

Bureau of Mines Information Circular/1980

MILS: The Mineral Industry Location System of the Federal Bureau of Mines

By Andrew W. Berg and Fred V. Carrillo



UNITED STATES DEPARTMENT OF THE INTERIOR

Information Circular 8815

MILS: The Mineral Industry Location System of the Federal Bureau of Mines

By Andrew W. Berg and Fred V. Carrillo



UNITED STATES DEPARTMENT OF THE INTERIOR
Cecil D. Andrus, Secretary

BUREAU OF MINES
Lindsay D. Norman, Acting Director

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

This publication has been cataloged as follows:

Berg, Andrew W

MILS, the mineral industry location system of the Federal Bureau of Mines.

(Information circular - Bureau of Mines ; 8815)

Supt. of Docs. no.: I 28,27:8815.

I. MILS (Information retrieval system), I. Carrillo, Fred V., joint author. II. Title. III. Series: United States. Bureau of Mines. Information circular ; 8815.

TN295.U4 [Z699.5.M5] 029.7 79-607770

CONTENTS

	<u>Page</u>
Abstract.....	1
Introduction.....	1
Input.....	2
Sources of data.....	2
Categories of information.....	2
Identification.....	4
Location.....	4
Universal Transverse Mercator (UTM).....	4
Topographic.....	4
Basin.....	4
Holdings.....	4
Reference.....	4
Commodity.....	4
Public land survey (PLS).....	4
Names.....	5
Bibliography.....	5
Owners.....	5
Precision.....	5
Updating procedures.....	5
Output available.....	5
Open file at the Western Field Operations Center.....	5
1:250,000-scale topographic quadrangles.....	5
1:500,000-scale State overlays.....	7
Commodity overlays.....	7
Cluster point locations.....	7
Density plot overlays.....	8
Indexes.....	8
Reproduction of open file data.....	8
Special requests.....	8
Magnetic tape.....	8
Special areas or data.....	9
Special request listings.....	9
Field operations centers.....	11
Appendix A.--Computer entry forms.....	12
Appendix B.--Computer cluster overlays and printouts.....	14
Appendix C.--Density plot overlays.....	21
Appendix D.--Indexes.....	23

ILLUSTRATIONS

1. Field Operations Center jurisdiction areas.....	3
2. Index for 1:250,000-scale quadrangle maps covering six Western States.....	6
3. Examples of some output options for MILS.....	10
A-1. MILS entry form 1.....	12
A-2. MILS entry form 2.....	13
B-1. Clustered MILS locations for the Wallace 1:250,000 quadrangle.....	14
B-2. Wallace 1:250,000-scale quadrangle.....	15

ILLUSTRATIONS--Continued

	<u>Page</u>
B-3. MILS printout page for Wallace 1:250,000-scale quadrangle.....	16
B-4. Clustered MILS locations for Idaho reduced from 1:500,000 scale...	17
B-5. MILS printout page for Idaho.....	18
B-6. Clustered MILS lead and zinc locations reduced from 1:1,750,000 scale.....	19
B-7. Printout page of lead and zinc occurrences in six Western States..	20
C-1. Density plot of MILS locations reduced from 1:7,500,000 scale.....	21
C-2. Density plot of gold occurrences reduced from 1:1,750,000 scale...	22
D-1. Page of State alphabetic index of Idaho MILS locations.....	23
D-2. Page of county alphabetic index for Shoshone County MILS locations	24

MILS: THE MINERAL INDUSTRY LOCATION SYSTEM OF THE FEDERAL BUREAU OF MINES

by

Andrew W. Berg¹ and Fred V. Carrillo²

ABSTRACT

The Bureau of Mines Mineral Industry Location System (MILS) is part of the computerized Minerals Availability System (MAS), a comprehensive data base of known mineral deposits. MILS, the location subsystem of MAS, has become widely used by the minerals industry and organizations with land-use planning and land management responsibilities.

Information on more than 135,000 mineral locations and processing plants in the United States is contained in the data base. This information includes the name, location, mineral commodity, type of operation, bibliography, and cross-references for each property or prospect.

Computer-drawn map overlays at various scales showing clustered MILS locations and computer printouts keyed to those overlays are available for inspection and reproduction at the Bureau's Field Operations Centers at Juneau, Alaska, Denver, Colo., Pittsburgh, Pa., and Spokane, Wash.

INTRODUCTION

The Mineral Industry Location System (MILS) is the location subsystem of the Federal Bureau of Mines Minerals Availability System (MAS). The objective of the MAS program is systematic measurement and classification of domestic and foreign mineral deposits according to their respective extraction technologies, economics, and commercial availability. MAS deals with complete mineral deposit evaluations and provides a rapid and systematic procedure to monitor the present and potential availability of mineral supplies to the United States.

Within MAS, the Mineral Industry Location System (MILS) locates and provides related information on mineral industry sites throughout the world. A "mineral industry location" is defined as metallic or nonmetallic occurrences, prospects, mines (both past and present producers), geothermal wells, and mineral processing plants such as mills, smelters, and refineries.

¹Geologist.

²Supervisory physical scientist.

Both authors are with the Western Field Operations Center, Bureau of Mines, Spokane, Wash.

Responsibility for development of MAS-MILS data for California, Idaho, Montana, Nevada, Oregon, Washington, and Hawaii, as well as offshore sites and deep-seabed deposits, resides with the Bureau's Western Field Operations Center (WFOC) at Spokane. Responsibility for the remaining States west of the Mississippi River resides with the Intermountain Field Operations Center (IFOC) at Denver. Responsibility for all States east of the Mississippi River resides with the Eastern Field Operations Center (EFOC) at Pittsburgh. Alaskan locations are the responsibility of the Alaska Field Operations Center (AFOC) at Juneau (fig. 1).

Because of differing startup dates, Field Operations Centers are at different levels of development regarding MAS-MILS input from their areas. To date, the MILS data base in Denver contains more than 4,500 locations for the AFOC area, 30,000 locations for the IFOC area, 39,000 locations for the EFOC area, and 58,000 locations for the WFOC area. Examples discussed in the following pages are from the WFOC area.

For Bureau use and open file availability, a comprehensive library of MILS data is maintained at WFOC for California, Idaho, Montana, Nevada, Oregon, Washington, and Hawaii. Map overlays of MILS locations and their related computer printouts provide a rapid means of identifying mineral properties in various geographic areas. These often provide a convenient starting point for a wide variety of mineral-related projects.

Principal users of MILS data include mining or minerals exploration companies as well as public and private organizations with land-use planning and land management responsibilities.

INPUT

Sources of Data

MILS data, for entry into the system, are derived from a variety of sources. Publications of the Bureau of Mines (USBM), the U.S. Geological Survey (USGS), and State geology departments are reviewed for mineral locations and related data. Unpublished data from the USBM and location information from mining companies comprise important additional sources of information. Various periodicals dealing with the mining industry, along with inspection reports of the Mine Safety and Health Administration (MSHA) on currently operating properties, are a constant source of current information to be incorporated into the MILS system.

Categories of Information

Each MILS property is assigned a numeric code which indicates the State, county, and a numeric sequence number within that county. For example, the Coeur Project property in Idaho is identified by the number 016-079-0040. This indicates the State of Idaho (016), county of Shoshone (079), and numeric sequence number (0040) in that county.

The information collected for each MILS property, when complete, consists of 12 categories or groups, as described in the following paragraphs.

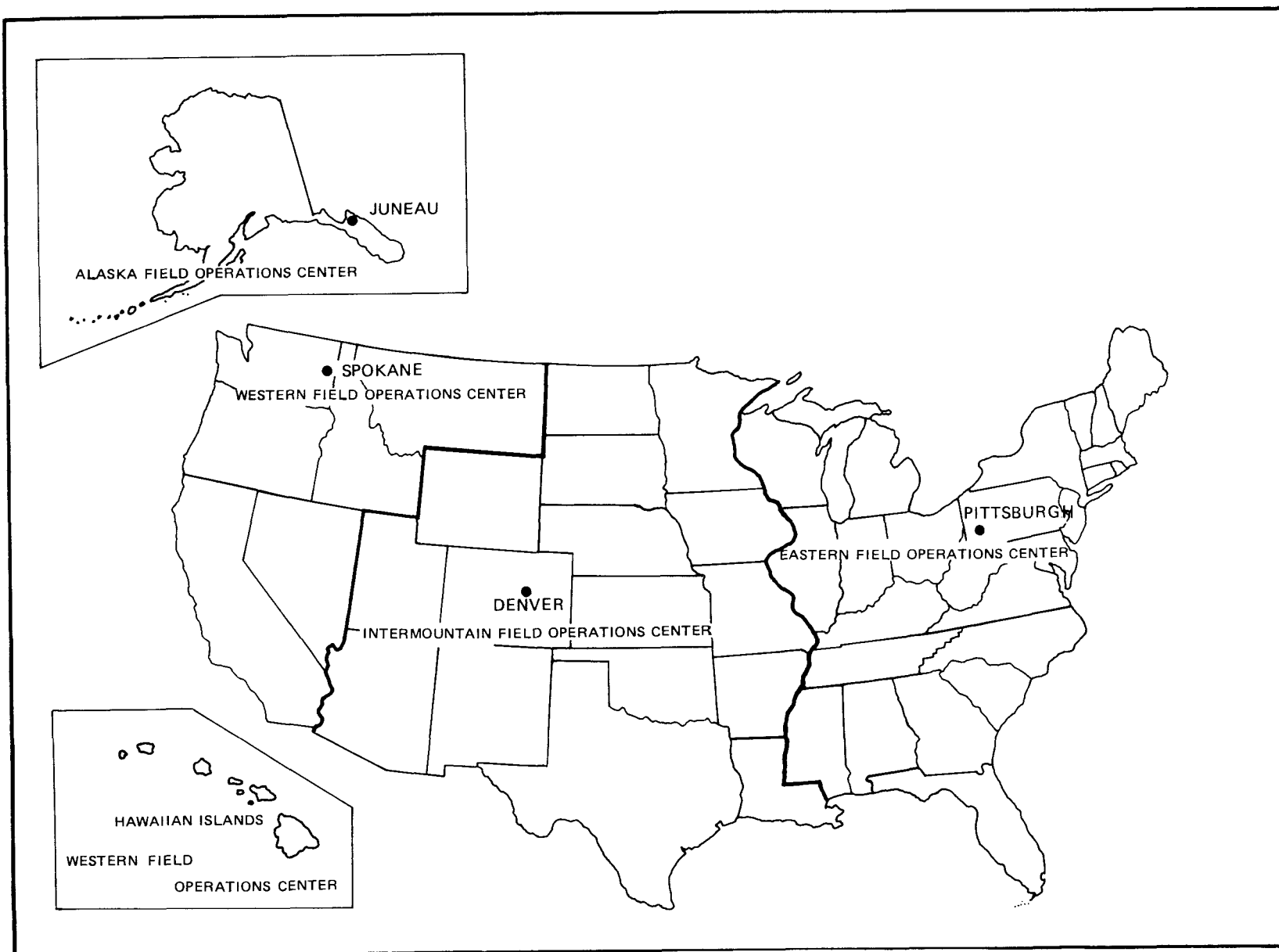


FIGURE 1. - Field Operations Center jurisdiction areas.

Identification

The identification group contains the primary property name, type of operation, and current operational status.

Location

Data entered in the location category include latitude, longitude, point of reference, elevation, and the year in which the property was last field-checked.

Universal Transverse Mercator (UTM)

Universal Transverse Mercator (UTM) coordinates are produced automatically by computer from the latitude-longitude entry, along with zone and hemisphere.

Topographic

The topographic group includes the name of the 1:250,000-scale quadrangle map that includes the MILS location. Name and scale of the largest scale USGS topographic quadrangle map on which the location was plotted for entry into MILS are also entered.

Basin

Under the basin category, the name of the drainage basin in which the mineral property is located and its corresponding USGS River Basin Code are entered.

Holdings

Holdings indicate the type of ownership or control of the mineral deposit or processing plant. Examples are fee ownership, private lease, or located claim. Three types can be entered in order of importance.

Reference

The MILS subsystem is cross-referenced to MSHA identification numbers, USBM mineral property files, USBM mine map repository, USGS Computerized Resources Information Bank (CRIB) system, and the soon-to-be-implemented USBM drill core library at Reno. The cross-references provide access to a wide variety of additional data.

Commodity

Mineral commodities are identified in order of decreasing importance.

Public Land Survey (PLS)

The PLS group provides for entry of the meridian, township, range, section, and section subdivision.

Names

Often a mineral property has had more than one official name. If several names are encountered in studying a property's literature, the "names" group permits their entry.

Bibliography

The bibliography group allows a user of MILS data to consult sources for additional information. The system can accommodate as many as 999 lines of bibliographic citations.

Owners

The name of the owner or operator and the home office location are entered in this group.

Completed computer input forms for the Coeur Project example are illustrated in appendix A. The completed forms can be mailed to the Minerals Availability Field Office in Denver for entry into the system or entered at the Field Operations Centers on remote computer terminals.

Precision

The system provides for an entry reflecting the degree of accuracy by which the location selected by the evaluator represents the actual location of the property. Location information from published sources is sometimes vague. Alternatives to entering such vague locations are either to leave properties out of the system or to apply a low degree of precision. The latter course is usually followed. When better location information becomes available from additional sources or field investigations, the entry is changed to a higher degree of precision.

Updating Procedures

Additions and corrections to the data base are made as new or additional information becomes available. This permits the data base to reflect, on a current basis, the latest and best information. Entry by remote terminal at Field Operations Centers permits daily updating.

OUTPUT AVAILABLE

Open File at the Western Field Operations Center

1:250,000-Scale Topographic Quadrangles

Standard base maps used for clear plastic overlays in MILS are USGS 1:250,000-scale quadrangles. The conterminous United States are covered by 473 of these quadrangles. The WFOC area is covered by 107 1:250,000-scale quadrangles (fig. 2). Computer-generated MILS data supply cluster point locations,³ which are plotted on the overlays. The computer printout keyed

³See definition of cluster point locations, page 7.

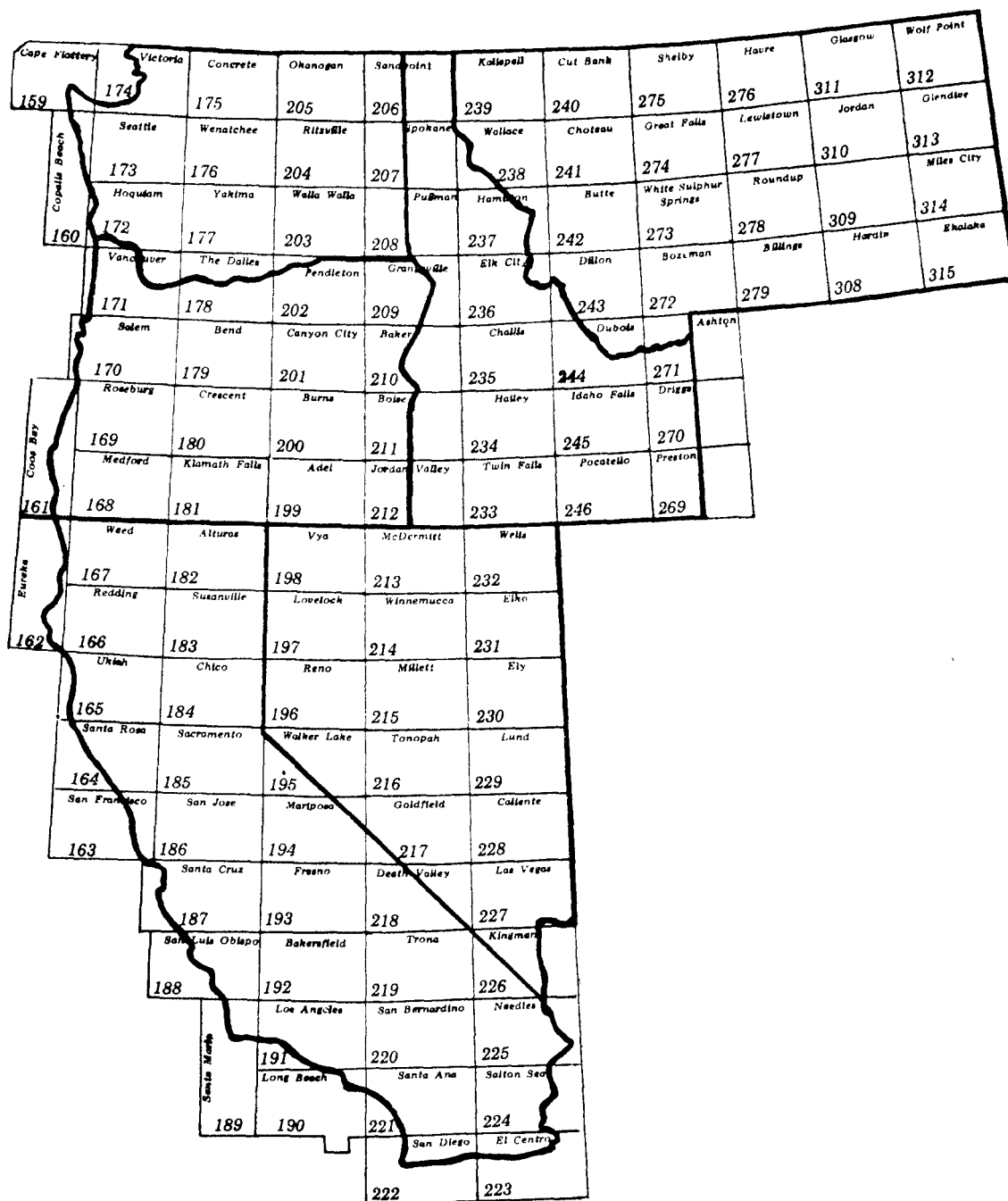


FIGURE 2. - Index for 1:250,000-scale quadrangle maps covering six Western States.

to these cluster numbers contains the corresponding data for each property represented on the overlay. Appendix B (fig. B-2) shows a reduced reproduction of the 1:250,000-scale map for the Wallace, Idaho, quadrangle. Figure B-1 shows the location symbols that appear on the corresponding computer-drawn MILS overlay. Appendix B also includes a typical page from the corresponding computer printout for the Wallace quadrangle (fig. B-3). The 1:250,000-scale overlays and their corresponding printouts are the most frequently requested MILS product.

1:500,000-Scale State Overlays

State MILS overlays at a scale of 1:500,000 are available. These overlays can be used with USGS State geologic maps as well as land status or other map types. An example of a State overlay is shown in figure B-4. Figure B-5 is a reproduction of a printout page keyed to that overlay. Such overlay and printout sets may be useful to organizations with land-use planning, exploration, or jurisdictional responsibilities on a statewide basis.

Commodity Overlays

Another useful overlay is one displaying clustered locations for a specific commodity or commodities in MILS. For this purpose a WFOC area base map has been prepared at a scale of 1:1,750,000. Figure B-6 illustrates an overlay and base map for lead and zinc. Figure B-7 is a computer printout page keyed to that overlay. Overlays and printouts for most major metal commodities are available at this scale from the WFOC open file library.

Cluster Point Locations

Plotting all individual sites on plastic overlays at most map scales could result in excessive cluttering of points. To avoid this problem, cluster points are used. A cluster point represents all MILS locations lying within 1/4 inch (0.63 cm) of the point on the overlay (fig. B-1). Circle radii distances on the ground represented by the 1/4-inch (0.63-cm) cluster radius at various map scales follow:

<u>Scale</u>	<u>Cluster radius</u>	<u>Ground distance</u>
1:24,000	1/4 inch (0.63 cm)	0.10 mile (0.16 km)
1:62,500	1/4 inch (.63 cm)	.25 mile (.40 km)
1:250,000	1/4 inch (.63 cm)	1.00 mile (1.61 km)
1:500,000	1/4 inch (.63 cm)	2.00 miles (3.22 km)
1:1,750,000	1/4 inch (.63 cm)	7.00 miles (11.26 km)
1:2,500,000	1/4 inch (.63 cm)	10.00 miles (16.10 km)
1:3,168,000	1/4 inch (.63 cm)	12.00 miles (19.31 km)

As the map scale becomes larger, the location density per cluster point can decrease to a minimum of one site. Even at the small scale of 1:1,750,000, with a cluster radius distance on the ground of 7 miles (11.26 km), a cluster point may represent only one site within certain areas or for certain commodities.

Density Plot Overlays

An additional method of displaying MILS data on an overlay is the density plot. By this method each MILS location is represented by a single computer-generated point on the overlay corresponding to its location coordinates. This point generation can be programed for all locations (fig. C-1), or for any selected data category within the system.

A density plot for gold at a scale of 1:1,750,000 is illustrated by a reduced reproduction (fig. C-2). Future uses for density plots could include areal geochemical studies and the definition of metallogenic provinces. Density plots are available on an open file basis for gold, lead, silver, and zinc, and for all MILS locations in the WFOC area.

Indexes

Indexes have been prepared to provide efficient access to the voluminous MILS data on open file. Two frequently used indexes are the State Alphabetic (fig. D-1) and the State/County Alphabetic (fig. D-2).

If a property name and county are known, reference to the appropriate alphabetic indexes will quickly tell the investigator if the property is in the MILS system. If the property name is known, but not the county, then the State alphabetic listing will quickly determine if the property is in the system. These listings also provide secondary names, location, 1:250,000-scale quadrangle name, 7.5- or 15-minute map name, and sequence number.

Reproduction of Open File Data

On receipt of a request for MILS open file data, the open file originals from the Field Operations Center library are taken to a local reproduction firm. Payment for reproduction is arranged between the requestor and the firm selected. In 1979 charges for these services varied somewhat between Field Operations Centers but were about \$0.90 per square foot for plastic overlays and \$0.09 per page for copies of the computer printout.

Special Requests

Magnetic Tape

A magnetic computer tape containing MILS data for the entire United States is available to organizations that wish to use it with their own computer facilities. This tape can be ordered at cost (\$80.00 in late 1979) from the Office of Minerals Availability, Bureau of Mines, 2401 E. Street NW, Washington, DC 20241. Payment should be made by check or money order to the Bureau of Mines. Additional information regarding the MILS computer tape may be obtained by calling 202-634-1292.

Special Areas or Data

The variety of uses for MILS data has created a demand for overlay configurations that differ from those currently maintained on open file at the Field Operations Centers. A Bureau of Land Management area, National Forest, or State land area might be required. Additionally, a need for a different set of information using overlays over standard map scales could develop for a specific problem. These kinds of output can be obtained on a special-request basis through the appropriate Field Operations Center.

Special requests require consideration of some of the output options that exist for MILS (fig. 3). For example, a special request for "producers" should specify whether "current producers" as well as "past producers" are required. In the "type of operation" category, a special request for all mines must include, at least, all surface, surface-underground, and underground mines to be reasonably inclusive.

Special requests are potentially costly, as programing and computer time on a custom basis are involved; therefore, quotations are obtained for the requestor before the work is undertaken.

Special Request Listings

Another type of special request is a list with limited specific data. The user might, for example, desire an alphabetic list of locations by township and range, a list with only the property name and commodity, or a wide variety of combinations limited only by the contents of the data base.

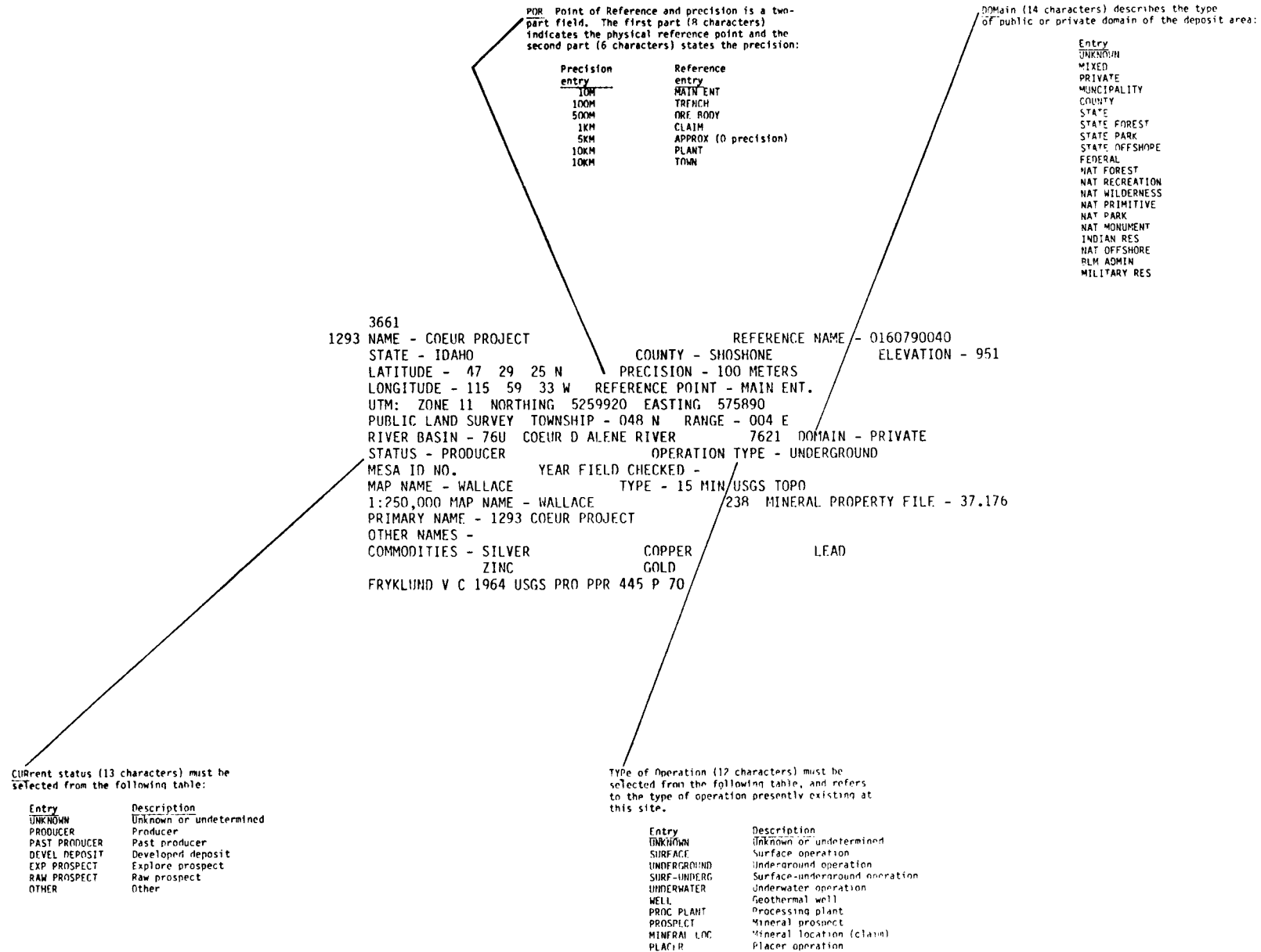


FIGURE 3. - Examples of some output options for MILS.

FIELD OPERATIONS CENTERS

A request for information about the MILS system or the implementation of a MILS request should be directed to the appropriate Field Operations Center. Addresses of the four centers follow.

Alaska Field Operations Center
Bureau of Mines
P.O. Box 550
Juneau, Alaska 99802

Intermountain Field Operations Center
Bureau of Mines
Building 20, Denver Federal Center
Denver, Colo. 80225

Eastern Field Operations Center
Bureau of Mines
4800 Forbes Avenue
Pittsburgh, Pa. 15213

Western Field Operations Center
Bureau of Mines
E. 315 Montgomery
Spokane, Wash. 99207

1 SEQUENCE NUMBER 10																
0160790040																

IDENTIFIER 11 15		N-REC 16 17		A/C 20 21													N-NAME (alternate) 55													
N - N A M																														
↓																														
IDENTIFIER 11 15		O-REC 16 17		O-NAME of owner or operator 21 28 29 31 32 51 52 55 56													76													
O - N A M				O-STATUS O-PCT O-HOME office location O-YOI													76													
OWNER																														
O - N A M																														
OWNER																														
IDENTIFIER 11 15		B-LIN 16 17		B-BIBibliography 20 21 25 30 35 40 45 50 55 60 65 70 75 80																										
B - B I B		001		FRYKLUND V. C. 1964, USGS PRO. PPR. 445, P. 70																										
↓																														

FIGURE A-2. - MILS entry form 2.

APPENDIX B.--COMPUTER CLUSTER OVERLAYS AND PRINTOUTS

Editor's Note.--In the following figure B-1, a single symbol represents all sites at a particular location.

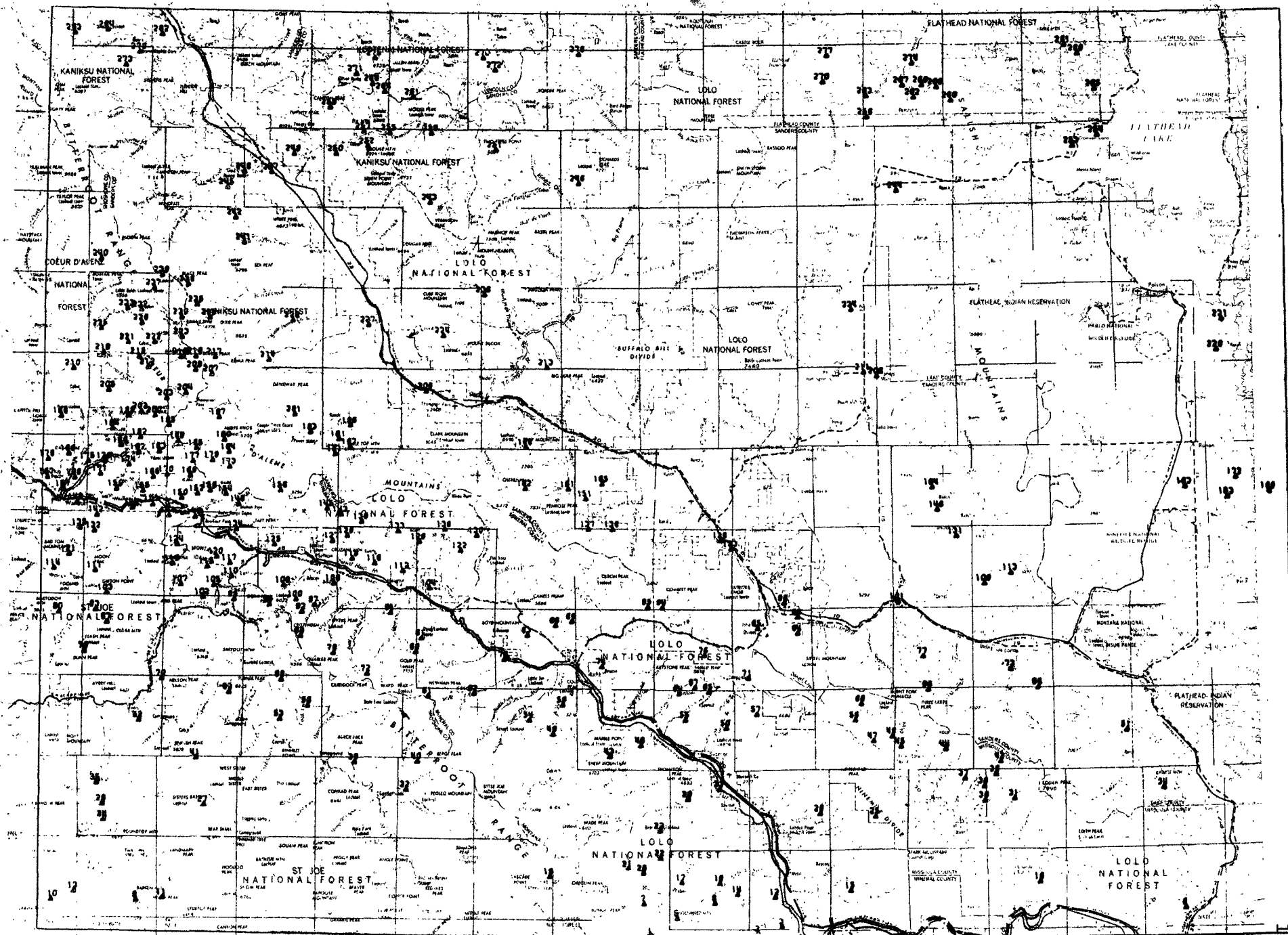


Figure B-1. Clustered MHS locations for the Wallace 1:250,000 quadrangle.

FIGURE B-2. Wallace 1:250,000-scale quadrangle.

167 259
 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
 LATITUDE - 47 29 25 N PRECISION - 100 METERS
 LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259920 EASTING 575890
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 19 E 1/2
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
 STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
 MESA ID NO. 10 00479 YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
 PRIMARY NAME - 167 COEUR PROJECT
 COMMODITIES - SILVER COPPER LEAD
 ZINC GOLD
 FRYKLUND V C 1964 USGS PRO PPR 445 P 70
 MILL CAPACITY 450 TPD PRODUCING 100,000 to 500,000 TONS ANNUALLY

260
 167 NAME - RAINBOW MINE REFERENCE NUMBER - 0160790361
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0899 METERS
 LATITUDE - 47 29 26 N PRECISION - 100 METERS
 LONGITUDE - 115 59 15 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259865 EASTING 576271
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 19 SE 1/4 SE 1/4 NE 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 167 RAINBOW MINE
 COMMODITIES - LEAD ZINC SILVER
 HOBBS ET AL 1965 USGS PROF PAPER 478.

261
 168 NAME - CUNNINGHAM MINE REFERENCE NUMBER - 0160790304
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1736 METERS
 LATITUDE - 47 30 13 N PRECISION - 100 METERS
 LONGITUDE - 115 49 40 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5261578 EASTING 588280
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 005 E
 DESCRIPTION SECTION - 16 SW 1/4 SE 1/4 NW 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - RAW PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - BURKE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 168 CUNNINGHAM MINE
 COMMODITIES - LEAD SILVER
 HOBBS AND OTHERS 1965 USGS PROF PAPER 478

FIGURE B-3. - MILS printout page for Wallace 1:250,000-scale quadrangle.

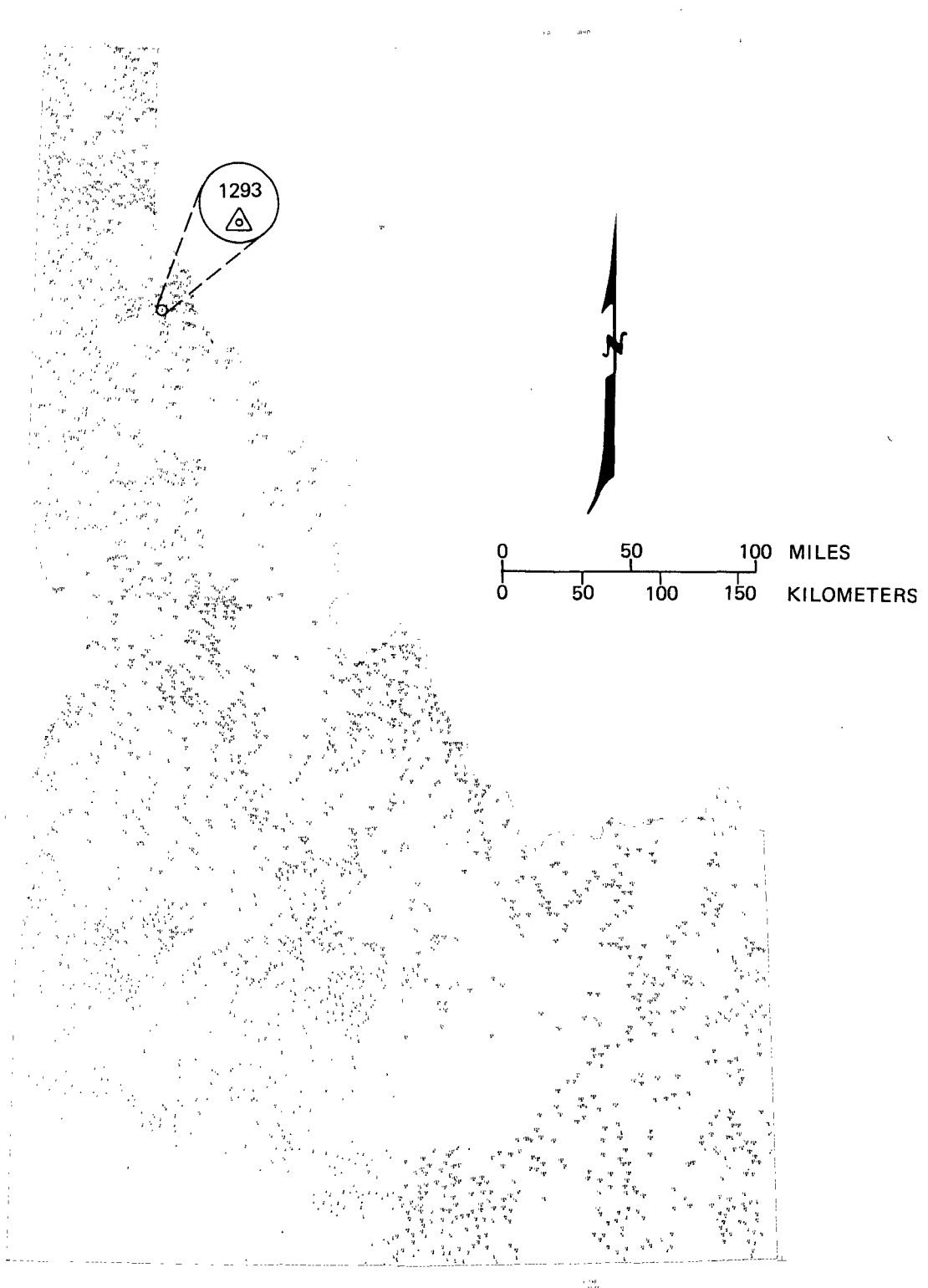


FIGURE B-4. - Clustered MILS locations for Idaho reduced from 1:500,000 scale.

3660
 1293 NAME - CALADAY REFERENCE NUMBER - 0160790245
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1097 METERS
 LATITUDE - 47 27 44 N PRECISION - 500 METERS
 LONGITUDE - 115 56 26 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5256860 EASTING 579850
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 16 NONE
 RIVER BASIN - 76AA LOCHSA RIVER 7627 DOMAIN - PRIVATE
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 1293 CALADAY
 COMMODITIES - UNDETERMINED
 3 MI SE OF OSBURN
 USBM LIAISON OFF REPT MNG OP 1972

3661
 1293 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
 LATITUDE - 47 29 25 N PRECISION - 100 METERS
 LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259920 EASTING 575890
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 19 E 1/2
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
 STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
 PRIMARY NAME - 1293 COEUR PROJECT
 OTHER NAMES -
 COMMODITIES - SILVER COPPER LEAD
 ZINC GOLD
 FRYLUND V C 1964 USGS PRO PPR 445 P 70

3662
 1293 NAME - GALENA MINE REFERENCE NUMBER - 0160790010
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
 LATITUDE - 47 28 40 N PRECISION - 100 METERS
 LONGITUDE - 115 57 58 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5258560 EASTING 577900
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 29 E 1/2
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
 STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
 MEAS ID NO. YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 64.013
 PRIMARY NAME - 1293 GALENA MINE
 COMMODITIES - LEAD ZINC COPPER
 ANTIMONY SILVER
 MINE-TONNES/YR - ORE =254016 LEACH = WASTE= 1975
 PLANT - TYPE=FLOTATION TONNES/YR- INPUT=254016 OUTPUT= 1975
 FRYKLUND V C 1964 USGS PP 445 (GOOD)
 IDA BUM & GEOL BULL 16 (GOOD)

FIGURE B-5. - MILS printout page for Idaho.

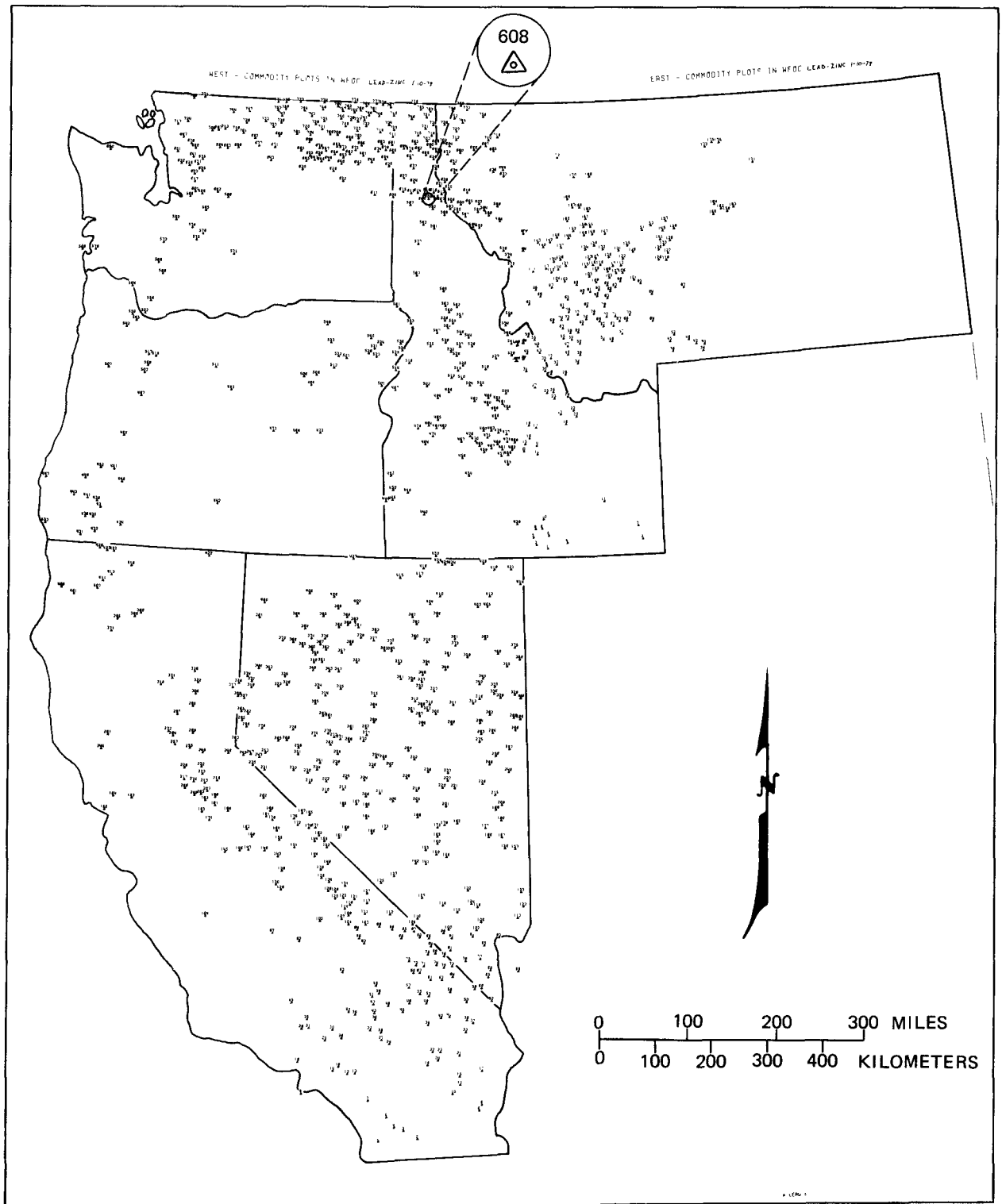


FIGURE B-6. - Clustered MILS lead and zinc locations reduced from 1:1,750,000 scale.

2239
 608 NAME - CAPITOL SILVER LEAD MINE NO. 2 REFERENCE NUMBER - 0160790293
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1496 METERS
 LATITUDE - 47 33 25 N PRECISION - 100 METERS
 LONGITUDE - 115 58 20 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5267351 EASTING 577323
 PUBLIC LAND SURVEY TOWNSHIP - 049 N RANGE - 004 E
 DESCRIPTION SECTION - 32 NE 1/4 NW 1/4 NE 1/4
 RIVER BASIN - U UNIDENTIFIED CODE DOMAIN - UNDETERMINED
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - BURKE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 608 CAPITAL SILVER LEAD MINE NO. 2
 COMMODITIES - LEAD SILVER
 HOBBS AND OTHERS 1965 USGS PROF PAPER 478

2240
 608 NAME - COEUR D ALENE MINE REFERENCE NUMBER - 0160790295
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0871 METERS
 LATITUDE - 47 29 53 N PRECISION - 100 METERS
 LONGITUDE - 116 00 45 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5260767 EASTING 574376
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 003 E
 DESCRIPTION SECTION - 24 NE 1/4 NE 1/4 SW 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - CALDER TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - SPOKANE 207 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 608 COEUR D ALENE MINE
 COMMODITIES - LEAD SILVER
 HOBBS AND OTHERS 1965 USGS PROF PAPER 478

2241
 608 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
 LATITUDE - 47 29 25 N PRECISION - 100 METERS
 LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259920 EASTING 575890
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION 19 E 1/2
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
 STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
 MESA ID NO. 10 00479 YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
 PRIMARY NAME - 608 COEUR PROJECT
 COMMODITIES - SILVER COPPER LEAD
 ZINC GOLD
 FRYKLUND V C 1964 USGS PRO PPR 445 P 70
 MILL CAPACITY 450 TPD PRODUCING 100,000 to 500,000 TONS ANNUALLY

FIGURE B-7. - Printout page of lead and zinc occurrences in six Western States.

APPENDIX C.--DENSITY PLOT OVERLAYS

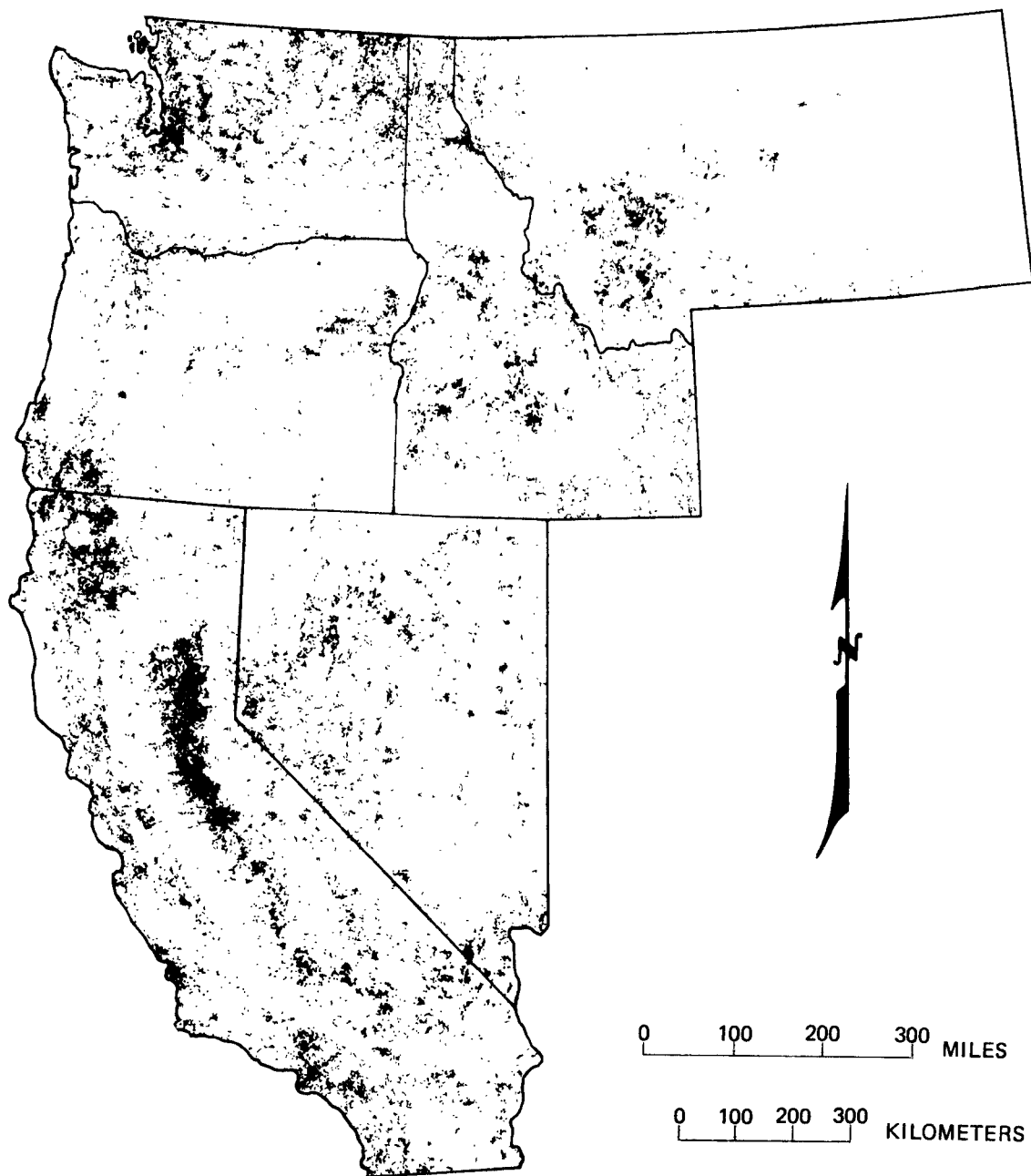


FIGURE C-1. - Density plot of MILS locations reduced from 1:7,500,000 scale.

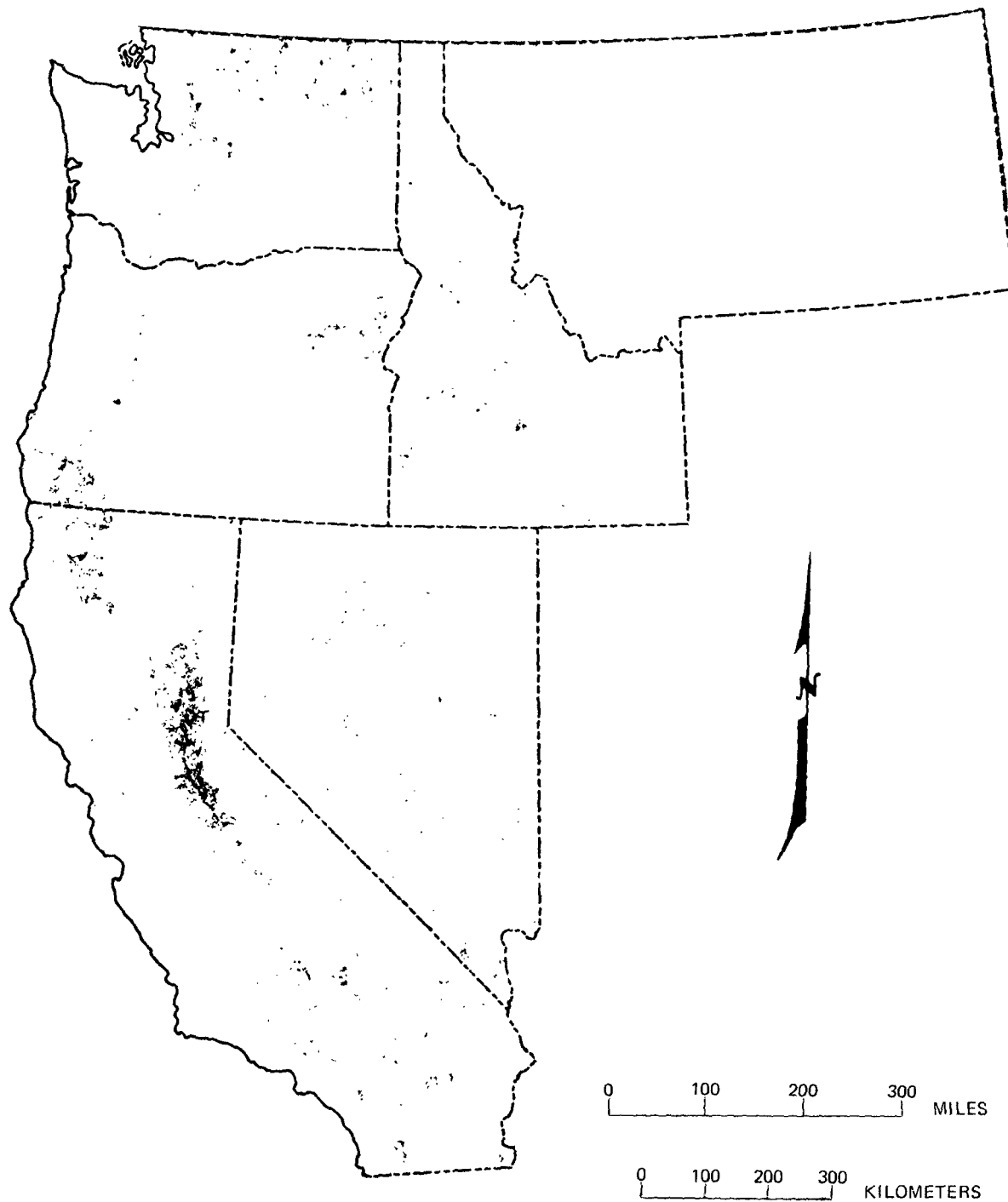


FIGURE C-2. - Density plot of gold occurrences reduced from 1:1,750,000 scale.

PROPERTY NAME	PRIMARY NAME	SEC	LOCATION	QUAD NAME	SEQUENCE #
CLEARWATER		23	T042N R010E	CHAMBERLAIN MTN	7 1603500005
CLEARWATER AND WOLVERINE		33	T003N R019E	HAILEY	1601300074
CLEARWATER COPPER MINE		16	T042N R007E	MALLARD PEAK	7 1607900186
CLEARWATER GULCH		06	T036N R006E	PIERCE	7 1603500038
CLEARWATER MINE		23	T042N R010E	CHAMBERLAIN MTN	7 1607900091
CLEARWATER MINE		34	T029N R006E	GOLDEN	7 1604900413
CLEVELAND		17	T028N R008E	ELK CITY	7 1604900090
CLEVELAND		16	T020N R009E	EDWARDSBURG	7 1608500095
CLEVELAND		31	T012S R041E	ONEIDA NARROWS RE	7 1604100003
CLEVELAND MINE		06	T006N R006E	PIONEERVILLE	7 1601500042
CLIFF		14	T022N R003W	CUPRUM	15 1600300020
CLIFTON BELL		07	T004N R010E	ROCKY BAR	7 1603200017
CLIMAX		20	T002N R018E	BELLEVUE	15 1601300030
CLIMAX		16	T016N R004W	STURGILL PEAK	15 1608700019
S CLIMAX	GOLDSTONE MINE	14	T021N R024E	GOLDSTONE MTN	15 1605200187
CLIMAX GROUP		11	T012N R029E	SCOTT PEAK	15 1605200331
S CLIMAX MINE	SILVER CROWN MINE	18	T003N R015E	SAWTOOTH	30 1602500053
CLIPPER		14	T012N R029E	SCOTT PEAK	15 1605200333
CLIPPER BULLION MINE		31	T024N R019E	SHOUP	15 1605200284
CLOVERLEAF MINE		06	T006N R006E	PIONEERVILLE	7 1601500047
CLUFF TUNNELS		32	T005N R044E	GARNS MTN	15 1608100006
COAL		15	T007S R033E	MICHAUD	15 1607700027
COAL CLOWARD MINE		06	T001N R040E	AMMON, ID	15 1601900073
COAL CREEK		16	T011N R014E	EAST BASIN CREEK	7 1603700382
COAL- FALL CK BASIN MINE		03	T001S R042E	HELL CREEK ID	7 1601300071
COAL-BRINSON MINE, CANYON COAL MNG		35	T002N R040E	HELL CREEK, ID	7 1601900072
COAL-CROLEY MINE		35	T001S R041E	HELL CREEK	15 1601900070
COAL-GOD SEND TO HEALTH MINE		04	T001S R042E	HELL CREEK, ID	15 1601900074
COBALT MINE		35	T021N R018E	BLACKBIRD MTN	15 1605200075
COEUR D ALENE AND PINE CK ANTIMONY		06	T048N R002E	KELLOGG	15 1607900018
COEUR D ALENE BIG CREEK		16	T048N R003E	KELLOGG	15 1607900076
COEUR D ALENE CHAMPION		12	T048N R005E	BURKE	15 1607900296
COEUR D ALENE MINE		24	T048N R003E	CALDER	15 1607900295
COEUR D ALENE MINE		05	T028N R007E	CENTER STAR MTN	7 1604900519
COEUR D ALENE MINING CO.		18	T049N R006E	COOPER GULCH	15 1607900137
COEUR D ALENE MOUNTAIN		12	T049N R003W	LANE	15 1605500027
S COEUR D ALENE NORTH FORK	MONARCH MINE	23	T049N R005E	BURKE	15 1607900130
COEUR D ALENE PREMIER		08	T047N R002E	CALDER	15 1607900243
S COEUR D ALENE INVESTORS INC	GOOD HOPE PLACERS INC	05	T005S R003E	SILVER CREEK	15 1607300246
COEUR PROJECT		19	T043N R004E	WALLACE	15 1607900040
COGDILL MINE		35	T049N R003E	KELLOGG	15 1607900297
COIN POND GROUP		10	T007N R004E	PLACERVILLE	7 1601500015
COLE ROAD PIT		08	T 3N R 2E	BOISE	15 1600100129
COLGATE LICKS		15	T036N R012E	BEAR MOUNTAIN	7 1604900542
COLLISTER		23	T014N R011E	GREYHOUND RIDGE	15 1603700246
COLONEL		16	T026N R006E	ELK CITY	1604900292
S COLONEL	COLONEL SELLERS	13	T029N R008E	ELK CITY	7 1604900041
COLONEL SELLERS		13	T029N R008E	ELK CITY	7 1604900041
COLONIAL CONCRETE PLANT		17	T010S R017E	TWIN FALLS	7 1608300076
COLONIAL CONCRETE SNAKE RIVER DREDG		33	T017S R009E	TWIN FALLS	7 1608300077
S COLORADO	TRADE DOLLAR	07	T005S R003W	SILVER CITY	15 1607300036

* 'S' indicates secondary name, with primary name listed to the right.

FIGURE D-1. - Page of State alphabetic index of Idaho MILS locations.

APPENDIX D.--INDEXES

COUNTY: 079 SHOSHONE

PROPERTY NAME	PRIMARY NAME	COMMODITY	LOCATION	SEC	QUAD-DESC	SEQ
S CHARLES DICKENS	SILVER CRESCENT	LEAD	T049N R003E 25	SPOKANE		0039
CHESTER		GOLD	T050N R005E 33	WALLACE		0113
S CHESTER	SILVER DOLLAR MINE	LEAD	T048N R003E 14	SPOKANE		0036
S CHICAGO	PARAGON MINE	LEAD	T049N R006E 07	WALLACE		0132
S CHICAGO-LONDON	PARAGON MINE	LEAD	T049N R006E 07	WALLACE		0132
CHRISTOPHERSON		GOLD	T049N R004E 16	WALLACE		0248
CINNABAR PROSPECT	EDWARDS PROSPECT	LEAD	T048N R005E 23	WALLACE		0294
S CLARKE MINE	SUNSET MINE	LEAD	T050N R003E 27	SPOKANE		0207
CLEARWATER COPPER MINE		LEAD	T049N R005E 33	WALLACE		0079
CLEARWATER MINE		COPPER	T042N R007E 16	HAMILTON		0186
COEUR D ALENE AND PINE CK ANTIMONY		GOLD	T042N R010E 23	HAMILTON		0091
COEUR D ALENE BIG CREEK		COPPER	T048N R002E 06	SPOKANE		0018
COEUR D ALENE MINING CO.		SILVER	T048N R003E 16	SPOKANE		0076
S COEUR D ALENE NORTH FORK	MONARCH MINE	LEAD	T049N R006E 18	WALLACE		0137
COEUR D ALENE PREMIER		LEAD	T048N R004E 14	WALLACE		0130
COEUR D ALENE CHAMPION MINE		LEAD	T047N R002E 08	SPOKANE		0243
COEUR D ALENE MINE		LEAD	T048N R005E 12	WALLACE		0296
COEUR PROJECT		LEAD	T048N R003E 24	SPOKANE		0295
COGDILL MINE		SILVER	T048N R004E 19	WALLACE		0040
S COLUMBIA VEIN	TRIMETALLIC MNG CO CLAIMS	LEAD	T049N R003E 35	SPOKANE		0297
COLUMBUS		COPPER	T042N R009E 16	HAMILTON		0182
S COLUSA	LEUSCHEL N. P. LEASE		T050N R005E 13	WALLACE		0101
COLUSA MINE		COPPER	T047N R002E 19	SPOKANE		0114
CONRAD'S CROSSING		LEAD	T047N R002E 18	SPOKANE		0202
CONSOLIDATED SILVER		GOLD	T044N R008E 14	WALLACE		0177
S CONSOLIDATED SILVER-LEAD MINE	U.S. SILVER-LEAD MINE	SILVER	T048N R003E 23	WALLACE		0420
S CONSOLIDATED SILVER-LEAD MINES	U.S. SILVER-LEAD MINE	LEAD	T050N R005E 13	SPOKANE		0100
CONSTITUTION MINE		LEAD	T050N R005E 13	SPOKANE		0100
COPPER CHIEF		LEAD	T047N R002E 02	SPOKANE		0030
COPPER KING MINE		COPPER	T047N R006E 21	WALLACE		0148
COPPER PLATE MINE		LEAD	T048N R005E 24	WALLACE		0065
COPPER PRINCE		LEAD	T048N R005E 23	WALLACE		0298
COPPER QUEEN MINE		COPPER	T045N R003E 10	SPOKANE		0278
CORBY MINE		LEAD	T047N R005E 12	WALLACE		0300
COUGAR GROUP		LEAD	T048N R002E 08	SANDPOINT		0301
COUGHLIN MINE		COPPER	T045N R004E 18	SPOKANE		0165
CRANE		LEAD	T048N R005E 25	WALLACE		0302
CRATER LAKE PEGMATITE		LEAD	T048N R003E 15	SPOKANE		0303
CRESCENT		FELDSPAR	T043N R004E 32	WALLACE		0192
CROWN POINT MINE		SILVER	T048N R003E 16	SPOKANE		0009
CRYSTAL LEAD MINE		LEAD	T048N R002E 11	SPOKANE		0031
S CUMMINGS MURRAY	SH-63 PIT	LEAD	T050N R005E 03	WALLACE		0096
S CUMMINGS MURRAY	TEFFI GROUP MANGANESE CLAIMS	STONE	T048N R003E 34	SPOKANE		0422
S CUMMINGS MURRAY	TEFFI GROUP MANGANESE CLAIM	MANGANESE	T050N R004E 28	WALLACE		0421
CUNNINGHAM MINE		MANGANESE	T050N R004E 28	WALLACE		0421
S CURLEW	PAGE MINE	LEAD	T048N R005E 16	WALLACE		0304
S CURLEW MINE	PAGE MINE	LEAD	T048N R002E 10	SPOKANE		0019
		LEAD	T048N R002E 10	SPOKANE		0019

* 'S' indicates secondary name, with primary name listed to the right.

FIGURE D-2. - Page of county alphabetic index for Shoshone County MILS locations.