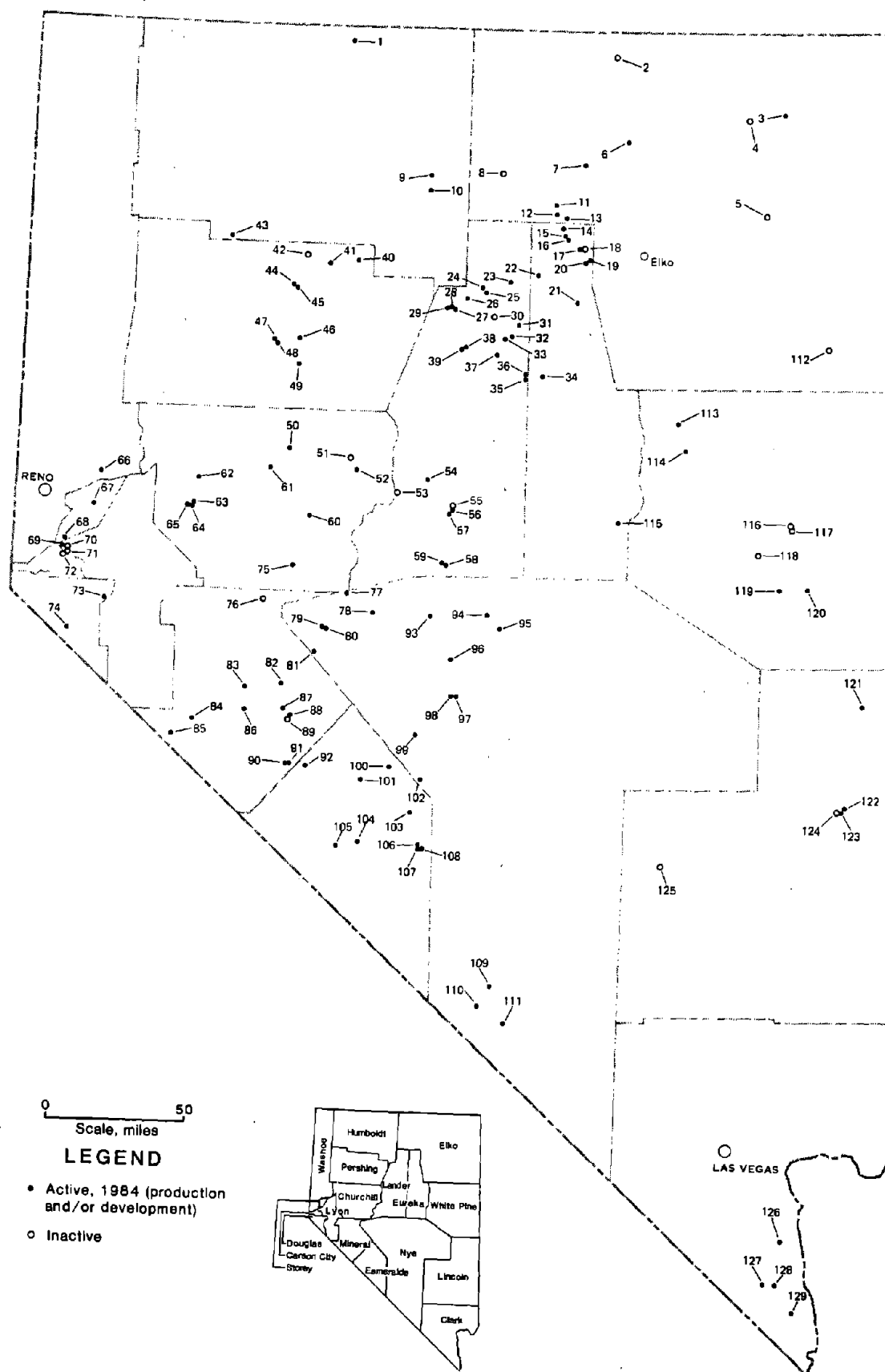


Figure 10.—Selected beneficiation facilities in Nevada.

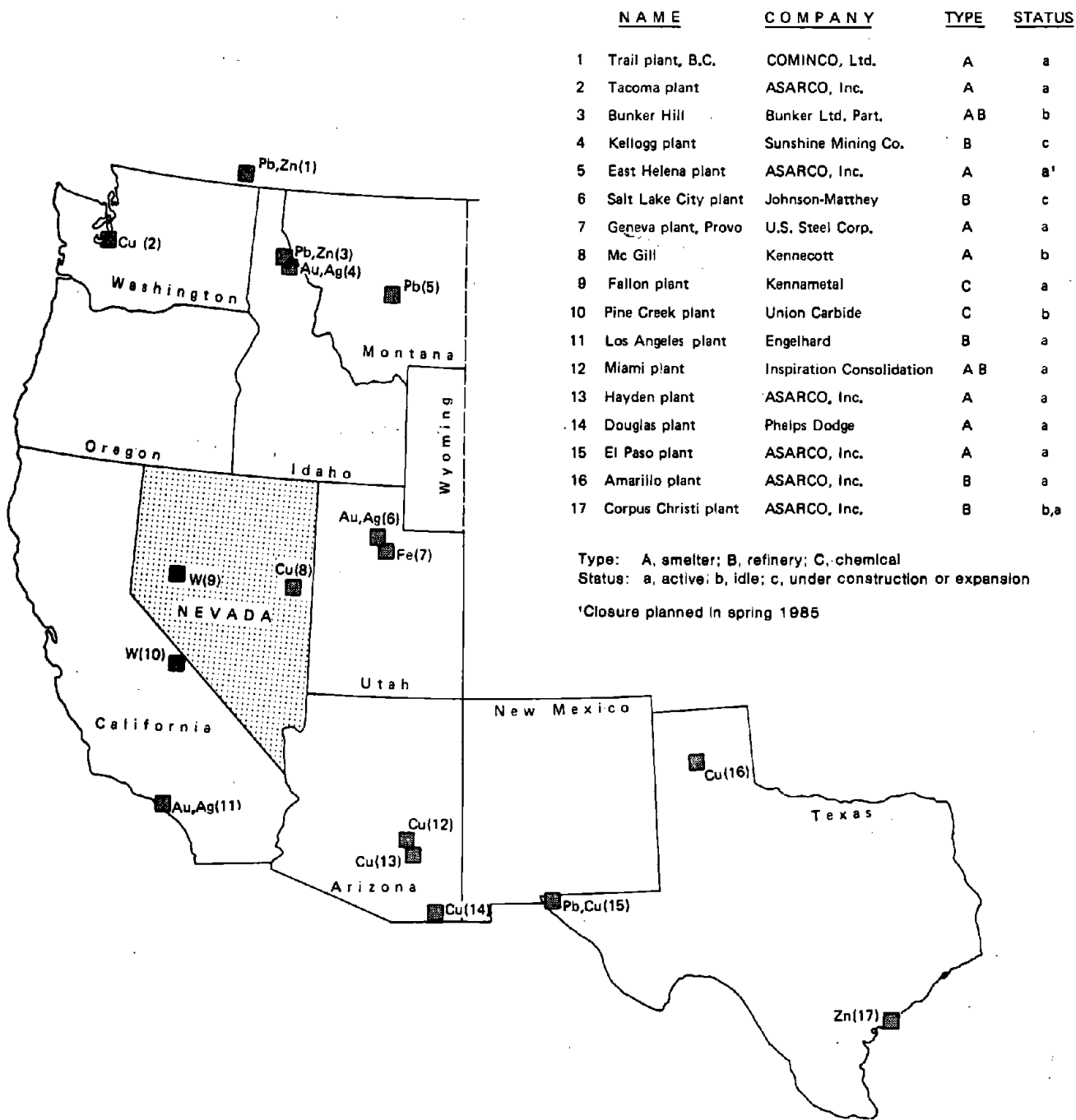


Figure 11.—Regional secondary processing facilities significant to Nevada.

Table 8.—Selected beneficiation facilities in Nevada

| Name and operator | County | Status | Map No. ¹ | Method | Capacity ² | Type | Comments |
|---|-----------|--------|----------------------|----------------------------------|--|------|---|
| ANTIMONY | | | | | | | |
| Barnice Canyon; Howard Turley. | Churchill | Idle | 51 | Mill, screen | 1.8 t/h | A | Capacity is ball mill capacity. Owner hopes to operate the mill in 1985 with possible addition of flotation circuit. The mine was operational in 1984. Ore contains Au, Ag. |
| BARITE | | | | | | | |
| Allen; Tom Norris Mining Co. | Lander | Active | 54 | Mill, gravity (jig). | 36 t/h | A | Produces about 18 t/h product. Equipment comprised of 1 roll crusher and 1 jig. |
| Argenta; Milchem, Inc. | do | do | 23 | Mill, gravity, grind. | 136 t/h crush, 16.4 t/h grind. | A, B | Reportedly operating at 55% to 60% of capacity; has accepted custom in the past. |
| Bateman Canyon; Milchem, Inc. | do | Idle | 30 | Mill, gravity (jig). | 54 t/h | A, B | Custom work accepted in past and will consider custom in future. |
| Battle Mountain Grinding; Imco Services, Inc. | do | Active | 25 | Mill, grind, classification. | 360 t/d, 27 t/h | A, B | 127,000 t/a capacity. 3 grinding mills, 9-t/h capacity each. |
| Dresser (Battle Mountain); Dresser Minerals. | do | do | 24 | Mill, crush, grind. | 32 t/h, total grind. | A, B | Grinding plant; 3 roller mills. Reported operating at about 60% capacity in early 1983. Would consider taking custom ore if spare capacity exists. |
| Dry Creek; Chromalloy Mining and Minerals (owner), leased by Circle A Construction. | Elko | do | 3 | Mill, gravity (jig). | 180 to 230 t/h | A | Capacity is jaw crusher. |
| Dunphy; N. L. Industries, Baroid Division. | Eureka | do | 22 | Mill, gravity, flotation, grind. | 110 t/h | A, B | Have done and would consider custom grinding, not flotation; 73-t/h railcar loading capacity. |
| East Northumberland; All Minerals, Inc. | Nye | do | 95 | Mill, gravity | 1,365 t/d, 90 t/h | A, B | Portable crusher; peak load for crushing circuit is 136 t/h. |
| Eisenmann; Eisenmann Chemical Co. | Eureka | do | 17 | Mill, crush, jig. | 272,000 t/a | A, B | Possesses 2 jigs; has done custom crushing and would consider custom jigging. In 1984, mill feed was stockpiled ore from its Lakes Mine. |
| Fallon; Standard Slag Co. | Churchill | do | 63 | Mill, flotation | 7.3 t/h product | A, B | Formerly a fluor spar mill, bought to feed P & S barite mine ore. |
| Greystone; Dresser Minerals. | Lander | do | 37 | Mill, gravity (jig). | 110 t/h estimated product. | A | Mill is portable; capable of producing 907,000 t/a product. |
| Jumbo; GEO Drilling Fluids, Inc. | Nye | do | 102 | Mill, crush, screen. | 272 t/h | A | Active in 1983; status unknown in 1984. |
| Kinkead; Kinkead Mining and Construction. | Mineral | do | 83 | do | 23 t/h | A | Mill has flotation capability; intermittent operation. Jig capacity—14 t/h. Normally operates at 90 t/d. |
| Mountain Springs (FMC); FMC Corp. | Lander | do | 39 | Mill, crush, screen. | 63,000 t/a | A | Primary crusher design capacity is about 181 t/h. |
| Mountain Springs (IMCO); Imco Services, Inc. | do | do | 38 | Mill, jig, table, flotation. | 400,000 t/a, 127,000 t/a ground product. | A | |
| Patsy Ann; Unichem Minerals, Inc. | Eureka | Idle | 18 | Gravity (jig) | 30 to 34 t/h | A | 2 jigs. New equipment operated about 2 months in 1983; no crusher. Product capacity is 10.9 t/jig; jigs processed Coyote Mine ore. |
| Rossi; Tom Norris, Inc. (contractor). | Elko | Active | 11 | Mill, gravity | 108 t/h | A | Minesite portable 2-stage crushing with 2 jigs; produces about 907 t product over 14 h/d. Product goes to Dunphy plant. |
| Stormy Creek; Old Soldier Minerals. | do | do | 4 | Mill, screen, gravity (jig). | 272 t/h crush, 109 t/h jig. | A, B | Operated partial year of 1983; idle in 1984. Will consider custom milling. |

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

| Name and operator | County | Status | Map No. ¹ | Method | Capacity ² | Type | Comments |
|--|------------|----------------------|----------------------|--|------------------------------|------|---|
| COPPER | | | | | | | |
| Battle Mountain Copper Basin (Electrolytic Plant); Duval Corp. | Lander | Active | 26 | Solvent extraction, electro-winning. | 5,170 t/a | A | Capacity is annual cathode capacity. Closed indefinitely in December 1984. |
| Battle Mountain Copper Canyon Precipitation Plant; Duval Corp. | do | do | 27 | Leach-precipitation. | 1,562-t/a product (at peak). | A | Capacity in terms of year's output. Plant treats leach solutions from Copper Canyon Mine dumps. 1984 estimated production is at levels of 50% to 70% of peak production capacity. |
| McGill Concentrator; Kennecott Minerals Co. | White Pine | Idle | 117 | Mill, flotation | 19,500 t/d | A, B | Located adjacent to McGill smelter. |
| McGill Smelter; Kennecott Minerals Co. | do | Idle, standby. | 116 | Smelter | 45,000-t/a product. | B | Product is blister Cu. Processed Kennecott's Robinson district concentrate through 1978. |
| Oro De Mojave; Quadra Mining & Development. | Clark | Active | 128 | Mill, flotation, jigging, CCD-Merrill-Crowe precipitation. | 73 t/h | A | Production began in 1984. Also recovers Pb, Ag, and Au. |
| Sunshine Puritan; Kennecott Minerals Co. | White Pine | Idle | 118 | Leach-precipitation. | <200-t/month product. | A | Production from unit greatly reduced when mining at the Ruth open pit copper mine ceased in 1978. Very small amount of production to February 1983. |
| Victoria; Hecla Mining Co. | Elko | do | 112 | Mill, flotation | 907 t/d | A | Intermittent operation. |
| GOLD AND/OR SILVER | | | | | | | |
| Aden; Hugh C. Ingle | Mineral | Idle | 89 | Mill, gravity, flotation. | <15 t/d | A, B | Has done custom in the past. |
| Alligator Ridge; Am-selco Minerals, Inc. | White Pine | Active | 114 | Mill, heap leach, cyanidation. | 2,700 t/d | A | Recovers Au with byproduct Ag and Hg. |
| American Flat; United Mining Co. of Nevada, Inc. | Storey | do | 68 | Mill, cyanidation. | 907 t/d | A, B | Operating at capacity in 1984. |
| Anchor Cox Canyon; Anchor Mine, Inc. | Churchill | do | 61 | Vat leach, cyanidation. | 72 t over 3- to 4-d period. | A | No crushing facilities by December 1984, though operators reportedly are in search of a crusher. |
| Argentum; Combined Metals & Recovery Systems. | Esmeralda | do | 92 | Mill, cyanidation (flotation). | 360 t/d | A, B | Capacity is crushing ability for flotation circuit. On standby in 1984. Will buy ore. |
| Ashby; Hugh C. Ingle, Jr. | Mineral | do | 86 | Mill, heap leach, cyanidation. | <10 t/d | A | Capacity is estimated. |
| Atlanta; Standard Slag Co. | Lincoln | do | 121 | Mill, cyanidation. | 520 t/d | A, B | Has taken custom in past. |
| Aurora; Centennial Exploration Corp. | Mineral | do | 85 | Mill, heap leach, cyanidation. | 900 t/d | A | Cone crusher capacity 91 t/h; jaw crusher capacity 136 t/h. |
| Austin Resources; Austin Resources Corp. | Lander | Idle | 55 | Mill, flotation | 68 t/d | A | Mill is intact and has processed Ag ore only. |
| Bald Mountain; Placer U.S. | White Pine | Active | 113 | Mill, heap leach, cyanidation. | 57 L/s (900 gal/min). | A | Recovers primarily Au. Full production will be reached about January 1985. Capacity is for carbon recovery plant. |
| Battle Mountain Copper Canyon; Duval Corp. | Lander | Active, development. | 28 | Mill, cyanidation, gravity. | 3,200 to 3,600 t/d. | A | Expansion to unknown capacity planned for 1983 completion. |
| Bauer; Bauer Metals, Inc. | do | Active | 57 | Mill, agglomeration, heap leach, cyanidation. | 907 t/d | A | Crusher rated capacity 726 t/h. Operation leaches tailings. Primarily extracts Ag, byproduct Au. Commenced production in 1983; full production in 1984. |
| Bell Mountain; Bell Mountain Mining Co. | Churchill | Development. | 75 | Mill, cyanidation (tank). | 650 t/d | A | Capacity is 1982 preliminary. |

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

| Name and operator | County | Status | Map No. ¹ | Method | Capacity ² | Type | Comments |
|--|-----------|----------------------|----------------------|---|-----------------------|------|---|
| GOLD AND/OR SILVER—Continued | | | | | | | |
| Bennetts; John Bennett (owner). | Lyon | Idle | 70 | Mill, cyanidation. | 32 t/d | B | Type questionable. Reportedly inactive since about 1942. Major components still present. |
| Bootstrap; Carlin Gold Mining Co. | Elko | Active | 13 | Heap leach, cyanidation. | 200,000 t/a | A | Recovers Au only. Dump leach. On-site plant consists of a 4-stage carbon column circuit. The gold-loaded carbon is stripped, acid washed, and regenerated at the Carlin mill. |
| Borealis; Tenneco Minerals Co. | Mineral | do | 84 | Mill, heap leach, crush, screen. | 2,270 t/d | A | Recovers Hg also. Crushing circuit capacity 272 t/h; Hg retort feed 0.9 t/8-h d; smelting furnace feed 0.9 t/8-h d. |
| Boss; Falcon Mining and Exploration Co. | Esmeralda | Active, development. | 101 | Mill, heap leach, cyanidation. | 180 t/h | A, B | Production anticipated to commence fall 1984. Crusher moved from Tonopah Divide Mine. Will consider buying compatible ore. |
| Buckhorn; Cominco American, Inc. | Eureka | Active | 34 | Mill, heap leach, cyanidation. | 260 t/h crush | A | Heaps to be built at 2,270 t/d ore, or 680,000 t/a. |
| Buckskin; Pacific Silver Corp. | Douglas | Development. | 73 | Mill | 270 t/d | A | |
| Bullion Monarch; Monarch Mining. | Lander | Active | 56 | Mill, flotation | 450 to 540 t/d | A, B | Recovers Ag. Will buy high-grade compatible to circuit; minimum lot 450 t. 1-t/h (24-h/d) smelter near completion. |
| Bullion Monarch; Universal Gas of Montana. | Eureka | do | 15 | Mill, cyanidation. | 360 t/d | A | Normal feed rate about 180 t/d. |
| Candelaria; NERCO Metals. | Mineral | do | 91 | Crush, screen, heap leach, cyanidation. | 7,300 t/d | A | Primarily produces Ag. |
| Carlin; Carlin Gold Mining Co. | Eureka | do | 16 | Mill, cyanidation. | 2,450 t/d | A | Recovers Hg also. Capacity is combined 2,000 t/d oxide and 450 t/d carbonaceous ore capacities. |
| Continental; Continental Co. | Clark | Inactive | 127 | Heap leach, cyanidation. | See comments | A | Became inactive in 1984. Has two 4,500-t leach ponds. Zn precipitation. |
| Cortez Leach; Cortez Gold Mines. | Lander | Active | 35 | Heap leach, cyanidation. | 57 L/s (900 gal/min). | A | Capacity is carbon-in-pulp plant. |
| Cortez; Cortez Gold Mines. | do | do | 36 | Mill, carbon-in-leach tanks and carbon columns, cyanidation. | 1,800 t/d, >180 t/h. | A | Processes ore from Horse Canyon Mine. Capacity is planned feed rate (660,000 t/a). |
| Dee; Dee Gold Mining Co. | Elko | do | 12 | Mill, cyanidation. | 820 t/d, 286 t/h. | A | Operation began in fall 1984. |
| DeLaMare; R. W. DeLaMare (owner). | Lyon | Idle | 72 | do | 45 t/d | B | Type questionable. Reportedly inactive since about 1942. Major components still present. |
| Dexter; Pecos Resources. | Elko | Active, development. | 7 | Heap leach, cyanidation, Merrill-Crowe precious metal plant recovery. | 16 L/s (250 gal/min). | A | Test heap leaching began in 1984. Capacity is Merrill-Crowe plant purchased from Tuscarora Associates. |
| Donovan; Mike Donovan (owner). | Lyon | Idle | 71 | Mill, cyanidation. | 45 t/d | B | Type questionable. Reportedly inactive since 1879. Major components still present. |
| Enfield Bell (Jerritt Canyon); Freeport Gold Co. | Elko | Active | 6 | do | 3,040 t/d | A | Original capacity was 2,750 t/d in 1981. |
| Esmeralda; Merrill A. Nelson (owner). | do | Idle | 8 | Mill, crush, grind, gravity (table). | 23 t/d | A | Last period of mill operation was for a short period in 1981. |

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

| Name and operator | County | Status | Map No. ¹ | Method | Capacity ² | Type | Comments |
|---|---------------|----------------------------------|----------------------|--|---|------|---|
| GOLD AND/OR SILVER—Continued | | | | | | | |
| F. M. Wright; F. M. Wright Mining Co. | Pershing ... | Active ... | 48 | Mill, flotation, gravity. | 45 t/d | B | Has run as captive mill. Presently processes precious metals. Has processed base metal sulfides and tungsten. |
| Fire Creek; Mines Resources, Inc. | Lander | ... do ... | 31 | Heap leach, cyanidation, carbon column recovery. | 30,400 t per 60-d period batch process. | A | |
| Fortune Cookie; Proquip, Inc. | Pershing ... | Active, production, development. | 41 | Placer, gravity. | 1,500 to 2,300 m ³ /shift (2,000 to 3,000 yd ³ /shift). See comments. | A | Feasibility and expansion to 4,600 to 7,600 m ³ (6,000 to 10,000 yd ³) on a 1-shift basis planned for 1985. |
| G & S; Robert E. Wilson. | Nye | Active ... | 93 | Mill, gravity ... | 18 t/d | A, B | Capacity estimated. Past product was tungsten. |
| Getchell; Watterson Mining, Contractor. | Humboldt ... | Development, feasibility. | 9 | Mill, cyanidation. | 91 t/d | A | 1983 activity was test leaching. |
| Global; Global Natural Resources, Inc. | Pershing ... | Active ... | 44 | Placer washing plant, trommel screen and sluice boxes. | 60 m ³ /h (80 yd ³ /h) | A | |
| Gold Hill; Fisk and Robertson Mining. | Churchill ... | ... do ... | 50 | Mill, vat leach, cyanidation, activated carbon. | 1,360 t/month.... | A | |
| Gold Quarry; Carlin Gold Mining Co. | Eureka | Development. | 19 | Heap leach; mill agitated leach, carbon-in-pulp. | 6,120 t/d | A | Will recover byproduct Hg. Mill to come on-stream in late 1985, processing about 2.3 million t/a ore. |
| Goldfield; Trafalgar Mines partnership. | Esmeralda . | Active ... | 107 | Agglomeration, heap leach, cyanidation. | See comments... | A | Operation reportedly shut down in 1984 with equipment still on-site. Plan was to reprocess 91 million t mill tailings. Reportedly, only 27,000 to 36,000 t material placed on heap. |
| Goldfield (Southern Pacific, Noranda, P.G. & U. joint venture); Blackhawk Mines Corp. (operator). | do | Development. | 108 | do | 1,090 t/d | A | Information in December 1984 indicated the development plan may have been abandoned. |
| Goldfield Tailings; Blackhawk Mines Corp. | do | Active ... | 108 | do | 23,000 t/a | A | |
| Goldstrike; Western States Minerals Corp. | Eureka | ... do ... | 14 | Cyanide heap leach of mine-run ore. | 1,500,000 m ³ (2,000,000 yd ³ /a) material handled. | A, B | Does no custom but may consider it if ore is compatible. Annual tonnage ore and waste estimated 3.6 million t. |
| Gooseberry; Asamera Minerals (U.S.), Inc. | Storey | ... do ... | 67 | Mill, cyanidation. | 320 t/d | A | Principal commodity is Ag. Full production reached in fall 1984. |
| Grey Eagle; Grey Eagle Mining Co. | Lander | ... do ... | 33 | Mill, crush, gravity. | 45 t/d | A | |
| Haywood-Santiago; NEVEX Gold Co., Inc. | Lyon | Development. | 69 | Mill, heap leach, cyanidation. | 15.8 L/s pregnant solution. | A, B | Will consider buying ore after 1 yr of production. Production anticipated to commence in November 1984. Full production anticipated to commence in first quarter 1985. |
| Imlay Canyon; Bill Dale. | Pershing ... | Active ... | 45 | Placer washing plant; trommel screen and sluice boxes. | 15- to 19-m ³ /h (20- to 25-yd ³ /h) test capacity. | A | Recovers Au, W, and Hg. Placer operation. Capacity will be increased in 1985 from stated test capacity. |

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

| Name and operator | County | Status | Map No. ¹ | Method | Capacity ² | Type | Comments |
|---|------------------|----------------------|----------------------|---|---|------|---|
| GOLD AND/OR SILVER—Continued | | | | | | | |
| Independence; United Mining and Milling. | Lander | Active . . . | 29 | Mill, cyanide vat leach. | 45 t/d | A, B | Principal commodity is Ag, by-product Au. Will consider custom. Mill burned and rebuilt in 1983. Operating less than capacity in 1984. |
| Ione Placer; Marshall Earth Resources, Inc. | Nye | . . . do . . . | 78 | Mill, screen, gravity. | 270 t/h | A | Ore comes from their Ione Placer and Sky Claims. |
| Jetco; Jetco Enterprises, Inc. | Clark | . . . do . . . | 129 | Mill, tank leach | NA | A, B | May take custom. Has 25- by 91-cm (10- by 36-in) jaw crusher and 1.2- by 1.5-m (4- by 5-ft) ball mill. |
| Jupiter; Circle A Construction. | Pershing . . . | . . . do . . . | 40 | Mill, char-in-pulp, cyanidation. | 1.4 t/h | A | |
| Lewis; Standard Slag Co. | Humboldt . . | . . . do . . . | 43 | Mill, heap leach | 3,200 t/d | A | Production began in August 1984. |
| Maggie Creek; Carlin Gold Mining Co. | Eureka | . . . do . . . | 20 | Heap leach, cyanidation. | 2,300 t/d | A | Milling grade is trucked and processed at Carlin mill. |
| Major Barite; Major Barite Co. | Lander | . . . do . . . | 32 | Mill, gravity . . . | 90 t/h | A, B | Formerly called the Bradshaw (processed barite). |
| Manhattan; Arizona Hillside Mining Co. | Nye | Active, standby. | 97 | Heap leach, cyanidation. | NA | A | Mine capacity is about 2,720 t/d. No crushing facilities. |
| Manhattan; Tenneco Minerals Co. | . . . do | . . . do . . . | 98 | Mill, gravity, flotation, cyanidation. | 2,700 t/d crush, 1,360 t/d flotation. | A | Plant startup in January 1984. |
| Mockingbird; P.G. Harrison and James Harris. | Clark | . . . do . . . | 126 | Mill, gravity . . . | 2 t/d | A | Has accepted custom but does not at present; intermittently active. |
| Montgomery Shoshone; Bullfrog Mining Enterprises. | Nye | . . . do . . . | 110 | Mill, screen, crush, vat leach. | 450 t/d crush | A, B | Possesses two 680-t vats; intermittently active. |
| Nevada Pacific; Nevada Pacific Mining Co. | Washoe | Development. | 66 | Gravity, jigs, tables. | 1,500 m ³ /d (2,000 yd ³ /d). | A | Construction in progress in December 1984 on mine and mill to process a 1.5 million m ³ (6 million yd ³) eluvial gold deposit. |
| Nevada Packard; Nevada Packard (joint venture). | Pershing . . . | Active . . . | 46 | Heap leach, cyanidation, Zn dust precipitation. | 200 gal/min | A | Recovers primarily Ag. 140-t/h capacity crusher. Sold in 1984. Production ceased in July 1984. Possesses 3 Shriver clarifier presses and 2 precipitation presses. |
| New Boston; New Boston Mining Co. | Mineral | . . . do . . . | 87 | Mill, screen, heap leach. | 150 t/h | A, B | Cyanidation. |
| New Pass; Donald Jung. | Lander | Idle | 53 | Mill, heap leach, cyanidation. | 36 t/d | A | Capacity is approximate. |
| Northumberland; Cyprus Mines Corp. | Nye | Active . . . | 94 | . . . do | 4,500 t/d | A | |
| Oreana; Coronado Oil & Minerals Co. | Pershing . . . | . . . do . . . | 47 | Mill, flotation, gravity. | 90 t/d (has never operated over 45 t/d). | A, B | Has processed Au, Sb, W. Minor production early 1983; none in 1984. Production anticipated commencing again in first quarter 1985. |
| Paradise Peak; FMC Corp. | Nye | Active, development. | 81 | Mill, cyanidation, agitation, leaching. | 907,000 t/a | A | Proposed capacity is estimated. Hg will be produced as by-product. Production planned to commence in 1986. |
| Paymaster; Jesse R. Wilson. | . . . do | Active . . . | 77 | Mill, tank cyanide leach, carbon recovery. | 90 t/d | A | Capacity is tank capacity. Ag recovery very minor. |
| Pinson; Pinson Mining Co. | Humboldt . . | . . . do . . . | 10 | Mill, carbon-in-pulp, cyanidation. | 1,360 t/d | A | Recovers byproduct Hg. In 1984, about 25% of ore mined was heap leached. |

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

| Name and operator | County | Status | Map No. ¹ | Method | Capacity ² | Type | Comments |
|--|------------|----------------------|----------------------|---|-------------------------------|------|---|
| GOLD AND/OR SILVER—Continued | | | | | | | |
| Pioche; Hollingshead Mining Contracting. | Lincoln | Active | 123 | Mill, flotation, gravity. | 23 t/d | A, B | Some custom work has been done. |
| Potosi; S & R Mining & Milling. | Mineral | do | 90 | Crush, screen, heap leach, cyanidation. | 230 t/d | A | Portable crusher. |
| Precious Metals (Brazos, Imperial-Klondike); Precious Metals, Inc. of Texas. | Lander | Inactive | 58 | Mill, flotation | 180 t/d | A | Anticipated restart of production in early 1984. Reportedly bought in late 1984 by Spirit Oil Co., Billings, MT. |
| Red Rock; Tseng Mining Co. | Mineral | Active | 88 | Mill, pond leach, screen. | 90 t/hr | B | Leases Ladd Enterprise mill. Has unused flotation capability. Ladd has about 180-t/h crushing capacity. |
| Relief Canyon; Lacana Mining, Inc. | Pershing | do | 49 | Mill, heap leach, cyanidation. | 4,500 t/d, 907,000 t/a. | A | 300-t/h design crushing capacity. Average annual product to be 680 kg (22,000 tr oz) Au. |
| Research Silver (Silver Horn); Silver Horn Research Mill Corp. | Lincoln | do | 122 | Mill, flotation, cyanidation. | 320 t/d | A, B | |
| Round Mountain; Smoky Valley Mining Co. | Nye | do | 96 | Mill, heap leach, cyanidation. | 9,000 t/d | A | Construction of a 36,000-t/d-capacity mill is being considered in 1984 for possible operation in 1987. |
| Santa Fe; Lacana Mining Corp. | Mineral | Development. | 82 | do | See comments | A | Production planned by December 1985 at minimum ore throughput of 590,000 t/a. |
| Silver Center-Wonder; Belmont Resources. | Churchill | Active | 60 | do | 5,400 t/wk, 136 t/h. | A | Processes Wonder Mine tailings and Silver Center Mine new ore. Capacity is March 1984 process rate. |
| Sixteen-to-One; Sunshine Mining Co. | Esmeralda | do | 105 | Mill, tank leach | 635 t/d | A, B | Has bought compatible ore. Crushing capacity about 130 t/h. Principal commodity is Ag. |
| Spicer Mining Co., Inc.; Nevada Mines & Minerals, Spicer Mining Co., Inc. | Nye | do | 109 | Mill, agglomeration, heap leach. | 70- to 90-t/d pilot crushing. | A, B | Active in 1984. Also performs custom assay. Processes captive ore from Mayflower Mine. Agglomeration capacity 230 t/d; test mill 23 t/d; carbon stripping 340 kg/batch. |
| Sterling; Saga Exploration Co. | do | do | 111 | Mill, heap leach, cyanidation. | 82 t/h | A | Projected daily crushing rate is 270 t. |
| Taylor; Silver King Mines, Inc. | White Pine | do | 120 | Mill, cyanidation. | 1,800 t/d, 91 t/h | A, B | Recovers primarily Ag. Has accepted custom. Normal operating rate is 1,090 t/d. |
| Tonopah Divide; Ebcu Enterprises. | Esmeralda | do | 103 | Mill, crush, screen, heap. | 910 t/d, 180 t/h | A | Production expected to cease fall 1984. Crusher will be moved to company's Boss Mine. |
| Tonopah West (Miller's); TW-MNR Assoc. | do | do | 100 | Mill, tank leach | 1,090 t/d | A | Recovers principally Ag with minor Au. Reprocesses old tailings in Tonopah district. Operations were suspended in July 1984 for an indefinite period. |
| Veta Grande; 20th Century Energy Corp. | Douglas | do | 74 | Mill, gravity, flotation. | 180 t/d, 36 t/h | A, B | Intermittent operation. |
| Victorine (Sumich); New Beginnings Resources. | Lander | Active, development. | 59 | Mill, jig, flotation, cyanide regrind, electrowinning (Ag), smelting. | 320 t/d | A, B | Capacity is current crusher capacity; design capacity is 450 t/d. Production to begin in mid-December 1984. Company will consider custom. |
| Windfall; Windfall Venture. | Eureka | Active | 115 | Cyanidation, heap leach. | 1,100 t/d | A | Inactive most of 1983. |

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

| Name and operator | County | Status | Map No. ¹ | Method | Capacity ² | Type | Comments |
|---|--------------------|----------------------|----------------------|--|--|------|---|
| IRON | | | | | | | |
| Nevada Barth; Nevada Barth Corp. | Eureka | Active . . . | 21 | Mill, crush, screen. | 200 to 300 t/h . . . | A | Feed is from stockpiles. Normal operating rate is 455 t/d. |
| LEAD—ZINC | | | | | | | |
| Casleton; Combined Metals Reduction Co. | Lincoln | Idle | 124 | Flotation | 1,270 t/d | A, B | Idle since about 1978. Plans in 1984 are to reopen by 1986. Will be looking for ore to purchase. Construction planned to begin in 1985 with completion in late 1986. Will recover Ag and Cu also. Design will allow for increase in capacity to 1,800 to 2,700 t/d. |
| Ward; Silver Kings Mines, Inc. | do | Development, design. | 119 | Mill, flotation . . . | 1,100 t/d | | |
| LITHIUM | | | | | | | |
| Silver Peak; Foote Mineral. | Esmeralda . . | Active . . . | 104 | Solar evaporation, chemical, refinery. | 7,260 t/a | A | Capacity in terms of production. Product is lithium carbonate (Li ₂ CO ₃). |
| MAGNESIUM (MAGNESITE—MgO) | | | | | | | |
| Luning; C-E Basic | Nye | Active . . . | 79 | Mill, screen | NA | A | Capacity is estimated. |
| Nevada Works; C-E Basic. | do | do . . . | 80 | Mill, calcine, flotation. | 2,000 t/d | | |
| MERCURY | | | | | | | |
| McDermitt; McDermitt Mine Joint Venture. | Humboldt . . | Active . . . | 1 | Mill, flotation, distillation. | 2,200 t/d flotation; 0.45-t/h furnace. | A | Product is elemental Hg. |
| MOLYBDENUM | | | | | | | |
| Nevada Moly; Anaconda Minerals Co. | Nye | Active . . . | 99 | Mill, flotation, tank leach. | 20,000 t/d | A | Also recovers Cu. Product is MoS ₂ . |
| TUNGSTEN | | | | | | | |
| Emerson; Union Carbide Corp. | Lincoln | Idle | 125 | Mill, flotation . . . | 907 t/d | A | Mill intact and on standby. |
| Fisk; Gee Mines | Churchill . . | Active . . . | 65 | Mill, gravity | 0.9 t/h | A | Mill leased to Gee Mines, which ran Ag ore through it in 1984. Originally built to process tungsten ore. |
| John Young (Wheeler); John Young (owner). | do | do . . . | 64 | Mill, gravity, amalgamation. | 0.45 t/h | A, B | Also recovers Au. Idle in 1984. Has accepted custom and will consider custom in the future. |
| Kennametal; Kennametal, Inc. | do | do . . . | 62 | Chemical | Proprietary data . . | B | A secondary processing plant, refinery. |
| Nevada Scheelite; Natural Resources Development, Inc. | Mineral | Idle | 76 | Gravity | 113 t/d, 36 t/h . . . | A | 36-t/h jaw crusher capacity. In 1984, mill being dismantled and equipment sold. |
| Oxbow Tungsten; P.A.B. Oil Mining Co. | Elko | do . . . | 2 | Mill, gravity, flotation. | 181 t/d | A | Last known operating year was 1978. Mill reportedly not intact. Possesses flotation cells and tables. Crushing equipment removed. |
| Springer; Utah International, Inc. | Pershing . . . | do . . . | 42 | Flotation | 1,800 t/d | A | Normal crushing rate is about 900 t/d. Final product is ammonium paratungstate. |
| Tungsten Mountain; Opportunity Village (owner). | Churchill . . . | Active . . . | 52 | Mill, table, flotation. | 1.8 t/h | A | Mill originally set up for tungsten recovery. Contains 5 tables and 2 flotation cells. In 1984, Pt, with minor Au and Ag, recovery was attempted. |
| Wells; Nevada Milling Inc. | Elko | Idle | 5 | Gravity, flotation. | 91 t/h | A | Rehabilitated in December 1983; operating in 1984. |

A Captive.

B Custom or accepts custom.

NA Not available.

¹Refer to figure 10.²Approximate feed unless otherwise noted in comments.

NOTE.—An entry of "mill" in method indicates crushing ability.

REVIEW OF SELECTED MINERAL COMMODITIES IN NEVADA

ALUMINUM

Aluminum, the third most abundant element in the Earth's crust, is second only to iron in terms of value of non-fuel mineral products in world commerce. The United States, the world's largest producer of aluminum metal, has accounted for about 30% of the world smelter output over the past 5 yr. At the present time, the only commercially viable smelter feed for the production of aluminum metal is alumina (Al_2O_3) obtained from bauxite ores. The United States imports over 90% of the aluminum raw material (both bauxite and alumina) it uses; however, it is technically

feasible to produce aluminum from domestic nonbauxite materials such as high-alumina clays, alunite, anorthosite, dawsonite in spent oil shale, and coal waste. Several deposits of nonbauxitic aluminous materials occur in Nevada—several hundred million metric tons of alunitized rock (<30% alunite) has been identified in the southern part of the State and significant deposits of kyanite-related minerals occur in Douglas, Mineral, and Pershing Counties (239). Future development of these resources depends on their ability to economically compete with foreign bauxite deposits and other domestic nonbauxitic sources of supply.

Bureau of Mines Mineral Industry Location System (MILS) Data—Aluminum in Nevada

| | |
|--------------------------------------|----|
| Total properties | 68 |
| Producers ¹ | 0 |
| Known principal deposits | 4 |
| Deposit abstracts in directory | 1 |

¹Producers of materials for aluminum only.

Reported Bauxite Production—United States and Nevada, 1978–83 (728–729)

| Year | United States ¹ | | Nevada | |
|------|----------------------------|------------------------|-------------------|------------------------|
| | 10 ³ t | Value, 10 ³ | 10 ³ t | Value, 10 ³ |
| 1978 | 1,669 | \$23,185 | NRP | NRP |
| 1979 | 1,821 | 24,875 | NRP | NRP |
| 1980 | 1,559 | 22,353 | NRP | NRP |
| 1981 | 1,510 | 26,489 | NRP | NRP |
| 1982 | 732 | 12,334 | NRP | NRP |
| 1983 | 679 | 11,309 | NRP | NRP |

NRP No reported production.

¹From 1978 to 1982, between 74% and 82% of domestically mined bauxite was used in the production of alumina. In 1983, no domestically mined bauxite was used in the production of aluminum metal.

Principal Known Aluminum Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|--------------------------------|-----------------|----------------------------------|----------------------------|-------------------|------------------------------|------------------|------|-----------|
| | | | | | 10 ³ t | wt % | Year | Reference |
| Boyd | Lincoln | Past producer ³ | Alunite | Small ... | 43 | 429.3 | 1978 | 239 |
| C-M Alunite ⁵ | do | Prospect | do | Medium .. | 289 | 421.5 | NAP | NAP |
| Goldfield district: | | | | | (⁶) | (⁶) | | |
| CTR leases | Esmeralda | Explored | do | do ... | 100 | 422 | 1978 | 239 |
| MTZ lease | do | do | do | do ... | 60,000 | 420 | 1978 | 239 |
| Hawthorne | Mineral | Past producer | Andalusite, corundum | do ... | 13,508- | 727 | 1967 | 277 |
| | | | | | 27,216 | | | |

NAP not applicable.

¹Based on estimate of metric tons of contained Al_2O_3 : Large, >100 million; medium, 1 million to 100 million; small, <1 million.

²Rounded.

³Lens of alunite mined for fertilizer.

⁴Wt % alunite.

⁵Deposit abstract in directory.

⁶No published data have been located.

⁷Wt % Al_2O_3 .

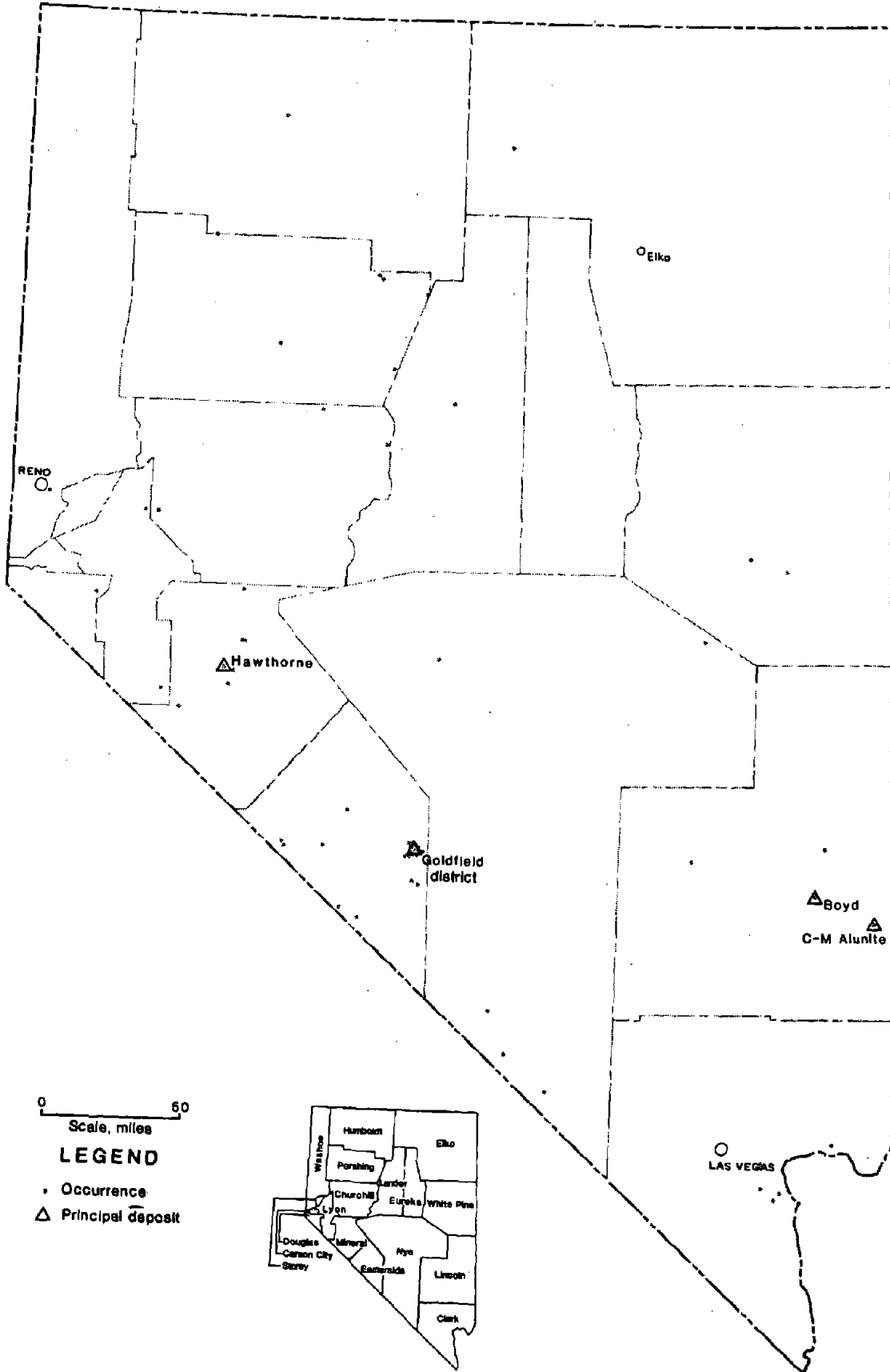


Figure 12.—Aluminum in Nevada.

ANTIMONY

Antimony, a brittle, silver-white metal, is consumed in minor amounts when compared with other base metals. Apparent U.S. annual antimony consumption averaged slightly more than 32,000 t from 1978 through 1983. In 1983, about 50% of consumption need was satisfied by recycling of old scrap, principally plates from lead-acid batteries. The remainder was supplied by domestic mines and imports of antimony metal, compounds, and ores. From 1978 to 1982 reported U.S. mine production averaged about 580 t, or less than 2% of domestic consumption.

Bureau of Mines Mineral Industry Location System (MILS) Data—Antimony in Nevada

| | |
|--------------------------------|-----|
| Total properties | 239 |
| Producers ¹ | 44 |
| Known principal deposits | 13 |
| Deposit abstracts in directory | 9 |

¹Includes past producers.

Antimony has been sporadically recovered from Nevada mines since the 1860's. The principal periods of production were during World War I and World War II, when increased demand and reduced imports caused antimony prices to increase. The last recorded production of antimony in Nevada was in 1974.

Reported Antimony Production¹—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|-------------------|------------------------|-------------------|------------------------|
| | 10 ³ t | Value, 10 ³ | 10 ³ t | Value, 10 ³ |
| 1978 | 724 | W | NRP | NRP |
| 1979 | 655 | W | NRP | NRP |
| 1980 | 311 | W | NRP | NRP |
| 1981 | 586 | W | NRP | NRP |
| 1982 | 456 | W | NRP | NRP |
| 1983 | 760 | W | NRP | NRP |

NRP No reported production.

W Withheld to avoid disclosing company proprietary data.

¹Antimony content of domestic ores and concentrates.

Principal Known Antimony Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|--------------------------------|-----------|----------------|----------------|-------------------|------------------------------|------------------|------|-----------|
| | | | | | 10 ³ t | wt % | Year | Reference |
| Antimony King ² | Lander | Past producer | Sb | Small | (³) | (³) | NAP | NAP |
| Bloody Canyon ² | Pershing | do | Sb, Ag | do | (³) | (³) | NAP | NAP |
| Bray-Beulah ² | Lander | do | Sb, Ag | do | (³) | (³) | NAP | NAP |
| Drumm | Churchill | do | Sb | Unknown | (³) | (³) | NAP | NAP |
| Dry Canyon ² | Lander | do | Sb, Ag | Small | (³) | (³) | NAP | NAP |
| Fencemaker ² | Pershing | do | Sb | Medium | (³) | (³) | NAP | NAP |
| Hard Luck-Pradier ² | Lander | do | Sb, Ag | Small | (³) | (³) | NAP | NAP |
| Hollywood ² | Pershing | do | Sb, Ag | do | (³) | (³) | NAP | NAP |
| Hoyt | Churchill | do | Sb, Ag | Unknown | (³) | (³) | NAP | NAP |
| IHX | do | do | Sb | do | (³) | (³) | NAP | NAP |
| New Potosi | Mineral | do | Au, Ag, Pb, Sb | do | (³) | (³) | NAP | NAP |
| Sutherland ² | Pershing | do | Sb | Small | (³) | (³) | NAP | NAP |
| White Caps ² | Nye | do | Au, Sb, As, Hg | do | (³) | (³) | NAP | NAP |

NAP Not applicable.

¹Based on estimate of metric tons of contained Sb: Large, >50,000; medium, 5,000 to 50,000; small, <5,000.

²Deposit abstract in directory.

³No published data have been located.

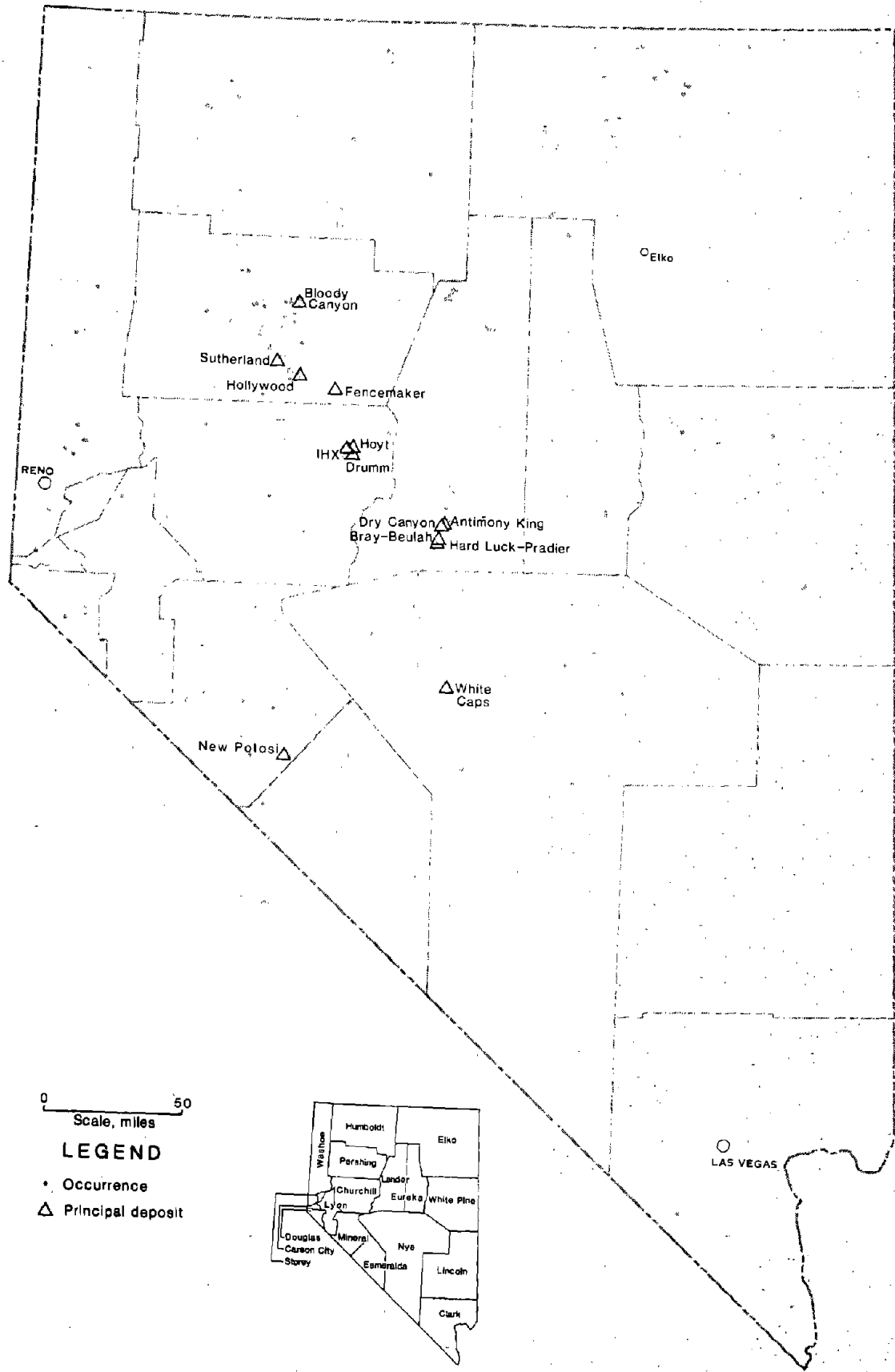


Figure 13.—Antimony in Nevada.

BARITE

Barite (barium sulfate) is primarily used as a weighting agent in oil well drilling (over 90% of 1982 production), paint manufacturing, glassmaking, rubber, and as a source of barium chemicals. In 1981, domestic production of barite reached record levels of 2.5 million t; in 1982, production

decreased to 1.67 million t; and by 1983, domestic output declined to only 26% of the 1981 level. Of the seven States reporting production in 1982, Nevada accounted for 85% of the total.

Bureau of Mines Mineral Industry Location System (MILS) Data—Barite in Nevada

| | |
|-------------------------------------|-----|
| Total properties..... | 235 |
| Producers ¹ | 125 |
| Known principal deposits..... | 23 |
| Deposit abstracts in directory..... | 17 |

¹Includes past producers.

Reported Barite Production—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|-------------------|------------------------|-------------------|------------------------|
| | 10 ³ t | Value, 10 ³ | 10 ³ t | Value, 10 ³ |
| 1978 | 1,969 | \$45,130 | 1,622 | \$30,034 |
| 1979 | 1,916 | 53,581 | 1,637 | 35,707 |
| 1980 | 2,037 | 65,957 | 1,740 | 47,800 |
| 1981 | 2,585 | 102,439 | 2,252 | 79,716 |
| 1982 | 1,674 | 69,522 | 1,429 | 52,727 |
| 1983 | 684 | 29,203 | 601 | 21,736 |

Principal Known Barite Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|----------------------------------|--------|----------------|-------------------|-------------------|--------------------------------|------------------|------|-----------|
| | | | | | ² 10 ³ t | sp gr | Year | Reference |
| Ann ³ | Nye | Explored | BaSO ₄ | Medium | (⁴) | (⁴) | NAP | NAP |
| Argenta ³ | Lander | Producer | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |
| Bald Mountain | do | Past producer | BaSO ₄ | Unknown | (⁴) | (⁴) | NAP | NAP |
| Big Ledge ³ | Elko | Explored | BaSO ₄ | Medium | (⁴) | (⁴) | NAP | NAP |
| East Northumberland ³ | Nye | Producer | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |
| Easy Miner ³ | Elko | Past producer | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |
| Fish Creek ³ | do | Explored | BaSO ₄ | Large | (⁴) | (⁴) | NAP | NAP |
| Greystone ³ | Lander | Producer | BaSO ₄ | Medium | (⁴) | (⁴) | NAP | NAP |
| Heavy Spar ³ | Elko | Past producer | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |
| Jungle ³ | do | do | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |
| Kay ³ | Nye | Explored | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |
| Lakes ³ | Elko | Past producer | BaSO ₄ | Large | 7,300 | (⁴) | 1982 | 304 |
| Miller | Lander | do | BaSO ₄ | Unknown | (⁴) | (⁴) | NAP | NAP |
| Mountain Springs ³ | do | Producer | BaSO ₄ | Large | (⁴) | (⁴) | NAP | NAP |
| P & S ³ | Nye | do | BaSO ₄ | Medium | (⁴) | (⁴) | NAP | NAP |
| Pleasant View | Lander | Past producer | BaSO ₄ | Unknown | (⁴) | (⁴) | NAP | NAP |
| Q-Bar | Elko | Explored | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |
| Queen Lode ³ | do | Past producer | BaSO ₄ | Medium | (⁴) | (⁴) | NAP | NAP |
| Reeds Canyon | Lander | Explored | BaSO ₄ | Unknown | (⁴) | (⁴) | NAP | NAP |
| Rossi ³ | Elko | Past producer | BaSO ₄ | Large | (⁴) | (⁴) | NAP | NAP |
| Slaven Canyon | Lander | Producer | BaSO ₄ | Unknown | (⁴) | (⁴) | NAP | NAP |
| Snoose ³ | Elko | Past producer | BaSO ₄ | Medium | (⁴) | (⁴) | NAP | NAP |
| Stormy Creek ³ | do | do | BaSO ₄ | do | (⁴) | (⁴) | NAP | NAP |

NAP Not applicable.

¹Based on estimate of metric tons of contained barite: Large, >5 million; medium 50,000 to 5 million; small, <50,000.

²Rounded.

³Deposit abstract in directory.

⁴No published data have been located.

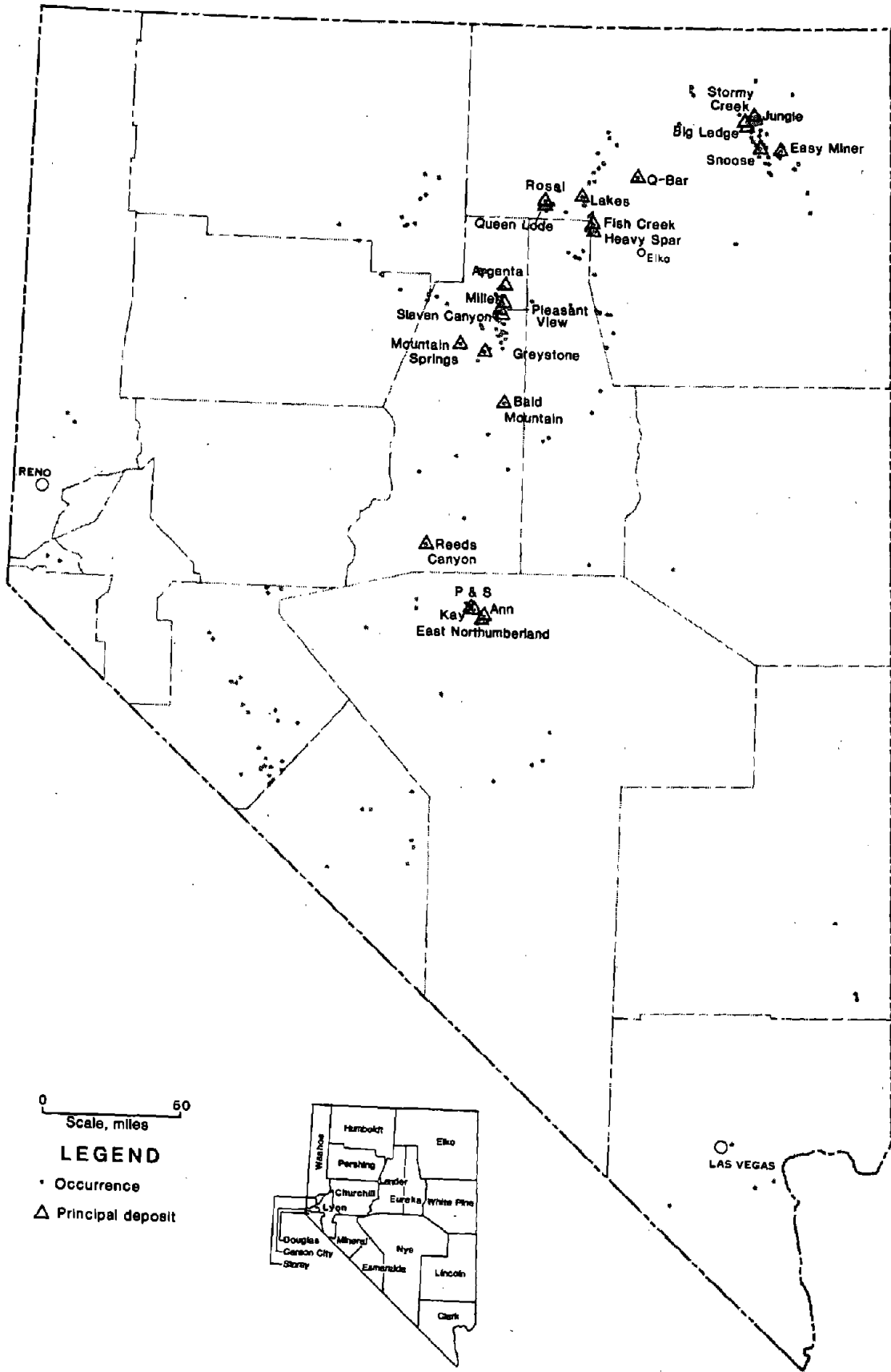


Figure 14.—Barite in Nevada.

BERYLLIUM

Beryllium, a lightweight, hard metal with a high strength-to-weight ratio, has high electrical, thermal shock, and corrosion resistance as well as high thermal conductivity. Although high costs have limited the amount of beryllium consumed (annual domestic consumption from 1978 through 1982 averaged 234 t), it is used where its unique combination of physical characteristics are required. Its uses are varied and range from components in electronic switchgear, to brake shoes, to heat shields in aerospace equipment, to neutron moderators or reflectors in nuclear

reactors. About 80% of the U.S. consumption of beryllium is in the form of copper alloys; the remainder is evenly divided between beryllium oxide and beryllium metal. Prior to the development of the Spor Mountain bertrandite deposits in Utah in the late 1960's, the United States was almost wholly dependent on imported beryl to meet domestic demand. Since that time the United States has become a major producer capable of supplying much of its beryllium requirements. Nevada has several beryllium occurrences; however, only small amounts have been mined in the past.

Bureau of Mines Mineral Industry Location System (MILS) Data—Beryllium in Nevada

| | |
|--------------------------------------|----|
| Total properties | 22 |
| Producers ¹ | 5 |
| Known principal deposits | 1 |
| Deposit abstracts in directory | 1 |

¹Includes past producers.

Reported Beryllium Production—United States and Nevada, 1978–83 (728–729)

Domestic production of beryllium is withheld from publication to avoid disclosing company proprietary data. No beryllium production was reported in Nevada from 1978 through 1983.

Principal Known Beryllium Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|----------------------------------|---------------|-----------------|--------------------------------|-------------------|------------------------------|------|------|-----------|
| | | | | | 10 ³ t | wt % | Year | Reference |
| Mount Wheeler ² | White Pine .. | Developed | Ba, CaF ₂ , W | Large ... | (?) | (?) | NAP | NAP |

NAP Not applicable.

¹Based on estimate of metric tons of contained BaO: Large, >1,000; medium, 10 to 1,000; small, <10.

²Deposit abstract in directory.

³No published data have been located.

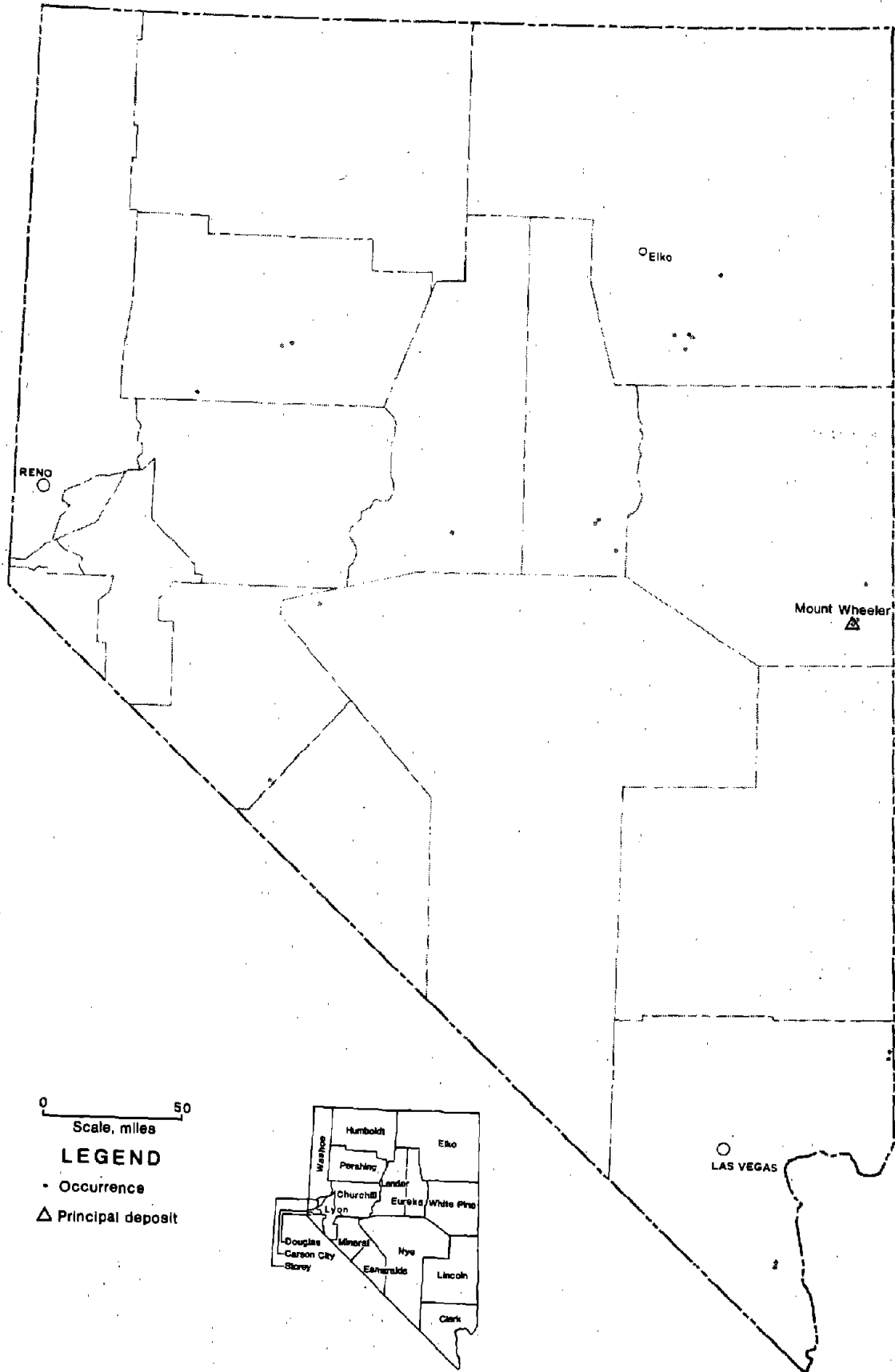


Figure 15.—Beryllium in Nevada.

COPPER

Copper, primarily used by ancient civilizations for jewelry, coinage, and weaponry, is used by modern society in thousands of applications because it possesses a versatility surpassed by few metals. More than 50% of the copper produced domestically is used in the electrical and communications industries, while another 40% is used in brass mills.

A lengthy labor strike in 1980 effectively immobilized 10 major domestic producers, which resulted in a substantial production decrease when compared with 1979 levels. In 1981, 15 mines in Nevada were producing copper ore, the bulk of which was from Duval's Copper Basin Mine; only 3 mines reported copper production in 1982. Although the United States continues to be a major copper producing nation, in 1982, for the first year since 1934 and for only the second year since 1883, the United States did not lead

Bureau of Mines Mineral Industry Location System (MILS) Data—Copper in Nevada

| | |
|--------------------------------------|-------|
| Total properties | 1,116 |
| Producers ¹ | 637 |
| Known principal deposits | 8 |
| Deposit abstracts in directory | 8 |

¹Includes past producers.

the world in newly mined copper. In 1982, the United States ranked second behind Chile and ahead of the U.S.S.R., Canada, Zambia, and 58 other countries.

A copper deposit was announced by Plexus Resources Corp., Salt Lake City, UT, in its 1984 annual report. The deposit, called the Lyon, is part of the Pumpkin Hollow iron-copper skarn complex in east-central Lyon County. The deep-seated Lyon deposit is reported to contain high-grade geologic reserves of 7.5 million tons of 3.1% Cu, 8.6 g/t Ag, and 0.51 g/t Au. Additionally, there is 26 million tons of 1.1% Cu peripheral to the high-grade zone. Unfortunately, the announcement of this significant copper deposit came too late for inclusion in this section's copper table and location map (fig. 16).

Reported Copper Production¹—United States and Nevada, 1978-83 (728-729)

| Year | United States ¹ | | Nevada | |
|------|--------------------------------|------------------------|--------------------------------|------------------------|
| | ² 10 ³ t | Value, 10 ³ | ² 10 ³ t | Value, 10 ³ |
| 1978 | 1,358 | \$1,990 | 20 | \$30 |
| 1979 | 1,444 | 2,961 | W | W |
| 1980 | 1,181 | 2,667 | W | W |
| 1981 | 1,538 | 2,886 | W | W |
| 1982 | 1,140 | 1,840 | W | W |
| 1983 | 1,038 | 1,750 | W | W |

W Withheld to avoid disclosing company proprietary data.

¹Contained copper.

²Rounded.

Principal Known Copper Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|--|------------|----------------|----------------|-------------------|--------------------------------|-------|------|-----------|
| | | | | | ² 10 ³ t | wt % | Year | Reference |
| Ann Mason ³ Battle Mountain Copper Basin. ³ | Lyon | Explored | Cu, Mo | Large | 448,056 | 0.4 | 1976 | 829 |
| | Lander | Standby | Cu, Ag, Au | Medium | 860 | 1.49 | 1978 | 707 |
| | | | | | | 4.925 | 1978 | 707 |
| | | | | | \$13.32 | 1978 | 707 | |
| Bear ³ | Lyon | Explored | Cu, Mo, Au, Ag | Large | 453,592 | .4 | 1979 | 829 |
| McArthur ³ | do | do | Cu | do | 11,793 | .43 | 1976 | 822 |
| McGill Tailings ³ | White Pine | Explored | Cu, Ag, Au | Medium | 38,287- | .3- | 1979 | 413 |
| | | | | | 72,575 | .4 | | |
| Robinson district ³ | do | Past producer | Cu, Mo, Au, Ag | Large | 82,554 | .67 | 1976 | 792 |
| Victoria ³ | Elko | Standby | Cu, Ag, Bi | Medium | 1,353 | 62.34 | 1977 | 337 |
| | | | | | 135 | 72.51 | 1977 | 337 |
| Yerington ³ | Lyon | Past producer | Cu, Mo, Ag, Au | Large | 115,122 | .34 | 1982 | 49 |

¹Based on estimate of metric tons of contained Cu: Large, >1 million; medium, 50,000 to 1 million; small, <50,000.

²Rounded.

³Deposit abstract in directory.

⁴g/t Ag.

⁵g/t Au.

⁶Proven.

⁷Probable.

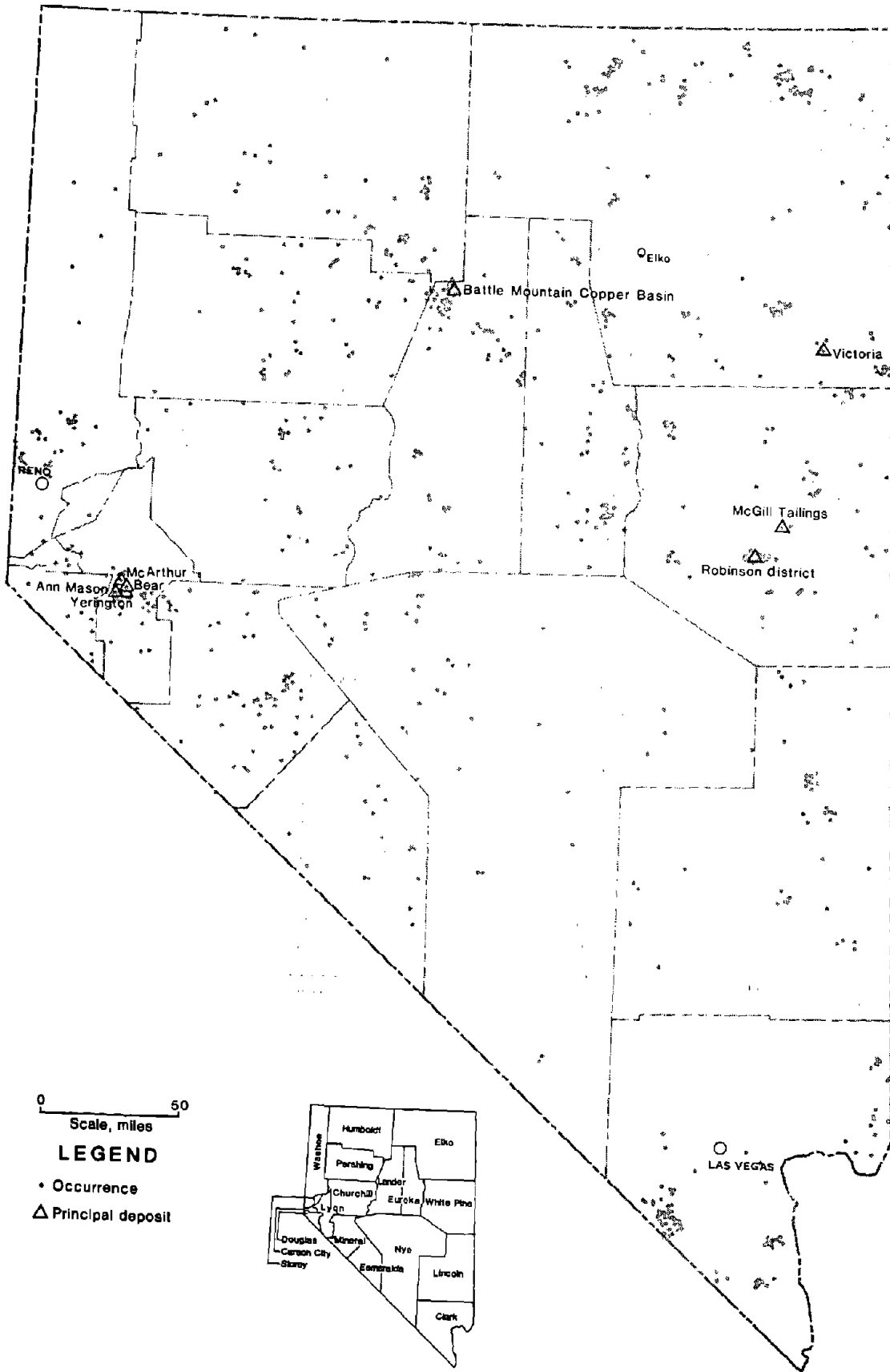


Figure 16.—Copper in Nevada.

FLUORSPAR

Fluorspar is a nonmetallic aggregate containing a sufficient quantity of fluorite (CaF_2) to be of commercial value. Two producers in southern Illinois accounted for over 90% of the domestic fluorspar production in 1983; the remainder was from Nevada and Texas. The manufacture of hydrofluoric acid, used in the aluminum, fluorchemical, and uranium industries, accounted for approximately 64% of the fluorspar consumed domestically in 1983. Another 34% was used as a flux in steelmaking. Enamels, glass manufacture,

coatings for welding rods, and other end uses accounted for the remainder of 1983 consumption. In 1981, 1982, and 1983, the Crowell Mine (Daisy) in Nye County was the sole producer of fluorspar in Nevada. The metallurgical grade fluorspar produced at the Crowell Mine was shipped to steel plants in California.

Bureau of Mines Mineral Industry Location System (MILS) Data—Fluorspar in Nevada

| | |
|--------------------------------|-----|
| Total properties | 152 |
| Producers ¹ | 47 |
| Known principal deposits | 9 |
| Deposit abstracts in directory | 6 |

¹Includes past producers.

Reported Fluorspar Production¹—United States and Nevada, 1978–83 (728–729)

| Year | United States ¹ | | Nevada | |
|------|--------------------------------|------------------------|--------------------------------|------------------------|
| | ² 10 ³ t | Value, 10 ³ | ² 10 ³ t | Value, 10 ³ |
| 1978 | 117,415 | \$13,261 | W | W |
| 1979 | 99,154 | 12,162 | W | W |
| 1980 | 84,037 | 12,611 | W | W |
| 1981 | 104,693 | 18,412 | W | W |
| 1982 | 69,869 | 13,293 | W | W |
| 1983 | 55,000 | 10,000 | W | W |

W Withheld to avoid disclosing company proprietary data.

¹As measured by finished shipments.

²Rounded.

Principal Known Fluorspar Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|-------------------------|--------|-------------------|-------------------------|-------------------|------------------------------|------------------|------|-----------|
| | | | | | 10 ³ t | wt % | Year | Reference |
| Bison ² | Eureka | Explored prospect | CaF_2 , Zn, Be | Large | (³) | (³) | NAP | NAP |
| Chicago Lode | Nye | Past producer | CaF_2 | Unknown | (³) | (³) | NAP | NAP |
| Crowell ² | do | Producer | CaF_2 | Medium | (³) | (³) | NAP | NAP |
| Horseshoe | do | Past producer | CaF_2 | Unknown | (³) | (³) | NAP | NAP |
| Mammoth ² | do | Explored | CaF_2 | Medium | (³) | (³) | NAP | NAP |
| Nycoc ² | do | Past producer | CaF_2 | do | (³) | (³) | NAP | NAP |
| Rainbow ² | do | do | CaF_2 | Small | (³) | (³) | NAP | NAP |
| Union Canyon | do | do | CaF_2 | Unknown | (³) | (³) | NAP | NAP |
| White Pine ² | do | Explored prospect | CaF_2 | Large | (³) | (³) | NAP | NAP |

NAP Not applicable.

¹Based on estimate of metric tons of contained CaF_2 . Large, >5 million; medium, 50,000 to 5 million; small, <50,000.

²Deposit abstract in directory.

³No published data have been located.

GOLD

Gold production in Nevada increased from 26% of total U.S. production in 1978 to 47% of U.S. total in 1983. Since 1980, Nevada has been the largest gold producing State. Nevada gold production more than tripled between 1978 and 1983. Nevada 1982 gold production was 28,626 kg. Production by the end of 1984 could easily be at the annual rate of 29,000 kg. After mid-decade, Nevada could be annually producing 31,000 kg (1 million oz) gold as new properties come on stream and several existing producers complete expansion. As a comparison, total 1983 U.S. gold production was 60,900 kg.

Most Nevada gold discoveries are very recent. Announcement of new Nevada discoveries and plans for mine-

mill development have been commonplace up to the present time.

One of the most recent discoveries was announced by AMAX Inc. in February 1985. Named the Sleeper, this gold and silver ore body is located about 50 km northwest of Winnemucca in Humboldt County. AMAX intends to develop and produce initially from a high-grade portion of the 3.8 million t ore body that, on the whole, averages 4.5 g/t Au and 25 g/t Ag. Production is scheduled to commence by mid-1986 at the mine rate of 450 t/d, producing about 1,700 kg Au and 1,900 kg Ag annually. Unfortunately, the announcement of this significant Nevada discovery came too late to include in the tabulation of principal known gold deposits below and on figure 18.

Bureau of Mines Mineral Industry Location System (MILS) Data—Gold in Nevada

| | |
|--------------------------------|-------|
| Total properties | 2,476 |
| Producers ¹ | 1,726 |
| Known principal deposits | 52 |
| Deposit abstracts in directory | 33 |

¹Includes past producers.

Reported Gold Production¹—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|--------------------|------------------------|--------|------------------------|
| | 10 ⁶ kg | Value, 10 ³ | kg | Value, 10 ³ |
| 1978 | 31.1 | \$193,324 | 8,125 | \$50,496 |
| 1979 | 30.0 | 296,550 | 7,779 | 76,905 |
| 1980 | 30.2 | 594,050 | 8,662 | 170,595 |
| 1981 | 42.9 | 633,918 | 16,323 | 241,220 |
| 1982 | 45.6 | 550,966 | 23,548 | 284,601 |
| 1983 | 60.9 | 829,929 | 28,626 | 390,226 |

¹Data are rounded.

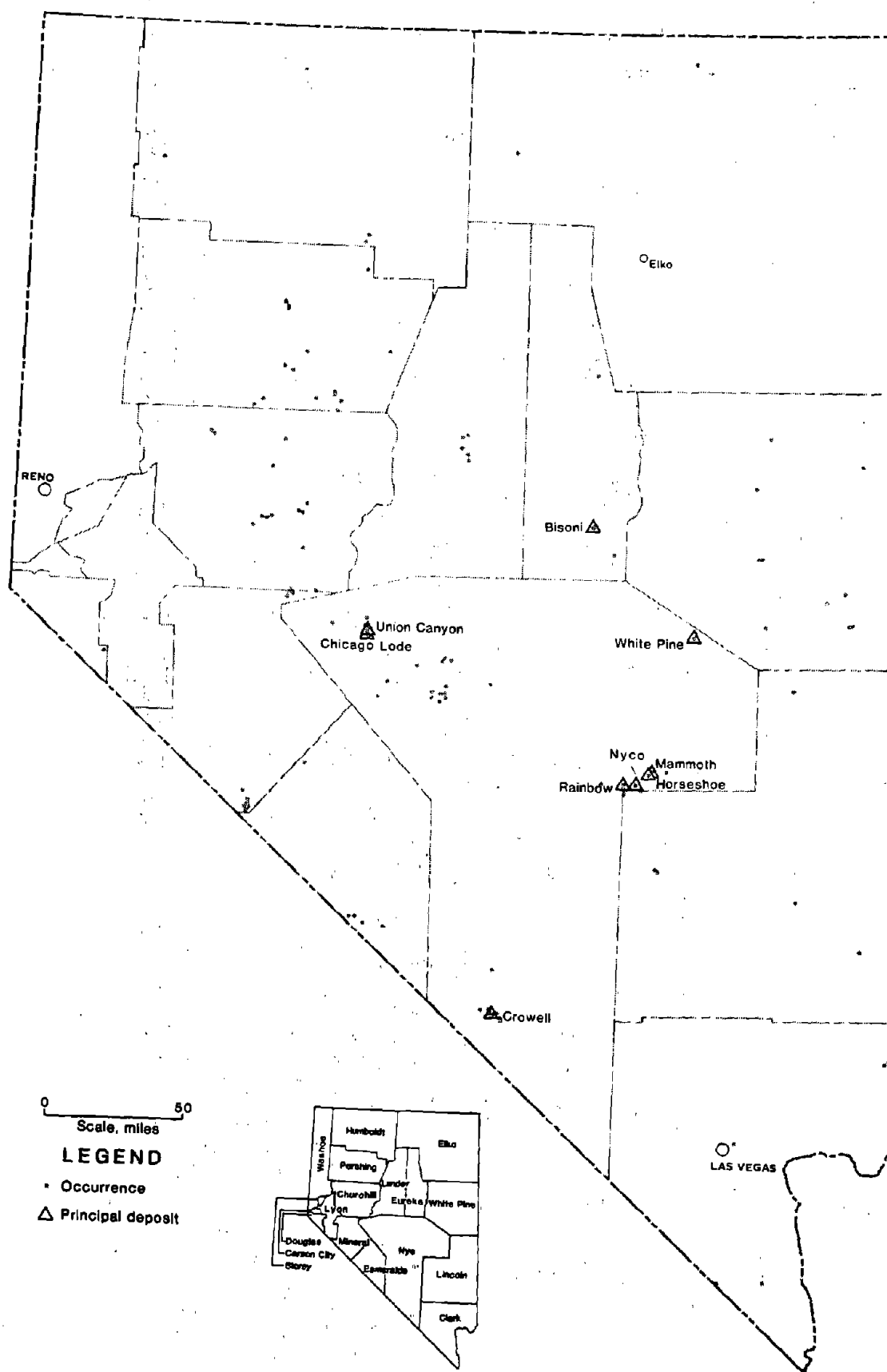


Figure 17.—Fluorspar in Nevada.

Principal Known Gold Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|--|------------|--|------------|-------------------|--------------------------------|------------------------|------|-----------|
| | | | | | ² 10 ⁶ t | g/t Au | Year | Reference |
| Alligator Ridge ³ | White Pine | Active-producer | Au, Ag, Hg | Medium | 3.5 | 3.1 | 1983 | 15 |
| Atlanta ³ | Lincoln | do | Au, Ag | Small | .9 | 3.0 | 1980 | 61 |
| Aurora ³ | Mineral | Active-producer, testing and developing. | Au, Ag | do | 1.4 | 4.42 455.0 410.0 | 1982 | 309, 444 |
| Bald Mountain ³ | White Pine | Active-testing and developing. | Au | do | 2.5 | 3.1 | 1984 | 499 |
| Battle Mountain Copper Canyon: ³ Fortitude. | Lander | Active-producer | Au, Ag | Medium | 14.5 | 4.8 418.0 | 1983 | 435 |
| Bell Mountain ³ | Churchill | Active-developing, exploration. | Au, Ag | Small | 2.5 | 2.02 456 | 1984 | 208 |
| Blue Star ³ | Eureka | Active-intermittent producer. | Au | do | 1.6 | 4.1 4100 | 1974 | 517 |
| Bootstrap ³ | Elko | Active-producer ⁵ | Au, Ag | do | <.9 | 1.5 | 1979 | 378 |
| Borealis ³ | Mineral | do | Au, Ag, Hg | do | 2.3- 2.7 | 2.7 42.1 | 1981 | 363 |
| Buckhorn ³ | Eureka | do | Au, Ag | do | 4.5 | 1.5 420 | 1983 | 769 |
| Buckskin | Douglas | Active-developing | Au, Cu, Ag | do | .36 | (⁶) | 1983 | 394 |
| Bullion Monarch ³ | Eureka | Active-producer | Au, Ag | Small | (7) | (7) | NAP | NAP |
| Carlin ³ | do | do | Au, Ag, Hg | Medium | 4.08 | 95.5 | 1983 | 511 |
| Cortez | do | Active-past producer ⁹ | Au | Small | (7) | (7) | NAP | NAP |
| Dee ³ | Elko | Active-producer | Au | do | 102.420 111.010 | 103.94 11.96 | 1983 | 493 |
| Dexter: High-grade zone | do | Active-exploration | Au, Ag | do | 1.8 | 1.37 465.1 | 1984 | 524, 534 |
| Low-grade zone | do | do | Au, Ag | do | 1.7 | 34 42.4 | 1984 | 524, 534 |
| Dry Canyon (Quito) | Lander | Active-exploration | Au, Sb | Small | 1.36 | 6.9 | 1984 | 799 |
| Eldorado Canyon | Clark | do | Au | Unknown | (7) | (7) | NAP | NAP |
| Enfield Bell (Jerritt Canyon). ³ | Elko | Active-producer | Au | Medium | 12.4 | 7.03 | 1984 | 313 |
| Fire Creek | Lander | Active-producer | Au | Small | .32 | 2 | 1982 | 611 |
| Florida Canyon | Pershing | Inactive-explored | Au | do | 18 | .7 | 1984 | 662 |
| Gance Creek | Elko | Active-exploration | Au | Unknown | (7) | (7) | NAP | NAP |
| Gatchell ¹³ | Humboldt | Active-past producer, exploration. | Au, Ag, W | Small | 2.950 9 | 6.2 5.5 | 1982 | 61 |
| Gold Bar | Eureka | Active-exploration | Au | do | 2.5 | 3 | 1984 | 660 |
| Gold Hill | Storey | Inactive | Au, Ag | do | (7) | (7) | NAP | NAP |
| Gold Quarry ³ | Eureka | Active-developing | Au, Hg | Large | 12166 13122 | 121.47 131.65 | 1983 | 511 |
| Goldfield ³ | Esmeralda | do | Au, Ag | Small | 1.919 | 2.4 | 1984 | 502 |
| Goldstrike ³ | Eureka | Active-producer | Au, Ag | do | (7) | (7) | NAP | NAP |
| Hilltop | Lander | Active-feasibility | Au | do | 149.34 | 12.5 | 1984 | 532 |
| Hog Ranch | Washoe | Active-exploration | Au | do | (¹⁵) | (¹⁵) | 1984 | 611 |
| Horse Canyon ³ | Eureka | Active-producer | Au | do | 3.121 | 1.89 | 1982 | 564 |
| Ivanhoe | Elko | Inactive-explored | Au | do | (¹⁶) | (¹⁶) | 1984 | 611 |
| Lewis | Humboldt | Active-developing | Au, Ag | do | >9.1 | NA | 1984 | 501 |
| Lucerne | Lyon | Inactive-explored | Au | do | (7) | (7) | NAP | NAP |
| Maggie Creek ³ | Eureka | Active-producer | Au | do | 3.3 | 2.7 | 1984 | 511 |
| Manhattan ³ | Nye | do | Au, Ag | do | 4.5 | 1.2 | 1983 | 311 |
| Mesona | Elko | Active-exploration | Au | do | (7) | (7) | NAP | NAP |
| Northumberland ³ | Nye | Active-producer | Au, Ag | do | 15.4 | 1.5 | 1981 | 61 |
| Paradise Peak | do | Active-developing | Au, Ag | Medium | 9.1 | 3.4 4103 | 1984 | 611, 772 |
| Pinson ³ | Humboldt | Active-producer | Au, Ag, Hg | Small | 102.7 112.2 | 103.19 11.89 | 1983 | 667 |
| Preble ³ | do | do | Au | do | 1.6 | 2.13 | 1984 | 770 |
| Rain ³ | Elko | Active-exploration | Au, Ag | do | 177.5 | 2.85 | 1983 | 511 |
| Rawhide | Mineral | do | Au, Ag | do | (¹⁸) | (¹⁸) | 1984 | 611 |
| Relief Canyon ³ | Pershing | Active-producer | Au, Ag | do | 8 | 1.1 | 1984 | 658 |
| Round Mountain ³ | Nye | do | Au, Ag | Large | 177.3 | 1.5 4.79 | 1981 | 388 |
| Santa Fe ³ | Mineral | Active-feasibility | Au, Ag | Small | 10.4 120.9 | 1.88 4.79 | 1983 | 531, 657 |
| Sterling ³ | Nye | Active-producer | Au, Ag, Hg | do | .18 | 6.9 | 1983 | 533 |
| Tonkin Springs: ³ Upper zone | Eureka | Active-exploration | Au | do | 2.3 | 3 | 1983 | 241 |
| Lower zone | do | do | Au | do | .45 | 3 | 1983 | 241 |
| Tonopah Divide ³ | Esmeralda | Active-producer | Au, Ag | do | (7) | (7) | NAP | NAP |
| Tonopah Hasbrouck ³ | do | Active-exploration | Au, Ag | do | 4.5 | 2 451 | 1982 | 611 |
| Victorine-Kingston | Lander | Active-producer, exploration. | Au, Ag | do | (7) | (7) | NAP | NAP |
| Windfall ³ | Eureka | Active-producer | Au, Ag | do | 2.7 | 1 | 1975 | 805 |

NAP Not applicable. NA Not available.

¹Based on estimate of metric tons of contained Au: Large, >90; medium, 90 to 30; small <30.²Rounded.³Deposit abstract in directory.⁴Silver.

⁵Pit inactive, reserves depleted. Low-grade dump is being leached.
⁶Development ore assayed 6.9 g/t Au, 0.9% Cu, and 14 g/t Ag.
⁷No published data have been located.
⁸Quantity and grade include Carlin and Blue Star reserves.
⁹Low-grade and high-stripping-ratio resource believed remaining; dump material currently being mined.
¹⁰Mill grade.
¹¹Leach grade.
¹²Total resource.

¹³Recoverable reserve.
¹⁴Contains 5.2 million t averaging 2.7 g/t amenable to open-pit mining.
¹⁵Contains >3,000 kg Au.
¹⁶Contains >15,000 kg Au.
¹⁷Contains 3.1 million t averaging 5.04 g/t Au.
¹⁸Contains >18,000 kg Au.
¹⁹Contains 6.3 million t oxide ore averaging 1.6 g/t Au and 15 g/t Ag, and 4.1 million t sulfide ore averaging 2.26 g/t Au and 30.9 g/t Ag.

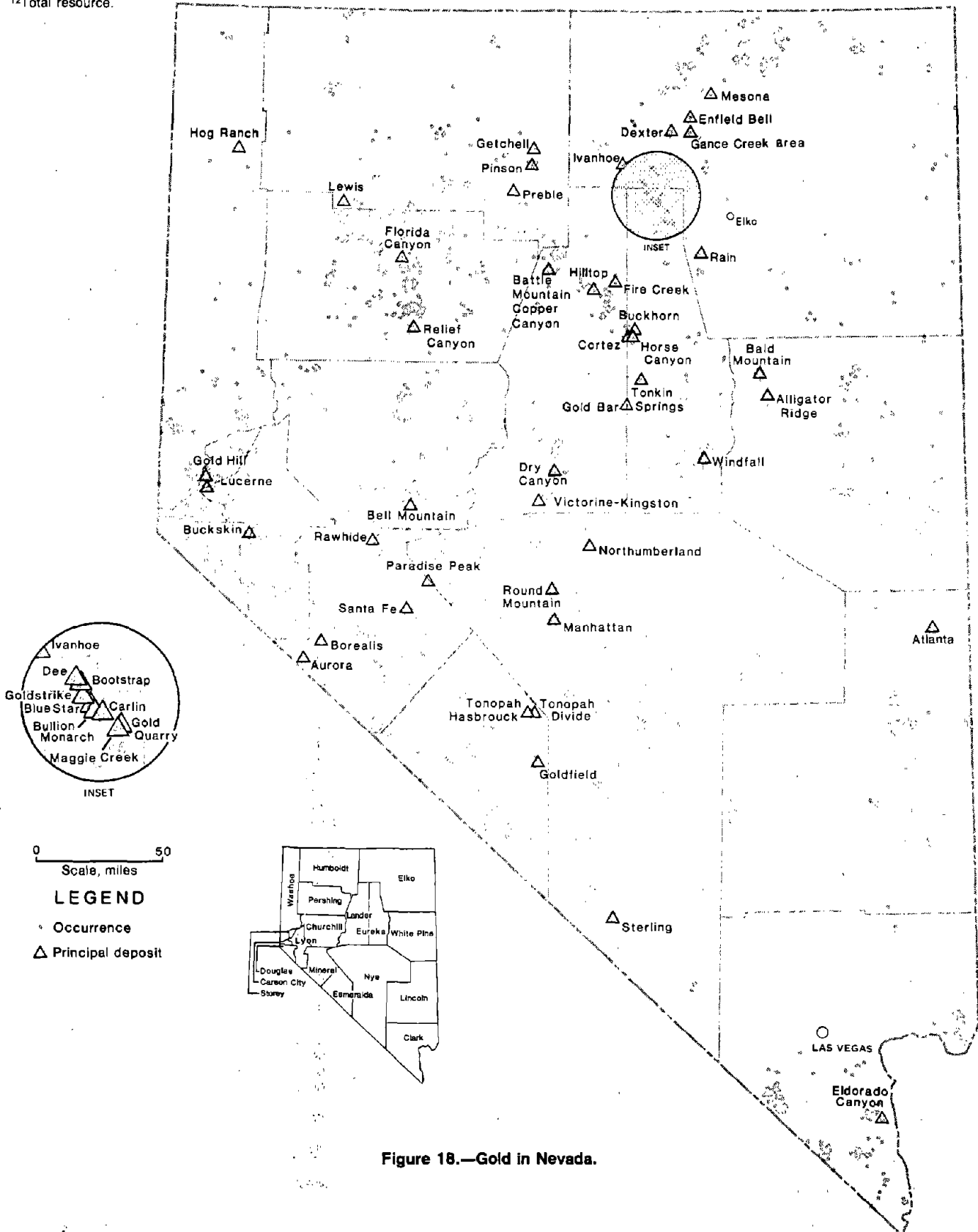


Figure 18.—Gold in Nevada.

IRON ORE

U.S. iron ore production, down about 50% in 1982 when compared with 1981 levels, was at the lowest since 1938. The reduction was largely due to the decline in iron and steel production. In California, a major mine was permanently closed and 9 of 13 taconite operations in the Lake Superior District were closed 7 to 12 months. In Nevada, the Nevada-Barth Corp. continued to ship ore to the Geneva,

UT, facility from its mine stockpile near Carlin; production reportedly ended in 1980 because of exhaustion of ore reserves. Two other mines, the Iron Mine in Churchill County and the Cooney Brothers, Pershing County, also reported shipments in 1982.

Bureau of Mines Mineral Industry Location System (MILS) Data—Iron Ore In Nevada

| | |
|--------------------------------|-----|
| Total properties | 218 |
| Producers ¹ | 77 |
| Known principal deposits | 9 |
| Deposit abstracts in directory | 9 |

¹Includes past producers.

Reported Iron Ore Production¹—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|--------------------------------|------------------------|--------------------------------|------------------------|
| | ² 10 ³ t | Value, 10 ³ | ² 10 ³ t | Value, 10 ³ |
| 1978 | 84,542 | \$2,401,387 | W | W |
| 1979 | 87,602 | 2,814,440 | W | W |
| 1980 | 70,711 | 2,544,121 | W | W |
| 1981 | 73,340 | 2,915,239 | 100.6 | \$1,490 |
| 1982 | 36,330 | 1,491,809 | 78.9 | 1,119 |
| 1983 | 45,006 | 1,944,988 | W | W |

W Withheld to avoid disclosing company proprietary data.

¹As measured by shipments; includes byproduct ore.

²Rounded.

Principal Known Iron Ore Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|-----------------------------|-----------|-------------------|----------------|-------------------|--------------------------------|------------------|------|-----------|
| | | | | | ² 10 ³ t | wt % | Year | Reference |
| Buena Vista ³ | Churchill | Past producer | Fe | Medium | 48,000 | 28.5 | 1971 | 4454 |
| Calico Hills ³ | Mineral | Unknown | Fe, Cu | Small | (⁵) | (⁵) | NAp | NAp |
| Dayton ³ | Lyon | Explored prospect | Fe | Medium | 48,000 | 42 | 1971 | 454 |
| Dodge-Ford ³ | Pershing | Past producer | Fe | do | (⁵) | (⁵) | NAp | NAp |
| Minnesota ³ | Douglas | do | Fe | Small | (⁵) | (⁵) | NAp | NAp |
| Modarelli ³ | Eureka | do | Fe | Medium | 45,000 | 42.7 | 1971 | 454 |
| Phelps-Stokes ³ | Nye | do | Fe | Small | (⁵) | (⁵) | NAp | NAp |
| Piute ³ | Pershing | Explored prospect | Fe | Large | (⁵) | (⁵) | NAp | NAp |
| Pumpkin Hollow ³ | Lyon | do | Fe, Cu, Au, Ag | do | 250,000 | 40 | 1969 | 771 |

NAp Not applicable.

¹Based on estimate of metric tons of contained Fe: Large, >100 million; medium, 5 million to 100 million; small, <5 million.

²Rounded.

³Deposit abstract in directory.

⁴Buena Vista published reserves-resources are for 3 separate ore bodies and include measured, indicated, and inferred estimates.

⁵No published data have been located.

⁶Wt % Cu.

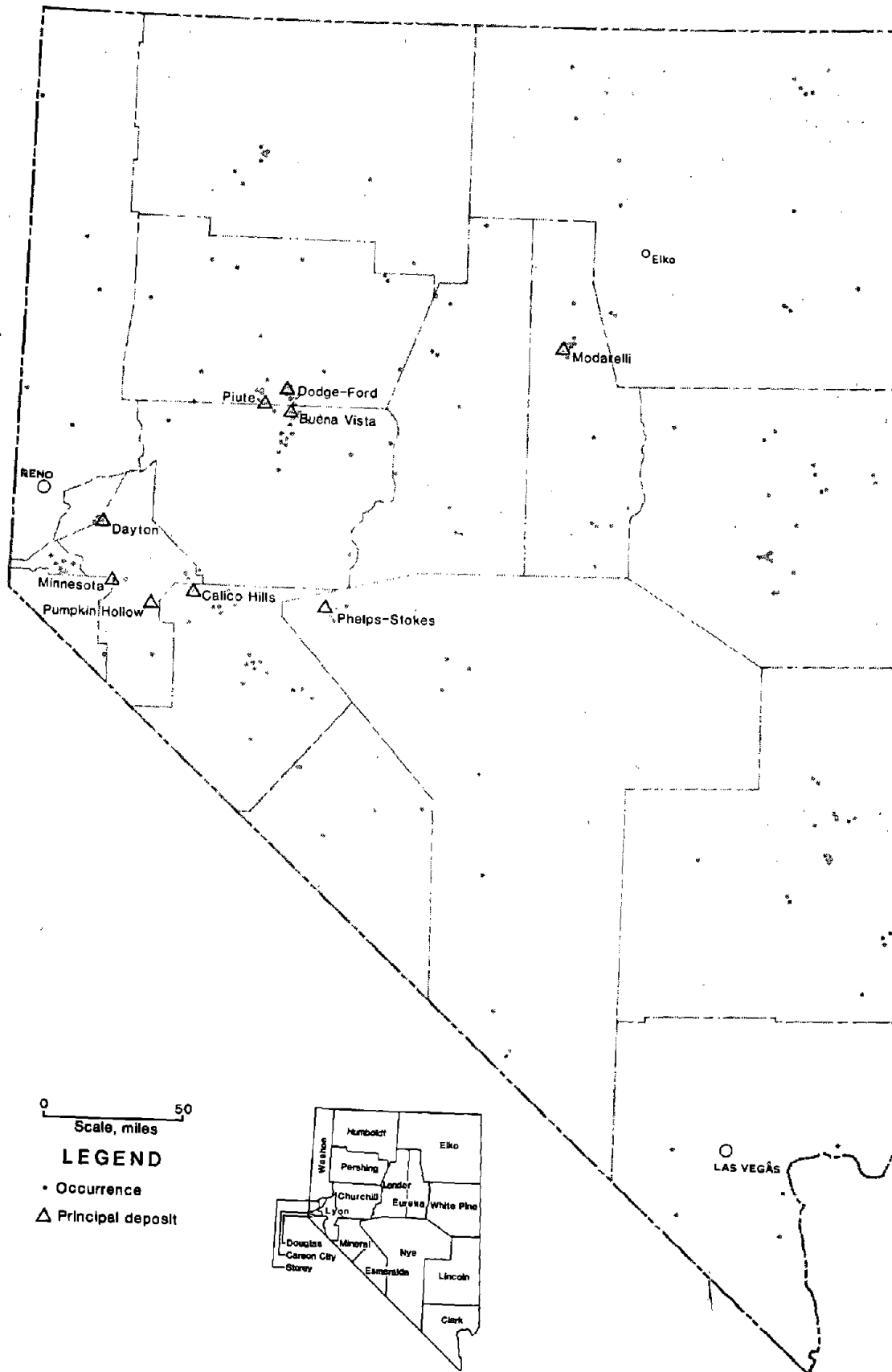


Figure 19.—Iron in Nevada.

LEAD AND ZINC

Lead and zinc are two of the most widely used metals in world industry. In terms of tonnage used, lead and zinc rank fifth and fourth, respectively, after iron, aluminum, and copper. In 1982, world mine production of lead and zinc was estimated at 3.5 million and 6.2 million t, respectively, while output from U.S. mines was estimated at 513,000 t lead and 303,000 t zinc.

Although Nevada is not a major producer of either lead or zinc, both metals have been periodically recovered from Nevada mines. The last significant period of production was during the mid-1970's when the Pan American Mine in

Bureau of Mines Mineral Industry Location System (MILS) Data—Lead and Zinc in Nevada

| | |
|--------------------------------------|-------|
| Total properties | 1,506 |
| Producers ¹ | 1,051 |
| Known principal deposits | 10 |
| Deposit abstracts in directory | 6 |

¹Includes past producers.

Lincoln County was operated by the Bunker Hill Co. Since 1979, however, output of lead and zinc has been small.

Reported Lead and Zinc Production—United States and Nevada, 1978–83 (722–723)

| Year | Lead | | Zinc | |
|---------------|-------------------|------------------------|-------------------|------------------------|
| | 10 ³ t | Value, 10 ³ | 10 ³ t | Value, 10 ³ |
| UNITED STATES | | | | |
| 1978 | 1530 | \$393,516 | 1303 | \$206,854 |
| 1979 | 1526 | 609,929 | 1267 | 219,841 |
| 1980 | 1550 | 515,189 | 1317 | 281,671 |
| 1981 | 1446 | 358,821 | 1312 | 306,879 |
| 1982 | 1513 | 288,579 | 1303 | 257,116 |
| 1983 | 1449 | 214,623 | 1275 | 251,204 |
| NEVADA | | | | |
| 1978 | 0.653 | \$485 | 1.371 | \$937 |
| 1979 | .024 | 28 | W | W |
| 1980 | .026 | 24 | .002 | 2 |
| 1981 | W | W | W | W |
| 1982 | W | W | 0 | 0 |
| 1983 | .014 | 7 | 0 | 0 |

W Withheld to avoid disclosing company proprietary data.

¹Rounded.

Principal Known Lead and/or Zinc Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|---------------------------------|------------------|-------------------------|--------------------------------|-------------------|------------------------------|----------------------------------|------|-----------|
| | | | | | 210 ³ t | wt % | Year | Reference |
| Argentina | Clark | Past producer | Zn, Pb, Ag, Au, Cu, V | Small | (⁴) | (⁴) | NAP | NAP |
| Caselton ³ | Lincoln | do | Zn, Pb, Ag, Mn | Medium | (⁴) | (⁴) | NAP | NAP |
| Mountain View | Eureka | do | Zn, Pb, Ag, Cu, Au | Small | (⁴) | (⁴) | NAP | NAP |
| Pan American ³ | Lincoln | do | Zn, Pb, Ag, Mn | Medium | 1,992 | 51.17 52.45 72.07 (sic) | 1982 | 168 |
| Potosi | Clark | do | Zn, Ag, Pb | Small | (⁴) | (⁴) | NAP | NAP |
| Prince ³ | Lincoln | do | Zn, Pb, Ag, Mn | Medium | (⁴) | (⁴) | NAP | NAP |
| Ridge 7129 ³ | Eureka | Explored | Zn, V, Mo, Se, oil shale | do | (⁴) | (⁴) | NAP | NAP |
| Ruby Hill ³ | do | Developed | Zn, Au, Ag, Pb | do | 2,841 | 53.7 58.3 85.48 71.94 | 1982 | 168 |
| Ward ³ | White Pine | Active-developing | Zn, Pb, Ag, Cu | do | 4,500 | 95.5 71.03 101.4 | 1983 | 637 |
| Yellow Pine | Clark | Past producer | Zn, Pb, Ag, Cu, Au | do | (⁴) | (⁴) | NAP | NAP |

NAP Not applicable.

¹Based on estimate of metric tons of contained Pb and Zn: Large, >1 million; medium, 50,000 to 1 million; small, <50,000.

²Rounded.

³Deposit abstract in directory.

⁴No published data have been located.

⁵Wt % Pb.

⁶Wt % Zn.

⁷g/t Ag.

⁸g/t Au.

⁹Combined wt % Zn-Pb.

¹⁰Wt % Cu.

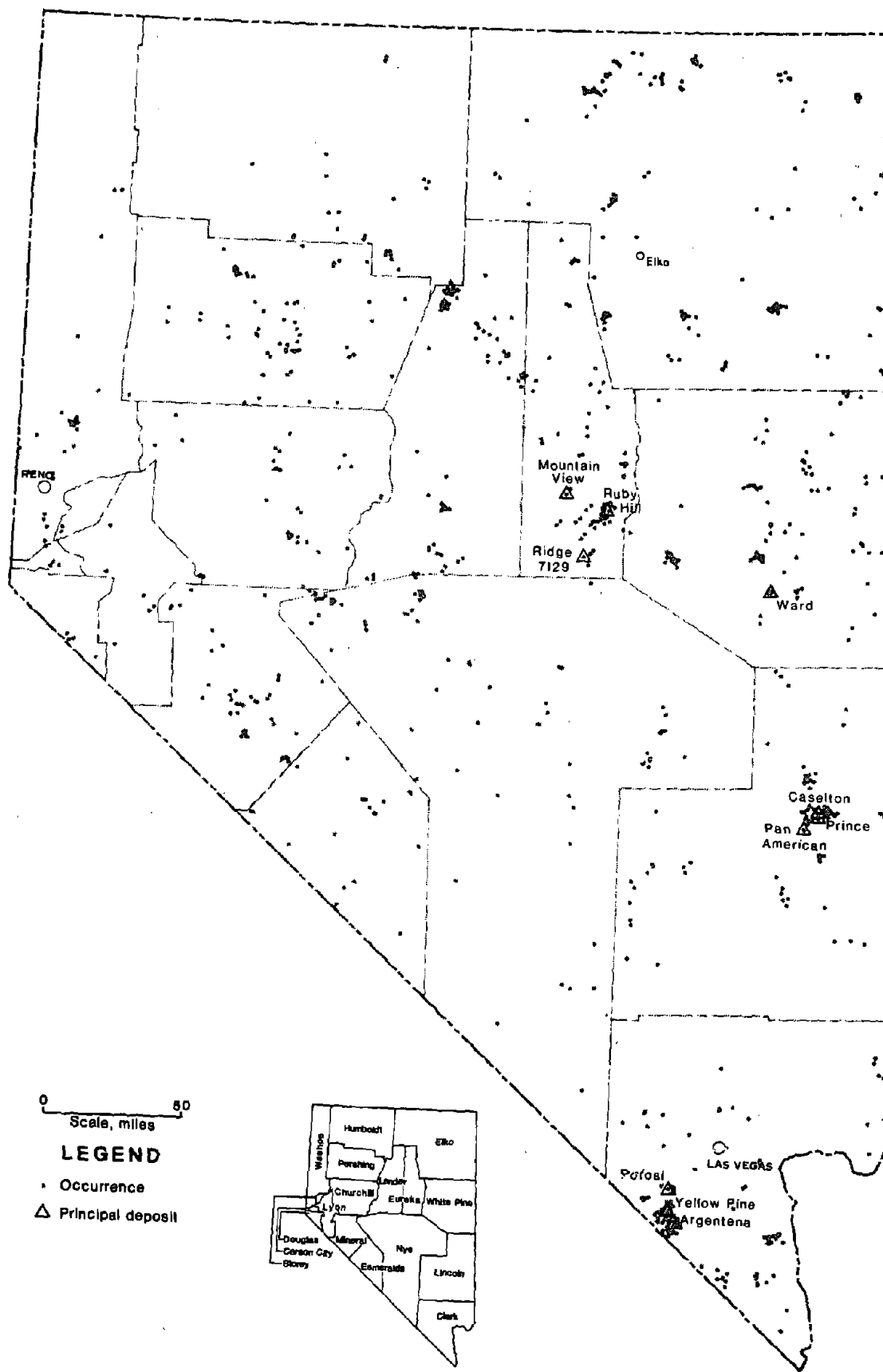


Figure 20.—Lead-zinc in Nevada.

LITHIUM

Lithium is the lightest weight, lowest density, and most electrochemically reactive metal known. It finds use in a variety of commercial or industrial applications. The United States is the world's largest consumer of lithium and from 1978 through 1983, apparent domestic consumption averaged 2,833 t. In 1983, the aluminum industry, the largest lithium user, accounted for about one-third of domestic consumption. Other consuming industries include ceramic and

specialty glass, lubricant, air conditioning, synthetic rubber, and primary batteries.

The United States is also the world's largest producer of lithium. In addition to supplying domestic needs, U.S. producers provide about 70% of market-economy countries supply of lithium. Approximately three-fourths of U.S. output is obtained from pegmatite deposits in North Carolina. The remainder is from lithium-bearing brines in Clayton Valley, NV. Currently, there is significant exploration activity in the McDermitt Caldera area near the Nevada-Oregon border where an extensive deposit of hectorite, a lithium-bearing clay, occurs.

Bureau of Mines Mineral Industry Location System (MILS) Data—Lithium in Nevada

| | |
|--------------------------------------|---|
| Total properties | 2 |
| Producers ¹ | 1 |
| Known principal deposits | 2 |
| Deposit abstracts in directory | 2 |

¹Includes past producers.

Reported Lithium Production—United States and Nevada, 1978–83 (722–723)

Lithium production data for both the United States and Nevada are withheld to avoid disclosing company proprietary data.

Principal Known Lithium Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|--------------------------------|-----------|----------------|-----------|-------------------|------------------------------|------------------|------|-----------|
| | | | | | 210 ³ t | wt % | Year | Reference |
| Montana Mountains ³ | Humboldt | Explored | Li, U | Large | (⁴) | (⁴) | NAp | NAp |
| Silver Peak ³ | Esmeralda | Producer | Li | do | 41 | (⁵) | 1979 | 638 |

NAp Not applicable.

¹Based on estimate of metric tons of contained LiO₂: Large, >100,000; medium, 10,000 to 100,000; small, <10,000.

²Rounded.

³Deposit abstract in directory.

⁴No published data have been located.

⁵Li as Li₂CO₃.

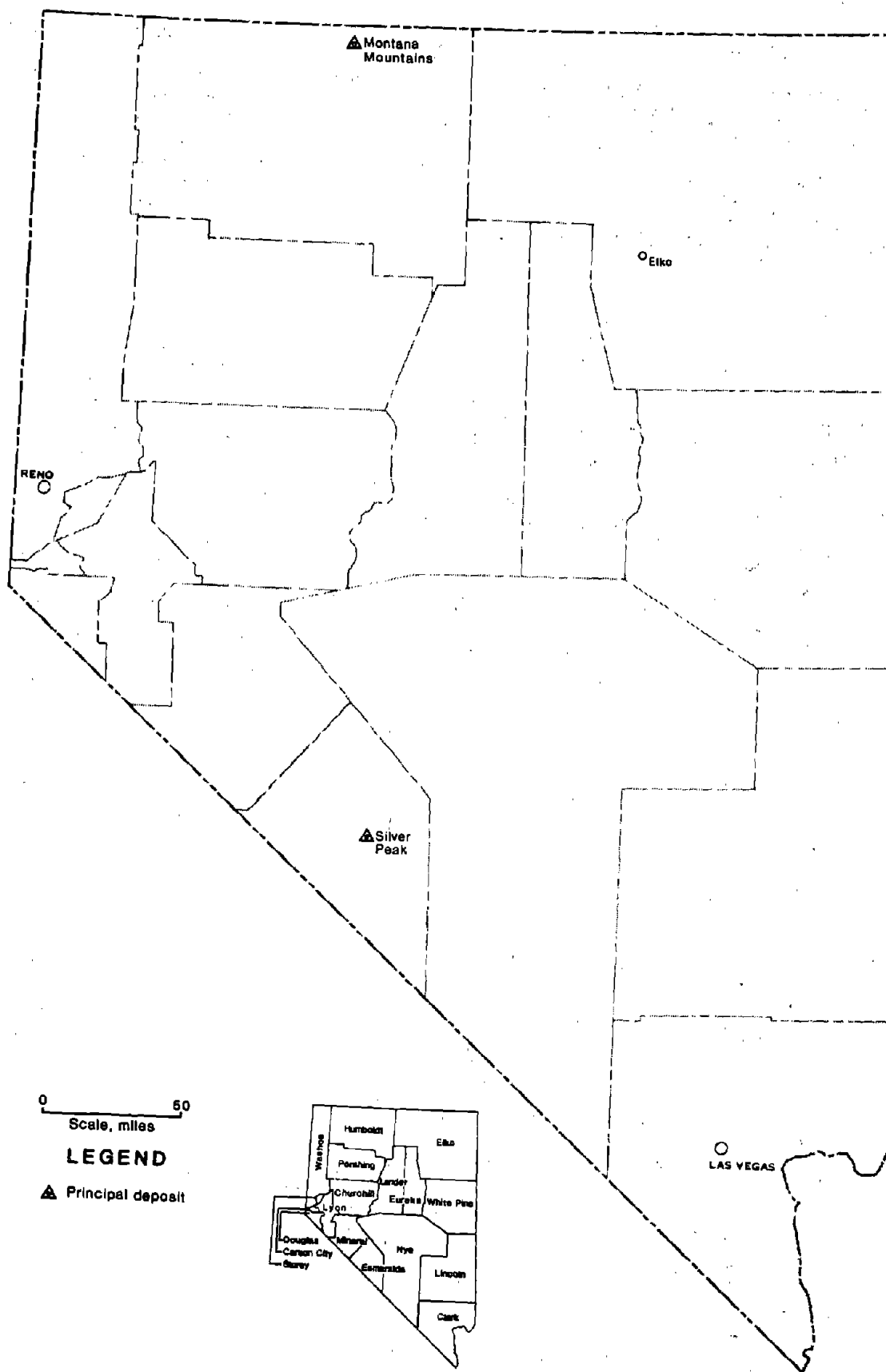


Figure 21.—Lithium in Nevada.

MAGNESIUM

Magnesium, the eighth most abundant element in the Earth's crust, has two basic commercial forms: magnesium metal and magnesium compounds. Apparent U.S. annual consumption of magnesium metal averaged 111,000 t from 1978 through 1983, and for the same period, apparent annual domestic consumption of magnesium compounds averaged nearly 705,000 t (magnesium content). In 1983, about 53% of consumption of metallic magnesium was in the production of aluminum-based alloys. Other uses of the metal included magnesium castings and wrought products; reducing agents for titanium, zirconium, uranium, and beryllium metal; cathodic protection; and production of nodular cast iron. About 80% of the magnesium compounds used in the United States is in the form of magnesia (MgO) for high-temperature, basic refractory materials. The steel industry, the largest consumer of magnesia refractories, uses about 5.5 kg of MgO per metric ton of steel ingot produced. Magnesium compounds are also used in the produc-

Bureau of Mines Mineral Industry Location System (MILS) Data—Magnesium in Nevada

| | |
|--------------------------------|----|
| Total properties | 35 |
| Producers ¹ | 2 |
| Known principal deposits | 2 |
| Deposit abstracts in directory | 2 |

¹Includes past producers.

tion of a variety of other industrial and consumer goods including such diverse products as pulp and paper, sugar, rubber, chemicals, pharmaceuticals, fertilizers, textiles, glass, paint, cements, and ceramics.

In the United States, magnesium metal and magnesium compounds are recovered from seawater, well and lake brines, dolomite, brucite, and magnesite.

Prior to World War II, Nevada produced minor amounts of magnesium compounds; however, in the early 1940's production of magnesia greatly expanded principally for feed to the Government-built magnesium metal plant near Henderson, NV. All of the ore was obtained from deposits near Gabbs in Nye County. Magnesite mining for the production of refractory grade magnesia began in 1949 and has been carried out since.

Reported Magnesium Production¹—United States and Nevada, 1978–83 (722–723)

| Year | United States | | Nevada | |
|------|--------------------------------|------------------------|-------------------|------------------------|
| | ² 10 ³ t | Value, 10 ³ | 10 ³ t | Value, 10 ³ |
| 1978 | 1,378 | \$221,626 | W | W |
| 1979 | 1,428 | 234,306 | W | W |
| 1980 | 1,297 | 277,506 | W | W |
| 1981 | 1,114 | 262,265 | W | W |
| 1982 | 915 | 222,287 | W | W |
| 1983 | 935 | 216,765 | W | W |

W Withheld to avoid disclosing company proprietary data.

¹Magnesium compounds shipped and used.

²Rounded.

Principal Known Magnesium Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|--------------------------|--------|----------------|-----------|-------------------|--------------------------------|------------------|------|-----------|
| | | | | | ² 10 ³ t | wt % | Year | Reference |
| Basic, Inc. ³ | Nye | Producer | MgO | Large | 24,500 | 4<5 | 1956 | 749 |
| Overton ³ | Clark | Explored | MgO | Medium | (⁵) | (⁵) | NAp | NAp |

NAp Not applicable.

¹Based on estimate of metric tons contained MgO: Large, >10 million; medium, 100,000 to 10 million; small, <100,000.

²Rounded.

³Deposit abstract in directory.

⁴Wt % CaO.

⁵No published data have been located.

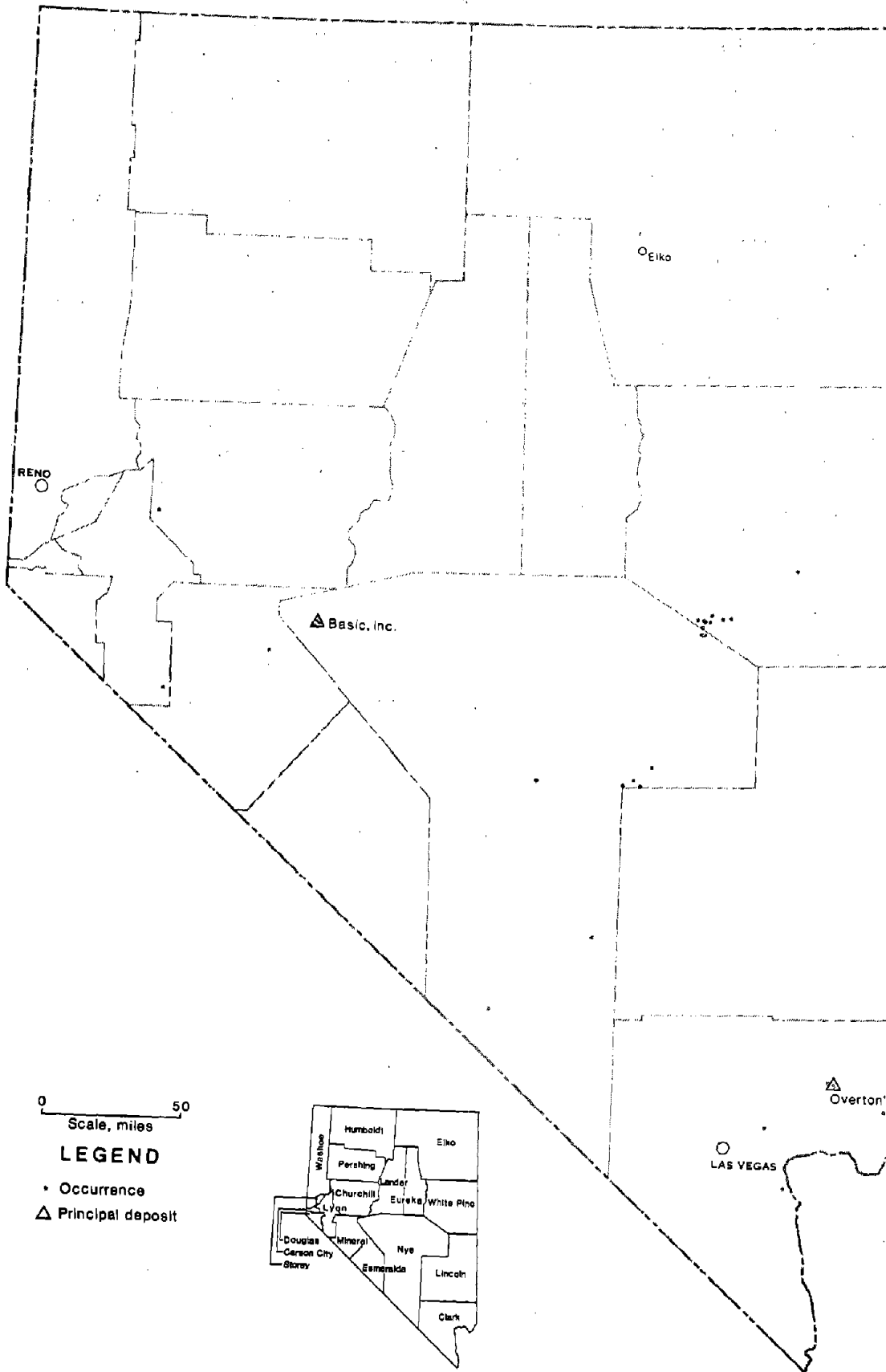


Figure 22.—Magnesium in Nevada.

MANGANESE

Manganese, an extremely critical material in an industrial economy, is essential in the production of virtually all steels and pig iron. When added to the melt in small amounts (approximately 6.8 kg/t), manganese acts as a scavenger by combining with oxygen and sulfur to form easily removable slag. When added in larger amounts (10% to 14%), manganese imparts a work hardening characteristic to steel without sacrificing other desired properties. Manganese added to aluminum, magnesium, and copper increases strength, hardness, and/or corrosion resistance. Other uses of manganese include the production of dry cell batteries and chemicals.

The United States is almost totally dependent on imports to satisfy domestic manganese demand. Between 1978 and 1982, net U.S. import reliance ranged from 97% to 99%

Bureau of Mines Mineral Industry Location System (MILS) Data—Manganese in Nevada

| | |
|--------------------------------------|-----|
| Total properties | 209 |
| Producers ¹ | 69 |
| Known principal deposits | 5 |
| Deposit abstracts in directory | 5 |

¹Includes past producers.

of domestic consumption. During war or other periods of artificially high prices, however, domestic mines have produced high-grade manganese ore or concentrates (>35% manganese). The Three Kids Mine in Clark County, the largest manganese producer in Nevada, is reported to have yielded more than 600,000 t of concentrates averaging about 45% manganese (727). Other major manganese past producers in Nevada include the Black Diablo Mine in Pershing County and the Caselton and Pioche No. 1 and 2 in Lincoln County. There has been no reported manganese production in Nevada since 1961.

Reported Manganese Production¹—United States and Nevada, 1978–83 (722–723)

| Year | United States | | Nevada | |
|------|---------------|------------------------|--------|------------------------|
| | t | Value, 10 ³ | t | Value, 10 ³ |
| 1978 | 34,723 | \$3,074 | NRP | NRP |
| 1979 | 27,998 | 2,902 | NRP | NRP |
| 1980 | 20,553 | 2,444 | NRP | NRP |
| 1981 | 22,067 | 2,890 | NRP | NRP |
| 1982 | 3,614 | 293 | NRP | NRP |
| 1983 | 3,335 | 216 | NRP | NRP |

NRP No reported production.

¹Manganese content of manganiferous ore (5% to 35% Mn, natural) shipped. Shipments are used as a measure of manganiferous ore production. No manganese ore (35% or more Mn, natural) was reported shipped from 1978 through 1983.

Principal Known Manganese Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|---------------------------|--------|----------------|------------|-------------------|------------------------------|------------------|------|-----------|
| | | | | | 210 ³ t | wt % | Year | Reference |
| Boulder City ³ | Clark | Explored | Mn | Medium | 13,600 | 3 | 1949 | 407 |
| Fannie Ryan ³ | do | do | Mn | Small | 23 | 7.6 | 1949 | 407 |
| Gibellini ³ | Eureka | do | Mn, Ni, Zn | do | (⁴) | (⁴) | NAP | NAP |
| Three Kids ³ | Clark | Past producer | Mn | Large | 7,230 | 13.2 | 1982 | 351 |
| Virgin River ³ | do | Expored | Mn | do | 290 | 10 | 1949 | 407 |

¹Based on estimate of metric tons of contained Mn: Large, >1 million; medium, 100,000 to 1 million; small, <100,000.

²Rounded.

³Deposit abstract in directory.

⁴No published data have been located.

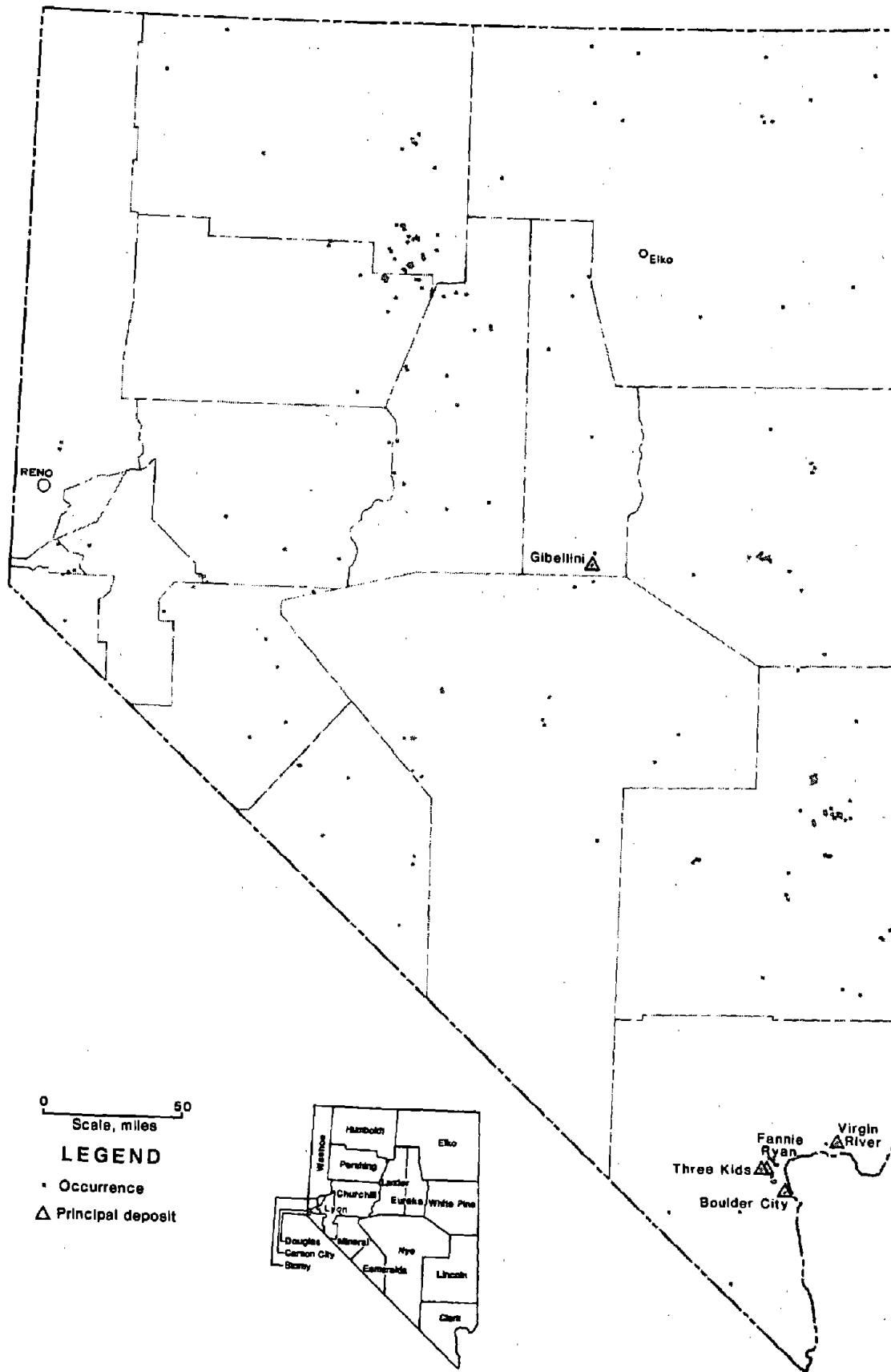


Figure 23.—Manganese in Nevada.

MERCURY

Mercury possesses a combination of useful properties, namely, liquidity at ordinary temperatures, chemical stability, good electrical conductivity, high density and surface tension, uniform volume expansion, toxicity of its compounds for use in fungicides and other pesticides, and an ability to alloy readily. This latter property in particular, resulted in mercury having an important role in Nevada's early mining history. At one time, cinnabar was widely mined throughout the State and mercury, recovered by retorting, was used in early day gold mine operations to recover free gold and silver from placer and lode ores. This practice all but disappeared when free-milling ores were depleted and the cyanide process was developed. Today, over half of domestic mercury consumption is used in electrical apparatus. Other areas of principal use are in the electrolytic production of chlorine and caustic soda, mildew-proofing paint, and in industrial and control instruments.

Bureau of Mines Mineral Industry Location System (MILS) Data—Mercury in Nevada

| | |
|--------------------------------|-----|
| Total properties | 283 |
| Producers ¹ | 124 |
| Known principal deposits | 4 |
| Deposit abstracts in directory | 3 |

¹Includes past producers.

In recent years, Nevada has been the largest producer of primary mercury in the United States. In 1983, the State was the Nation's sole producer. Placer U.S. Inc.'s McDermitt Mine accounted for 99.8% of U.S. total mercury mine production in 1982, or 85% of total domestic mine and secondary mercury production. In 1983, Nevada supplied the nation with about 50% of the 50,000 flasks reported consumed. Although the bulk of mercury is produced from the McDermitt Mine, the Carlin, Pinson, and Borealis gold mines produce small quantities of mercury as a byproduct of gold refining. When the Paradise Peak gold mine commences production in the near future, about 90 t or 2,600 flasks of mercury is expected to be produced annually. An additional unknown quantity of mercury will be produced at the proposed Gold Quarry gold mine.

Reported Mercury Production—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|---------------|------------------------|--------|------------------------|
| | Flasks | Value, 10 ³ | Flasks | Value, 10 ³ |
| 1978 | 24,163 | \$3,705 | 24,163 | \$3,705 |
| 1979 | 29,519 | 8,299 | 29,368 | 8,256 |
| 1980 | 30,657 | 11,939 | 30,431 | 11,851 |
| 1981 | 27,904 | 11,549 | 27,819 | 11,514 |
| 1982 | 25,760 | W | 25,760 | W |
| 1983 | 25,070 | W | 25,070 | W |

W Withheld to avoid disclosing company proprietary data.

Principal Known Mercury Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|---------------------------|-------------|---------------------------|------------|-------------------|------------------------------|------------------|------|-----------|
| | | | | | 210 ³ t | kg/t | Year | Reference |
| B & B ² | Esmeralda | Inactive-past producer | Hg, Sb | Small | (⁴) | (⁴) | NAP | NAP |
| Carson River ³ | Carson City | Inactive-Comstock wastes. | Hg, Au, Ag | Medium | (⁴) | (⁴) | NAP | NAP |
| McDermitt ³ | Humboldt | Active-producer | Hg | do | 1,202 | 4.44 | 1982 | 584 |
| Pilot Mountain district | Mineral | Inactive-past producer | Hg | Small-medium | (⁴) | (⁴) | NAP | NAP |

NAP Not applicable.

¹Based on estimate of flasks of contained Hg: Large, >500,000; medium, 500,000 to 10,000; small, <10,000.

²Rounded.

³Deposit abstract in directory.

⁴No published data have been located.

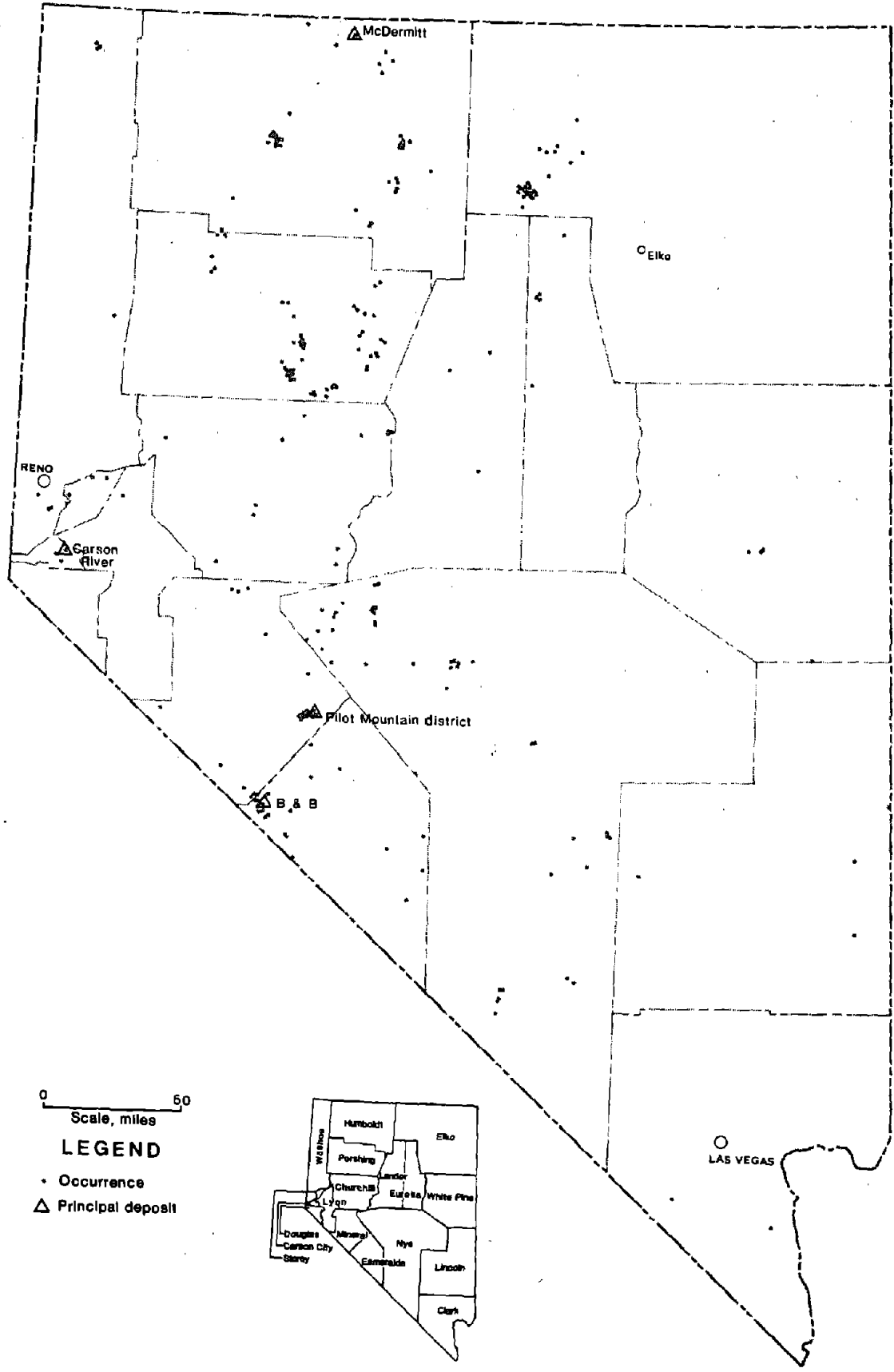


Figure 24.—Mercury in Nevada.

MOLYBDENUM

Molybdenum, a silver-white metallic element, is used as an alloying agent, refractory metal, and in lubricants, catalysts, and pigments. The United States has consistently been the world's largest producer of molybdenum, accounting for about two-thirds of the world annual output from 1976 through 1981. In 1982, however, the U.S. share of world production declined to about 41%, when domestic mines produced an estimated 38,275,000 kg of molybdenum, down from 63,458,000 kg in 1981. In 1983 U.S. mine output declined by nearly 60% and accounted for less than 25% of world molybdenum production.

Until 1980, the molybdenum produced in Nevada was as a byproduct of copper ore. By the end of 1981, Nevada's first primary molybdenum mine, the Anaconda Minerals Co. Nevada Moly Mine, was on-stream; however, no shipments were made. The mine operated through mid-1982, when the mill was shut down for modifications. Although milling resumed in October, the operation was again shut down in January 1983 because of the worldwide oversupply of molybdenum. In September 1983, operations resumed at 60% capacity.

Bureau of Mines Mineral Industry Location System (MILS) Data—Molybdenum in Nevada

| | |
|--------------------------------------|-----|
| Total properties | 162 |
| Producers ¹ | 2 |
| Known principal deposits | 5 |
| Deposit abstracts in directory | 4 |

¹Includes past producers.

Reported Molybdenum Production—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|-------------------|------------------------|--------|------------------------|
| | 10 ³ t | Value, 10 ³ | ton | Value, 10 ³ |
| 1978 | 60 | \$807,950 | 45 | \$469 |
| 1979 | 55 | 871,088 | 18 | 242 |
| 1980 | 68 | 1,344,181 | NRP | NRP |
| 1981 | 63 | 995,541 | NRP | NRP |
| 1982 | 38 | 504,089 | W | W |
| 1983 | 15 | 167,164 | W | W |

NRP No reported production.

W Withheld to avoid disclosing company proprietary data.

¹Rounded.

Principal Known Molybdenum Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|----------------------------|---------|----------------|---------------|-------------------|------------------------------|---------------------|------|-----------|
| | | | | | 10 ³ t | wt % | Year | Reference |
| B & C Springs ² | Nye | Explored | Mo, Cu, Ag | Large | 131,000 | 0.12 | 1983 | 710 |
| Buckingham ² | Lander | do | Mo, Ag, Cu, W | do | 907,000 | .06 | 1982 | 701 |
| Mount Hope ² | Eureka | Developing | Mo | do | 408,000 | ³ 13-.32 | 1981 | 383 |
| Nevada Moly ² | Nye | Producer | Mo, Cu | do | 455,000 | .072 | 1983 | 736 |
| Pine Nut | Mineral | Explored | Mo, W | do | 82,000 | ⁴ 0.68 | 1983 | 794 |

¹Based on estimate of metric tons of contained Mo: Large, >200,000; medium, 5,000 to 200,000; small, <5,000.

²Deposit abstract in directory.

³Wt % MoS₂

⁴Wt % Cu.

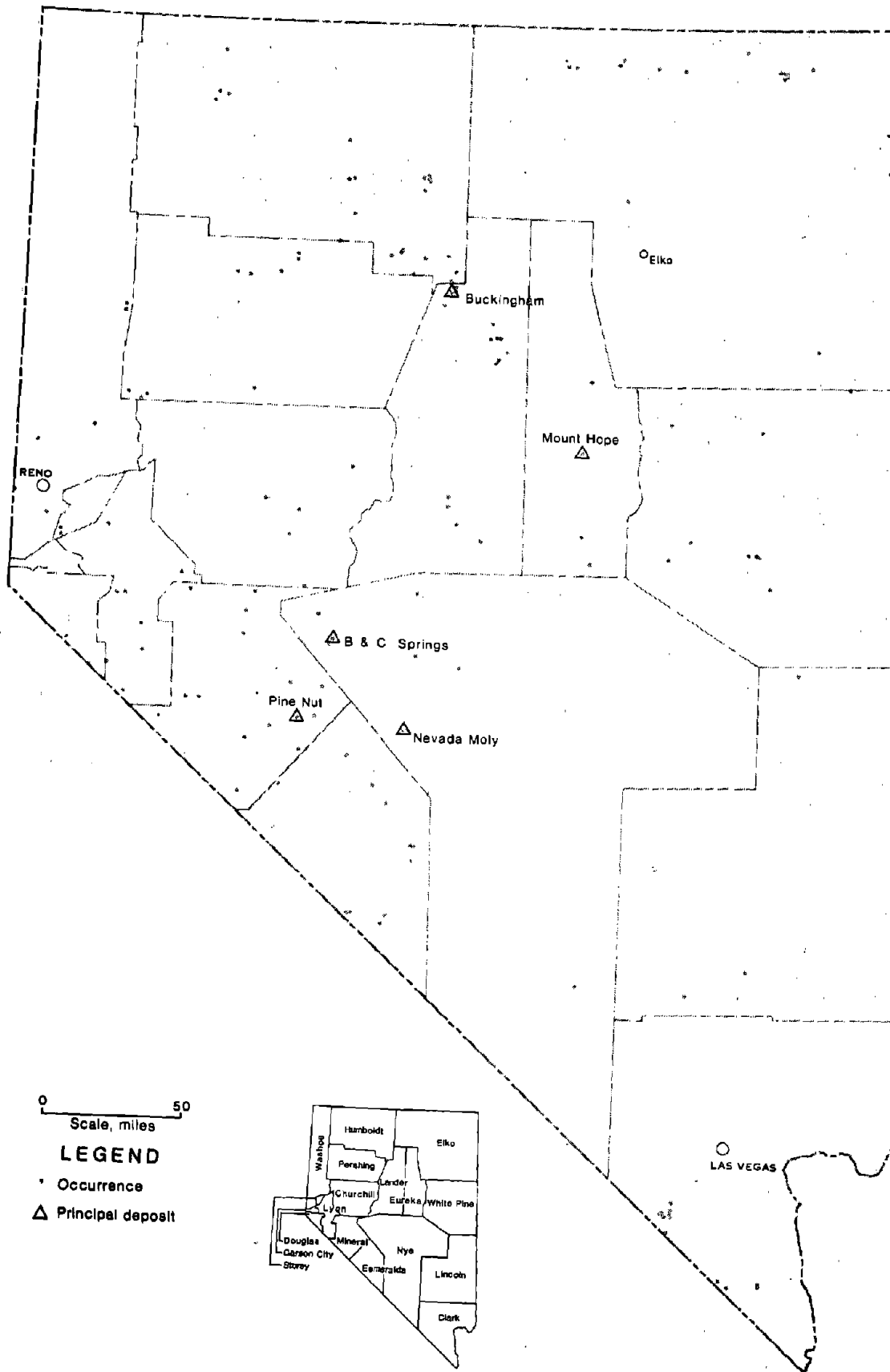


Figure 25.—Molybdenum in Nevada.

SILVER

Both silver and gold have long been used as storehouses for wealth; however, silver possesses physical and chemical properties that also make it critical in producing many modern industrial and consumer products. Silver's unique properties include the highest electrical and thermal conductivity of all metals; the forming of photosensitive compounds; the resistance to oxidation at high temperatures while maintaining strength; and exceptional malleability and ductility. In 1982, U.S. consumers used about 4.66 million kg of silver while domestic mines yielded only slightly more than 1.25 million kg of primary metal or about 27% of apparent domestic consumption (728). Mines in Nevada contributed about 7.8% of the total domestic mine output and the State ranked fifth behind Idaho, Arizona, Montana, and Utah.

Nevada, the Silver State, earned its nickname early in its history when the rich ore bodies in the Comstock,

Tonopah, and Eureka districts were discovered and mined. A recent revival in Nevada's silver mining industry began in 1979 in response to sharp increases in silver prices. Although industry activity slowed in 1981 and 1982, the revival had resumed momentum by 1983; the Sixteen-to-One commenced production in February 1982, and the Candelaria Mine, the Nation's largest open-pit silver mine, reopened in August 1983.

Nevada silver production is likely to increase over the next several years, especially if precious metal prices remain attractive. A major share of the increase will be from "byproduct" silver produced from Nevada's expanding gold mining industry. Several large gold mines are undergoing expansion and recent new discoveries may yield substantial silver. The Ward Mine should add a significant quantity of silver to the State's annual output when production commences after 1986.

Bureau of Mines Mineral Industry Location System (MILS) Data—Silver in Nevada

| | |
|--------------------------------------|-------|
| Total properties | 2,479 |
| Producers ¹ | 1,740 |
| Known principal deposits | 6 |
| Deposit abstracts in directory | 5 |

¹Includes past producers.

Reported Silver Production—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|--------------------|------------------------|---------|------------------------|
| | 10 ³ kg | Value, 10 ³ | kg | Value, 10 ³ |
| 1978 | 1,225 | \$212,681 | 25,004 | \$4,341 |
| 1979 | 1,179 | 420,261 | 17,431 | 6,215 |
| 1980 | 1,006 | 666,955 | 29,237 | 19,392 |
| 1981 | 1,265 | 427,987 | 94,538 | 31,975 |
| 1982 | 1,252 | 319,902 | 97,735 | 24,981 |
| 1983 | 1,350 | 496,671 | 160,618 | 59,073 |

¹Rounded.

Principal Known Silver Deposits in Nevada¹

| Deposit | County | Current status | Commodity | Size ² | Published reserves-resources | | | |
|-----------------------------------|------------------|--------------------------|--------------|-------------------|------------------------------|------|------|-----------|
| | | | | | 10 ³ t | g/t | Year | Reference |
| Candelaria ⁴ | Mineral | Active-producer | Ag, Au | Medium | 16,800 | 37.4 | 1983 | 423 |
| Gooseberry ⁴ | Storey | do | Ag, Au | Small | 509 | 349 | 1984 | 504 |
| Mohawk | Esmeralda | do | Ag | do | 180 | 8.9 | 1980 | 762 |
| Rochester ⁴ | Pershing | Active-feasibility | Ag, Au | Medium | 80,100 | 51 | 1983 | 94 |
| Sixteen-to-One ⁴ | Esmeralda | Active-producer | Ag, Au | Small | 1,000 | 190 | 1984 | 700 |
| Taylor ⁴ | White Pine | do | Ag, Au | Medium | 6,000 | 110 | 1983 | 637 |

¹Many of Nevada's gold deposits also contain significant silver reserves-resources and with moderate price changes could be described as silver properties; many of these gold-silver deposits are listed under "Principal Known Gold Deposits in Nevada."

²Based on estimate of metric tons of contained Ag: Large, >10,000; medium, 10,000 to 500; small, <500.

³Rounded.

⁴Deposit abstract in directory.

⁵g/t Au.

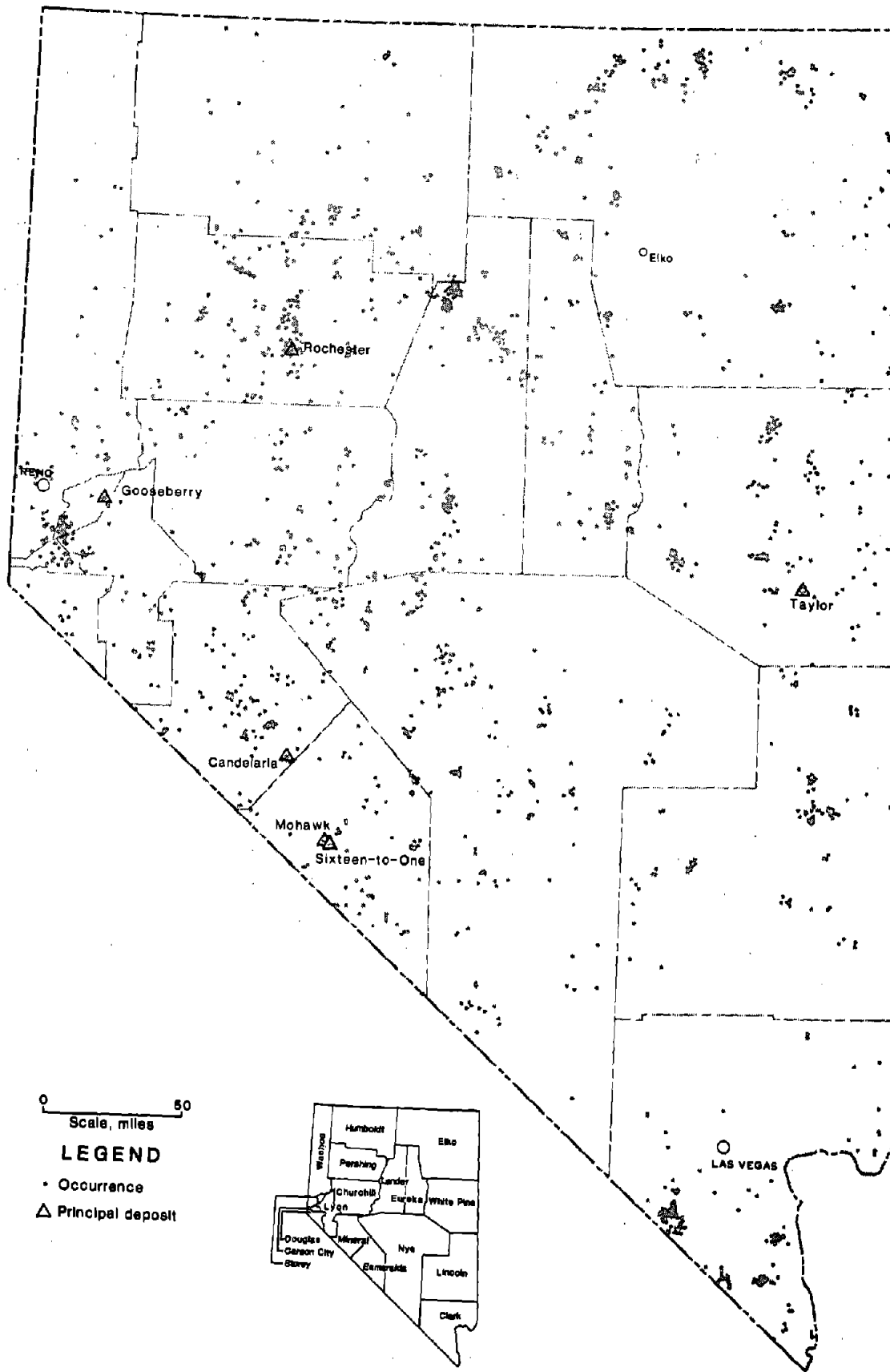


Figure 26.—Silver in Nevada.

TUNGSTEN

Tungsten, vital to the defense industry, is essential for high-speed wear-resistant applications in most plant, mine, construction, and drilling operations, and for lamp filaments and many other pure metal uses. It is an important alloying element in tool steel. Approximately 95% of domestic tungsten production, up about 31% in 1981 from 1980 levels, came from two mines in California and one each in Colorado and Nevada. The Emerson Mine, Lincoln County, NV, was that State's largest producer, accounting for over 90% of

production in 1981. The Emerson, Nevada Scheelite, Springer, Red Ant No. 2, Bobby No. 4, and Wells Tungsten reportedly produced in 1981. As of July 1983, tungsten production in Nevada was at a much lower level as a result of depressed tungsten market conditions. In 1984, the principal Nevada tungsten mines remain closed.

Bureau of Mines Mineral Industry Location System (MILS) Data—Tungsten in Nevada

| | |
|--------------------------------------|-----|
| Total properties | 597 |
| Producers ¹ | 321 |
| Known principal deposits | 14 |
| Deposit abstracts in directory | 8 |

¹Includes past producers.

Reported Tungsten Production¹—United States and Nevada, 1978–83 (728–729)

| Year | United States | | Nevada | |
|------|---------------------------------|------------------------|---------------------------------|------------------------|
| | ² 10 ³ kg | Value, 10 ³ | ² 10 ³ kg | Value, 10 ³ |
| 1978 | 3,130 | \$56,961 | 119 | \$1,687 |
| 1979 | 3,014 | 55,785 | W | W |
| 1980 | 2,738 | 50,575 | W | W |
| 1981 | 3,545 | 62,231 | W | W |
| 1982 | 1,575 | 22,062 | W | W |
| 1983 | 1,016 | 10,528 | W | W |

W Withheld to avoid disclosing company proprietary data.

¹Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

²Rounded.

Principal Known Tungsten Deposits in Nevada

| Deposit | County | Current status | Commodity | Size ¹ | Published reserves-resources | | | |
|--|------------------|-------------------------|---------------------------------------|-------------------|--------------------------------|------------------|------|-----------|
| | | | | | ² 10 ³ t | wt % | Year | Reference |
| Desert Scheelite | Mineral | Past producer | W | Small | (³) | (³) | NAp | NAp |
| Emerson ⁴ | Lincoln | Standby | W, Mo, Zn, CaF ₂ , U | Large | (³) | (³) | NAp | NAp |
| Garnet-Tennessee Mountain ⁴ | Elko | Past producer | W, Mo | Medium | 359 | 50.42 | 1977 | 526, 527 |
| Granite Creek | Humboldt | do | W, Mo | Small | (³) | (³) | NAp | NAp |
| Gunmetal ⁴ | Mineral | do | W, Mo, Au | Large | (³) | (³) | NAp | NAp |
| Indian Springs ⁴ | Elko | Developed | W | do | 12,610 | 5,265 | 1970 | 147 |
| | | | | | 39,000 | 5,164 | | |
| Linka ⁴ | Lander | Past producer | W, Mo | Small | (³) | (³) | NAp | NAp |
| Monte Cristo | White Pine | Explored prospect | W, Mo | Large | (³) | (³) | NAp | NAp |
| Nevada Scheelite ⁴ | Mineral | Past producer | W, Cu, Mo | do | (³) | (³) | NAp | NAp |
| Riley | Humboldt | do | W, Cu, Zn, Pb | Small | (³) | (³) | NAp | NAp |
| Riley Extension | do | do | W, Cu, Zn, Pb | do | (³) | (³) | NAp | NAp |
| Springer ⁴ | Pershing | Standby | W, Mo | Large | (³) | (³) | NAp | NAp |
| Tonopah ⁴ | Humboldt | Past producer | W, Cu, Mo | Medium | (³) | (³) | NAp | NAp |
| Wells | Elko | Producer | W | Small | (³) | (³) | NAp | NAp |

NAp Not applicable.

¹Based on estimate of metric tons of contained W: Large, >10,000; medium, 500 to 10,000; small, <500.

²Rounded.

³No published data have been located.

⁴Deposit abstract in directory.

⁵Wt % WO₃.

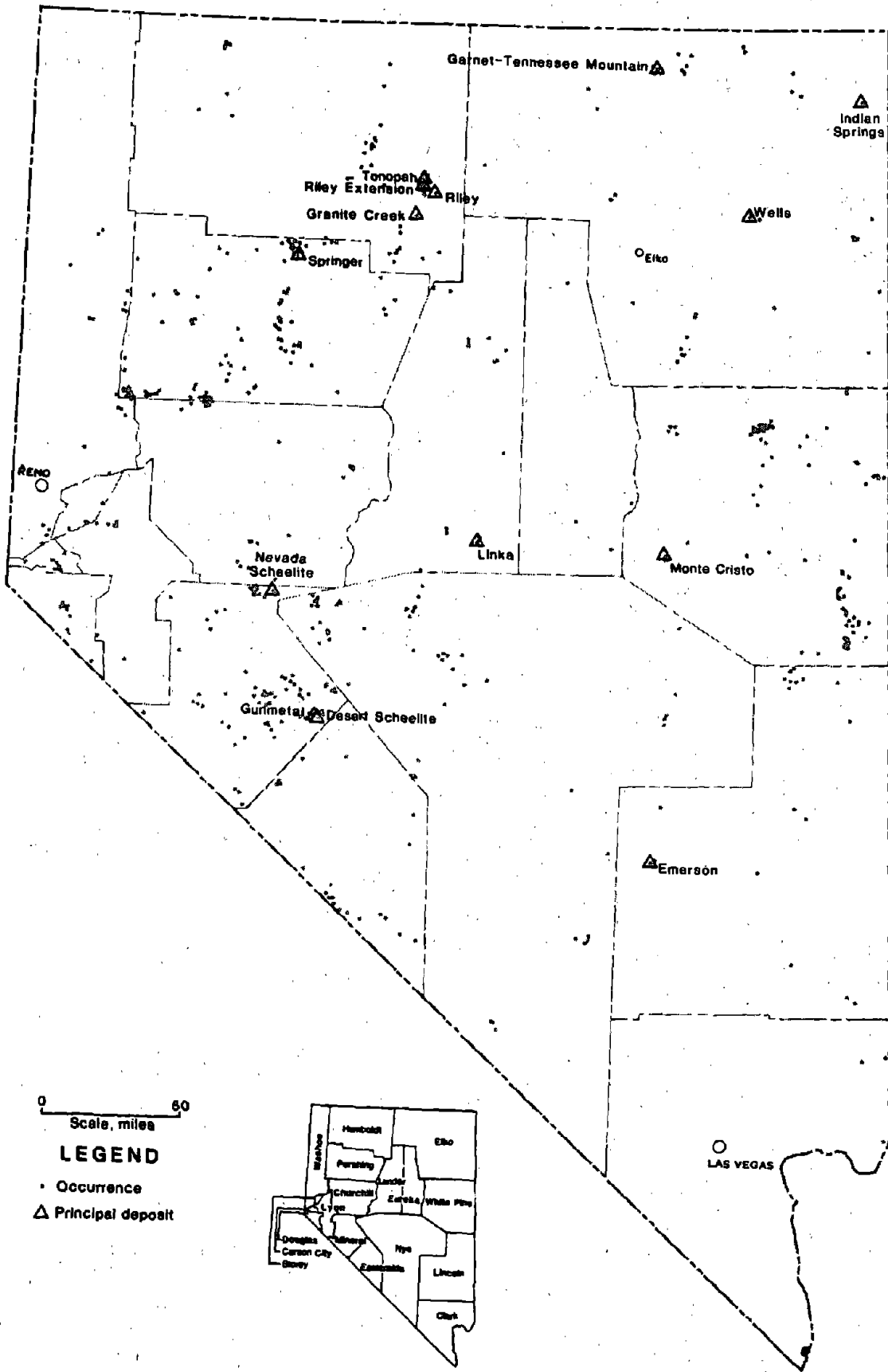


Figure 27.—Tungsten in Nevada.

ABSTRACTS OF SELECTED DEPOSITS IN NEVADA

As previously described, the heart of this publication consists of single-page, site-specific deposit abstracts for 119

selected deposits in Nevada. Figure 28 and table 9 serve as an index for the deposit abstract section.

TABLE 9.—Deposit abstract index

(Refer to figure 28)

| Map No. | Deposit name | (¹) | Map No. | Deposit name | (¹) | Map No. | Deposit name | (¹) | Map No. | Deposit name | (¹) | Map No. |
|---------|----------------------------|-------------------|---------|----------------------|-------------------|---------|-------------------|-------------------|---------|--------------|------------------|---------|
| 1.. | Indian Springs | W | 60. | Dry Canyon | Sb | 52 | Indian Springs | W | 1 | | | |
| 2.. | Easy Miner | BaSO ₄ | 61. | Hard Luck-Pradler | Sb | 86 | Jungle | BaSO ₄ | 6 | | | |
| 3.. | Snoose | BaSO ₄ | 62. | Bray-Beulah | Sb | 88 | Kay | BaSO ₄ | 88 | | | |
| 4.. | Big Ledge | BaSO ₄ | 63. | Gooseberry | Ag | 59 | Lakes | BaSO ₄ | 11 | | | |
| 5.. | Stormy Creek | BaSO ₄ | 64. | Dayton | Fe | 39 | Linka | W | 58 | | | |
| 6.. | Jungle | BaSO ₄ | 65. | Carson River | Hg | 106 | Maggie Creek | Au | 15 | | | |
| 7.. | Garnet-Tennessee Mountain. | W | 66. | Minnesota | Fe | 80 | Mammoth | CaF ₂ | 107 | | | |
| 8.. | McDermitt | Hg | 67. | McArthur | Cu | 83 | Manhattan | Au | 91 | | | |
| 9.. | Montana Mountains | Li | 68. | Ann Mason | Cu | 77 | McArthur | Cu | 67 | | | |
| 10. | Enfield Bell | Au | 69. | Yerington | Cu | 51 | McDermitt | Hg | 8 | | | |
| 11. | Lakes | BaSO ₄ | 70. | Bear | Cu | 76 | McGill Tailings | Cu | 100 | | | |
| 12. | Fish Creek | BaSO ₄ | 71. | Pumpkin Hollow | Fe | 40 | Minnesota | Fe | 66 | | | |
| 13. | Heavy Spar | BaSO ₄ | 72. | Calico Hills | Fe | 42 | Modarelli | Fe | 45 | | | |
| 14. | Gold Quarry | Au | 73. | Bell Mountain | Au | 70 | Montana Mountains | Li | 9 | | | |
| 15. | Maggie Creek | Au | 74. | Nevada Scheelite | W | 73 | Mount Hope | Mo | 49 | | | |
| 16. | Carlin | Au | 75. | Phelps-Stokes | Fe | 41 | Mount Wheeler | Be | 104 | | | |
| 17. | Bullion Monarch | Au | 76. | Basic, Inc. | MgO | 4 | Mountain Springs | BaSO ₄ | 43 | | | |
| 18. | Blue Star | Au | 77. | B & C Springs | Mo | 55 | Nevada Moly | Mo | 92 | | | |
| 19. | Goldstrike | Au | 78. | Santa Fe | Au | 29 | Nevada Scheelite | W | 74 | | | |
| 20. | Bootstrap | Au | 79. | Borealis | Au | 18 | Northumberland | Au | 85 | | | |
| 21. | Dee | Au | 80. | Aurora | Au | 20 | Nyco | CaF ₂ | 108 | | | |
| 22. | Queen Lode | BaSO ₄ | 81. | Gunmetal | W | 79 | Overton | MgO | 115 | | | |
| 23. | Rossi | BaSO ₄ | 82. | Candelaria | Ag | 119 | P & S | BaSO ₄ | 84 | | | |
| 24. | Getchell | Au | 83. | B & B | Hg | 62 | Pan American | Pb-Zn | 112 | | | |
| 25. | Tonopah | W | 84. | P & S | BaSO ₄ | 46 | Phelps-Stokes | Fe | 75 | | | |
| 26. | Pinson | Au | 85. | Northumberland | Au | 41 | Pinson | Au | 26 | | | |
| 27. | Preble | Au | 86. | Ann | BaSO ₄ | 38 | Plute | Fe | 37 | | | |
| 28. | Springer | W | 87. | East Northumberland. | BaSO ₄ | 17 | Preble | Au | 27 | | | |
| 29. | Bloody Canyon | Sb | 88. | Kay | BaSO ₄ | 114 | Prince | Pb-Zn | 111 | | | |
| 30. | Rochester | Ag | 89. | Round Mountain | Au | 72 | Pumpkin Hollow | Fe | 71 | | | |
| 31. | Relief Canyon | Au | 90. | White Caps | Sb | 82 | Queen Lode | BaSO ₄ | 22 | | | |
| 32. | Sutherland | Sb | 91. | Manhattan | Au | 16 | Rain | Au | 38 | | | |
| 33. | Hollywood | Sb | 92. | Nevada Moly | Mo | 65 | Rainbow | CaF ₂ | 108 | | | |
| 34. | Dodge-Ford | Fe | 93. | Tonopah Divide | Au | 110 | Relief Canyon | Au | 31 | | | |
| 35. | Fencemaker | Sb | 94. | Tonopah Hasbrouck | Au | 98 | Ridge 7129 | Zn | 57 | | | |
| 36. | Buena Vista | Fe | 95. | Silver Peak | Li | 84 | Robinson district | Cu | 101 | | | |
| 37. | Plute | Fe | 96. | Sixteen-to-One | Ag | 21 | Rochester | Ag | 30 | | | |
| 38. | Rain | Au | 97. | Goldfield | Au | 34 | Rossi | BaSO ₄ | 23 | | | |
| 39. | Argenta | BaSO ₄ | 98. | Crowell | CaF ₂ | 60 | Round Mountain | Au | 89 | | | |
| 40. | Battle Mountain | Cu | 99. | Sterling | Au | 87 | Ruby Hill | Pb-Zn | 53 | | | |
| 41. | Copper Basin. | Mo | 100 | McGill Tailings | Cu | 2 | Santa Fe | Au | 78 | | | |
| 42. | Buckingham | Au | 101 | Robinson district | Cu | 113 | Silver Peak | Li | 85 | | | |
| 43. | Battle Mountain | Au | 102 | Ward | Pb-Zn | 10 | Sixteen-to-One | Ag | 96 | | | |
| 44. | Copper Canyon. | BaSO ₄ | 103 | Taylor | Ag | 117 | Snoose | BaSO ₄ | 3 | | | |
| 45. | Mountain Springs | BaSO ₄ | 104 | Mount Wheeler | Be | 35 | Springer | W | 28 | | | |
| 46. | Greystone | BaSO ₄ | 105 | White Pine | CaF ₂ | 12 | Sterling | Au | 99 | | | |
| 47. | Modarelli | Fe | 106 | Atlanta | Au | 7 | Stormy Creek | BaSO ₄ | 5 | | | |
| 48. | Buckhorn | Au | 107 | Mammoth | CaF ₂ | 24 | Sutherland | Sb | 32 | | | |
| 49. | Horse Canyon | Au | 108 | Nyco | CaF ₂ | 56 | Taylor | Ag | 103 | | | |
| 50. | Tonkin Springs | Au | 109 | Rainbow | CaF ₂ | 14 | Three Kids | Mn | 118 | | | |
| 51. | Mount Hope | Mo | 110 | Caselton | Pb-Zn | 87 | Tonkin Springs | Au | 48 | | | |
| 52. | Victoria | Cu | 111 | Prince | Pb-Zn | 19 | Tonopah | W | 25 | | | |
| 53. | Bald Mountain | Au | 112 | Pan American | Pb-Zn | 63 | Tonopah Divide | Au | 93 | | | |
| 54. | Alligator Ridge | Au | 113 | Emerson | W | 83 | Tonopah Hasbrouck | Au | 94 | | | |
| 55. | Ruby Hill | Pb-Zn | 114 | C-M Alunite | Al | 81 | Victoria | Cu | 50 | | | |
| 56. | Windfall | Au | 115 | Overton | MgO | 61 | Virgin River | Mn | 116 | | | |
| 57. | Linka | W | 116 | Virgin River | Mn | 13 | Ward | Pb-Zn | 102 | | | |
| 58. | Antimony King | Sb | 117 | Fannie Ryan | Mn | 33 | White Caps | Sb | 90 | | | |
| 59. | | | 118 | Three Kids | Mn | 47 | White Pine | CaF ₂ | 105 | | | |
| | | | 119 | Boulder City | Mn | | Windfall | Au | 54 | | | |
| | | | | | | | Yerington | Cu | 69 | | | |

¹Primary commodity.

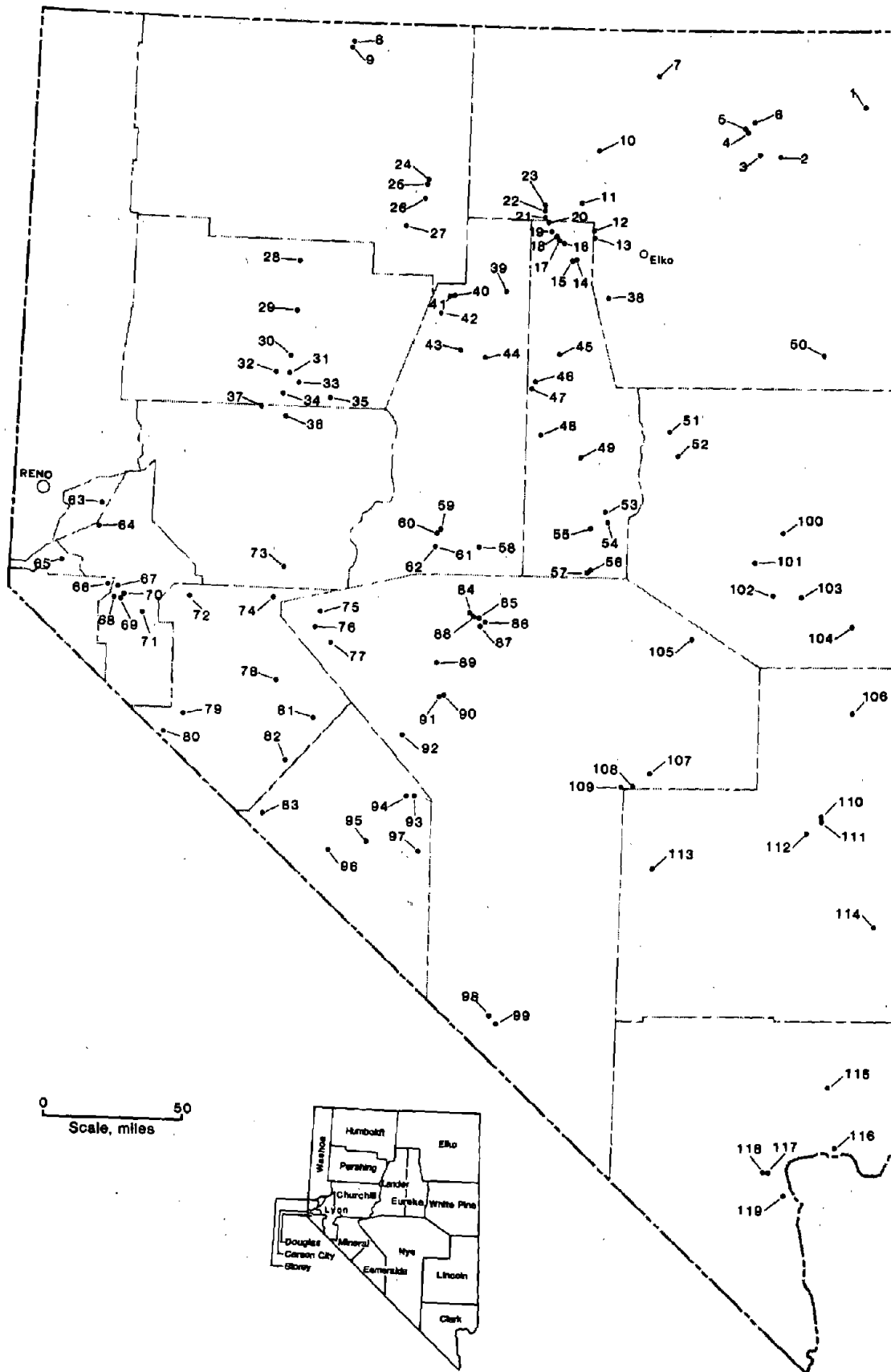


Figure 28.—Location of principal deposits with deposit abstracts.

ALLIGATOR RIDGE—GOLD

Ore body names: Vantage 1, 2, and 3

Commodities: Au, Ag, Hg
(Au-Ag ratio = 9:1)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|----------------------------------|
| County | White Pine. | General location | About 50 km northeast of Eureka. |
| Mining district | Buck Mountain (8 km north of mine). | Meridian | Mount Diablo. |
| Elevation | 2,250 m. | Tract | Sec. 1, T 22 N, R 57 E. |
| Topography | Rugged. | Latitude | 39°48'24" N. |
| Domain | Public, BLM-administered. | Longitude | 115°31'12" W. |
| Owner | Amselco Minerals, Inc., Denver, CO (subsidiary of Selection Trust Ltd., London, England), 50%; NERCO Minerals Co., Fairbanks, AK (subsidiary of Pacific Power & Light Co., Portland, OR), 50% (1984). | | |
| Operator | Amselco Minerals, Inc. (1984). | | |

GEOLOGY¹

| | | | |
|---|---|--------------------------|--|
| Type of ore body | Disseminated; stratabound. | Host formation | Pilot Shale. |
| Origin | Hydrothermal. | Geologic age | Mississippian. |
| Shape of ore body | Irregular. | Rock relationships | Siltstone, silicified-brecciated, contains ore. |
| Ore controls | Bedding; faulting. | | Siltstone, unaltered carbonaceous calcareous, is unaltered, unmineralized Pilot Shale. |
| Strike and dip of mineralized zone. | N 20° E; nearly horizontal. | | Limestone is above and below host rock. |
| Age of mineralization | Tertiary (5 to 30 million yr). | Alteration | Jasperoid silicification, oxidation, decarbonatization. |
| Mineralized zone average dimensions, m: | | Size | Medium. |
| Length | 915. | | |
| Width | 305. | | |
| Thickness | 75. | | |
| Depth | 120 (deepest ore body). | | |
| Mineral names | Gold (coarse free and submicrometer free); oxide zone—specular hematite, jarosite, stibiconite, goethite, drusy quartz, barite, calcite, gypsum, alunite, kaolinite; carbonaceous ore—stibnite, pyrite, orpiment, realgar, calcite. | | |

DEVELOPMENT

| | | | |
|------------------------------|--|--------------------------------|--|
| Current status | Active-producer. | Distance to water supply | On-site wells, 180 m deep. |
| Type of operation | Surface. | Road requirement | Amselco improved about 50 km of county road. |
| Mining method | Open pit: 680,000-t/a capacity. | Distance to power supply | 50- to 60-km powerline constructed. |
| Year of discovery | June 1976. | Mill location | On-site. |
| Discovery method | Outcrop sampling. | Mill status | Active. |
| Initial production | May 1981. | Milling method | Agglomeration, heap cyanide leaching, carbon adsorption, electrolysis, smelting. |
| Past production | 1,980.3 kg (63,668 tr oz) Au, 141.8 kg (4,558 tr oz) Ag (1981) (133). | Process rate | 680,000 t/a (2,700 t/d). |
| | Total, 1.8 million t (2 million ton) ore with 3.91 g/t (0.114 tr oz/ton) leachable metal (1981-83) (15). | Product type | Dore bullion bars; 92% Au, 8% Ag. |
| Annual production rate | About 1,900 kg Au (60,000 tr oz), 440 kg Ag (14,000 tr oz). | Distance shipped | About 700 km. |
| | | Destination | Anaheim, CA. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|--|------|-----------|
| 1. Not reported in reference | 14,000,000 tons | 0.12 tr oz/ton Au | 1981 | 61 |
| 2. Demonstrated | 5,000,000 tons | 0.12 tr oz/ton Au (average stripping ratio of 3.08:1; tons waste:tons ore). | 1981 | 835 |
| 3. Proven | 3,900,000 tons | 0.092 tr oz/ton Au (stripping ratio = 3.5:1) | 1983 | 15 |

REFERENCES

| | | |
|--|----------------------------|------------------------------------|
| 15, 61, 82, 83, 90, 111, 133, 163, 227, 284, 297, 298, 358, 378, 400, 412, 481, 565, 587, 681, 835. | USGS quad maps | Ely, 1:250,000. Cold Creek, 15' |
| | USBM sequence number | 0320380470. |
| | Mid number | 2801624. |

¹The deposit, as presently defined, consists of 4 separate but adjacent mineralized areas. Ore bodies are irregular but roughly circular in plan with widths of 100 to 200 m, lengths of 200 m, and thicknesses estimated at 40 to 50 m. Pilot Shale host is approximately 80 to 90 m thick but thins and disappears to the west and south. 1984 projected mine life is mid-1988.

ANN—BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Nye. | General location | About 65 km southeast of Austin. |
| Mining district | Northumberland. | Meridian | Mount Diablo. |
| Elevation | 2,500 m. | Tract | Sec. 28, T 13 N, R 46 E. |
| Topography | Rugged. | Latitude | 38°55'40" N. |
| Domain | Federal; National forest. | Longitude | 116°47'45" W. |
| Owner | W. B. Kohlmoos, N. S. Mallory, T. Corder (1983). | | |
| Operator | Dresser Industries, Dallas, TX (1983). | | |

GEOLOGY

| | | | |
|---|---------------------|--------------------------|---------------------------|
| Type of ore body | Bedded replacement. | Host formation | Pinecone. |
| Origin | Sedimentary. | Geologic age | Devonian. |
| Shape of ore body | Irregular. | Rock relationships | Chert. |
| Ore controls | Bedding. | | Claystone, lies over ore. |
| Strike and dip of mineralized zone. | N 40° E: 45° E. | | Mudstone. |
| Mineralized zone average dimensions, m. | Unknown. | Size | Medium. |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|--------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply | <3 km. |
| Type of operation | Possible surface. | Road requirement | <10 km. |
| Year of discovery | 1967. | Distance to power supply | <10 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-------------------------------|----------------------------|----------------------------|
| 338, 357, 368, 546, 623, 624. | USGS quad maps | Tonopah, 1:250,000. |
| | | Northumberland Pass, 7.5'. |
| | USBM sequence number | 0320230718. |

ANN MASON—COPPER

Alternate names: None

Commodities: Cu, Mo

LOCATION-OWNERSHIP

| | | | |
|-----------------|-------------------|------------------------|---------------------------------------|
| County | Lyon. | General location | About 58 km southeast of Carson City. |
| Elevation | 1,829 m. | Meridian | Mount Diablo. |
| Domain | BLM administered. | Tract | Sec. 13, T 13 N, R 24 E. |
| | | Latitude | 38°59'03" N. |
| | | Longitude | 119°14'47" W. |

Owner..... The Anaconda Minerals Co., Denver, CO (a wholly owned subsidiary of Atlantic Richfield Co., Denver, CO)(1984).

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Disseminated, porphyry copper. | Host formation | Yerington Batholith. |
| Origin | Magmatic, hydrothermal. | Geologic age | Jurassic. |
| Shape of ore body | Irregular. | Rock relationships | Quartz monzonite, encloses ore, gangue. |
| Ore controls | Dikes, faulting. | | Porphyritic quartz monzonite, encloses ore, gangue. |
| Plunge and dip of mineralized zone. | West: gentle. | | Granodiorite, encloses ore, gangue. |
| Age of mineralization ... | 168 million yr. | | Quartz monzonite porphyry dikes; highest ore grades occur near dikes. |
| Mineralized zone average dimensions, m: | | | Tertiary volcanics; above ore on the north. |
| Length | 2,360. | Alteration | Sodic-calcic, potassic, propylitic, sodic, sericitic. |
| Thickness | +530. | Size | Large. |
| Depth | 90 to +240. | | |
| Mineral names | Chalcopyrite, pyrite, bornite, molybdenite, goethite, limonite, chrysocolla, hematite, quartz, K-feldspar, plagioclase, hornblende, biotite, magnetite, sphene, apatite, zircon, ilmenite, augite, chlorite, sericite. | | |

DEVELOPMENT

Current status..... Inactive-explored prospect.
 Type of operation..... Prospect.
 Year of discovery..... 1968.
 Discovery method..... Geophysical, drilling.
 Initial production..... No production.

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|------------------------|----------------|------|-----------|
| 1..Not reported in reference | 495,000,000 tons | 0.40% Cu | 1976 | 829 |

REFERENCES

| | | |
|------------------------------------|----------------------------|--|
| 126, 128, 453, 567, 695, 822, 829. | USGS quad maps | Walker Lake, 1:250,000. Yerington, 15'. |
| | USBM sequence number | 0920190169. |

Comments: Copper mineralization is contemporaneous with and spatially related to a swarm of quartz monzonite porphyry dikes that intrude into granodiorite and quartz monzonite. Mineralized zone dimensions are for >0.2% Cu.

ANTIMONY KING—ANTIMONY

Alternate names: Last Chance, Pine, Dry Canyon, Big Creek, Stokes,
Mammoth, Mountain View, Commodore, Confidence

Commodities: Sb

LOCATION-OWNERSHIP

| | | | |
|-----------------------|-----------------------------|------------------------|----------------------------------|
| County | Lander. | General location | About 12 km southwest of Austin. |
| Mining district | Big Creek. | Meridian | Mount Diablo. |
| Elevation | 2,682 m. | Tract | Sec. 26, T 18 N, R 43 E. |
| Topography | Rugged. | Latitude | 39°23'27" N. |
| Domain | Mixed. | Longitude | 117°06'08" W. |
| Owner | Donald Colson (1984). | | |
| Lessee | FMC Corp., Reno, NV (1984). | | |

GEOLOGY

| | | | |
|---|----------------------------|--------------------------|--|
| Type of ore body | Shear zone; fracture zone. | Host formation | Valmy. |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Shale, encloses ore. Limestone, encloses ore. Sandstone, near ore. Chert, near ore. Siltstone, near ore. |
| Ore controls | Faulting; fracturing. | Size | Small. |
| Strike and dip of mineralized zone. | N 55° W: 55° W. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 200. | | |
| Width | 40. | | |
| Thickness | 2. | | |
| Depth | 0. | | |
| Mineral names | Stibnite, pyrite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | <10 km. |
| Type of operation | Underground. | Road requirement | <50 km. |
| Year of discovery | 1890. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | 1907. | | |
| Last production | 1970. | | |
| Past production | 454 t Sb metal (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-----------|----------------------------|-------------------------------------|
| 376, 693. | USGS quad maps | Millett, 1:250,000. Austin, 15'. |
| | USBM sequence number | 0820150034. |

Comments: Some production apparently combined with or reported as output from the Dry Canyon antimony mine.

ARGENTA—BARITE

Alternate names: Barium King, Milchem, Nevada Barite,
Yuba-Shelton, Baryte No. 1, 3

Commodities: BaSO₄

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--------------------------------------|
| County | Lander. | General location | About 18 km east of Battle Mountain. |
| Mining district | Argenta. | Meridian | Mount Diablo. |
| Elevation | 1,890 m. | Tract | Sec. 19, T 32 N, R 47 E. |
| Topography | Rugged. | Latitude | 40°38'14" N. |
| Domain | Public; private. | Longitude | 116°44'20" W. |
| Owner | Milchem, Inc., Battle Mountain, NV (1984). | | |

GEOLOGY

| | | | |
|---|---------------------|--------------------------|-------------------------------------|
| Type of ore body | Sedimentary. | Host formation | Slaven. |
| Origin | Sedimentation. | Geologic age | Devonian. |
| Shape of ore body | Tabular. | Rock relationships | Chert, lies over ore, encloses ore. |
| Ore controls | Bedding; lithology. | Size | Medium. |
| Strike and dip of mineralized zone. | N 10° E; 20° E. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 400. | | |
| Width | 170. | | |
| Thickness | 15. | | |
| Depth | 60. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|--------------------------------|--|
| Current status | Active-producer. | Distance to water supply | On-site. |
| Type of operation | Open pit. | Road requirement | None. |
| Initial production | 1935. | Distance to power supply | On-site. |
| Last production | 1983. | Mill location | 65 km north of mine. |
| Past production | About 5,215,000 t barite mined to January 1982 (365). | Mill status | Active. |
| | | Milling method | Crushing, jigging, grinding. |
| | | Product type | Jigged and ground barite. |
| | | Distance shipped | Gulf Coast, California, Wyoming, and Canada. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|--|
| 87, 283, 330, 346, 385, 392, 546, 548, 601, 688, 693. | USGS quad maps | Winnemucca, 1:250,000. Dunphy, 15'. |
| | USBM sequence number | 0320150057. |
| | Mid number | 2600635. |

Comments: Existing pit operations cover about 40.5 ha. The Argenta has been divided into 6 major areas for development, of which 2 are currently being stripped and mined.

ATLANTA—GOLD

Alternate names: Atlanta Home, Atlanta Strip, Hillside,
Sparrow Hawk, Pactolion Fraction, Belle

Commodities: Au, Ag,
minor U

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Lincoln. | General location | About 80 km northeast of Pioche. |
| Mining district | Atlanta. | Meridian | Mount Diablo. |
| Elevation | 2,073 m. | Tract | Sec. 24, T 7 N, R 68 E. |
| Topography | Hilly. | Latitude | 38°27'57" N. |
| | | Longitude | 114°19'18" W. |
| Owner-operator | Standard Slag Co., Reno, NV (1984). | | |
| Owner | Bobcat Properties, Inc., Fort Lauderdale, FL (1984). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|--|
| Type of ore body | Disseminated gold in shear-breccia zone. | Host formation | Ely Springs Dolomite (see comments). |
| Origin | Hydrothermal; open space filling of breccia zone. | Geologic age | Ordovician. |
| Shape of ore body | Tabular (planet). | Rock relationships | Dolomite, massive dolomite below ore zone. |
| Ore controls | Faulting, silicification, brecciation. | | Jasperoid breccia, portions are ore. |
| Strike and dip of mineralized zone. | N 5° E: 45° W. | | Quartz porphyry, near ore, in places contains low-grade gold. |
| Age of mineralization | Tertiary. | Alteration | Silicification, intense; kaolinitic argillization, alunitization. |
| Mineralized zone aver- age dimensions (breccia zone), m: | | Size | Small. |
| Length | 200. | | |
| Width | 250. | | |
| Mineral names | Gold (microscopic), silver (microscopic), limonite, quartz, manganese oxides, jasperoid, hematite, barite, clay. | | |

DEVELOPMENT

| | | | |
|------------------------------|--|--------------------------------|--|
| Current status | Active-producer. | Distance to water supply | 14 km. |
| Type of operation | Surface. | Road requirement | Existing to site. |
| Mining method | Open pit; multiple bench. | Distance to power supply | On-site, 26-km line. |
| Year of discovery | About 1906; reactivated in 1974. | Mill location | On-site. |
| Initial production | 1975 (Standard Slag). | Mill status | Active, producing. |
| Last production | Ongoing 1984. | Milling method | Cyanide leach, countercurrent decan- tation, Merrill-Crowe zinc precipi- tation, smelting. |
| Past production | May 1, 1975, to May 31, 1982: 2,500 kg (80,000 tr oz) Au, 12,000 kg (400,000 tr oz) Ag. Estimated total ore milled is 860,000 t (680). | Process rate | 520 t/d (570 ton/d). |
| Annual production rate | Estimated 400 kg (13,000 tr oz) Au and 2,000 kg (65,000 tr oz) Ag (132). | Product type | Bullion. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|---|------|-----------|
| 1. Not reported in reference | 1,100,000 tons | 0.08 tr oz/ton Au; 1.6 tr oz/ton Ag | 1980 | 61 |

REFERENCES

| | | |
|--|----------------------------|------------------------------------|
| 61, 102, 132, 207, 265, 288, 289, 393, 412, 617, 678, 680, 723, 724. | USGS quad maps | Lund, 1:250,000. Atlanta, 7.5'. |
| | USBM sequence number | 0320170169. |
| | USGS MRDS number | M032067. |
| | Mid number | 2601143. |

Comments: The Atlanta ore body carries disseminated submicroscopic gold and uranium within a breccia zone consisting of brecciated fragments of limestone (Ordovician-Ely Springs Dolomite), quartz porphyry, quartzite (Ordovician-Eureka Quartzite), volcanic rocks (possibly Tertiary-ignimbrites), jasperoid. Breccia is cemented chiefly by quartz. The ore zone has been intruded by quartz-porphyry and is bounded by 2 high-angle, west-dipping normal faults. Tertiary volcanic ignimbrites form the hanging wall; the Ely Springs Dolomite forms the footwall.

AURORA—GOLD

Patented claim names: Silver Lining Consolidated, Humboldt,
Humboldt W., Astor, Alice C. Dennis
Alternate names: Humboldt East Claims, Humboldt West Claims

Commodities: Au, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|----------|------------------------|---------------------------------|
| County | Mineral. | General location | About 35 km north of Hawthorne. |
| Mining district | Aurora. | Meridian | Mount Diablo. |
| Elevation | 2,290 m. | Tract | Sec. 17, T 5 N, R 28 E. |
| Topography | Hilly. | Latitude | 38°12'23" N. |
| Domain | Private. | Longitude | 118°53'16" W. |

Owner-lessee Electra North West Resources, Ltd., Vancouver, BC, Canada (1983).
Owner-lessee Centennial Minerals, Ltd., Vancouver, BC, Canada (1983).
Operator Centennial Exploration Corp. (1983).
(Portions of the property are leased from Hanna Mining Co. and from Houston International Minerals.)

GEOLOGY

| | | | |
|---|--|-----------------------------|---|
| Type of ore body | Fissure vein. | Host formation | Volcanics. |
| Origin | Hydrothermal. | Geologic age | Tertiary. |
| Shape of ore body | Tabular. | Rock relationships | Andesite, altered, encloses ore. Quartz, vein encloses ore, vein is ore. |
| Ore controls | Faulting. | Alteration (district) | Potassic, argillic, propylitic. |
| Strike and dip of mineralized zone | N 40° E: 60 to 70° W. | Size | Small. |
| Age of mineralization | 10 million yr. | | |
| Pit zone average dimensions (1983 plan), m: | | | |
| Length | 490. | | |
| Width | 60 to 120. | | |
| Depth | 12 to 35. | | |
| Mineral names | Native gold, quartz, sulfides (sparse) | | |
| | (typical mineralogy of ore veins has been quartz, adularia, argentiferous tetrahedrite, pyrite, chalcopyrite, and soft blue-gray material containing gold, and native gold). | | |

DEVELOPMENT

| | | | |
|--------------------------|--|--------------------------------|---|
| Current status | Active-producer; developing. | Distance to water supply. . . | 900 m, from abandoned underground workings. |
| Type of operation | Surface. | Road requirement | No new access road required. |
| Mining method | Open pit. | Distance to power supply . . . | On-site diesel electric generation. |
| Year of discovery | District discovery in 1860. | Mill location | On-site. |
| Discovery method | Unknown. | Mill status | Active-testing. |
| Initial production | June 1983 (planned). | Milling method | Test cyanide heap leach, adsorption-desorption columns, electrolysis, smelting. |
| Past production | The first dore was planned to be poured in July 1983. Planned production for 1983 was 77,000 t containing about 300 kg gold. Anticipated recovery was 70%. Total waste production planned was 200,000 t (309). | Process rate | 90-t jaw and cone crusher, estimate about 1,600 t/d and 196,000 t/a. |
| | | Product type | Gold dore. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|--|------|-----------|
| 1..Probable and inferred | 1,500,000 tons | 0.129 tr oz/ton Au | 1983 | 309 |
| 2..Not reported in reference | 1,200,000 tons | 0.13 tr oz/ton Au; 0.30 tr oz/ton Ag | 1982 | 444 |

REFERENCES

| | | |
|---------------------------------|----------------------------|---|
| 7, 90, 228, 309, 356, 444, 598. | USGS quad maps | Walker Lake, 1:250,000. Aurora, 15'. |
| | USBM sequence number | 0320210544. |
| | Mid number | 2601790. |

Comments: Ore body reflected in published reserves is reported to be open at depth and along strike.

B & B—MERCURY

Alternate names: Chrysler, Kollsman Mine

Commodities: Hg, Sb

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|---|
| County | Esmeralda. | General location | About 91 km west of Tonopah and 27 km northwest of Dyer. |
| Mining district | Oneota (Fish Lake Valley). | Meridian | Mount Diablo. |
| Elevation | 2,414 m. | Tract | Sec. 1, T 1 S, R 33 E. |
| Topography | Rugged. | Latitude | 37°53'17" N. |
| Domain | National forest. | Longitude | 118°15'04" W. |
| Owner | Robert W. Hughes (locator), Las Vegas, NV (1982). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|---|
| Type of ore body | Disseminated; breccia fill. | Host formation | Volcanics. |
| Origin | Hydrothermal. | Geologic age | Tertiary. |
| Shape of ore body | Tabular. | Rock relationships | Opalite blanket, encloses ore, gangue. |
| Ore controls | Faulting; lithology; bedding. | | Rhyolite tuff, lies under ore. Andesite breccia, near ore. |
| Mineralized zone average dimensions, m (estimated): | | Alteration | Extensive silicification of rhyolite tuffs. |
| Length | 600. | Size | Small. |
| Width | 300. | | |
| Thickness | 15. | | |
| Mineral names | Cinnabar, schuetteite, chalcedony, opal, zeolites, alunite, kermesite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|-------------|
| Current status | Inactive-past producer. | Distance to water supply ... | <3 km. |
| Type of operation | Surface; underground. | Road requirement | None. |
| Mining method | Open pit; drift. | Distance to power supply ... | <10 km. |
| Year of discovery | 1925. | Mill location | On-site. |
| Discovery method | Ore mineral in place. | Mill status | Dismantled. |
| Initial production | 1927. | | |
| Last production | 1970. | | |
| Past production | See comments. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--------------------------------|----------------------------|--------------------------------------|
| 8, 29, 42, 103, 148, 276, 376. | USGS quad maps | Mariposa, 1:250,000. Benton, 15'. |
| | USBM sequence number | 0320090084. |
| | USGS MRDS number | M055003. |

Comments: Published past production data are obscure and some production credited to the B & B Mine between 1957 and 1970 was taken from other ore bodies nearby. Mercury production from the district is probably about 8,000 flasks. The remaining reserves are low grade and large tonnage.

B & C SPRINGS—MOLYBDENUM

Alternate names: B C Project, B C Well, U.V. Industries Moly Prospect

Commodities: Mo, Cu, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------------|
| County | Nye. | General location | About 75 km northeast of Hawthorne. |
| Mining district | Paradise Peak. | Meridian | Mount Diablo. |
| Elevation | 2,140 m. | Tract | Sec. 34, T 11 N, R 37 E. |
| Topography | Rolling. | Latitude | 38°46'50" N. |
| Domain | Mixed. | Longitude | 117°48'06" W. |
| Owner | Sharon Steel Corp., Miami Beach, FL (1982). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|----------------------------------|
| Type of ore body | Disseminated; fissure vein. | Host formation | Luning. |
| Origin | Hydrothermal; contact metasomatic. | Geologic age | Upper Triassic. |
| Shape of ore body | Irregular; tabular. | Rock relationships | Limestone, is ore, encloses ore. |
| Ore controls | Lithology; igneous. | Size | Large. |
| Strike and dip of mineralized zone. | N 15° E: 05° E. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 1,195. | | |
| Width | 465. | | |
| Thickness | 51. | | |
| Depth | 172. | | |
| Mineral names | Molybdenite, chalcopyrite, pyrite, tetrahedrite, sphalerite, covellite, magnetite, calcite, dolomite, quartz. | | |

DEVELOPMENT

| | | | |
|-------------------------|---------------------------|------------------------------|----------|
| Current status | Active-explored prospect. | Distance to water supply ... | On-site. |
| Year of discovery | 1968. | Road requirement | <50 km. |
| Discovery method | Geophysical anomaly. | Distance to power supply ... | <50 km. |

PUBLISHED RESERVES-RESOURCES

| <i>Class</i> | <i>Quantity</i> | <i>Grade</i> | <i>Year</i> | <i>Reference</i> |
|------------------------------------|---------------------|----------------|-------------|------------------|
| 1. Not reported in reference | 131,000,000 t | 0.12% Mo | 1983 | 710 |

REFERENCES

| | | |
|--|----------------------------|---|
| 11, 29, 156, 196, 357, 368, 433, 626, 646, 710, 750, 758, 827, 828, 837. | USGS quad maps | Tonopah, 1:250,000. Paradise Peak, 7.5'. |
| | USBM sequence number | 0320230678. |

BALD MOUNTAIN—GOLD

Alternate names: BF Claim Group, Top Group

Commodities: Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|-------------------|------------------------|---|
| County | White Pine. | General location | About 130 km northwest of Ely. |
| Mining district | Bald Mountain. | Meridian | Mount Diablo. |
| Elevation | 2,440 m. | Tract | Secs. 16, 17, 18, T 24 N, R 57 E (unsurveyed). |
| Topography | Mountainous. | Latitude | 39°57'55" N. |
| Domain | BLM administered. | Longitude | 115°34'31" W. |

Owner-operator Placer U.S., Inc., San Francisco, CA (subsidiary of Placer Development Ltd., Vancouver, BC, Canada),
75% ownership (1984).

GEOLOGY

| | | | |
|--------------------------------------|--------------------------|--------------------------|---|
| Type of ore body | Disseminated. | Host formation | Unknown. |
| Origin | Probably hydrothermal. | Geologic age | Unknown. |
| Shape of ore body | Unknown. | Rock relationships | Limey shales, surface, at drill roads. |
| District ore controls | Faulting, lithology. | Size | Limestone, surface, at drill roads. Small. |
| Strike and dip of district rocks. | Northwest: 10° to 20° E. | | |

Mineralized zone develop-
ment dimensions, m:

| | | | | |
|--------------|--------|--------|--------|----------|
| | Area 1 | Area 3 | Area 5 | Top area |
| Length | 600 | 600 | 600 | 760 |
| Width | 600 | 460 | 300 | 760 |

Mineral names Unavailable

(Known district minerals include quartz, jasper, pyrite, calcite, stib-
nite, malachite, chrysocolla, cerussite, powellite, molybdenite.)

NOTE: Past district gold production came from veinlike replace-
ment deposits in breccia zones (some jasperoid) along northwest,
northeast, or north-striking faults in limestone; northwest- or west-
striking quartz veins in quartz monzonite porphyry, and valley placers.

DEVELOPMENT

| | | | |
|--------------------------|---|--------------------------------|---|
| Current status | Active-testing; exploration; development. | Distance to water supply | On-site; deep well. |
| Type of operation | Surface. | Road requirement | Access—13 km improvement; 3 km new. |
| Mining method | Conventional open pit. | Distance to power supply | Unknown. |
| Year of discovery | Exploration since 1975. | Mill location | On-site. |
| Discovery method | Geochemical; drilling. | Mill status | Construction. |
| Initial production | 1983 (initial testing). | Milling method | Conventional cyanide heap leach— study ongoing whether carbon- adsorption or zinc precipitation for gold recovery. |
| Last production | Ongoing. | | |
| Past production | For 2 months, 109 kg (3,500 tr oz) Au was produced from 60,000 t of ore during test heap leaching (1983) (499). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|---|----------------------|-------------------------|------|-----------|
| 1. Reserves indicated | 1,600,000 t | 3.43 g/t Au | 1981 | 563 |
| 2. Not reported in reference ¹ | 200,000 tons | 0.10 tr oz/ton Au | 1983 | 495 |
| 3. Indicated and inferred | 2,800,000 tons | 0.09 tr oz/ton Au | 1984 | 499 |

REFERENCES

| | | |
|---|----------------------------|--|
| 58, 284, 495, 499, 563, 577, 587, 618, 765. | USGS quad maps | Ely, 1:250,000. Cold Creek Ranch, 15' |
| | USBM sequence number | 0320330503. |

Comments: In 1983, mining of 230,000 t of ore from Area 5 at the rate of 1,800 t/d began for test heap leaching. Tests were scheduled to begin in September 1983 and end in June 1984. Intensive ongoing exploration in 1983 was defining reserves in the 3 other adjacent areas. Reserves are contained in 6 deposits.

¹This resource was described as minable reserves for test work.

BASIC, INC.—MAGNESITE

Alternate names: Gabbs

Commodities: MgO

LOCATION-OWNERSHIP

| | | | |
|-----------------------|------------------------------|------------------------|-------------------------------------|
| County | Nye. | General location | About 74 km northeast of Hawthorne. |
| Mining district | Gabbs. | Meridian | Mount Diablo. |
| Elevation | 1,646 m. | Tract | Sec. 26, T 12 N, R 36 E. |
| Topography | Rugged. | Latitude | 38°52'11" N. |
| Domain | Private; BLM administered. | Longitude | 117°53'50" W. |
| Owner | C-E Basic, Gabbs, NV (1984). | | |

GEOLOGY

| | | | |
|---|-----------------------------|--------------------------|---|
| Type of ore body | Replacement. | Host formation | Luning. |
| Origin | Metamorphism; hydrothermal. | Geologic age | Triassic. |
| Shape of ore body | Irregular; massive. | Rock relationships | Limestone, lies under ore. Shale, lies under ore. Dolomite, replaced by ore, gangue. |
| Ore controls | Lithology. | Size | Large. |
| Mineralized zone average dimensions, m: | | | |
| Length | 1,520. | | |
| Width | 1,000. | | |
| Thickness | 60. | | |
| Depth | 0. | | |
| Mineral names | Magnesite, brucite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|--------------------------------|---|
| Current status | Active-producer. | Distance to water supply | <3 km. |
| Type of Operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | On-site. |
| | | Mill location | On-site. |
| Year of discovery | 1927. | Mill status | Active. |
| Discovery method | Ore mineral in place. | Milling method | Crushing, heavy media, flotation, calcining. |
| Initial production | 1941. | Process rate | 2,000 t/d. |
| Last production | 1984. | Product type | Refractory magnesite. |
| Past production | Confidential proprietary data. | Distance shipped | 46 km. |
| | | Destination | Luning, NV, for transshipment. |

PUBLISHED RESERVES-RESOURCES

| <i>Class</i> | <i>Quantity</i> | <i>Grade</i> | <i>Year</i> | <i>Reference</i> |
|--------------------|-----------------------|--|-------------|------------------|
| 1. Measured | 27,000,000 tons | Magnesite containing <5% CaO | 1956 | 749 |
| 2. Do | 18,000,000 tons | Magnesite containing 5% to 26% CaO | 1956 | 749 |
| 3. Do | 7,000,000 tons | Magnesite containing >26% CaO | 1956 | 749 |
| 4. Indicated | 2,000,000 tons | Magnesite containing <5% CaO | 1956 | 749 |
| 5. Do | 100,000 tons | Magnesite containing 5% to 26% CaO | 1956 | 749 |

REFERENCES

| | | |
|--|----------------------------|--|
| 212, 273, 357, 368, 609, 688, 699, 733, 749. | USGS quad maps | Tonopah, 1:250,000. Paradise Peak, 15'. |
| | USBM sequence number | 0320230158. |
| | Mid number | 2600864. |

BATTLE MOUNTAIN COPPER BASIN—COPPER

Alternate names: Copper Basin Mine-Duval Corp.

Commodities: Cu, Ag, Au

LOCATION-OWNERSHIP

| | | | |
|---------------------------|---|----------------------------|---|
| County | Lander. | General location | About 10 km southwest of Battle Mountain. |
| Mining district | Battle Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,615 m. | Tract | Sec. 32, T 32 N, R 44 E. |
| Topography | Rugged. | Latitude | 40°36'12" N. |
| Domain | Private. | Longitude | 117°02'50" W. |
| Owner-operator | Duval Corp., Tucson, AZ (subsidiary of Pennzoil Co., Houston, TX) (1984). | | |

GEOLOGY

| | | | |
|---|----------------------------------|------------------------------|---|
| Type of ore body | Disseminated; stockwork. | Host formation | Igneous intrusive. |
| Origin | Hydrothermal; oxidation. | Geologic age | Upper Cretaceous. |
| Shape of ore body | Tabular. | Rock relationships | Quartz monzonite, ore in fractures, gangue. |
| Ore controls | Igneous; fracturing. | Size | Conglomerate, gangue. |
| Mineralized zone average dimensions, m: | | | Medium. |
| Length | 1,000. | | |
| Width | 600. | | |
| Thickness | 30. | | |
| Depth | 75. | | |
| Mineral names | Malachite, chrysocolla, cuprite. | | |

DEVELOPMENT

| | | | |
|------------------------------|-----------------|------------------------------------|-------------------------------------|
| Current status | Active-standby. | Distance to water supply | <10 km. |
| Type of operation | Surface. | Road requirement | <50 km. |
| Mining method | Bench (berm). | Distance to power supply | On-site. |
| Year of discovery | <1869. | Mill status | Active, standby. |
| Discovery method | Ore in place. | Milling method | Solvent extraction; electrowinning. |
| Initial production | 1897. | Process rate | 5,170-t/a (18-t/d) output capacity. |
| Last production | Possibly 1981. | Product type | Cathode quality copper. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|--|----------------------------------|--|------|-----------|
| 1. Measured | 948,000 tons | 1.49% Cu; 0.027 tr oz/ton Au; 0.39 tr oz/ton Ag. | 1978 | 707 |
| 2. Not reported in reference | 3,066,000 tons (mill). | 1.75% Cu (sulfide). | 1968 | 806 |
| | 22,657,000 tons (leach). | 0.41% Cu (oxide). | 1968 | 806 |

REFERENCES

| | | |
|---|--------------------------------|--|
| 144, 220, 591, 606, 641, 648, 693, 705, 707, 708, 717, 742. | USGS quad maps | Winnemucca, 1:250,000 Antler Peak, 15'. |
| | USBM sequence number | 0320150003. |
| | USGS MRDS number | M030001. |
| | Mid number | 2600220. |

BATTLE MOUNTAIN COPPER CANYON—GOLD

Alternate names: Copper Canyon Mine
Ore body names: Northeast, Tomboy, Minnie, Fortitude

Commodities: Au, Ag (Cu
formerly produced from
adjacent pit)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|---|
| County | Lander. | General location | About 20 km southwest of Battle Mountain. |
| Mining district | Battle Mountain | Meridian | Mount Diablo. |
| Elevation | 1,700 m. | Tract | Sec. 34, T 31 N, R 43 E. |
| Topography | Rugged. | Latitude | 40°31'12" N. |
| Domain | Private; public-BLM administered. | Longitude | 117°07'13" W. |
| Owner-operator | Duval Corp., Tucson, AZ (subsidiary of Pennzoil Co., Houston, TX) (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|-----------------|
| Type of ore body | Stockwork (Fortitude ore body). | Host formation | Battle. |
| Origin | Contact metasomatic, replacement. | Geologic age | Pennsylvanian. |
| Shape of ore body | Tabular. | Rock relationships | Unavailable. |
| Ore controls | Faults; fractures. | Alteration | Silicification. |
| Strike and dip of mineralized zone. | North: vertical. | Size | Medium. |
| Age of mineralization | Middle Tertiary (37 million yr). | | |
| Mineralized zone average dimensions, m (estimated): | | | |
| Length | 520. | | |
| Width | 340. | | |
| Thickness | 120. | | |
| Depth | 75. | | |
| Mineral names | Free gold, silver, pyrrhotite, pyrite, "soluble" copper. | | |

DEVELOPMENT

| | | | |
|------------------------------|---|------------------------------|--|
| Current status | Active-producer, development. | Distance to water supply ... | <3 km, wells in Reese Valley. |
| Type of operation | Surface. | Road requirement | Existing. |
| Mining method | Open pit. | Distance to power supply ... | Existing, 5 km. |
| Year of discovery | 1981 (announced—Fortitude). | Mill location | On-site. |
| Discovery method | Geologic inference, geochemical sampling; drilling. | Mill status | Active-producing, expansion. |
| Initial production | Dec. 1984 from Fortitude ore body. | Milling method | Gravity (20%)—tabled, amalgamated, retorted. |
| Annual production rate | Reported 1983 mill expansion will enable company to produce 4.7 t Au and 46.7 t Ag during 1985, when production from the Fortitude ore body comes on-stream; currently about 36,000 t/d ore produced. | | Cyanide agitated tank leach (80%)—carbon-in-pulp, electrolysis, smelting. 3,200 to 3,400 t/d (1982). |
| | | Process rate | Dore bullion bars, 95% to 96% Au-Ag. |
| | | Product type | Engelhard Industries, Union City and Anaheim, CA. |
| | | Destination | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|--|------|-----------|
| Minnie and Tomboy: | | | | |
| 1..Not reported in reference | 3,900,000 tons | 0.09 tr oz/ton Au; 0.28 tr oz/ton Ag | 1981 | 164 |
| Fortitude: | | | | |
| 1..Proven and probable | 16,000,000 tons | 0.15 tr oz/ton Au; 0.57 tr oz/ton Ag | 1981 | 164 |
| 2..Not reported in reference | 14,500,000 | 4.8 g/t Au; 18 g/t Ag | 1983 | 435 |
| 3.. Do | 15,000,000 tons | 2,400,000 tr oz Au; 9,200,000 tr oz Ag | 1984 | 400 |

REFERENCES

| | | |
|--|----------------------------|---|
| 13, 33, 34, 35, 54, 55, 56, 57, 88, 89, 90, 141, 142, 143, 144, 149, 151, 164, 224, 317, 328, 378, 381, 391, 412, 434, 435, 437, 438, 465, 484, 500, 558, 588, 590, 591, 605, 606, 608, 641, 693, 706, 707, 709, 711, 712, 742, 817, 818, 820, 825, 838. | USGS quad maps | Winnemucca, 1:250,000. Antler Peak, 15'. |
| | USBM sequence number | 0320150631. |
| | Mid number | 260550. |

Comments: Production began in 1967 as a copper property. Operations shifted about 1978 to adjacent gold-silver ore bodies when copper prices declined and precious metal prices climbed. The existing flotation mill was converted to precious metal recovery. Of 4 separate gold ore bodies, the Minnie and Tomboy were mined initially and are essentially depleted. The Fortitude ore body, described above, is the largest with development completed in 1984. The mill expansion to handle Fortitude ore will enable Duval to produce 4.7 t (150,000 tr oz) Au and 46.7 t (1.5 million tr oz) Ag during 1985 (434).

BEAR—COPPER

Alternate names: None

Commodities: Cu, Mo, Au,
Ag**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|---------------------------------------|
| County | Lyon. | General location | About 54 km southeast of Carson City. |
| Mining district | Mason Valley. | Meridian | Mount Diablo. |
| Elevation | 1,329 m. | Tract | Sec. 4, T 13 N, R 25 E. |
| Domain | Private. | Latitude | 39°00'47" N. |
| | | Longitude | 119°11'24" W. |
| Owner | The Anaconda Minerals Co., Denver, CO (subsidiary of Atlantic Richfield Co., Denver, CO) (1984). | | |

GEOLOGY

| | | | |
|-------------------------|--|--------------------------|---|
| Type of ore body | Replacement; disseminated. | Host formation | Porphyry dikes. |
| Origin | Hydrothermal; oxidation. | Geologic age | Tertiary. |
| Shape of ore body | Unknown. | Rock relationships | Quartz monzonite, encloses ore, gangue. |
| Ore controls | Igneous; contact zone; faulting. | | Granodiorite, near ore. |
| Mineral names | Chalcopyrite, pyrite, bornite, molybdenite. | Size | Large. |

DEVELOPMENT

| | | | |
|-------------------------|-----------------------------|------------------------------|---------|
| Current status | Inactive-explored prospect. | Distance to water supply ... | <10 km. |
| Type of operation | Prospect. | Road requirement | <10 km. |
| Year of discovery | 1961. | Distance to power supply ... | <10 km. |
| Discovery method | Auxiliary mineral in place. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|------------------------|----------------|------|-----------|
| 1. Not reported in reference | 500,000,000 tons | 0.40% Cu | 1979 | 829 |

REFERENCES

| | | |
|---------------------|----------------------------|-----------------------------------|
| 453, 695, 822, 829. | USGS quad maps | Reno, 1:250,000. Wabuska, 15'. |
| | USBM sequence number | 0320190171. |

Comments: The deposit does not outcrop and is deeply buried.

BELL MOUNTAIN—GOLD

Alternate names: None

Commodities: Au, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Churchill. | General location | About 60 km southeast of Fallon. |
| Mining district | Fairview. | Meridian | Mount Diablo. |
| Elevation | 1,810 m. | Tract | Sec. 10, T 15 N, R 34 E. |
| Topography | Hilly. | Latitude | 39°10'45" N. |
| Domain | Private. | Longitude | 118°07'59" W. |
| Owner | Nevada Silver, Inc. (subsidiary of American Pyramid Resources, Inc., Vancouver, BC, Canada), 100% (1982). | | |
| Owner-operator | Southern Pacific Land Co. (if option agreement met in 1984, will own 66.6% of the property and will become the operator) (1984). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|--|
| Type of ore body | Vein; brecciated, sheared. | Host formation | Undifferentiated volcanics. |
| Origin | Hydrothermal. | Geologic age | Tertiary (Miocene). |
| Shape of ore body | Tabular. | Rock relationships | Rhyolite pyroclastics, encloses ore (vein). |
| Ore controls | Fracturing; faulting. | | Tuff, air fall, encloses ore (vein). |
| Strike and dip of mineralized zone | N 90° W: 45° S (Main Vein). | | Basalt dikes, near ore. |
| Mineralized zone average dimensions, m: | | Alteration | Calcite-quartz vein, contains ore. |
| Length | >1,600 (reserves developed on 300 m). | | Broad silicification, chloritization, and argillization with sericitization close to walls of vein; oxidation. |
| Width | >115 (downdip). | Size | Small. |
| Thickness | 10 to 18. | | |
| Mineral names | Possible electrum and argentite, native silver, cerargyrite, possible acanthite, yellow-gray chlorides, manganiferous calcite, ocherous limonite, quartz, adularia, barite, fluor spar, rhodochrosite, montmorillonite. | | |

DEVELOPMENT

| | | | |
|------------------------------|---|--------------------------------|---|
| Current status | Active-development; exploration. | Distance to water supply | 12 km pipeline from well at Stingaree Flat. |
| Type of operation | Surface. | Road requirement | 12 km to U.S. Highway 50. |
| Mining method | Open-pit; on 5-m benches. | Distance to power supply | On-site caterpillar diesels. |
| Year of discovery | Unavailable. | Mill location | On-site. |
| Discovery method | Unavailable. | Mill status | Development. |
| Initial production | 1927. | Milling method | Tank cyanidation (CCD); zinc precipitation, smelting. |
| Past production | 35 t ore; 17 g/t (0.5 tr oz/ton) Au; 562 g/t (16.4 tr oz/ton) Ag. | Process rate | 650 t/d (1982 preliminary). |
| Annual production rate | Anticipate 1.43 t Au; 37.5 t Ag (recovery from proven reserves). | Product type | Dore bullion (Ag-Au 30:1). |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|---------------------------|---|------|-----------|
| 1. Proven | 1,000,000 t | 1.5 g/t Au; 50 g/t Ag (Main Vein) | 1982 | 40 |
| 2. Not reported in reference | 1,500,000 to 2,000,000 t. | 4.2 g/t Au; 100 g/t Ag (Zphinz Zone); grade based on assay of first crosscut. | 1982 | 71 |
| 3. Proven | 1,000,000 tons | 0.055 tr oz/ton Au; 1.4 tr oz/ton Ag | 1984 | 208 |
| Probable | 1,000,000 tons | 0.022 tr oz/ton Au; 1.0 tr oz/ton Ag | 1984 | 208 |
| Possible | 500,000 tons | 0.14 tr oz/ton Au; 3.3 tr oz/ton Ag (Zphinz Zone) | 1984 | 208 |

REFERENCES

| | | |
|----------------------------|----------------------------|--|
| 40, 71, 84, 208, 224, 802. | USGS quad maps | Reno, 1:250,000. Bell Canyon, 7.5'. |
| | USBM sequence number | 0320010050. |
| | Mid number | 2601775. |

Comments: Sulfides and sulfosalts have been completely leached from the vein. Original ore minerals were electrum and argentite. Zphinz Zone was discovered as a cross structure of Main Vein in about 1982. Large reserves of low-grade 'ore' reported as extensions of Main Vein. Recent discovery of ore in the Zphinz Zone could alter original development plans.

BIG LEDGE—BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|---------------------------------|
| County | Elko. | General location | About 53 km northwest of Wells. |
| Mining district | Snake Mountains. | Meridian | Mount Diablo. |
| Elevation | 2,440 m. | Tract | Sec. 27, T 42 N, R 61 E. |
| Topography | Rugged. | Latitude | 41°29'57" N. |
| Domain | Mixed; private leases and unpatented claims on public lands administered by BLM. | Longitude | 115°03'02" W. |
| Owner | Mary's River Ranch (1983). | | |
| Operator | Chromalloy American Corp., St. Louis, MO (1983). | | |

GEOLOGY

| | | | |
|---|--------------------------------|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Valmy. |
| Origin | Sedimentation; hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular; irregular. | Rock relationships | Chert, lies along ore, encloses ore. Shale, lies along ore, encloses ore. |
| Ore controls | Bedding; lithology. | Size | Medium. |
| Strike and dip of mineralized zone. | N 15° to 45° E: 30° to 45° NW. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 380. | | |
| Width | 105. | | |
| Thickness | 30. | | |
| Depth | 0. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply ... | Unknown. |
| Type of operation | Possible surface. | Road requirement | <50 km. |
| Year of discovery | 1978. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--|----------------------------|--|
| 77, 95, 123, 205, 226, 278, 546, 669, 716, 775, 778. | USGS quad maps | Wells, 1:250,000. Black Butte NE, 7.5'. |
| | USBM sequence number | 0320070904. |

BISONI—FLUORINE

Alternate names: Bisoni Fluorite, Fish Creek

Commodities: CaF₂, Zn,
Be**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|-----------------------------------|------------------------|----------------------------------|
| County | Eureka. | General location | About 15 km southwest of Eureka. |
| Mining district | Fish Creek. | Meridian | Mount Diablo. |
| Elevation | 2,316 m. | Tract | Sec. 23, T 18 N, R 52 E. |
| Topography | Hilly. | Latitude | 39°25'12" N. |
| Domain | BLM administered. | Longitude | 116°05'17" W. |
| Owner | Maynard and Lester Bisoni (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|------------------------------|
| Type of ore body | Disseminated; replacement; fissure vein. | Host formation | Antelope Valley Limestone. |
| Origin | Hydrothermal. | Geologic age | Middle Ordovician. |
| Shape of ore body | Tabular; massive. | Rock relationships | Limestone, ore in fractures. |
| Ore controls | Lithology; bedding. | | Limestone, encloses ore. |
| Strike and dip of mineralized zone. | N 45° W; 5° S. | Size | Large. |
| Mineralized zone average dimensions, m: | | | |
| Length | 1,200. | | |
| Width | 790. | | |
| Thickness | 98. | | |
| Depth | 34. | | |
| Mineral names | Fluorite, quartz, calcite, limonite, sphalerite, beryl, hematite, muscovite, scheelite, molybdenite, sericite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------|------------------------------|---------|
| Current status | Inactive-explored prospect. | Distance to water supply ... | <10 km. |
| Year of discovery | 1960. | Road requirement | <50 km. |
| Discovery method | Ore mineral in place. | Distance to power supply ... | <50 km. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---------------------|----------------------------|--|
| 275, 281, 545, 593. | USGS quad maps | Millet, 1:250,000. Bellevue Peak, 15' |
| | USBM sequence number | 0320110195. |

BLOODY CANYON—ANTIMONY

Alternate names: Red Star, Hutton

Commodities: Sb, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-----------------------------|
| County | Pershing. | General location | About 15 km south of Imlay. |
| Mining district | Star. | Meridian | Mount Diablo. |
| Elevation | 1,975 m. | Tract | Sec. 36, T 31 N, R 34 E. |
| Topography | Rugged. | Latitude | 40°31'02" N. |
| Domain | Mixed. | Longitude | 118°08'08" W. |
| Owner | Hybert L. Neal (1960). | | |
| Operator | Metro-dyne International, Inc., Oreana, NV (1970). | | |

GEOLOGY

| | | | |
|---|-------------------------------|--------------------------|-------------------------|
| Type of ore body | Fissure vein. | Host formation | Koipato. |
| Origin | Hydrothermal. | Geologic age | Triassic. |
| Shape of ore body | Tabular. | Rock relationships | Rhyolite, encloses ore. |
| Ore controls | Faulting; fracturing. | | Limestone, near ore. |
| Strike and dip of mineralized zone: | | Size | Small. |
| West Vein | N 10° W: 80° to 85° E. | | |
| East Vein | N 10° to 25° E: 80° to 85° E. | | |
| Mineralized vein average dimensions, m: | | | |
| Length | 100. | | |
| Width | 60. | | |
| Thickness | 1. | | |
| Depth | 0. | | |
| Mineral names | Stibnite, pyrite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Underground. | Road requirement | None. |
| Year of discovery | 1868. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1907. | | |
| Last production | 1942. | | |
| Past production | 100 t metal (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---------------|----------------------------|----------------------|
| 74, 329, 376. | USGS quad maps | Lovelock, 1:250,000. |
| | | Imlay, 15'. |
| | USBM sequence number | 0320270294. |
| | USGS MRDS number | M060338. |

Comments: The Bloody Canyon is reported to be second only to the Sutherland Mine in antimony production; principal periods of production were in 1907 and 1917-21.

BLUE STAR—GOLD

Alternate names: Number 8, South Pit, East Pit, North Pit

Commodities: Au,
turquoise

LOCATION-OWNERSHIP

| | | | |
|--|----------|----------------------------|----------------------------------|
| County | Eureka. | General location | About 43 km northwest of Carlin. |
| Mining district | Lynn. | Meridian | Mount Diablo. |
| Elevation | 1,830 m. | Tract | Sec. 4, T 35 N, R 50 E. |
| Topography | Hilly. | Latitude | 40°56'35" N. |
| Domain | Private. | Longitude | 116°21'38" W. |
| Owner-operator Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp., New York, NY) (1984). | | | |

GEOLOGY

| | | | |
|---|---|------------------------------|--|
| Type of ore body | Disseminated. | Host formation | Vinini (in upper plate of Roberts Mountains Thrust Fault). |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Irregular in plan. | Rock relationships | Sandy siltstone, ore in fractures, gangue, most favored host. |
| Ore controls | Faulting; fracturing; lithology. | | Cherty shale, adjacent to ore. |
| Strike and dip of mineralized zone. | Northwest: unknown. | | Quartzite sandstone, contains some ore. |
| Age of mineralization | Miocene (37.5 million yr). | | Limestone, dolomitic limestone, sandy calcareous siltstone, beneath ore. |
| Mineralized zone average dimensions, m: | | | Dacite porphyry dikes, near ore. |
| Length | 365. | | Quartz diorite plug, about 3 km north. |
| Width | 200. | | Jasperoid, near ore. |
| Thickness | 90. | Alteration | Silicification, sericitic kaolinitic |
| Mineral names | Quartz, clays, sericite, kaolinite, calcite, barite, pyrite, realgar, orpiment, stibnite, cinnabar, native gold, turquoise, chrysocolla, malachite, euchroite, montmorillonite, sphalerite. | Size | Small. |

DEVELOPMENT

| | | | |
|------------------------------|---|----------------------------|--|
| Current status | Active-producer (intermittent). | Road requirement | 8-km access road to Carlin Mine built in 1974. |
| Type of operation | Surface. | Mill location | Mill grade trucked 8 km to Carlin mill. |
| Mining method | Open pit; bench. Mining by Carlin Gold Mining Co. began in 1974 and consists of 3 pits. | Mill status | Active. |
| Year of discovery | 1959 (first claimed for turquoise in 1929). | Milling method | Agitated cyanide leach, CCD; oxidation-chlorination pretreatment for carbonaceous ore; CCD wash; Merrill-Crowe zinc precipitation, smelting. |
| Discovery method | Unknown. | Product type | Dore bars, weighing about 34 kg. |
| Initial production | 1975. | | |
| Last production | Ongoing 1983. | | |
| Past production | About 124 kg (4,000 tr oz) in 1980 (132). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|---|--------------------------|-----------------------------|------|-----------|
| 1..Not reported in reference ¹ | 1,800,000 tons | 0.12 tr oz/ton Au | 1974 | 517 |

REFERENCES

| | |
|--|---|
| 59, 61, 90, 132, 182, 183, 319, 398, 458, 505, 517, 570, 593, 616. | USGS quad maps Winnemucca, 1:250,000. Rodeo Creek NE, 7.5'. USBM sequence number 0320110166. Mid number 2600500. |
|--|---|

Comments: This property was initially developed for its high-quality turquoise. In 1968, Newmont Mining Corp. acquired property and subsequent drilling defined 3 ore bodies (South, East, North) with reserves described above.

¹Resource referred to as reserves.

BOOTSTRAP—GOLD

Alternate names: Bootstrap Mine Dump

Commodities: Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|----------------------------------|
| County | Elko. | General location | About 56 km northwest of Carlin. |
| Mining district | Bootstrap. | Meridian | Mount Diablo. |
| Elevation | 1,760 m. | Tract | Sec. 10, T 38 N, R 49 E. |
| Topography | Rolling hills. | Latitude | 41°01'08" N. |
| Domain | Private. | Longitude | 116°24'58" W. |
| Owner-operator | Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp., New York, NY) (1984). | | |

GEOLOGY

| | | | |
|---|----------------------------------|--------------------------|---|
| Type of ore body | Disseminated. | Host formation | Vinini (upper plate of Roberts Mountains Thrust Fault). |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Brecciated limestone, contains ore in fractures. |
| Ore controls | Faulting, fracturing, lithology. | | Siltstone, contains ore in fractures. |
| Strike of mineralized zone. | N 70° E. | | Porphyry dikes, contains ore in fractures. |
| Mineralized zone average dimensions, m (estimated): | | | Jasperoid, jasperoid breccia, near ore. |
| Length | 400. | Alteration | Argillic, silicification. |
| Width | 180. | Size | Small. |
| Mineral names | Undetermined. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|--|
| Current status | Active, producing. | Distance to water supply ... | On-site wells. |
| Type of operation | Surface, low-grade dump leach. | Road requirement | Existing, 19-km access road built to Carlin Mine. |
| Mining method | Open pit (inactive-ore body depleted). Mining began by Carlin Mining Co. in 1973. | Distance to power supply ... | On-site diesel electric generation. |
| Year of discovery | About 1940; Newmont made additional discoveries in early 1970's. | Mill location | On-site. |
| Discovery method | Surface sampling, drilling. | Mill status | Active. |
| Initial production | Late 1950's or early 1960's; Carlin in 1975. Present dump leach began in 1979. | Milling method | Dump cyanide heap leach, carbon adsorption. |
| Last production | From open pit in 1978. Leach dump to produce until end of 1985 or 1986. | Process rate | 200,000 t/a ore, at 54% Au recovery. |
| Past production | 104.5 kg Au (1983) (511). About 820,000 t, 0.86 g/t Au ore has been treated into mid-1984. | Product type | Gold-loaded carbon in drums. |
| Annual production rate . | About 200 kg Au at peak, less currently. | Distance shipped | 19 km. |
| | | Destination | Carlin mill at Carlin Mine for further processing by caustic-cyanide solution, strip solution, electro-winning on steel wool and smelted to dore products. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|--|------|-----------|
| 1..Not reported in reference | 2,100,000 tons | About 0.15 tr oz/ton Au (includes Carlin's Blue Star Mine 1974 unmined reserves). | 1974 | 510 |
| 2..Proven | <1,000,000 tons | 0.044 tr oz/ton Au (0.028 to 0.063 tr oz/ton; low-grade material stockpiled from previous mining operation). | 1979 | 378 |

REFERENCES

| | | |
|--|----------------------------|--|
| 83, 186, 226, 319, 378, 398, 412, 505, 506, 510, 511, 589, 616, 669. | USGS quad maps | McDermitt, 1:250,000. Santa Renia Field, 7.5' |
| | USBM sequence number | 0320070349. |
| | Mid number | 2600501. |

Comments: About 800,000 t of low-grade material containing 0.96 g/t was stockpiled for leaching from previous mining. Heap leaching of this material continues after construction of dump leach facility in 1978.

BOREALIS—GOLD

Alternate names: Jamies Ridge,¹ East Ridge ProjectCommodities: Au, Ag, Hg
(byproduct mercury)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-------------------------------------|
| County | Mineral. | General location | About 24 km southwest of Hawthorne. |
| Mining district | Aurora. | Meridian | Mount Diablo. |
| Elevation | 2,195 m. | Tract | Sec. 17, T 6 N, R 29 E. |
| Topography | Hilly. | Latitude | 38°22'57" N. |
| Domain | National forest. | Longitude | 118°45'36" W. |
| Owner | Houston International Minerals Corp. (HIMCO), Denver, CO (subsidiary of Tenneco, Inc.) (1983). | | |
| Operator | W. E. Vining Co. (contractor), Carson City, NV (1983). | | |

GEOLOGY

| | | | |
|--|--|--------------------------|---|
| Type of ore body | Breccia fill; stratiform; disseminated. | Host formation | Esmeralda, Volcanics. |
| Origin | Hydrothermal. | Geologic age | Miocene. |
| Shape of ore body | Lenticular (flattened football). | Rock relationships | Silicified andesite breccia, is ore. Sponge rock (altered tuff), is ore. Andesite flows and breccia, lies under ore. Andesite and ash flow tuff, lies along ore. |
| Ore controls | Faults; lithology; fractures; hot springs vents. | Alteration | Potassic, silicification, oxidation (ore zone), argillic, kaolin, propylitic (country rock). |
| Strike and dip of mineralized zone. | N 55°E; relatively flat. | Size | Small. |
| Age of mineralization ... | 5 to 12 million yr, possibly Pliocene. | | |
| Mineralized zone aver- age dimensions, m: | | | |
| Length | 370. | | |
| Width | 152. | | |
| Thickness | 60. | | |
| Mineral names | Quartz, hematite, montmorillonite, chlorite, calcite, pyrite, barite, kaolinite, alunite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|------------------------------|---|
| Current status | Active-producer. | Distance to water supply ... | 5 km (wells to plan site tanks). |
| Type of operation | Surface. | Road requirement | 0.5 km new plant access. |
| Mining method | Open-pit. | Distance to power supply ... | 11 km. |
| | | Mill location | On-site. |
| Year of discovery | 1977 (HIMCO began exploration). | Mill status | Active. |
| Discovery method | Geochemical anomaly. | Milling method | Agglomeration, cyanide heap leach- ing, Merrill-Crowe zinc precipi- tation. |
| Initial production | 1981. | Process rate | Crusher, 2,270 t/d. |
| Last production | Ongoing. | Process type | 34-kg dore buttons. |
| Annual production rate . | About 544,000 t ore planned, about 934 kg combined Au and Ag, about 870 kg (28,000 tr oz) Au. | Destination | By air to Reno, NV, then shipped to Handy & Harmon, Attleboro, MA. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|---------------------|---------------------------------|--|------|-----------|
| 1..Identified | 2,500,000 to 3,000,000 tons. | 0.08 tr oz/ton Au; 0.62 tr oz/ton Ag | 1981 | 383 |

REFERENCES

| | | |
|--|----------------------------|--|
| 73, 196, 209, 228, 287, 356, 378, 380, 383, 485, 488, 512, 598, 651, 688, 696, 766. | USGS quad maps | Walker Lake, 1:250,000. Aurora 15'. |
| | USBM sequence number | 0320210463. |
| | Mid number | 2601655. |

¹Jamies Ridge is another discrete ore body discovered in 1982, 6 km northeast of Borealis deposit. This 250-m by 100-m by 30-m-thick deposit was placed in production in April 1983 for about 7 months of mining to depletion. Production: first exploited in 1906 and again in the late 1950's; no records available.

BOULDER CITY-MANGANESE

Alternate names: None

Commodities: Mn

LOCATION-OWNERSHIP

| | | | |
|-----------------------|----------------------------------|------------------------|-------------------------------------|
| County | Clark. | General location | About 39 km southeast of Las Vegas. |
| Mining district | Las Vegas. | Meridian | Mount Diablo. |
| Elevation | 671 m. | Tract | Sec. 23, T 23 S, R 64 E. |
| Topography | Rolling. | Latitude | 35°56'45" N. |
| Domain | Municipality. | Longitude | 114°47'23" W. |
| Owner | City of Boulder City, NV (1980). | | |

GEOLOGY

| | | | |
|---|------------------------------|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Muddy Creek. |
| Origin | Hydrothermal; sedimentation. | Geologic age | Miocene. |
| Shape of ore body | Tabular. | Rock relationships | Gypsiferous sandstone, encloses ore, lies over and under ore. |
| Ore controls | Bedding; lithology. | | Tuff, lies over and under ore. |
| Strike and dip of mineralized zone. | East-west: 4° S. | | Gravel, lies over ore. |
| Mineralized zone average dimensions, m: | | Size | Medium. |
| Length | 1,168. | | |
| Width | 716. | | |
| Thickness | 18. | | |
| Depth | 7. | | |
| Mineral names | Wad. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply ... | <10 km. |
| Type of operation | Possible surface. | Road requirement | None. |
| Year of discovery | 1941. | Distance to power supply ... | <10 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES¹

| Class | Quantity | Grade | Year | Reference |
|---------------------|-----------------------|---------------------------------------|------|-----------|
| 1.. Indicated | 1,000,000 tons | Average: 7.5% Mn; cutoff: 5% Mn | 1949 | 407 |
| 2.. Do | 3,000,000 tons | Average: 4.5% Mn; cutoff: 3% Mn | 1949 | 407 |
| 3.. Do | 6,000,000 tons | Average: 4.0% Mn; cutoff: 2% Mn | 1949 | 407 |
| 4.. Do | 15,000,000 tons | Average: 3.0% Mn; cutoff: 1% Mn | 1949 | 407 |

REFERENCES

| | | |
|---|----------------------------|--|
| 36, 41, 267, 354, 386, 407, 547, 721, 733, 844. | USGS quad maps | Kingman, 1:250,000. Boulder City, 7.5'. |
| | USBM sequence number | 0320030322. |

¹Tonnages are cumulative and rounded to nearest million.

BRAY-BEULAH—ANTIMONY

Alternate names: Beulah, Genesee, Aberasturi

Commodities: Sb, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|------------|------------------------|------------------------------|
| County | Lander. | General location | About 22 km south of Austin. |
| Mining district | Big Creek. | Meridian | Mount Diablo. |
| Elevation | 2,804 m. | Tract | Sec. 27, T 17 N, R 43 E. |
| Topography | Rugged. | Latitude | 39°18'26" N. |
| Domain | Private. | Longitude | 117°07'52" W. |

Owner..... Mary J. Bray (Beulah Claim), James O. Holmes (Genesee Claim) (1963).

GEOLOGY

| | | | |
|---|-----------------------------|-------------------------|--------------------------------|
| Type of ore body | Fissure vein. | Host formation | Valmy. |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationship | Siliceous slate, encloses ore. |
| Ore controls | Faulting. | Size | Small. |
| Strike and dip of mineralized zone. | N 30° W: 45° to 85° SW. | | |
| Mineralized zone average dimensions, m: | | | |
| Thickness | 1. | | |
| Mineral names | Stibnite, pyrite, graphite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|---------|
| Current status | Inactive-past producer. | Distance to water supply ... | <10 km. |
| Type of operation | Underground. | Road requirement | <50 km. |
| Year of discovery | 1864. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1891. | | |
| Past production | >908 t Sb metal (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-----------|----------------------------|---------------------|
| 376, 693. | USGS quad maps | Millett, 1:250,000. |
| | | Austin, 15°. |
| | USBM sequence number | 0320150192. |

Comments: The Bray-Beulah is reported to be the third largest antimony producer in Nevada.

BUCKHORN—GOLD

Associated names: Barbi Lake Copper Mines, North Buckhorn,
South Buckhorn, North Aspen, South Aspen

Commodities: Au, Ag
(Au-Ag ratio = 1:15)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Eureka. | General location | About 90 km southwest of Carlin. |
| Mining district | Buckhorn. | Meridian | Mount Diablo. |
| Elevation | 2,100 m. | Tract | Secs. 30, 31, T 27 N, R 49 E. |
| Topography | Hilly. | Latitude | 40°10'53" N. |
| Domain | Private. | Longitude | 116°29'33" W. |
| Owner | Cominco American, Inc., Spokane, WA (76%), and Pembina International Corp., Calgary, AB, Canada, combined will manage the operation. Pembina, as a minority partner, will put up a share of the development money for an identical profit sharing percentage (1984). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|---|
| Type of ore body | Breccia (fault); vein. | Host formation | Undifferentiated basaltic andesite flows. |
| Origin | Hydrothermal; oxidation. | Geologic age | Pliocene |
| Shape of ore body | Irregular; pods. | Rock relationships | Shale and siltstone, encloses ore. Basaltic andesitic flows, lies above ore. Gravels and conglomerates, lies beneath ore (Tertiary). Breccia, silicified, in places is ore. |
| Ore controls | Faulting; igneous; lithology (breccia). | Alteration | Argillic, kaolinization. |
| Age of mineralization ... | Pliocene (14.6 million yr). | Size | Small. |
| Pit average dimensions, m (estimated): | | | |
| | North Buckhorn | South Buckhorn | |
| Length | 400 | 360 | |
| Width | 340 | 230 | |
| Mineral names | Native gold and silver, pyrite (argentiferous and auriferous), limonite, marcasite, adularia, kaolinite, montmorillonite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|------------------------------|--|
| Current status | Active-producing. | Distance to water supply ... | On-site, <1 km. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit; about 1,191,000 t/a ore (1,034,000 t waste and subgrade) over 4 yr. | Distance to power supply ... | Unavailable. |
| | | Mill location | On-site. |
| | | Mill status | Development. |
| | | Milling method | Agglomeration, cyanide heap leach, Merrill-Crowe zinc precipitation, smelting. |
| Year of discovery | 1908. | Process rate | 680,000 t/a; crusher, 259 t/h (285 ton/h). |
| Discovery method | Surface prospecting. | Product type | Probably dore. |
| Initial production | Early 1984 (for Cominco). | | |
| Past production | Operations through 1950 yielded about 1,200 kg Au and 10,000 kg Ag; mining and milling beginning in 1979 yielded about 470 kg/a Au (132). | | |
| Annual production rate . | Producing about 934 kg Au and 8,400 kg Ag. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|--|------|-----------|
| 1..Not reported in reference | 5,000,000 tons | 0.044 tr oz/ton Au; 0.583 tr oz/ton Ag | 1983 | 769 |

REFERENCES

| | | |
|---|----------------------------|---|
| 132, 135, 452, 593, 594, 675, 769, 779, 780, 781, 782, 784, 787, 833. | USGS quad maps | Winnemucca, 1:250,000. Horse Creek Valley, 15' |
| | USBM sequence number | 0320110167. |
| | USGS MRDS number | W016382. |
| | Mid number | 2600785. |

Comments: Buckhorn Mine consists of at least 2 ore bodies. Current plans are to operate 2 separate open pits, the North Buckhorn and the South Buckhorn. Ore occurs within 60 m of surface. Ore is within oxide and sulfide zones. Company projected mine life from 1984 is 4 yr; mill, 7 yr.

BUCKINGHAM—MOLYBDENUM

Alternate names: AMAX Molybdenum Deposit, Rocky Mountain Energy Moly Deposit

Commodities: Mo, Ag, Cu,
W**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|---|------------------------|---|
| County | Lander. | General location | About 11 km southwest of Battle Mountain. |
| Mining district | Battle Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,798 m. | Tract | Sec. 30, T 32 N, R 44 E. |
| Topography | Rugged. | Latitude | 40°36'56" N. |
| Domain | Mixed; private and BLM administered | Longitude | 117°03'42" W |
| Owner | AMAX, Inc., Denver, CO (33%); Rocky Mountain Energy Co., Broomfield, CO (Union Pacific Corp.) (1984). | | |
| Operator | AMAX, Inc. (1984). | | |

GEOLOGY

| | | | |
|---|--|----------------------|-----------------------------|
| Type of ore body | Stockwork; disseminated. | Host formation | Widely varying lithologies. |
| Origin | Hydrothermal; contact metasomatic. | Geologic age | Cambrian; Tertiary. |
| Shape of ore body | Massive; irregular. | Size | Large. |
| Ore controls | Igneous; fracturing. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 2,000. | | |
| Width | 1,200. | | |
| Thickness | 640. | | |
| Mineral names | Pyrite, molybdenite, pyrrhotite, chalcopyrite, sphalerite, galena, arsenopyrite, bismuthinite, freibergite, tetrahedrite, quartz, scheelite. | | |

DEVELOPMENT

| | | | |
|-------------------------|---------------------------|------------------------------|---------------|
| Current status | Active-explored prospect. | Distance to water supply ... | Undetermined. |
| Type of operation | Prospect. | Road requirement | Undetermined. |
| Year of discovery | Undetermined. | Distance to power supply ... | Undetermined. |
| Discovery method | Ore mineral in place. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|------------------------|----------------|------|-----------|
| 1..Not reported in reference | 907,000,000 tons | 0.06% Mo | 1982 | 701 |

REFERENCES

| | | |
|--|----------------------------|---|
| 56, 381, 588, 590, 591, 592, 605, 606, 610, 693, 701, 706, 712, 717, 742, 794, 803, 813, 837. | USGS quad maps | Winnemucca, 1:250,000. Antler Peak, 15'. |
| | USBM sequence number | 0320150108. |

Comments: Ore largely in fractures in hornfels and quartzites of the Harmony Formation (Cambrian).

BUENA VISTA—IRON

Alternate names: None

Commodities: Fe

LOCATION-OWNERSHIP

| | | | |
|-----------------------|----------------|------------------------|------------------------------------|
| County | Churchill. | General location | About 36 km southwest of Lovelock. |
| Mining district | Mineral Basin. | Meridian | Mount Diablo. |
| Elevation | 1,341 m. | Tract | Sec. 4, T 24 N, R 34 E. |
| Topography | Hilly. | Latitude | 39°58'25" N. |
| Domain | Private. | Longitude | 118°09'55" W. |

Owner-operator Southern Pacific Co., San Francisco, CA; U.S. Steel Corp., Salt Lake City, UT (1975).

GEOLOGY

| | | | |
|---|---|--------------------------|--|
| Type of ore body | Replacement, breccia fill, disseminated. | Host formation | Leach. |
| Origin | Contact metasomatic. | Geologic age | Pennsylvanian. |
| Shape of ore body | Tabular, irregular, pipelike. | Rock relationships | Lamprophyre, lies along ore, near ore. |
| Ore controls | Igneous, faulting. | Size | Medium. |
| Mineralized zone average dimensions, m: | | | |
| Length | 3,353. | | |
| Width | 914. | | |
| Thickness | 137. | | |
| Mineral names | Magnetite, hematite, scapolite, chlorite, calcite, quartz, apatite, sphene, hornblende. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|---------|
| Current status | Inactive-past producer. | Distance to water supply ... | <10 km. |
| Type of operation | Surface. | Road requirement | None. |
| Discovery method | Ore mineral in place. | Distance to power supply ... | <50 km. |
| Initial production | 1952. | | |
| Last production | 1960. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|---------------------------------|-----------------------|----------------|------|-----------|
| 1..Measured ¹ | 18,000,000 long tons. | 32.7% Fe | 1971 | 454 |
| 2..Indicated ¹ | 3,000,000 long tons. | 33.3% Fe | 1971 | 454 |
| 3..Measured ² | 5,000,000 long tons. | 26.2% Fe | 1971 | 454 |
| 4..Indicated ² | 900,000 long tons. | 22.1% Fe | 1971 | 454 |
| 5..Inferred ³ | 5,700,000 long tons. | 22.1% Fe | 1971 | 454 |
| 6..Measured ¹ | 5,500,000 long tons. | 25.5% Fe | 1971 | 454 |
| 7..Indicated ² | 2,400,000 long tons. | 25.5% Fe | 1971 | 454 |
| 8..Inferred ³ | 4,700,000 long tons. | 25.5% Fe | 1971 | 454 |

REFERENCES

| | | |
|--|----------------------------|--|
| 10, 75, 150, 282, 324, 332, 367, 454, 515, 536, 568, 579, 583, 733, 751, 802, 841. | USGS quad maps | Reno, 1:250,000. |
| | USBM sequence number | Dixie Hot Springs, 15'. 0320010043. |

¹West ore body.²South Central ore body.³East ore body.

BULLION MONARCH—GOLD

Alternate names: Polar Resources Pit

Commodities: Au, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|----------------------------------|
| County | Eureka. | General location | About 30 km northwest of Carlin. |
| Mining district | Lynn. | Meridian | Mount Diablo. |
| Elevation | 1,770 m. | Tract | Sec. 10, T 35 N, R 50 E. |
| Topography | Hilly. | Latitude | 40°55'03" N. |
| Domain | BLM administered. | Longitude | 116°20'37" W. |
| Owner-operator | Universal Gas (Montana), Inc., Elko, NV (1984). | | |

GEOLOGY

| | | | |
|--|----------------------------------|--------------------------|--|
| Type of ore body | Vein (fault zone); disseminated. | Host rocks | Roberts Mountains and Volcanics. |
| Origin | Hydrothermal. | Geologic age | Devonian (Roberts Mountains), Tertiary (Volcanics). |
| Shape of ore body | Podlike (along fault zone). | Rock relationships | Fault gouge, contains ore, is ore. Limestone, lies under ore (footwall). Volcanic, lies above ore (hanging wall). |
| Ore controls | Faulting; fracturing. | Alteration | Jasperoid, near ore. Silicification (gold zone), argillic (carbonate wall rock). |
| Strike and dip of mineralized zone. | N 50° W; steeply northeast. | Size | Small. |
| Age of mineralization ... | Miocene. | | |
| Mineralized zone aver- age dimensions, m: | | | |
| Length | 270. | | |
| Width | Unknown. | | |
| Pit depth | 6 (estimated 1982). | | |
| Mineral names | Quartz, iron oxides, clays. | | |

DEVELOPMENT

| | | | |
|-------------------------|---|------------------------------|------------------------------|
| Current status | Active-producer. | Distance to water supply ... | On-site, developed. |
| Type of operation | Surface. | Road requirement | Developed to site. |
| Mining method | Conventional open pit. | Mill location | On-site. |
| Past production | More than 90,000 t ore produced by 1981 (728). | Mill status | Active. |
| | | Milling method | Carbon-in-pulp cyanide. |
| | | Process rate | 180 t/d (peak load 360 t/d). |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information; however, published grade is 0.2 tr oz/ton Au (see comments) (690).

REFERENCES

| | | |
|--------------------------|----------------------------|---|
| 182, 183, 593, 690, 728. | USGS quad maps | Winnemucca, 1:250,000. Rodeo Creek NE, 7.5'. |
| | USBM sequence number | 0320110214. |
| | Mid number | 2601343. |

Comments: Average grade ranges from 7.5 to 56.6 g/t Au; highest grade reaching 240 to 270 g/t Au.

C-M ALUNITE—ALUMINUM

Alternate names: Clover Mountains

Commodities: Al, K₂SO₄, S**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|--------------------------------------|
| County | Lincoln. | General location | About 43 km southeast of Caliente. |
| Mining district | Unorganized. | Meridian | Mount Diablo. |
| Elevation | 1,610 m. | Tract | Sec. 10, T 7 S, R 70 E (unsurveyed). |
| Topography | Rolling. | Latitude | 37°21'19" N. |
| Domain | BLM administered. | Longitude | 114°10'05" W. |
| Owner | Earth Sciences, Inc., Golden, CO (1984). | | |

GEOLOGY

| | | | |
|---|---------------------|--------------------------|-------------------------------|
| Type of ore body | Replacement. | Host formation | Volcanics. |
| Origin | Hydrothermal. | Geologic age | Tertiary. |
| Shape of ore body | Undetermined. | Rock relationships | Agglomerate, replaced by ore. |
| Ore controls | Igneous, lithology. | | Tuff, replaced by ore. |
| Mineralized zone average dimensions, m: | | Size | Medium. |
| Length | 3,000. | | |
| Width | 3,000. | | |
| Thickness | 16. | | |
| Depth | 6. | | |
| Mineral names | Alunite. | | |

DEVELOPMENT

| | | | |
|--------------------------|------------------------|------------------------------|----------|
| Current status | Inactive-raw prospect. | Distance to water supply ... | <10 km. |
| Type of operation | Possible surface. | Road requirement | <10 km. |
| Year of discovery | 1971. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---------------------|----------------------------|----------------------|
| 239, 549, 724, 753. | USGS quad maps | Caliente, 1:250,000. |
| | | Jack Mountain, 7.5'. |
| | USBM sequence number | 0320170001. |

CALICO HILLS—IRON

Alternate names: Calico Deposit

Commodities: Fe, Cu

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---------------------|------------------------|------------------------------|
| County | Mineral. | General location | About 51 km south of Fallon. |
| Mining district | Unincorporated. | Meridian | Mount Diablo. |
| Elevation | 1,390 m. | Tract | Sec. 5, T 13 N, R 29 E. |
| Topography | Gentle. | Latitude | 39°01'03" N. |
| Domain | Indian reservation. | Longitude | 118°45'54" W. |
| Owner | Undetermined. | | |

GEOLOGY

| | | | |
|---|---|----------------------|------------------|
| Type of ore body | Replacement, fissure vein. | Host formation | Possibly Luning. |
| Origin | Contact metasomatism. | Geologic age | Upper Triassic. |
| Shape of ore body | Unknown (possibly lenticular). | Rock names | Sandstone. |
| Ore controls | Contact zone, lithology, faulting. | | Shale. |
| Mineralized zone average dimensions, m. | Unknown. | | Limestone. |
| Mineral names | Magnetite, pyrite, pyrrhotite, chalcopyrite, grossularite, actinolite, epidote, galena, sphalerite, molybdenite, tremolite. | Size | Skarn (tactite). |
| | | | Large. |

DEVELOPMENT

| | | | |
|--------------------------|----------------------|------------------------------|---------|
| Current status | Unknown. | Distance to water supply ... | <50 km. |
| Type of operation | Prospect. | Road requirement | None. |
| Year of discovery | 1963. | Distance to power supply ... | <50 km. |
| Discovery method | Geophysical anomaly. | | |
| Initial production | None. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information. Moore reports (454) that the Calico Hills deposit contains a very large quantity of material averaging 20% Fe and 0.07% Cu, and that high-grade portions have an average grade of 44% Fe.

REFERENCES

| | | |
|----------------|----------------------------|-----------------------|
| 454, 598, 740. | USGS quad maps | Reno, 1:250,000. |
| | | Weber Reservoir, 15'. |
| | USBM sequence number | 0320210388. |

CANDELARIA—SILVER

Alternate names: Candelaria Partners Mine and Plant
Pit names: Lucky Hill, Mt. Diablo, Northern Belle

Commodities: Ag, Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|---------------------------------|
| County | Mineral. | General location | About 80 km south of Hawthorne. |
| Mining district | Candelaria. | Meridian | Mount Diablo. |
| Elevation | 1,731 m. | Tract | Sec. 3, T 3 N, R 35 E. |
| Topography | Hilly. | Latitude | 38°09'32" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 118°05'11" W. |
| Owner-operator | NERCO Metals, Inc., Fairbanks, AK (subsidiary of Pacific Power & Light Co., Portland, OR) (1984). | | |
| Owner | CoCa Mines, Inc., Denver, CO (owns 37% limited partnerships) (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Disseminated, veins parallel to bedding. | Host formation | Candelaria. |
| Origin | Hydrothermal. | Geologic age | Triassic. |
| Shape of ore body | Tabular. | Rock relationships | Shale (tuffaceous), serpentinite, contains ore. |
| Ore controls | Fracturing. | Alteration | Silicification, dolomization. |
| Strike and dip of | N 45° E: 40° to 60° N. | Size | Medium. |
| mineralized zone. | | | |
| Age of mineralization | Early Cretaceous. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 1,230. | | |
| Width | 40. | | |
| Thickness | 130. | | |
| Open pit depth | 90 to 120. | | |
| Mineral names | Limonite, jarosite, gold, jamesonite, pyrite, chalcopyrite (minor), galena (minor), clays, dolomite. | | |

DEVELOPMENT

| | | | |
|------------------------------|--|--------------------------------|---|
| Current status | Active-producer. | Distance to water supply | 8 km to two 300-m wells. |
| Type of operation | Surface, heap leach. | Road requirement | About 10 km, county road improved. |
| Mining method | Open pit (2,400,000-t/a ore capacity; 32,800-t/d ore plus waste of which 9,300 t is recovered ore). | Distance to power supply | 14 km, 69-kV power. |
| | | Mill location | On-site. |
| | | Mill status | Active. |
| Year of discovery | 1863. | Milling method | Agglomeration, cyanide heap leach, Merrill-Crowe zinc dust precipitation. |
| Discovery method | Surface outcrop. | Mill feed capacity | 7,300-t/d heap leach facility. |
| | | Product type | Dore bullion (34-kg buttons). |
| Initial production | August 1980 by Occidental; August 1983 by NERCO. | | |
| Last production | June 1982 by Occidental; ongoing production by NERCO. | | |
| Past production | 8,389 kg Ag (1980) (165); 52,100 kg Ag, >286 kg Au (1981) (165, 764). | | |
| Annual production rate | About 53,000 kg Ag (1.7 million tr oz) and 280 kg Au (9,000 tr oz) produced between April and September. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|--|------|-----------|
| 1. Proven | 12 to 13,000,000 tons | 3.15 tr oz/ton Ag and 0.002 tr oz/ton Au | 1980 | 158 |
| 2. Not reported in reference | 18,500,000 tons | 1.09 tr oz/ton Ag (with gold byproduct) | 1982 | 423 |

REFERENCES

| | | |
|---|----------------------------|--|
| 48, 82, 83, 90, 92, 133, 158, 165, 197, 208, 300, 305, 378, 412, 423, 427, 436, 440, 491, 498, 540, 598, 599, 649, 655, 688, 691, 763, 764, 776, 777. | USGS quad maps | Walker Lake, 1:250,000. Candelaria, 7.5'. |
| | USBM sequence number | 0320210476. |
| | Mid number | 2601511. |

Comments: The Candelaria Mine is the largest open pit silver mine in the United States. NERCO plans 5,000-ton/d mine rate (1.6 million tr oz) Ag production. A deeper ore body of massive sulfide nature has been tentatively recognized.

CARLIN—GOLD

Ore body names: Carlin-West, Main, East

Commodities: Au, Ag, Hg
(byproduct mercury)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|------------------------------|
| County | Eureka. | General location | About 32 km north of Carlin. |
| Mining district | Lynn. | Meridian | Mount Diablo. |
| Elevation | 1,877 m. | Tract | Sec. 14, T 36 N, R 50 E. |
| Topography | Hilly. | Latitude | 40°54'41" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 116°19'13" W. |
| Owner-operator | Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp., New York, NY) (1984). | | |

GEOLOGY

| | | | |
|--|--|--------------------------|--|
| Type of ore body | Disseminated, replacement stratiform. | Host formation | Upper Roberts Mountains. |
| Origin | Hydrothermal, oxidation. | Geologic age | Upper Silurian and Lower Devonian. |
| Shape of ore body | Tabular, irregular. | Rock relationships | Dolomitic siltstone, replaced by ore, ore in fractures, gangue. |
| Ore controls | Fractures (near attitude of host rocks), breccia zones, faults, lithology. | | Silty dolomite, replaced by ore, ore in fractures, gangue. |
| Strike and dip of mineralized zone | Northeast: 60° W. | | Silty to sandy carbonaceous dolomitic limestone, in vicinity of ore (unmineralized, unaltered host formation). |
| Age of mineralization | Mid-Tertiary. | | Feldspar porphyry dikes, in mine area, sometimes contains gold. |
| Mineralized zone average dimensions (estimated exposure at mine), m: | | Alteration | Argillization, silicification, pyritization, decarbonatization. |
| Length | 2,000. | Size | Medium. |
| Width | 800. | | |
| Thickness | 100. | | |
| Mineral names | Gold, pyrite, barite, iron oxides, arsenopyrite, realgar, stibnite, cinnabar, galena, calcite, kaolinite, quartz, sericite, ellisite, weissbergite, avicennite, lorandite. | | |

DEVELOPMENT

| | | | |
|--|--|--------------------------------|---|
| Current status | Active-producer. | Distance to water supply | 4 km by pipeline from wells. |
| Type of operation | Surface. | Road requirement | 32 km paved access road built. |
| Mining method | Open pit—6-m benches, 28,000 t/d ore and waste mined. | Distance to power supply | 75 km from Battle Mountain area. |
| | | Mill location | On-site. |
| Year of discovery | 1962. | Mill status | Active. |
| Discovery method | Geological inference, surface mapping, geochemical sampling, drilling. | Milling method | Agitated cyanide leach, CCD; oxidation-chlorination pretreatment circuit for carbonaceous ores; Merrill-Crowe zinc precipitation. |
| Initial production | 1965. | Process rate | 2,000 t/d oxide ore, 450 t/d carbonaceous ore (Newmont's 1983 annual report—mill capacity of 2,485 t/d). |
| Last production | Ongoing 1983. | Product type | Dore buttons (about 34-kg), about 85% Au; byproduct mercury. |
| Past production (includes production from Carlin, Bootstrap, Blue Star, and Maggie Creek pits) | 94,700 kg (3,044,000 tr oz) Au (1965-79) (61). 17,311 kg (556,559 tr oz) Au; includes 2,442 kg (78,523 tr oz) Au from heap leach (1980-83) (511). | Destination | Various refiners (Englehard, Handy & Harmon, et al). |
| Annual production rate | 3,700 kg Au (Carlin mill only) (511). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|--|------|-----------|
| 1..Not reported in reference | 11,000,000 tons | 0.32 tr oz/ton Au (original reserves, Carlin pit only, stripping ratio = 3:1). | 1964 | 319, 398 |
| 2. Do ¹ | 4,700,000 tons | 0.164 tr oz/ton Au | 1982 | 2 |
| 3..Proven and probable | 4,497,000 tons | 0.160 tr oz/ton Au (includes Blue Star) | 1983 | 511 |

REFERENCES

| | | |
|--|----------------------------|---|
| 2, 6, 27, 59, 61, 83, 90, 114, 115, 132, 182, 183, 230, 233, 234, 240, 245, 247, 248, 297, 319, 378, 398, 409, 410, 411, 435, 505, 511, 516, 562, 569, 571, 572, 573, 589, 593, 616, 692, 773. | USGS quad maps | Winnemucca, 1:250,000. Roden Creek NE, 7.5'. |
| | USBM sequence number | 0320110027. |
| | Mid number | 2600062. |

Comments: Silver and mercury production is minor. Some published sources state most favorable host lithology as silty dolomitic limestone.

¹Resource is referred to as reserves.

CARSON RIVER—MERCURY

Alternate names: None

Commodities: Hg, possible
Au, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|----------------------------------|
| County | Carson City. | General location | About 13 km east of Carson City. |
| Mining district | Delaware. | Meridian | Mount Diablo. |
| Elevation | 1,375 m. | Tract | Sec. 7, T 15 N, R 21 E. |
| Topography | River bed; in hilly to rugged terrain. | Latitude | 39°10'52" N. |
| Domain | BLM administered. | Longitude | 119°39'56" W. |
| Claimants | Rocky Comers, Craig Maxwell, Korey Farnworth, Carson City, NV (1982). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|------------------------------------|
| Type of ore body | Placer. | Host | Carson River bottom. |
| Origin | Mill tailing. | Geologic age | Quaternary. |
| Shape of ore body | Disseminated; stratiform. | Rock relationships | Stream gravel, contains mercury. |
| Ore controls | River channel. | Size | Various bedrock, contains mercury. |
| Age of deposit | Recent (1862—see Published Reserves-Resources section). | | Unknown, possibly medium. |
| Mineralized zone average dimensions (estimated), m: | | | |
| Length | <900. | | |
| Width | <15. | | |
| Thickness | Thin. | | |
| Mineral names | Mercury. | | |

DEVELOPMENT

| | | | |
|-------------------------|-------------------------------|------------------------------|----------|
| Current status | Inactive-limited exploration. | Distance to water supply ... | On-site. |
| Type of operation | Surface. | Road requirement | On-site. |
| Mining method | Placer. | Distance to power supply ... | 3 km. |
| | | Mill location | No mill. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.¹

REFERENCES

| | | |
|--|----------------------------|---------------------------------------|
| 3, 29, 96, 189, 453, 509, 585, 586, 736. | USGS quad maps | Reno, 1:250,000. New Empire, 7.5'. |
| | USBM sequence number | 0325100062. |

Comments: Mercury is present in deep holes, bedrock, and gravel beds.

¹It has been reported that perhaps up to 14 to 15 million lb of mercury found its way into the river when mercury was used to recover precious metals from the Comstock (1982) (3).

CASELTON—LEAD-ZINC

Alternate names: Combined Metals Reduction, Raymond and Ely

Commodities: Zn, Pb, Ag,
Au, Mn

LOCATION-OWNERSHIP

| | | | |
|-----------------|---|------------------|-----------------------------|
| County | Lincoln. | General location | About 1 km south of Pioche. |
| Mining district | Pioche. | Meridian | Mount Diablo. |
| Elevation | 1,890 m. | Tract | Sec. 29, T 1 N, R 67 E. |
| Topography | Hilly. | Latitude | 37°55'06" N. |
| Domain | Mixed. | Longitude | 114°29'01" W. |
| Owner | Kerr-McGee Corp., Oklahoma City, OK (1983). | | |

GEOLOGY

| | | | |
|---|--------------------------------------|--------------------|---|
| Type of ore body | Replacement, fissure vein. | Host formation | Lyndon. |
| Origin | Hydrothermal. | Geologic age | Middle Cambrian. |
| Shape of ore body | Tabular. | Rock relationships | Limestone, replaced by ore, encloses ore. |
| Ore controls | Bedding, faulting. | Host formation | Combined Metal Member of Pioche Shale. |
| Mineralized zone average dimensions, m: | | Geologic age | Lower Cambrian. |
| Length | 2,440. | Rock relationships | Limestone, replaced by ore, encloses ore. |
| Width | 400. | | Shale, lies over ore, lies under ore. |
| Thickness | 10. | Size | Medium. |
| Depth | 300. | | |
| Mineral names | Sphalerite, galena, manganosiderite. | | |

DEVELOPMENT

| | | | |
|--------------------|---|--------------------------|-------------------------------------|
| Current status | Inactive-past producer. | Distance to water supply | On-site. |
| Type of operation | Underground. | Road requirement | None. |
| Mining method | Room and pillar. | Distance to power supply | On-site. |
| Year of discovery | 1864. | Mill location | On-site. ¹ |
| Discovery method | Ore mineral in place. | Mill status | Inactive, standby. |
| Initial production | 1864. | Milling method | Flotation. |
| Last production | 1958. | Process rate | 1,400 t/d. |
| Past production | 2.95 million t sulfide ore averaging 171.4 g/t Ag, 4.5% Pb, and 12% Zn (724). | Product type | Zinc concentrate, lead concentrate. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.²

REFERENCES

| | | |
|------------------------------------|----------------------|---------------------------------------|
| 216, 274, 322, 720, 721, 724, 791. | USGS quad maps | Caliente, 1:250,000. Pioche, 7.5'. |
| | USBM sequence number | 0320170099. |
| | USGS MRDS number | M032004. |

¹Caselton mill is owned by Combined Metals Reduction Corp.²Sulfide ore has been largely exhausted; large quantities of oxidized ore remain.

CROWELL—FLUORINE

Alternate names: Daisy Mine, Fluorspar Mine, Beatty Fluorspar, Betsy Mine

Commodities: CaF₂**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|---|------------------------|--------------------------------------|
| County | Nye. | General location | About 102 km southeast of Goldfield. |
| Mining district | Fluorine. | Meridian | Mount Diablo. |
| Elevation | 1,356 m. | Tract | Sec. 23, T 12 S, R 47 E. |
| Topography | Hilly. | Latitude | 36°52'52" N. |
| Domain | BLM administered. | Longitude | 116°41'40" W. |
| Owner-operator | Crowell Fluorspar Co., Beatty, NV (1984). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|---|
| Type of ore body | Replacement, breccia fill, fissure vein. | Host formation | Nopah. |
| Origin | Hydrothermal. | Geologic age | Upper Cambrian. |
| Shape of ore body | Irregular, pipelike, lenticular. | Rock relationships | Dolomite, replaced by ore. |
| Ore controls | Faulting, lithology | | Limestone, lies along ore, replaced by ore. |
| Strike and dip of mineralized zone. | N 45° E; 88° E. | | Shale, lies along ore. |
| Mineralized zone average dimensions, m: | | Size | Medium. |
| Length | 274. | | |
| Width | 8. | | |
| Thickness | 162. | | |
| Depth | 25. | | |
| Mineral names | Fluorite, cinnabar, calcite, quartz, orthoclase, montmorillonite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|------------------------------|----------|
| Current status | Active-producer. | Distance to water supply ... | <10 km. |
| Type of operation | Underground. | Road requirement | None. |
| Mining method | Open stope. | Distance to power supply ... | On-site. |
| Year of discovery | 1918. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1919. | | |
| Past production | 185,627 t (1919-76). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|---|
| 4, 31, 97, 98, 99, 207, 213, 217, 266, 275, 281, 283, 368, 373, 381, 401, 545, 557, 714, 733, 811, 812, 815, 816. | USGS quad maps | Death Valley, 1:250,000. Bare Mountain, 15'. |
| | USBM sequence number | 0320230001. |
| | USGS MRDS number | W006927. |
| | Mid number | 2600091. |

DAYTON—IRON

Alternate names: Rosetta Mine

Commodities: Fe

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|--------------------------------|
| County | Lyon. | General location | About 36 km southeast of Reno. |
| Mining district | Red Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,370 m. | Tract | Sec. 6, T 17 N, R 23 E. |
| Topography | Rolling. | Latitude | 39°21'56" N. |
| Domain | Private. | Longitude | 119°26'57" W. |
| Owner | Utah International, San Francisco, CA (1966). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|-----------------------------------|
| Type of ore body | Replacement. | Host formation | Metamorphosed sediments. |
| Origin | Contact metasomatic, oxidation. | Geologic age | Triassic. |
| Shape of ore body | Massive. | Rock relationships | Marble, replaced by ore. |
| Ore controls | Lithology, igneous. | | Skarn (tactite), replaced by ore. |
| Mineralized zone average dimensions, m: | | | Hornfels, replaced by ore. |
| Length | 400. | Size | Gneiss, encloses ore, gangue. |
| Width | 150. | | Schist, encloses ore, gangue. |
| Thickness | 150. | | |
| Depth | 5. | | |
| Mineral names | Hematite, limonite, magnetite, pyrite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|---------|
| Current status | Inactive-explored prospect. | Distance to water supply ... | <10 km. |
| Type of operation | Prospect. | Road requirement | None. |
| Mining method | Proposed open pit. | Distance to power supply ... | <10 km. |
| Year of discovery | 1910. | | |
| Discovery method | Test shaft, bedrock sampling. | | |
| Initial production | Unknown. | | |
| Last production | None. | | |
| Past production | A small quantity mined during World War II for ship ballast (454). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|--------------|------|-----------|
| 1..Not reported in reference | 45,000,000 long tons. | 42% Fe | 1971 | 454 |

REFERENCES

| | | |
|--|----------------------------|--------------------------------------|
| 110, 113, 214, 453, 454, 536, 559, 580, 583, 600, 695. | USGS quad maps | Reno, 1:250,000. |
| | USBM sequence number | Churchill Butte, 15'. 0320190060. |

DEE—GOLD

Alternate names: Boulder Creek deposit

Commodities: Au
Ag (not recovered)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|----------------------------------|
| County | Elko. | General location | About 46 km northwest of Carlin. |
| Mining district | Bootstrap. | Meridian | Mount Diablo. |
| Elevation | 1,645 m. | Tract | Sec. 34, T 37 N, R 49 E. |
| Topography | Hilly. | | Sec. 3, T 36 N, R 49 E. |
| Domain | BLM administered. | Latitude | 41°01'28" N. |
| | | Longitude | 118°25'18" W. |
| Owner | Cordex V Syndicate (1984). | | |
| Operator | Dee Gold Mining Co. (Cordex V operational entity) (Dee Gold comprises Rayrock Mines, Inc., Lacana Mining Corp., Dome Exploration Ltd., all of Toronto, ON, Canada; each with 29.3%; J. S. Livermore, 12%. Rayrock will manage the operation for the partnership company). | | |

GEOLOGY

| | | | |
|--|--|--------------------------|---|
| Type of ore body | Disseminated. | Host formation | Vinini (upper plate of Roberts Mountains Thrust Fault). |
| Origin | Hydrothermal. | Rock relationships | Silicic shale and chert, is ore gangue. |
| Shape of ore body | Elongate. | | Jasperoid, near ore, contains some Au. |
| Ore controls | Faults (steep normal). | Alteration | Silicification, pyritization, argillic. |
| Strike and dip of mineralized zone. | East-west: unavailable. | Size | Small. |
| Planned pit average dimensions (approximate), m: | | | |
| Length | 800. | | |
| Width | 800 (at widest point, narrow at each end). | | |
| Pit area | 23 ha (57 acres). | | |
| Mineral names | Free gold (oxidized ore zone). | | |

DEVELOPMENT

| | | | |
|------------------------------|---|--------------------------------|---|
| Current status | Active-producer. | Distance to water supply | On-site wells. |
| Type of operation | Surface. | Road requirement | About 3 km haul access. |
| Mining method | Pit; about 800 t/d ore will be mined; stripping ratio = 7:1. | Distance to power supply | About 9 km to Rossi area. |
| | | Mill location | On-site. |
| Year of discovery | Mid-1970's by Phillip Davis, local prospector. | Mill status | Under construction. |
| Discovery method | Surface outcropping, geochemical, drilling. | Milling methods | Agitated cyanide leach, carbon-in-pulp, electrolysis. |
| | | | Heap leach. |
| Initial production | September-October 1984. | Process rate | 820 t/d. |
| Annual production rate | About 1,200 kg (38,000 tr oz) Au anticipated for first 2 yr, then 1,000 kg/yr (33,000 tr oz) gold thereafter. | Product type | Dore bullion. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|--|------|-----------|
| 1..Not reported in reference | 1,110,000 tons | 0.028 tr oz/ton Au (leach grade) | 1983 | 493 |
| | 2,670,000 tons | 0.115 tr oz/ton Au (milling grade) | 1983 | 493 |
| 2..Probable | 2,670,000 tons | 0.115 tr oz/ton Au | 1984 | 659 |
| | 1,100,000 tons | Heap leach, low grade | 1984 | 659 |

REFERENCES

| | | |
|--|----------------------------|---------------------------|
| 14, 27, 28, 59, 61, 72, 90, 226, 278, 493, 529, 530, 555, 659, 669, 754. | USGS quad maps | McDermitt, 1:250,000. |
| | | Santa Renia Fields, 7.5'. |
| | USBM sequence number | 0320070126. |

Comments: Property adjoins Carlin's Bootstrap Mine and was acquired by Cordex in 1981. Minimum mine life is 8 yr. During 1981 and 1982, about 240 exploratory drill holes were completed in proposed pit area. In late summer and early fall of 1982, 2 pilot-scale heap leach tests were conducted. Silver (high grade) reported tied to silica beneath gold zone. Company reported mine life is 8 yr from 1984.

DODGE-FORD—IRON

Alternate names: Ford Mine, Iron Horse, Iron Colt

Commodities: Fe

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--------------------------------------|------------------------|------------------------------------|
| County | Perabing. | General location | About 25 km southeast of Lovelock. |
| Mining district | Mineral Basin. | Meridian | Mount Diablo. |
| Elevation | 1,262 m. | Tract | Sec. 6, T 25 N, R 34 E. |
| Topography | Gentle. | Latitude | 40°04'10" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 118°12'00" W. |
| Owner | C. W. Hunley, et al (1971). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|-------------------|
| Type of ore body | Replacement, breccia fill, disseminated. | Host formation | Metavolcanics. |
| Origin | Contact metasomatic, hydrothermal. | Geologic age | Upper Jurassic. |
| Shape of ore body | Lenticular, tabular. | Rock relationships | Andesite, gangue. |
| Ore controls | Faulting, igneous. | Size | Diorite, gangue. |
| Mineralized zone average dimensions, m: | | | Medium. |
| Length | 450. | | |
| Width | 300. | | |
| Thickness | 10. | | |
| Depth | 3. | | |
| Mineral names | Magnetite, scapolite, apatite, chlorite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|------------------------------|---------|
| Current status | Inactive-past producer. | Distance to water supply ... | <10 km. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply ... | <50 km. |
| Year of discovery | 1952. | | |
| Discovery method | Ore mineral not in place. | | |
| Initial production | 1954. | | |
| Last production | 1961. | | |
| Past production | 800,000 t prior to 1971 (454). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-----------|----------------------------|--|
| 329, 454. | USGS quad maps | Lovelock, 1:250,000. Buffalo Mountain, 15'. |
| | USBM sequence number | 0820270390. |
| | USGS MRDS number | M060449. |

DRY CANYON—ANTIMONY

Alternate names: Antimony No. 4, Beulah, Bray

Commodities: Sb, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|----------------------|------------------------|----------------------------------|
| County | Lander. | General location | About 13 km southwest of Austin. |
| Mining district | Big Creek. | Meridian | Mount Diablo. |
| Elevation | 2,505 m. | Tract | Sec. 35, T 18 N, R 43 E. |
| Topography | Rugged. | Latitude | 39°22'51" N. |
| Domain | National forest. | Longitude | 117°06'41" W. |
| Owner | Mary J. Bray (1958). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|--------------------------|
| Type of ore body | Fissure vein. | Host formation | Valmy. |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Limestone, encloses ore. |
| Ore controls | Fracturing. | Size | Small. |
| Strike and dip of mineralized zone. | N 35° W: 55° SW. | | |
| Mineralized zone average dimensions, m: | | | |
| Thickness | 0.3. | | |
| Mineral names | Stibnite, pyrite, tetrahedrite, sphalerite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|--------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply | <10 km. |
| Type of operation | Underground. | Road requirement | <50 km. |
| Year of discovery | Unknown. | Distance to power supply | <50 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | Undetermined. | | |
| Last production | 1916-18. | | |
| Past production | 272 t of 55% Sb (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-----------|----------------------------|-------------------------------------|
| 376, 693. | USGS quad maps | Millett, 1:250,000. Austin, 15'. |
| | USBM sequence number | 0320150136. |

Comments: Some production apparently combined with or reported as output from Antimony King (Last Chance) Mine.

EAST NORTHUMBERLAND—BARITE

Alternate names: Bluestone, IMCO Pit, All Minerals, Liesa,
Merry Christmas, Blackstar

Commodities: BaSO₄

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Nye. | General location | About 67 km southeast of Austin. |
| Mining district | Northumberland. | Meridian | Mount Diablo. |
| Elevation | 2,380 m. | Tract | Sec. 5, T 12 N, R 46 E. |
| Topography | Rugged. | Latitude | 38°53'37" N. |
| Domain | National forest. | Longitude | 116°49'30" W. |
| Owner-operator | All Minerals Corp., Murray, UT (1983). | | |

GEOLOGY

| | | | |
|---|-----------------------------|--------------------------|---------------------------|
| Type of ore body | Replacement. | Host formation | Pinecone. |
| Origin | Sedimentation, metamorphic. | Geologic age | Devonian. |
| Shape of ore body | Lenticular, irregular. | Rock relationships | Chert, lies over ore. |
| Ore controls | Bedding, faulting. | | Shale, lies over ore. |
| Strike and dip of mineralized zone. | N 70° E: 10° W. | | Mudstone, lies under ore. |
| Mineralized zone average dimensions, m: | | Size | Medium. |
| Length | 1,500. | | |
| Width | 100. | | |
| Thickness | 15. | | |
| Depth | 15. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|------------------------------|------------------------------|
| Current status | Active-producer. | Distance to water supply ... | <10 km. |
| Type of operation | Surface. | Road requirement | <10 km. |
| Mining method | Open pit. | Distance to power supply ... | On-site generation. |
| | | Mill location | On-site. |
| Year of discovery | 1967. | Mill status | Active. |
| Discovery method | Ore mineral in place. | Milling method | Jigging. |
| | | Process rate | 514 t/d. |
| Initial production | 1975. | Product type | Crude barite. |
| Last production | 1983. | Destination | California, Oklahoma, Texas. |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--|----------------------------|----------------------------|
| 87, 338, 357, 368, 546, 601, 623, 624. | USGS quad maps | Tonopah, 1:250,000. |
| | | Northumberland Pass, 7.5'. |
| | USBM sequence number | 0320230183. |
| | Mid number | 2600847. |

Comments: The deposit occurs as 3 separate ore bodies: Liesa Group, All Minerals Group, and Merry Christmas Group.

EASY MINER—BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|---------------------------------|
| County | Elk. | General location | About 29 km northeast of Wells. |
| Mining district | Snake Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,900 m. | Tract | Secs. 11, 12, T 40 N, R 63 E. |
| Topography | Hilly. | Latitude | 41°21'45" N. |
| Domain | Public and private. | Longitude | 114°48'04" W. |
| Owner-operator | A. W. Arnold and Associates, Houston, TX (1983). | | |

GEOLOGY

| | | | |
|---|------------------------|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Valmy. |
| Origin | Syngenetic-diagenetic. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Chert, overlies ore. Argillite, underlies ore. Chert, underlies ore. |
| Ore controls | Bedding. | Size | Medium. |
| Strike and dip of mineralized zone. | North-south: 30° W. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 120. | | |
| Width | 90. | | |
| Thickness | 30. | | |
| Depth | 0 to 6. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|------------------------------|--|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply ... | On-site (diesel generator). |
| | | Mill location | Mine site. |
| Year of discovery | 1970's. | Mill status | Idle. |
| Discovery method | Geological. | Milling method | Gravity separation. |
| | | Process rate | 1,200 t/d. |
| Initial production | 1980. | Product type | 3.95 sp gr barite-rich rock. |
| Last production | 1982. | Distance shipped | Truck—35 km, then rail either 2,000 km or 3,000 km, depending on market. |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

226, 546, 612, 669, 716.

| | |
|----------------------------|--------------------------------------|
| USGS quad maps | Wells, 1:250,000. Melandco, 7.5'. |
| USBM sequence number | 0320070887. |
| Mid number | 2601687. |

EMERSON—TUNGSTEN

Alternate names: Tempiute, Tem Piute, Lincoln, Wah Chang Tungsten Mine
North Tempiute, South Thumb

Commodities: W, Mo, Zn,
CaF₂, U

LOCATION-OWNERSHIP

| | | | |
|-----------------|--|------------------|-------------------------------|
| County | Lincoln | General location | About 99 km west of Caliente. |
| Mining district | Tem Piute. | Meridian | Mount Diablo. |
| Elevation | 2,013 m. | Tract | Sec. 36, T 3 S, R 56 E. |
| Topography | Rugged. | Latitude | 37°38'28" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 115°37'49" W. |
| Owner | Teledyne, Inc., Los Angeles, CA, 75%; North Tempiute Mining and Development, Hiko, NV, 25% (1981). | | |
| Operator | Union Carbide Corp., Mining and Metals Div., Alamo, NV (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------|---|
| Type of ore body | Replacement, disseminated, shear zone. | Host formation | Guilmette. |
| Origin | Contact metasomatic, hydrothermal. | Geologic age | Mississippian. |
| Shape of ore body | Irregular. | Rock relationships | Limestone, replaced by ore, lies along ore. |
| Ore controls | Contact zone, lithology. | | Hornfels, near ore. |
| Strike and dip of mineralized zone. | N 40° E: 60° W. | | Quartzite, near ore. |
| Mineralized zone average dimensions, m: | | | Marble, lies along ore. |
| Length | 2,000. | Size | Skarn (tactite), is ore, gangue. |
| Width | 500. | | Large. |
| Thickness | 15. | | |
| Depth | 0. | | |
| Mineral names | Scapolite, tremolite, muscovite, magnetite, bismuth, scheelite, sphalerite, fluorite, molybdenite, garnet, pyrite, pyrrhotite. | | |

DEVELOPMENT

| | | | |
|--------------------|--|--------------------------|------------------------------|
| Current status | Active-standby. | Distance to water supply | On-site. |
| Type of operation | Surface-underground. | Road requirement | None. |
| Mining method | Shrinkage stoping, open pit. | Distance to power supply | On-site. |
| Year of discovery | 1916. | Mill location | On-site. |
| Discovery method | Ore mineral in place. | Mill status | Inactive. |
| Initial production | 1937. | Milling method | Scheelite flotation. |
| Last production | 1981. | Product type | WO ₃ concentrate. |
| Past production | Several million kilograms of tungsten metal recovered. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------|--|
| 52, 69, 137, 231, 271, 343, 553, 724, 738, 800, 843, 848. | USGS quad maps | Caliente, 1:250,000. Tempiute Mountain, 15' |
| | USBM sequence number | 0320170012. |
| | USGS MRDS number | M030087. |
| | Mid number | 2600340. |

ENFIELD BELL—GOLD

Alternate names: Bell, Jerritt Canyon, Freeport Gold

Commodities: Au

Ore body names: Marlboro Canyon, Alchem, North Generator Hill,
Lower Generator Hill, West Generator Hill

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--|
| County | Elko. | General location | About 80 km northwest of Elko. |
| Mining district | Jerritt Canyon. | Meridian | Mount Diablo. |
| Elevation | 1,825 m. | Tract | Secs. 33, 34, 35, T 41 N, R 54 E; Sec. 3, T 40 N, R 54 E. |
| Topography | Rugged. | Latitude | 41°23'44" N. |
| Domain | National forest (mine); BLM administered (mill); private. | Longitude | 115°59'39" W. |
| Owner | Freeport Gold Co., New York, NY (70%) (subsidiary of Freeport-McMoran, Inc., New York, NY); FMC Gold, Inc., Chicago, IL (30%) (1985). | | |
| Operator | Freeport Gold Co. (1985). | | |

GEOLOGY

| | | | | |
|--|---|----------------------|--------------------------|--|
| Type of ore body | Disseminated, stratiform, replacement. | | Host formations | Hansen Creek (primary); Roberts Mountains (basal 60 m). |
| Origin | Hydrothermal, oxidation. | | Geologic age | Upper Ordovician. |
| Shape of ore body | Tabular, elongate. | | Rock relationships | Lower Silurian. Hansen Creek: Chert carbonate, jasperoid, lies under ore, lies over ore. Dolomite, above ore. Carbonaceous banded limestone, is ore, lies along ore, gangue. Bioclastic limestone, under ore. |
| Ore controls | Faults, fractures, lithology. | | Alteration | Roberts Mountains: Dolomite, lies above ore. Calcareous siltstone, encloses ore, is ore, gangue. |
| Strike and dip of mineralized zone. | Unknown. | | Size | Medium. |
| Age of mineralization ... | Mid-Tertiary. | | | |
| Ore body dimensions (approximate), m: | | | | |
| Length | Marlboro | Otherfour ore bodies | | |
| Width | 1,220. | 230 to 760. | | |
| Thickness | 120. | 60 to 120. | | |
| Mineral names | 110. | Unknown. | | |
| | Gold (free), gold (tied to organics), pyrite, realgar, orpiment, arsenopyrite, cinnabar, stibnite, barite, calcite, quartz. | | | |

DEVELOPMENT

| | | | |
|------------------------------|--|--------------------------------|--|
| Current status | Producer-active. | Distance to water supply | 3 km to deep wells. |
| Type of operation | Surface. | Road requirement | 10 km paved plant access. |
| Mining method | Open pit, multiple bench, about 4,400 t/d ore, 23,000 t/d waste; stripping ratio = 7.9:1. | Distance to power supply | 26 km, 120 kV. |
| Year of discovery | 1971 (anomaly), 1973 (Alchem ore body); 1976 (Marlboro Canyon). | Mill location | 13 km east of mine (truck). |
| Discovery method | Geochemical, geologic inference, drilling. | Mill status | Active. |
| Initial production | July 1981. | Milling method | Agitated cyanide leach (pretreatment of carbonaceous ore by preoxidation chlorination); carbon-in-pulp; zinc precipitation; electrolysis. |
| Past production | 426 kg Au (13,700 tr oz) in sales, (1981) (316). >6,100 kg (196,000 tr oz) Au (1982) (435). 8,150 kg (262,000 tr oz) Au forecast (1984) (418). | Process rate | 3,040 t/d (3,350 ton/d); original capacity was 2,490 t/d (50% of capacity oxide circuit, 50% carbonaceous circuit). |
| Annual production rate | 6,000 kg (200,000 tr oz) dore annual rated capacity (435). | Product type | Dore bullion bars (about 34 kg each). |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------|-----------------------|--------------------------|------|-----------|
| 1. Proven and probable | 11,614,000 tons | 0.233 tr oz/ton Au | 1983 | 551 |
| 2. Do | 13,700,000 tons | 0.205 tr oz/ton Au | 1984 | 313 |

REFERENCES

| | | |
|---|----------------------------|---|
| 53, 61, 85, 90, 116, 173, 190, 224, 226, 253, 254, 278, 297, 299, 302, 306, 313, 316, 336, 344, 346, 348, 376, 378, 415, 418, 423, 430, 435, 479, 551, 599, 612, 616, 669, 688, 692, 730, 773, 839. | USGS quad maps | Wells, 1:250,000. California Mountain, 7.5'. |
| | USBM sequence number | 0320070879. |
| | Mid number | 2601620. |

Comments: Mineral zone is in lower plate of Roberts Mountains Thrust Fault. Ore is carbonaceous (50%) and oxide (50%) requiring segregation during milling. Area of 5 ore bodies measures about 1,200 m by 3,300 m, and about 100 m thick.

FANNIE RYAN—MANGANESE

Alternate names: None

Commodities: Mn

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-------------------------------------|
| County | Clark. | General location | About 24 km southeast of Las Vegas. |
| Mining district | Las Vegas. | Meridian | Mount Diablo. |
| Elevation | 610 m. | Tract | Sec. 36, T 21 S, R 63 E. |
| Topography | Rolling. | Latitude | 36°05'06" N. |
| Domain | BLM administered. | Longitude | 114°53'27" W. |
| Owner | United States (managed by BLM) (1980). | | |

GEOLOGY

| | | | |
|---|------------------------------|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Muddy Creek. ¹ |
| Origin | Hydrothermal, sedimentation. | Geologic age | Pliocene. |
| Shape of ore body | Tabular. | Rock relationships | Gypsiferous sandstone, encloses ore, lies over ore. |
| Ore controls | Lithology, faulting. | | Gravel, lies over ore. |
| Strike and dip of mineralized zone. | N 55° E: 30° W. | Size | Small. |
| Mineralized zone average dimensions, m: | | | |
| Length | 300. | | |
| Width | 176. | | |
| Thickness | 3.7. | | |
| Depth | 25. | | |
| Mineral names | Wad. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply ... | <3 km. |
| Type of operation | Possible surface. | Road requirement | <10 km. |
| Year of discovery | 1941. | Distance to power supply ... | <10 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES^a

| Class | Quantity | Grade | Year | Reference |
|--------------------|-------------------|---|------|-----------|
| 1.. Measured | 900 tons | Average: 17.2% Mn; cutoff: 15% Mn | 1949 | 407 |
| 2.. Do | 1,720 tons | Average: 15.7% Mn; cutoff: 12% Mn | 1949 | 407 |
| 3.. Do | 2,380 tons | Average: 14.3% Mn; cutoff: 10% Mn | 1949 | 407 |
| 4.. Do | 3,960 tons | Average: 12.6% Mn; cutoff: 8% Mn | 1949 | 407 |
| 5.. Do | 25,800 tons | Average: 7.6% Mn; cutoff: 5% Mn | 1949 | 407 |

REFERENCES

| | | |
|--------------------------|----------------------------|---|
| 354, 386, 407, 547, 721. | USGS quad maps | Las Vegas, 1:250,000. Henderson, 7.5'. |
| | USBM sequence number | 0320030008. |
| | USGS MRDS number | M031084. |

¹Manganiferous zone consists of 3 beds ranging 0.76 to 2.5 m thick.^aTonnages are cumulative.

FENCEMAKER—ANTIMONY

Alternate names: Fenstonmaker, Lucky Lode, S & W

Commodities: Sb

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------|
| County | Pershing. | General location | About 53 km east of Lovelock. |
| Mining district | Table Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,800 m. | Tract | Sec. 31, T 26 N, R 37 E. |
| Topography | Rolling. | Latitude | 40°04'19" N. |
| Domain | BLM administered. | Longitude | 117°51'26" W. |
| Owner | Silver Bell Mining and Developing, Inc., Lovelock, NV (1989). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Shear zone, replacement, disseminated. | Host formation | Boyer Ranch. |
| Origin | Hydrothermal. | Geologic age | Middle Jurassic. |
| Shape of ore body | Irregular, tabular. | Rock relationships | Limestone, encloses ore, replaced by ore. |
| Ore controls | Fracturing, faulting. | | Shale, lies over ore, lies under ore |
| Strike and dip of mineralized zone. | N 30° E; 30° E. | Size | Medium. |
| Mineralized zone average dimensions, m: | | | |
| Length | 25. | | |
| Width | 4. | | |
| Thickness | 13. | | |
| Depth | 7. | | |
| Mineral names | Stibnite, cinnabar, chalcopyrite, silver, gold, calcite, quartz. | | |

DEVELOPMENT

| | | | |
|--------------------------|------------------------|------------------------------|----------|
| Current status | Past producer-standby. | Distance to water supply ... | On-site. |
| Type of operation | Underground. | Road requirement | None. |
| Mining method | Open stope. | Distance to power supply ... | On-site. |
| | | Mill locaton | On-site. |
| Year of discovery | 1880. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1880. | | |
| Last production | 1982. | | |
| Past production | 1 t Sb metal (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

29, 68, 329, 376, 381, 464, 541, 671, 672.

| | |
|----------------------------|--|
| USGS quad maps | Winnemucca, 1:250,000. Fencemaker, 15'. |
| USBM sequence number | 0320270414. |
| USGS MRDS number | M055423. |
| Mid number | 2601650. |

FISH CREEK—BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|------------------------------|
| County | Elko. | General location | About 27 km north of Carlin. |
| Mining district | Swales Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,950 m. | Tract | Sec. 2, T 35 N, R 52 E. |
| Topography | Hilly. | Latitude | 40°57'10" N. |
| Domain | Mixed. | Longitude | 116°06'15" W. |
| Owner | Maggie Creek Ranch Co., Elko, NV; New Park Resources, Inc., Metairie, LA (1983). | | |

GEOLOGY

| | | | |
|---|------------------------------|--------------------------|-----------------------------|
| Type of ore body | Sedimentary. | Host formation | Vinini. |
| Origin | Sedimentation. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Chert, encloses ore. |
| Ore controls | Bedding. | | Siltstone, replaced by ore. |
| Strike and dip of mineralized zone. | N 50° to 60°E: 10° to 20° W. | | Sandstone, lies over ore. |
| Mineralized zone average dimensions, m: | | Size | Large. |
| Length | 2,100. | | |
| Width | 300. | | |
| Thickness | 15. | | |
| Depth | 1. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|----------|
| Current status | Inactive-explored (extensively drilled). | Distance to water supply ... | <30 km. |
| Type of operation | Possible surface. | Road requirement | <10 km. |
| Year of discovery | 1955. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-----------------------------------|----------------------------|------------------------|
| 87, 185, 226, 283, 349, 546, 669. | USGS quad maps | Winnemucca, 1:250,000. |
| | | Swales Mountain, 7.5'. |
| | USBM sequence number | 0320070901. |

GARNET-TENNESSEE MOUNTAIN—TUNGSTEN

Alternate names: Knowles Bros. Tungsten Claims, Tennessee Mountain Mine,
Tennessee Mountain, Garnet Tungsten, Garnet

Commodities: W, Mo

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|------------------------------------|
| County | Elko. | General location | About 24 km east of Mountain City. |
| Mining district | Alder. | Meridian | Mount Diablo. |
| Elevation | 2,438 m. | Tract | Sec. 17, T 45 N, R 56 E. |
| Topography | Rugged. | Latitude | 41°47'41" N. |
| Domain | National forest. | Longitude | 115°40'25" W. |
| Owner | Knowles Bros., 50%; P. D. Montrose, 50% (1981). | | |
| Operator | PAB Oil and Mining (1981). | | |

GEOLOGY

| | | | |
|---|---|-------------------------|---|
| Type of ore body | Replacement. | Host formation | Tennessee Mountain. |
| Origin | Contact metasomatic, metamorphism. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationship | Limestone, encloses ore, replaced by ore. |
| Ore controls | Contact zone, igneous. | | Shale, encloses ore, replaced by ore. |
| Strike and dip of mineralized zone. | N 50° W: 55° S. | | Skarn (tactite), replaced by ore. |
| Mineralized zone average dimensions, m: | | Size | Hornfels, replaced by ore. |
| Length | 335. | | Medium. |
| Width | 53. | | |
| Thickness | 8. | | |
| Depth | 53. | | |
| Mineral names | Scheelite, powellite, molybdenite, pyrite, chalcocopyrite, magnetite, garnet, uraninite, chlorite, epidote. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Underground. | Road requirement | None. |
| Mining method | Sublevel. | Distance to power supply ... | >100 km. |
| Year of discovery | 1949. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1970. | | |
| Last production | 1977. | | |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

| <i>Class</i> | <i>Quantity</i> | <i>Grade</i> | <i>Year</i> | <i>Reference</i> |
|------------------------------------|--------------------|-----------------------------|-------------|------------------|
| 1. Not reported in reference | 396,000 tons | 0.42% WO ₃ | 1977 | 526, 527 |

REFERENCES

| | | |
|---|----------------------------|-------------------|
| 70, 91, 139, 154, 226, 278, 526, 527, 669, 733. | USGS quad maps | Wells, 1:250,000. |
| | | Rowland, 15'. |
| | USBM sequence number | 0320070011. |
| | USGS MRDS number | D001177. |

GETCHELL—GOLD

Alternate names: None

Commodities: Au, Ag, W,
As

LOCATION-OWNERSHIP

| | | | |
|-----------------|--------------------------------------|------------------|--------------------------------------|
| County | Humboldt. | General location | About 70 km northeast of Winnemucca. |
| Mining district | Potosi. | Meridian | Mount Diablo. |
| Elevation | 1,707 m. | Tract | Sec. 33, T 39 N, R 42 E. |
| Topography | Hilly. | Latitude | 41°12'59" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 117°15'23" W. |

Owner: FRM Minerals, Inc., Denver, CO (subsidiary of First Mississippi Corp., Jackson, MS) (1984).

GEOLOGY

| | | | |
|---|---|--------------------|--|
| Type of ore body | Disseminated, replacement. | Host formation | Preble. |
| Origin | Hydrothermal. | Geologic age | Cambrian. |
| Shape of ore body | Sheetlike, irregular. | Rock relationships | Gouge (quartz, carbon, clay), is ore, encloses ore, gangue. |
| Ore controls | Faulting, fracturing, folding, lithology. | | Argillite, sheared and replaced by gouge, ore in fractures, gangue. |
| Strike and dip of mineralized zone. | N 25° W: 45° to 90° E. | | Arenaceous limestone, sheared and replaced by gouge, ore in fractures, gangue. |
| Age of mineralization | Cretaceous to Miocene (90 million yr). | | Shale, lies over ore, lies under ore. |
| Mineralized zone average dimensions, m: | | | Granodiorite and dacite porphyry dikes, near ore. |
| Length | >2,100. | Alteration | Silicification, decarbonatization. |
| Width | 1,000 (downdip). | Size | Small. |
| Thickness | 12 (assay walls). | | |
| Mineral names | Native gold, quartz (Au), carbon (Au), pyrite (Au), arsenopyrite (Au), calcite, kaolinite, chlorite, realgar, orpiment, cinnabar, stibnite, chalcopyrite, sphalerite, marcasite, magnetite, barite, fluorite, chabasite, getchellite, galkhaite, scheelite. | | |

DEVELOPMENT

| | | | |
|--------------------|---|--------------------------|---|
| Current status | Active-past producer, exploration. | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | Existing. |
| Mining method | Open pit; tailings and dump recovery was being planned by Conoco (see comments). | Distance to power supply | Existing. |
| | | Mill location | On-site. |
| | | Mill status | Active (1983). |
| Year of discovery | 1934. | Milling method | Tailings test-cyanide leach tank, carbon columns. |
| Discovery method | Ore mineral in place. | Process rate | 91 t/d. |
| Initial production | 1938. | | |
| Last production | 1967. | | |
| Past production | 12,069 kg (398,033 tr oz) Au (1938-50); no production in 1946-47 (44). 1,916,910 t (2,113,030 tons), 9.29 g/t (0.271 tr oz/ton) Au (1962-67) (44). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------|-----------------------------|------------------------------------|------|-----------|
| 1. Not reported in reference | 3,200,000 tons | 0.3 tr oz/ton Au; 0.1 tr oz/ton Ag | 1982 | 690 |
| 2. Do | 3,250,000 tons | 0.18 tr oz/ton Au | 1982 | 61 |
| Possible | 10,000,000 tons | 0.16 tr oz/ton Au | 1982 | 61 |
| 3. Proven | 1,400,000 tons | 0.22 tr oz/t Au | 1983 | 84 |
| 4. Not reported in reference | >750,000 tr oz ¹ | Not applicable | 1983 | 201 |

REFERENCES

| | | |
|---|----------------------|-----------------------|
| 43, 44, 45, 47, 61, 67, 79, 81, 84, 174, 201, 232, 242, 243, 269, 270, 285, 292, 308, 334, 335, 336, 364, 425, 616, 628, 656, 690, 702, 773, 801, 807, 808. | USGS quad maps | McDermitt, 1:250,000. |
| | USBM sequence number | Osgood Mountains, 15' |
| | USGS MRDS number | M030027. |
| | Mid number | 2601801. |

Comments: Gold mineralization has also been observed on the Village Fault, located 300 m east of the Getchell Fault described above. Conoco, Inc. sold the property in 1983. Plans were to dewater and explore the 3 existing pits beginning in mid-1983. Two phases of development were planned: Phase I—heap leaching existing tailings and old mine waste material from 1983 to 1994; Phase II—open pit mining with associated milling operations. Construction was to start in late 1985, with production commencing 1 yr later.

¹Company reports "reserves appear to exceed" troy ounce total.

GIBELLINI—MANGANESE

Alternate names: Niganz Manganese-Nickel, Black Iron

Commodities: Mn, Ni, Zn

LOCATION-OWNERSHIP

| | | | |
|-----------------------|-------------------------|------------------------|------------------------------|
| County | Eureka. | General location | About 27 km south of Eureka. |
| Mining district | Fish Creek. | Meridian | Mount Diablo. |
| Elevation | 2,103 m. | Tract | Sec. 35, T 16 N, R 52 E. |
| Topography | Hilly. | Latitude | 39° 12' 30" N. |
| Domain | BLM administered. | Longitude | 116° 05' 23" W. |
| Owner | Louis Gibellini (1976). | | |

GEOLOGY

| | | | |
|---|----------------------------|--------------------------|---|
| Type of ore body | Shear zone, replacement. | Host formation | Vinini. |
| Origin | Hydrothermal, replacement. | Geologic age | Lower Devonian. |
| Shape of ore body | Pipelike, massive. | Rock relationships | Limestone, ore in fractures. |
| Ore controls | Fracturing, faulting. | | Sandstone, lies along ore, lies over ore. |
| Strike and dip of mineralized zone. | N 70° E: 30° W. | | Shale, near ore, lies along ore. |
| Mineralized zone average dimensions, m: | | | Chert, near ore, lies along ore. |
| Length | 50. | Size | Quartzite, near ore, lies along ore. |
| Width | 30. | | Small. |
| Thickness | 20. | | |
| Depth | 10. | | |
| Mineral names | Psilomelane, pyrolusite. | | |

DEVELOPMENT

| | | | |
|-------------------------|---|--------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply | <3 km. |
| Type of operation | Surface, underground. | Road requirement | None. |
| Year of discovery | 1942. | Distance to power supply | <100 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Past production | No production; 2 car lots shipped in 1953 for testing, averaged 31.7% Mn (721). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---------------|----------------------------|-----------------------|
| 51, 593, 721. | USGS quad maps | Millett, 1:250,000. |
| | | Cockalorum Wash, 15'. |
| | USBM sequence number | 0320110006. |
| | USGS MRDS number | W000698. |

Comments: The manganese-rich material contains equal amounts of pyrolusite and psilomelane; it also contains appreciable amounts of zinc, nickel, and minor amounts of cobalt, copper, vanadium, and molybdenum. An analysis of a metallurgical sample revealed the following in percent (51):

| | | | | | | | | | | | | |
|------|-----|-----|-----|-----|------|------|-------------------------------|-----|-----|-----|-------|--------------------------------|
| Mn | Fe | Ni | Co | Zn | Cu | Mo | V ₂ O ₅ | Ba | CaO | S | Insol | Al ₂ O ₃ |
| 18.5 | 3.0 | 1.7 | 0.3 | 3.2 | 0.12 | 0.11 | 0.88 | 3.7 | 2.3 | 0.2 | 41.6 | 6.0 |

GOLD QUARRY—GOLD

Alternate names: None

Commodities: Au, Hg

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|---|
| County | Eureka. | General location | About 23 km south-southeast of Carlin Mine. |
| Mining district | Maggie Creek. | Meridian | Mount Diablo. |
| Elevation | 1,658 m. | Tract | Sec. 34, 35, T 84 N, R 51 E. |
| Topography | Hilly. | Latitude | 40°47'27" N. |
| Domain | Private, private lease, BLM administered. | Longitude | 116°13'00" W. |
| Owner | Newmont Mining Corp., New York, NY (1985). | | |
| Operator | Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp.) (1985). | | |

GEOLOGY

| | | | |
|---|--------------------|--------------------------|---|
| Type of ore body | Disseminated. | Host formation | Vinini (upper plate of Roberts Mountains Thrust Fault). |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Pipelike. | Rock relationships | Cherts, contains ore in shears and fractures, gangue. |
| Ore controls | Faults; lithology. | | Quartzites, contains ore in shears and fractures, gangue. |
| Mineralized zone average dimensions (estimated), m: | | | Siltstones, probable host of new discovery. |
| Length | 620. | | Carbonates, probable host of new discovery. |
| Width | 460. | Alteration | Silicification (jasperoid), argillic. |
| Mineral names | Native gold. | Size | Large. |

DEVELOPMENT

| | | | |
|---------------------------|--|----------------------|--|
| Current status | Active-development, construction. | Mill location | On-site probable. |
| Type of operation | Surface. | Mill status | Development. |
| Mining method | Open pit; will mine about 2.3 million t/a ore. | Milling method | Cyanide heap leach and cyanide agitated leach, carbon-in-pulp gold recovery. |
| Year of discovery | 1977 (new). | Process rate | 6,120 t/d (6,750 ton/d) ore. |
| Discovery method | Geological inference, drilling. | Product type | Dore bars and byproduct Hg. |
| Initial production | 1936; by Newmont from full-scale test heap leach (about 1982-83); mill production scheduled to commence August 1985. | | |
| Past production | 54.1 t (59.7 tons), 14.3 g/t (0.417 tr oz/ton) Au, 30.2 g/t (0.88 tr oz/ton) Ag (1936) (593). | | |
| | 1,314 kg (42,230 tr oz) from 886,202 t (976,871 tons) ore from test heap leach (1983) (511). | | |
| Annual production rate .. | 5,300 kg Au (170,000 tr oz) anticipated beginning August 1985. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|-------------------------------|------------------------|---|------|-----------|
| 1.. Proven and probable | 45,000,000 tons | 0.078 tr oz ton/Au (high grade) | 1983 | 511 |
| | 89,000,000 tons | 0.032 tr oz ton/Au (low grade, stripping ratio 1.6:1) | 1983 | 511 |
| | 49,000,000 tons | 0.029 tr oz ton/Au (unrecoverable) | 1983 | 511 |
| Total | 183,000,000 tons | 0.043 tr oz ton/Au (recoverable and unrecoverable) | 1983 | 511 |

REFERENCES

| | | |
|--|----------------------------|---|
| 27, 90, 116, 134, 184, 224, 237, 319, 435, 505, 507, 511, 514, 593, 834. | USGS quad maps | Winnemucca, 1:250,000. Schroeder Mountain, 7.5'. |
| | USBM sequence number | 0320110219. |
| | Mid number | 2601635. |

Comments: Mine-mill construction began in the spring of 1984. Newmont pays royalties of 18% on 87.5% of the mineral rights held by Ash and Thornton. Geology and ore characteristics are reported much the same as at Carlin. In 1982, full-scale heap leaching and milling tests were conducted. Total recoverable high- and low-grade 1983 proven and probable reserves is 134 million tons, 0.048 tr oz/ton Au.

GOLDFIELD—GOLD

Alternate names: Goldfield Project, Pacific Gold and Uranium,
Goldfield Consolidated Main Vein

Commodities: Au, Ag
(Au-Ag ratio about 3:1)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Emeralda. | General location | About 40 km south of Tonopah. |
| Mining district | Goldfield. | Meridian | Mount Diablo. |
| Elevation | 1,720 m. | Tract | Secs. 25, 26, 36, T 2 S, R 42 E. |
| Topography | Hilly-mountainous. | Latitude | 37°43'30" N. |
| Domain | Patented claims. | Longitude | 117°13'11" W. |
| Owner | Davis Goldfield Mining Co. (receives 7.5% net royalty increasing to 10%) (1983). | | |
| Lessees | Southern Pacific Land Co., San Francisco, CA, 50%; Noranda Exploration, Inc., Toronto, ON, Canada, 25%; Pacific Gold and Uranium, Inc. (PG & U), Los Angeles, CA 25% (1983). | | |
| Operator | Blackhawk Mines Corp. (1984). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|--|
| Type of ore body | Vein systems, replacement. | Host formations | Porphyritic Rhyodacite. |
| Origin | Hydrothermal. | | Quartz Latite flows and tuffs (Kendall Tuff). |
| Shape of ore bodies | Variable-pipes, lenticular, tabular. | Geologic ages | Lower Miocene. |
| Ore controls | Faults, fractures. | | Oligocene. |
| Strike and dip of mineralized zone. | North: 30° to 40° E. | Rock relationships | Silicified porphyritic rhyodacite, portions are ore, encloses ore (major host). |
| Age of mineralization | Miocene. | | Porphyritic rhyodacite, gangue. |
| Proposed pit average dimensions (estimated), m: | | | Silicified quartz latite, portions are ore, encloses ore. |
| Length | 460. | | Quartz latite, gangue. |
| Width | 45. | | Siliceous shale and argillite, lies beneath ore (Ordovician Palmetto Formation). |
| Thickness | 30. | | Quartz monzonite, lies beneath ore (Tertiary). |
| Mineral names | Native gold, famatinite, tetrahedrite-tennantite, bismuthinite, goldfieldite, chalcopyrite, galena, sphalerite, sylvanite, hessite, petzite, calaverite, pyrite, quartz, jasperoid, limonite, halloysite, gypsum. | Alteration | Highly bleached and altered—advanced argillization, alunitization, silicification. |
| | | Size | Small. |

DEVELOPMENT

| | | | |
|------------------------------|---|--------------------------------|---|
| Current status | Active-developing. | Distance to water supply | Two 300-gpm wells near plant site. |
| Type of operation | Surface. | Road requirement | 2.4 km (improvement). |
| Mining method | Open pit (shallow). | Distance to power supply | 3.2 km. |
| | | Mill location | Near mine. |
| Year of discovery | 1902 (district); 1981 (option acquired by Noranda and PG & U). | Mill status | Development. |
| Discovery method | Recent drilling. | Milling method | Anticipated agglomerated cyanide heap leach; zinc precipitation or carbon absorption. |
| Initial production | Anticipated fourth quarter 1984. | Process rate | About 1,100 t/d ore. |
| Last production | Unknown. | | |
| Past production | District—130,328 kg Au; 45,107 kg Ag; 3,479 t Cu; 23 t Pb from 7,021,750 t ore (1903-60). 1948-51 production withheld (\$). | | |
| Annual production rate | About 270,000 t ore. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|--------------------------|------|-----------|
| 1. Not reported in reference | 500,000 tons | 0.07 tr oz/ton Au | 1980 | 162 |
| 2. Proven | 2,115,000 tons | 0.070 tr oz/ton Au | 1984 | 502 |

REFERENCES

| | | |
|---|----------------------------|--------------------------------|
| 7, 8, 19, 20, 21, 22, 23, 24, 162, 208, 209, 246, 325, 340, 497, 502, 576, 627, 631, 632, 703, 809. | USGS quad maps | Goldfield, 1:250,000. |
| | USBM sequence number | Goldfield, 15'. 0320090415. |

Comments: Specific geology of the proposed pit area was not available. Geologic data describe the area of the district that will host the proposed development work. Reserve tonnage reported from 3 discrete ore bodies along Goldfield ledge. Reserve cutoff grade is 0.020 tr oz/ton Au.

GOLDSTRIKE—GOLD

Ore body names: Long Lac deposit, Bazza (past open pits: Goldstrike No. 6, Goldstrike No. 9, Pan Cana No. 1, E. P. No. 1, E. P. No. 2)

Commodities: Au, Ag
(Au-Ag ratio = 20:1)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--|
| County | Eureka. | General location | About 38 km northwest of Carlin. |
| Mining district | Lynn. | Meridian | Mount Diablo. |
| Elevation | 1,700 m. | Tract | Sec. 30, T 36 N, R 50 E. Sec. 24, T 36 N, R 49 E. |
| Topography | Hilly. | Latitude | 40°58'12" N. |
| Domain | BLM administered. | Longitude | 116°21'55" W. |
| Operator | Western States Minerals Corp., Wheat Ridge, CO (in a joint venture partnership with Pan Cana Industries) (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|--|
| Type of ore body | Disseminated. | Host formation | Vinini Formation (most favorable); skarn, latite, dike, granodiorite. |
| Origin | Hydrothermal. | Geologic age | Ordovician (Vinini). |
| Shape of ore body | Tabular to elongated lensoid. | Rock relationships | Argillites (carbonaceous), fractures contain ore. Shales (sometimes carbonaceous), fractures contain ore. Siltstone, fractures contain ore. Quartzite (minor), near ore, gangue. Chert (minor), near ore, gangue. Limestone (rare), gangue. Granodiorite-to-diorite stock, contains ore (Early Cretaceous). Quartz latite and latite dikes, contains ore. Skarn (xenoliths in diorite stock), contains ore. Jasperoid, above ore, near ore. |
| Ore controls | Faulting, fracturing-brecciation, lithology. | Alteration | Silicification, argillic, sericite. |
| Strike of mineralized zone. | N 55° W. | Size | Small. |
| Age of mineralization ... | Cretaceous (78 million yr). | | |
| Mineralized area average dimensions (estimated), m: | | | |
| Length | 2,100. | | |
| Width | 1,400. | | |
| Thickness | 75 to 170. | | |
| Depth | 10. | | |
| Principal minerals | Pyrite (auriferous), marcasite (auriferous), quartz, sericite, kaolinite, montmorillonite, goethite. | | |
| Other | Chalcopyrite, scheelite, hematite, garnet, diopside, tremolite, calcite, barite, jarosite, variscite, chalcedony, alunite, stibnite, aragonite, realgar, orpiment, arsenopyrite, sphalerite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------------|------------------------|-----------------------------|
| Current status | Active-producer. | Road requirement | None, existing to the site. |
| Type of operation | Surface. | Mill location | On-site. |
| Mining method | Open pit. | Mill status | Active. |
| Initial production | 1976-77 (by Pan Cana Industries). | Milling method | Cyanide heap leach. |
| Past production | About 230 kg Au (1979) (132). | Process rate | Unknown. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-------------------------------|----------------------------|---|
| 132, 182, 183, 460, 593, 690. | USGS quad maps | Elko, 1:250,000. Rodeo Creek NE, 7.5'. |
| | USBM sequence number | 0320110168. |
| | Mid number | 2601089. |

Comments: Best mineralization occurs at intersection of high-angle structures and following low-angle structures. About 4 to 5 areas or zones of gold mineralization occur in the mine area. Northwest-trending high-angle faults (pre-mineral) have dominant control over mineralization. Individual mineral zones are 60 to 300 m in length with northwest elongation and 15 to 60 m in width. Both oxide and unoxidized ore exists. Oxide ore is known to exist up to 90 m in depth. Unoxidized sulfide ore has been as shallow as 20 m.

GOOSEBERRY—SILVER

Alternate names: Gooseberry Claims, Red Top Claims

Commodities: Ag, Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|---------------------------|
| County | Storey. | General location | About 24 km east of Reno. |
| Mining district | Unorganized. | Meridian | Mount Diablo. |
| Elevation | 1,646 m. | Tract | Sec. 25, T 19 N, R 22 E. |
| Topography | Rugged. | Latitude | 39°29'03" N. |
| Domain | Mixed, private (patented claims); BLM administered (unpatented claims). | Longitude | 119°27'52" W. |
| Owner-operator | Asamera Minerals (U.S.), Inc., Reno, NV (subsidiary of Asamera, Inc., Calgary, AB, Canada), 75% (1984). | | |
| Owner | Ican Resources Ltd., Vancouver, BC, Canada, 25% (1984). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|--|
| Type of ore body | Fissure vein, shear zone, disseminated. | Host formation | Kate Peak. |
| Origin | Hydrothermal. | Geologic age | Miocene. |
| Shape of ore body | Tabular. | Rock relationships | Dacite porphyry, ore in veins and fractures, gangue. |
| Ore controls | Faulting, fracturing. | | Rhyodacite, ore in veins and fractures, gangue. |
| Strike and dip of mineralized zone | N 20° W; 80° S. | | Flow breccia, near ore. |
| Age of mineralization | Tertiary. | | Calcite-quartz-adularia vein, contains ore, gangue. |
| Vein average dimensions, m: | | | Granodiorite, near ore. |
| Length | >900. | Alteration | Propylitic, argillic. |
| Width | >440 (downdip). | Size | Small. |
| Thickness | 2.5. | | |
| Mineral names | Electrum, argentite, native gold and silver, pyrite, stephanite, minor galena, chalcopyrite, sphalerite, calcite, quartz, adularia. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|--------------------------------|---|
| Current status | Active-producer. ¹ | Distance to water supply | 11 km, pumped from river. |
| Type of operation | Underground. | Road requirement | Existing. |
| Mining method | Cut-and-fill stoping (by yearend 1983, 25% of mill feed will be drawn by shrinkage stoping). | Distance to power supply | On-site. |
| | | Mill location | On-site. |
| | | Mill status | Active. |
| | | Milling method | Flotation, cyanidation of concentrate, Merrill-Crowe zinc dust precipitation. |
| Year of discovery | 1906. | Process rate | 320 t/d. |
| Discovery method | Surface outcrop. | Product type | Pb, Ag, Au precipitate. |
| | | Destination | Englehard Industries, Los Angeles, CA. |
| Initial production | 1976, by Westcoast Oil and Gas Corp.; 1983, by Asamera. | | |
| Last production | 1981, Westcoast Oil and Gas Corp.; Asamera currently producing in 1985. | | |
| Past production | 15,551 kg Ag (1980) (165). 4,959 kg Ag (1981) (165). 9,528.7 kg Ag, 218.7 kg Au (1983) (172). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|-------------------------------|--------------|---|------|-----------|
| 1.. Proven and probable | 607,000 tons | 9.73 tr oz/ton Ag; 0.23 tr oz/ton Au | 1983 | 101 |
| Possible | 730,000 tons | | | |
| 2.. Reserves | 500,000 tons | 9 tr oz/ton Ag; 0.25 tr oz/ton Au | 1984 | 537 |
| 3.. Proven and probable | 581,800 tons | 10.18 tr oz/ton Ag; 0.26 tr oz/ton Au | 1984 | 504 |

REFERENCES

| | | |
|--|----------------------------|---|
| 66, 90, 101, 165, 172, 378, 412, 470, 504, 528, 537, 597, 607, 695, 783. | USGS quad maps | Reno, 1:250,000. Churchill Butte, 15'. |
| | USBM sequence number | 0320290018. |
| | Mid number | 2600249. |

Comments: Asamera is considering installation of an on-site plant to produce dore bullion from the precipitate. In 1982, Asamera acquired the property from Scurry-Rainbow (subsidiary of Westcoast Oil and Gas Corp.), which had been operating the Gooseberry.

¹Gooseberry production was suspended in February 1985 because of depressed metal prices. Exploration and development was reported to continue during the suspension.

GREYSTONE—BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|---------------------------------------|
| County | Lander. | General location | About 41 km south of Battle Mountain. |
| Mining district | Bullion. | Meridian | Mount Diablo. |
| Elevation | 2,000 m. | Tract | Sec. 26, T 28 N, R 45 E. |
| Topography | Hilly. | Latitude | 40°16'27" N. |
| Domain | BLM administered. | Longitude | 116°52'21" W. |
| Owner | Dresser Industries, Dallas, TX (1984). | | |

GEOLOGY

| | | | |
|---|---------------------------|--------------------------|------------------------------|
| Type of ore body | Sedimentary, replacement. | Host formation | Slaven Chert. |
| Origin | Sedimentation. | Geologic age | Devonian. |
| Shape of ore body | Tabular. | Rock relationships | Chert, encloses ore, gangue. |
| Ore controls | Bedding, lithology. | | Shale, encloses ore. |
| Strike and dip of mineralized zone. | N 40° W: 30° S. | Size | Limestone, encloses ore. |
| Mineralized zone average dimensions, m: | | | Medium. |
| Length | 900. | | |
| Width | 110. | | |
| Thickness | 90. | | |
| Depth | 0. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|-------------------------------|
| Current status | Active-producer. | Distance to water supply ... | <3 km. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply ... | On-site. |
| | | Mill location | On-site. |
| Year of discovery | 1951. | Mill status | Operating. |
| Discovery method | Ore mineral in place. | Milling method | Crushing, screening, jigging. |
| | | Process rate | 1,813 t/d. |
| Initial production | 1954. | Product type | Crushed barite concentrate. |
| Last production | 1983. | Distance shipped | 46 km. |
| Past production | More than 3.6 million t mined, processed, and shipped (385). | Destination | Battle Mountain, NV. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

76, 87, 218, 283, 330, 346, 385, 392, 546, 548, 601, 693.

| | |
|----------------------------|------------------------|
| USGS quad maps | Winnemucca, 1:250,000. |
| | Mt. Lewis, 15'. |
| USBM sequence number | 0320150073. |
| Mid number | 2600411. |

Comments: The Greystone is reported to be the largest producing barite mine in the country and one of the largest ever discovered and developed (385).

GUNMETAL—TUNGSTEN

Alternate names: Desert Scheelite; Garnet; Lindsay; Summerfield

Commodities: W, Mo, Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-----------------------------------|
| County | Mineral. | General location | About 70 km northwest of Tonopah. |
| Mining district | Shoshone. | Meridian | Mount Diablo. |
| Elevation | 2,255 m. | Tract | Sec. 18, T 6 N, R 37 E. |
| Topography | Rugged. | Latitude | 38°23'10" N. |
| Domain | Private. | Longitude | 117°53'40" W. |
| Owner | Union Carbide Corp., Danbury, CT (1981). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|--|
| Type of ore body | Replacement. | Host formation | Luning. |
| Origin | Contact metasomatic. | Geologic age | Triassic. |
| Ore controls | Lithology, faulting. | Rock relationships | Limestone, replaced by ore. |
| Mineralized zone average dimensions, m: | | | Marble, gangue, encloses ore. |
| Length | 214. | Size | Skarn (tactite), gangue, encloses ore. |
| Thickness | 15. | | Large. |
| Mineral names | Scheelite, garnet, galena, tetrahedrite, molybdenite, sphalerite, quartz, calcite, epidote. | | |

DEVELOPMENT

| | | | |
|-------------------------|--------------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Surface-underground. | Road requirement | None. |
| Year of discovery | 1916. | Distance to power supply ... | <50 km. |
| Discovery method | Unknown. | | |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

223, 343, 444, 598, 608, 733, 740, 774.

| | |
|----------------------------|---------------------|
| USGS quad maps | Tonopah, 1:250,000. |
| USBM sequence number | 0320210054. |
| USGS MRDS number | M030116. |

HARD LUCK-PRADIER—ANTIMONY

Alternate names: Pradier, Romano, Big Creek

Commodities: Sb, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|------------|------------------------|------------------------------|
| County | Lander. | General location | About 22 km south of Austin. |
| Mining district | Big Creek. | Meridian | Mount Diablo. |
| Elevation | 2,804 m. | Tract | Sec. 27, T 17 N, R 43 E. |
| Topography | Rugged. | Latitude | 39°18'17" N. |
| | | Longitude | 117°07'57" W. |

Owner..... Big Creek Mining and Milling Co., Austin, NV (1958).

GEOLOGY

| | | | |
|--|---|--------------------------|----------------------|
| Type of ore body | Silicified fault breccia. | Host formation | Valmy. |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular, podlike. | Rock relationships | Shale, encloses ore. |
| Ore controls | Faulting. | | Slate, encloses ore. |
| Strike and dip of mineralized zone | N 20° W: flat lying. | Size | Small. |
| Mineral names | Stibnite, malachite, tetrahedrite, azurite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | <10 km. |
| Type of operation | Underground, surface. | Road requirement | <50 km. |
| Mining method | Unknown. | Distance to power supply ... | <50 km. |
| | | Mill location | No mill. |
| Year of discovery | Prior to 1936. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | About 1936. | | |
| Last production | 1958. | | |
| Past production | 88 t Sb metal (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-----------|----------------------------|---------------------|
| 376, 693. | USGS quad maps | Millett, 1:250,000. |
| | | Austin, 15°. |
| | USBM sequence number | 0320150193. |

Comments: Stibnite occurs as blebs, small pods, and single crystals.

HEAVY SPAR—BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|------------------------------|
| County | Elko. | General location | About 25 km north of Carlin. |
| Mining district | Swales Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,685 m. | Tract | Sec. 10, T 35 N, R 52 E. |
| Topography | Hilly. | Latitude | 40°56'12" N. |
| Domain | BLM administered. | Longitude | 116°08'51" W. |
| Owner | New Park Resources, Inc., Metairie, LA (1983). | | |

GEOLOGY

| | | | |
|---|-----------------|--------------------------|-----------------------------|
| Type of ore body | Replacement. | Host formation | Vinini. |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Siltstone, replaced by ore. |
| Ore controls | Bedding. | | Chert, encloses ore. |
| Strike and dip of mineralized zone. | N 15° E: 45° W. | | Shale, encloses ore. |
| Mineralized zone average dimensions, m: | | Size | Medium. |
| Length | 213. | | |
| Width | 91. | | |
| Thickness | 15. | | |
| Depth to | 15. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | <3 km. |
| Type of operation | Surface. | Road requirement | <10 km. |
| Mining method | Open pit. | Distance to power supply ... | <50 km. |
| | | Mill location | No mill. |
| Year of discovery | 1963. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1981. | | |
| Last production | 1983. | | |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-----------------------------------|----------------------------|------------------------|
| 87, 185, 226, 283, 349, 546, 669. | USGS quad maps | Winnemucca, 1:250,000. |
| | | Swales Mountain, 7.5'. |
| | USBM sequence number | 0320070098. |
| | Mid number | 2601673. |

Comments: The property ceased production in 1983 because of depressed barite market conditions. The Heavy Spar may be an extension of the Fish Creek deposit in sec. 2, T 35 N, R 52 E.

HOLLYWOOD—ANTIMONY

Alternate names: Lakeview, Antelope Springs, Lee

Commodities: Sb, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--------------------------------------|------------------------|-------------------------------|
| County | Pershing. | General location | About 29 km east of Lovelock. |
| Mining district | Antelope Springs (Relief, Pershing). | Meridian | Mount Diablo. |
| Elevation | 1,390 m. | Tract | Sec. 2, T 26 N, R 34 E. |
| Topography | Rugged. | Latitude | 40°08'54" N. |
| Domain | BLM administered. | Longitude | 118°07'04" W. |
| Owner | Alma D. Priester (1960). | | |

GEOLOGY

| | | | |
|---|--------------------------------|--------------------------|---|
| Type of ore body | Fissure vein. | Host formation | Grass Valley. |
| Origin | Hydrothermal. | Geologic age | Upper Triassic. |
| Shape of ore body | Tabular. | Rock relationships | Calcareous shale, near ore. Limestone, near ore. Siltstone, near ore. |
| Ore controls | Faulting, fracturing. | Size | Small. |
| Strike and dip of mineralized zone. | N 35° to 60° W; 60° to 65° NE. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | >50. | | |
| Width | Unknown. | | |
| Thickness | 0.5. | | |
| Depth | 0. | | |
| Mineral names | Stibnite, pyrite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|---|
| Current status | Inactive-past producer. | Distance to water supply ... | <10 km. |
| Type of operation | Underground. | Road requirement | <3 km. |
| Mining method | Unknown. | Distance to power supply ... | <50 km. |
| Year of discovery | 1864. | Mill location | Ore shipped to Austin, NV, for milling in 1967. |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1916. | | |
| Last production | 1967. | | |
| Past production | 464 t Sb metal (375). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|----------------|----------------------------|---|
| 329, 376, 718. | USGS quad maps | Lovelock, 1:250,000. Buffalo Mountain, 15' |
| | USBM sequence number | 0320270361. |
| | USGS MRDS number | M060417. |

Comments: Principal period of production from the Hollywood Mine was during World War I.

HORSE CANYON—GOLD

Alternate names: None

Commodities: Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|--------------------------------------|
| County | Eureka. | General location | About 100 km southwest of Elko. |
| Mining district | Cortez-Mill Canyon. | Meridian | Mount Diablo. |
| Elevation | 2,530 m. | Tract | Sec. 3, T 26 N, R 48 E (unsurveyed). |
| Topography | Rugged. | Latitude | 40°08'50" N. |
| Domain | BLM administered. | Longitude | 116°32'45" W. |
| Owners | Placer U.S., Inc., San Francisco, CA (subsidiary of Placer Development, Ltd., Vancouver, BC, Canada); Kennecott Copper Corp., Salt Lake City, UT; Vernon F. Taylor, Jr. (1984). | | |
| Operator | Cortez Gold Mines (operational entity of Placer U.S., Inc.) (1984). | | |

GEOLOGY

| | | | |
|------------------------|---|--------------------------|---|
| Type of ore body | Disseminated. | Host formation | Vinini (upper plate of Roberts Mountains Thrust Fault). |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Ore controls | Faults, fractures, lithology. | Rock relationships | Shale, in part cherty and carbonaceous, ore host. |
| Planned pit size | 27 ha (68 acres). | | Siltstone, ore host. |
| Mineral names | Native gold, quartz, iron oxides, clays, barite, jasperoid, jarosite. | Alteration | Rhyolite dikes, near ore, intrudes host (Miocene). |
| | | Size | Silicified jasperoid breccia, hosted in Vinini. |
| | | | Silicification, iron staining, bleaching. |

DEVELOPMENT

| | | | |
|------------------------------|---|--------------------------------|---|
| Current status | Active-producer. | Distance to water supply | On-site at Cortez. |
| Type of operation | Surface, mine rate about 660,000 t/a ore; stripping ratio is about 3:1 (waste:ore). | Road requirement | About 22 km to Cortez mill. |
| Mining method | Open pit. | Distance to power supply | Existing to Cortez mill. |
| Initial production | February 1983 (mining); May 1983 (milling). | Mill location | Cortez mill (22 km haulage from mine). |
| Annual production rate | 600 kg (20,000 tr oz) Au (1983); then 1,200 kg (40,000 tr oz) Au thereafter. | Mill status | Active. |
| | | Milling method | Agitated tank cyanide leach (CIL-carbon in leach), carbon columns, pressure stripping, electrolysis-steel wool, smelting. |
| | | Process rate | 1,800 t/d (2,000 ton/d). |
| | | Product type | Dore buttons. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|-------------------------------------|----------------------|--------------------------|------|-----------|
| 1.. Not reported in reference | 3,121,000 t..... | 1.89 g/t Au | 1982 | 564 |
| 2.. Do..... | 3,400,000 tons | 0.065 tr oz/ton Au | 1983 | 189 |

REFERENCES

| | | |
|---|----------------------------|--|
| 27, 84, 90, 100, 169, 170, 219, 426, 513, 564, 593, 692, 780, 781, 785. | USGS quad maps | Winnemucca, 1:250,000. Cortez, 15'. |
| | USBM sequence number | 0320110228. |

Comments: The Horse Canyon ore is milled at the Cortez mill. The Cortez gold deposit was mined until 1973 when mining operations shifted west to Placer Amex's Gold Acres gold deposit across the valley. Mining and milling continued until February 1976. Cortez and Gold Acres dumps were leached to 1980. In 1980, mining on other Cortez and Gold Acres dumps began; Cortez material was leached and Gold Acres material milled. Horse Canyon ore replaced output from Gold Acres low-grade dumps in May 1983. The Cortez dumps were still actively being mined and leached in late 1983. Company reported mine life is less than 5 yr from 1983.

INDIAN SPRINGS—TUNGSTEN

Alternate names: None

Commodities: W

LOCATION-OWNERSHIP

| | | | |
|---------------------------|--|----------------------------|---------------------------------|
| County | Elko. | General location | About 82 km northeast of Wells. |
| Mining district | Delano. | Meridian | Mount Diablo. |
| Elevation | 2,047 m. | Tract | Sec. 10, T 43 N, R 68 E. |
| Topography | Rugged. | Latitude | 41°37'29" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 114°14'46" W. |
| Owner | Norman Ludwig; AZL Resources, Inc., Phoenix, AZ; Utah International, Inc., San Francisco, CA (1981). | | |
| Operator | Utah International, Inc. (1981). | | |

GEOLOGY

| | | | |
|---|--|------------------------------|---|
| Type of ore body | Stockwork, replacement. | Host formation | Pequop. |
| Origin | Hydrothermal, contact metasomatic. | Geologic age | Upper Permian. |
| Shape of ore body | Irregular. | Rock relationships | Sandstone, ore in fractures, replaced by ore. |
| Ore controls | Contact zone, igneous. | Size | Large. |
| Strike and dip of mineralized zone. | N 30° E. 90° E. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 1,524. | | |
| Width | 150. | | |
| Thickness | 30. | | |
| Depth | 30. | | |
| Mineral names | Scheelite, garnet, powellite, pyrite, chalcopyrite, molybdenite, galena, sphalerite, tetrahedrite, chalcocite, argentite, bornite, covellite, magnetite, goethite. | | |

DEVELOPMENT

| | | | |
|------------------------------|-----------------------------|------------------------------------|----------|
| Current status | Inactive-developed deposit. | Distance to water supply | On-site. |
| Year of discovery | 1951. | Road requirement | None. |
| Discovery method | Ore mineral in place. | Distance to power supply | <50 km. |
| Initial production | None. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|--|---------------------------|----------------------------------|------|-----------|
| 1. Not reported in reference | 43,600,000 tons | 0.164% WO ₃ | 1970 | 147 |
| 2. Do. | 13,900,000 tons | 0.265% WO ₃ | 1970 | 147 |

REFERENCES

| | | |
|-------------------------------|--------------------------------|--|
| 147, 226, 278, 538, 661, 669. | USGS quad maps | Wells, 1:250,000. Delano Mountain, 15'. |
| | USBM sequence number | 0320070016. |
| | USGS MRDS number | D002193. |

JUNGLE—BARITE

Alternate names: Jungle A & B, Boies, Consolation, Jungle Extension, Ala

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|---------------------------------|
| County | Elko. | General location | About 48 km northeast of Wells. |
| Mining district | Snake Mountains. | Meridian | Mount Diablo. |
| Elevation | 2,135 m. | Tract | Sec. 7, T 42 N, R 62 E. |
| Topography | Hilly. | Latitude | 41°32'30" N. |
| Domain | Mixed; patented mining claims and located mining claims on public lands administered by BLM. | Longitude | 114°59'42" W. |
| Owner-operator | Chromalloy American Corp., St. Louis, MO (1983). | | |

GEOLOGY

| | | | |
|--|------------------------------|-------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Valmy. |
| Origin | Sedimentation, hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular, irregular. | Rock relationship | Chert, encloses ore. Shale, encloses ore. |
| Ore controls | Bedding, lithology. | | Conglomerate, encloses ore. |
| Strike and dip of mineralized zone. | Flat lying. | Size | Medium. |
| Mineralized zone aver- age dimensions, m: | | | |
| Length | >180. | | |
| Width | 170. | | |
| Thickness | 8.5. | | |
| Depth | 35. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------------|------------------------------|---|
| Current status | Inactive-past producer (standby). | Distance to water supply ... | >10 km. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply ... | <50 km. |
| Year of discovery | 1955. | Mill location | Off-site 18 km east. |
| Discovery method | Ore mineral in place. | Mill status | Standby. |
| Initial production | 1977. | Milling method | Crushing, screening, jigging. |
| Last production | 1981. | Product type | Unground barite concentrate. |
| Past production | Confidential proprietary data. | Distance shipped | 70 km to Wells, NV, by truck; then 2,350 km to Cyril, OK, by rail. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|---|
| 77, 95, 123, 205, 226, 278, 546, 669, 688, 716, 775, 778. | USGS quad maps | Wells, 1:250,000. Boies Reservoir, 7.5'. |
| | USBM sequence number | 0320070367. |
| | Mid number | 2601098. |

KAY-BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Nye. | General location | About 56 km southeast of Austin. |
| Mining district | Northumberland. | Meridian | Mount Diablo. |
| Elevation | 2,820 m. | Tract | Sec. 14, T 13 N, R 45 E. |
| Topography | Rugged. | Latitude | 38°57'50"N. |
| Domain | National forest. | Longitude | 116°51'58" W. |
| Owner | Chromalloy American Corp., St. Louis, MO (1983). | | |

GEOLOGY

| | | | |
|---|--------------------|--------------------------|---------------------------|
| Type of ore body | Replacement | Host formation | Pinecone. |
| Origin | Sedimentation. | Geologic age | Devonian. |
| Shape of ore body | Irregular. | Rock relationships | Chert, encloses ore |
| Ore controls | Bedding, faulting. | | Shale, encloses ore. |
| Strike and dip of mineralized zone. | N 45° E: 10° W. | Size | Greenstone, encloses ore. |
| Mineralized zone average dimensions, m: | | | Medium. |
| Length | Unknown. | | |
| Width | Unknown. | | |
| Thickness | 1.5. | | |
| Depth | 11. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply ... | On-site. |
| Type of operation | Possible surface. | Road requirement | On-site. |
| Year of discovery | 1958. | Distance to power supply ... | <10 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-------------------------------|----------------------------|-----------------------|
| 338, 357, 368, 546, 623, 624. | USGS quad maps | Tonopah, 1:250,000. |
| | USBM sequence number | Northumberland, 7.5'. |
| | | 0320230719. |

LAKES-BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|---|------------------------|------------------------------|
| County | Elko. | General location | About 46 km north of Carlin. |
| Mining district | Lakes. | Meridian | Mount Diablo. |
| Elevation | 2,220 m. | Tract | Sec. 1, T 37 N, R 51 E. |
| Topography | Hilly. | Latitude | 41°08'06" N. |
| Domain | Private. | Longitude | 116°11'36" W. |
| Owner | 25 Corporation, Lincoln, NE; NL Baroid (a division of NL Industries, Inc., New York, NY-lessee) (1983). | | |

GEOLOGY

| | | | |
|---|-------------------|--------------------------|---|
| Type of ore body | Bedded. | Host formation | Vinini. |
| Origin | Replacement. | Geologic age | Ordovician. |
| Shape of ore body | Tabular, massive. | Rock relationships | Chert, lies under ore, replaced by ore. |
| Strike and dip of mineralized zone. | S 45° W: 5° S. | Tuffs, lies over ore. | |
| Mineralized zone average dimensions, m: | | Size | Large. |
| Length | 320 | | |
| Width | 185. | | |
| Thickness | 45. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Surface. | Road requirement | <10 km. |
| Mining method | Open pit. | Distance to power supply ... | <10 km. |
| Year of discovery | 1955. | Mill location | No mill. |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1973. | | |
| Last production | 1981. | | |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|--------------------------------|----------------------|------------------|------|-----------|
| 1..Not reported in reference.. | 8,000,000 tons | 4.10 sp gr | 1982 | 304 |

REFERENCES

| | | |
|-------------------------|----------------------------|---|
| 87, 226, 304, 546, 669. | USGS quad maps | McDermitt, 1:250,000. Lake Mountain, 7.5'. |
| | USBM sequence number | 0320070364. |
| | Mid number | 2600969. |

Comments: Ownership of the Lakes deposit has been the subject of 2.5 yr of litigation. In June 1982, the Nevada Supreme Court ruled in favor of NL Industries.

LINKA-TUNGSTEN

Alternate names: Garnetite, Spruce
Mountain, Toiyabe Claims

Commodities: W, Mo

LOCATION-OWNERSHIP

| | | | |
|-----------------|--|------------------------|----------------------------------|
| County | Lander. | General location | About 27 km southeast of Austin. |
| Elevation | 1,800 m. | Meridian | Mount Diablo. |
| Domain | BLM administered. | Tract | Sec. 18, T 17 N, R 45-1/2 E. |
| | | Latitude | 39°19'00" N. |
| | | Longitude | 116°50'00" W. |
| Owner | Consolidated Uranium Mines, Inc., Salt Lake City, UT (1972). | | |

GEOLOGY

| | | | |
|-------------------------|--|--------------------------|-----------------------------|
| Type of ore body | Replacement, shear zone. | Host formation | Antelope Valley. |
| Origin | Contact metasomatism, hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Irregular. | Rock relationships | Marble, lies along ore. |
| Ore controls | Lithology, contact zone. | | Hornfels, lies along ore. |
| Mineralized zone aver- | | | Limestone, replaced by ore. |
| age dimensions, m: | | | Skarn, is ore, gangue. |
| Length | 153. | Size | Small. |
| Width | 12. | | |
| Thickness | 46. | | |
| Mineral names | Schaelite, quartz, garnet, epidote, calcite, molybdenite, pyrite. | | |

DEVELOPMENT

| | | | |
|-------------------------|--------------------------------|------------------------------|---------|
| Current status | Inactive-past producer. | Distance to water supply ... | <3 km. |
| Type of operation | Surface-underground. | Distance to power supply ... | <50 km. |
| Year of discovery | 1941. | | |
| Discovery method | Ore mineral in place. | | |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|----------------|----------------------------|--|
| 404, 693, 733. | USGS quad maps, | Millett, 1:250,000. Spencer Hot Springs, 15'. |
| | USBM sequence number | 0320160011. |
| | USGS MRDS number | M030019. |

MAGGIE CREEK-GOLD

Ore body names: Main, West

Commodities: Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|------------------------------|
| County | Eureka. | General location | About 11 km north of Carlin. |
| Mining district | Maggie Creek (Schroeder). | Meridian | Mount Diablo. |
| Elevation | 1,603 m. | Tract | Sec. 4, T 34 N, R 51 E. |
| Topography | Hilly. | Latitude | 40°51'49" N. |
| Domain | Mixed, private, private lease, BLM administered. | Longitude | 116°14'47" W. |
| Owner | Newmont Mining Corp., New York, NY (1985). | | |
| Operator | Carlin Gold Mining Co. (subsidiary of Newmont Mining Corp.) (1985). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|--|
| Type of ore body | Disseminated, replacement, stratiform. | Host formation | Roberts Mountains (upper plate of Roberts Mountains Thrust Fault). |
| Origin | Hydrothermal, oxidation. | Geologic age | Upper Silurian. |
| Shape of ore body | Tabular. | Rock relationships | Argillaceous dolomitic limestone, ore in fractures, replaced by ore, gangue. |
| Ore controls | High-angle fault, northeast-trending fracture zone, lithology. | | Siltstone, ore in fractures, replaced by ore, gangue. |
| Strike of mineralized zone. | About N 30° E. | | Shale, ore in fractures, replaced by ore, gangue. |
| Age of mineralization ... | Mid-Tertiary. | | Sandstone, ore in fractures, gangue. |
| Mineralized zone average dimensions, m: | | Alteration | Silicification, decarbonation, argillization. |
| Length | Main 730 West 120 | Size | Small. |
| Width | 60 to 180 | | |
| Thickness | 40 (estimated) 40 (estimated) | | |
| Pit area | 85.7 ha (210 acres). | | |
| Mineral names | Native gold, pyrite, quartz, clays, carbon (not associated with gold), barite, chert, illite, kaolinite, montmorillonite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|--|
| Current status | Active-producer. | Distance to water supply ... | On-site wells. |
| Type of operation | Surface. | Road requirement | 23 km to Carlin mill. |
| Mining method | Open pit, about 15,000 t/d ore and waste mined. Mining began in July 1980. | Distance to power supply ... | On-site diesel electric generation, 1,300 kW (four 275-kW units, one 200-kW standby unit). |
| Year of discovery | 1976-77. | Mill location | Heap leach-on-site; milling ore to Carlin mill. |
| Discovery method | Geological inference, drilling. | Mill status | Active. |
| Initial production | April 1981 (leach facility commissioned). | Milling methods | Leaching grade ore-cyanide agglomeration, cyanide heap leach, carbon adsorption, electrolysis, smelting. |
| Past production | 987.19 kg (31,739 tr oz) Au from 240,794 t (265,430 tons) ore treated (1983) (511). | Process rate | Milling grade-agitated cyanide leach, CCD, Merrill-Crowe zinc precipitation. |
| Annual production | 450,000 t (500,000 tons) leaching grade ore; estimated 220,000 t (240,000 tons) milling grade. | Product type | Dore bullion approximately 950 fine. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|--------------------------------|---|------|-----------|
| 1..Not reported in reference | 4,350,000 t ¹ | 3.20 g/t Au (milling plus leaching grade) | 1980 | 435 |
| 2..Proven and probable | 3,606,000 tons | 0.079 tr oz/ton Au | 1983 | 511 |
| Above contains | 2,202,000 tons | 0.037 tr oz/ton Au | 1983 | 511 |

REFERENCES

| | | |
|---|----------------------------|---|
| 27, 59, 90, 129, 184, 319, 398, 400, 435, 505, 508, 511, 593, 688, 832. | USGS quad maps | Winnemucca, 1:250,000. Schroeder Mountain, 7.5'. |
| | USBM sequence number | 0320110182. |
| | Mid number | 2601635. |

Comments: Maggie Creek deposit adjoins the Gold Quarry property.

¹Published reserves consist of about 2.09 million t, 5.14 g/t Au milling grade ore, and 2.26 million t, 1.3 g/t Au leaching grade. Anticipated last year of production is 1986.

MAMMOTH-FLUORINE

Alternate names: Star Mine, Perkins Claim, Perkins Prospect, Pine Creek Prospect, Carlson Prospect, Rocket Group and Big Jim, Jumbo Prospect, Horseshoe, Northern Horseshoe, Higrade, White Horse, North Star Group

Commodities: CaF₂

LOCATION-OWNERSHIP

County Nye.
 Mining district Quinn Canyon Range.
 Elevation 2,266 m.
 Topography Hilly.
 Domain National forest.
 Owner Norman E. Wood (1976).

General location About 101 km west of Caliente.
 Meridian Mount Diablo.
 Tract Sec. 2, T 8 N, R 56 E.
 Latitude 38°09'04" N.
 Longitude 115°39'20" W.

GEOLOGY

Type of ore body Breccia fill, replacement.
 Origin Hydrothermal.
 Shape of ore body Irregular, lenticular.
 Ore controls Lithology, contact zone.
 Strike and dip of N 15° E: 15° to 30° W.
 mineralized zone.
 Mineralized zone average dimensions, m:
 Length 229.
 Width 30.
 Thickness 30.
 Mineral names Fluorspar, jasper, calcite.

Host formation Antelope Formation.
 Geologic age Ordovician.
 Rock relationships Limestone, ore in fractures, replaced by ore.

Host formation Shingle Pass.
 Geologic age Tertiary.
 Rock relationships Unspecified extrusive, ore in fractures.

Host formation Needles Range.
 Geologic age Tertiary.
 Rock relationships Unspecified extrusive, ore in fractures.

Size Medium.

DEVELOPMENT

Current status Inactive-explored prospect.
 Type of operation Surface.
 Year of discovery 1943.
 Discovery method Ore mineral in place.

Distance to water supply ... <3 km.
 Road requirement None.
 Distance to power supply ... <50 km.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

281, 283, 357, 545, 604, 733, 815, 816.

USGS quad maps Lund, 1:250,000.
 USBM sequence number 0320230202.

MANHATTAN-GOLD

Related names: Houston Oil & Minerals Manhattan (HIMCO) Project Claim Group includes Big Four, Mayflower, Reilly Fraction, Iron Queen, Iron King, Gold Wedge, Little Grey, Jumping Jack, Juna, St. George, Stray Dog, Skookum

Commodities: Au, Ag

LOCATION-OWNERSHIP

| | | | |
|---------------------------|---|----------------------------|-----------------------------------|
| County | Nys. | General location | About 56 km northeast of Tonopah. |
| Mining district | Manhattan. | Meridian | Mount Diablo. |
| Elevation | 1,290 m. | Tract | Sec. 23, T 8 N, R 44 E. |
| Topography | Hilly. | Latitude | 38°32'19" N. |
| Domain | Private. | Longitude | 117°00'31" W. |
| Owner-operator | Tenneco Minerals Corp., Inc., Houston, TX (1985). (Mining is by contractor--W.E. Vining, Carson City, NV.) | | |

GEOLOGY

| | | | |
|---------------------------------|--|------------------------------|---|
| Type of ore body | Disseminated, stockwork-quartz veining. | Host formation | Gold Hill. |
| Origin | Hydrothermal. | Geologic age | Cambrian. |
| Shape of ore body | Tabular. | Rock relationships | Schist, ore in fractures, gangue. |
| Ore controls | Faults, fractures (joints). | | Pyrite, shale, ore in fractures, gangue. |
| Age of mineralization | Miocene (16 million yr.) | | Quartzite, sandstone, ore in fractures, gangue. |
| Mineral names | Free gold, electrum, quartz, calcite, adularia, manganese oxide, pyrite, iron oxide. | Alteration | Pyritization. |
| | | Size | Small. |

DEVELOPMENT

| | | | |
|----------------------------------|---|------------------------------------|---|
| Current status | Active-producer | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | Existing. |
| Mining method | Open pit (by contract); about 2,700 t/d ore. | Distance to power supply | Unknown. |
| | | Mill location | On-site. |
| Year of discovery | 1866, silver first discovered in district; 1905, gold discovered. | Mill status | Active. |
| Discovery method | Geochemical, drilling. | Milling method | Gravity concentration, flotation, batch cyanide agitated leach, Merrill-Crowe zinc precipitation. |
| Initial production | 1980 by HIMCO; late 1983 for Tenneco. | Process rate | Crusher about 2,700 t/d; flotation about 1,369 t/d. |
| Last production | Late 1982 by HIMCO; ongoing for Tenneco (1985). | Product type | Au-Ag precipitate. |
| Annual production rate | Between 810 kg Au and 840 kg Au anticipated (26,000 to 27,000 tr oz). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|----------------------|--------------------------|------------------------------|------|-----------|
| 1...Proven | 5,000,000 tons | 0.036 tr oz/ton Au | 1983 | 311 |

REFERENCES

| | | |
|---|--------------------------------|---|
| 90, 136, 191, 192, 194, 311, 357, 368, 378, 494, 584, 719, 768. | USGS quad maps | Tonopah, 1:250,000. Manhattan, 7.5'. |
| | USBM sequence number | 0320230395. |
| | Mid number | 2601566. |

Comments: The mine was temporarily shut down between January 1982 and fall of 1983.

McARTHUR-COPPER

Alternate names: None

Commodities: Cu

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|---------------------------------------|
| County | Lyon. | General location | About 45 km southeast of Carson City. |
| Mining district | Mason. | Meridian | Mount Diablo. |
| Elevation | 1,438 m. | Tract | Sec. 25, T 14 N, R 24 E. |
| Topography | Gentle. | Latitude | 39°02'56" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 119°14'17" W. |
| Owner | The Anaconda Minerals Co., Denver, CO (a wholly owned subsidiary of Atlantic Richfield Co., Denver, CO) (1979). | | |

GEOLOGY

| | | | |
|-----------------------------|---|--------------------------|--|
| Type of ore body | Replacement, breccia fill. | Host formation | Igneous intrusive. |
| Origin | Contact metasomatic, hydrothermal. | Geologic age | Mesozoic. |
| Shape of ore body | Unknown. | Rock relationships | Quartz monzonite, replaced by ore, gangue. |
| Ore controls | Igneous, fracturing, faulting. | Size | Breccia, encloses ore, gangue. Large. |
| Strike of mineralized zone. | N 70° W. | | |
| Mineral names | Chalcocite, pyrite, chalcopyrite, cuprite, malachite. | | |

DEVELOPMENT

| | | | |
|------------------------|--|------------------------------|---------|
| Current status | Inactive-explored prospect. | Distance to water supply ... | <10 km. |
| Discovery method | Trenching, drilling. | Road requirement | <10 km. |
| | | Distance to power supply ... | <10 km. |
| Last production | 1943. | | |
| Past production | Reported 5 carloads ore shipped in 1943 (695). | | |

PUBLISHED RESERVES-RESOURCES

| <i>Class</i> | <i>Quantity</i> | <i>Grade</i> | <i>Year</i> | <i>Reference</i> |
|------------------------------------|-----------------------|----------------|-------------|------------------|
| 1..Not reported in reference | 13,000,000 tons | 0.43% Cu | 1976 | 822 |

REFERENCES

| | | |
|------------------------------------|----------------------------|-----------------------------------|
| 126, 128, 453, 567, 695, 822, 824. | USGS quad maps | Reno, 1:250,000. Wabuska, 15'. |
| | USBM sequence number | 0320190023. |

Comments: Extensive exploration done by the Bureau in 1948-50; further drilling done by Anaconda Co. in 1974.

McDERMITT-MERCURY

Alternate names: None

Commodities: Hg

LOCATION-OWNERSHIP

| | |
|--|--|
| County Humboldt. | General location About 10 km southwest of McDermitt. |
| Mining district Opalite (Cordero). | Meridian Mount Diablo. |
| Elevation 1,402 m. | Tract Sec. 27, T 47 N, R 37 E. |
| Topography Flat. | Latitude 41°55'13" N. |
| Domain Mixed; BLM administered, public lands-private. | Longitude 117°48'37" W. |
| Owner-operator Placer U.S. Inc., San Francisco, CA (subsidiary of Placer Development Ltd., Vancouver, BC, Canada), 51% (1983). | |
| Owner Sterling Mineral Venture, 49% (1983). | |

GEOLOGY

| | |
|---|---|
| Type of ore body Sedimentary, replacement. | Host formation Tuffaceous sediment (lake beds). |
| Origin Hydrothermal, sedimentation. | Geologic age Miocene. |
| Shape of ore body Tabular overall. | Rock relationships Clay, is ore, encloses ore. |
| Ore controls Faulting, bedding. | Chert, under ore, is ore. |
| Strike and dip of mineralized zone N 45° W; 4° E. | Alteration Argillic. |
| Age of mineralization Miocene. | Size Medium. |
| Mineralized zone average dimensions, m: | |
| Length 760. | |
| Width 670. | |
| Thickness 6. | |
| Depth 30. | |
| Mineral names Cinnabar, corderoite, montmorillonite, chalcedony, iron and manganese oxides, calcite, cristobalite, gypsum, alunite, apatite, stibnite, alpha tridynite. | |

DEVELOPMENT

| | |
|--|---|
| Current status Active-producer. | Distance to water supply On-site wells. |
| Type of operation Surface. | Road requirement None. |
| Mining method Open pit; overall stripping ratio is about 4.7:1 waste:ore. | Distance to power supply On-site. |
| | Mill location On-site. |
| Year of discovery 1941 (drill penetration of ore body). | Mill status Active. |
| Discovery method Geological inference. | Milling method Flotation, distillation. |
| | Process rate 2,200 t/d ore, 90 t/h (furnace-0.45 t/h Hg concentrate). |
| Initial production 1975 (stripping began in 1974). | Product type Refined mercury. |
| Past production 237,000 t, 4.51 kg/t Hg ore milled; 489,000 kg Hg metal production (1981) (564). | Distance shipped 4,348 km. |
| | Destination New York, NY, and various other national locations. |
| | |
| | |
| | |
| Annual production rate About 240,000 t ore and 20,000 flasks. | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------|--------------------------|-------------------------|------|-----------|
| 1. Indicated | 3,000,000 tons | 10 lb Hg/ton | 1976 | 596 |
| 2. Measured | 1,648,000 t | 0.5 wt pct Hg | 1980 | 563 |
| 3. Do | 1,410,000 t | 5.15 kg/t Hg | 1981 | 564 |
| 4. Do | 1,202,000 t | 4.44 kg/t Hg | 1982 | 564 |

REFERENCES

| | |
|--|--|
| 7, 29, 104, 202, 229, 276, 406, 466, 468, 474, 563, 564, 596, 602, 616, 639, 642, 643, 673, 725, 801, 845. | USGS quad maps McDermitt, 1:250,000. Jordan Meadows, 15'. |
| | USBM sequence number 0320130259. |
| | USGS MRDS number MO54731. |
| | Mid number 2600646. |

Comments: Largest mercury producer in the United States. Individual ore bodies are asymmetric lenslike bodies that thin and decrease in grade away from hot spring centers of mineralization. Reported final pit depth will be about 50 m. The ore body is estimated to contain 400,000 flasks of mercury.

McGILL TAILINGS—COPPER

Alternate names: Keystone Dumps

Commodities: Cu

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-------------------------------|
| County | White Pine. | General location | About 19 km northeast of Ely. |
| Mining district | Robinson Canyon. | Meridian | Mount Diablo. |
| Elevation | 1,865 m. | Tract | Sec. 29, T 18 N, R 64 E. |
| Topography | Gentle. | Latitude | 39°23'55" N. |
| Domain | Private. | Longitude | 114°47'44" W. |
| Owner | Kennecott Copper Corp., Salt Lake City, UT (1984). | | |

GEOLOGY

| | | | |
|------------------------|-----------------------|----------------------------|---------|
| Type of ore body | Mill waste, tailings. | Identified resources | Medium. |
|------------------------|-----------------------|----------------------------|---------|

DEVELOPMENT

| | | | |
|----------------------|--------------------|------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply ... | On-site. |
| Mining method | Surface. | Road requirement | None. |

PUBLISHED RESERVES-RESOURCES

| <i>Class</i> | <i>Quantity</i> | <i>Grade</i> | <i>Year</i> | <i>Reference</i> |
|------------------------------------|-----------------------------|----------------------|-------------|------------------|
| 1..Not reported in reference | 40,000,000 to 80,000,000 | 0.3 to 0.4% Cu | 1979 | 413 |

REFERENCES

| | | |
|--------------------------|----------------------------|-----------------|
| 180, 284, 413, 473, 477. | USGS quad maps | Ely, 1:250,000. |
| | | McGill, 15'. |
| | USBM sequence number | 0320330056. |

Comments: The tailings deposit at McGill represents a 70-yr accumulation of tailings from the adjacent concentrator. Over the years the "natural classification of the coarse and heavy particles resulted in a deposit of minable grade copper-bearing material suitable for concentrating and smelting" (473). In 1978-79, Kennecott conducted exploration and feasibility studies on the deposit. In the fall of 1979, Kennecott announced that recovery of copper from about 800 ha (2,000 acres) awaited only a corporate go-ahead. It was stated that an investment of \$15 million would be required and would "pay for itself in less than a year" (160). The plan was to use conveyors to transport 9.5 million t (10.5 million tons) annually back to the mill and smelter facilities for reprocessing. Recycling of the 0.5% Cu tailings would take between 8 and 10 yr (160).

MINNESOTA—IRON

Alternate names: Standard Slag Mine, Minnesota Copper Lode Claim

Commodities: Fe

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--------------------------------------|------------------------|---------------------------------------|
| County | Douglas. | General location | About 38 km southeast of Carson City. |
| Mining district | Buckskin. | Meridian | Mount Diablo. |
| Elevation | 1,823 m. | Tract | Sec. 19, T 14 N, R 24 E. |
| Topography | Hilly. | Latitude | 39°04'04" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 119°20'00" W. |

Owners

V. Cox; J. Adams; A. J. Hawkins; M. Russell; L. J. Anderson; Standard Slag Co., Reno, NV (1975).

GEOLOGY

| | | | |
|---|---|--------------------------|------------------------------------|
| Type of ore body | Replacement. | Host formation | Sedimentary Series. |
| Origin | Contact metasomatic. | Geologic age | Triassic. |
| Shape of ore body | Irregular. | Rock relationships | Dolomite, replaced by ore, gangue. |
| Ore controls | Faulting, lithology. | Size | Small. |
| Mineralized zone average dimensions, m: | | | |
| Length | 244. | | |
| Width | 152. | | |
| Thickness | 122. | | |
| Mineral names | Magnetite, hematite, dolomite, pyrite, chalcopyrite, martite, magnesite, malachite, chlorite, sericite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | <3 km. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Surface. | Distance to power supply ... | On-site. |
| Year of discovery | 1900. | | |
| Discovery method | Auxiliary mineral in place. | | |
| Initial production | 1916. | | |
| Last production | 1967. | | |
| Past production | 4,000,000 t ore and concentrate through 1967 (454). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--------------------------|----------------------------|--------------------------------|
| 296, 381, 453, 454, 580. | USGS quad maps | Reno, 1:250,000. Como, 15'. |
| | USBM sequence number | 0320050021 |
| | USGS MRDS number | W016379. |

MODARELLI—IRON

Alternate names: Amarilla Deposit, Requa Mine, Simplot Mine

Commodities: Fe

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--------------------------------------|------------------------|------------------------------|
| County | Eureka. | General location | About 39 km south of Carlin. |
| Mining district | Modarelli. | Meridian | Mount Diablo. |
| Elevation | 2,067 m. | Tract | Sec. 30, T 29 N, R 51 E. |
| Topography | Very rugged. | Latitude | 40°21'59" N. |
| Domain | Private. | Longitude | 116°15'44" W. |
| Owner | Linda and Vincent Modarelli (1981). | | |
| Owner-operator | J. R. Simplot Co., Boise, ID (1981). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|---|
| Type of ore body | Replacement, stockwork. | Host formation | Older Volcanic Series. |
| Origin | Contact metasomatic. | Geologic age | Oligocene. |
| Shape of ore body | Irregular. | Rock relationships | Tuff, near ore, Dacite, near ore. Latite, near ore. Rhyolite, replaced by ore, ore in fractures. Andesite, lies under ore. |
| Ore controls | Faulting. | Size | Medium. |
| Strike and dip of mineralized zone. | N 45° W: 60° N. | | |
| Mineral names | Hematite, magnetite, quartz, calcite, apatite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Year of discovery | 1903. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1951. | | |
| Last production | 1959. | | |
| Past production | 406,000 t mined between 1951-59 (454). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|--------------------|-----------------------|--|------|-----------|
| 1..Indicated | 44,000,000 long tons. | 42.75% Fe, 1.05% P ₂ O ₅ | 1971 | 454 |

REFERENCES

| | | |
|---|----------------------------|--|
| 10, 75, 150, 235, 282, 324, 332, 366, 454, 462, 536, 568, 583, 593, 625, 733, 751. | USGS quad maps | Winnemucca, 1:250,000. Frenchie Creek, 15'. |
| | USBM sequence number | 0320110028. |
| | USGS MRDS number | W016363. |

MONTANA MOUNTAINS—LITHIUM

Alternate names: McDermitt Caldera Lithium; Kings River Lithium; Uravada

Commodities: Li, U

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------------|
| County | Humboldt. | General location | About 48 km southwest of McDermitt. |
| Mining district | None; closest is Opalite (McDermitt), 38 km northeast. | Meridian | Mount Diablo. |
| Elevation | 2,080 m. | Tract | Sec. 24, T 45 N, R, 34 E. |
| Domain | Public, BLM administered. | Latitude | 41°45'44" N. |
| | | Longitude | 118°06'29" W. |
| Owners | J. M. Huber Corp., Macon, GA (1984); Chevron Resources, Denver, CO (1984); Jim and Grace LeBret, Frank and Ann Bengoa, Orovada, NV (1984); Norman LeBret, Priscilla Vaagen, George and Lynn LeBret, Spokane, WA (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|-----------------------|
| Type of ore body | Volcanic moat deposits. | Host formation | Tuffaceous sediments. |
| Origin | Hydrothermal, hot springs. | Geologic age | Tertiary. |
| Shape of ore body | Tabular. | Rock relationships | Hectorite, is ore. |
| Ore controls | Hot springs vent zones, moat sediments. | Alteration | Zeolite. |
| Strike and dip of mineralized zone. | Horizontal. | Size | Large. |
| Age of mineralization | Tertiary. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 15,000. | | |
| Width | 1,000. | | |
| Thickness | 75. | | |
| Depth | 75. | | |
| Mineral names | Smectite, calcite, chalcedony, analcime. | | |

DEVELOPMENT

| | | | |
|-------------------------|--------------------------|------------------------------|------------------|
| Current status | Active-exploration. | Distance to water supply ... | 5 km. |
| Type of operation | Possible surface. | Road requirement | Paved haul road. |
| Mining method | Open pit. | Distance to power supply ... | 5 km. |
| Year of discovery | 1979. | | |
| Discovery method | Field mapping, drilling. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--|----------------------------|--|
| 108, 125, 155, 221, 244, 379, 396, 397, 602, 603, 638, 801. | USGS quad maps | McDermitt, 1:250,000. Disaster Peak, 15'. |
| | USBM sequence number | 0320130482. |

Comments: Potentially the largest single lithium resource in the United States containing a drill-hole-indicated resource of 200 million t averaging 1.2% Li₂O.

MOUNT HOPE—MOLYBDENUM

Alternate names: Whim Shaft, Lorraine Workings, Nevada Morn Prospect

Commodities: Mo, Zn, Cd,
Pb, Cu, Ag, Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|-----------------------------------|------------------------|----------------------------------|
| County | Eureka. | General location | About 34 km southeast of Eureka. |
| Mining district | Mt. Hope. | Meridian | Mount Diablo. |
| Elevation | 2,240 m. | Tract | Sec. 18, T 22 N, R 52 E. |
| Topography | Rugged. | Latitude | 39°47'15" N. |
| Domain | BLM administered. | Longitude | 116°09'29" W. |
| Owner | EXXON Corp., New York, NY (1982). | | |

GEOLOGY

| | | | |
|--|--|----------------------|-------------------------------|
| Type of ore body | Stockwork, disseminated porphyry molybdenum. | Host formation | Quartz porphyry (major host). |
| Origin | Contact metasomatic, hydrothermal. | Geologic age | Mid-Tertiary. |
| Shape of ore body | Stockwork. | Size | Large. |
| Ore controls | Igneous, faulting, fracturing. | | |
| Pit average dimensions (proposed), km: | | | |
| Length | 2. | | |
| Width | 1.75. | | |
| Mineral names | Molybdenite; other minerals unknown. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|------------------------------|--|
| Current status | Active-developing-exploration. | Distance to water supply ... | 16 km. |
| Type of operation | Surface (proposed). | Road requirement | Nons. |
| Mining method | Open pit; mining 27,000 t/d ore, using large electric shovels was proposed. | Distance to power supply ... | 32 km. |
| | | Mill location | On-site. |
| | | Mill status | Proposed. |
| Year of discovery | 1870 (Pb and Zn); 1981 (Mo discovery announced). | Milling method | Concentrator, hydrometallurgical, conversion plant (proposed). |
| Discovery method | Drilling, geochemistry. | Product type | Molybdc acid, ferromolybdenum (proposed). |
| Initial production | 1886. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|------------------------|---------------------------------------|------|-----------|
| 1..Not reported in reference | 450,000,000 tons | 0.13% to 0.32% MoS ₂ | 1981 | 383 |

REFERENCES

| | | |
|------------------------------------|----------------------------|--|
| 383, 395, 448, 593, 793, 813, 837. | USGS quad maps | Millett, 1:250,000. Garden Valley, 15'. |
| | USBM sequence number | 0320110037. |
| | USGS MRDS number | W016396. |
| | Mid number | 2601132. |

Comments: Molybdenum was first observed in a drill hole drilled by Phillips Petroleum in 1970-71. The higher grade mineralization is reported to occur where the asymmetric halos of alteration and molybdenum mineralization merge around 2 deep coaxial stocks. Molybdenite has been reported to occur at depths ranging from 46 m to 960 m.

MOUNT WHEELER—BERYLLIUM

Alternate names: Pole Adit

Commodities: Be, CaF₂, W**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|---|------------------------|-------------------------------|
| County | White Pine. | General location | About 60 km southeast of Ely. |
| Mining district | Mt. Washington. | Meridian | Mount Diablo. |
| Elevation | 2,377 m. | Tract | Sec. 16, T 12 N, R 68 E. |
| Topography | Very rugged. | Latitude | 38°53'50" N. |
| Domain | National forest. | Longitude | 114°20'16" W. |
| Owner | Mt. Wheeler Mines, Inc., Salt Lake City, UT (1983). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|--|
| Type of ore body | Replacement, fissure vein, shear zone. | Host formation | Pioche Shale. |
| Origin | Unknown. | Geologic age | Cambrian. |
| Shape of ore body | Lenticular. | Rock relationships | Limestone, replaced by ore. Shale, lies over ore. Shale, lies under ore. |
| Ore controls | Fracturing, bedding. | Size | Large. |
| Mineralized zone average dimensions, m: | | | |
| Length | 1,000. | | |
| Width | 8. | | |
| Thickness | 5. | | |
| Depth | 0. | | |
| Mineral names | Phenacite, fluorite, scheelite, beryl, bertrandite. | | |

DEVELOPMENT

| | | | |
|--------------------------|------------------------------|--------------------------------|----------|
| Current status | Inactive-developed. | Distance to water supply | On-site. |
| Type of operation | Possible underground. | Road requirement | None. |
| Year of discovery | 1959. | Distance to power supply | <10 km. |
| Discovery method | Auxiliary minerals in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|---------------------------------------|
| 119, 122, 249, 250, 275, 284, 359, 679, 797, 798. | USGS quad maps | Lund, 1:250,000. Wheeler Peak, 15' |
| | USBM sequence number | 0320330039. |
| | USGS MRDS number | D001197. |

MOUNTAIN SPRINGS—BARITE

Alternate names: FMC Mine

Commodities: BaSO₄

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|------------------------------|
| County | Lander. | General location | About 39 km south of Carlin. |
| Mining district | Mountain Springs. | Meridian | Mount Diablo. |
| Elevation | 1,563 m. | Tract | Sec. 8, T 28 N, R 44 E. |
| Topography | Rolling. | Latitude | 40°18'25" N. |
| Domain | Mixed, BLM administered. | Longitude | 117°02'28" W. |
| Owner | FMC Corp. Inc., Chicago, IL (1984). | | |
| Operator | FMC Corp. Inc.; IMCO Services—milling (a wholly owned subsidiary of Halliburton Co., Dallas, TX) (1984). | | |

GEOLOGY

| | | | |
|---|---------------------|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Slaven. |
| Origin | Sedimentation. | Geologic age | Devonian. |
| Shape of ore body | Tabular. | Rock relationships | Chert, lies over ore, encloses ore. Limestone, lies over ore. |
| Ore controls | Bedding, lithology. | Size | Large. |
| Strike and dip of mineralized zone. | N 30° W: 45° S. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 244. | | |
| Width | 36. | | |
| Thickness | 30. | | |
| Depth | 0. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|--------------------------------|-----------------------------------|
| Current status | Active-producer. | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | On-site. |
| Year of discovery | 1947. | Mill location | On-site. |
| Discovery method | Ore mineral in place. | Mill status | Producer-standby. |
| Initial production | 1952. | Milling method | (¹). |
| Last production | Ongoing. | Process rate | FMC—63,000 t/a; IMCO—400,000 t/a. |
| Past production | Confidential proprietary data. | Product type | Crushed concentrated barite. |
| | | Distance shipped | 44 km. |
| | | Destination | Battle Mountain, NV. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--|----------------------------|---------------------------------------|
| 78, 87, 131, 173, 315, 330, 346, 347, 385, 392, 546, 548, 601, 688, 693, 735. | USGS quad maps | Winnemucca, 1:250,000. McCoy, 15'. |
| | USBM sequence number | 0320150072. |
| | Mid number | 2600401. |

¹FMC Corp. operates a small crushing and screening plant; IMCO Services operates a large beneficiation plant. The IMCO plant incorporates jigging, tabling, and flotation concentrating techniques.

NEVADA MOLY—MOLYBDENUM

Alternate names: Anaconda-Nevada Moly Prospect, Hall Copper, Hall Hand
Property, Liberty Mine, San Antonio Mine, Hall Molly

Commodities: Mo, Cu, Ag,
Au

LOCATION-OWNERSHIP

| | | | |
|-----------------|---|------------------|-----------------------------------|
| County | Nye | General location | About 27 km northwest of Tonopah. |
| Mining district | San Antonio | Meridian | Mount Diablo. |
| Elevation | 1,798 m. | Tract | Sec. 5, T 5 N, R 42 E. |
| Topography | Hilly. | Latitude | 38°19'23" N. |
| Domain | Mixed. | Longitude | 117°17'31" W. |
| Owner-operator | The Anaconda Minerals Co., Denver, CO (a wholly owned subsidiary of Atlantic Richfield Co., Denver, CO) (1984). | | |

GEOLOGY

| | | | |
|---|---|--------------------|--|
| Type of ore body | Replacement, stockwork, disseminated. | Host formation | Valmy. |
| Origin | Hydrothermal, oxidation. | Geologic age | Ordovician. |
| Shape of ore body | Pipelike, cylindrical. | Rock relationships | Quartz porphyry, is ore. |
| Ore controls | Contact zone, igneous, faulting. | Size | Metamorphosed sediments, ore in fractures, along bedding planes. |
| Strike and dip of mineralized zone. | N 45° E: 15° to 50° E. | | Large. |
| Mineralized zone average dimensions, m: | | | |
| Length | 780. | | |
| Width | 760. | | |
| Thickness | 40. | | |
| Depth | 3. | | |
| Mineral names | Creedite, chalcopryrite, pyrite, sphalerite, chalcocite, molybenite, pyrrhotite, malachite, azurite, powellite, limonite, galena. | | |

DEVELOPMENT

| | | | |
|-------------------|--|--------------------------|---|
| Current status | Active-producer. ¹ | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit, conventional truck and shovel with 14-m benches. | Distance to power supply | On-site. |
| | | Mill location | On-site. |
| | | Mill status | Operating. |
| Year of discovery | 1863. | Milling method | Two-product bulk flotation. |
| Discovery method | Ore mineral in place. | Process rate | 20,000 t/d (full capacity). |
| | | Product type | MoS ₃ concentrate to leach plant; Cu concentrate to smelter. MoS ₃ product capacity is estimated 7,260 t/a. |
| Production | Full production capabilities reached in December 1981. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------|---------------|---------------------|------|-----------|
| 1..Not reported in reference | 455,000,000 t | 0.072% Mo, 0.06% Cu | 1983 | 736 |

REFERENCES

| | | |
|--|----------------------|---|
| 26, 161, 181, 196, 279, 310, 355, 357, 368, 402, 420, 469, 472, 475, 599, 608, 619, 736, 759, 813, 837, 842. | USGS quad maps | Tonopah, 1:250,000. San Antonio Ranch, 15' |
| | USBM sequence number | 0320230005. |
| | USGS MRDS number | M030038. |

Comments: Eighty percent of resource is in the quartz porphyry intrusive.

¹The Nevada Moly Mine indefinitely suspended operations in January 1985 because of poor market conditions.

NEVADA SCHEELITE—TUNGSTEN

Alternate names: Leonard Mine

Commodities: W, Cu, Mo

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-------------------------------------|
| County | Mineral. | General location | About 58 km northeast of Hawthorne. |
| Mining district | Regent-Rawhide. | Meridian | Mount Diablo. |
| Elevation | 1,555 m. | Tract | Sec. 1, T 13 N, R 32 E. |
| Topography | Hilly. | Latitude | 39°01'00" N. |
| Domain | BLM administered. | Longitude | 118°19'30" W. |
| Owner-operator | Natural Resources Development Ltd., Reno, NV (subsidiary of NRD Mining, Ltd., Vancouver, BC, Canada) (1982). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Shear zone, replacement. | Host formation | Luning. |
| Origin | Contact metasomatic, hydrothermal. | Geologic age | Triassic. |
| Shape of ore body | Tabular, irregular. | Rock relationships | Granite, lies along ore, lies over ore. |
| Ore controls | Contact zone, lithology. | | Skarn (tactite), is ore. |
| Strike and dip of mineralized zone. | N 25° E: 80° E. | | Limestone, lies along ore, replaced by ore. |
| Mineralized zone average dimensions, m: | | | Hornfels, lies along ore, near ore. |
| Length | 2,000. | Size | Tuff, near ore. |
| Width | 20. | | Large. |
| Mineral names | Scheelite, wollastonite, garnet, pyrite, chalcopyrite, molybdenite, magnetite, epidote, calcite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|------------------------------------|
| Current status | Inactive-past producer. | Distance to water supply ... | <10 km. |
| Type of operation | Underground. | Road requirement | None. |
| Mining method | Overhand square set. | Distance to power supply ... | On-site. |
| Year of discovery | 1930. | Mill location | On-site; mill dismantled 1984. |
| Discovery method | Ore mineral in place. | Product type | WO ₃ concentrate (65%). |
| Initial production | 1937. | Distance shipped | 90 km by truck. |
| Last production | 1982. | Destination | Fallon, NV (Kennametal). |
| Past production | 301,000 stu ¹ of WO ₃ (704). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|------------------------------------|----------------------------|----------------------------|
| 215, 275, 598, 704, 733, 740, 774. | USGS quad maps | Reno, 1:250,000. |
| | | Big Kasock Mountain, 7.5'. |
| | USBM sequence number | 0320210033. |
| | Mid number | 2800614. |

¹stu = short ton unit = 20 lb of contained WO₃.

NORTHUMBERLAND—GOLD

Alternate names: Cyprus Northumberland
Ore body names: Chipmunk, Main

Commodities: Au, Ag
(Au-Ag ratio = 2:1)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|---------------------------------------|
| County | Nye. | General location | About 120 km northeast of Tonopah. |
| Mining district | Northumberland. | Meridian | Mount Diablo. |
| Elevation | 2,600 m. | Tract | Sec. 24, T 13 N, R 45 E (unsurveyed). |
| Topography | Rugged. | Latitude | 38°57'29" N. |
| Domain | National forest. | Longitude | 116°50'44" W. |
| Owner-operator | Cyprus Northumberland Mining Co., Austin, NV (subsidiary of Amoco Metals Co., Englewood, CO) (1983). | | |

GEOLOGY

| | | | |
|-------------------------------------|--|--------------------------|---|
| Type of ore body | Disseminated, stratabound, replacement. | Host formations | Vinini. |
| Origin | Hydrothermal. | | Roberts Mountains. |
| Shape of ore body | Irregular, relatively tabular or flat. | Geologic ages | Ordovician. |
| Ore controls | Faults, igneous contact, fractures, lithology. | Rock relationships | Silurian. |
| Strike of mineralized zone. | West-northwest. | | Tuff, lies above ore. |
| Age of mineralization | Late Cretaceous (84.6 million yr). | | Carbonaceous shales, contains disseminated gold (Vinini). |
| Mineralized zone average dimensions | | | Calcareous siltstone, contains disseminated gold (Vinini). |
| Length | 1,100. | | Jasperoid replaced limestone, portions are ore, lies above ore. |
| Width | 240. | | Jurassic granitic intrusive, occurs as sills in host rocks, is mineralized. |
| Thickness | 18 to 21. | | |
| Depth | 0 to 9 (Main). | Alteration | Silicification, argillic (Paleozoic), sericitic (intrusive). |
| Mineral names | Gold, arsenopyrite, pyrite, stibnite, realgar, orpiment, cinnabar, calcite, quartz, jasperoid, dolomite, barite, carbon. | Size | Small. |

DEVELOPMENT

| | | | |
|------------------------------|--|--------------------------------|--|
| Current status | Active-producer. | Distance to water supply | On-site, 3 wells at mill. |
| Type of operation | Surface. | Distance to power supply | On-site, diesel electric generator. |
| Mining method | Conventional open pit; mine about 4,500 t/d ore. | Mill location | Off-site, 14 km. |
| | | Mill status | Active. |
| Year of discovery | 1936 (low-grade gold in district). | Milling method | Cyanide heap leach, carbon adsorption columns, stripping, electro-winning, smelting. |
| Discovery method | Surface sampling and drilling. | Process rate | Crusher—4,500 t/d (5,000 ton/d), 5 d/wk. |
| Initial production | Early 1981 (Cyprus-Amoco). | Product type | Au-Ag dore bullion. |
| Annual production rate | About 620 kg Au (20,000 tr oz). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|--------------------------|------|-----------|
| 1..Proven | 6,000,000 tons | 0.065 tr oz/ton Au | 1979 | 831 |
| 2..Not reported in reference | 17,000,000 tons | 0.045 tr oz/ton Au | 1981 | 61 |

REFERENCES

| | | |
|--|----------------------------|----------------------------|
| 60, 61, 207, 222, 232, 338, 357, 368, 403, 404, 405, 461, 480, 539, 599, 601, 616, 623, 624, 630, 692, 752, 761, 773, 831. | USGS quad maps | Tonopah, 1:250,000. |
| | USBM sequence number | Northumberland Pass, 7.5'. |
| | Mid number | 0320230403. |
| | | 2601661. |

Comments: Ore reportedly occurs in and adjacent to a thrust fault separating lower plate Roberts Mountains Formation from upper plate Vinini Formation. Amoco 1983 operational plans were to mine the Main ore body to completion in 1985, then mine the Chipmunk ore body from 1985 to 1993. The crusher is co-located with the ore bodies; crushed ore is hauled west to the leaching facility at the mouth of West Northumberland Canyon in Big Smoky Valley. Ore heaps for leaching will be constructed at the rate of 5 to 6 per year. Heaps measure about 1,000 m long, 46 m wide, and 6 m high.

NYCO—FLUORINE

Alternate names: Spar #1 - 3

Commodities: CaF₂

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|------------------------------|
| County | Nye. | General location | About 117 km west of Pioche. |
| Mining district | Quinn Canyon Range. | Meridian | Mount Diablo. |
| Elevation | 2,560 m. | Tract | Sec. 34, T 3 N, R 55 E. |
| Topography | Hilly. | Latitude | 38°04'42" N. |
| Domain | National forest. | Longitude | 115°46'05" W. |
| Owner | C. Solan, 33%; W. Stable, 33%; Don W. Terrill, 33% (1981). | | |
| Operator | Teledyne Wah Chang (subsidiary of Teledyne Industries, Los Angeles, CA) (1957). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|-------------------------|
| Type of ore body | Fissure vein, breccia fill. | Host formation | Shingle Pass Tuff. |
| Origin | Hydrothermal. | Geologic age | Tertiary. |
| Shape of ore body | Lenticular. | Rock relationships | Tuff, ore in fractures. |
| Ore controls | Faulting. | Size | Medium. |
| Strike and dip of mineralized zone. | N 80° E: 49° N. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 91. | | |
| Width | 91. | | |
| Thickness | 9. | | |
| Mineral names | Fluorite, sericite, kaolinite, quartz, pyrite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|---------|
| Current status | Inactive-past producer. | Road requirement | <10 km. |
| Type of operation | Underground. | Distance to power supply ... | <50 km. |
| Year of discovery | 1950. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1951. | | |
| Last production | Undetermined. | | |
| Past production | 998 t. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|------------------|
| 281, 283, 357, 545, 604, 733, 815, 816. | USGS quad maps | Lund, 1:250,000. |
| | USBM sequence number | 0320230201. |

OVERTON—MAGNESITE

Alternate names: None

Commodities: MgO

LOCATION-OWNERSHIP

| | | | |
|-----------------------|-------------------------------------|------------------------|---------------------------------|
| County | Clark | General location | About 20 km southeast of Moapa. |
| Mining district | Overton. | Meridian | Mount Diablo. |
| Elevation | 463 m. | Tract | Sec. 34, T 16 S, R 67 E. |
| Topography | Hilly. | Latitude | 36°30'05" N. |
| Domain | BLM administered. | Longitude | 114°29'04" W. |
| Owner | Laura Gentry, Las Vegas, NV (1983). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|---|
| Type of ore body | Sedimentary. | Host formation | Horse Spring. |
| Origin | Sedimentation. | Geologic age | Tertiary. |
| Shape of ore body | Tabular, lenticular. | Rock relationships | Siltstone, lies under ore. Dolomite, replaced by ore, gangue. Siltstone, lies over ore. Conglomerate, lies over ore. |
| Ore controls | Bedding. | Size | Medium. |
| Strike and dip of mineralized zone | N 20° W; 34° E. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 3,000. | | |
| Width | 18. | | |
| Thickness | 90. | | |
| Depth | 12. | | |
| Mineral names | Magnesite, quartz, feldspar, plagioclase, dolomite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | <3 km. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply ... | <10 km. |
| Year of discovery | 1915. | Mill location | No mill. |
| Discovery method | Ore mineral in place. | | |
| Initial production | Unknown. | | |
| Last production | Unknown. | | |
| Past production | Small—data not available. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------------------|-------------------------|------|-----------|
| 1. Not reported in reference | 850,000 tons ¹ | 38% MgO (minimum) | 1936 | 266 |
| 2. Do | 3,700,000 tons ¹ | 34% MgO (minimum) | 1936 | 266 |
| 3. Do | 5,100,000 tons ¹ | 30% MgO (minimum) | 1936 | 266 |

REFERENCES

| | | |
|-----------|----------------------------|---------------------------------------|
| 266, 386. | USGS quad maps | Las Vegas, 1:250,000. Overton, 15' |
| | USBM sequence number | 0320030011. |

¹In beds 6 in. or more thick. Tonnages are cumulative.

P & S—BARITE

Alternate names: Old Soldier Mine

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|-------------------------------------|------------------------|----------------------------------|
| County | Nye. | General location | About 62 km southeast of Austin. |
| Mining district | Northumberland. | Meridian | Mount Diablo. |
| Elevation | 2,440 m. | Tract | Sec. 14, T 13 N, R 45 E. |
| Topography | Rugged. | Latitude | 38°58'11" N. |
| Domain | National forest. | Longitude | 116°52'47" W. |
| Owner | Standard Slag Co., Reno, NV (1983). | | |

GEOLOGY

| | | | |
|---|------------------------------|--------------------------|---|
| Type of ore body | Stratiform. | Host formation | Pinecone. |
| Origin | Sedimentation, metamorphism. | Geologic age | Middle Devonian. |
| Shape of ore body | Lenticular. | Rock relationships | Chert, encloses ore, gangue. Quartzite, encloses ore, gangue. Siltstone, encloses ore, gangue. Shale, encloses ore, gangue. Dacite, near ore. |
| Ore controls | Bedding. | Size | Medium. |
| Strike and dip of mineralized zone. | N 45° E: 15° E. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 160. | | |
| Width | 135. | | |
| Thickness | 36. | | |
| Depth | 50. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------------|--------------------------------|------------------|
| Current status | Active-producer. | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | <100 km. |
| Year of discovery | 1961. | Mill location | Fallon, NV. |
| Discovery method | Unknown. | Mill status | Active. |
| Initial production | 1977. | Milling method | Flotation. |
| Last production | 1985. | Process rate | 130 t/d. |
| Past production | 713,782 t ore (1978-80) (16). | Product type | Crushed barite. |
| | | Distance shipped | 695 km. |
| | | Destination | Bakersfield, CA. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

16, 87, 338, 357, 368, 546, 623, 624.

| | |
|----------------------------|---|
| USGS quad maps | Tonopah, 1:250,000. Jet Springs, 7.5'. |
| USBM sequence number | 0320230716. |
| Mid number | 2800823. |

PAN AMERICAN—LEAD-ZINC

Alternate names: St. Patrick Mining Co.

Commodities: Zn, Pb, Ag,
Au, Mn, Fe

LOCATION-OWNERSHIP

| | |
|--|---|
| County Lincoln. | General location About 15 km southwest of Pioche. |
| Mining district Comet. | Meridian Mount Diablo. |
| Elevation 1,954 m. | Tract Sec. 9, T 1 S, R 66 E. |
| Topography Rugged. | Latitude 37°52'18" N. |
| Domain Mixed. | Longitude 114°38'19" W. |
| Owner Resco International, Houston, TX (1983). | |

GEOLOGY

| | |
|--|---|
| Type of ore body Replacement, fissure vein. | Host formation Combined Metals Member of Pioche Shale. |
| Origin Hydrothermal. | Geologic age Lower Cambrian. |
| Shape of ore body Tabular. | Rock relationships Shale, lies over ore, near ore. Limestone, lies over ore, replaced by ore. Lamprophyre, lies along ore, lies over ore. |
| Ore controls Bedding, faulting. | Size Medium. |
| Strike and dip of mineralized zone North-south: 10° E. | |
| Mineralized zone average dimensions, m: | |
| Length 430. | |
| Width 200. | |
| Thickness 5. | |
| Depth 250. | |
| Mineral names Sphalerite, galena, psilomelane, pyrolusite. | |

DEVELOPMENT

| | |
|--|--|
| Current status Inactive-past producer. | Distance to water supply On-site. |
| Type of operation Underground. | Road requirement None. |
| Mining method Room and pillar. | Distance to power supply On-site. |
| Year of discovery 1929. | Mill location Pan American ore was concentrated at the Casleton mill during its last period of production. |
| Discovery method Ore mineral in place. | |
| Initial production 1947. | |
| Last production 1978. | |
| Past production Confidential proprietary data. | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|----------------------------------|--------------------------|---|------|-----------|
| 1..Proven ¹ | 2,196,000 tons | Pb, 1.17%; Zn, 2.45%; Ag, 2.07% (sic) | 1982 | 168 |

REFERENCES

| | |
|---|--|
| 168, 216, 274, 322, 720, 721, 724, 791. | USGS quad maps Calliente, 1:250,000. Bennett Pass, 7.5'. |
| | USBM sequence number 0320170045. |
| | USGS MRDS number M092092. |
| | Mid number 02800229. |

¹Reserves listed under St. Patrick Mining Co., Inc.

PHELPS-STOKES—IRON

Alternate names: Iron Mountain Claims, Stokes Iron Mine,
Phelps-Stokes Iron Deposit

Commodities: Fe

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------------|
| County | Nye. | General location | About 80 km northeast of Hawthorne. |
| Mining district | Gabbs. | Meridian | Mount Diablo. |
| Elevation | 1,865 m. | Tract | Sec. 21, T 12 N, R 37 E. |
| Topography | Gentle. | Latitude | 38°53'14" N. |
| Domain | Mixed, private. | Longitude | 117°49'45" W. |
| Owner | Grace Church; Standard Slag Co., Reno, NV (1975). | | |
| Operator | Standard Slag Co. (1975). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|-------------------------|
| Type of ore body | Replacement. | Host formation | Luning. |
| Origin | Contact metasomatic. | Geologic age | Upper Triassic. |
| Shape of ore body | Irregular. | Rock relationships | Shale, lies above ore. |
| Ore controls | Faulting, lithology, contact zone. | | Dolomite, encloses ore. |
| Strike and dip of mineralized zone. | N 75° W; 60° N. | Size | Small. |
| Mineralized zone average dimensions, m: | | | |
| Length | 550. | | |
| Width | 61. | | |
| Thickness | 122. | | |
| Mineral names | Magnetite, pyrite, pyrrhotite, hematite, gypsum, chlorite, sericite, actinolite, phlogopite, kaolin, calcite, augite, quartz, feldspar. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|-------------------------------|---------|
| Current status | Inactive-past producer. | Distance to water supply. . . | <10 km. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply. . . | <50 km. |
| Year of discovery | 1902. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1949. | | |
| Last production | 1957. | | |
| Past production | 1,200,000 t shipping grade ore and concentrates (454). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--------------------------|----------------------------|--|
| 357, 368, 454, 580, 750. | USGS quad maps | Tonopah, 1:250,000. Paradise Peak, 15'. |
| | USBM sequence number | 0320230155. |

PINSON—GOLD

Alternate names: Ogee-Pinson

Commodities: Au, Ag,
Hg (recovered byproduct)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|--------------------------------------|
| County | Humboldt. | General location | About 64 km northeast of Winnemucca. |
| Mining district | Potosi. | Meridian | Mount Diablo. |
| Elevation | 1,500 m. | Tract | Sec. 32, T 38 N, R 42 E. |
| Topography | Hilly. | Latitude | 41°07'45" N. |
| Domain | Private. | Longitude | 117°17'30" W. |
| Owner | J. S. Livermore, P. E. Galli, D. M. Duncan (21%); Lacana Mining, Inc. (26.25%); Rayrock Mines, Inc. (26.5%); United Siscoe Mines, Inc. (26.25%); all of Toronto, ON, Canada (1986). | | |
| Operator | Pinson Mining Co., Winnemucca, NV (1985). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|--|
| Type of ore body | Disseminated, breccia fill, replacement | Host formation | Comus. |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Thin-bedded siltstone and limestone, contains lower grade ore. |
| Ore controls | Faulting, fractures, lithology. | | Massive limestone, replaced by ore, lies above ore. |
| Strike and dip of mineralized zone. | Northeast: 40° to 50° E. | | Jasperoid breccia, replaces limestone above, is ore (major host). |
| Age of mineralization | Late Cretaceous (90 million yr). | | Andesite dikes, near ore (altered to clay). |
| Mineralized zone average dimensions, m: | | | Phyllitic shale, lies beneath ore and is fault footwall (Cambrian Preble Formation). |
| Length | 370. | Alteration | Silicification (ore zone), seritization (wallrock), oxidation. |
| Width | 130 (downdip). | Size | Small. |
| Thickness | 65. | | |
| Depth | About 5. | | |
| Mineral names | Gold, quartz, chalcedony, pyrite, marcasite, sericite, kaolinite, calcite, jasper, cinnabar. | | |

DEVELOPMENT

| | | | |
|------------------------------|---|--------------------------------|---|
| Current status | Active-producer, exploration. | Distance to water supply | <10 km. |
| Type of operation | Surface. | Road requirement | <1 km. |
| Mining method | Open pit; about 1,200 t/d ore and 17,000 t/d waste mined. | Distance to power supply | <1 km (road and powerline to Getchell Mine runs very near Pinson). |
| Year of discovery | 1945; again in 1971. | Mill location | On-site. |
| Discovery method | 1945—outcrop; 1971—geological inference and drilling. | Mill status | Active. |
| | | Milling method | Cyanide heap leach. Cyanide pretreatment, carbon column-agitated leach, CIP, electrolysis, smelting. |
| Initial production | January 1981 (milling); late 1982 (heap leaching). Expected mine life is 10 yr. | Process rate | 1,360 t/d (1,500 ton/d) (1983). |
| Past production | About 91,000 t ore, shipped to Getchell Mine (1949–50) (318). 110,440 t ore mined (1960) (16). 340,937 t ore milled; 1,753.3 kg Au recovered (1981) (372). 450,863 t ore milled; 2,200 kg Au recovered (1982) (372). 1,700 kg Au recovered (1983) (523); 1,900 kg Au forecast (1984) (523). | Product type | Dore bullion bars; 34 to 41 kg each, 950 to 975 fine (mercury recovery is 0.9 kg per cathode, 12 to 14 cathodes are refined per shift). |
| Annual production rate | About 1,741 kg Au (56,000 tr oz). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|--------------------|----------------------|---|------|-----------|
| 1. Indicated | 3,245,000 tons | 0.106 tr oz/ton Au (diluted mill grade) | 1980 | 640 |
| 2. Do | 5,000,000 tons | 0.025 tr oz/ton Au (leach grade) | 1980 | 554 |
| 3. Proven | 3,000,000 tons | 0.093 tr oz/ton Au (mill grade) | 1983 | 667 |
| Do | 2,400,000 tons | 0.026 tr oz/ton Au (leach grade) | 1983 | 667 |

REFERENCES

| | | |
|--|----------------------------|---|
| 16, 47, 79, 83, 90, 173, 204, 269, 285, 290, 292, 318, 372, 378, 412, 436, 438, 443, 482, 523, 525, 554, 555, 580, 561, 566, 578, 640, 662, 667, 713, 770, 773, 801. | USGS quad maps | McDermitt, 1:250,000. Osgood Mountains, 15'. |
| | USBM sequence number | 09320130220. |
| | Mid number | 2801597. |

Comments: Two pits are planned for development. Huttli (292) reports 3,760 t ore assaying 6.38 g/t Au was produced at the Ogee-Pinson. Original rated mill capacity in 1980 was 907 t/d (1,000 ton/d). In 1983, exploration drilling resulted in additional indicated resource along the mineral zone extension. The new discovery is fairly deep and narrow.

PIUTE—IRON

Alternate names: None

Commodities: Fe

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|------------------------------------|
| County | Pershing. | General location | About 20 km southeast of Lovelock. |
| Mining district | Wildhorse. | Meridian | Mount Diablo. |
| Elevation | 1,207 m. | Tract | Sec. 25, T 25 N, R 32 E. |
| Topography | Gentle. | Latitude | 40°00'30" N. |
| Domain | Federal. | Longitude | 118°20'30" W. |
| Owner | C. W. Hunley, 60%; E. L. and H. C. Stephenson, 30%; R. W. and L. M. Belanger, 10% (1975). | | |

GEOLOGY

| | | | |
|--|--|--------------------------|---|
| Type of ore body | Breccia fill, replacement, disseminated. | Host formation | Star Peak Group. |
| Origin | Contact metasomatic. | Geologic age | Triassic. |
| Shape of ore body | Pipelike. | Rock relationships | Breccia, replaced by ore, ore in fractures. |
| Ore controls | Fracturing. | | Andesite, encloses ore. |
| Mineralized zones average dimensions, m: | | | Marble, replaced by ore. |
| Depth | 230. | Size | Large. |
| Mineral names | Magnetite, pyrite, calcite, alabanite. | | |

DEVELOPMENT

| | | | |
|-------------------------|-----------------------------|--------------------------------|---------|
| Current status | Inactive-explored prospect. | Distance to water supply. . . | >10 km. |
| Type of operation | Possible surface. | Road requirement | None. |
| Year of discovery | 1952. | Distance to power supply . . . | <10 km. |
| Discovery method | Geophysical anomaly. | | |
| Past production | None. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.¹

REFERENCES

| | | |
|-----------|----------------------------|--|
| 329, 454. | USGS quad maps | Lovelock, 1:250,000. Lovelock, 15'. |
| | USBM sequence number . . . | 0320270382. |
| | USGS MRDS number | M060441. |

Comments: Southern Pacific Land Co. owns adjacent odd numbered sections.

¹Moore reports (454) "... an enormous quantity of material containing more than 20 percent iron, a very large quantity averaging more than 30 percent iron, and substantial quantity containing more than 50 percent iron."

PREBLE—GOLD

Alternate names: None

Commodities: Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------------|
| County | Humboldt. | General location | About 27 km due east of Winnemucca. |
| Mining district | Potosi. | Meridian | Mount Diablo. |
| Elevation | 1,430 m. | Tract | Sec. 18, T 36 N, R 41 E. |
| Topography | Hilly. | Latitude | 40°58'23" N. |
| Domain | Private. | Longitude | 117°24'00" W. |
| Owner | D. M. Duncan, P. E. Galli, J. S. Livemore, 21%; Lacana Mining, Inc., 26.25%; United Siscoe Mines, Inc., 26.25%; Rayrock Mines, Inc., 26.5%; all of Toronto, ON, Canada (1985). | | |
| Operator | Pinson Mining Co., Winnemucca, NV (1985). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|--|
| Type of ore body | Disseminated, replacement. | Host formation | Preble. |
| Origin | Hydrothermal, shear zone. | Geologic age | Cambrian. |
| Shape of ore body | Tabular. | Rock relationships | Massive limestone, replaced by ore, gangue. |
| Ore controls | Faulting, lithology. | | Carbonaceous calcareous shale, replaced by ore, gangue (principal host). |
| Strike and dip of mineralized zone. | Northeast: 30° SE. | | Dolomite, in area, but not associated with gold. |
| Age of mineralization | Late Cretaceous. | | Andesite sills (altered to clay), lies beneath ore, lies between ore horizons. |
| Mineralized zone average dimensions (main ore body), m: | | | Granodiorite, near ore. |
| Length | 300. | Alteration | Silicification, oxidation. |
| Thickness | 96. | Size | Small. |
| Excavation depth | 360 (planned). | | |
| Mineral names | Gold, pyrite, clay, limonite, goethite, lepidocrocite, quartz, chalcocopyrite. | | |

DEVELOPMENT

| | | | |
|------------------------------|---|------------------------|---|
| Current status | Active-producer. | Mill location | Pinson Mine and on-site heap leach. |
| Type of operation | Surface. | Mill status | Pinson mill active. |
| Mining method | Open pit. | Milling method | Pinson is carbon column, agitated leach, CIP. |
| Year of discovery | 1972. | Process rate | See Pinson abstract. |
| Discovery method | Float and outcrop chip sampling; geochemical. | Product type | Ore. |
| | | Distance shipped | About 24 km by truck. |
| | | Destination | Pinson mill. |
| Initial production | Fourth quarter 1984. | | |
| Annual production rate | 330,000 t ore anticipated. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|---------------------------------------|------|-----------|
| 1. Indicated | 1,340,000 tons | 0.08 tr oz/ton Au (leach grade) | 1980 | 554 |
| 2. Not reported in reference | 1,242,000 tons | 0.073 tr oz/ton Au | 1983 | 372 |
| 3. Do | 1,800,000 tons | 0.062 tr oz/ton Au | 1984 | 770 |

REFERENCES

| | | |
|--|----------------------------|---|
| 175, 176, 177, 178, 179, 180, 198, 204, 372, 435, 439, 443, 482, 564, 560, 561, 578, 611, 640, 770, 801. | USGS quad maps | Winnemucca, 1:250,000. Golconda, 7.5'. |
| | USBM sequence number | 0320130443. |

Comments: The mineralized zone can be traced for at least 1,200 m along strike.

PRINCE—LEAD-ZINC

Alternate names: Virginia Louise, Davidson (Prince Consolidated Mining Co.)

Commodities: Zn, Pb, Ag,
Au, Mn**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|---------------------------------|
| County | Lincoln. | General location | About 4 km southwest of Pioche. |
| Mining district | Pioche. | Meridian | Mount Diablo. |
| Elevation | 1,780 m. | Tract | Sec. 33, T 1 N, R 67 E. |
| Topography | Gentle. | Latitude | 37°54'04" N. |
| Domain | Mixed. | Longitude | 114°28'23" W. |
| Owner | Prince Consolidated Mining Co., Pioche, NV (1983). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|--|
| Type of ore body | Replacement, fissure vein. | Host formation | Lyndon Limestone. |
| Origin | Hydrothermal. | Geologic age | Middle Cambrian. |
| Shape of ore body | Tabular. | Rock relationships | Limestone, encloses ore, ore in fractures. |
| Ore controls | Bedding, faulting. | | Shale, lies under ore, lies along ore. |
| Strike and dip of mineralized zone. | N 20° W: 15° E. | | Quartzite, lies under ore, lies along ore. |
| Mineralized zone average dimensions, m: | | Size | Medium. |
| Length | 380. | | |
| Width | Unknown. | | |
| Thickness | 13. | | |
| Mineral names | Cerussite, anglesite, hemimorphite, braunite, pyrolusite, goethite, limonite, hematite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|----------|
| Current status | Inactive-past producer | Distance to water supply ... | <3 km. |
| Type of operation | Underground-glory hole. | Road requirement | None. |
| Year of discovery | 1869. | Distance to power supply ... | On-site. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | 1870. | | |
| Last production | 1949. | | |
| Past production | 1,112,000 t ore averaging 102.8 g/t Ag; 1.03 g/t Au; 3% Pb; 4% Zn; and 12% Mn (724). | | |

PUBLISHED RESERVES-RESOURCESNo published reserve-resource information.¹**REFERENCES**

| | | |
|---|----------------------------|---------------------------------------|
| 216, 274, 322, 333, 720, 721, 724, 791. | USGS quad maps | Caliente, 1:250,000. Pioche, 7.5'. |
| | USBM sequence number | 0320170023. |
| | USGS MRDS number | D000023. |

¹Much oxidized ore is reported as remaining; however, no published estimate is available.

PUMPKIN HOLLOW—IRON

Alternate names: Lyon Copper-Iron Deposits, Lyon Claims
 Ore body names: Northwest Deposit, North Deposit, South Deposit, East Deposit, E-2 Deposit

Commodities: Fe, Cu, Au,
 Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|---------------------------------------|
| County | Lyon. | General location | About 68 km southeast of Carson City. |
| Mining district | Unorganized. | Meridian | Mount Diablo. |
| Elevation | 1,428 m. | Tract | Sec. 3, T 12 N, R 26 E. |
| Topography | Hilly. | Latitude | 38°56'25" N. |
| Domain | Mixed. | Longitude | 119°03'03" W. |
| Owner | U.S. Steel Corp., Pittsburgh, PA (1984). | | |
| Lessee | Plexus Resources Co., Salt Lake City, UT (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Replacement, disseminated. | Host formation | Metasedimentary rocks. |
| Origin | Contact metasomatism, hydrothermal. | Geologic age | Triassic. |
| Shape of ore body | Tabular. | Rock relationships | Limestone, replaced by ore. Shale, replaced by ore. Chert, replaced by ore. Skarn (tactite), is ore, gangue. Marble, replaced by ore, gangue. |
| Ore controls | Contact zone, lithology, faulting. | Size | Large. |
| Strike and dip of mineralized zone. | Northeasterly; steeply northwest. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 853. | | |
| Width | 610. | | |
| Thickness | 114. | | |
| Depth | 107. | | |
| Mineral names | Magnetite, pyrite, pyrrhotite, chalcopyrite, actinolite, hedenbergite, diopside, calcite, chlorite, epidote, tremolite, garnet, talc, serpentine, quartz, bornite. | | |

DEVELOPMENT

| | | | |
|-------------------------|----------------------|------------------------------|---------|
| Current status | Inactive-explored. | Distance to water supply ... | >10 km. |
| Type of operation | Prospect. | Road requirement | <10 km. |
| Year of discovery | 1960. | Distance to power supply ... | <50 km. |
| Discovery method | Geophysical anomaly. | | |
| Past production | None. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|-----------------------|------|-----------|
| 1..Not reported in reference | 250,000,000 long tons | 40% Fe, 0.3% Cu | 1969 | 771 |

REFERENCES

| | | |
|-------------------------------|----------------------------|--|
| 360, 453, 454, 668, 695, 771. | USGS quad maps | Walker Lake, 1:250,000. Yerington, 15'. |
| | USBM sequence number | 0320190181. |
| | USGS MRDS number | W016414. |

Comments: The Pumpkin Hollow deposits contain 6 discrete ore bodies.

QUEEN LODGE—BARITE

Alternate names: None

Commodities: BaSO₄

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|---|
| County | Elko. | General location | About 67 km southeast of Battle Mountain. |
| Mining district | Bootstrap. | Meridian | Mount Diablo. |
| Elevation | 1,860 m. | Tract | Sec. 27, T 37 N, R 49 E. |
| Topography | Hilly. | Latitude | 41°03'19" N. |
| Domain | Private. | Longitude | 118°25'50". |
| Owner | NL Baroid-NL Industries, Inc., Houston, TX (1985). | | |
| Operator | Tom Norris Construction (mining contractor), Battle Mountain, NV (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Sedimentary. | Host formation | Vinini. |
| Origin | Sedimentation, hydrothermal (submarine hot springs). | Geologic age | Ordovician. |
| Shape of ore body | Tabular, massive, irregular. | Rock relationships | Chert, encloses ore, gangue. Siltstone, encloses ore, gangue. Shale, encloses ore, gangue. Conglomerate, encloses ore, gangue. |
| Ore controls | Bedding. | Size | Medium. |
| Strike and dip of mineralized zone. | N 30° E: 65° N. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 300. | | |
| Width | 90. | | |
| Thickness | 6. | | |
| Depth | 0. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------------|--------------------------------|---|
| Current status | Inactive-past producer (standby). | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | Mine—on-site generation. Mill—on-site commercial supply. |
| Year of discovery | 1938. | Mill location | Dunphy Siding, 48 km south of mine. |
| Discovery method | Ore mineral in place. | Mill status | Standby. |
| Initial production | 1978. | Milling method | Flotation, grinding. |
| Last production | 1982. | Product type | Fine ground barite. |
| Past production | Confidential proprietary data. | Destination | Alaska, West Coast, and intermountain markets. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|---|
| 77, 95, 123, 226, 278, 392, 546, 669, 688, 775, 778, 796. | USGS quad maps | McDermitt, 1:250,000. Santa Renia Fields, 7.5' |
| | USBM sequence number | 0320070364. |
| | Mid number | 2601148. |

Comments: The Queen Lodge is mined in conjunction with the Rossi (Sage Hen).

RAIN—GOLD

Ore body names: Main, Southeast Extension

Commodities: Au, Ag
(Au-Ag ratio = 10-20:1)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|----------------------------------|
| County | Elko. | General location | About 14 km southeast of Carlin. |
| Mining district | Carlin. | Meridian | Mount Diablo. |
| Elevation | 2,070 m. | Tract | Sec. 3, T 31 N, R 53 E. |
| Topography | Hilly. | | Sec. 33, T 32 N, R 53 E. |
| Domain | Possibly private. | Latitude | 40°36'35" N. |
| | | Longitude | 116°00'25" W. |
| Owner | Newmont Mining Corp., New York, NY (1985). | | |
| Operator | Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp.) (1985). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|--|
| Type of ore body | Epithermal, disseminated, sediment-hosted. | Host formation | Webb. |
| Origin | Hydrothermal, epithermal. | Geologic age | Mississippian. |
| Shape of ore body | West-northwest elongate manto. | Rock relationships | Jasperoid breccia, contains ore. |
| Ore controls | Faulting, fracturing, lithology (minor). | | Siltstone and breccia, contains ore. |
| Strike and dip of mineralized zone | N 30° to 40° W; dip southwest | | Sandstones, contains ore. |
| Mineralized zone average dimensions, m: | | Alteration | Shales, contains ore. |
| Length | About 730. | | Silicification, oxidation, argillization, baritization, bleaching. |
| Thickness | 110 (maximum). | Size | Small. |
| Depth | 46. | | |
| Mineral names | Gold, quartz, barite, limonite, manganese oxides, hematite, jarosite, calcite, illite, kaolinite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|----------------------|--------------------------------------|
| Current status | Active-exploration, feasibility, standby. | Mill location | Likely will be co-located with mine. |
| Type of operation | Surface | Mill status | No mill. |
| Mining method | Proposed open pit. | Milling method | Cyanide heap leach probable. |
| Year of discovery | 1980. | | |
| Discovery method | Geochemical-rock chip sample, drilling. | | |
| Initial production | Pending development; possibly 1990's. | | |
| Past production | None. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------|----------------|-----------------------------------|------|-----------|
| 1. Not reported in reference | 8,300,000 tons | 0.083 tr oz/ton Au (ore in-place) | 1983 | 511 |
| Above contains | 3,400,000 tons | 0.147 tr oz/ton Au | 1983 | 511 |

REFERENCES

| | | |
|---|----------------------------|---|
| 27, 59, 61, 90, 118, 224, 226, 319, 350, 363, 511, 581, 663, 664, 665, 669. | USGS quad maps | Winnemucca, 1:250,000. Dixie Flats, 15'. |
| | USBM sequence number | 0320070271. |

Comments: Development of the Rain deposit is expected to recommence after Gold Quarry goes into production. Further drilling may disclose greater reserves as the ore body is reportedly open at depth and to the east. Ore is in fractures and occurs in the axis of a regional north-northwest plunging antiform. At Rain, the antiform is marked by a high-angle reverse fault trending west-northwest and dipping steeply southwest.

RAINBOW—FLUORINE

Alternate names: Bruno Prospect, Fluorspar Corp. of America, Hope

Commodities: CaF₂**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|---|------------------------|------------------------------|
| County | Nye. | General location | About 117 km west of Pioche. |
| Mining district | Quinn Canyon Range. | Meridian | Mount Diablo. |
| Elevation | 2,042 m. | Tract | Sec. 1, T 2 N, R 54 E. |
| Topography | Hilly. | Latitude | 30°03'47" N. |
| Domain | BLM administered. | Longitude | 115°51'17" W. |
| Owner | Wesley Koyen, Alamo, NV (Rainbow and Emerald Claims); Ed Slavin, Tonopah, NV (Bruno Claims) (1981). | | |

GEOLOGY

| | | | |
|---|--------------------|--------------------------|-----------------------------|
| Type of ore body | Fissure vein. | Host formation | Volcanic rocks undivided. |
| Origin | Hydrothermal. | Geologic age | Tertiary. |
| Shape of ore body | Lenticular. | Rock relationships | Tuff, ore in fractures. |
| Ore controls | Faulting, igneous. | | Rhyolite, ore in fractures. |
| Strike and dip of mineralized zone. | N 20° E: 40° W. | | Dacite, ore in fractures. |
| Mineralized zone average dimensions, m: | | Size | Latite. |
| Length | 2,414. | | Small. |
| Width | 805. | | |
| Thickness | 30. | | |
| Mineral names | Fluorite, quartz. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|---------|
| Current status | Inactive-past producer. | Road requirement | <10 km. |
| Type of operation | Surface. | Distance to power supply ... | <50 km. |
| Mining method | Surface open stope. | | |
| Year of discovery | 1941. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1945. | | |
| Last production | 1946. | | |
| Past production | 181 t (545). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--|----------------------------|------------------|
| 281, 283, 357, 368, 545, 604, 733, 815, 816. | USGS quad maps | Lund, 1:250,000. |
| | USBM sequence number | 0320230200. |

RELIEF CANYON—GOLD

Alternate names: (site of) Emerald Spar Fluorite deposit

Commodities: Au, Ag,
CaF₂ (nonrecoverable)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-------------------------------|
| County | Pershing. | General location | About 24 km east of Lovelock. |
| Mining district | Relief-Antelope Springs. | Meridian | Mount Diablo. |
| Elevation | 1,645 m. | Tract | Sec. 16, T 27 N, R 34 E. |
| Topography | Rugged. | Latitude | 40°12'15" N. |
| Domain | Mixed, Federal, private lease. | Longitude | 118°10'13" W. |
| Owner-operator | Lacana Mining Corp., Toronto, ON, Canada (1986). (The development of the property is a joint venture; Lacana's partner is unknown.) | | |

GEOLOGY

| | | | |
|---|--|--------------------------|--|
| Type of ore body | Disseminated epithermal gold, stratabound. | Host formations | Grass Valley. Natchez Pass (Cane Springs). |
| Origin | Hydrothermal. | Geologic age | Late Triassic. |
| Shape of ore body | Irregular triangular wedge or bell-shape in plan. | Rock relationships | Argillite, quartzite, siltstone, shale (Grass Valley), adjacent and above principal ore zone. |
| Ore controls | Faulting, lithology. | | Jasperoid breccia zone, contains ore. |
| Age of mineralization | Unknown, possibly from Late Cretaceous to Late Tertiary. | | Carbonaceous dolomitic limestone, minor shale and siltstone (Natchez Pass), adjacent and below principal ore zone. |
| Mineralized zone average dimensions, m: | | Alteration | Jasperoid silicification, argillic, iron staining, intense oxidation. |
| Length | 730. | Size | Small. |
| Width | 550. | | |
| Thickness | 0 to >30. (deposit open to the southwest) | | |
| Mineral names | Native gold or electrum, quartz, pyrite, sericite, hematite, fluorspar, jasperoid, clay. | | |

DEVELOPMENT

| | | | |
|------------------------------|---|--------------------------------|---|
| Current status | Active-producer. | Distance to water supply | <5 km. |
| Type of operation | Surface. | Road requirement | <5 km. |
| Mining method | Conventional open pit; mine 4,500 t/d ore, and about 6,400 t/d waste. | Distance to power supply | <5 km. |
| | | Mill location | On-site. |
| Year of discovery | 1979-82. | Mill status | Active. |
| Discovery method | Mapping, stream sediment sampling, drilling by Duval Corp. | Milling method | Agglomeration, sodium cyanide heap leach, carbon column recovery. |
| | | Process rate | About 4,500 t/d. |
| Initial production | September-October 1984. | | |
| Past production | None. | | |
| Annual production rate | 762 kg (24,500 tr oz) Au. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|---|------|-----------|
| 1. Not reported in reference | 7,000,000 tons | 0.042 tr oz/ton Au | 1983 | 530 |
| 2. Do ^a | 8,000,000 tons | 0.04 tr oz/ton Au (diluted ore; stripping ratio = 1.5:1). | 1983 | 199 |
| 3. Do ^a | 9,000,000 tons | 0.032 tr oz/ton Au (stripping ratio = 2:1) | 1984 | 658 |

REFERENCES

| | | |
|--|----------------------------|--|
| 90, 199, 224, 329, 331, 496, 525, 530, 658, 662, 755, 810. | USGS quad maps | Lovelock, 1:250,000. Buffalo Mountain, 15'. |
| | USBM sequence number | 0320270720. |

Comments: Gold is in and near jasperoid silicification principally within a sedimentary breccia at the contact between the above 2 host formations.

^aResource is referred to as preliminary pit plan diluted reserves.^aResource is referred to as minable reserves.

RIDGE 7129—ZINC

Alternate names: Gibellini, Bisoni Properties

Commodities: Zn, V, Mo,
Se, oil shale

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|----------------------------------|
| County | Eureka. | General location | About 37 km southwest of Eureka. |
| Mining district | Fish Creek. | Meridian | Mount Diablo. |
| Elevation | 2,164 m. | Tract | Sec. 3, T 15 N, R 52 E. |
| Topography | Hilly. | Latitude | 39°12'30" N. |
| Domain | Unknown. | Longitude | 118°05'34" W. |
| Owner | Maynard and Lester Bisoni; Noranda Exploration, Inc., Lakewood CO (1979). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|--------------------------|
| Type of ore body | Sedimentary. | Host formation | Woodruff. |
| Origin | Sedimentation, oxidation. | Geologic age | Devonian. |
| Shape of ore body | Irregular. | Rock relationships | Mudstone, encloses ore. |
| Ore controls | Lithology. | | Siltstone, encloses ore. |
| Mineralized zone average dimensions, m: | | | Chert, near ore. |
| Length | >600. | Size | Medium. |
| Width | 300. | | |
| Thickness | 60. | | |
| Depth | Surface. | | |
| Mineral names | Sphalerite, metaheawettite, molybdenite, kerogen. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply ... | Unknown. |
| Type of operation | Possible underground. | Road requirement | <10 km. |
| Year of discovery | Unknown. | Distance to power supply ... | <50 km. |
| Discovery method | Drilling, trenching. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|----------------|----------------------------|-----------------------|
| 112, 333, 593. | USGS quad maps | Millett, 1:250,000. |
| | | Cockalorum Wash, 15'. |
| | USBM sequence number | 0320110222. |

| | | |
|--------------------------|-------------------------|-----------------------|
| Comments: Assay results: | <i>Unoxidized rock,</i> | <i>Oxidized rock,</i> |
| | ppm | ppm |
| V | 3,000- 7,000 | 6,000-8,000 |
| Zn | 4,000-18,000 | 30- 100 |
| Se | 30- 200 | 200- 400 |
| Mo | 70- 960 | 30- 80 |

Fresh black rock yielded as much as 12 gal/ton (60 L/t) syncrude oil (112).

ROBINSON DISTRICT—COPPER

Includes: New Ruth Pit, Ruth-Kimberly, Veteran-Tripp Open Pit,
Veteran-Tripp Underground, Veteran-Tripp Lo-Grade

Commodities: Cu, Mo, Ag,
Au, platinum group
metals

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--------------------------|
| County | White Pine. | General location | About 10 km west of Ely. |
| Mining district | Robinson. | Meridian | Mount Diablo. |
| Elevation | 1,920 to 2,320 m. | Tract | T 16 N, R 62-63 E. |
| Topography | Hilly. | Latitude | 39°15'20" N. |
| Domain | Private. | Longitude | 114°57'59" W. |
| Owner-operator | Kennecott Copper Corp., Salt Lake City, UT (1984). | | |

GEOLOGY

| | | | |
|-------------------------|---|--------------------------|--|
| Type of ore body | Disseminated, replacement, vein supergene, stockwork. | Host formation | Various (18 formations). |
| Origin | Hydrothermal, oxidation, replacement. | Geologic age | Ordovician-Tertiary. |
| Shape of ore body | Irregular, massive. | Rock relationships | Various sedimentary, encloses ore, replaced by ore. |
| Ore controls | Igneous, fracturing, lithology. | | Quartz monzonite, encloses ore, is ore. |
| District dimensions: | | | Metamorphosed and/or altered sedimentary, encloses ore, is ore. |
| Length | 19 km. | Size | Large. |
| Width | 14 km. | | |
| Depth | 0 to 500 m. | | |
| Mineral names | Chalcopyrite, bornite, molybdenite, argentite, pyrite, chalcocite, cerussite, calcite, fluorite, pyrolusite, braunite, hemimorphite, smithsonite, native gold, scheelite, hematite, jarosite, malachite, azurite, cuprite, native copper, chalcantite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---------------------------------|------------------------------|----------------|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit, underground. | Distance to power supply ... | On-site. |
| Year of discovery | 1867. | Mill location | McGill, 32 km. |
| Discovery method | Ore mineral in place. | Mill status | Inactive. |
| Initial production | 1870. | Milling method | Flotation. |
| Last production | 1978. | Process rate | 19,972 t/d. |
| Past production | Greater than 204 million t ore. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.¹

REFERENCES

| | | |
|---|----------------------|--------------------------------|
| 1, 17, 37, 38, 39, 127, 264, 280, 284, 293, 294, 321, 341, 374, 419, 432, 438, 556, 674, 792, 806, 819, 820, 821, 825, 826. | USGS quad maps | Ely, 1:250,000. Ruth, 7.5'. |
|---|----------------------|--------------------------------|

¹In 1976, Kennecott Copper Corp. reported that 454,000 t of copper could be recovered from 82,554,000 t ore averaging 0.67% Cu (792).

ROCHESTER—SILVER

Alternate names: Silver State, Nenzel Hill

Commodities: Ag, Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--------------------------------------|
| County | Pershing. | General location | About 30 km northeast of Lovelock. |
| Mining district | Rochester. | Meridian | Mount Diablo. |
| Elevation | 1,829 m. | Tract | Sec. 15, 16, 21, 22, T 28 N, R 34 E. |
| Topography | Hilly, rugged. | Latitude | 40°17'23" N. |
| Domain | Mixed; private, BLM administered (4 patented claims and 20 unpatented lode claims). | Longitude | 118°12'00" W. |
| Owner | Royal Apex Silver, Inc., Wallace, ID (Coeur d'Alene Mines Corp. owns 49.8% of Royal Apex) (1983). | | |
| Operator | Coeur d'Alene Mines Corp., Wallace, ID, lessee (acquired 85% of net operating property); ASARCO, Inc., New York, NY, holds a small royalty interest (1985). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|---|
| Type of ore body | Disseminated, stockwork. | Host formation | Koipato Group (Weaver, Rochester, Limerick Formations). |
| Origin | Hydrothermal. | Geologic age | Permian-Triassic. |
| Shape of ore body | Tabular, irregular. | Rock relationships | Rhyolite ash-flow tuffs, volcani- clastics, contains veins and disseminated silver (Weaver Formation). |
| Ore controls | Faults, fractures. | Alteration | Rhyolite flows and tuffs, contains veins and disseminated silver (Rochester Formation). |
| Strike of mineralized zone | Northeast. | Size | Medium. |
| Age of mineralization | Late Cretaceous (70 to 80 million yr). | | |
| Mineralized zone aver- age dimensions, m: | | | |
| Length | 1,150. | | |
| Width | 750. | | |
| Thickness | 0 to >200. | | |
| Depth | 0. | | |
| Mineral names | Argentian tetrahedrite, chlorargyrite, silver, acanthite, sphalerite, arsenopyrite, chalcocopyrite, electrum, pyrite (95% of sulfides), quartz, sericite (numerous others). | | |

DEVELOPMENT

| | | | |
|--------------------------|---|------------------------------|--------------|
| Current status | Active-past producer, feasibility. | Distance to water supply ... | Unavailable. |
| Type of operation | Possible surface. | Road requirement | Unavailable. |
| Mining method | Possible open pit. | Distance to power supply ... | Unavailable. |
| Year of discovery | 1912 (high-grade silver ore). | | |
| Initial production | 1912. | | |
| Last production | 1951. | | |
| Past production | District— >2,595 kg Au; 276,000 kg Ag; 12.7 t Cu; 152 t Pb; 30 t Zn (329). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-------------------|--|------|-----------|
| 1..Probable | 70,000,000 tons | 1.39 tr oz/ton Ag; 0.0072 tr oz/ton Au | 1980 | 159 |
| Possible | 30,000,000 tons | | | |
| 2..Not reported in reference | 75,000,000 tons | 1.5 tr oz/ton Ag | 1981 | 61 |
| 3.. Do | >100,000,000 tons | 1 to 2 tr oz/ton Ag; "small amounts of Au" | 1981 | 745 |
| 4..Indicated | 88,300,000 tons | 1.5 tr oz/ton Ag; 0.007 tr oz/ton Au | 1983 | 94 |

REFERENCES

| | | |
|---|----------------------------|--|
| 61, 74, 93, 94, 159, 323, 329, 362, 613, 662, 745, 746, 758, 776, 777. | USGS quad maps | Lovelock, 1:250,000. Unionville, 15'. |
| | USBM sequence number | 0320270673. |

Comments: Coeur d'Alene Mines Corp. purchased ASARCO's interest in the property in 1983. Mineral zone dimensions represent disseminated silver grade higher than 34 g/t (>1 oz/ton). From 1969-82, ASARCO reportedly spent \$2.9 million in exploration costs on the property. Work in 1984 included large-scale leach testing and about 1,600 m of core drilling. In 1984, the drilling season expanded total mineralized material to 102.1 million t.

ROSSI—BARITE

Alternate names: Sage Hen, Dunphy, National Lead Co.

Commodities: BaSO₄

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|---|
| County | Elko. | General location | About 66 km southeast of Battle Mountain. |
| Mining district | Bootstrap. | Meridian | Mount Diablo. |
| Elevation | 1,770 m. | Tract | Sec. 22, T 37 N, R 49 E. |
| Topography | Hilly. | Latitude | 41°04'03" N. |
| Domain | Mixed; private and BLM administered public lands. | Longitude | 116°25'31" W. |
| Owner | NL Baroid-NL Industries, Inc., Houston, TX (1983). | | |
| Operator | Tom Norris Construction (mining contractor), Battle Mountain, NV (1983). | | |

GEOLOGY

| | | | |
|--|--|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Vinini. |
| Origin | Sedimentation, hydrothermal (submarine hot springs). | Geologic age | Ordovician. |
| Shape of ore body | Tabular, massive, irregular. | Rock relationships | Chert, encloses ore, gangue. Shale, near ore, gangue. Quartzite, near ore. Limestone, near ore. |
| Ore controls | Bedding. | Size | Large. |
| Strike and dip of mineralized zone | N 55° E: 60° N. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 1,800. | | |
| Width | Unknown. | | |
| Thickness | 10. | | |
| Depth | 0. | | |
| Mineral names | Barite, chert, witherite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------------|--------------------------------|--|
| Current status | Inactive-past producer (standby). | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | Mine—on-site generator. Mill—on-site commercial supply. |
| Year of discovery | 1937. | Mill location | Dunphy Siding, 48 km south of mine. |
| Discovery method | Ore mineral in place. | Mill status | Standby. |
| Initial production | 1947. | Milling method | Jigging, flotation, grinding. |
| Last production | 1982. | Product type | Finely ground barite. |
| Past production | Confidential proprietary data. | Destination | Alaska, West Coast, and intermountain markets. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--|----------------------------|--|
| 71, 87, 95, 123, 226, 278, 392, 449, 546, 669, 688, 775, 778, 796. | USGS quad maps | McDermitt, 1:250,000. Santa Renia Fields, 7.5'. |
| | USBM sequence number | 0320070094. |
| | Mid number | 2600397. |

Comments: The Rossi (Sage Hen) is mined in conjunction with the Queen Lode.

ROUND MOUNTAIN—GOLD

Alternate names: Smoky Valley Mine, Round Mountain Common Operation
 Related names: Sunnyside Pit, Southeast Pit

Commodities: Au, Ag
 (Au-Ag ratio ≈ 1:2)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------|
| County | Nye. | General location | About 80 km north of Tonopah. |
| Mining district | Round Mountain (Jefferson Canyon). | Meridian | Mount Diablo. |
| Elevation | 1,920 m. | Tract | Sec. 19, T 10 N, R 44 E. |
| Topography | Hilly. | Latitude | 38°42'30" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 117°05'00" W. |
| Owner | Louisiana Land and Exploration Co. (LL & E), Lakewood, CO, 50%; Felmont Oil, New York, NY, 25%; Case, Pomeroy and Co., 25% (1984). (Echo Bay Mines Ltd., Edmonton, AB, Canada, bought LL & E's 50% interest subject to completion of definitive agreement, expected in January 1985.) | | |
| Operator | Smoky Valley Mining Division of Copper Range Co. (subsidiary of LL & E) (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------------|--|
| Type of ore body | Disseminated, fissure vein, stockwork. | Principal host formation | Tertiary Volcanics (Jefferson Caldera). |
| Origin | Hydrothermal, oxidation. | Geologic age | Oligocene. |
| Shape of ore body | Unknown. | Rock relationships | Quaternary gravel, is ore (resource unknown). |
| Ore controls | Fracturing, lithology. | | Densely welded rhyolite ignimbrite, is ore, in veins and stockwork. |
| Strike and dip of mineralized zone. | Northwest: southwest. | | Poorly welded rhyolite ignimbrite, is ore, disseminated (contains largest ore reserves). |
| Age of mineralization | Miocene (25 million yr). | | Lithic tuff, is ore in veins. |
| Mineralized area dimensions (excluding outlying placer areas), m: | | | Shale, slate, quartzite (Ordovician), is ore in veins. |
| Length | 1,800. | | Granite (Cretaceous Shoshone), is ore in veins. |
| Width | 1,200. | Alteration | Sericitic, propylitic, argillic, silicification, oxidation. |
| Thickness | >750. | Size | Large. |
| (Disseminated zone is about 600 m wide and 1,700 m long.) | | | |
| Mineral names | Electrum, auriferous pyrite, free gold, pyrite, limonite, adularia, quartz, fluorite, realgar, alunite, calcite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|--------------------------------|--|
| Current status | Active-producer, expansion feasibility. | Distance to water supply | 13.7 km to stream from Jett Canyon. |
| Type of operation | Surface. | Road requirement | About 1 km. |
| Mining method | Open pit; with 1983 production rate of 9,000 t/d ore, 23,000 t/d waste. | Distance to power supply | On-site. |
| | | Mill location | On-site. |
| Year of discovery | 1901 (district lode gold); 1906 (placer gold); 1979 (LL & E). | Mill status | Active. |
| Discovery method | Ore mineral in place, drilling. | Milling method | Cyanide heap leach, carbon adsorption, electrowinning, smelting. |
| Initial production | 1906; again in 1976 (LL & E). | Pad process rate | 48-d cycle, 9,000 t/d. |
| Past production | 16,700 kg Au (district) (1901-59) (422). 7,493.6 kg Au and 3,940.2 kg Ag (1977-81) (422). 2,256.9 kg Au (1982). 2,900 kg Au, 1,700 kg Ag (1983). 3,100 kg Au planned (1984) (670). | Product type | Dore bullion (2/3 Au, 1/3 Ag). |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|------------------------|--|------|-----------|
| 1..Not reported in reference | 11,617,000 tons | 0.061 tr oz/ton Au, 0.07 tr oz/ton Ag (original reserves, cutoff grade 0.02 tr oz Au). | 1974 | 412 |
| 2..Proven and probable | 195,400,000 tons | 0.043 tr oz/ton Au, 0.023 tr oz/ton Ag (114,400,000 tons proven and 81,000,000 tons probable (undiluted)). | 1981 | 388 |
| 3..Indicated | 228,300,000 tons | 0.03715 tr oz/ton Au | 1983 | 169 |

REFERENCES

| | | |
|---|----------------------------|--|
| 46, 61, 83, 84, 90, 169, 187, 193, 195, 196, 301, 303, 312, 357, 368, 378, 387, 388, 404, 408, 412, 416, 422, 431, 447, 492, 550, 616, 620, 621, 622, 670, 767, 795, 840. | USGS quad maps | Tonopah, 1:250,000. Round Mountain, 7.5'. |
| | USBM sequence number | 0320230149. |
| | USGS MRDS number | W001574. |
| | Mid number | 2800594. |

Comments: A 36,000-t/d (40,000-ton/d) mill to attain 90% recovery of reserves is under study. Reserves reported in 1983 delineated from 1977 through 1982. This reserve includes production in the intervening years.

RUBY HILL--ZINC

Alternate names: Fad Shaft, Eureka Corporation Mine, Look Out Mine,
Locan Shaft

Commodities: Zn, Au, Ag,
Pb

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------|
| County | Eureka. | General location | About 2 km west of Eureka. |
| Mining district | Eureka. | Meridian | Mount Diablo. |
| Elevation | 2,100 m. | Tract | Sec. 22, T 19 N, R 53 E. |
| Topography | Hilly. | Latitude | 39°30'21" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 115°59'02" W. |
| Owner | Richmond-Eureka Corp., Miami Beach, FL, 75%; Silver Eureka Corp., Toronto, ON, Canada, 25% (1985). (Sharon Steel Corp., Miami Beach, FL, owns 82% of Richmond-Eureka Corp.) | | |

GEOLOGY

| | | | |
|--|---|--------------------------|--|
| Type of ore body | Replacement, breccia fill. | Host formation | Eldorado Dolomite. |
| Origin | Hydrothermal. | Geologic age | Mid-Cambrian. |
| Shape of ore body | Irregular, pipelike. | Rock relationships | Limestone, encloses ore, replaced by ore. |
| Ore controls | Faulting, fracturing, lithology. | | Dolomite, lies under ore. |
| Strike and dip of mineralized zone. | N 40° W: 60° NE (Ruby Hill Fault); N 90° E: 01° W (trend of deep sulfides). | Alteration | Intense pyritic alteration. |
| Mineralized zone aver- age dimensions, m: | | Size | Medium. |
| Length | 600. | | |
| Width | 370. | | |
| Thickness | <245. | | |
| Depth | 730. | | |
| Mineral names | Pyrite, sphalerite, galena, smithsonite, cerrusite, arsenopyrite, argentite, gold. (Gold is present in pyrite and arsenopyrite; silver is contained in solid solution with galena.) | | |

DEVELOPMENT

| | | | |
|--------------------------|--|--------------------------------|---|
| Current status | Inactive-standby; partially developed. | Distance to water supply | On-site. |
| Type of operation | Underground. | Road requirement | Existing paved road. |
| Mining method | Cut and fill. | Distance to power supply | <5 km to on-site substation. |
| Year of discovery | Late 1930's (deep sulfide ore body). | Mill location | On-site (building and infra- structure). |
| Discovery method | Diamond drilling. | Mill status | Equipment removed. |
| Initial production | 1866 (Eureka district). | | |
| Last production | 1984 (estimated). | | |
| Past production | None from deep sulfide deposit. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|--------------------|----------------------|---|------|-----------|
| 1. Indicated | 3,132,000 tons | 0.16 tr oz/ton Au; 5.65 tr oz/ton Ag; 3.7% Pb; 8.3% Zn. | 1982 | 168 |

REFERENCES

| | | |
|---|----------------------------|---------------------------------|
| 50, 84, 105, 152, 168, 238, 255, 256, 257, 261, 326, 389, 450, 451, 518, 519, 520, 521, 593, 697, 722, 741. | USGS quad maps | Ely, 1:250,000. Eureka, 15'. |
| | USBM sequence number | 0320110093. |
| | USGS MRDS number | M030021. |
| | Mid number | 2600233. |

Comments: There has been no commercial production from the deep sulfide ore body. In 1975, a 245-t sample was taken for metallurgical testing. Excessive water and metallurgical problems have long hampered development of the deposit.

SANTA FE—GOLD

Alternate names: None

Commodities: Au, Ag
(Au-Ag ratio = 1:15)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--------------------------------|
| County | Mineral. | General location | About 42 km east of Hawthorne. |
| Mining district | Santa Fe. | Meridian | Mount Diablo. |
| Elevation | 1,490 m. | Tract | Sec. 2, T 8 N, R 34 E. |
| Topography | Hilly. | Latitude | 38°35'05" N. |
| Domain | BLM administered. | Longitude | 118°09'20" W. |
| Owner | Westley Mines Ltd., Vancouver, BC, Canada, 82%; Brican Resources Ltd., Vancouver, BC, Canada, 18%; (1984). | | |
| Operator | Lacana Mining Corp., Reno, NV (will earn 51% interest by late 1985 if presently held agreement conditions are met) (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|--|
| Type of ore body | Disseminated, epithermal, replacement in breccia fill. | Host formations | Guild Mine Member of Mickey Pass Tuff. |
| Origin | Hydrothermal. | Geologic ages | Pamlico. |
| Shape of ore body | Irregular, pipelike. | Rock relationships | Oligocene. |
| Ore controls | Faulting, lithology. | | Triassic. |
| Strike and dip of mineralized zone. | N 30° to 40° W; 75° to 80° NE. | | Rhyodacite tuff (densely welded), above ore, encloses ore. |
| Age of mineralization | Miocene. | | Limestone (medium-grained), encloses ore, lies along ore, below ore. |
| Mineralized zone average dimensions, m: | | | Jasperoid breccia, is ore. |
| Length | 530 to 1,100. | Alteration | Silicification, carbonitization, sericitic. |
| Width | 120. | Size | Small. |
| Thickness | >300. | | |
| Mineral names | Gold, silver, pyrite, quartz, jasper, chalcedony, carbonaceous material, sericite, kaolinite, stibnite, hematite, barite, calcite. | | |

DEVELOPMENT

| | | | |
|------------------------------|--|--------------------------------|--|
| Current status | Active-feasibility. | Distance to water supply | Unknown. |
| Type of operation | Surface. | Road requirement | 0.8 km. |
| Mining method | Open pit proposed (300 m long by 60 wide). | Distance to power supply | Unknown. |
| | | Mill location | On-site (planned). |
| | | Mill status | Feasibility study—1983. |
| Year of discovery | Claims first staked early 1960's. | Milling method | Cyanide heap leach anticipated; small scale, on-site heap leaching was planned for 1984. |
| Annual production rate | 590,000 t/a ore anticipated as minimum throughput. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|-------------------------------------|--------------------------------|---|------|-----------|
| 1.. Not reported in reference | 4,360,000 tons | 0.082 tr oz/ton Au; 1.22 tr oz/ton Ag | 1981 | 690 |
| 2.. Do | 5,000,000 tons (oxide) | 0.04 tr oz/ton Au; 0.45 tr oz/ton Ag | 1984 | 657 |
| | 4,500,000 tons (sulfide) | 0.066 tr oz/ton Au; 0.9 tr oz/ton Ag | 1984 | 657 |
| 3.. Do | 7,000,000 tons (oxide) | 0.041 tr oz/ton Au; 0.45 tr oz/ton Ag | 1984 | 786 |
| 4.. Do | 6,900,000 tons (oxide) | 0.048 tr oz/ton Au | 1984 | 531 |

REFERENCES

| | | |
|--|----------------------------|--|
| 86, 130, 196, 463, 503, 523, 531, 598, 650, 657, 690, 786. | USGS quad maps | Walker Lake, 1:250,000. Luning, 7.5'. |
| | USBM sequence number | 0320210280. |
| | USGS MRDS number | W016420. |

Comments: Gold and silver occur within a pyritic jasperoid replacement of brecciated carbonate and volcanic rocks. By December 1982, drilling had not defined bottom of mineralized pipe. In June 1983, Westley Mines Ltd. was carrying out feasibility studies into the development of an open pit mine using heap leach for metal recovery.

SILVER PEAK—LITHIUM

Alternate names: Clayton Valley

Commodities: Li₂CO₃**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|---------------------------------------|------------------------|-----------------------------------|
| County | Esmeralda. | General location | About 49 km southwest of Tonopah. |
| Mining district | Silver Peak. | Meridian | Mount Diablo. |
| Elevation | 1,300 m. | Tract | Sec. 22, T 2 S, R 39 E. |
| Topography | Flat. | Latitude | 37°45'10" N. |
| Domain | BLM administered. | Longitude | 117°38'20" W. |
| Owner-operator | Foote Minerals Co., Exton, PA (1985). | | |

GEOLOGY

| | | | |
|--------------------------------------|--|--------------------------|-----------------------------|
| Type of ore body | Subsurface brine. | Host formation | Esmeralda. |
| Origin | Hydrothermal, evaporation. | Geologic age | Tertiary. |
| Shape of ore body | Tabular. | Rock relationships | Evaporites, encloses brine. |
| Ore controls | Evaporation. | | Clays, encloses brine. |
| Mineralized zone average dimensions. | Covers an area of 8,300 ha, up to 460 m thick. | Size | Silts, encloses brine. |
| Mineral names | Hectorite. ¹ | | Large. |

DEVELOPMENT

| | | | |
|--------------------------|--------------------------------|--------------------------------|--|
| Current status | Active-producer. | Distance to water supply | On-site. |
| Type of operation | Wells. | Road requirement | On-site. |
| Mining method | Solution mining. | Distance to power supply | On-site. |
| Year of discovery | Early 1900's. | Mill location | Silver Peak. |
| Discovery method | Drilling. | Mill status | Operating. |
| Initial production | 1966. | Milling method | Solar evaporation; chemical precipitation. |
| Past production | Confidential proprietary data. | Process rate | 1,200 t/a Li. |
| | | Product type | Lithium carbonate. |
| | | Distance shipped | 84 km from Silver Peak. |
| | | Destination | Sold f.o.b. bagging plant at Mina, NV. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|-----------------------|---------------------|---|------|-----------|
| 1..Possible | 386,250,000 t | 0.02% Li | 1978 | 345 |
| 2..Demonstrated | 45,000 tons | Li as Li ₂ CO ₃ | 1979 | 638 |

REFERENCES

| | | |
|--|----------------------------|---|
| 8, 32, 109, 117, 146, 345, 369, 370, 371, 535, 542, 543, 544, 595, 614, 638, 677, 747, 748, 804. | USGS quad maps | Goldfield, 1:250,000. Silver Peak, 15' |
| | USBM sequence number | 0320090109. |

¹Lithium occurs as a constituent in a subsurface saline brine; hectorite may be the source of the brine's lithium content.

SIXTEEN-TO-ONE—SILVER

Alternate names: None

Commodities: Ag, Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|------------------------------------|
| County | Esmeralda. | General location | About 100 km southwest of Tonopah. |
| Mining district | Red Mountain. | Meridian | Mount Diablo. |
| Elevation | 2,130 m. | Tract | Sec. 32, T 2 S, R 38 E. |
| Topography | Rugged, mountainous. | Latitude | 37°42'57" N. |
| Domain | BLM administered. | Longitude | 117°47'06" W. |
| Owner-operator | Sunshine Mining Co., Dallas, TX, 66-2/3% (1985). | | |
| Owner | Mid-Continent Mining Co., Denver, CO, 33-1/3% (1984). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|---|
| Type of ore body | Fisurre vein. | Host formation | Volcanics. |
| Origin | Hydrothermal. | Geologic age | Miocene. |
| Shape of ore body | Tabular. | Rock relationships | Quartz vein, portions are ore. |
| Ore controls | Faulting. | | Andesite (tuff flows and tuffaceous sediments), primary host to vein. |
| Strike and dip of mineralized zone. | N 40° to 70° E; 65° to 90° SE. | | Rhyolite (tuff, flow breccias), host to vein in uppermost levels. |
| Mineralized zone average dimensions, m: | | Alteration | Silicification (footwall), argillic (hanging wall). |
| Length | 580. | Size | Small. |
| Thickness | 6.7. | | |
| Development depth | 240. | | |
| Mineral names | Argentite-acanthite, proustite, pyrrargyrite, marcasite, chalcopyrite, tetrahedrite, native silver (minor), native gold, galena, sphalerite, pyrite, quartz, calcite, barite (minor), siderite (minor). | | |

DEVELOPMENT

| | | | |
|--------------------------|---|--------------------------------|--|
| Current status | Active-producer. | Distance to water supply | At millsite, 400-m well. |
| Type of operation | Underground. | Road requirement | 14-km road improvement. |
| Mining method | Sublevel blasthole stoping; 685 t/d ore (1983). | Distance to power supply | 8 to 14 km, 24.6 kV. |
| | | Mill location | 5.6 km east of mine. |
| Year of discovery | 1935 (first staked). | Mill status | Active. |
| Discovery method | Ore mineral in place. | Milling method | Cyanide leach tank, CCD, zinc dust precipitation. |
| Initial production | February 1982. | Process rate | 635 t/d (700 ton/d). |
| Past production | 19,490.8 kg (626,643 tr oz) Ag; 138.5 kg (4,453 tr oz) Au (1982) (698). 28,065.3 kg (902,321 tr oz) Ag; 218.9 kg (7,037 tr oz) Au (1983) (700). | Product type | 20- to 30-kg dore buttons. |
| | | Destination | Airlifted to Sunshine's Big Creek Refinery, Kellogg, ID. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|---|----------------------|--|------|-----------|
| 1..Not reported in reference ¹ | 1,100,000 tons | 8.38 tr oz/ton Ag; 0.03 tr oz/ton Au | 1982 | 847 |
| 2..Proven and probable | 1,077,572 tons | 5.4 tr oz/ton Ag; 0.028 tr oz/ton Au | 1984 | 700 |

REFERENCES

| | | |
|--|----------------------------|---|
| 7, 8, 124, 171, 224, 307, 339, 483, 487, 489, 653, 694, 698, 699, 700, 765, 847. | USGS quad maps | Goldfield, 1:250,000. Piper Peak, 15'. |
| | USBM sequence number | 0320090134. |
| | Mid number | 2601638. |

Comments: 1983 metal output recovered from ore averaging 1.65 g/t Au and 187 g/t Ag. 1983 mill output averaged 564 t per operating day. Sunshine's 1983 annual report states the potential for additional reserves is excellent as drilling on the western and downdip extensions of the Sixteen-to-One Vein has intersected mineralization. Sunshine reports the nearby Nivloc Mine, under its control, contains up to 900,000 t of minable ore.

¹Reserve is minable reserve; includes 10% dilution of 1 tr oz/ton Ag, 0.01 tr oz/ton Au, and represents reserves above 6,650-ft elevation.

SNOOSE—BARITE

Alternate names: Snoose Creek

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|--|------------------------|---------------------------------|
| County | Elko. | General location | About 28 km due north of Wells. |
| Mining district | Snake Mountains. | Meridian | Mount Diablo. |
| Elevation | 2,100 m. | Tract | Sec. 4, T 40 N, R 62 E. |
| Topography | Hilly. | Latitude | 41°23'00" N. |
| Domain | Private. | Longitude | 114°58'17" W. |
| Owner | Minerals—Grube Estate, 50%; AZL Resources, Phoenix, AZ, 25%; Superior Oil Co., Sparks, NV, 25%. | | |
| Operator | Surface—Sierra Pacific Power Co., Reno, NV (1983). Chromalloy American Corp., St. Louis, MO (1983). | | |

GEOLOGY

| | | | |
|---|------------------------------|--------------------------|----------------------------|
| Type of ore body | Sedimentary. | Host formation | Valmy. |
| Origin | Sedimentation, hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Massive, tabular. | Rock relationships | Greenstone, lies over ore. |
| Ore controls | Bedding. | | Siltstone, encloses ore. |
| Strike and dip of mineralized zone. | N 30° W: 35° E. | | Chert, near ore. |
| Mineralized zone average dimensions, m: | | | Limestone, encloses ore. |
| Length | 335. | Size | Shale, encloses ore. |
| Width | 130. | | Medium. |
| Thickness | 14. | | |
| Depth | 0. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------------|--------------------------------|--|
| Current status | Inactive-past producer (standby). | Distance to water supply | Millsite. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | Mill on-site generation. |
| Year of discovery | 1978. | Mill location | 34 km northeast of mine. |
| Discovery method | Ore mineral in place. | Mill status | Standby. |
| Initial production | 1978. | Milling method | Crushing, screening, jigging. |
| Last production | 1982. | Mill feed capacity | 565 t/d. |
| Past production | Confidential proprietary data. | Product type | Unground barite concentrate. |
| | | Distance shipped | 56 km to Wells, NV, by truck; then 2,350 km to Cyril, OK, by rail. |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|--|----------------------------|------------------------|
| 77, 95, 123, 226, 278, 449, 546, 669, 716, 775, 778. | USGS quad maps | Wells, 1:250,000. |
| | USBM sequence number | Loomis Mountain, 7.5'. |
| | Mid number | 0320070856. |
| | | 2601759. |

SPRINGER—TUNGSTEN

Alternate names: Nevada-Massachusetts, Sutton, Stank Mine, Humboldt Mine,
Uncle Sam, Summit Mine, Mill City, Humboldt-Springer, Tungsten

Commodities: W, Mo

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-----------------------------|
| County | Pershing. | General location | About 13 km north of Imlay. |
| Mining district | Mill City. | Meridian | Mount Diablo. |
| Elevation | 1,493 m. | Tract | Sec. 35, T 34 N, R 34 E. |
| Topography | Hilly. | Latitude | 40°46'53" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 118°07'56" W. |
| Owner | General Electric Corp., Fairfield, CT, 80%; Broken Hills Proprietary, Ltd., Melbourne, Australia, 20% (1983). | | |
| Operator | Utah International, Inc., San Francisco, CA (a wholly owned subsidiary of Broken Hills Proprietary, Ltd.) (1983). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Replacement, fissure vein. | Host formation | Raspberry. |
| Origin | Contact metasomatic, hydrothermal. | Geologic age | Upper Triassic. |
| Shape of ore body | Tabular. | Rock relationships | Limestone, replaced by ore; gangue. |
| Ore controls | Lithology, bedding. | | Hornfels, lies over ore, lies under ore. |
| Strike and dip of mineralized zone. | N 20° E; 70° W. | | Slate, lies over ore, lies under ore. |
| Mineralized zone average dimensions, m: | | | Quartzite, lies over ore, lies under ore. |
| Length | 1,524. | Size | Large. |
| Width | 400. | | |
| Thickness | 9.6. | | |
| Mineral names | Scheelite, molybdenite, chalcopyrite, turquoise, arsenopyrite, stilbite, pyrrhotite, garnet, pyrite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|--|
| Current status | Inactive-developed (standby). | Distance to water supply ... | <3 km. |
| Type of operation | Underground. | Road requirement | None. |
| Mining method | Shrinkage stope (65%), cut and fill (35%). | Distance to power supply ... | On-site. |
| | | Mill location | On-site. |
| Year of discovery | 1914. | Mill status | On standby. |
| Discovery method | Ore mineral in place. | Milling method | Flotation and chemical (APT). |
| | | Process rate | 907 t/d. |
| Initial production | 1982 (from district, 1917). | Product type | APT. |
| Last production | Produced for a period in 1982. | Distance shipped | 3,496 km by truck. |
| | | Destination | Cleveland, OH (G.E.'s Refractory Metals products). |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|--|
| 206, 259, 260, 263, 314, 329, 342, 343, 352, 376, 421, 478, 608, 685, 715, 739, 774, 830, 846, 848. | USGS quad maps | Lovelock, 1:250,000. Eugene Mountains Area, 15' |
| | USBM sequence number | 0320270048. |
| | USGS MRDS number | M060313. |
| | Mid number | 2600964. |

STERLING—GOLD

Alternate names: Diamond Queen, Gold Ranch, North Panama, Panama,
Abrose Open Pit

Commodities: Au, Ag, Hg,
Sb (Au-Ag ratio ≈ 100:1)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--------------------------------------|
| County | Nye. | General location | About 10 km east of Beatty. |
| Mining district | Bare Mountain. | Meridian | Mount Diablo. |
| Elevation | 1,220 m. | Tract | Sec. 5, T 13 S, R 48 E (unsurveyed). |
| Topography | Rugged, mountainous. | Latitude | 36°49'50" N. |
| Domain | BLM administered. | Longitude | 116°38'25" W. |
| Owner-operator | Saga Exploration Co., Winnemucca, NV (1984). | | |
| Owner | Geomex Development, Inc., Calgary, AB, Canada, 46.5% (1984). | | |

GEOLOGY

| | | | |
|--|--|--------------------------|---|
| Type of ore body | Disseminated, fault zone, fissure-filling. | Host formations | Wood Canyon. Bonanza King. |
| Origin | Hydrothermal. | Geologic ages | Possible Precambrian. Cambrian. |
| Shape of ore body | Tabular. | Rock relationships | Siltstone (breccia), contains ore (upper plate, Bonanza King). Shale, contains ore (upper plate, Bonanza King). Breccia, common in ore zone. Jasperoid (breccia), near ore, may be ore. Dolomite (breccia), near ore, lies beneath ore. |
| Ore control | Fault (thrust). | Alteration | Oxidation, silicification (below ore), kaolinization. |
| Strike and dip of mineralized zone. | North: unknown. | Size | Small. |
| Age of mineralization ... | 13.9 million yr. | | |
| Mineralized zone aver- age dimensions, m: | | | |
| Length | Undetermined. | | |
| Width | Up to 25. | | |
| Thickness | Up to 20. | | |
| Mineral names | Free gold, kaolinite, halloysite, alunite, limonite, jarosite, calcite, fluorite, stibnite, cerrusite, galena, possible cinnabar and pyrite. | | |

DEVELOPMENT

| | | | |
|----------------------------|---------------------------------------|------------------------------|---|
| Current status | Active-producer. | Distance to water supply ... | Unknown. |
| Type of operation | Underground, surface. | Road requirement | Unknown. |
| Year of discovery | 1980 by Cordex exploration. | Distance to power supply ... | On-site diesel electric generation. |
| Discovery method | Unavailable. | Mill location | Estimated 1 km east of mine. |
| Initial production | 1980. | Mill status | Active. |
| Past production | 289 kg Au (9,303 tr oz) (1983) (533). | Milling method | Cyanide heap leach, carbon column recovery. |
| Annual production rate ... | 280 to 370 kg Au. | Process rate | 270 t/d (300 ton/d) projected in 1980 for crusher; crusher rated capacity is 82 t/h (90 ton/h) (see comments). |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|--|--------------------|------------------------|------|-----------|
| 1. Not reported in reference ¹ | 250,000 tons | 0.5 tr oz/ton Au | 1980 | 61 |
| 2. Proven, probable, possible ² | 200,000 tons | 0.20 oz/ton Au | 1983 | 533 |

REFERENCES

| | | |
|----------------------------|----------------------------|---|
| 61, 97, 98, 209, 210, 533. | USGS quad maps | Death Valley, 1:250,000. Bare mountain, 15'. |
| | USBM sequence number | 0320230486. |
| | Mid number | 2601503. |

Comments: Garside and Tingley (210) report disseminated gold mineralization occurs along thrust fault between upper plate siltstone and lower plate dolomite. The ore occurs mainly in the siltstone of the upper plate. Ore contains up to 0.5% Hg. In 1980, a test heap was planned in May and full-scale leaching was anticipated to commence as early as June or July 1980.

¹Garside and Tingley (210) report ore below 0.1 tr oz/ton Au not mined. Ore grades are generally 0.5 to 1 tr oz/ton Au, but can be up to 4 tr oz/ton Au.

²Additional 7,500 tr oz recoverable gold reported in open pit. Total recoverable gold reserves is an estimated 41,000 tr oz.

STORMY CREEK—BARITE

Alternate names: None

Commodities: BaSO₄**LOCATION-OWNERSHIP**

| | | | |
|--------------------------|---|------------------------|---------------------------------|
| County | Elko. | General location | About 36 km northwest of Wells. |
| Mining district | Snake Mountains. | Meridian | Mount Diablo. |
| Elevation | 2,195 m. | Tract | Sec. 27, T 42 N, R 61 E. |
| Topography | Rugged. | Latitude | 41°31'24" N. |
| Domain | Private. | Longitude | 115°11'51" W. |
| Owner ¹ | (1983). | | |
| Lessee | Old Soldier Minerals, Houston, TX (1983). | | |
| Operator | Geowest Services, Inc., Elko, NV (1983). | | |

GEOLOGY

| | | | |
|---|-------------------------------|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Valmy. |
| Origin | Probably submarine volcanism. | Geologic age | Ordovician. |
| Shape of ore body | Tabular. | Rock relationships | Limestone, lies over ore. Chert, lies over ore. |
| Ore controls | Bedding. | Size | Medium. |
| Strike and dip of mineralized zone. | N 15° W: nearly flat lying. | | |
| Mineralized zone average dimensions, m: | | | |
| Length | 300. | | |
| Width | 200. | | |
| Thickness | 12. | | |
| Depth | 5. | | |
| Mineral names | Barite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------------|--------------------------------|--|
| Current status | Inactive-past producer (standby). | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | On-site generation. |
| | | Mill location | 10.4 km from mine. |
| Year of discovery | Unknown. | Mill status | Standby. |
| Discovery method | Ore mineral in place. | Milling method | Crushing, jigging. |
| | | Process rate | 908 t/d. |
| Initial production | 1981. | Product type | Crude barite. |
| Last production | 1982. | Distance shipped | 3,000 km to Abbeville, LA; 2,000 km to Elk City, OK. |
| Past production | Confidential proprietary data. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|---|----------------------------|---|
| 87, 205, 226, 330, 392, 546, 548, 612, 669, 688, 716. | USGS quad maps | Wells, 1:250,000. Stormy Peak, 7.5'. |
| | USBM sequence number | 0320070882. |
| | Mid number | 2601592. |

¹Ownership is divided among numerous individuals of the Wright and Marble families of Deeth, NV.

SUTHERLAND—ANTIMONY

Alternate names: Reid, Salvation, Kermesite, Thies-Hutchins

Commodities: Sb

LOCATION-OWNERSHIP

| | | | |
|-----------------------|-------------|------------------------|-------------------------------|
| County | Pershing. | General location | About 19 km east of Lovelock. |
| Mining district | Block Knob. | Meridian | Mount Diablo. |
| Elevation | 1,603 m. | Tract | Sec. 15, T 27 N, R 33 E. |
| Topography | Rugged. | Latitude | 40°12'45" N. |
| Domain | Private. | Longitude | 118°18'35" W. |

Owner-operator

Saga Exploration Co., Winnemucca, NV (1976).

GEOLOGY

| | | | |
|---|----------------------------|--------------------------|--------------------------------|
| Type of ore body | Fault fissure. | Host formation | Possible Auld Lang Syne Group. |
| Origin | Hydrothermal. | Geologic ages | Triassic. |
| Shape of ore body | Tabular. | | Jurassic. |
| Ore controls | Faulting, fracturing. | Rock relationships | Sandstone, encloses ore. |
| Strike and dip of mineralized zone. | Northwest: 80° W to 80° E. | | Shale, near ore. |
| Mineralized zone average dimensions, m: | | Size | Limestone, encloses ore. |
| Length | 150. | | Small. |
| Width | 75. | | |
| Thickness | 1. | | |
| Depth | 0. | | |
| Mineral names | Stibnite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-------------------------|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | <50 km. |
| Type of operation | Underground. | Road requirement | None. |
| Year of discovery | Unknown—prior to 1870. | Distance to power supply ... | <50 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | 1870. | | |
| Last production | 1975. | | |
| Past production | 1,542 t Sb metal (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

329, 376, 683, 718.

| | |
|----------------------------|----------------------|
| USGS quad maps | Lovelock, 1:250,000. |
| | Lovelock, 15'. |
| USBM sequence number | 0320270355. |
| USGS MRDS number | M060408. |
| Mid number | 2800544. |

Comments: Sutherland Mine is reported to have been the largest antimony producer in Nevada. Most of the production was during World War I.

TAYLOR—SILVER

Associated pit names: Northwest, Northeast, Bishop, Argus

Commodities: Ag, Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|-------------------------------|
| County | White Pine. | General location | About 24 km southeast of Ely. |
| Mining district | Taylor. | Meridian | Mount Diablo. |
| Elevation | 2,290 m. | Tract | Sec. 16, T 14 N, R 65 E. |
| Topography | Hilly, rugged. | Latitude | 39°04'40" N. |
| Domain | Mixed; private and National forest. | Longitude | 114°40'50" W. |
| Owner-operator | Silver King Mines, Inc., Salt Lake City, UT, 50% (1984). | | |
| Owner | NERCO Minerals Co., Fairbanks, AK, 50% (A subsidiary of Pacific Power and Light Co., Portland, OR) (1984). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|--|
| Type of ore body | Disseminated, breccia fill, replacement. | Host formation | Guilmette (possibly Joana). |
| Origin | Hydrothermal. | Geologic age | Devonian. |
| Shape of ore body | Tabular, blanketlike. | Rock relationships | Limestone breccia, encloses ore. |
| Ore controls | Fractures, folding, bedding. | | Jasperoid limestone, is ore, gangue. |
| Strike and dip of mineralized zone. | N 18° W; 40° E. | | Rhyolitic dikes and sills, intrudes ore, contains ore xenoliths. |
| Age of mineralization | Cretaceous or Tertiary. | Alteration | Silicification (jasperoid). |
| Mineralized zone average dimensions (of central higher deposit), m: | | Size | Medium. |
| Length | 900. | | |
| Width | 150. | | |
| Thickness | 15. | | |
| Depth | 9. | | |
| Mineral names | Argentite, native silver, possible cerargyrite, rare galena, chalcopyrite, tetrahedrite, sphalerite, stibnite, calcite, clay, limonite, rare fluorite. | | |

DEVELOPMENT

| | | | |
|------------------------------|--|--------------------------------|---|
| Current status | Active-producer. ¹ | Distance to water supply | 1.8 km to deep wells. |
| Type of operation | Surface. | Road requirement | 6 km was improved. |
| Mining method | Open pit, benched; ore production about 1,500 t/d; stripping ratio = 1.7:1 (waste:ore). | Distance to power supply | 5-km 69-kV line installed. |
| | | Mill location | On-site. |
| | | Mill status | Producing. |
| | | Milling method | Agitated cyanide leach, CCD, zinc dust precipitation. |
| Year of discovery | 1868 (district); early 1960's (present deposit). | Process rate | 1,090 t/d (1,200 ton/d). |
| Discovery method | Percussion drilling. | Product type | Silver precipitate. |
| | | Distance shipped | 885 km. |
| Initial production | 1965 (by Silver King, underground); May 1981 (open pit). | Destination | Handy & Harmon, El Monte, CA. |
| Past production | District—about 54,000 t ore, 690 g/t Ag (prior to 1885). District—about 91,000 t ore, 340 g/t Ag (1920–60). Taylor underground—3,600 t ore, 1,030 g/t Ag (1964). Taylor Pit—>87,000 kg Ag (1982 to early 1984) (676). | | |
| Annual production rate | 2,600 to 3,300 kg (85,000 to 105,000 tr oz/month). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|---------------------------------|-----------------------|--|------|-----------|
| 1..Proven and indicated | 10,000,000 tons | 3.2 tr oz/ton Ag | 1980 | 636 |
| 2..Measured and indicated | 7,000,000 tons | 3.2 tr oz/ton Ag (cutoff 2 tr oz/ton Ag) | 1983 | 637 |

REFERENCES

| | | |
|--|----------------------------|--|
| 12, 90, 120, 121, 153, 157, 165, 167, 251, 252, 284, 390, 414, 428, 429, 441, 442, 445, 446, 582, 636, 637, 644, 647, 652, 654, 676, 760, 777, 789, 790. | USGS quad maps | Ely, 1:250,000. Conners Pass, 7.5'. |
| | USBM sequence number | 0320330465. |
| | Mid number | 2601564. |

Comments: Mineralized zone—asymmetrical-plunging anticline; orientation of dimensions are gross estimates.

¹The Taylor Mine closed after December 31, 1984, because of depressed silver prices.

THREE KIDS—MANGANESE

Alternate names: None

Commodities: Mn

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------------|
| County | Clark. | General location | About 23 km southeast of Las Vegas. |
| Mining district | Las Vegas. | Meridian | Mount Diablo. |
| Elevation | 550 m. | Tract | Sec. 35, T 21 S, R 63 E. |
| Topography | Hilly. | Latitude | 36°04'50" N. |
| Domain | Mixed | Longitude | 114°47'23" W. |
| Owner | Sam's Ranch Estate, Inc., Las Vegas, NV (1984). | | |

GEOLOGY

| | | | |
|--|-------------------------------|--------------------------|---|
| Type of ore body | Sedimentary. | Host formation | Muddy Creek. |
| Origin | Hydrothermal, sedimentation. | Geologic age | Pliocene. |
| Shape of ore body | Tabular. | Rock relationships | Shale, lies over ore. Evaporite, lies over ore. Gypsiferous sandstone, is ore. Dolomite, lies over ore. Andesite, lies under ore. |
| Ore controls | Lithology, faulting. | Size | Large. |
| Strike and dip of mineralized zone. | N 45° E: 30° N. | | |
| Mineralized zone average dimension, m: | | | |
| Length | 417. | | |
| Width | 396. | | |
| Thickness | 12. | | |
| Depth | 39. | | |
| Mineral names | Wad, psilomelane, pyrolusite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|--------------------------------|---|
| Current status | Inactive, past producer. | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply | On-site. |
| Year of discovery | 1917. | Mill location | Milling facilities have been removed from site. |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1917. | | |
| Last production | 1961. | | |
| Past production | 2,260,000 t ore averaging 18% Mn yielded nearly 610,000 t of concentrates averaging 45% Mn (733). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|----------------------|------------------|----------------|------|-----------|
| 1..Demonstrated..... | 7,230,000 t..... | 13.2% Mn | 1982 | 351 |

REFERENCES

| | | |
|---|----------------------------|---|
| 9, 41, 262, 267, 291, 327, 351, 386, 399, 407, 457, 547, 721, 726, 733, 743, 744. | USGS quad maps | Las Vegas, 1:250,000. Henderson, 7.5'. |
| | USBM sequence number | 0320030010. |
| | USGS MRDS number | M031085. |

TONKIN SPRINGS—GOLD

Alternate names: Rob Claim Group

Commodities: Au

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Eureka. | General location | About 95 km northeast of Eureka. |
| Mining district | Antelope. | Meridian | Mount Diablo. |
| Elevation | 2,130 m. | Tract | Sec. 3, T 23-1/2 N, R 49 E. |
| Topography | Hilly, mountainous. | Latitude | 39°54'27" N. |
| Domain | BLM administered. | Longitude | 116°26'54" W. |
| Owner-operator | Silver State Mine Corp., Denver, CO, 55% (1985). | | |
| Owner | Precambrian Exploration, Inc., Lakewood, CO, 45% (1985). | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Disseminated, replacement. | Host formation | Lower Vinini. |
| Origin | Hydrothermal. | Geologic age | Ordovician. |
| Shape of ore body | Stratiform; irregular in plan. | Rock relationships | Sandy dolomite limestone-jasperoid replacement, contains ore. |
| Ore controls | Northwest-trending fractures, volcanic capping, sill-like intrusive. | | Black carbonaceous shale, near ore. |
| Strike and dip of mineralized zone. | Northwest; nearly horizontal. | | Calcareneite, jasperoid replacement contains ore (best host). |
| Age of mineralization | Tertiary. | | Siltstones, near ore. |
| Mineralized zone average dimensions, m: | | | Chert, near ore. |
| Length | 450. | Alteration | Intrusives (syenite), near ore. |
| Width | 300. | | Tertiary volcanics, above ore. |
| Thickness: | | Size | Small. |
| Zone | 85. | | |
| Bed | ≈5 to ≈25. | | |
| Depth | 0 to 70. | | |
| Mineral names | Pyrite (auriferous), arsenopyrite (auriferous), possible free gold, realgar, orpiment, stibnite, calcite, jasper. (About 75% of the gold is thought to occur in sulfides.) | | |

DEVELOPMENT

| | | | |
|--------------------------|---|-------------------------------|---|
| Current status | Active-exploration. | Distance to water supply. . . | Unknown. |
| Type of operation | Would be surface. | Road requirement | Unknown. |
| Mining method | Would be open pit. | Distance to power supply. . . | Unknown. |
| Year of discovery | 1981. | Mill status | Feasibility. |
| Discovery method | Geochemical survey, geological mapping. | Milling method | Would require an autoclave system or some type of pressure chlorination-pressure acidation treatment. |
| Initial production | No production schedule established. | | |
| Past production | None. | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|--|------|-----------|
| 1. Not reported in reference | 4,000,000 tons | 0.06 tr oz/ton Au | 1976 | 616 |
| 2. Indicated | 2,500,000 tons | 0.09 tr oz/ton Au; Upper Zone, stripping ratio = 2.4:1 (waste:ore). | 1983 | 241 |
| Indicated | 500,000 tons | 0.09 tr oz/ton Au; Lower Zone, stripping ratio = 14.7:1 (waste:ore). | 1983 | 241 |

REFERENCES

| | | |
|-------------------------|----------------------------|-------------------------------|
| 27, 241, 486, 593, 616. | USGS quad maps | Millett, 1:250,000. |
| | | Roberts Creek Mountains, 15'. |
| | USBM sequence number | 0320110229. |

Comments: A northwest-trending set of high-angle normal faults, probably associated with basin and range rifting, is most important of two faulting patterns for mineralization. Gold distribution is homogeneous throughout microfractured rock along strike of mineral trend.

TONOPAH—TUNGSTEN

Alternate names: Moly Tonopah, Jack

Commodities: W, Cu, Mo

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--------------|------------------------|--------------------------------------|
| County | Humboldt. | General location | About 53 km northeast of Winnemucca. |
| Mining district | Potosi. | Meridian | Mount Diablo. |
| Elevation | 1,743 m. | Tract | Sec. 33, T 39 N, R 42 E. |
| Topography | Rugged. | Latitude | 41°12'36" N. |
| Domain | Unknown. | Longitude | 117°15'26" W. |
| Owner-operator | Unavailable. | | |

GEOLOGY

| | | | |
|---|--|--------------------------|---|
| Type of ore body | Replacement, contact metasomatism. | Host formation | Preble. |
| Origin | Sedimentary, igneous intrusion. | Geologic age | Cambrian. |
| Shape of ore body | Undetermined. | Rock relationships | Granodiorite, lies along ore. |
| Ore controls | Lithology, fracturing, faulting. | | Skarn, is ore. |
| Strike and dip of mineralized zone. | North-northeast: east. | | Marble, lies along ore, encloses ore. |
| Mineralized zone average dimensions, m: | | | Hornfels, lies along ore, encloses ore. |
| Length | >907. | | Limestone, replaced by ore, lies along ore. |
| Width | Unknown. | Size | Medium. |
| Thickness | Up to 4.6. | | |
| Depth | Unknown. | | |
| Mineral names | Chrysocolla, calcite, epidote, quartz pyrite, chalcopyrite, molybdenite, scheelite, powellite. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|----------|
| Current status | Inactive-past producer. | Distance to water supply ... | On-site. |
| Type of operation | Surface, underground. | Distance to power supply ... | On-site. |
| Mining method | Open pit, overhand stope. | Road requirement | On-site. |
| Year of discovery | Before 1950. | | |
| Discovery method | Undetermined. | | |
| Initial production | 1950. | | |
| Last production | Unknown. | | |
| Past production | 19,750 tons ore, averaging 0.3% WO ₃ containing 5,925 short ton units ¹ WO ₃ (285). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|-------------------------------|----------------------------|---|
| 263, 269, 270, 272, 285, 801. | USGS quad maps | McDermitt, 1:250,000. Osgood Mountains, 15'. |
| | USBM sequence number | 0320130047. |
| | USGS MRDS number | M030029. |

Comments: Property is 183 to 366 m west of South Extension pit of the Getchell gold mine, operated by Getchell Mine, Inc., 1950-55. See references for Getchell Mine for additional information.

¹Short ton unit = 20 lb of contained WO₃.

TONOPAH DIVIDE—GOLD

Alternate names: Old Big Divide, Gold Hill, Gold Mountain, Divide

Commodities: Au, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---------------------|------------------------|-------------------------------|
| County | Esmeralda. | General location | About 10 km south of Tonopah. |
| Mining district | Divide. | Meridian | Mount Diablo. |
| Elevation | 1,890 m. | Tract | Sec. 28, T 2 N, R 42 E. |
| Topography | Hilly, mountainous. | Latitude | 37°59'42" N. |
| Domain | Unknown. | Longitude | 117°14'17" W. |

Owner

Operator

Tonopah Divide Mining Co., Reno, NV (1984).
 Ebc Enterprises, Tonopah, NV (Parent company is Falcon Explorations Co., Emeryville, CA. A lease-option agreement on the property has been held since 1980.) (1984)

GEOLOGY

| | | | |
|---|---|--------------------------|--|
| Type of ore body | Vein, disseminated in stockwork. | Host formations | Volcanics—Fraction Breccia (principal host). Siebert—Oddie Rhyolite. |
| Origin | Hydrothermal. | Geologic age | Tertiary. |
| Shape of ore body | Tabular. | Rock relationships | Rhyolitic volcanics, fractures contain ore, gangue. Rhyolitic breccia, fractures contain ore, gangue. |
| Ore controls | Faults, fractures (shear zone). | Alteration | Minor silicification, sericitic, chloritic, oxidation, pyritization; potassic, and propylitic zoned around fault zone. |
| Strike and dip of mineralized zone. | N 40° W: nearly vertical (main lode). | Size | Small. |
| Age of mineralization | Miocene (16 to 17 million yr). | | |
| Mineralized zone average dimensions (size as determined by assay walls) (361), m: | | | |
| Length | 150. | | |
| Width | 135. | | |
| Thickness | 6.5. | | |
| Depth | 0. | | |
| Mineral names | Cerargyrite, "sooty" argentite, molybdenite, powellite, ferrimolybdate, sphalerite, chalcocopyrite, argenticiferous galena, possible tetrahedrite, limonite, sericite, pyrite, adularia, quartz, kaolinite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|--------------------------------|--|
| Current status | Active-producer. | Distance to water supply | On-site, 154-m well (mill). |
| Type of operation | Surface. | Road requirement | Existing. |
| Mining method | Open pit; 1981-82 production rate was about 900 t/d ore. | Distance to power supply | Unknown. |
| | | Mill location | 10 km southwest of mine in Alkali Flat. |
| Year of discovery | 1902, Au; 1917, Ag (district). | Mill status | Active. |
| Initial production | About 1912; 1981 by Falcon Exploration Co. | Milling method | Cyanide heap leach, zinc precipitation (Ag), carbon precipitation (Au). |
| Last production | Closed in July 1982; reported active in 1983-84. Open pit expected to be mined out by end of 1984. | Process rate | 907 t/d (1,000 ton/d) (1981); rated crusher capacity of 181 t/h (200 ton/h). |
| Past production | District total; 101,886 kg (3,275,079 tr oz) Ag; 1,010 kg (32,474 tr oz) Au. Most production from 1920-29 and from Tonopah Divide Mine (209). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.¹

REFERENCES

| | | |
|---|----------------------------|---|
| 7, 8, 82, 83, 84, 85, 209, 211, 361, 377, 629, 703. | USGS quad maps | Goldfield, 1:250,000. Mud Lake, 15'. |
| | USBM sequence number | 0320090087. |
| | USGS MRDS number | M030063. |
| | Mid number | 2801527. |

Comments: Original mine life planned in 1981 was 5 yr. The mine plan was to initially mine and truck 70,000 t of mine dumps to the millsite at the approximate rate of 907 t/d. After completion of mining the dumps, mining would commence on the main open pit that contains approximately 1.45 million t ore. Each heap pad contains approximately 360,000 t ore.

¹Falcon Exploration 1981 operations plans were to initially mine about 1.5 million t of combined dump material and lode material. Garside and Tingley's field examination report of March 26, 1982 (211), states that the average grade is 8.6 g/t (0.25 tr oz/ton) Ag and about 2.7 g/t (0.08 tr oz/ton) Au.

TONOPAH HASBROUCK—GOLD

Alternate names: None

Commodities: Au, Ag

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|----------------------------------|
| County | Esmeralda. | General location | About 8 km southwest of Tonopah. |
| Mining district | Divide. | Meridian | Mount Diablo. |
| Elevation | 1,735 m. | Tract | Sec. 33, T 2 N, R 42 E. |
| Topography | Hilly, mountainous. | Latitude | 37°59'29" N. |
| Domain | BLM administered, private. | Longitude | 117°16'09" W. |
| Owner | Cordex Exploration Co., Reno, NV (1984). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|---|
| Type of ore body | Fissure veins, disseminated. | Host formation | Siebert (Volcanic). |
| Origin | Hydrothermal. | Geologic age | Miocene. |
| Shape of ore body | Tabular. | Rock relationships | Rhyolite tuff, contains disseminated Au. |
| Ore controls | Faulting, fracturing, lithology. | | Dacite and rhyolite breccia, contains ore. |
| Age of mineralization | Mid-Miocene (15.5 to 16.5 million yr). | | Volcaniclastics, cut by ore veins, below disseminated Au. |
| Mineralized zone average dimensions, m: | | Alteration | Argillic, silicification, oxidation; potassic, phyllic, propylitic zones around fractures and faults. |
| Length | >1,500 (workings). | Size | Small. |
| Depth | >90. | | |
| Mineral names | Free gold, electrum, argentite, silver halides, pyrite, quartz, sericite. | | |

DEVELOPMENT

| | |
|-------------------------|--|
| Current status | Active-exploration, past producer. |
| Type of operation | Explored by Cordex for low-grade precious metal open pit. |
| Year of discovery | 1902, Ag discovered in district; 1974, exploration commenced by Cordex Exploration Co. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|----------------------|---|------|-----------|
| 1. Not reported in reference | 5,000,000 tons | 0.06 tr oz/ton Au, 1.5 tr oz/ton Ag | 1982 | 611 |

REFERENCES

| | | |
|---|----------------------------|---|
| 7, 8, 62, 63, 64, 65, 209, 211, 224, 361, 377, 381, 611, 629. | USGS quad maps | Goldfield, 1:250,000. Klondike 7.5'. |
| | USBM sequence number | 0320090339. |

Comments: Sixteen samples taken from silicified sedimentary rocks on Hasbrouck Mountain by the Nevada Bureau of Mines and Geology in the 1970's averaged 2 g/t (0.06 tr oz/ton) Au and 43.2 g/t (1.26 tr oz/ton) Ag (211).

VICTORIA—COPPER

Alternate names: Anaconda-Victoria

Commodities: Cu, Ag, Bi

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---------------------------------------|------------------------|--------------------------------|
| County | Elko. | General location | About 126 km northeast of Ely. |
| Mining district | Dolly Varden. | Meridian | Mount Diablo. |
| Elevation | 2,316 m. | Tract | Sec. 5, T 28 N, R 66 E. |
| Topography | Rugged. | Latitude | 40°19'45" N. |
| Domain | Private. | Longitude | 114°33'08" W. |
| Owner-operator | Hecla Mining Co., Wallace, ID (1985). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|---|
| Type of ore body | Skarn-breccia pipe. | Host formation | Pequop. |
| Origin | Solution collapse, contact metamorphism. | Geologic age | Permian. |
| Shape of ore body | Arcuate in plan. | Rock relationships | Limestone, encloses ore, breccia contains ore. |
| Ore controls | Fracturing, contact zone. | | Dolomite, encloses ore, breccia contains ore. |
| Dip of mineralized zone. | 45° | | Calcareous sandstone-quartzite, encloses ore, breccia contains ore. |
| Age of mineralization ... | Possibly Cretaceous. | | Quartz latite porphyry dike, near ore. |
| Mineralized zone average dimensions, m: | | | Porphyritic quartz monzonite, beneath ore. |
| Length | 100. | Alteration | Silicification, argillic, oxidation. |
| Width | 175. | Size | Medium. |
| Thickness | 180. | | |
| Mineral names | Chalcopyrite, pyrite, chalcocite, bornite, bismuthinite, quartz, calcite, wittichenite, covellite, chrysocolla, malachite, azurite, native copper (minor), cuprite, Fe-oxides, diopside, calcite. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|------------------------------|--------------------|
| Current status | Inactive-past producer, standby. | Distance to water supply ... | On-site. |
| Type of operation | Underground. | Road requirement | None. |
| Mining method | Sublevel block caving. | Distance to power supply ... | On-site. |
| Year of discovery | 1872. | Mill location | On-site. |
| Discovery method | Ore mineral in place. | Mill status | Inactive, standby. |
| Initial production | 1973-74 (Anaconda). | Milling method | Flotation. |
| Last production | 1977 (Anaconda); 1981 (Day Mines, Inc.-Hecla Mining Co.). | Process rate | 907 t/d. |
| Past production | Confidential proprietary data. | Product type | Cu-Ag concentrate. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|-------------------|----------------------|----------------|------|-----------|
| 1..Proven | 1,491,200 tons | 2.34% Cu | 1977 | 387 |
| 2..Probable | 148,388 tons | 2.51% Cu | 1977 | 387 |

REFERENCES

| | | |
|---|----------------------------|------------------|
| 25, 226, 337, 476, 669, 768, 823, 824, 836. | USGS quad maps | Elko, 1:250,000. |
| | USBM sequence number | 0320070001. |
| | USGS MRDS number | W002693. |
| | Mid number | 2600558. |

Comments: See reference 836 for additional reserve-resource data. Anaconda Minerals Co. explored the ore body in the early 1940's. Day Mines, Inc., purchased the property from Anaconda in 1979. Day Mines was purchased by Hecla in 1981. The Victoria ore body is a breccia-fill deposit in the Pequop Limestone Formation near the contact of the Melrose porphyritic quartz monzonite stock of Cretaceous-Jurassic age. Bedded limestone, dolomite, and sandstone sediments of the Pequop surrounding the Victoria ore body have strikes trending from N 34° E to almost due east. Dips range from 0° to 34° S to SW, with an average dip of approximately 20° SW (337).

VIRGIN RIVER—MANGANESE

Alternate names: None

Commodities: Mn

LOCATION-OWNERSHIP

| | | | |
|-----------------------|--|------------------------|--------------------------------|
| County | Clark. | General location | About 61 km east of Las Vegas. |
| Mining district | Virgin River. | Meridian | Mount Diablo. |
| Elevation | 439 m. | Tract | Sec. 18, T 20 S, R 67 E. |
| Topography | Hilly. | Latitude | 36°11'40" N. |
| Domain | National recreation area. | Longitude | 114°27'38" W. |
| Owner | United States (managed by National Park Service) (1988). | | |

GEOLOGY

| | | | |
|---|------------------------------|--------------------------|--|
| Type of ore body | Sedimentary. | Host formation | Muddy Creek. |
| Origin | Hydrothermal, sedimentation. | Geologic age | Pliocene. |
| Shape of ore body | Tabular. | Rock relationships | Shale, lies over ore. Gypsiferous sandstone, is ore. Basalt, lies over and under ore. ¹ |
| Ore controls | Bedding, lithology. | Size | Large. |
| Strike and dip of mineralised zone. | N 5° W; 30° E. | | |
| Mineralised zone average dimensions, m: | | | |
| Length | 1,480. | | |
| Width | 280. | | |
| Thickness | 7. | | |
| Depth | 39. | | |
| Mineral names | Wad. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------|--------------------------------|----------|
| Current status | Inactive-explored. | Distance to water supply | <3 km. |
| Type of operation | Possible surface. | Road requirement | <50 km. |
| Year of discovery | 1902. | Distance to power supply | <50 km. |
| Discovery method | Ore mineral in place. | Mill location | No mill. |
| Initial production | No production. | | |

PUBLISHED RESERVES-RESOURCES²

| Class | Quantity | Grade | Year | Reference |
|--------------------|--------------------|---------------------------------------|------|-----------|
| 1.. Measured | 14,000 tons | Average: 17% Mn; cutoff: 15% Mn | 1949 | 407 |
| 2.. Do | 55,000 tons | Average: 15% Mn; cutoff: 12% Mn | 1949 | 407 |
| 3.. Do | 134,000 tons | Average: 13% Mn; cutoff: 10% Mn | 1949 | 407 |
| 4.. Do | 215,000 tons | Average: 12% Mn; cutoff: 8% Mn | 1949 | 407 |
| 5.. Do | 320,000 tons | Average: 10% Mn; cutoff: 5% Mn | 1949 | 407 |

REFERENCES

| | | |
|---|----------------------------|---|
| 9, 262, 267, 291, 327, 353, 386, 407, 547, 721, 726, 733 | USGS quad maps | Las Vegas, 1:250,000. Virgin Basin, 15'. |
| | USBM sequence number | 0820030009. |
| | USGS MRDS number | M081068. |

¹A 4.5-m basalt flow separates 2 manganeseiferous beds.

²Tonnages are cumulative and represent minimum mining width of 0.95 m.

WARD—ZINC-LEAD

Associated ore bodies: Caroline, Good Luck

Commodities: Zn-Pb, Ag,
Cu, Au, Mo (Mo—not
recoverable, deep seated)

LOCATION-OWNERSHIP

| | | | |
|-----------------------|---|------------------------|-------------------------------------|
| County | White Pine. | General location | About 13 km south-southwest of Ely. |
| Mining district | Ward. | Meridian | Mount Diablo. |
| Elevation | 2,560 m. | Tract | Sec. 15, T 14 N, R 63 E. |
| Topography | Rugged. | Latitude | 39°04'45" N. |
| Domain | BLM administered. | Longitude | 114°52'55" W. |
| Owner-operator | Silver King Mines, Inc., Salt Lake City, UT (60%); Pacific Silver Corp., Salt Lake City, UT (40%) (1985). | | |
| Royalties to | Gulf Oil Corp., Denver, CO (a 2-1/2% net smelter return (NSR) on future production until accrual of \$3.5 million); Phillips Petroleum Co., Bartlesville, OK (a 3% NSR). | | |

GEOLOGY

| | | | |
|--|---|--------------------------|--|
| Type of ore body | Replacement. | Host formations | Ely. |
| Origin | Hydrothermal. | | Joana. |
| Shape of ore body | Tabular, mantos. | | Guilmette Limestone. |
| Ore controls | Lithology, fracturing. | Geologic ages | Pennsylvanian. |
| Strike and dip of mineralized zone. | N 65° W; 20° E. | | Mississippian. |
| Age of mineralization ... | Tertiary. | | Devonian. |
| Mineralized zone aver- age dimensions, m: | | Rock relationships | Limestone, gangue. |
| Length | 760. | | Skarn, replaced by ore. |
| Width | 60. | | Marble, gangue. |
| Thickness | 14. | | Tertiary monzonite stock, sills, dikes, intrudes ore. |
| Depth | 280. | Alteration | Carbonization, silicification. |
| Mineral names | Sphalerite, chalcopyrite, galena, pyrite, covellite, chalcocite, barite, smithsonite, molybdenite, jasperoid. | Size | Medium. |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|--|
| Current status | Active-development. | Distance to water supply ... | <3 km. |
| Type of operation | Underground, access by twin 1,370-m declines. | Road requirement | None. |
| Mining method | Unknown. | Distance to power supply ... | <10 km. |
| Year of discovery | 1968 (deep ore bodies). | Mill location | On-site. |
| Discovery method | Geological inference, drilling. | Mill status | Development. |
| Initial production | Expected in 1986-87. | Milling method | Flotation. |
| Last production | 1967 (district). | Process rate | 1,100 t/d (1,200 ton/d) planned. Construction to begin in 1985, completion in late 1986. |
| | | Product type | Zn, Cu, Pb concentrates. |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|---|-----------------------|--|------|-----------|
| 1. Not reported in reference ¹ | 5,000,000 tons | 3 tr oz/ton Ag; 1.4% Cu; 5.5% combined Pb-Zn at North Good Luck portion of deposit. | 1983 | 637 |
| Indicated | 17,000,000 tons | 30 million tr oz Ag; 2 billion lb combined Cu, Pb, and Zn. | 1983 | 637 |

REFERENCES

| | | |
|--|----------------------------|------------------------------|
| 145, 153, 166, 188, 203, 224, 258, 268, 284, 381, 424, 433, 471, 490, 633, 634, 635, 636, 637, 644, 645, 757, 776. | USGS quad maps | Ely, 1:250,000. Ely, 15'. |
| | USBM sequence number | 0320330112. |
| | USGS MRDS number | W016410. |
| | Mid number | 2600576. |

Comments: A 1,100-t/d (1,200-ton/d) flotation plant is being designed such that capacity can be increased to 1,800 t/d or 2,700 t/d (2,000 or 3,000 ton/d) at a later date. The first 5 yr of production are anticipated to average 100 g/t Ag, 5.5% Zn, and 1.4% Cu.

¹Resource is referred to as blocked.

WHITE CAPS—ANTIMONY

Alternate names: None

Commodities: Au, Sb, As,
Hg**LOCATION-OWNERSHIP**

| | | | |
|-----------------------|---|------------------------|-----------------------------------|
| County | Nye. | General location | About 56 km northeast of Tonopah. |
| Mining district | Manhattan. | Meridian | Mount Diablo. |
| Elevation | 2,438 m. | Tract | Sec. 21, T 8 N, R 44 E. |
| Topography | Rugged. | Latitude | 38°31'54" N. |
| Domain | Unknown. | Longitude | 117°02'57" W. |
| Owner | Argus Resources, Inc., Glendale, CA (1985). | | |

GEOLOGY

| | | | |
|--------------------------------------|---|--------------------------|--|
| Type of ore body | Replacement. | Host formation | White Caps Limestone Member of the Gold Hill Formation. |
| Origin | Replacement of limestone. | Geologic age | Cambrian. |
| Shape of ore body | Irregular. | Rock relationships | Limestone, replaced by ore. |
| Ore controls | Lithology, faulting. | Size | Small. |
| Mineralized zone average dimensions. | Unknown. | | |
| Mineral names | Gold, realgar, pyrite, stibnite, fluorite, cinnabar, orpiment. | | |

DEVELOPMENT

| | | | |
|--------------------------|--|------------------------------|---------------------------|
| Current status | Inactive-past producer. | Distance to water supply ... | Can be developed on-site. |
| Type of operation | Underground. | Road requirement | None. |
| Year of discovery | 1905. | Distance to power supply ... | <10 km. |
| Discovery method | Ore mineral in place. | Mill location | Unknown. |
| Initial production | 1911. | | |
| Last production | 1984. | | |
| Past production | \$2.5 million Au; 45 t Sb metal (376). | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

29, 191, 192, 194, 195, 276, 357, 368, 376, 814.

| | |
|----------------------------|---|
| USGS quad maps | Tonopah, 1:250,000; Manhattan, 7.5'. |
| USBM sequence number | 0320230120. |
| USGS MRDS number | M05530. |

Comments: White Caps Mine is primarily a gold deposit containing appreciable amounts of antimony in the form of stibnite.

WHITE PINE—FLUORINE

Alternate names: None

Commodities: CaF₂

LOCATION-OWNERSHIP

| | | | |
|-----------------------|-----------------------------------|------------------------|-------------------------------|
| County | Nye. | General location | About 61 km southwest of Ely. |
| Mining district | Unorganized. | Meridian | Mount Diablo. |
| Elevation | 2,438 m. | Tract | Sec. 21, T 12 N, R 58 E. |
| Topography | Hilly. | Latitude | 38°52'57" N. |
| Domain | National forest. | Longitude | 115°26'55" W. |
| Owners | Maynard and Lester Bisoni (1981). | | |

GEOLOGY

| | | | |
|---|---|--------------------------|---|
| Type of ore body | Disseminated, replacement. | Host formation | Lincoln Peak. |
| Origin | Hydrothermal. | Geologic age | Cambrian. |
| Shape of ore body | Tabular. | Rock relationships | Phyllite, encloses ore, ore in fractures. |
| Ore controls | Bedding, faulting. | | Limestone, encloses ore, replaced by ore. |
| Strike and dip of mineralized zone. | N 40° W: 30° E. | | Rhyolite, near ore. |
| Mineralized zone average dimensions, m: | | | Quartz monzonite, near ore. |
| Length | 990. | Size | Quartz diorite, near ore. |
| Width | 300. | | Large. |
| Thickness | 210. | | |
| Mineral names | Fluorite, calcite, quartz, vesuvianite, mica, diopside, orthoclase, chlorite. | | |

DEVELOPMENT

| | | | |
|--------------------------|-----------------------------|--------------------------------|----------|
| Current status | Inactive-explored prospect. | Distance to water supply | On-site. |
| Type of operation | Surface. | Road requirement | <10 km. |
| Mining method | Proposed open pit. | Distance to power supply | <50 km. |
| Year of discovery | 1976. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | None. | | |

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

| | | |
|----------------|----------------------------|------------------------|
| 455, 456, 545. | USGS quad maps | Lund, 1:250,000. |
| | | Currant Mountain, 15'. |
| | USBM sequence number | 0320230667. |

WINDFALL—GOLD

Alternate names: Eureka Windfall Mine, Western-Windfall Project
Ore bodies: Windfall, Rustler, Paroni

Commodities: Au, Ag
(Au-Ag ratio ≈5.7:1)

LOCATION-OWNERSHIP

| | | | |
|-----------------|--|------------------|-------------------------------|
| County | Eureka. | General location | About 6.5 km south of Eureka. |
| Mining district | Eureka (Pinto). | Meridian | Mount Diablo. |
| Elevation | 2,330 m. | Tract | Sec. 2, T 18 N, R 53 E. |
| Topography | Rugged. | Latitude | 39°27'15" N. |
| Domain | Mixed; private and BLM administered. | Longitude | 116°58'42" W. |
| Owner | Western Mining Services Ltd., Reno, NV (subsidiary of Western Gas, Oil and Mining, Reno, NV) (1982). | | |
| Operator | Western-Windfall Ltd., Eureka, NV (operational entity of Western Mining Services Ltd.) (1982). | | |

GEOLOGY

| | | | |
|--|---|--------------------|--|
| Type of ore body | Disseminated, replacement. | Host formations | Hamburg Dolomite. Dunderberg Shale. |
| Origin | Hydrothermal, oxidation. | Geologic ages | Mid-Cambrian. Upper Cambrian. |
| Shape of ore body | Sheeted, wedge-shaped. | Rock relationships | Sanded dolomite, ore in fractures, lies under ore (Windfall ore body). Shale, ore in fractures, lies above ore. Jasperoid, contains ore (Rustler ore body). Oligocene intrusive and extrusive rhyodacite, lies near ore, lies above ore (ore bodies localize along shale-dolomite contact). |
| Ore controls | Fracturing, faulting, folding, lithology. | Size | Small. |
| Age of mineralization | Late Cretaceous-Tertiary. | | |
| Mineralized zone aver- age dimensions, m: | | | |
| Length | About 2,000. | | |
| Width | 30 to 60. | | |
| Thickness | >300. | | |
| (Rustler ore body—400 m by 200 m by 300 m deep). | | | |
| Mineral names | Free gold, silver, iron oxides, arsenopyrite, kaolinite, jasperoid, quartz, calcite. | | |

DEVELOPMENT

| | | | |
|------------------------|---|--------------------------|---|
| Current status | Active-producer. | Distance to water supply | 6.5 km to wells. |
| Type of operation | Surface. | Distance to power supply | 3.2-km electric transmission line installed. |
| Mining method | Open pit; multiple bench (3 m); about 320,000 t/a ore. | Mill location | On-site. |
| Year of discovery | 1902 or 1908; rediscovered in 1974 by Idaho Mining Corp. | Mill status | Active. |
| Discovery method | Geochemical anomaly (1974); drilling. | Milling method | Cyanide heap leach, carbon adsorp- tion, electrolysis, smelting. |
| Initial production | 1975. | Process rate | 1,100 t/d (1,250 ton/d) (1980). |
| Last production | 1983. | Product type | Dore bullion (60% Au, 30% Ag). |
| Past production | About 59,000 t ore, 10 g/t Au (1908-19) (232); published production of recent years is unavailable. | | |
| Annual production rate | Reported 200 kg (5,000 tr oz) Au from leaching about 320,000 t ore (1982) | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|-------------------------|----------------|-------------------|------|-----------|
| 1..Proven and indicated | 3,000,000 tons | 0.03 tr oz/ton Au | 1975 | 805 |

REFERENCES

| | | |
|--|----------------------|---------------------------------------|
| 80, 83, 232, 365, 378, 412, 518, 520, 522, 552, 593, 692, 775, 805. | USGS quad maps | Ely, 1:250,000. Pinto Summit, 15'. |
| | USBM sequence number | 0320110142. |
| | Mid number | 2600891. |

Comments: The Hamburg Dolomite is the principal host. The Windfall Mine reopened and shut down again in 1983. As a result of the permeable texture of the Windfall ore, it was not necessary to crush it prior to heap leaching. Pond irrigation (rather than sprinkler irrigation) enables year-round leaching operations. The Windfall ore body is depleted, the Rustler ore body is being mined, and the Paroni ore body is being developed.

YERINGTON—COPPER

Alternate names: Anaconda Copper, Empire Nevada

Commodities: Cu, Mo, Ag,
Au

LOCATION-OWNERSHIP

| | | | |
|--------------------------|------------------------------------|------------------------|---------------------------------------|
| County | Lyon. | General location | About 53 km southeast of Carson City. |
| Mining district | Mason. | Meridian | Mount Diablo. |
| Elevation | 1,365 m. | Tract | Sec. 16, T 13 N, R 25 E. |
| Topography | Rolling. | Latitude | 38°59'01" N. |
| Domain | Private. | Longitude | 119°11'35" W. |
| Owner ¹ | Don Tibbals, Yerington, NV (1985). | | |

GEOLOGY

| | | | |
|--|--|--------------------------|--|
| Type of ore body | Disseminated, stockwork. | Host formation | Yerington Batholith. |
| Origin | Hydrothermal. | Geologic age | Jurassic. |
| Shape of ore body | Massive. | Rock relationships | Quartz monzonite, ore in fractures, gangue. |
| Ore controls | Igneous, fracturing. | | Granodiorite, ore in fractures, gangue. |
| Strike and dip of mineralized zone. | N 60° W: 05° W. | Size | Large. |
| Mineralized zone aver- age dimensions, m: | | | |
| Length | 1,650. | | |
| Width | 490. | | |
| Thickness | 195. | | |
| Depth | 60. | | |
| Mineral names | Chalcopyrite, bornite, covellite, pyrite, magnetite, chrysocolla, cuprite, tenorite, malachite, chalcocite, copper. | | |

DEVELOPMENT

| | | | |
|--------------------------|---|------------------------------|-------------|
| Current status | Inactive-past producer, abandoned. | Distance to water supply ... | On-site. |
| Type of operation | Surface. | Road requirement | None. |
| Mining method | Open pit. | Distance to power supply ... | On-site. |
| | | Mill status | Dismantled. |
| Year of discovery | 1865. | | |
| Discovery method | Ore mineral in place. | | |
| Initial production | 1953. | | |
| Last production | 1978. | | |
| Past production | 771,000 t Cu from 144 million t ore (49). | | |

PUBLISHED RESERVES-RESOURCES

| Class | Quantity | Grade | Year | Reference |
|------------------------------------|-----------------------|-----------------|------|-----------|
| 1..Not reported in reference | 126,900,000 tons | 0.343% Cu | 1982 | 49 |

REFERENCES

| | | |
|---|----------------------------|--|
| 25, 49, 126, 128, 140, 286, 295, 320, 380, 453, 467, 567, 574, 575, 666, 695, 822, 824. | USGS quad maps | Walker Lake, 1:250,000. Yerington, 15'. |
| | USBM sequence number | 0820190001. |
| | USGS MRDS number | M030104. |
| | Mid number | 2600085. |

¹In 1982, Don Tibbals reached an agreement to purchase the Yerington property from the Anaconda Minerals Co., Denver, CO. At that time, Tibbals planned to convert most of the 3,295 ha (8,143 acres) into an industrial park, consisting of about 50 industrial buildings, 170 homes, 20 apartments, recreational buildings, and utilities including a sewage system.

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APPENDIX A.—LIST OF ABBREVIATIONS

CHEMICAL SYMBOLS

| | |
|---------------------------------|----------------------------------|
| Ag | Silver. |
| Al | Aluminum. |
| Al ₂ O ₃ | Alumina. |
| APT | Ammonium paratungstate. |
| Au | Gold. |
| Ba | Barium. |
| BaSO ₄ | Barium sulfate, barite. |
| Be | Beryllium. |
| Ca | Calcium. |
| CaF ₂ | Fluorite, fluorspar. |
| CaO | Calcium oxide. |
| Co | Cobalt. |
| Cu | Copper. |
| F | Fluorine. |
| Fe | Iron. |
| Hg | Mercury. |
| Li | Lithium. |
| LiO ₂ | Lithia. |
| Li ₂ CO ₃ | Lithium carbonate. |
| Mg | Magnesium. |
| MgO | Magnesia. |
| Mn | Manganese. |
| Mo | Molybdenum. |
| MoS ₂ | Molybdenite, molybdenum sulfide. |
| Ni | Nickel. |
| Pb | Lead. |

| | |
|-------------------------------|---------------------|
| S | Sulfur. |
| Sb | Antimony. |
| Se | Selenium. |
| V | Vanadium. |
| V ₂ O ₅ | Vanadium pentoxide. |
| W | Tungsten. |
| WO ₃ | Tungsten trioxide. |
| Zn | Zinc. |

MISCELLANEOUS ABBREVIATIONS
AND SYMBOLS

| | |
|--------|-----------------------------------|
| BLM | (U.S.) Bureau of Land Management. |
| CCD | Countercurrent decantation. |
| Insol. | Insoluble. |
| MRDS | Mineral Resources Data System. |
| ppt | Precipitation. |
| quad | Quadrangle. |
| R | Range. |
| Sec. | Section. |
| T | Township. |
| USBM | (U.S.) Bureau of Mines. |
| USGS | U.S. Geological Survey. |
| ° | Degree. |
| ' | Minute of arc (plane angle). |
| " | Second of arc (plane angle). |

APPENDIX B.—COMMON CONVERSION FACTORS¹To convert to kilograms (kg)
from—

| | |
|----------------------|-----------------------|
| Grams | Multiply by— 0.001 |
| Troy ounces | .0311035 |
| Pounds (avoirdupois) | .453592 |
| Short tons | 907.185 |
| Metric tons | 1,000.0 |

To convert to metric tons (t)
from—

| | |
|----------------------|--------------------------|
| Grams | Multiply by— 0.000001 |
| Pounds (avoirdupois) | .000453592 |
| Kilograms | .001 |
| Short tons | .907185 |

To convert to troy ounces (tr oz)
from—

| | |
|----------------------|---------------------------|
| Grams | Multiply by— 0.0321507 |
| Pennyweights | .05 |
| Pounds (avoirdupois) | 14.5833 |
| Kilograms | 32.1507 |
| Short tons | 29,166.7 |
| Metric tons | 32,150.7 |

To convert to pounds (lb) from—

| | |
|-------------|----------------------------|
| Grams | Multiply by— 0.00220462 |
| Troy ounces | .0685714 |
| Kilograms | 2.20462 |
| Short tons | 2,000.0 |
| Metric tons | 2,204.62 |

To convert to short tons (ton)
from—

| | |
|----------------------|-------------------------------|
| Grams | Multiply by— 0.00000110231 |
| Pounds (avoirdupois) | .0005 |
| Kilograms | .00110231 |
| Metric tons | 1.10231 |

To convert to 76-lb flasks from—

| | |
|----------------------|------------------------------|
| Grams | Multiply by— 0.0000290082 |
| Pounds (avoirdupois) | .0131579 |
| Kilograms | 0.0290082 |
| Short tons | 26.3158 |
| Metric tons | 29.0082 |

To convert to grams per metric
ton from—

| | |
|---------------------------|-------------------------|
| Troy ounces per short ton | Multiply by— 34.2857 |
|---------------------------|-------------------------|

To convert to troy ounces per
short ton from—

| | |
|----------------------|---------------------------|
| Grams per metric ton | Multiply by— 0.0291667 |
|----------------------|---------------------------|

To convert to cubic meters (m³)
from—

| | |
|-----------|----------------------------|
| Acre feet | Multiply by— 1,233.6192 |
|-----------|----------------------------|

¹Except for cubic meter conversion to acre feet, conversion factors are from BuMines Statistical Standard 1-83, June 6, 1983.

Note: Boldface conversion factors are exact.