U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Digital mining claim density map for Federal lands in New Mexico: 1996

by

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Open-File Report 99-411

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INTRODUCTION

This report describes a digital map generated by the U.S. Geological Survey (USGS) to provide digital spatial mining claim density information for federal lands in New Mexico as of March 1997. Mining claim data is earth science information deemed to be relevant to the assessment of historic, current, and future ecological, economic, and social systems. There is no paper map included in this Open-File report.

In accordance with the Federal Land Policy and Management Act of 1976 (FLPMA), all unpatented mining claims, mill, and tunnel sites must be recorded at the appropriate BLM State office. BLM maintains a cumulative computer listing of mining claims in the MCRS database with locations given by meridian, township, range, and section. A mining claim is considered closed when the claim is relinquished or a formal BLM decision declaring the mining claim null and void has been issued and the appeal period has expired. All other mining claims filed with BLM are considered to be open and actively held. The digital map (figure 1.) with the mining claim density database available in this report are suitable for geographic information system (GIS)-based regional assessments at a scale of 1:100,000 or smaller.
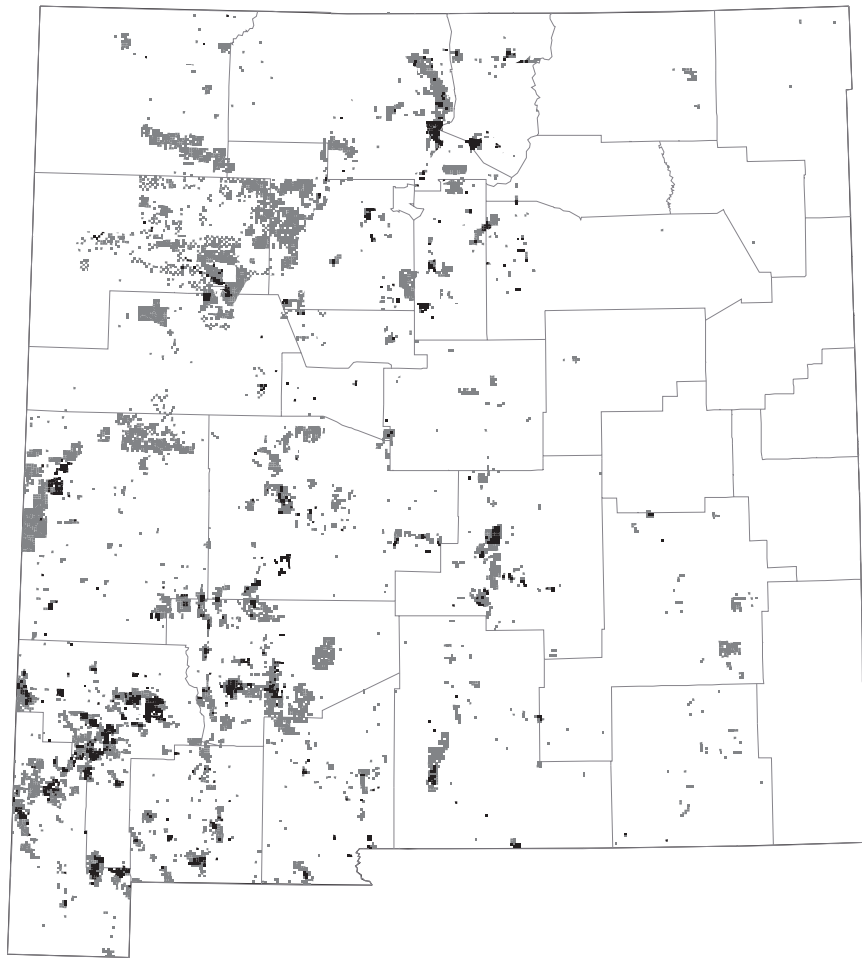

Figure 1. --- Open (black) and closed (gray) status of mining claims in New Mexico for 1996.

DATA SOURCES, PROCESSING, AND ACCURACY

Data Sources

The mining claim density database of federal lands in New Mexico is one of 13 statewide databases published in the U.S. Geological Survey Open-File Report 99-325. The database contains information identifying 1) the meridian, township, range, and section (MTRS) designation, a unique record identifier, 2) the number and type of claims (lode, placer, mill site, tunnel site) within each section, and 3) the status of the claims (open is held by a claimant, closed is no longer held). The original mine claim data used to create the databases in OF99-325 were acquired from the BLM in March 1997. An official quarterly release of the MCRS mine claim data for New Mexico is available by specific request from the:

United States Department of the Interior
Bureau of Land Management
Mining Claim Recordation System Coordinator
NI-112, Denver Federal Center
P.O. Box 25047
Denver, CO 80225-0047

The statewide Public Land Survey (PLS) digital map of New Mexico, grf0004.e00, was used to create the digital mining claim density map. The digital map was in Arc/Info export format and was acquired from the Earth Data Analysis Center (EDAC), University of New Mexico. Metadata from EDAC for this digital file is in grf0004.txt. The PLS is from 1:100,000 scale sources. The digital file and metadata are available from:

Earth Data Analysis Center (EDAC)
Geographic Data Service Manager
2500 Yale Boulevard SE, Suite 100
Albuquerque, New Mexico 87131-6031
(505) 277-3622
edac@spock.unm.edu

Processing

The digital file, drf0004.e00, was imported using Arc/Info, version 7.1.1 (Environmental Systems Research Institute, Inc., Redlands, California), a commercially available GIS software, as an Arc/Info coverage into a workspace on a Sun Ultra 1 with Solaris 2.5.1 operating software. A unique identifier corresponding in form to the MTRS in the mining claim density database was created in the polygon attribute table (.pat) of the New Mexico digital map. The .pat was converted to a dBase file, brought into dBase5, and the MTRS field was created and populated. Three fields, section, township, and range were dropped from the file. The file was then converted back to a .pat file and replaced the original .pat. The mining claim density database from OF99-325 was then linked, using a relate file, with the digital PLS of New Mexico. The linking process connected the data in the database to their corresponding sections in the digital map. The result was a digital mining claim density map (figure 1.) with the attributes of the current database. A subset of the digital map, that part containing mine claim density data, was created and named nm_clms. This step was necessary because the PLS acquired from EDAC is not public domain data. However, subsets of the PLS, such as the one in this report, can be released provided that the PLS of the state cannot be recreated from the subset. The relate file was renamed nm_clms.rel and the database of New Mexico from OF99-325 was renamed nm_clms.clms. The renaming allows the database and the relate file to be included in the single export file, nm_clms.e00, created when packaging the digital map for others.

Figure 1 displays the sections of the PLS containing claims and their status for this digital map. The map can be queried regarding its other attributes and can be used in investigating relationships with other digital data.

Accuracy

Several factors can affect the accuracy of the mining claim density database and digital map. The original data from BLM may contain errors. Two possible sources of error in the database are 1) incorrect position of the mining claim submitted by the claimant, and 2) input errors from the data entry papers to the computer database.

The digital map of the PLS of New Mexico may contain errors. Possible errors include 1) misidentified sections, 2) sections with no identifying information, and 3) sections missing from the PLS digital map. These errors would result in incorrect locations of the mining claim density data or failure of the data to be connected with the digital map.

Tables 1 and 2, summarize the number of mining claims by type and status for the digital map and the database. The total number of claims in the digital map (table 1) do not agree with the total number of claims in the mining claim density database from OF99-325 (table 2). Some contributing factors may be 1) failure of the data to find a section to combine with in the digital map, or 2) sections occurring as multiple parts due to irregular state boundaries, shorelines, or to non-PLS land surveys. The first type of error results in a decrease in the expected number of claims in the digital map. The second results in an increase. Both sources of error may be present. A ratio of the grand totals of all claims of Table 1 to Table 2 should show the degree of fit of the digital map totals to the original database totals. A value equal to 1 indicates a 100% fit. A value less than 1 indicates data was lost. A value greater than 1 indicates multi-part sections may be in the digital PLS map. The table shows that the digital map contains 153,415 mining claims but the database contains 164,519 mining claims. A ratio of the two numbers, .93251, indicates a fair fit.

Table 1. Mining claim totals by type and status in New Mexico (database linked to digital map)

	DIGITAL MAP DATABASE CLAIM TOTALS				
Type of Claim	LODE	PLACER	MILL	TUNNEL	ALL CLAIMS
Number of Open Mining Claims	8,038	1,397	170	31	9,636
Number of Closed Mining Claims	129,694	13,269	779	37	143,779
Grand Totals	137,732	14,666	949	68	153,415

Table 2. Mining claim totals by type and status in New Mexico (nm_clms.clms database)

	DENSITY DATABASE CLAIM TOTALS				
Type of Claim	LODE	PLACER	MILL	TUNNEL	ALL CLAIMS
Number of Open Mining Claims	8,813	1,437	180	30	10,460
Number of Closed Mining Claims	139,438	13,708	835	78	154,059
Grand Totals	148,251	15,145	1015	108	164,519

Another concern regarding accuracy involves the visual representation of the data to a viewer. The digital map does not accurately represent the aerial extent of the lands covered by a mining claim because the presence of one mining claim, about 20 acres for a lode claim, will 'color in' the entire section (640 acres) it occurs in. A section is typically 1 square mile. The visual representation of one claim is magnified by a factor of 32 times its actual size. The best digital map resolution available at this time is to the section. Any area calculations done with the digital map for mining claims will likely be unreliable. Specific information about a particular area should be acquired from the BLM State office.

Additionally, the positional accuracy of a mining claim is generalized to one section in the PLS even if it crosses into another section. Mining claims generally follow geologic features and usually do not conform to the PLS lines. The procedure used by Campbell (1996) chooses the first section listed for a mining claim in the MCRS as the section of position. This method insures that each claim is counted only once. The digital map is considered accurate enough for geographic representations for the purposes of regional assessments at a scale of 1:100,000 or smaller.

MINING CLAIM DENSITY MAP CONTENTS

Table 3 contains the structure and descriptions of specific fields within the digital map, nm_clms, including the additional field, mtrs. Table 4 contains the structure and descriptions of specific fields within the mining claim density database, nm_clms.clms. The italicized field in bold type, *mtrs*, is common to both the PLS and the database and is used by the relate file to link the database to the digital map.

Table 3. Field structure and descriptions of specific fields for the digital map

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	DEC	DESCRIPTION
1	area	4	12	Floating	3	Internal Arc/Info polygon area
5	perimeter	4	12	Floating	3	Internal Arc/Info polygon perimeter
9	nm_clms#	4	5	Binary	-	Internal Arc/info polygon number
13	nm_clms-id	4	5	Binary	-	User-defined polygon number
17	*mtrs*[1]	18	18	Character	-	**M**eridian+**T**ownship+**R**ange+**S**ection
35	data	30	30	Character	-	Composite of section, township, range
65	pvt_land	30	30	Character	-	Description of private land

[1] For example, '23 30.0N 29E05' is Meridian 23 (New Mexico), Township 30 North, Range 29 East, Section 5

Table 4. Field structure and descriptions for the mine claim density database

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	DEC	DESCRIPTION
1	*mtrs*[1]	18	18	Character	-	**M**eridian+**T**ownship+**R**ange+**S**ection
19	nolc[2]	4	4	Integer	-	**N**umber of **O**pen **L**ode **C**laims[2]
23	nopc	4	4	Integer	-	**N**umber of **O**pen **P**lacer **C**laims
27	nomc	4	4	Integer	-	**N**umber of **O**pen **M**ill site **C**laims
31	notc	4	4	Integer	-	**N**umber of **O**pen **T**unnel **C**laims
35	toc	4	4	Integer	-	**T**otal number of **O**pen **C**laims
39	nclc	4	4	Integer	-	**N**umber of **C**losed **L**ode **C**laims
43	ncpc	4	4	Integer	-	**N**umber of **C**losed **P**lacer **C**laims
47	ncmc	4	4	Integer	-	**N**umber of **C**losed **M**ill site **C**laims
51	nctc	4	4	Integer	-	**N**umber of **C**losed **T**unnel **C**laims
55	tcc	4	4	Integer	-	**T**otal number of **C**losed **C**laims
59	tc	4	4	Integer	-	**T**otal number of **C**laims of all kinds

[1] For example, '23 30.0N 29.2E05' is Meridian 23 (New Mexico), Township 30 North, Range 29 ½ East, Section 5
[2] in a section of the PLS

REFERENCES

Campbell, Harry W., 1996, Procedure for making a mining claim density map from BLM claim recordation digital data: U.S. Geological Survey Open-File Report 96-736, 13 p.

Earth Data Analysis Center, University of New Mexico, 1993, BLM (Bureau of Land Management) PLSS (Public Land Survey System): digital map, grf0004.

Hyndman, Paul C. and Harry W. Campbell, 1999, Digital databases containing mining claim density information for Arizona, California, Colorado, Idaho, Montana, Nebraska, New Mexico, Nevada, Oregon, South Dakota, Utah, Washington, and Wyoming created from the BLM Mining Claim Recordation System: 1996: U.S. Geological Survey Open-File Report 99-325, 21 p.

OBTAINING DIGITAL DATA

The digital mining claim density map of New Mexico, nm_clms, is provided with this report in Arc/Info EXPORT format as nm_clms.e00. The mining claim density database, nm_clms.clms, and the relate file, nm_clms.rel, are contained in the export file. A metadata file, nm_clms.met, occurs separately. These files and this report are available from the USGS public access FTP site and the World Wide Web site on the Internet. Table 4 lists the files and their sizes.

Table 5. Files available with this Open-File Report

FILE NAME	FILE TYPE	SIZE IN KILOBYTES
of99-411.pdf	PDF file	409
nm_clms.e00	Arc/Info export	10,422
nm_clms.met	Metadata	31
grf0004.txt	Metadata for drf0004.e00	18

By Anonymous FTP

Do the following steps to obtain the files for OF99-411by anonymous ftp. Windows users may need to start FTP in the MSDOS window.

STEP (type the words between the quotes)	REASON
cd to your_local_directory	Go to a directory to receive the WinZip file – you may need to make a directory first
'ftp wrgis.wr.usgs.gov'	Make ftp connection with the USGS computer, WRGIS
Name: 'anonymous'	Use 'anonymous' as your user name
Password: *your email address*	Use your email address as a password (you@email_address)
'cd pub/open-file'	Go down to the pub/open-file directory
'cd of99-411'	Go down to the specific open file directory
'binary'	Type the word 'binary' to change the transfer type to binary mode
'get of99-411.exe'	Copy the self-extracting file across the Internet to the receiving directory on your computer
'bye'	Close the ftp connection

Extracting the files from the of99-411.exe self-extracting file is accomplished by typing the name of the file, 'of99-411', and pressing the 'Enter' key. The files will unload automatically.

By the World Wide Web

The files for this report can be obtained over the Internet at URL http://wrgis.wr.usgs.gov/open-file/. Do the following steps to obtain the files for OF99-411 by the World Wide Web:

STEP	REASON
Attach to the internet with your web browser	This connects you to the internet.
Type 'http://wrgis.wr.usgs.gov/open-file/'	Make sure the internet address looks like this to connect with the USGS computer, WRGIS
Find the report in the listing and click on of99-411	This opens a page with instructions and information for downloading the report
Follow the instructions for downloading the data and this report	You should receive the report to your computer

METADATA

Following are 1) an Arc/Info description of the digital map, nm_clms, 2) a description of the relate file, and 3) the formal metadata for the digital map and associated files.

Description of SINGLE precision coverage nm_clms

FEATURE CLASSES

Feature Class	Subclass	Number of Features	Attribute data (bytes)	Spatial Index?	Topology?
ARCS		21604	60		
POLYGONS		7720	94		Yes
NODES		14650			

SECONDARY FEATURES

Tics	4
Arc Segments	36688
Polygon Labels	7511

TOLERANCES

Fuzzy = 62.493 V   Dangle = 0.000 N

COVERAGE BOUNDARY

Xmin = -288331.312   Xmax = 256461.938
Ymin = 151340.078   Ymax = 776265.125

STATUS

The coverage has not been Edited since the last BUILD or CLEAN

COORDINATE SYSTEM DESCRIPTION

Projection	LAMBERT
Datum	NAD27
Units	METERS
Spheroid	CLARKE1866
Parameters:	
1st standard parallel	33 00 0.0
2nd standard parallel	45 00 0.0
central meridian	-106 00 0.0
latitude of projection's origin	30 00 0.0
false easting (meters)	0.0
false northing (meters)	0.0

Description of Arc/Info nm_clms.rel relate structure

```
Relation          = NM_CLMS
Table-Id          = nm_clms.clms
Database          = info
Item              = MTRS
Column            = mtrs
Type              = ORDERED
Access            = RO
```

Formal metadata for the mine claim density map and associated files

The following metadata describes the mining claim density map:

```
Identification_Information:
  Citation:
    Citation_Information:
      Originator: Paul C. Hyndman
      Originator: Harry W. Campbell
      Publication_Date: 1999
      Title:
        Digital mining claim density map for Federal lands in New Mexico: 1996
      Edition: Version 1.0
      Geospatial_Data_Presentation_Form: map
  Description:
    Abstract:
      The mining claim density data of federal lands in New Mexico are
      Combined with the digital New Mexico Public Land Survey (PLS) to create
      a digital map of the density of mine claims in Open-File Report 99-411.

      The mining claim density data of federal lands in New Mexico was one of
      13 western states released in Open-File Report 99-325.  The database for
      New Mexico was converted to an Arc/Info file and connected with the PLS
      by an Arc/Info relate.

      As stated in OF 99-325, "These mining claim density databases were
      created from data obtained in March 1997, from the Mining Claim
      Recordation System (MCRS) of the Bureau of Land Management.  These
      databases provide mining claim density information in a tabular form.
      They quantify the status of mining claim activity for 1996 and include
      information on mining claim activity since 1976.  The databases contain
      information identifying 1) the general location of mining claims within
      the Public Land Survey System (PLS), 2) the number and type of claims
      (lode, placer, mill site, tunnel site), and 3) the status of the claims
      (open is held, closed is no longer held by a claimant)".

      Combining the database with a digital PLS coverage of New Mexico enables
      a user to spatially display the mine claim data as a digital map and
      compare it with other spatial themes.
    Purpose:
      The digital map was developed to document mining claim
      activity on federal lands in New Mexico and to investigate
      interrelationships of mining claim activity with physical and social
      science concerns.

      This digital map is not to be considered as a legal representation of
      survey lines and corners or of mining claim boundaries.
    Supplemental_Information: This data is in Arc/Info 7.1 format
    Data_Set_Part:
      Part_Type: Arc/Info export file
```

```
            Part_Name: nm_clms.e00
            Part_Description: This Arc/Info export file contains the coverage
              nm_clms, the database nm_clms.clms, and the relate nm_clms.rel.
              This digital map contains only those parts of the New Mexico PLS which
              contain mine claim density data.  The original PLS of New Mexico was
              acquired from the U.S. Bureau of Mines when it was closed by Congress
              in 1996.  The Bureau of Mines purchased the PLS of New Mexico from a
              private company.  The data is proprietary and cannot be released in
              its complete form.
      Data_Set_Part:
        Part_Type: Arc/Info database
        Part_Name: nm_clms.clms
        Part_Description: This database contains mine claim density information
          for federal lands in the state, from 1976 through 1996.  It is one of
          several state databases from OF 99-325.
      Data_Set_Part:
        Part_Type: Arc/Info relate
        Part_Name: nm_clms.rel
        Part_Description: This file contains the parameters needed to relate the
          database, nm_clms.clms to the digital map database, nm_clms.pat.  The
          structure of the relate is:
            RELATION                   = NM_CLMS
            TABLE-ID                   = nm_clms.clms
            DATABASE                   = info
            ITEM                       = MTRS
            COLUMN                     = mtrs
            TYPE                       = ORDERED
            ACCESS                     = RO
Time_Period_of_Content:
  Time_Period_Information:
    Range_of_Dates/Times:
      Beginning_Date: 1976
      Ending_Date: 1997
  Currentness_Reference: Release date of data by the Bureau of Land
    Management in March, 1997
Status:
  Progress: Complete
  Maintenance_and_Update_Frequency: None planned
Spatial_Domain:
  Bounding_Coordinates:
    West_Bounding_Coordinate: -109
    East_Bounding_Coordinate: -103
    North_Bounding_Coordinate: 37
    South_Bounding_Coordinate: 31
Keywords:
  Theme:
    Theme_Keyword_Thesaurus: None
    Theme_Keyword: mining claim density
    Theme_Keyword: lode
    Theme_Keyword: placer
    Theme_Keyword: mill site
    Theme_Keyword: tunnel site
    Theme_Keyword: mine claim
  Place:
    Place_Keyword_Thesaurus: None
    Place_Keyword: New Mexico
Access_Constraints: None
Use_Constraints:
  Users should contact the BLM for current data.  The U.S. Geological Survey
  makes no warranties related to the accuracy of the data and users are
  required to determine suitability of use for any particular purpose.
  This digital map is not meant to be construed as a legal
  representation of mining claim boundaries.  The PLS digital map is from
  the Earth Data Analysis Center, Albuquerque, New Mexico.
  Users should contact them for a current digital PLS map and metadata.
  The map should not be used at scales larger than 1:100,000.
```

The user must obtain current information on mining claims from the
New Mexico State Office of the Bureau of Land Management for the area of
interest since the mining claim density data is not current. The
information in the database does not provide the legal location or
status of individual mining claims.

Any hardcopies utilizing this data set shall clearly indicate their
source. If the user has modified the data in any way they are
obligated to describe the types of modifications they have performed
on the hardcopy map. User specifically agrees not to misrepresent
this data set, nor to imply that changes they made were approved by
the U.S. Geological Survey.
Point_of_Contact:
  Contact_Information:
    Contact_Person_Primary:
      Contact_Person: Paul Hyndman
      Contact_Organization: U.S. Geological Survey
    Contact_Position: Geologist
    Contact_Address:
      Address_Type: mailing and physical address
      Address: 904 W. Riverside Ave., Rm. 202
      City: Spokane
      State_or_Province: Washington
      Postal_Code: 99201
      Country: U.S.A.
    Contact_Voice_Telephone: 509-368-3100 or 509-368-3118
    Contact_Facsimile_Telephone: 509-368-3199
    Contact_Electronic_Mail_Address: phyndman@usgs.gov
    Contact_Instructions: General office phone is 509-368-3100
Data_Set_Credit:
  Cheryl Laudenbach, Denver Service Center, BLM, provided the original
  mining claim data from the Mining Claim Recordation Database. The data
  was used to create the mining claim density databases in OF 99-325.
Native_Data_Set_Environment: Solaris 2.5.1, Sun Ultra 1, Arc/Info 7.1.2
Data_Quality_Information:
  Attribute_Accuracy:
    Attribute_Accuracy_Report:
      OF 99-325 reports that the attributes of the mining claim data from BLM
      data, claims per section, do not represent the exact number of claims in
      each section. Some claims overlap into adjoining sections and/or
      townships. In order to count each claim only once, it was necessary to
      choose one section for each claim to be identified with. Therefore, the
      first section listed in the BLM database for a particular claim was
      chosen as the section the claim was counted in.

      The accuracy was tested by summing each category of claim in the mining
      claim database and comparing the sum to those from the original BLM
      database. The sums for each category matched.

      No attempt was made to determine the accuracy of BLM's database.
  Completeness_Report:
    None of the data from BLM was omitted. The data is considered complete
    for the purpose of determining mining claim density in this State.
  Logical_Consistency_Report:
    The data set is a derived subset of the original BLM data. No
    modifications to the BLM data were made.
  Positional_Accuracy:
    Horizontal_Positional_Accuracy:
      Horizontal_Positional_Accuracy_Report:
        A claim may be within a section or it may straddle two, three, or four
        sections. In order to count each claim only once, it was
        necessary to choose one section for each claim to be identified
        with. Therefore, the first section listed in the BLM database
        for a particular claim was chosen as the section the claim was
        counted in.
  Lineage:
    Source_Information:

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```
      Source_Citation:
        Citation_Information:
          Originator:
            U.S. Geological Survey
          Publication_Date: 1999
          Title: Digital databases containing mining claim density information
            for Arizona, California, Colorado, Idaho, Montana, Nebraska, New
            Mexico, Nevada, Oregon, South Dakota, Utah, Washington, and
            Wyoming created from the BLM Mining Claim Recordation System: 1996
          Edition: 1
          Geospatial_Data_Presentation_Form: tabular database
          Series_Information:
            Series_Name: Open-File Report
            Issue_Identification: OF 99-325
          Publication_Information:
            Publication_Place: Denver, Colorado
            Publisher: U.S. Geological Survey
          Other_Citation_Details:
            Original data from the Bureau of Land Management Mine Claim
            Recordation Database (MCRD)
          Online_Linkage: URL = http://wrgis.wr.usgs.gov/open-file/of99-325
      Type_of_Source_Media: digital file
      Source_Time_Period_of_Content:
        Time_Period_Information:
          Range_of_Dates/Times:
            Beginning_Date: 1976
            Ending_Date: 199703
        Source_Currentness_Reference:
          The data were copied from BLM's MCRD database on March, 1997.
          The data are cumulative from 1976, when the database was created.
      Source_Citation_Abbreviation: USGS OF99-325
      Source_Contribution:
        This database contributed the mine claim density information
        needed to create a spatial mine claim density map.
    Process_Step:
      Process_Description:
        The mine claim density database of New Mexico was released as part of
        the U.S. Geological Open-File Report, OF 99-325.  It was imported as
        an Arc/Info table, nm_clms.clms, using the command, dbaseinfo.  A
        relate, nm_clms.rel, was made to connect the database to the PLS of
        New Mexico.  This report can be found at URL:
        http://wrgis.wr.usgs.gov/open-file/
      Process_Date: 1997-1998
Data_Quality_Information:
  Completeness_Report:
    The digital PLS of New Mexico is assumed to be complete although it does
    not cover the entire state.
  Logical_Consistency_Report:
    The PLS in this report is a derived subset of the original PLS.  Only
    those sections containing mine claim density data are included in this
    report.
  Positional_Accuracy:
    Horizontal_Positional_Accuracy:
      Horizontal_Positional_Accuracy_Report:
        Refer to the metadata for the pls, file cf101.text.
  Lineage:
    Source_Information:
      Source_Citation:
        Citation_Information:
          Originator:
            Earth Data Analysis Center, Albuquerque, New Mexico
          Publication_Date: 1993
          Title: BLM PLS
          Geospatial_Data_Presentation_Form: map
      Type_of_Source_Media: digital file
      Source_Time_Period_of_Content:
        Time_Period_Information:
```

```
            Single_Date/Time:
               Calendar_Date: 1993
           Source_Currentness_Reference:
             The PLS may not be current with regard to section lines and corners.
       Source_Citation_Abbreviation: none
       Source_Contribution:
         EDAC provided the digital PLS of New Mexico at a nominal cost.
     Process_Step:
       Process_Description:
         A field, mtrs, was added to the New Mexico PLS to which the mine claim
         density database could be attached.  The polygon attribute table, .pat,
         was converted to a dBase file.  The mtrs field was created and
         populated and the table was converted back to a .pat table.  Some
         fields, section, township, and range were dropped as they were
         incorporated in the mtrs code.  The original .pat was replaced with the
         new .pat.  The data was attached through the use of a relate,
         nm_clms.rel, and a subset of the New Mexico PLS which contained only
         mine claim density data was created.  An example of commands for using
         the relate in ArcEdit for selecting all claims in the Total Claims (tc)
         field is:
         'restore relate nm_clms.rel'
         'editcover nm_clms'
         'sel nm_clms//tc'
       Process_Date: 1997
Spatial_Data_Organization_Information:
   Direct_Spatial_Reference_Method: Vector
   Point_and_Vector_Object_Information:
     SDTS_Terms_Description:
       SDTS_Point_and_Vector_object_Type: Point
       Point_and_Vector_Object_Count: 14650
       SDTS_Point_and_Vector_object_Type: String
       Point_and_Vector_Object_Count: 21604
       SDTS_Point_and_Vector_object_Type: GT-polygon composed of chains
       Point_and_Vector_Object_Count: 7720
Spatial_Reference_Information:
   Horizontal_Coordinate_System_Definition:
     Planar:
       Map_Projection:
         Map_Projection_Name: Lambert Conformal Conic
         Lambert_Conformal_Conic:
           Standard_Parallel: 33 0 0.0
           Standard_Parallel: 45 0 0.0
           Longitude_of_Central_Meridian: -106 0 0.0
           Latitude_of_Projection_Origin: 30
           False_Easting: 0.00000
           False_Northing: 0.00000
       Planar_Coordinate_Information:
         Planar_Coordinate_Encoding_Method: coordinate pair
         Planar_Distance_Units: meters
     Geodetic_Model:
       Horizontal_Datum_Name: North American Datum of 1927
       Ellipsoid_Name: Clarke 1866
Entity_and_Attribute_Information:
   Detailed_Description:
     Entity_Type:
       Entity_Type_Label: nm_clms.clms
       Entity_Type_Definition:
         Summary of values for number and type of mining claims in each section
         from OF99-325.  The data is tied to an MTRS code which represents the
         Meridian + Township + Range + Section.  This code provides a unique
         identifier for each Section of the PLS.
       Entity_Type_Definition_Source:
         The Bureau of Land Management is the official
         source for PLS designations and surveys and for
         the mining claim data.
     Attribute:
       Attribute_Label: MTRS
```

```
      Attribute_Definition:
        A concatenation of Meridian, Township, Range, and
        Section of the PLS
      Attribute_Definition_Source: Bureau of Land Management
      Attribute_Domain_Values:
        Enumerated_Domain:
          Enumerated_Domain_Value: MMTTT.TDRRR.RESS__
          Enumerated_Domain_Value_Definition:
            MTRS is an 18-character field which is a concatenation
            of meridian (M), Township (T), township direction (D),
            range (R), range direction (E), and section (S).  The form
            of the field is MMTTT.TDRRR.RESS__.  The last two spaces
            were included in the beginning of the study but were not utilized.

            MM = the FIPS code for meridian.  FIPS stands for the Federal
            Information Processing Standard.  The code for the meridian is:

            23 - New Mexico

            TTT.T = BLM Township designation as 'TTT.T' may include a fraction
            of a Township.  For example, Township 1 would be '__1.0'.
            Township 27.5 would be '_27.2'.  The '.2' is a 1/2 township.

            D = BLM Township direction may be North (N) or South (S).

            RRR.R = BLM Range designation as 'RRR.R' which may include a
            fraction of a Range See Township (T) for example.

            E = BLM Range direction may be East (E) or West (W).

            SS = BLM Section number.  For example, section 1 is '_1' and
            section 35 is '35'.  Generally the highest section number is 36,
            but there are exceptions in several States.
          Enumerated_Domain_Value_Definition_Source:
            Hyndman and Campbell, 1999
Attribute:
  Attribute_Label: NOLC
  Attribute_Definition:
    Number of Open (or recorded) Lode Claims
    within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 69
Attribute:
  Attribute_Label: NOPC
  Attribute_Definition:
    Number of Open (or recorded) Placer Claims
    within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 26
Attribute:
  Attribute_Label: NOMC
  Attribute_Definition:
    Number of Open (or recorded) Mill site Claims
    within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 39
Attribute:
  Attribute_Label: NOTC
```

```
  Attribute_Definition:
    Number of Open (or recorded) Tunnel site Claims
    within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 20
Attribute:
  Attribute_Label: TOC
  Attribute_Definition:
    Total number of Open (or recorded) Claims of all types
    within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 93
Attribute:
  Attribute_Label: NCLC
  Attribute_Definition:
    Number of Closed (or terminated and closed)
    Lode Claims within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 180
Attribute:
  Attribute_Label: NCPC
  Attribute_Definition:
    Number of Closed (or terminated and closed)
    Placer Claims within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 84
Attribute:
  Attribute_Label: NCMC
  Attribute_Definition:
    Number of Closed (or terminated and closed)
    Mill site Claims within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 114
Attribute:
  Attribute_Label: NCTC
  Attribute_Definition:
    Number of Closed (or terminated and closed)
    Tunnel site Claims within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
      Range_Domain_Maximum: 12
Attribute:
  Attribute_Label: TCC
  Attribute_Definition:
    Total number of Closed (or terminated and closed)
    Claims of all types within a section
  Attribute_Definition_Source: Hyndman and Campbell, 1999
  Attribute_Domain_Values:
    Range_Domain:
      Range_Domain_Minimum: 0
```

```
        Range_Domain_Maximum: 180
    Attribute:
      Attribute_Label: TC
      Attribute_Definition:
        Total number of all Claims of all types
        within a section
      Attribute_Definition_Source: Hyndman and Campbell, 1999
      Attribute_Domain_Values:
        Range_Domain:
          Range_Domain_Minimum: 1
          Range_Domain_Maximum: 180
Detailed_Description:
  Entity_Type:
    Entity_Type_Label: nm_clms.pat
    Entity_Type_Definition:
      Summary of values for number and type of mining claims in each section
      from OF99-325.  The data is tied to an MTRS code which represents the
      Meridian + Township + Range + Section.  This code provides a unique
      identifier for each Section of the PLS.
    Entity_Type_Definition_Source:
      The Bureau of Land Management is the official
      source for PLS designations and surveys and for
      the mining claim data.
  Attribute:
    Attribute_Label: area
    Attribute_Definition:
      The area of each polygon in the coverage
    Attribute_Definition_Source: Arc/Info
    Attribute_Domain_Values:
      Range_Domain:
        Range_Domain_Minimum: not determined
        Range_Domain_Maximum: not determined
  Attribute:
    Attribute_Label: perimeter
    Attribute_Definition:
      Length of perimeter of each polygon in the coverage
    Attribute_Definition_Source: Arc/Info
    Attribute_Domain_Values:
      Range_Domain:
        Range_Domain_Minimum: not determined
        Range_Domain_Maximum: not determined
  Attribute:
    Attribute_Label: nm_clms#
    Attribute_Definition:
      Internal polygon tracking number
    Attribute_Definition_Source: Arc/Info
    Attribute_Domain_Values:
      Range_Domain:
        Range_Domain_Minimum: not determined
        Range_Domain_Maximum: not determined
  Attribute:
    Attribute_Label: nm_clms-id
    Attribute_Definition:
      Polygon tracking number which can be modified by user
    Attribute_Definition_Source: Arc/Info
    Attribute_Domain_Values:
      Range_Domain:
        Range_Domain_Minimum: not determined
        Range_Domain_Maximum: not determined
  Attribute:
    Attribute_Label: MTRS
    Attribute_Definition:
      A concatenation of Meridian, Township, Range, and
      Section of the PLS
    Attribute_Definition_Source: Bureau of Land Management
    Attribute_Domain_Values:
      Enumerated_Domain:
```

```
                   Enumerated_Domain_Value: MMTTT.TDRRR.RESS__
                   Enumerated_Domain_Value_Definition:
                     MTRS is an 18-character field which is a concatenation
                     of meridian (M), Township (T), township direction (D),
                     range (R), range direction (E), and section (S).  The form
                     of the field is MMTTT.TDRRR.RESS__.  The last two spaces
                     were included in the beginning of the study but were not utilized.

                     MM = the FIPS code for meridian.  FIPS stands for the Federal
                     Information Processing Standard.  The code for the meridian is:

                     23 - New Mexico

                     TTT.T = BLM Township designation as 'TTT.T' may include a fraction
                     of a Township.  For example, Township 1 would be '__1.0'.
                     Township 27.5 would be '_27.2'.  The '.2' is a 1/2 township.

                     D = BLM Township direction may be North (N) or South (S).

                     RRR.R = BLM Range designation as 'RRR.R' which may include a
                     fraction of a Range See Township (T) for example.

                     E = BLM Range direction may be East (E) or West (W).

                     SS = BLM Section number.  For example, section 1 is '_1' and
                     section 35 is '35'.  Generally the highest section number is 36,
                     but there are exceptions in several States.
                   Enumerated_Domain_Value_Definition_Source:
                     Hyndman and Campbell, 1999
         Attribute:
           Attribute_Label: DATA
           Attribute_Definition:
             A concatenation of section, township, and range
           Attribute_Definition_Source: EDAC
           Attribute_Domain_Values:
             Unrepresentable_Domain: Character field
           Beginning_Date_of_Attribute_Values: 1993
         Attribute:
           Attribute_Label: PVT_LAND
           Attribute_Definition:
             Different names and designations for private land
           Attribute_Definition_Source: EDAC
           Attribute_Domain_Values:
             Unrepresentable_Domain: Character field
           Beginning_Date_of_Attribute_Values: 1993
Distribution_Information:
  Distributor:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Paul Hyndman
        Contact_Organization: U.S. Geological Survey
      Contact_Position: Geologist
      Contact_Address:
        Address_Type: mailing and physical address
        Address: W. 904 Riverside Avenue, Room 202
        City: Spokane
        State_or_Province: Washington
        Postal_Code: 99201
        Country: USA
      Contact_Voice_Telephone: 509-368-3118
      Contact_Facsimile_Telephone: 509-368-3199
      Contact_Electronic_Mail_Address: phyndman@usgs.gov
      Contact_Instructions: Main phone number is 509-368-3100
    Resource_Description: Open-File Report 99-411
  Distribution_Liability:
    The U.S. Geological Survey (USGS) provides this data "as is."
    The USGS makes no guarantee or warranty concerning the accuracy of
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out of the delivery, installation, operation, or support by the USGS.
Technical_Prerequisites: The user should have GIS software capable of
  reading Arc/Info files
Distributor:
  Contact_Information:
    Contact_Organization_Primary:
      Contact_Organization: U.S. Geological Survey Information Services
    Contact_Address:
      Address_Type: mailing and physical address
      Address:
        Open-File Reports
        Box 2586
      City: Denver
      State_or_Province: CO
      Postal_Code: 80225
      Country: USA
    Contact_Voice_Telephone: 1-303-202-4200
    Contact_Facsimile_Telephone: 1-303-202-4693
Resource_Description: Open-File Report 99-411
Distribution_Liability:
  The U.S. Geological Survey (USGS) provides this data "as is."
  The USGS makes no guarantee or warranty concerning the accuracy of
  information contained in the geographic data. The USGS further makes no
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  for use lies entirely with the user. Although this data has been
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  implied, is made by the USGS regarding the use of this data on any other
  system, nor does the fact of distribution constitute or imply any such
  warranty.

  In no event shall the USGS have any liability whatsoever for payment
  of any consequential, incidental, indirect, special, or tort damages
  of any kind, including, but not limited to, any loss of profits
  arising out of use of or reliance on the geographic data or arising
  out of the delivery, installation, operation, or support by the USGS.
Technical_Prerequisites: The user should have software GIS software capable
  of reading Arc/Info files.
Distributor:
  Contact_Information:
    Contact_Organization_Primary:
      Contact_Organization: U.S.G.S. Earth Science Information Office
    Contact_Address:
      Address_Type: mailing and physical address
      Address: 904 West Riverside Avenue, Rm 135
      City: Spokane
      State_or_Province: WA
      Postal_Code: 99201
      Country: USA
    Contact_Voice_Telephone: 509-368-3130
    Contact_Facsimile_Telephone: 509-353-2872
    Contact_Electronic_Mail_Address: esnfic@mailmcan1.wr.usgs.gov

```
     Hours_of_Service: 8:00 a.m. - 4:30 p.m. Pacific time zone
   Resource_Description: Open-File Report 99-411
   Distribution_Liability:
     The U.S. Geological Survey (USGS) provides this data "as is."
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     for use lies entirely with the user.  Although this data has been
     processed successfully on computers at the USGS, no warranty, expressed or
     implied, is made by the USGS regarding the use of this data on any other
     system, nor does the fact of distribution constitute or imply any such
     warranty.

     In no event shall the USGS have any liability whatsoever for payment
     of any consequential, incidental, indirect, special, or tort damages
     of any kind, including, but not limited to, any loss of profits
     arising out of use of or reliance on the geographic data or arising
     out of the delivery, installation, operation, or support by the USGS.
   Technical_Prerequisites: The user should have software GIS software capable
     of reading Arc/Info files.
Metadata_Reference_Information:
  Metadata_Date: 19990225
  Metadata_Review_Date: 19990331
  Metadata_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Paul Hyndman
        Contact_Organization: U.S. Geological Survey
      Contact_Position: Geologist
      Contact_Address:
        Address_Type: mailing and physical address
        Address: W. 904 Riverside Avenue, Room 202
        City: Spokane
        State_or_Province: Washington
        Postal_Code: 99201
        Country: USA
      Contact_Voice_Telephone: 509-368-3118
      Contact_Facsimile_Telephone: 509-368-3199
      Contact_Electronic_Mail_Address: phyndman@usgs.gov
      Hours_of_Service: 8am to 4:30pm
      Contact_Instructions: Main phone is 509-368-3100
  Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial
Metadata
  Metadata_Standard_Version: FGDC-STD-001-1998
  Metadata_Time_Convention: local time
  Metadata_Access_Constraints: none
  Metadata_Use_Constraints: none
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