GEOLOGICAL SURVEY CIRCULAR 846

CRIB-UTAH: Utah Metal and Nonmetal Resource Information Available in the U.S. Geological Survey Mineral Data System—Computerized Resource Information Bank

CRIB-UTAH: Utah Metal and Nonmetal Resource Information Available in the U.S. Geological Survey Mineral Data System—Computerized Resource Information Bank

By Edwin W. Tooker and George Wong

GEOLOGICAL SURVEY CIRCULAR 846

1982

United States Department of the Interior

JAMES G. WATT, *Secretary*

Geological Survey

Dallas L. Peck, *Director*

Library of Congress catalog card no. 82-600521

Free on application to Branch of Distribution, U.S. Geological Survey
604 South Pickett Street, Alexandria, VA 22304

CONTENTS

ILLUSTRATIONS

TABLES

CRIB-UTAH: Utah Metal and Nonmetal Resource Information Available in the U.S. Geological Survey Mineral Data System—Computerized Resource Information Bank

By Edwin W. Tooker and George Wong

INTRODUCTION

The U.S. Geological Survey's revised and expanded computerized resource information file for the State of Utah, CRIB-UTAH, is available for public use through the aegis of the Office of Information Systems Programs, University of Oklahoma, and the General Electric World-Wide MARK 3000 Computer Network. Part of a national file of resource data, the Utah file currently consists of more than 3,500 records containing location, geologic, and resource information about metal and some nonmetal deposits or commodity occurrences in the State. These records are stored in the U.S. Geological Survey's Computerized Resource Information Bank (CRIB), a part of the U.S. Geological Survey's Mineral Data System (MDS) which is revised in a continuing program of verification, documentation, corrections, and addition of new information.

The retrieval programs available for use with CRIB make possible highly selective rapid searches of this file. The information can be reproduced as a complete record or specified parts of a record, as tabulations, and as map plots for selected fields of interest. Procedures for public access and use can be obtained from the Director of Information Systems Programs, University of Oklahoma, P.O. Box 3030, Norman, OK 73070. Additional information concerning MDS-CRIB can be obtained from the Regional MDS Representative, U.S. Geological Survey, 345 Middlefield Road, Menlo Park, CA 94025; Federal Center, Denver, CO 80225; or National Center, 12201 Sunrise Valley Drive, Reston, VA 22092.

CRIB-UTAH provides a source of existing resource information from a number of specialized internal Geological Survey files (see U.S. Geological Survey, 1979) and publicly available literature sources. The file represents a comprehensive central source of documented or verified nonconfidential geologic and resource information about metal and nonmetal mineral localities for the State of Utah. The file excludes organic fuels, most industrial minerals (clays and saline evaporate minerals), and construction materials (i.e., sand, gravel, and cement rock). Complementary files discussed below, are available for those resource materials specifically excluded.

A compilation of data such as this relies on the cooperation and assistance of many persons. We are pleased to acknowledge some of those whose contributions to the completion of this file have been substantial: Maureen G. Johnson, Jocelyn A. Peterson, and Donald F. Huber, U.S. Geological Survey, guided us through the computer input-output phases. Donald T. McMillan, director, and Hellmut H. Doelling, economic geologist, of the Utah Geological and Mineral Survey were most cooperative in discussing the methodology of resource files and in exchanges of data. Gail McCoy, William J. Moore, Richard A. Armin, Hal T. Morris, Roscoe M. Smith, and Thomas A. Steven, U.S. Geological Survey, contributed information from the Tooele, Delta, and Richfield 1°x2° quadrangle projects of the Conterminous United States Mineral Assessment Program (CUSMAP). William J. Hassler made available the Utah files of the U.S. Geological Survey exploration loan programs (OME and DMEA). Terry W. Offield, U.S. Geological Survey, contributed computerized information on energy materials in Utah from the National Uranium Resource Evaluation (NURE) program. To the many others, unnamed, we tender our sincere thanks.

PURPOSE OF THE CRIB-UTAH FILE

CRIB-UTAH is one of several files currently being compiled by the U.S. Geological Survey for the conterminous United States to be a working tool in meeting advisory responsibilities for assessing the known and potential locatable mineral resources of the nation (U.S. Geological Survey, 1975). Constructed primarily for use by the U.S. Geological Survey to help meet its specific national resource responsibilities, it complements several other files prepared for regional, local, or other uses. The file will also be available for use in geologic mapping, mineral-commodity compilations, and metallogenesis research. Focus is therefore on those metallic and nonmetallic commodities of broad national or international interest, rather than on equally important materials that are generally abundant but of more local (Statewide) economic significance: common nonmetals (sodium and potassium), industrial minerals (brick clay, limestone for flux, or gem stones), and construction materials (sand, gravel, and cement rock). The CRIB-UTAH file emphasizes geologic information on resource occurrence, because the geologic availability of the resource material is a primary consideration. While no appraisal of currently economic resources is made, all available production data are included.

COMPLEMENTARY AVAILABLE RESOURCE DATA

Complementary data file sources for the organic fuels, industrial (metallic and nonmetallic) minerals, and construction materials are available. Reports and documents on organic fuel materials are located in several files described in U.S. Geological Survey Circular 817 (1979). Some of these data are included in the MDS-CRIB files of the Utah Geological and Mineral Survey (UGMS), 606 Black Hawk Way, Salt Lake City, UT 84108. The UGMS file also contains geologic information on the occurrence and estimates of the resource potential of the common nonmetals, industrial minerals, and construction materials. Information about the economic factors of resource production of metallic and nonmetallic materials may be found in the Minerals Availability System (MAS) file prepared by the U.S. Bureau of Mines (1974), available through the U.S. Bureau of Mines, Western Field Operations Center, East 315 Montgomery Avenue, Spokane, WA 99107.

DESCRIPTION OF THE CRIB-UTAH FILE

The CRIB-UTAH file currently contains 3,552 entries similar in format to the example shown as table 1. CRIB is a dynamic file continually being corrected, updated, and added to as new information is made available. The file is an inventory of metal and nonmetal occurrence localities. The records include available data such as the name, location, geologic setting, commodity information, deposit development information, production, resource potential, and significant literature citations. The file uses the program GIPSY, an English-based computer language format by which new data and new records can be added easily, old data corrected and revised, and superfluous or duplicate records deleted (Keefer and Calkins, 1978). Information about a metal or nonmetal commodity, its location by district, county, longitude and latitude, Universal Transverse Mercator (UTM), or township and range, can be retrieved by means of interactive access, batch computer text, tabular printout, or map plots.

Geologic and resource information about historical mineral deposits (those now worked out), currently economic and productive deposits, and subeconomic occurrence localities that may contain potentially usable metallic or nonmetallic resource materials make this file more than an inventory of past and present productive deposits.

Output retrieval from the CRIB-UTAH file may be in the form of batch computer text similar to that shown in table 1, or in selective tabular printout similar to that shown in table 2. Tables and maps used here that were derived directly from the computer have not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

SOURCES OF CRIB INFORMATION

The CRIB-UTAH file brings together in verified form several overlapping sources of data from individual resource programs within the Geologic and Conservation Divisions of the U.S. Geological Survey and data from State of

Utah agencies and other public and private sources. The Conservation Division has had special responsibility for the assessment and management of leasable minerals on Federal lands; the Geologic Division has maintained special expertise for the assessment and measurement of the geologic availability of the major metal and nonmetal commodities and has responsibility for locatable minerals on all lands. The Geologic Division has managed the U.S. Geological Survey mineral exploration loan programs (OME-DMEA) and has been involved in the National Uranium Resource Evaluation (NURE), and the Forest Service Regional Area Resource Evaluation (RARE II), a mapping program to assess the resource potential in the Richfield, Tooele, and Delta 1°x2° quadrangles, as part of the Conterminous United States Mineral Assessment Program (CUSMAP). Programs such as the Circumpacific Resource Study, the National Atlas, the Wilderness Resource Assessment programs, and the metallogenic map program of the Geologic Division are a few of the major continuing sources of information.

A major source of data for this file is the Utah Geological and Mineral Survey (UGMS), which has developed a file for use in the resource appraisal of leasable and other minerals for the U.S. Bureau of Land Management (BLM) to assist them in management of leasable minerals on Federal lands in Utah. The extensive published literature on the mineral resources of Utah is an important additional source of data.

LEVELS OF COVERAGE AND ACCURACY

The CRIB-UTAH file is a level-one compilation (U.S. Geological Survey, 1975, p. 19) or inventory of known and available resource information based essentially on a search of existing files and of the literature. Each entry has been verified as to location by longitude and latitude and UTM coordinates, references to the literature have been authenticated, and the geologic information in the file has been expanded where possible. Even so, the records vary in the amount of detail, quality, and consistency, in large part because of similar variations in the original data, the differences in intensity and specialization of the individual contributors, the particular program emphasis of the contributor, and differences in an individual's capabilities for making such observations. We have made no onsite investigations in individual deposits, mines, or prospects, and no assessments or estimates of resource potential have been added by the compilers of the present file to those of the original contributors. Should the depth of information currently in the files be insufficient for the users' purposes, appropriate references cited should be consulted. The extent and distribution of mineral deposits and occurrence localities in the file are summarized in table 1. Table 2 shows the total number of records and the distribution of major commodity groups by county and geologic provinces in Utah.

SUMMARY MAPS OF METAL AND NONMETAL LOCALITIES

The series of maps that follow afford a visual estimate of the individual metal and nonmetal commodity localities documented in the CRIB-UTAH file, as detailed in table 2, within the boundaries of the main geologic regions in Utah, the Great Basin, the Northern Rocky Mountains, and the Colorado Plateau (which also happen to coincide with physiographic provinces—the Basin and Range, the Northern Rocky Mountains, and the Colorado Plateaus), and individual counties (figs. 1-20). Index to the 1°x2° quadrangle base maps in the State is inset on figure 1. The distribution maps (figs. 2-20) are in order of base metals (copper, lead, and zinc); precious metals (gold and silver); ferroalloy metals (iron, manganese, titanium, molybdenum, and vanadium); uranium; and other important but less abundant materials—beryllium, phosphorus, mercury, tungsten, fluorine (as fluorite), barium (as barite), the rare-earth minerals (including thorium and monazite), arsenic, bismuth, cadmium, antimony, selenium, and tellurium. Because these maps are reproductions of computer printouts, they do not include all the information expected from maps that comply with Geological Survey standards and nomenclature. Although not all locality points may be resolvable at the reduced scale shown, local areas of interest can be resolved on computer plots at a more detailed scale.

REFERENCES CITED

Keefer, E. K., and Calkins, J. A., 1978, Description of individual data items and codes in CRIB: U.S. Geological Survey Circular 755-B, p. B1-B32.

U.S. Bureau of Mines, 1974, The Bureau of Mines minerals availability system and resource classification manual: U.S. Bureau of Mines Information Circular 8654, 199 p.

U.S. Geological Survey, 1975, Mineral resource perspectives 1975: U.S. Geological Survey Professional Paper 940, 24 p.

——1979, Scientific and technical, spatial, and bibliographic data bases of the U.S. Geological Survey: U.S. Geological Survey Circular 817, 181 p.

FIGURES 1-20; TABLES 1,2

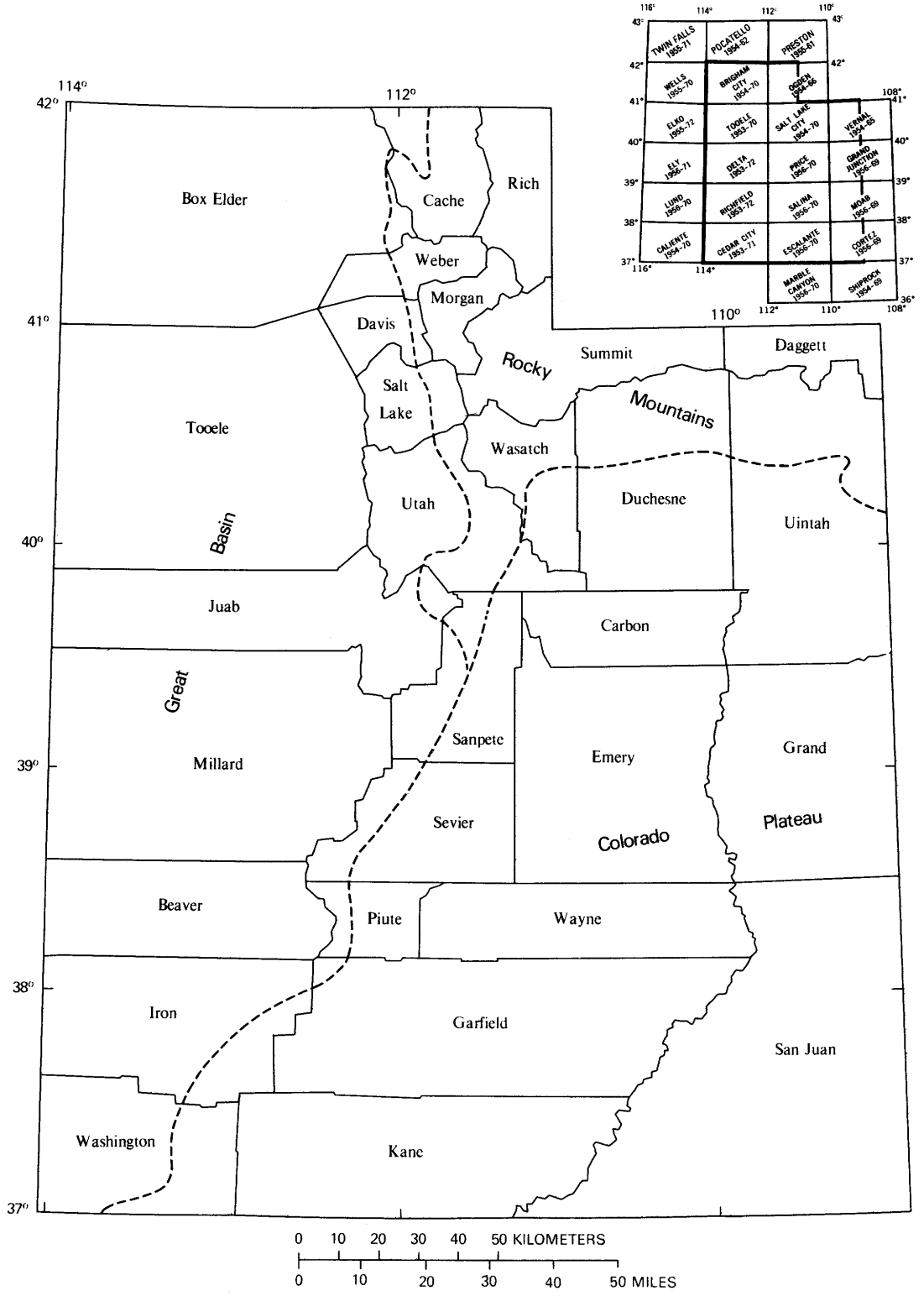

FIGURE 1.—Index map of Utah, showing counties, areas of 1°×2° (1:250,000 scale) topographic quadrangle maps, and three main geologic regions (Great Basin, Northern Rocky Mountains, and Colorado Plateau).

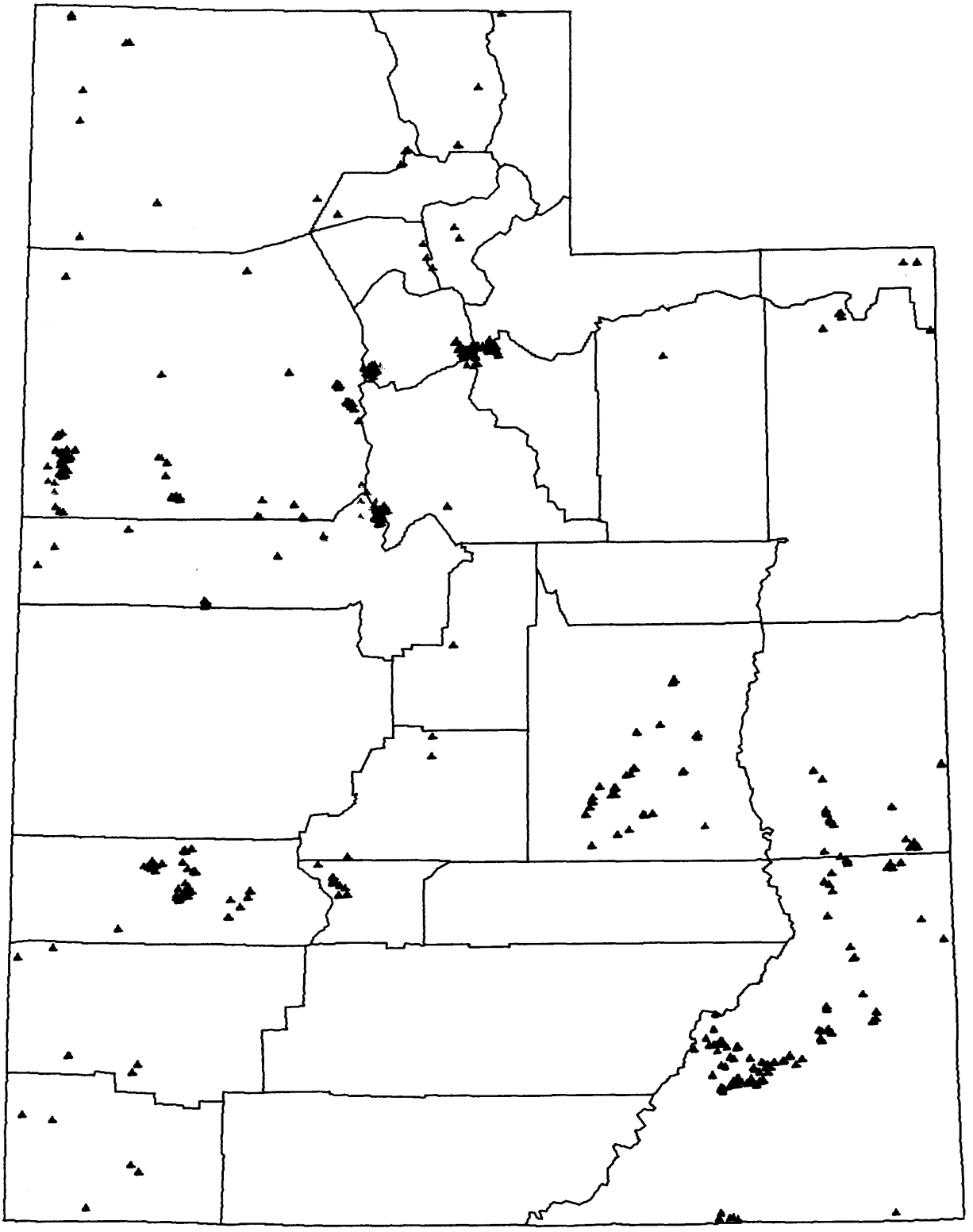

FIGURE 2.—Deposits and occurrences of copper (triangles) in Utah listed in CRIB-UTAH file.

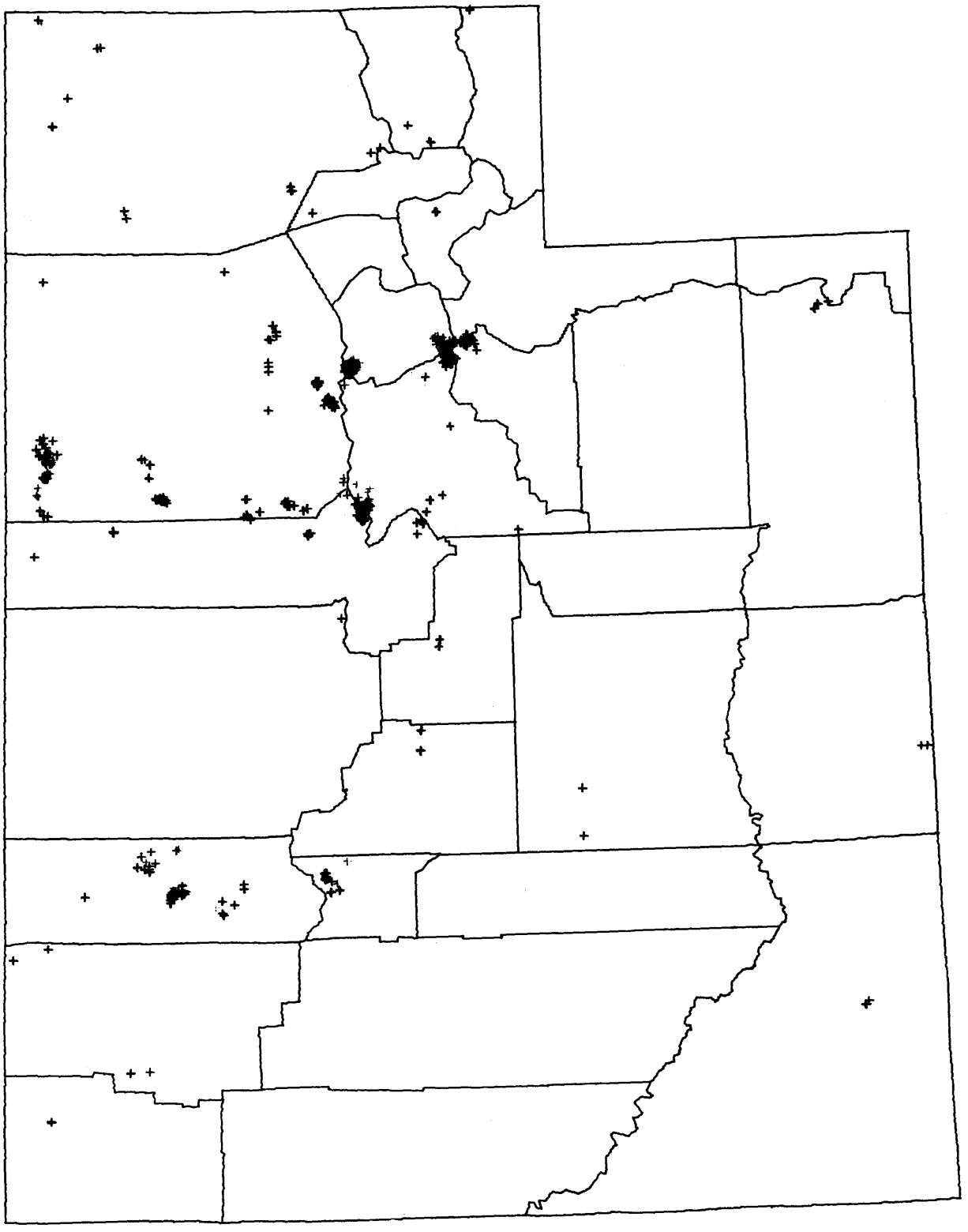

FIGURE 3.—Deposits and occurrences of lead (crosses) in Utah listed in CRIB-UTAH file.

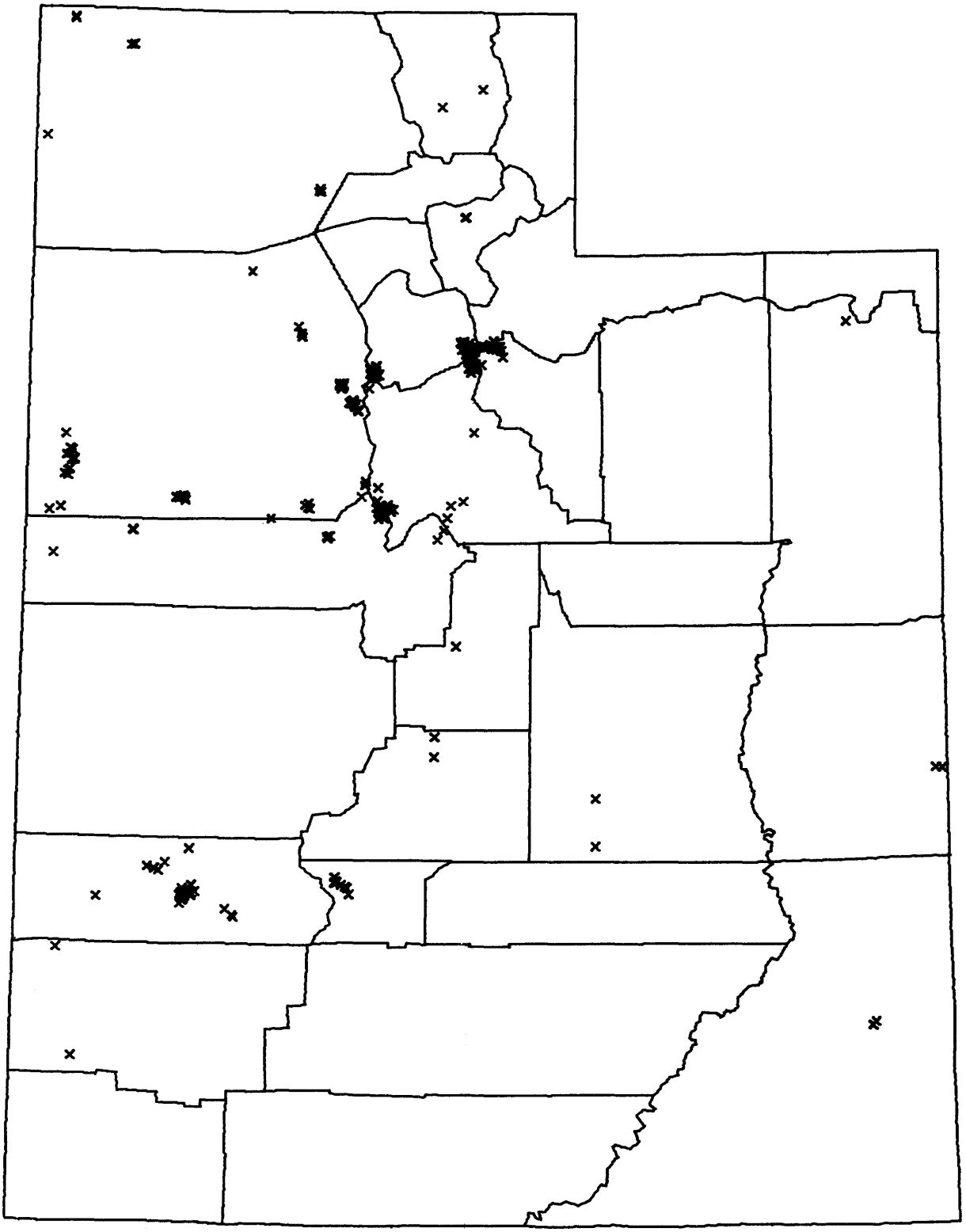

FIGURE 4.—Deposits and occurrences of zinc (X's) in Utah listed in CRIB-UTAH file.

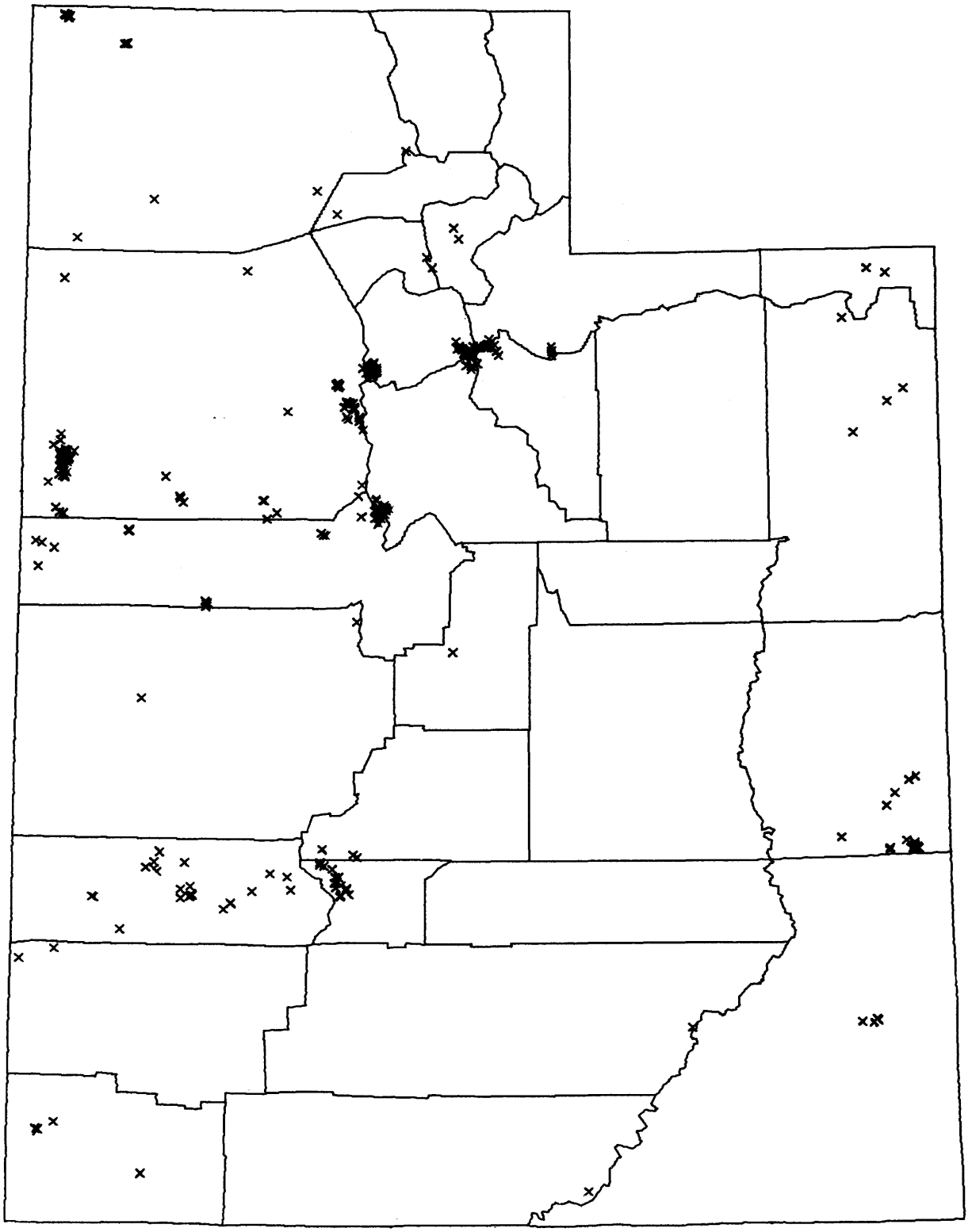

FIGURE 5.—Deposits and occurrences of gold (X's) in Utah listed in CRIB-UTAH file.

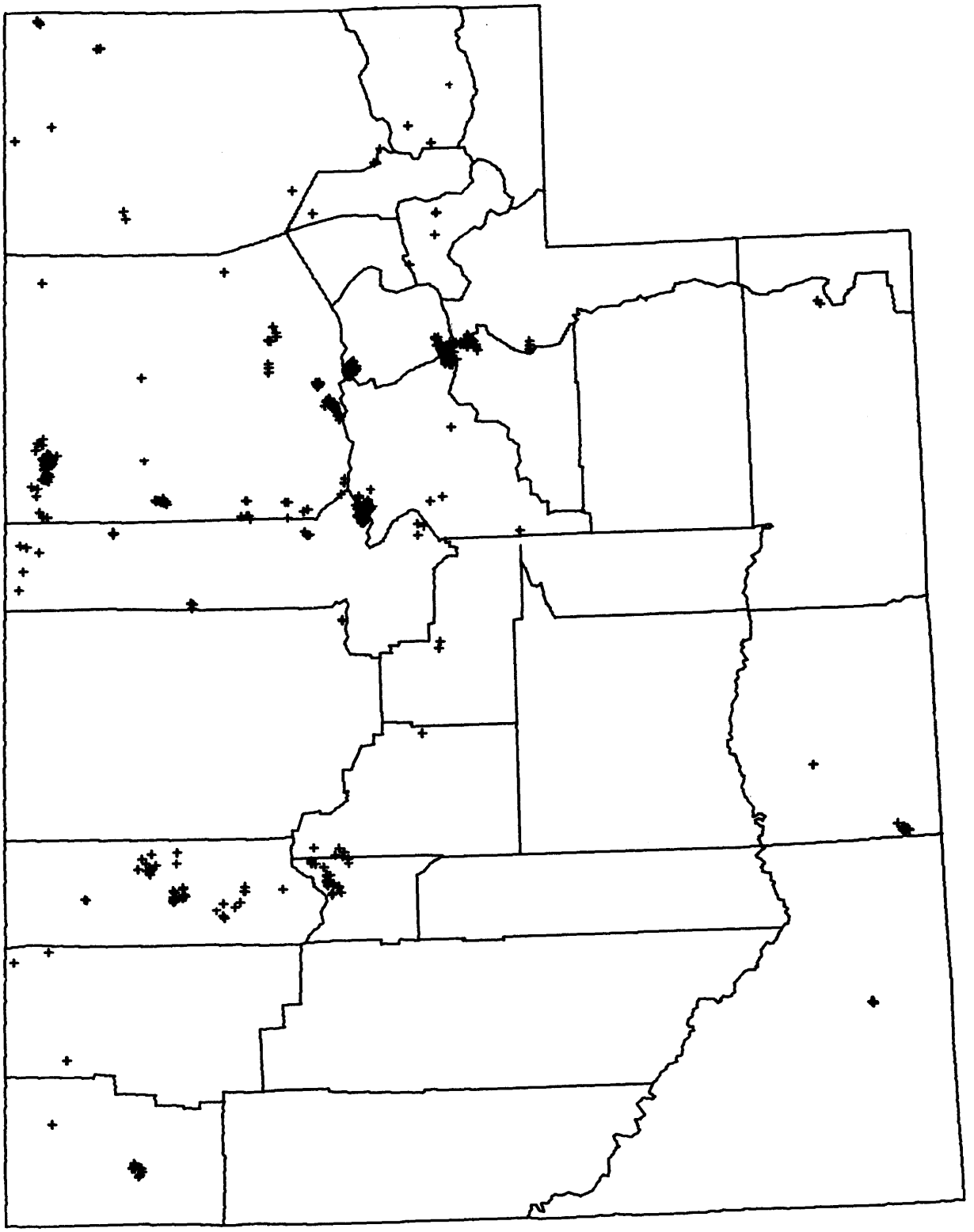

FIGURE 6.—Deposits and occurrences of silver (crosses) in Utah listed in CRIB-UTAH file.

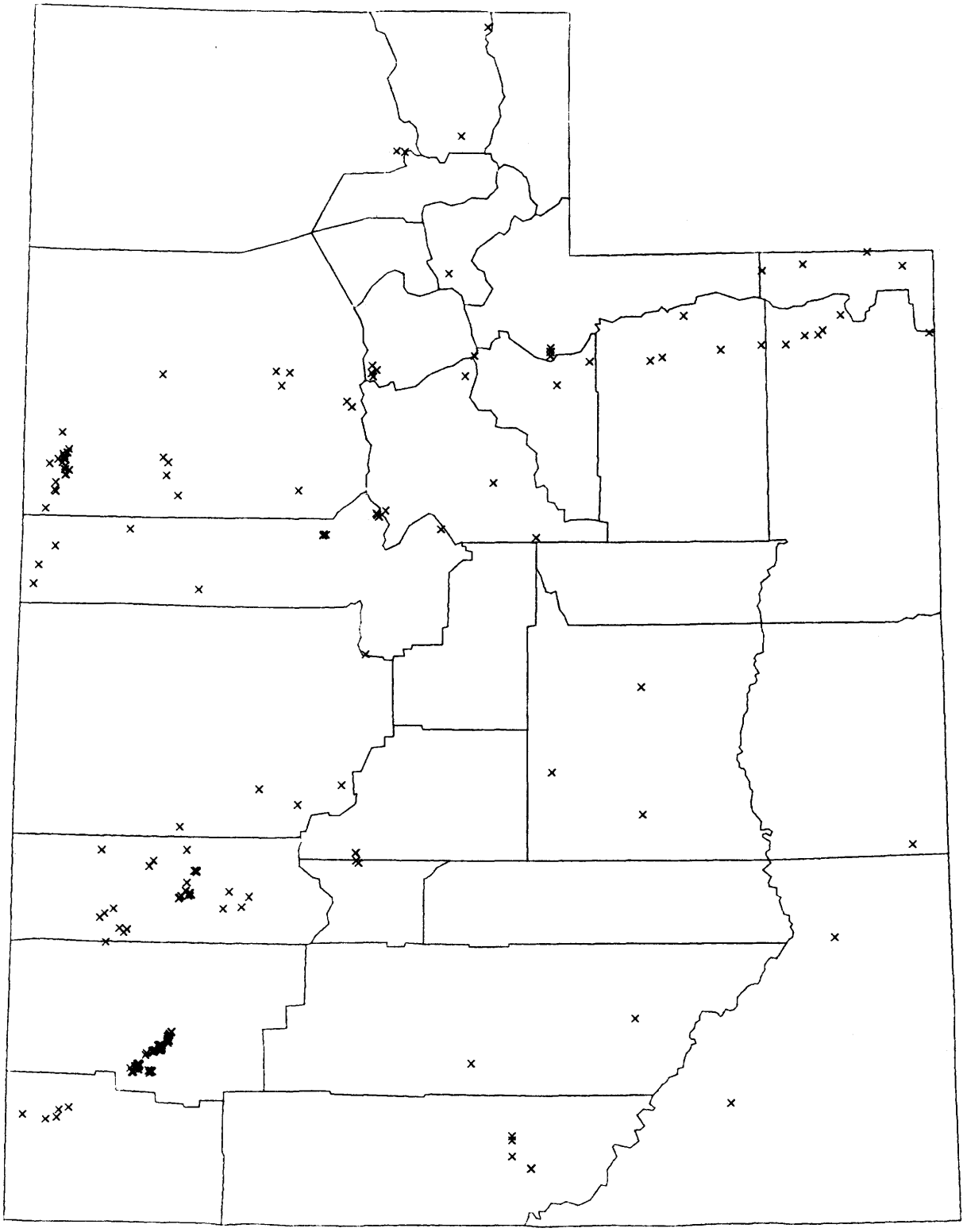

FIGURE 7.—Deposits and occurrences of iron (X's) in Utah listed in CRIB-UTAH file.

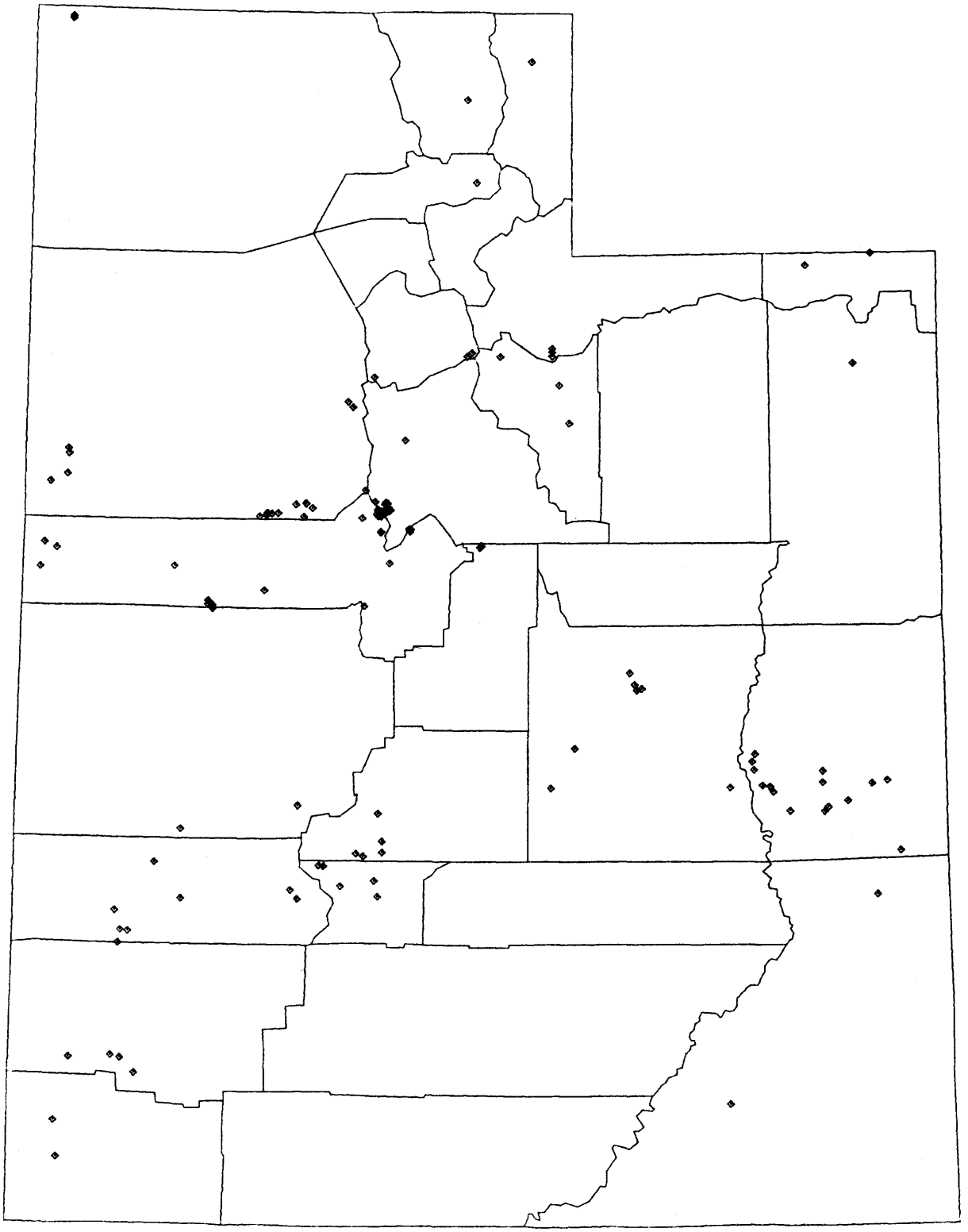

FIGURE 8.—Deposits and occurrences of manganese (diamonds) in Utah listed in CRIB-UTAH file.

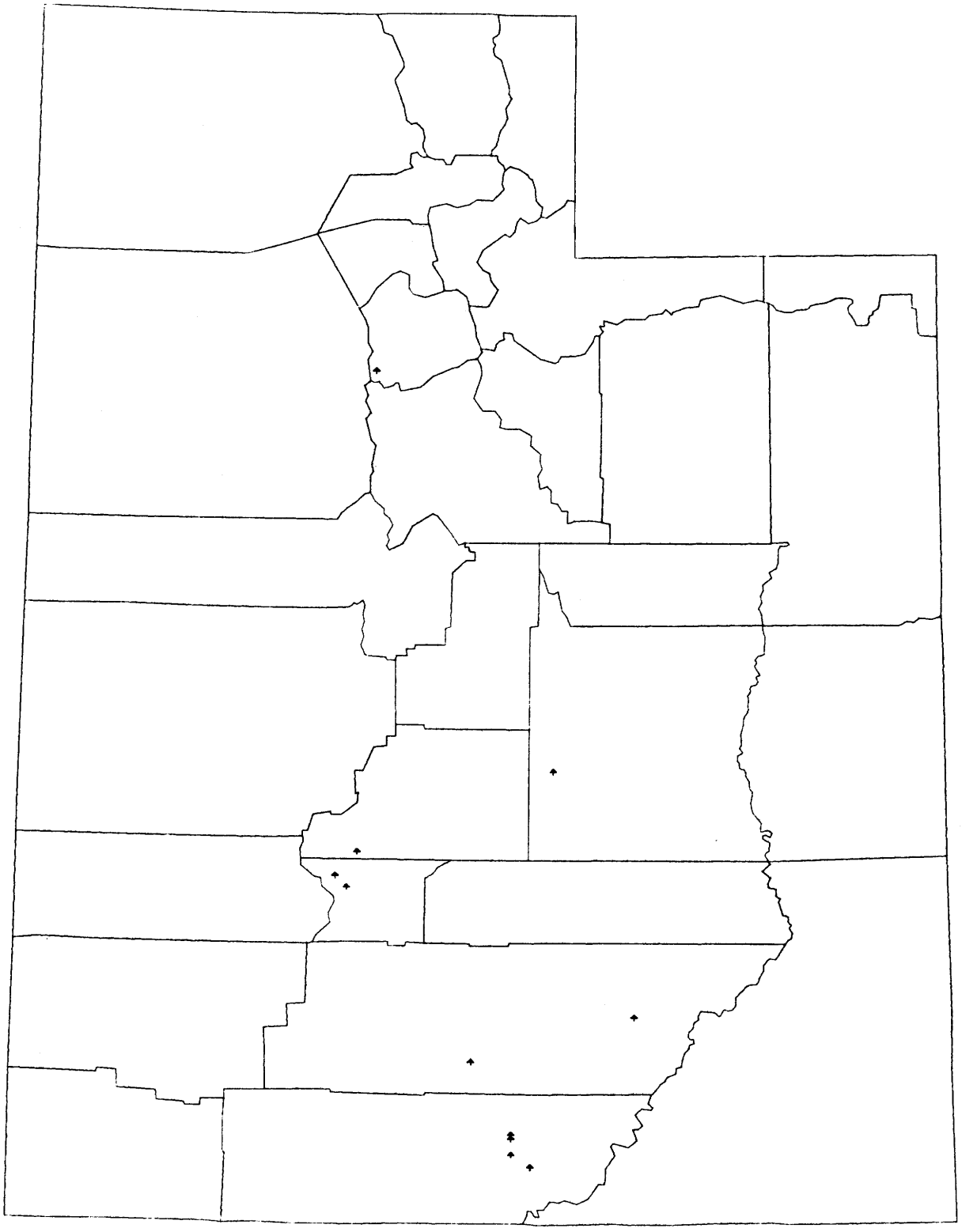

FIGURE 9.—Deposits and occurrences of titanium (arrows) in Utah listed in CRIB-UTAH file.

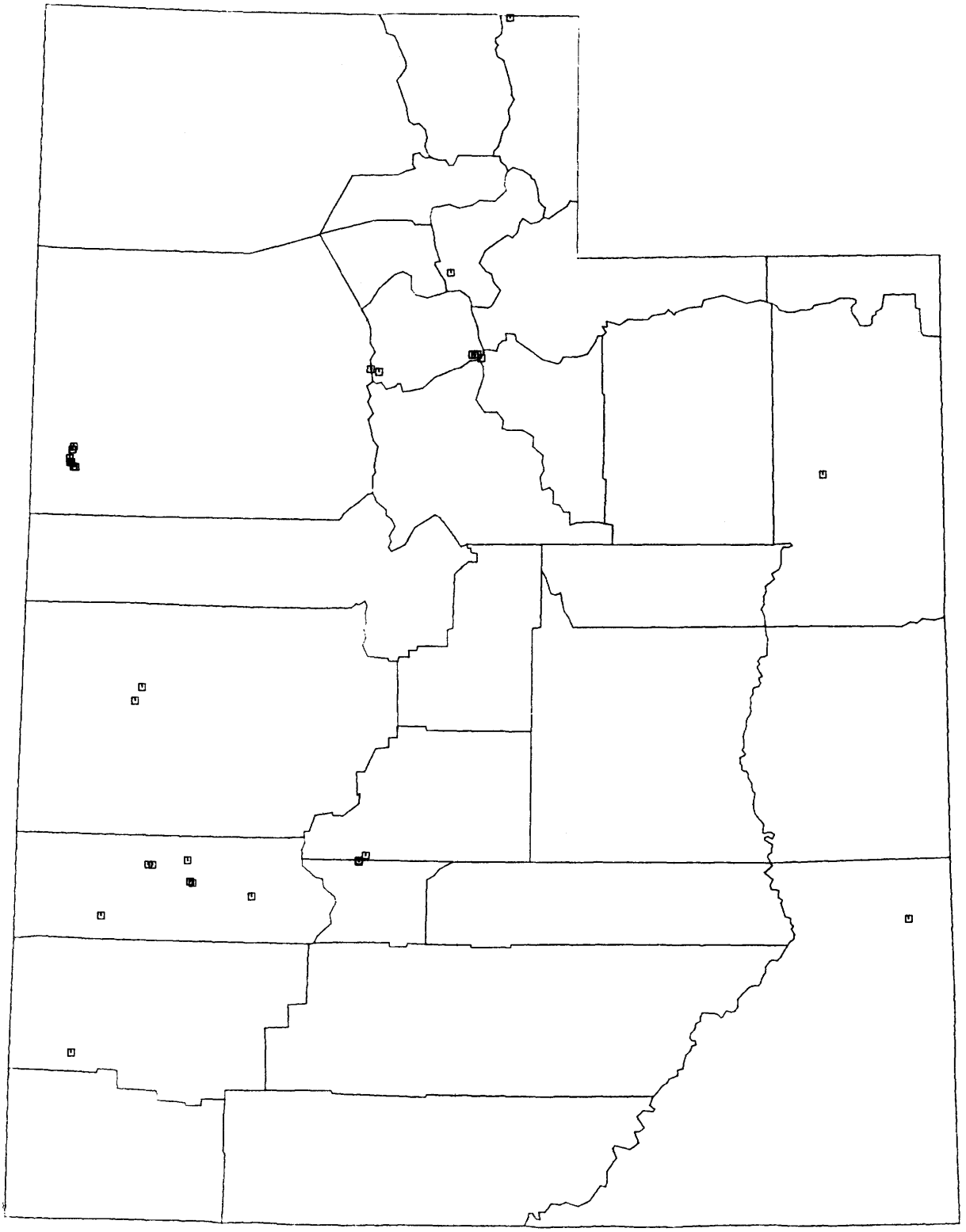

FIGURE 10.—Deposits and occurrences of molybdenum (squares) in Utah listed in CRIB-UTAH file.

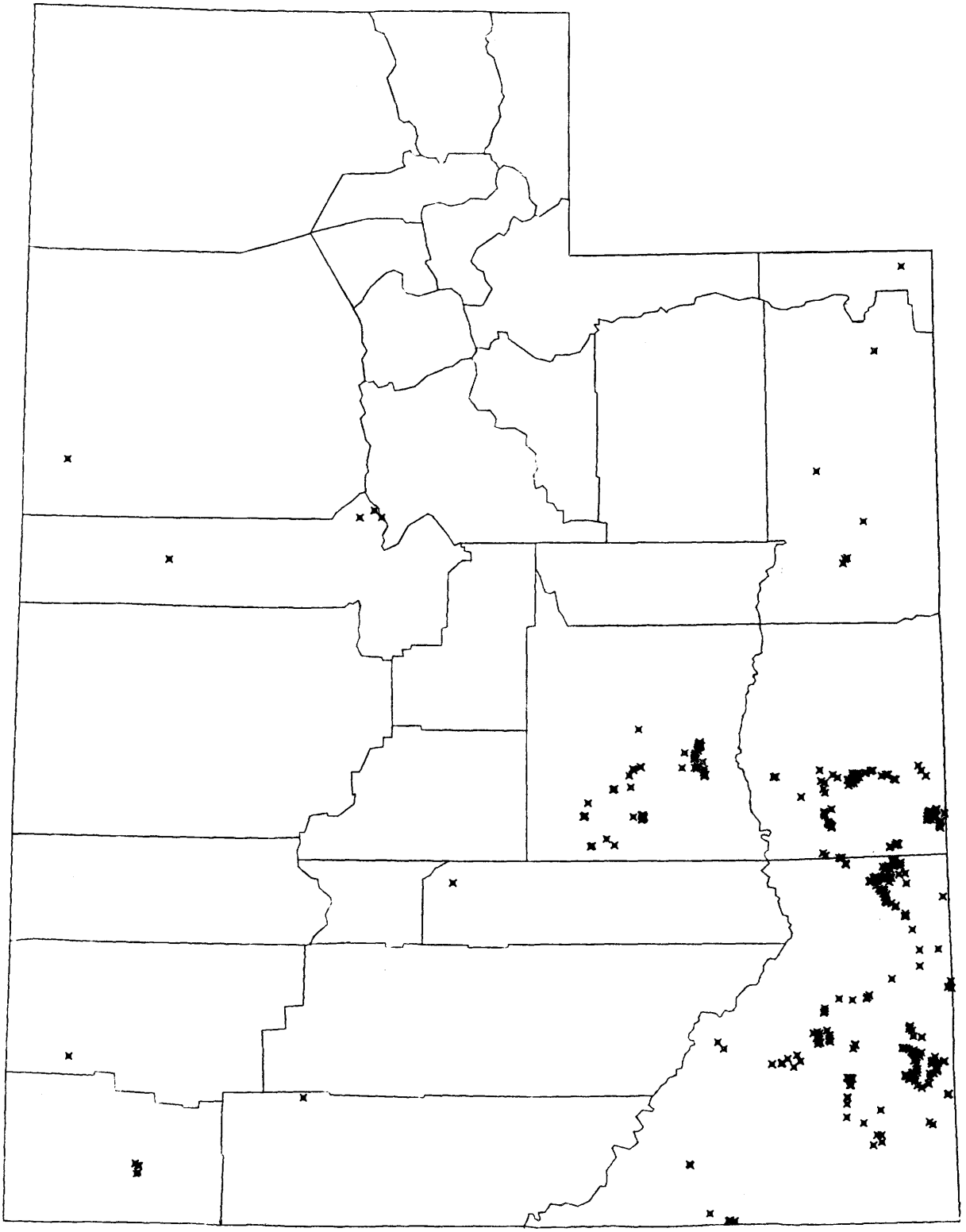

FIGURE 11.—Deposits and occurrences of vanadium (X's) in Utah listed in CRIB- UTAH file.

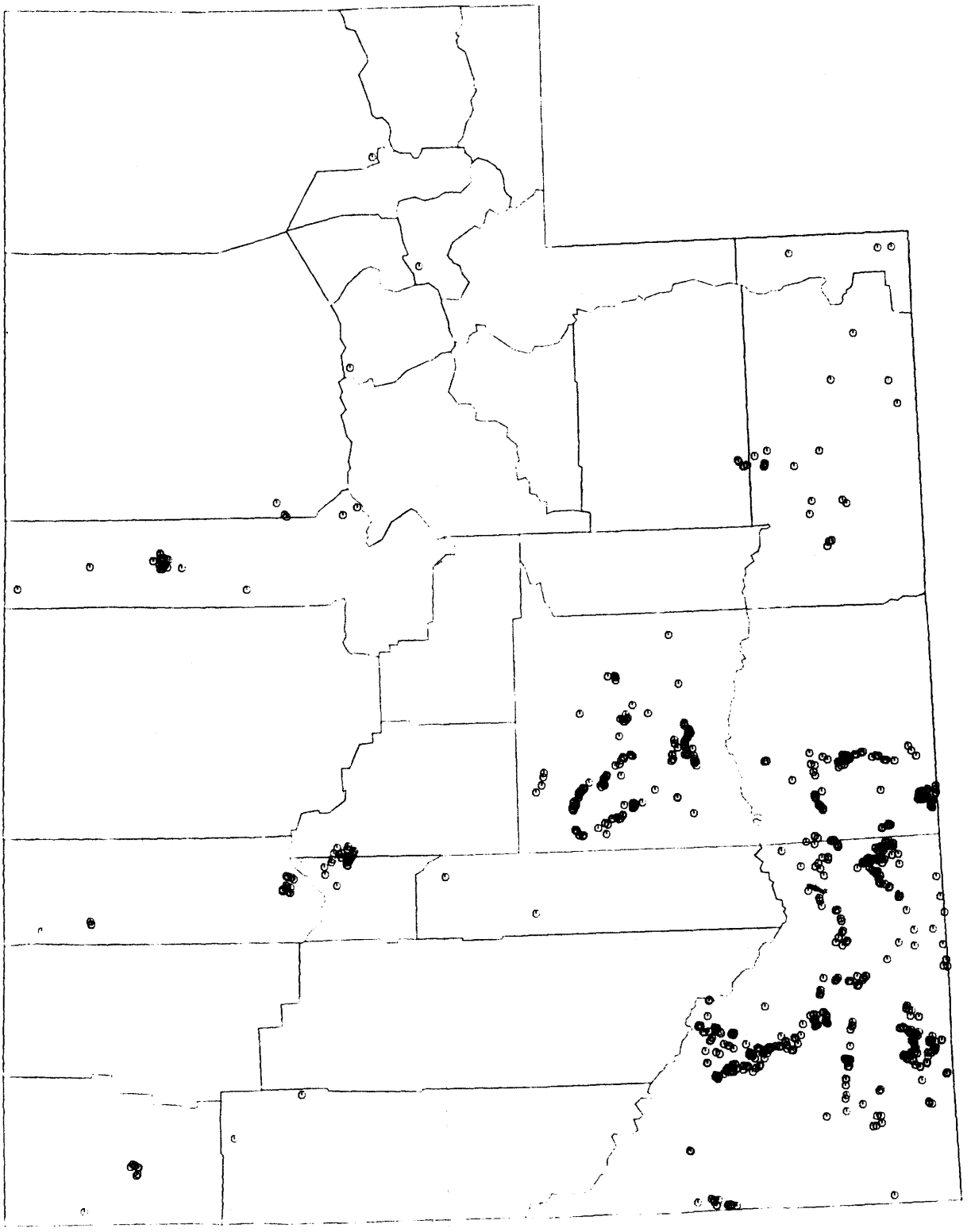

FIGURE 12.—Deposits and occurrences of uranium (circles) in Utah listed in CRIB-UTAH file.

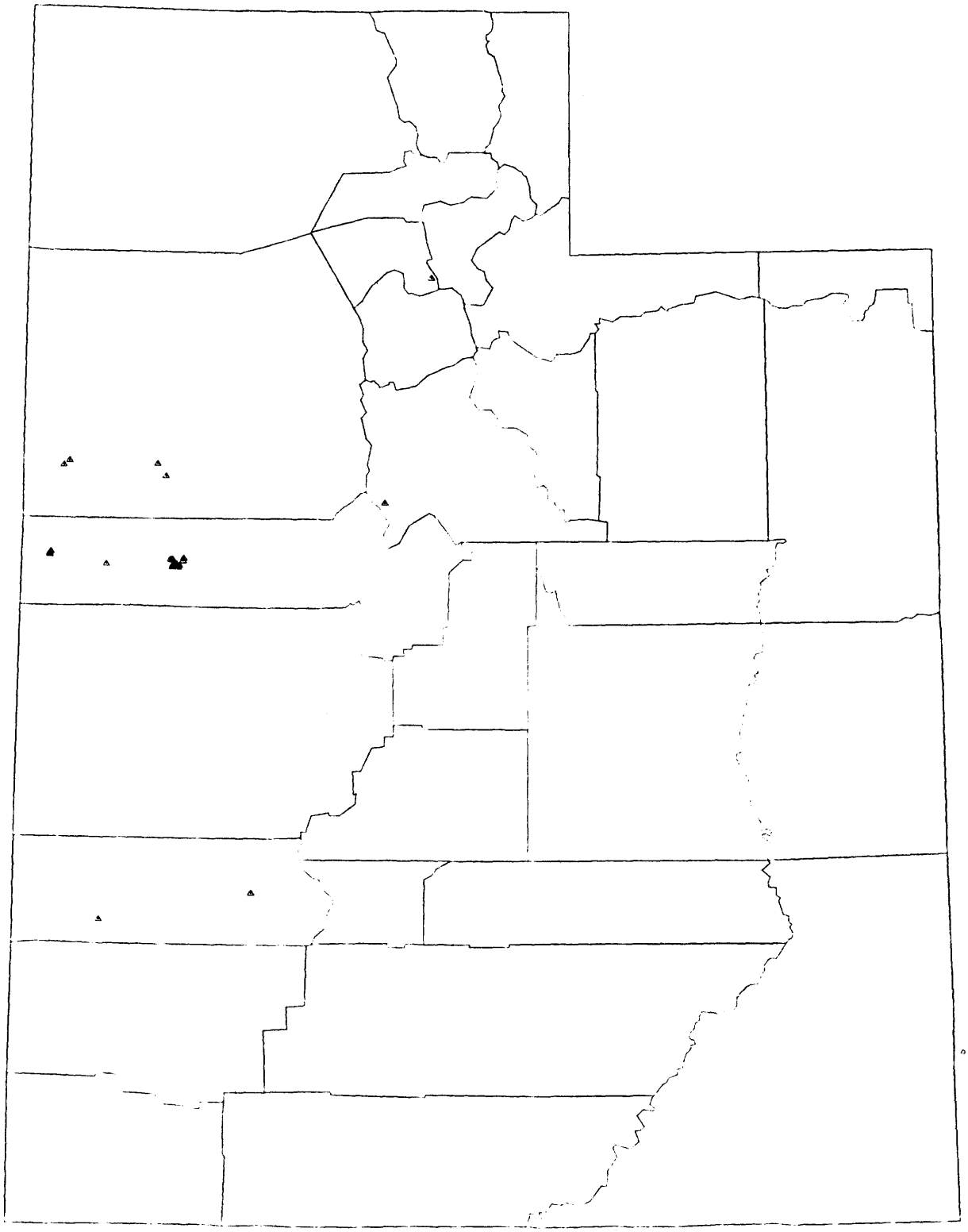

FIGURE 13.—Deposits and occurrences of beryllium (triangles) in Utah Listed in CRIB-UTAH file.

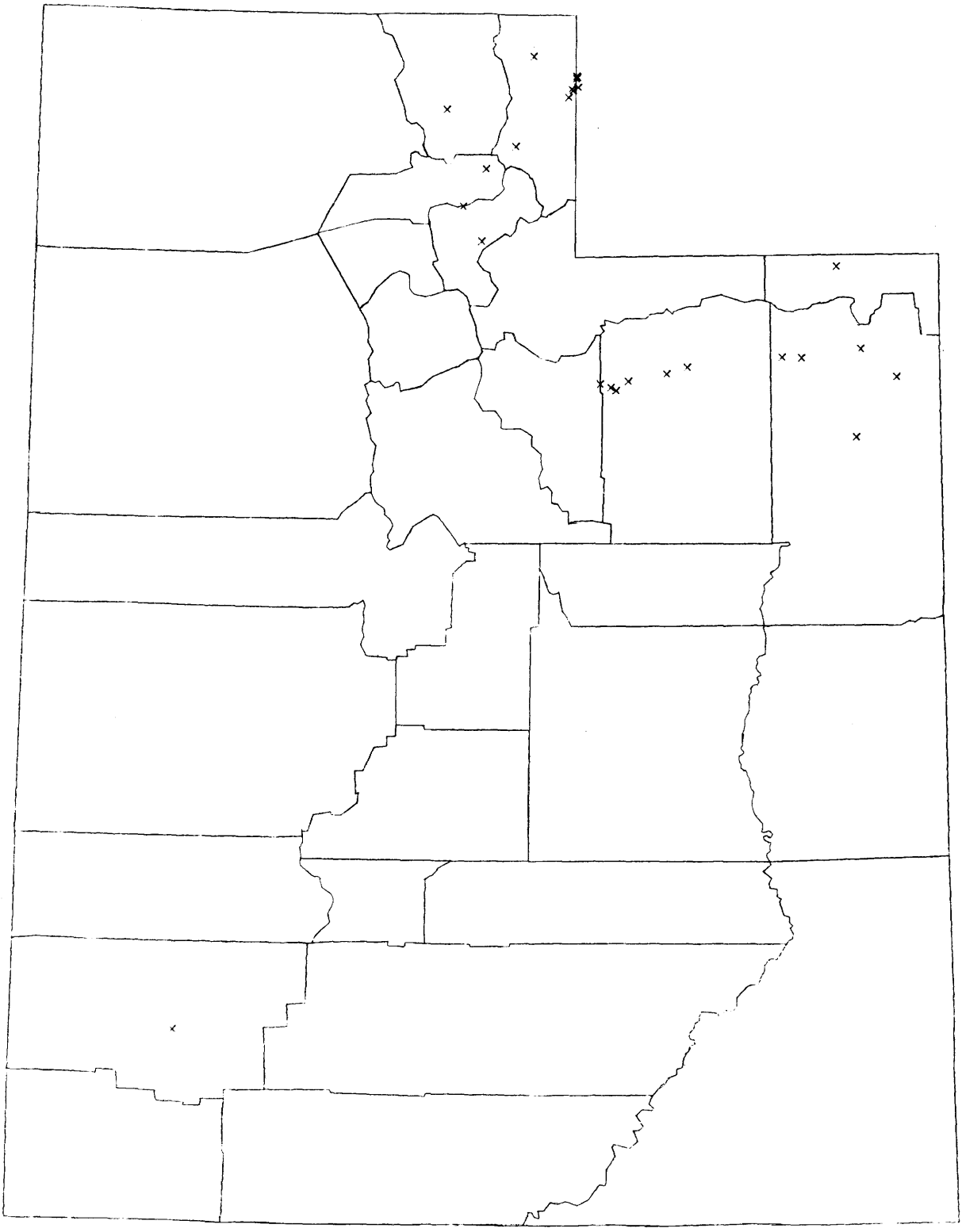

FIGURE 14.—Deposits and occurrences of phosphorus (X's) in Utah listed in CRIB-UTAH file.

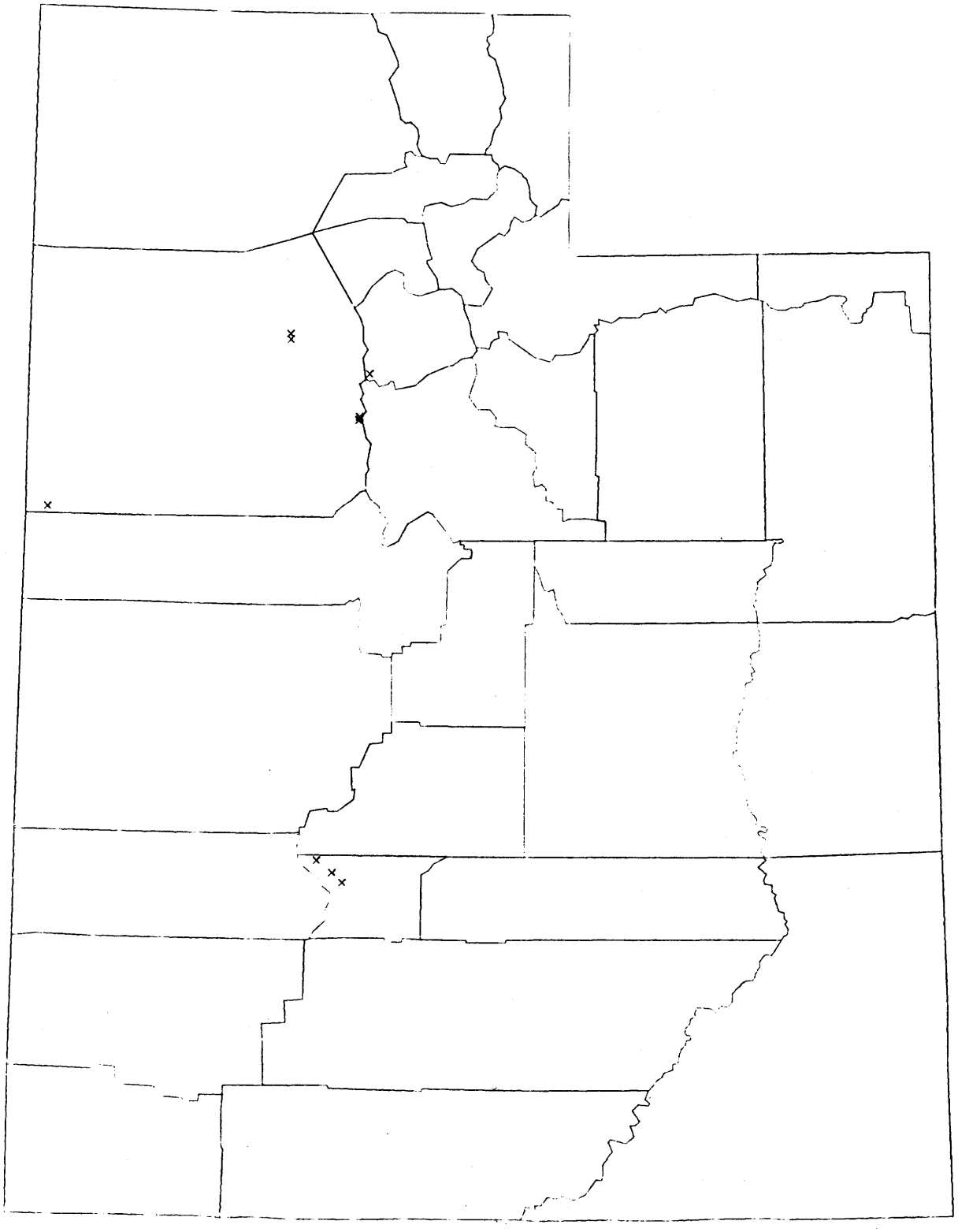

FIGURE 15.—Deposits and occurrences of mercury (X's) in Utah listed in CRIB-UTAH file.

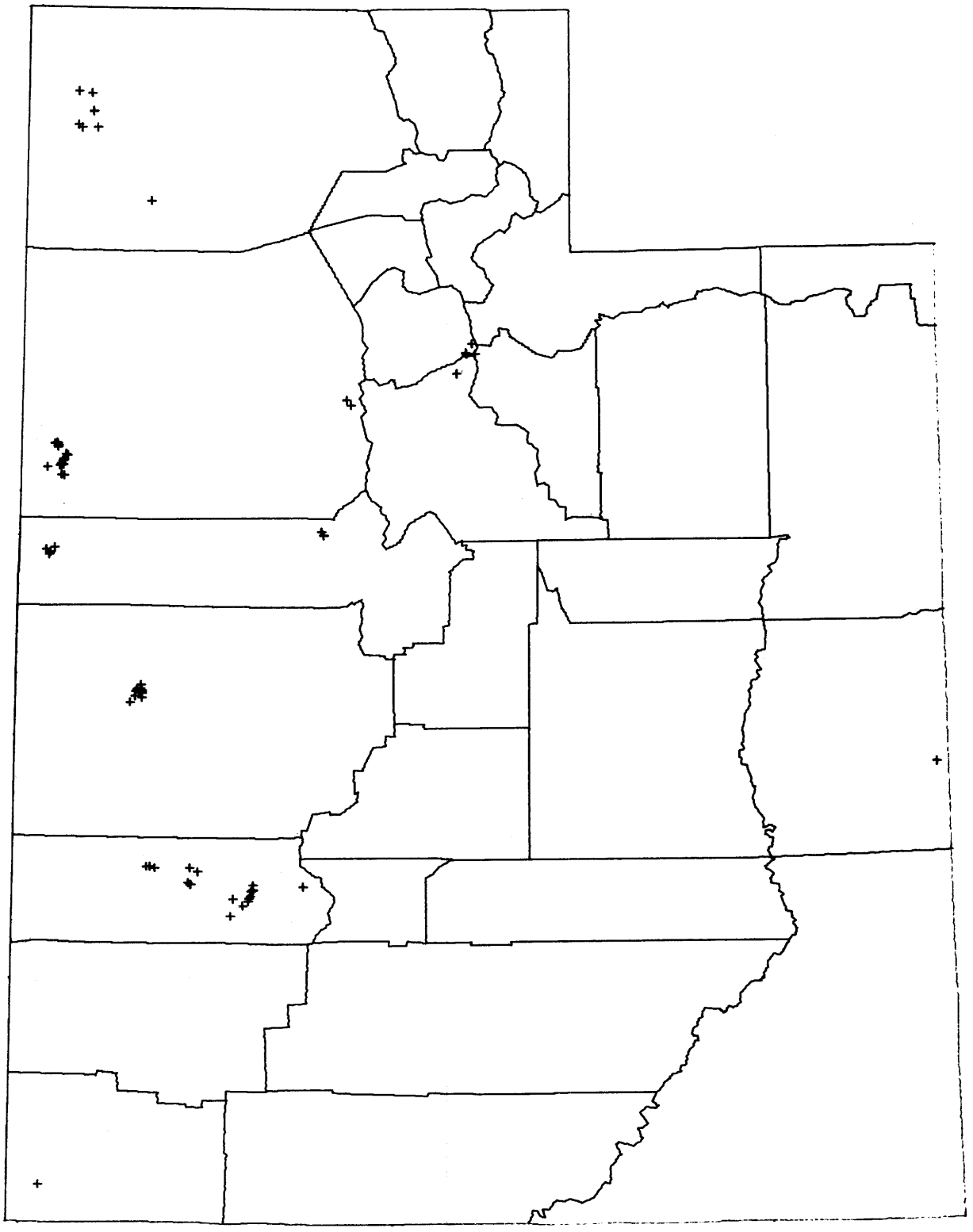

FIGURE 16.—Deposits and occurrences of tungsten (crosses) in Utah listed in CRIB-UTAH file.

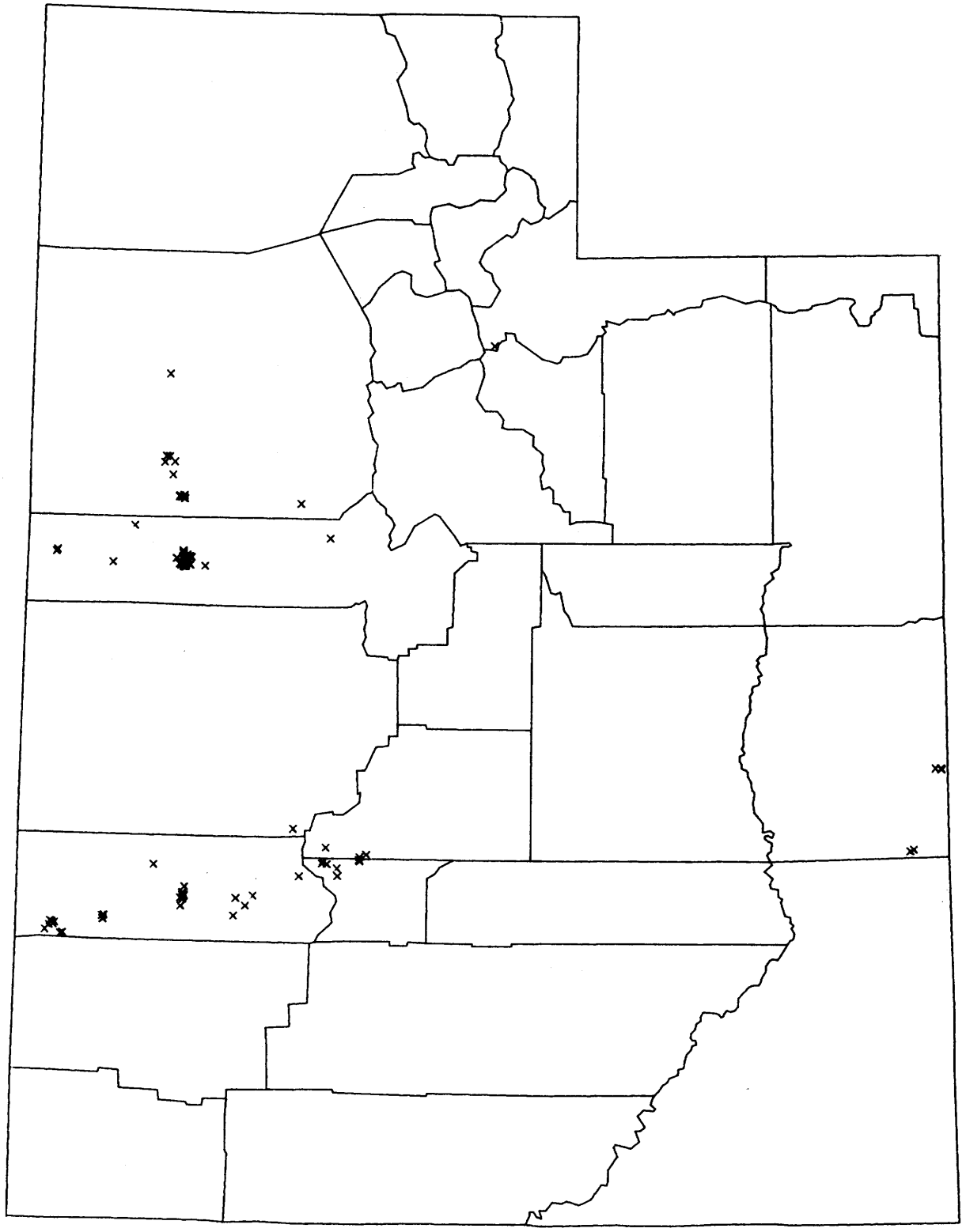

FIGURE 17.—Deposits and occurrences of fluorite (X's) in Utah listed in CRIB-UTAH file.

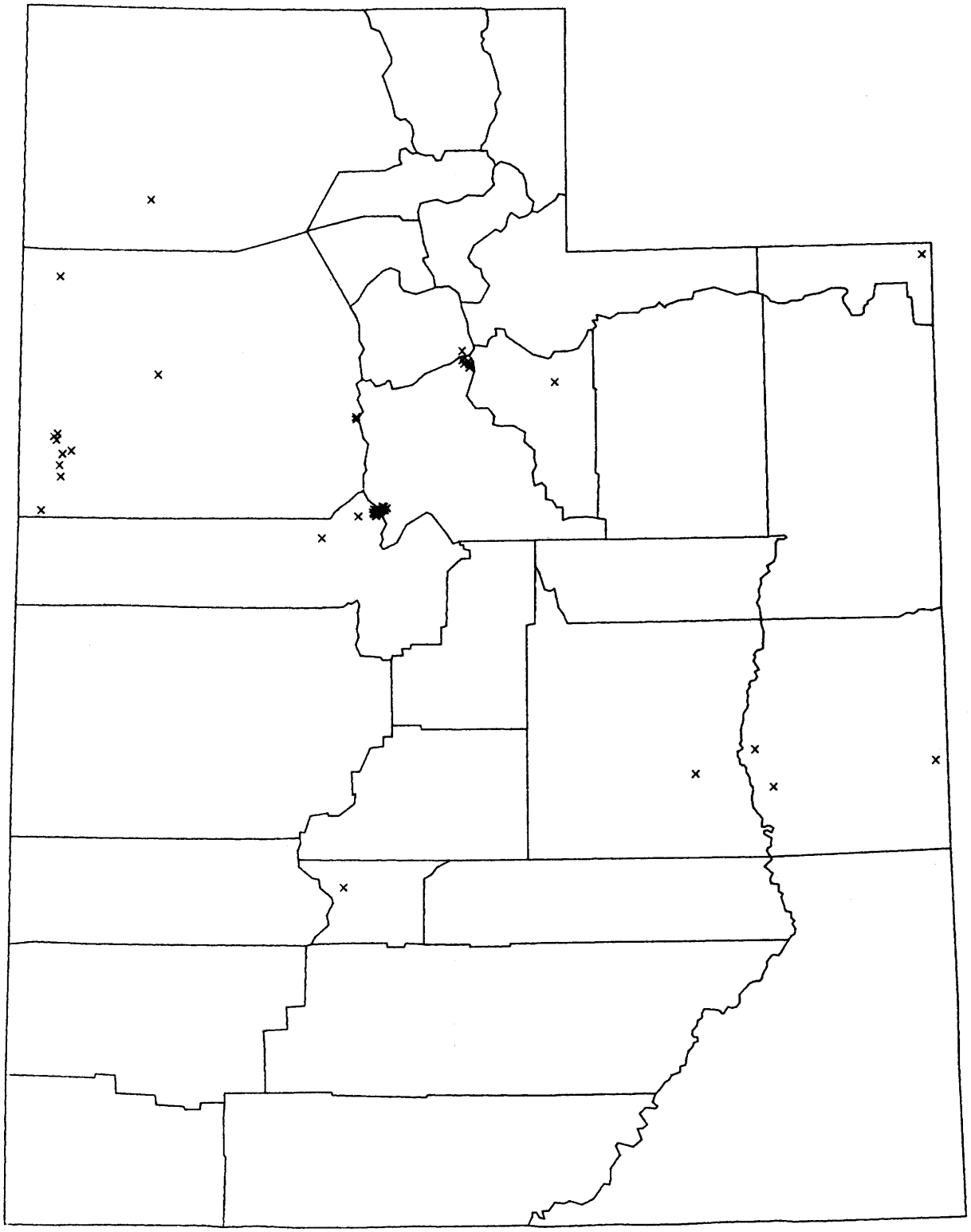

FIGURE 18.—Deposits and occurrences of barite (X's) in Utah listed in CRIB-UTAH file.

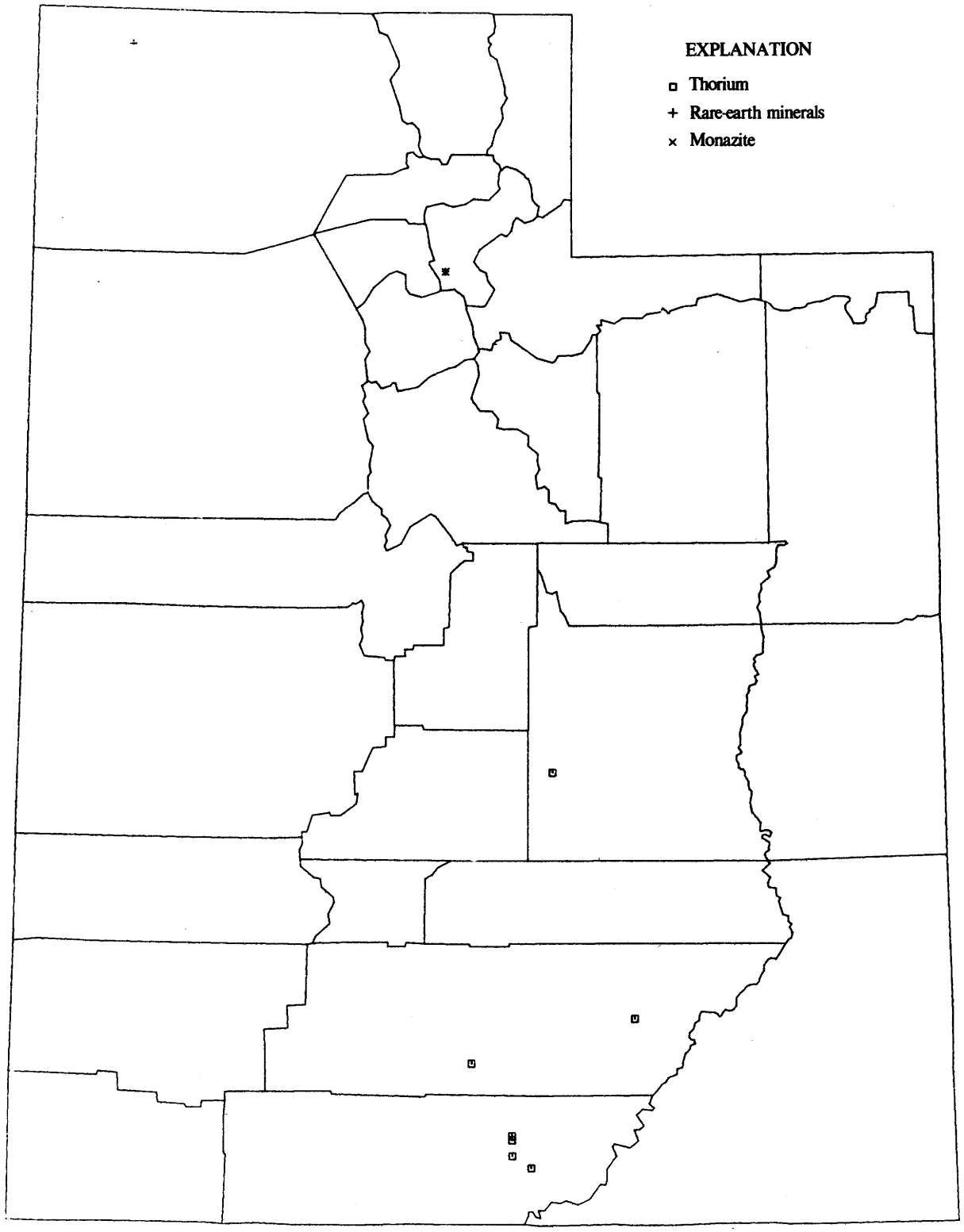

FIGURE 19.—Deposits and occurrences of thorium, rare-earth minerals, and monazite in Utah listed in CRIB-UTAH file.

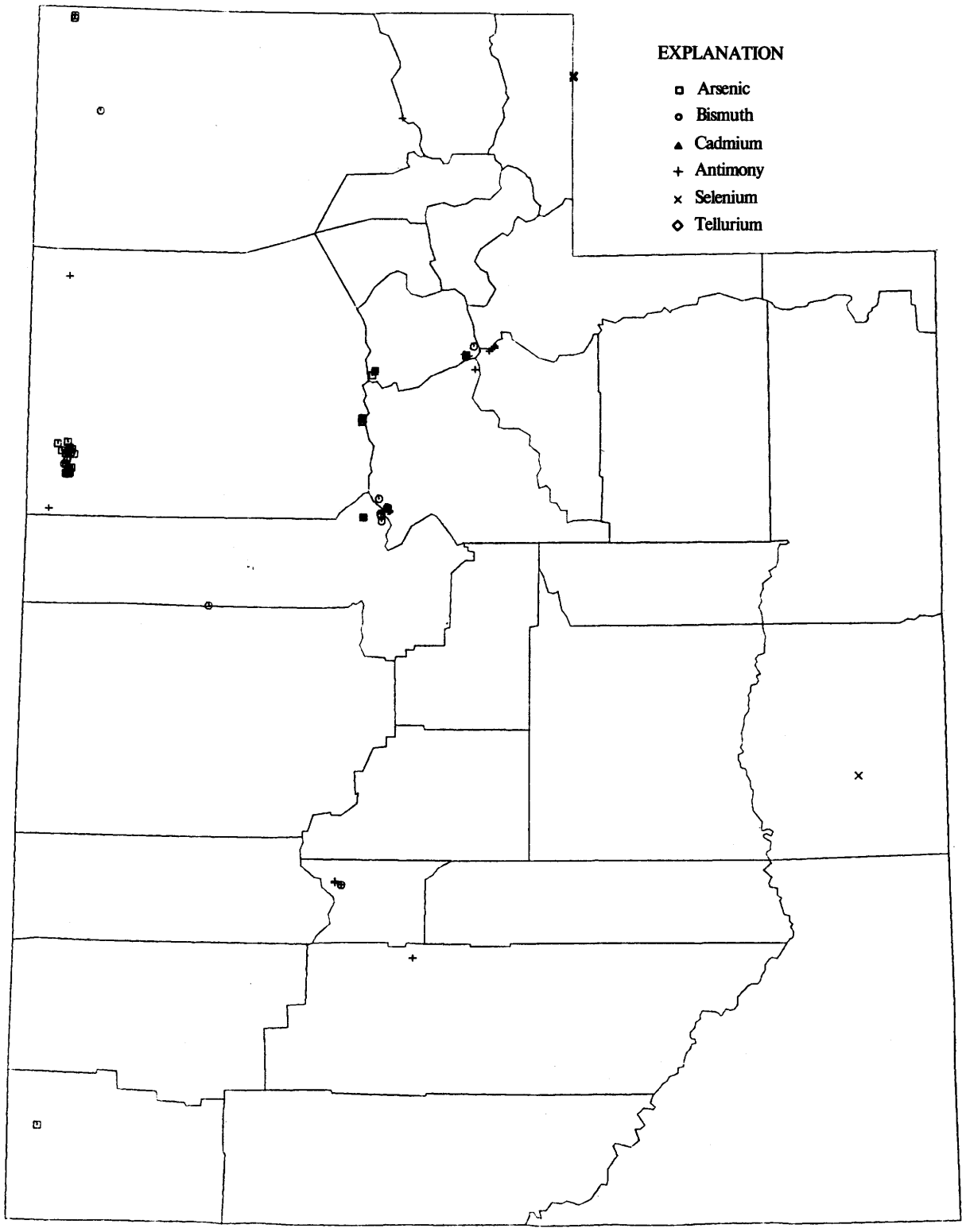

FIGURE 20.—Deposits and occurrences of arsenic, bismuth, cadmium, antimony, selenium, and tellurium in Utah listed in CRIB-UTAH file.

TABLE 1.—*Typical CRIB-UTAH file entry*

```
CRIB MINERAL RESOURCES FILE 12

                                        RECORD IDENTIFICATION
                                          RECORD NO.............  DC12525
                                          COUNTRY/ORGANIZATION.  USGS
                                          FILE LINK ID.........  CONSV
                                          MAP CODE NO. OF REC..

                                        REPORTER
                                          DATE..................................  74
                                            06
                                          UPDATED...............................  79
                                            01
                                          BY....................................  WONG,
                                             GEORGE; TOOKER, ED

NAME AND LOCATION
  DEPOSIT NAME.................  CHIEF MINE
  SYNONYM NAME.................  CHIEF CONSOLIDATED

  MINING DISTRICT/AREA/SUBDIST.  TINTIC DISTRICT
  SUBDISTRICT..................  MAIN TINTIC

  COUNTRY CODE.................  US
  COUNTRY NAME:
   UNITED STATES

  STATE CODE.............  49
  STATE NAME:
   UTAH

  COUNTY.................  JUAB

  QUAD SCALE          QUAD NO OR NAME
   1: 24000            EUREKA, 1954

  LATITUDE            LONGITUDE
   39-57-03N           112-07-01W

  UTM NORTHING        UTM EASTING        UTM ZONE NO
   4422691.            404594.            +12

  TWP.....  010S
  RANGE....  002W
  SECTION..  18
  MERIDIAN.  SL

  ALTITUDE.. 6577 FT

  POSITION FROM NEAREST PROMINENT LOCALITY:  SOUTH-CENTRAL EDGE OF EUREKA
    TOWNSITE

  LOCATION COMMENTS: LOCATION IS OF NO. 1 SHAFT

COMMODITY INFORMATION
  COMMODITIES PRESENT.........  AG  PB  ZN  CU  AU  MN  CD

    PRODUCER(PAST OR PRESENT):
              MAJOR PRODUCTS.. AG  PB  ZN
              MINOR PRODUCTS.. CU  AU
              COPRODUCTS......
              BYPRODUCTS...... CD
```

TABLE 1.—*Typical CRIB-UTAH file entry—Continued*

```
    OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
                POTENTIAL.......
                OCCURRENCE..... MN

  ORE MATERIALS (MINERALS,ROCKS,ETC.):
    GALENA, SPHALERITE, ARGENTITE, NATIVE SILVER, NATIVE GOLD, WURTZITE,
    CERARGYRITE, CERUSSITE, PLUMBOJAROSITE, ENARGITE,
    TETRAHEDRITE-TENNANTITE, PROUSTITE

  ANALYTICAL DATA(GENERAL)
    1910 - 56 AVE:  0.1 OZ AU, 15.5 OZ AG, 0.3 % CU, 6 % PB, 2.3 % ZN


EXPLORATION AND DEVELOPMENT
  STATUS OF EXPLOR. OR DEV.  4
                             PROPERTY IS INACTIVE

  EXPLOR. AND DEVELOP. COMMENTS:
    1980-UNDER EXPLORATION BY ASARCO


DESCRIPTION OF DEPOSIT

  DEPOSIT TYPES:
    REPLACEMENT
  FORM/SHAPE OF DEPOSIT: POD, PIPELIKE, AND VEIN DEPOSITS ALL IRREGULARLY
    INTERCONNECTED.

  SIZE/DIRECTIONAL DATA
    SIZE OF DEPOSIT.....  MED-LARGE
  COMMENTS(DESCRIPTION OF DEPOSIT):
    GRANITE CLAIMS PIPE(75 FEET IN DIAMETER AND 800 FEET THICK); THIS IS ONE
    EXAMPLE OF THE MANY ORE BODIES IN THE MINE.

DESCRIPTION OF WORKINGS
     UNDERGROUND
     SURFACE AND UNDERGROUND
     LENGTH OF WORKINGS.............. 120       MI

  COMMENTS(DESCRIP. OF WORKINGS):
    THE LENGTH OF WORKINGS INCLUDES ADJACENT MINES.  THE MINE IS DEVELOPED BY
    TWO SURFACE SHAFTS, FOUR UNDERGROUND WINZES WITH DRIFTS AND CROSSCUTS.
    NO. 1 SHAFT IS 1,850 FEET DEEP WITH NINE LEVELS.  NO. 2 SHAFT IS 1,800
    FEET DEEP; IT IS USE FOR VENTILATION AND ESCAPE.  THE LOWEST LEVEL IS AT
    3,050 FEET BELOW THE SURFACE.

PRODUCTION
      YES


 ANNUAL PRODUCTION (ORE AND COMMODITIES)


 CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

   ITEM          ACC  AMOUNT  THOUS.UNITS YEAR  GRADE,REMARKS
 8  ORE         ACC 3451.780 TONS        1909 - 1956
 9  AG          ACC 52098.12 OZ          1909 - 56
 10 PB          ACC 410540.1 LB          1909 - 56
 11 ZN          ACC 165711.8 LB          1909 - 56
 12 CU          ACC 10878.11 LB          1909 - 56
 13 AU          ACC 0200.496 OZ          1909 - 56
```

TABLE 1.—*Typical CRIB-UTAH file entry—Continued*

```
PRODUCTION YEARS.....  1909-1956

SOURCE OF INFORMATION (PRODUCTION).. UTAH GEOL SOC GUIDEBOOK # 12

PRODUCTION COMMENTS....  $48,770,940 (NET FROM THE SMELTER AT PREVAILING
  PRICES)

GEOLOGY AND MINERALOGY

  AGE OF HOST ROCKS.............  EORD-LMISS
  HOST ROCK TYPES...............  OPOHONGA LIMESTONE TO DESERET LIMESTONE
    FORMATIONS

  AGE OF ASSOC. IGNEOUS ROCKS..  OLIGO
  IGNEOUS ROCK TYPES............  (30-32 M.Y.) PACKARD QUARTZ LATITE; SILVER
    CITY MONZONITE PORPHYRY AND RELATED PLUTONS

  PERTINENT MINERALOGY.........  GANGUE OF BRECCIATED, VUGGY, BARITIC
    JASPEROID

  IMPORTANT ORE CONTROL/LOCUS..  NORTHEAST TRENDING STRIKE-SLIP FAULTS.

  GEOLOGICAL DESCRIPTIVE NOTES.  2 ORE ZONES

  LOCAL GEOLOGY

    SIGNIFICANT LOCAL STRUCTURES:
      THE MINE IS ON THE WEST LIMB AND IN THE TROUGH OF THE TINTIC SYNCLINE.
      BEDS IN THE LIMB ARE STEEP TO OVERTURNED.  EAST BECK FAULT(N 60 E,
      STEEP NW); MILLIONAIRE ROW FAULT(N 60 E, IRREGULAR N); INTERMEDIATE
      FAULT(N 77 E, 75 S); LEADVILLE REVERSE FAULT(N 75 E, STEEP SE);
      BULKHEAD FAULT(N 75 W, 65-85 SW).

    SIGNIFICANT ALTERATION:
      OXIDATION TO THE 1800 FT LEVEL; LIMESTONES WERE DOLOMITIZED, PYRITIZED,
      AND JASPEROIDIZED PRIOR TO ORE DEPOSITION.

    GEOLOGICAL PROCESSES OF CONCENTRATION OR ENRICHMENT:
      ASCENDING HYDROTHERMAL ORE FLUIDS.


GENERAL REFERENCES
  1) COOK, DR, 1957 , GEOL OF E TINTIC MTNS AND ORE DEP OF TINTIC MINING
    DIST:  UTAH GEOL SOC GUIDEBOOK # 12 , PL 3 , P. 80 - 93
  2) USBM MIN. RES. 1923-1933
  3) LINDGREN, W AND LOUGHLIN, GF, 1919 , GEOL AND ORE DEP OF TINTIC MINING
    DIST:  USGS PROF PAPER 107 , P. 205 - 207
  4) MORRIS, H.T., 1968, THE MAIN TINTIC MINING DISTRICT,UTAH: IN ORE
    DEPOSITS OF THE U. S., 1933-1967, AIME GRATON-SALES VOLUME 2, P.
    1043-1073.
```

TABLE 2.—*Distribution of CRIB-UTAH commodity localities by county and geologic region*

County	Geologic region[1]	Number of entries	Base metals (Cu, Pb, Zn)	Ferrous metals (Fe, Mn, V, Ti, Mo)	Precious metals (Au, Ag, Pt gp)	Energy metals (U-Th, Li)	Miscellaneous metals (W, Sn, Be, Nb/Ta, Hg, Co/Ni, Cr)	Nonmetals (F, P, Al)
Beaver	BR	200	123	47	73	28	34	36
Box Elder	BR	89	49	8	39	1	10	1
Cache	RM	25	11	4	6	0	0	1
Carbon	CP	105	0	0	0	0	0	0
Daggett	RM	10	2	4	2	3	0	1
Davis	BR	15	3	0	2	0	1	0
Duchesne	CP and RM	53	3	5	0	6	0	6
Emery	CP	483	34	109	1	279	4	0
Garfield	CP	157	22	22	9	146	3	0
Grand	CP	371	32	147	25	236	2	5
Iron	BR and CP	162	11	73	42	5	3	1
Juab	BR	260	149	50	124	37	32	49
Kane	CP	15	0	7	1	12	2	0
Millard	BR	64	17	16	10	2	19	1
Morgan	BR and RM	9	5	2	5	1	0	2
Piute	BR and CP	90	19	13	26	45	5	32
Rich	RM	11	1	2	0	0	0	9
Salt Lake	BR and RM	267	194	17	157	2	11	2
San Juan	B	480	107	245	6	427	0	0
Sampete	BR and CP	5	2	2	2	1	0	0
Sevier	BR and CP	36	3	6	5	19	0	10
Summit	RM	26	19	6	20	1	0	4
Tooele	BR	331	231	59	203	3	34	20
Uintah	CP and RM	36	7	10	7	16	0	4
Utah	BR and RM	138	82	22	58	0	2	2
Wasatch	RM	17	10	5	6	0	0	0
Washington	BR and CP	65	14	22	19	29	1	2
Wayne	CP	8	5	1	0	6	1	1
Weber	BR	4	1	1	1	0	0	2
Total----------		3,552						

[1]BR = Basin and Range
CP = Colorado Plateau
RM = Rocky Mountain

GPO 587-041/35