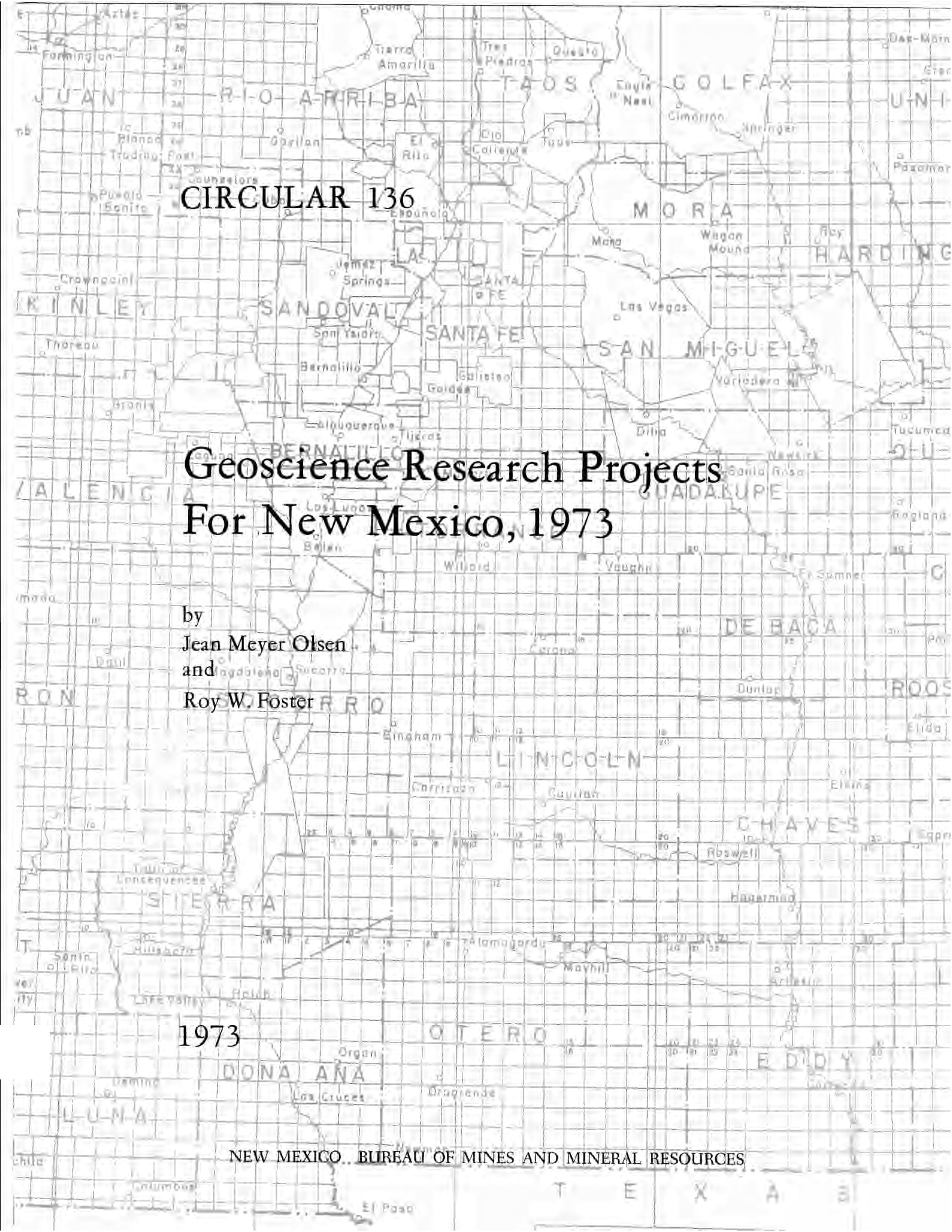

CIRCULAR 136

Geoscience Research Projects For New Mexico, 1973

by
Jean Meyer Olsen
and
Roy W. Foster

1973

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Circular 136

New Mexico Bureau of Mines & Mineral Resources

A DIVISION OF
NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY

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SOCORRO 1973

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PREFACE

This circular is the second in a series listing currently active projects primarily in the fields of geology and geophysics. Also noted are projects in engineering and hydrology that are of potential interest to earth scientists. Added this year is the status of topographic mapping as of June 1, 1973.

The report includes annotated listings of 349 projects (exclusive of topographic mapping) supported by 134 organizations. Projects are listed under 13 topical categories, each, where appropriate, with a separate indexed map. Project numbers designate the principal field of research and map location, for example GM50 is project 50 under Geologic Mapping. Other fields of research are indicated by the category abbreviations following most of the project numbers, for example in the foregoing, "AD" and "SG" indicate project GM50 also involves age dating and structural geology. The upper case letters following the author's name indicate the organizations supporting the work, for example "UNC" is University of North Carolina. Topics, authors, and organizations are indexed at the beginning of the report followed by the list of projects.

The authors appreciate the continued support of the geoscientists and engineers working in New Mexico, and welcome any comments regarding organization and content of this circular.

Jean Meyer Olsen, temporary assistant
Roy W. Foster, petroleum geologist
New Mexico State Bureau of Mines
and Mineral Resources

Socorro, New Mexico
July 1, 1973

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USFS	United States Forest Service: H40
USGS	United States Geological Survey: H33,34,40,41; MR11,13; ST1,3; STNP1; GM22,56; GP3
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USGS(BCEG)	USGS-Branch of Central Environmental Geology: EG8
USGS(BER)	USGS-Branch of Exploration Research: GC19
USGS(BFGP)	USGS-Branch of Field Geochemistry and Petrology: GC21; MP10,11
USGS(BOFCR)	USGS-Branch of Organic Fuel and Chemical Resources: GCNP4; MR17,18; MP9; ST37,38; GM61,84
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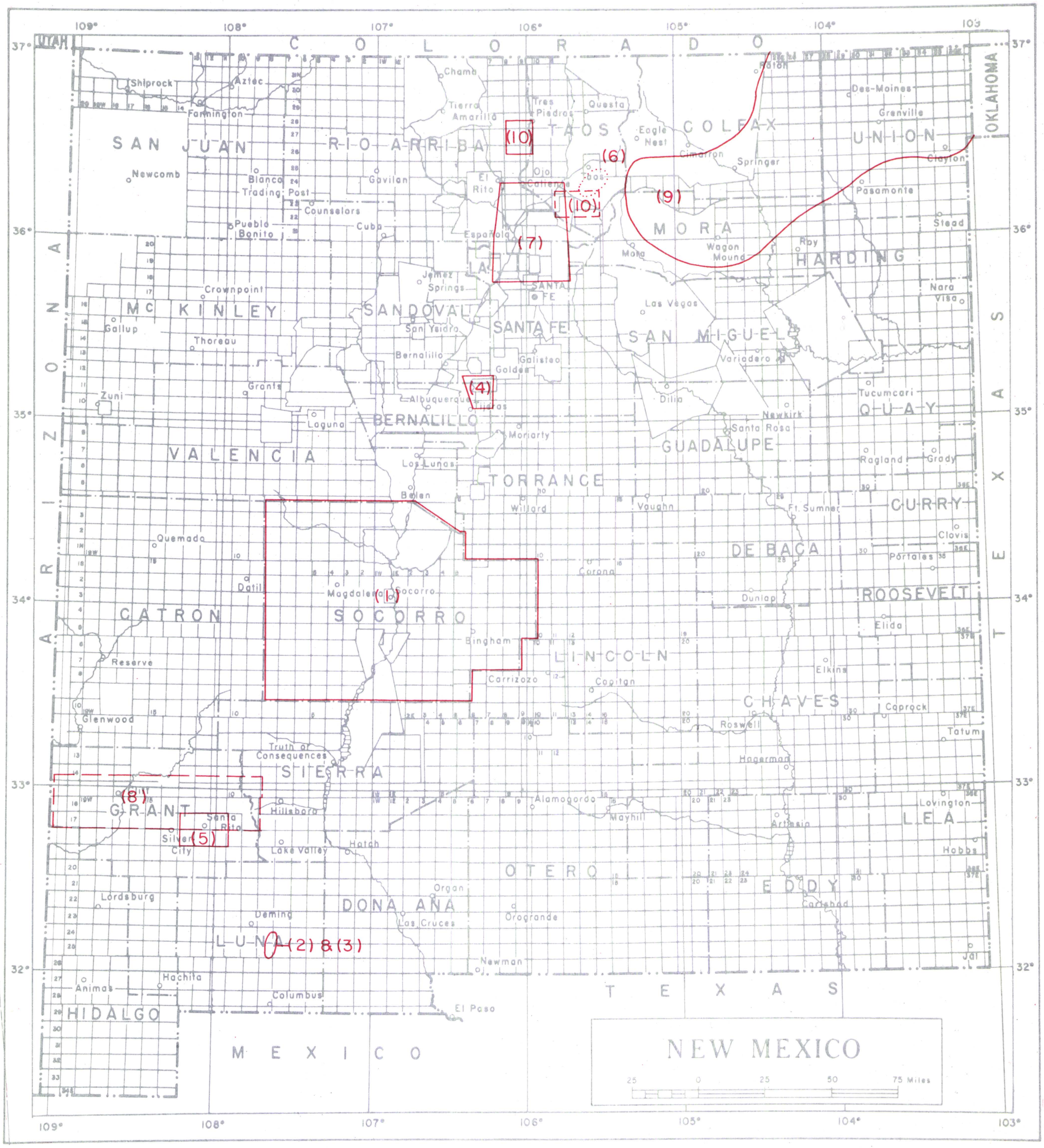
UTEP	University of Texas at El Paso: H38; MRNP4; ST15,16; GM38-40
UWA	University of Washington: AD10; GC22
UWI	University of Wisconsin: ST29
UWY	University of Wyoming: GM54; GP7
WATER	Water Association to Expand Resources: H41
WMU	Western Michigan University: GM51
WNMU	Western New Mexico University: GM13,14
WRC	Water Resources Council: H38
WSC	Weber State College: ST27
WSMR	White Sands Missile Range: 1114,15; HNP17


NEW MEXICO
C O L O R A D O
A R I Z O N A
T E X A S
M E X I C O
OKLAHOMA
UTAH
SAN JUAN
RIO ARRIBA
TAOS
COLFAX
UNION
MORA
HARDING
McKINLEY
SANDOVAL
SANTA FE
SAN MIGUEL
QUAY
BERNALILLO
VALENCIA
TORRANCE
GUADALUPE
CURRY
DE BACA
ROOSEVELT
CATRON
SOCORRO
LINCOLN
CHAVES
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AGE DATING

PROJECTS

AGE DATING (AD)

Project

1 (IMP) Geochronology of mid-Tertiary plutons in Socorro County, New Mexico: C. E. Chapin; NMSBMMR.
K-Ar dating of widely distributed stocks and dikes of dioritic to granitic composition.

2 (IMP,SG) Age dating the igneous rocks in the Florida Mountains: L. J. Corbitt; ENMU, MRDC.
Critical areas will be sampled and dated in an effort to understand the igneous rocks in the Florida Mountains.

3 (SH,SG) Age determination of the Andesite Agglomerate overlying the Lobo Formation in the Florida Mountains: L. J. Corbitt; ENMU.
It is believed that a radiometric date on the basal andesites which are interbedded with typical Lobo red beds will give the approximate age of the Lobo Formation in the Florida Mountains.

4 (SH,ST) Rb-Sr geochronology of Phanerozoic sedimentary rocks: D. G. Brookins with B. Mukhopadhyay; UNM.
Absolute age of Mississippian and Pennsylvanian sedimentary rocks.

5 (M, MRM) Potassium-argon dating related to intrusive and hydrothermal activity in the central mining district, southwestern New Mexico: F. W. McDowell, D. Norton; UTA, KR.
Ages will be determined for unaltered intrusives, intrusives affected by the hydrothermal event, and new minerals formed during the event in an attempt to define the duration of intrusive and hydrothermal activity in the region. Sample collecting and mineral separation have been completed. K and Ar analytical work will begin shortly.

6 (IMP, GC) Age of the Embudo Granite, New Mexico: W. Shiver and P. D. Fullagar; UNC.
Determination of Rb-Sr whole-rock age of Embudo Granite. Study includes major element and petrographic analyses. Additional Embudo samples have been collected and processed. Metarhyolites from the Precambrian units cut by Embudo also will be analyzed.

7 (GC,M) Age study of the Santa Fe Group: H. Faul; UP.
Precision K-Ar dating of stratigraphically controlled ash beds.

8 (GC,V) Radiometric dating, southwestern New Mexico: M. Bikerman; UPITT, NSF, NMSBMMR.
K-Ar dating of volcanic rocks in Catron and Grant counties. Stratigraphy and volcanology of the volcanic rocks.

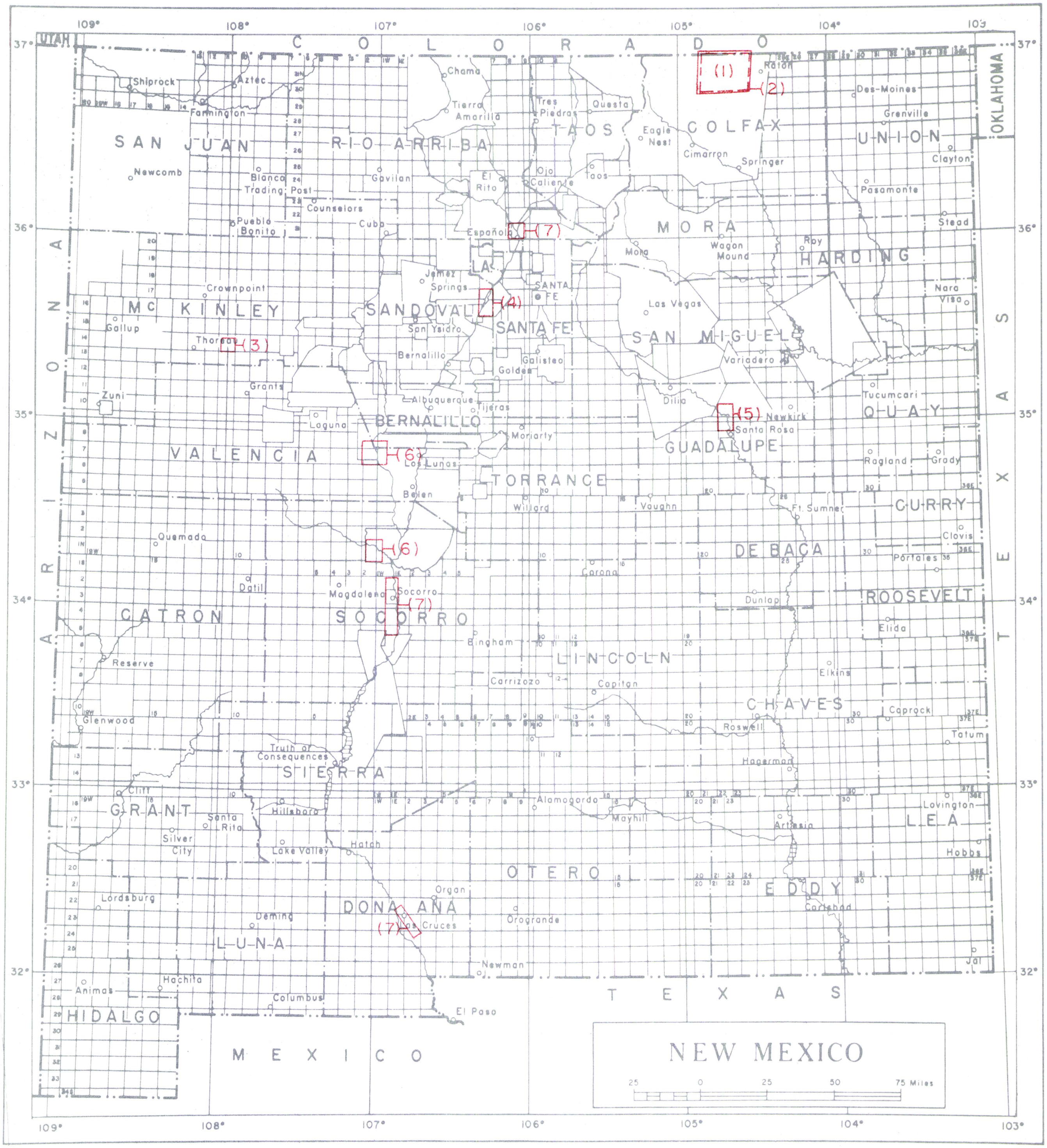
9 Age dating of volcanic rocks of the southern High Plains, Colorado and New Mexico: J. C. Stormer; UG, NSF, GSA, NMSBMMR.
K-Ar isotopic age dating of rocks from the Spanish Peaks complex, Colorado, and volcanic rocks from Mora, Colfax, and Union counties, New Mexico.

10 Radiometric dating of Precambrian rocks in northern New Mexico: R. L. Gresens; UWA, NSF, UA.
K-Ar and Rb-Sr dates are being obtained on metarhyolites and other metamorphic and igneous rocks in the Precambrian terranes of the Las Tablas-La Madera quadrangles and the Picuris Range.

Not Plotted (ADNP)

1 (GC,IMP,MR,SH,SG) Isotope dating: F. E. Kottlowski, R. H. Weber, M. E. Willard, C. E. Chapin; NMSBMMR.
Dating of key igneous rock units by isotope methods (mainly K-Ar) to establish chronology in Cenozoic and relationships to mineralization and tectonism.

2 (SH) Age dating of igneous rocks in south-central New Mexico: F. E. Kottlowski (NMSBMMR), W. R. Seager and R. E. Clemons (NMSU).
Collection, dating, and tracing regional relations of igneous rock units in the general Dona Ana County and adjoining areas. Preliminary results being compiled for Isochron West.



ENGINEERING

ENGINEERING (E)

Project

1 (GPI, MG, MRC) Infrared and displacement studies in an unsupported coal mine roof: R. M. Stateham and L. J. Markos; USBM(DMRC).
Infrared and displacement studies are in progress in an unsupported roof at Kaiser Steel Corporation's York Canyon Coal Mine, Raton, New Mexico. The objective of these studies is the correlation of thermal anomalies in the roof to loose or parted roof rock. Successful completion of the study will make possible the detection of loose, hazardous rock from remote safe locations.

2 (MRC) Measurement and evaluation of subsidence over a coal mine with varying overburden thickness: W. N. Youngs; USBM, KSC.
Surface and subsurface measurement of subsidence over the York Canyon Mine, leading to the development of a subsidence control and prediction capability.

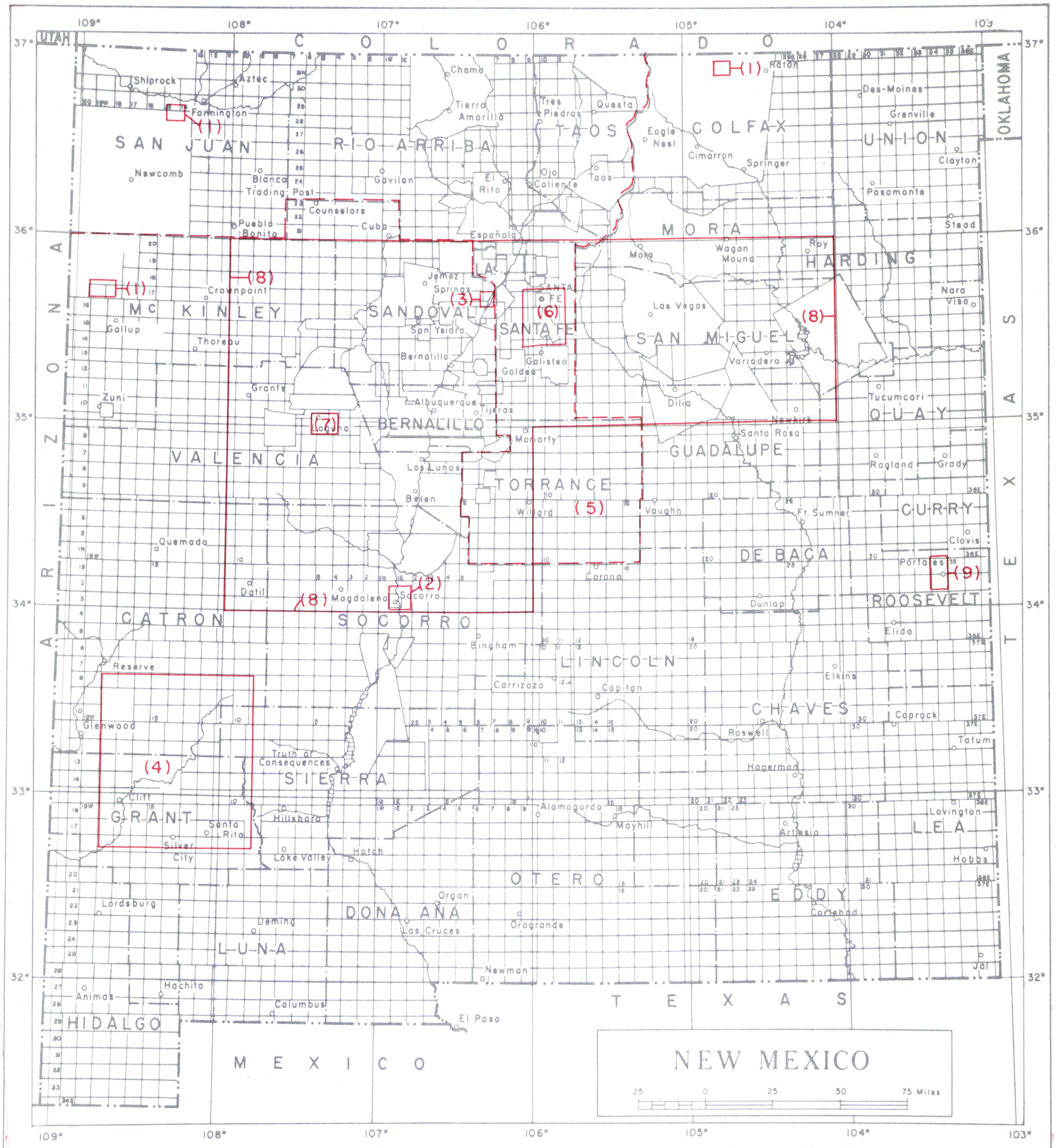
3 (MRU) Nuclear radiation hazards in mining: USBM(DMRC) and USBM(SMRC); USDI, USBM.
Control of exposure to radon daughter products in underground mines - wall sealant studies in Dakota Mine near Grants, New Mexico.

4 (EG,EVG,GM,GP,H,SG) Cochiti Lake Project: CE (Albuquerque).
Zoned earthfill embankment, outlet works, off channel spillway and irrigation works. Constructed on alluvial fill, basalt, and sandstone foundation. Dam is approximately 50 miles north of Albuquerque, New Mexico, on Rio Grande. Constructed for multiple use, i.e. flood control, irrigation and recreation.

5 (EG,G,GP,H,SG,SH) Los Esteros Lake Project: CE (Albuquerque).
Combination rolled earth and rockfill embankment, to be constructed for flood control and irrigation purposes, on the Pecos River at river mile 766.4 approximately 7 miles north of Santa Rosa, New Mexico. Embankment foundation will be on the Santa Rosa Formation.

6 (EG,G) Rio Puerco-Rio Salado: CE (Albuquerque).
Hidden Mountain on the Rio Puerco and one site on the Rio Salado. Survey reports have been written describing the general geology and a few borings made by the Soil Conservation Service.

7 Rio Grande Floodway: CE (Albuquerque) and BR.
Levee construction in Espanola, Socorro and Truth or Consequences areas and diversion channel in Las Cruces.



ENGINEERING GEOLOGY

ENGINEERING GEOLOGY (EG)

Environmental Geology (EVG), Land-use Planning (EL) Project

1 (EVG,GC,MRC,S,SP) Trace element analysis of potentially hazardous materials in New Mexico mineral resource products: K. Vonder Linden and J. Shomaker; NMSBMMR, UCMC.
To quantitatively determine the presence of potentially hazardous materials in mineral products produced in the state. Emphasis to date has been on determining trace element levels of mercury in coal.

2 (EVG,GM,G) Engineering geology of Socorro, New Mexico: K. Vonder Linden; NMSBMMR.
Study the geology of Socorro to define and evaluate geologic factors influencing the suitability of this area for development.

3 (GC) Geochemical investigation of allogenic and authigenic clays and water chemistry as factors in studying the permanency of Cochiti Dam: D. G. Brookins; UNM.
Determine stability of clay minerals being used in construction of Cochiti Dam.

4 (EVG,GM,G,SH,S) Late Cenozoic sedimentational and erosional history of the upper Gila River and upper Mimbres River drainages, southwestern New Mexico: D. Deal; SRSU.
Post-volcanic sedimentation (stratigraphy of the Gila Conglomerate) and later erosional history of the Gila River drainage upstream of the Big Burro Mountains, and of the Mimbres River drainage north of the Deming basin.

5 (EVG, EL, GM, G, MR, MRI, ST, BH) Geology and aggregate resources: A. D. Lovelace and others; NMSHD(GS), USDT(FHA).
Report includes discussion of geology and aggregate resources; 26, 30' quadrangle maps of the area, physiographic maps, materials inventory charts and other pertinent maps and charts.

6 (EVG,GM) Geology of urban development; northern Rio Grande basin: H. E. Malde; USGS (BRMEG).
Geologic mapping and specialized maps of environmental factors related to physical environmental and resource features.

7 (GM,SG) Mechanism of collapse over nuclear explosions: F. N. Houser; USGS(BSP).
Examination and detailed mapping of selected natural and man-made collapses. Includes sandstone pipes of Laguna area.

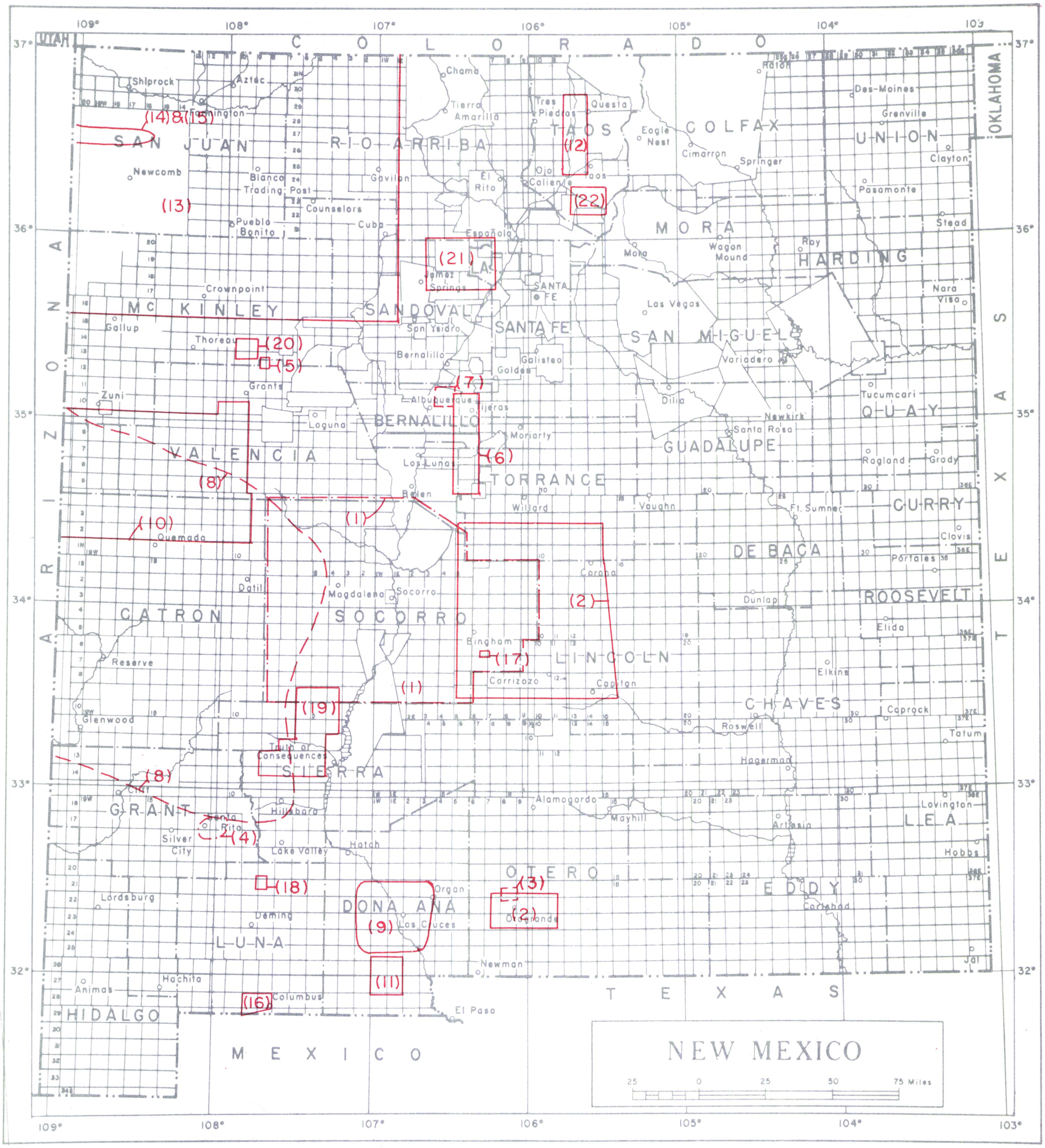
8 (EVG,GM) Environmental geologic studies, Rio Grande trough, New Mexico: G. 0. Bachman; USGS(BCEG).
Pilot environmental geologic studies and geologic mapping in the Santa Fe, Albuquerque, and Socorro 2° quadrangles.

9 (EVG,S,SP) The wind blown dust of Portales, New Mexico: J. H. Puffer; RSU.
Mineralogical and grain size variations are being correlated with wind speed and elevation.

Not Plotted (EGNP)

1 (EVG,HC) Mercury concentration in natural waters in New Mexico: L. Brandvold; NMSBMMR.
An investigation of mercury content of water in New Mexico.

2 (EVG,EL,G,GP,H,MR,S,SP,SG) New Mexico Remote Sensing Council: K. onder Linden and R. H. Weber; NMSBMMR, UNM(TAC), NMSU, and NMIMT.
To establish a multi-institutional group for effecting the development and efficient interrelationship of programs of research, education, utilization and information distribution in the application of remote sensing technology to the natural resource and environmental quality management problems of New Mexico and the adjacent region.



GEOCHEMISTRY

GEOCHEMISTRY (GC)

Project

1 (GM,M,MRM,S,SP) Geochemical prospecting: C. W. Walker and C. E. Chapin; NMSBMMR.
The use of trace elements in the mineral barite as indicators of base metal mineralization. A successful attainment of this project will represent a contribution to the advancement of knowledge in the general field of geochemical exploration.

2 (AD, HG, HC, MRM) Thermally controlled magnetite deposition in central New Mexico: R. E. Beane, F. B. Titus, jr., G. K. Billings; NMIMT, NMSBMMR.
Study of geologic controls responsible for deposition of magnetite adjacent to intrusive rocks and extension of results to prediction of paleo-groundwater flow patterns.

3 (MRM,IMP) Alteration and zoning in igneous rocks, Orogrande, New Mexico: L. Jaramillo, R. E. Beane; NMIMT, NMSBMMR.
Study of mineralogy and geochemistry in syenodioritic igneous intrusives and associated contact metamorphic deposits in central portion of Jarilla Mountains, Otero County, New Mexico (Orogrande district).

4 (MRM) Geochemical characteristics of mineralizing fluids, Santa Rita, New Mexico: R. E. Beane; NMIMT.
Study of mineral equilibrium relations and calculation of chemical characteristics of hydrothermal solutions responsible for porphyry copper alteration and mineralization at Santa Rita.

5 Geochemical-environmental baseline for uranium mining: G. K, Billings, L. Holt, G. Linn; NMIMT, GMC.
A pre-mining environmental baseline for heavy metals in soils, surface and groundwaters.

6 (AD,GM,IMP) Geochemistry and geochronology of the Precambrian rocks in New Mexico: D. G. Brookins, A. M. Kudo (UNM), and K. C. Condie (NMIMT).
Major and trace element studies of Precambrian volcanic and plutonic rocks; Rb-Sr age studies; some petrography. Initial emphasis will be on Los Pinos-Manzano-Sandia Precambrian. Chemical analyses complete for Los Pinos; age work in progress. Manzanos being sampled. Master's thesis (UNM) in progress in northern Sandias.

7 (IMP) Geochemical study of new locality of plagioclase-rich orbicular rocks, Sandia Mountains: A. M. Kudo and R. Enz; UNM.
Major and trace element study, petrographic isotopic work.

8 (IMP) Geochemistry of volcanic rocks associated with the Colorado Plateau: M. Murray; LSU.
To establish geochemical parameters that define the volcanic rocks surrounding the Colorado Plateau - distinguish it from other mid-tertiary rocks, and subdivide the rocks themselves.

9 (HG,HC) Geochemical investigation of composition of shallow groundwaters in Las Cruces region: M. Hocker; UC.

10 (AD,SG,V) Late-Cenozoic volcanism in west-central New Mexico: A. W. Laughlin (Prin. Invest.) and Grad. students, J. Carden, G. Gallagher, F. Dellechaie, M. Gawell; KSU.
Petrographic and geochemical study of the basalts and ultramafic inclusions of west-central New Mexico. Determination of the time of onset of volcanism, depth of magma generation and relation to tectonic pattern of the area.

11 (M, IMP, GP, GM, SG) Investigation of mafic and ultramafic rock inclusions in maar rocks in and around Kilbourne Hole, New Mexico: J. C. Butler and D. McGee; UH, UHGF.
A further thrust in the direction of Carter's classic work. Emphasis is placed on garnet-rich nodules and other rock types that were not previously recognized or described. Goal: to try to reconstruct the composition of the lower crust and upper mantle under southeastern New Mexico, and to compare with material from a similar locality in San Luis Potosi, Mexico. Geophysical surveys are also involved to determine more about the structure of the maar.

12 (IMP) Geochemistry of Taos basalts, New Mexico: D. E. Dunn and P. C. Ragland; UNC, NAS.
ailed chemical analysis focusing on the vertical and lateral variation of continental basalts from a single province, with emphasis on the variation within single flow units.

13 (MRP,HC,HH,S,SP) Geochemistry of Pennsylvanian, Jurassic and Cretaceous crude oils in the Four Corners Region: W. E. Reed (UCLA) and F. A. F. Berry (UCB); UCA.
Investigation into the geochemistry of various crude oils from Pennsylvanian, Jurassic and Cretaceous reservoir rocks in the four states of the Four Corners Region. Chromatographic analyses of various petroleum fractions. Characterization of oils by stratigraphic horizon, age, and present reservoir temperatures. Principal conclusion is that local organic environment determines crude oil composition.

14 (MRP,HC,HH,S,SP) Hydrodynamics, aqueous geochemistry, and sedimentary facies associated with Barker Creek Reef Bank of Pennsylvanian Age, New Mexico and Arizona: F. A. F. Berry (UCB); various independent and small oil companies.

15 (MRP,HC,HH,S,SP) Possible petroleum accumulations in Barker Creek Reef Bank, New Mexico and Arizona, including surface geochemical studies: F. A. F. Berry (UCB).

16 (IMP, M, MRM, MG) Trace base metal-petrography-rock alteration of the productive Tres Hermanas stock, Luna County, New Mexico: P. Doraibabu and P. D. Proctor; UMR, NMSBMMR.
To confirm or deny the existence of spatial and possible genetic relationships between the trace metals Zn, Pb, and Cu and the known mineral deposits and surrounding rock types, and to determine if the relationships established might be used as exploration tools in locating areas favourable to mineralization in unexposed areas of stocks of similar type.

17 (MRM,IMP,SP) Geochemical and biogeochemical studies of the Hansonberg mining district, New Mexico: A. Silverman and P. D. Proctor; UMR, NMSBMMR.

The objective of the research is to identify areas in the Hansonberg mining district having anomalous contents of copper, lead and zinc in the soils and plants, and to relate these, if possible, to the known occurrences of mineralization in the district. Some supplemental geologic and alteration mapping of the district is also underway.

18 (MRM,IMP,SP) Trace base metals-petrography-rock alteration and mineralization, Cook's Peak stock, Luna County, New Mexico: P. Doraibabu and P. D. Proctor; UMR, NMSBMMR.

A major purpose of the investigation was to determine if spatial and genetic relationships exist between various trace metals, petrography and alteration of the stock and ore deposits of nearby mining districts. Supporting objectives include comparison of the trace element patterns of this stock with other stocks and the evaluation of trace element patterns and/or rock alteration as guides for mineral exploration about the stocks.

19 (MRM) Basin Range exploration: H. V. Alminas; USGS (BER).

Geochemical sampling of the Sierra Cuchillo, adjacent eastern margin of the Black Range, and Hillsboro 15 minute quadrangle has been completed. MI series maps on the scale 1:48,000 and encompassing the entire sampled area are being prepared. These maps will show on a photofield reconnaissance and compiled (other sources) geologic base the distribution of copper, bismuth, zinc, lead, tungsten, tin, silver, molybdenum, and the mineral fluorite in heavy concentrates of stream sediment. Three map sets are utilized for this purpose.

Reports on the exploration geochemistry of the southern San Mateos and the Sierra Cuchillo are expected to follow. Preparation has begun.

20 Ambrosia Lake: H. C. Granger; USGS(BRMMR).

A laboratory study of ion exchange and its effect on the stability and leaching of synthetic natural glass, and an artificial ore roll model experiment, using pyrite.

21 (AD,M) Petrogenesis of the Polvadera Group, Jemez Mountains: R. A. Bailey; USGS(BFGP).

Electron microprobe, chemical analysis, K-Ar dating, and Sr-Rb isotope studies.

22 (AD,GM,IMP,M) Study of trace elements in muscovite: R. L. Gresens and H. L. Stensrud; UWA, NSF.

Precambrian metamorphic terranes in the Picuris Range and the Las Tablas quadrangle were investigated. 234 mica samples (mostly muscovite) and 66 whole rock samples were partially analyzed for 12 elements, including a number of minor and trace elements. 30 muscovite samples were analyzed by electron microprobe. The study includes (a) possible use of trace elements in mica as a guide to pre-metamorphic stratigraphy, (b) partitioning of trace and minor elements between biotite and muscovite, (c) chemical changes during progressive growth of muscovite, (d) occurrence of phlogopite in low Mg quartzo-feldspathic gneisses, and (e) occurrence and geochemistry of red muscovite from piedmontite-bearing schists. Some remapping and reinterpretation of Precambrian geology and stratigraphy are involved.

Not Plotted (GCNP)

1 (IMP,V) Pliocene-Holocene basalts of New Mexico: A. M. Kudo and K. Aoki; UNM.

Chemistry and petrology of basalts of New Mexico.

2 Sr isotopy of Tertiary and younger volcanics: D. G. Brookins, with A. M. Kudo; UNM.

3 (MRM) Regional variation in heavy metals of Colorado Plateau stratified rocks: R. A. Cadigan; USGS(BRMMR).

Geochemical statistical studies of the distribution and covariance of metallic elements in rock samples.

4 (M) Geology and geochemistry of humates: V. E. Swanson; USGS(BOFCR).

Solubility and metal-sorption studies of leonardite samples collected in New Mexico.

5 Distribution of elements: A. T. Miesch; USGS(BRGC).

Reconnaissance geochemical survey of Cambro-Ordovician rocks of the cratonic part of the western United States.

6 (S) Data of sedimentary rocks: H. A. Tourtelot; USGS(BRGC).

Compilation of published chemical analyses of sedimentary rocks of the United States. Analyses of rocks from Utah, Arizona, and New Mexico will be published as a separate report.

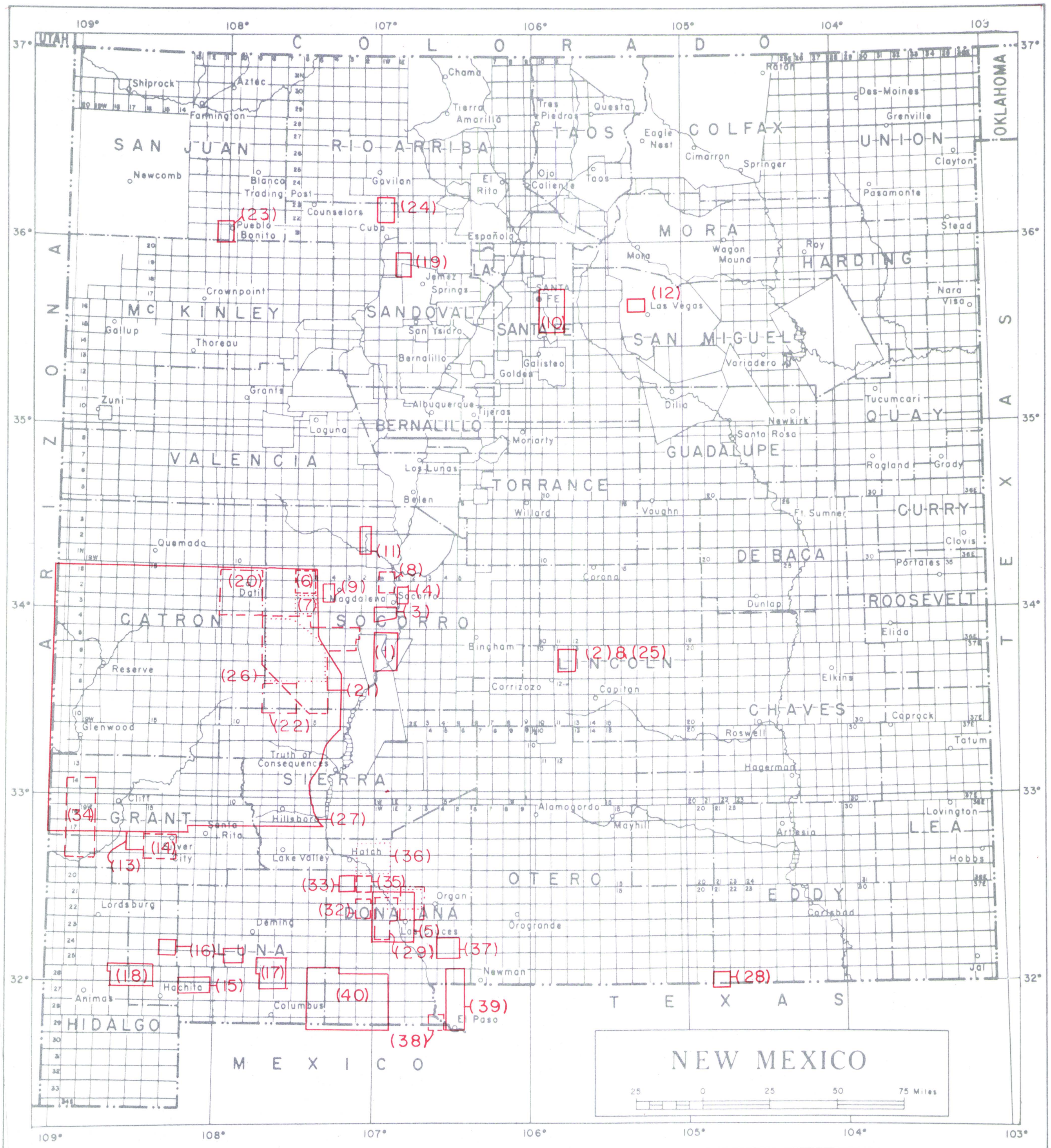
7 Basin and range granites: D. E. Lee; USGS(BRGC).

Reconnaissance geochemical survey of Mesozoic granitic rocks of the Basin and Range Province of the western United States.

8 Dispersion of elements in weathering: R. W. White; USGS(BRGC).

A study of chemical changes during weathering of basaltic rocks in diverse climates. Preliminary work includes a locality near Raton, New Mexico.

Geologic mapping 1-40 follows



GEOLOGIC MAPPING
(PROJECTS 1-40)

GEOLOGIC MAPPING (GM)

Structural Geology (SG), Astrogeology (AG)

Project

1 (GC,SG,G,IMP,V,S,SP,MRI) Geology of the southern Chupadera Mountains, Socorro County: J. Renault, C. W. Walker; NMSBMMR, Government.
General geology with special emphasis on the volcanic history and development of the Pliocene to Recent sedimentary series.

2 (AD,IMP,M,SG,MRM,SH,MG) Geology of the White Oaks Gold District, Lincoln County, New Mexico: M. E. Willard; NMSBMMR.
Sedimentary stratigraphy, tectonic structure, igneous history, ore mineralization.

3 (AD,IMP,MRM,M,MG,SG,SH) Geology and ore deposits of the Luis Lopez District, Socorro County, New Mexico: M. E. Willard; NMSBMMR.
Volcanic stratigraphy, tectonic structure, manganese mineralization.

4 (MRI,MRM,SG,SH) Geology of the Las Cruces quadrangle: F. E. Kottlowski (NMSBMMR) and W. R. Seeger (NMSU).
General geology, stratigraphy, and economic geology of the Las Cruces 15' quadrangle.

5 (MRM,M,MG,S,SP,SH,SG,GC,G,H) Origin of copper mineralization in Pennsylvanian sandstones, Chupadera Mines area, Socorro County, New Mexico: M. J. Jaworski (NMIMT) and K. Vonder Linden (NMSBMMR).
Investigating the origin of local zones of malachite and azurite in the upper Pennsylvanian rocks east of Socorro. Project involves mapping and petrographic study.

6 (SH,S,SG,MG,AD,IMP,MRM) Geology of the Tres Montosas-Council Rock area, Socorro County, New Mexico: R. Chamberlin; NMIMT, NMSBMMR.
Cenozoic stratigraphy and structure of the Tres Montosas-Council Rock area and an evaluation of its mineral potential:

7 (SH,S,MG,SG,AD,IMP,MRM) Geology of the Tres Montosas-Grey Hill area, Socorro County, New Mexico: W. H. Wilkinson; NMIMT, NMSBMMR.
Cenozoic stratigraphy and structure of the Tres Montosas-Grey Hill area and an evaluation of its mineral potential.

8 (IMP,SG) Geology of the Lemitar Mountains, New Mexico: T. M. Woodward; NMIMT, SX, NMSBMMR.
Geologic field mapping of the Lemitar Mountains north from Corkscrew Canyon (Canyoncito del Puertocito del Lemitar) about 5 miles. East-west extent from the pediment gravels on the east slope of the range in the Rio Grande Valley west to the pediment gravels bordering the La Jencia Basin (Snake Ranch flats) on the east side. Work will be concentrated on mapping and describing the igneous and metamorphic history along with the complex structural development dating back to Precambrian time.

9 (SH,S,SG,MG,AD,G,IMP,MRM) Geology of the Silver Hill area, Socorro County, New Mexico: D. B. Simon; NMIMT, NMSBMMR.
Cenozoic stratigraphy and structure of the Silver Hill area and an evaluation of its mineral potential.

10 (SG,IMP) Geology of southwestern Sangre de Cristo Mountains: A. J. Budding; NMIMT.
Structural and petrologic studies of the Precambrian in the southwestern Sangre de Cristo Mountains. Effect of Laramide and younger deformations on Precambrian basement and Phanerozoic sedimentary cover. Continuation of Picuris-Pecos fault zone south of N35°45'.

11 (GC,IMP,V) Precambrian geology of the Ladron Mountains: K. C. Condie, NMIMT.
Detailed field mapping of the Precambrian terrane in the Ladron Mountains with accompanying petrologic and geochemical studies.

12 (SG,SH,H,MRG) Geology and structure of the Montezuma, New Mexico area: W. Bejnar; NMHU, NMSBMMR.
Geologic description of the Montezuma area, including geologic structures, stratigraphy, and speculation about the hot springs.

13 (SG,SH,S,IMP,SP) Circle Mesa 7-1/2' quadrangle: J. E. Cunningham; WNMU, NMSBMMR.
Study nature of northern extensions of Paleozoic and Mesozoic sedimentary rocks, distribution of Cretaceous-Tertiary volcanics, and structure and distribution of post-volcanic sediments.

14 (IMP,MRM,S,SH,SP,SG) Geology of the Silver City 7-1/2' quadrangle: J. E. Cunningham; WNMU, NMSBMMR.

15 (SG,SH) Geologic mapping of the southern portion of the Klondike Hills, Luna County, New Mexico: L. J. Corbitt; ENMU.
The structure of this area is much more complicated than reconnaissance geologic maps indicate.

16 (SH,SG) Geologic mapping of the Snake Hills and Paleozoic outcrops northwest of the Victorio Mountains, Luna and Grant counties, New Mexico: L. J. Corbitt, R. Arnold and R. Varnell; ENMU.
These two areas exhibit tectonically mixed rocks. The structural complexity is interpreted to be the result of Laramide thrusting.

17 (IMP,SH,SG,AD) Geology of Florida Mountains area: Brockman Hills and other nearby mountain areas: L. J. Corbitt and R. Arnold, R. Varnell, W. Riggesbee; ENMU.

18 (AD,SH,SG) Geologic mapping of the Brockman and Coyote Peak 7-1/2' quadrangles: L. J. Corbitt and F. L. Nials; ENMU, NSF.
The Brockman Hills appear to be a series of northwest trending synclines and anticlines in the Cretaceous Mojado Formation, overturned to the northeast in front of the large northwest trending thrust faults in the Little Hatchet Mountains.

19 (SG,MRI,MRM,IMP,SH) Geologic mapping of San Miguel Mountain 7-1/2' quadrangle: L. A. Woodward; UNM, NMSBMMR.
Geologic mapping, 1:24,000.

20 (SG,IMP,V,SH) Geology of the Datil area, Catron and Socorro counties, New Mexico: P. Noftz; UNM, NASA.
General geology; volcanic stratigraphy and correlation.

21 (SG,V) Volcano-tectonic structures and their petrologic significance, San Mateo and southern Magdalena Mountains, Socorro County, New Mexico: E. Deal; UNM, NASA.
Geology of a large cauldron complex. Structure, petrology, geochemistry, regional geologic mapping.

22 (SG, MRM, IMP, V, SH) Geology of the northern end of the Sierra Cuchillo, Socorro County, New Mexico: R. Maldonado; UNM, USGS.
General geology and structure, volcanic stratigraphy and correlation; mineral deposits.

23 (SH) Geology of the Chaco Canyon area: C. T. Siemers; UNM.
Stratigraphy of Chaco Canyon area, including bedrock (Mesozoic) and Quaternary deposits.

24 (SH,SG) Geology of Regina 7-1/2' quadrangle: L. Woodward; UNM.

25 (MRM,SG,SH) Geology of Baxter Mountain, Lincoln County, New Mexico: J. R. Grainger; UNM.
Ore deposits, structure, and stratigraphy.

26 (IMP,AG,GC,MRM,SG) Geology of northern San Mateo Mountains: E. Deal; UNM, NASA.
Geology of a major rhyolite ash-flow tuff cauldron. Petrology, chemical analyses, some mineralization.

27 (AG,IMP,MR,SH,SG,V) Mogollon Plateau: W. E. Elston; UNM, NASA.
Evolution of Mogollon Plateau; mainly volcanic and structural history; regional geologic mapping.

28 (G,SG) Structural and speleological analysis of the McKittrick Hill area, Eddy County, New Mexico: D. Jagnow; UNM.

29 (SG,IMP,V,SH) Geology of the Cedar Hills-Selden Hills area, Dona Ana County, New Mexico: W. R. Seager and R. E. Clemons; NMSU.
Detailed mapping, petrography, structure and stratigraphy study; includes detailed report.

30 (SG,MRI,V,SH) Geologic map of the southern half of the San Diego Mountain quadrangle, Dona Ana County, New Mexico: W. R. Seager; NMSU, NMSBMMR.
Geologic map with short descriptive text.

31 (SG,MRM,V,SH) Geology of the Dona Ana Mountains, Dona Ana County, New Mexico: W. R. Seager and F. E. Kottlowski; NMSU, NMSBMMR.
Folded Permian rocks, complex volcanic stratigraphy and numerous monzonitic intrusives related to mineralization characterize the Dona Ana Mountains.

32 (SG, MP, V) Geology of the NE 1/4 of the Corralitos Ranch 15' quadrangle, Dona Ana County, New Mexico: R. E. Clemons; NMSU, NMSBMMR.
Detailed field mapping and description of volcanic stratigraphy, petrography, and structure; investigation of possible mineralization associated with volcanic activity.

33 (IMP, SH, SG, V) Geology of Souse Springs 7-1/2' quadrangle, Dona Ana County, New Mexico: R. E. Clemons and W. R. Seager; NMSU, NMSBMMR.
Detailed field mapping and description of volcanic stratigraphy and structure.

34 (IMP,V,SG) Geology of Blue Creek Basin, New Mexico: W. R. Seager and R. E. Clemons; NMSU.
Geologic mapping, volcanology, structure and petrography of the area from Mule Creek, Arizona, to Red Rock, New Mexico.

35 (IMP,MRM,SH,SG,V) Geology of Sierra Alta 7-1/2' quadrangle, Dona Ana County, New Mexico: W. R. Seager and R. E. Clemons; NMSU, NMSBMMR.
Detailed field mapping and description of volcanic stratigraphy and structure. Also possible mineralization associated with the volcanic activity.

36 (MRI,MRM,SH,SG) Geology of the Rincon and northeastern Hatch quadrangles, Dona Ana County, New Mexico: W. R. Seager and J. W. Hawley; NMSU, NMSBMMR.
Geologic map and text of 7-1/2' quadrangle including account of barite, fluorite, manganese, sand and gravel, and clay deposits.

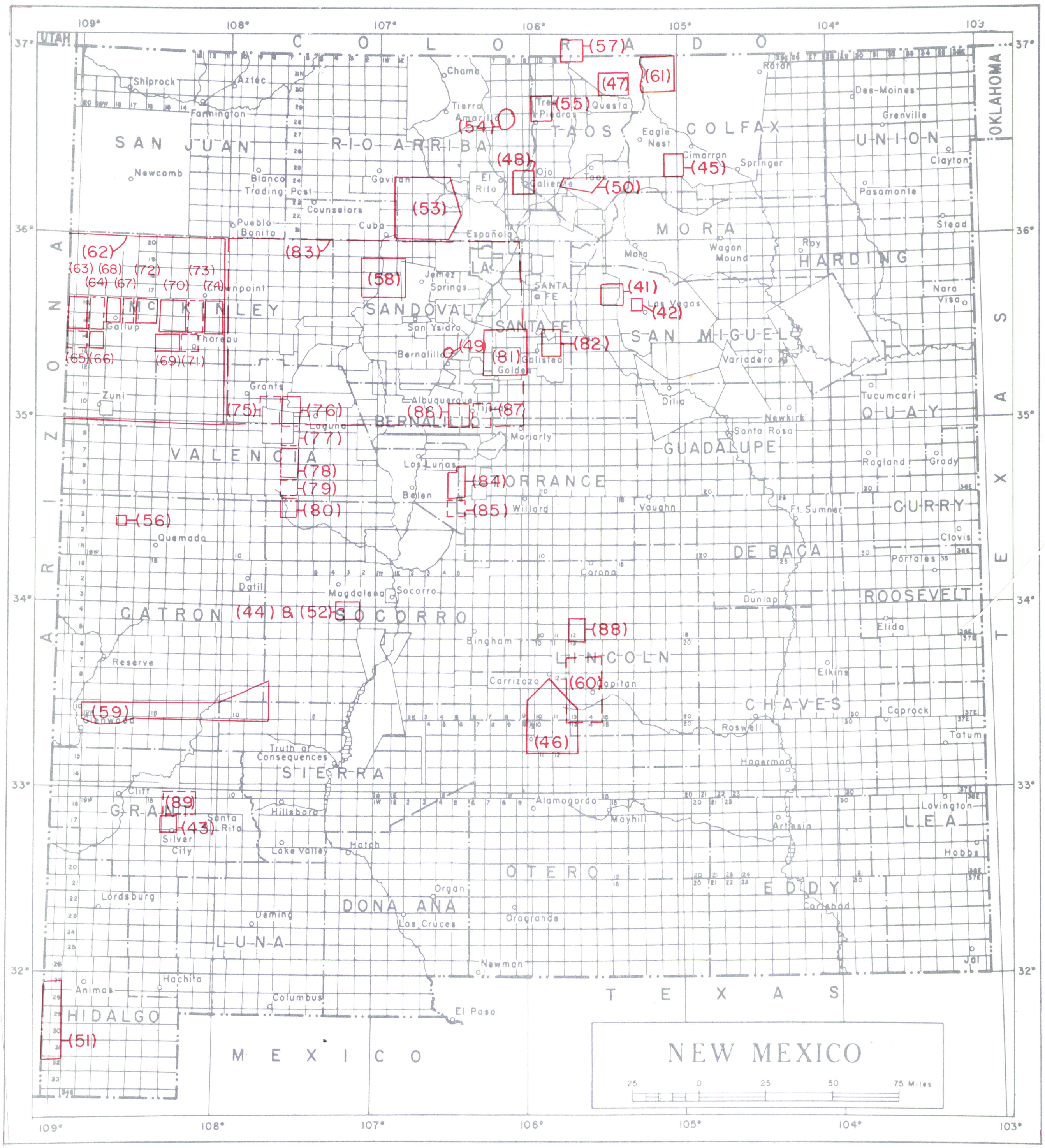
37 (MRI,SH,SG) Geology of the Bishop Cap and southwestern Organ Mountain area, Dona Ana County, New Mexico: W. R. Seager and W. V. Kramer; NMSU.
General geology of area including map, sections, and an account of barite, fluorite deposits.

38 (G,MRI,SH,SG) Structural geology of the Cristo Rey uplift: E. M. P. Lovejoy; UTEP, NMSBMMR.

39 (SG,AD,G) Tectonics of the Franklin Mountains, Texas and New Mexico: E. M. P. Lovejoy; UTEP.
Detailed mapping and structural and geomorphic studies of the Franklin Mountains as related to Basin Range Cenozoic tectonics.

40 (IMP,M,MRI,SG) Geology of the Potrillo Volcanics: J. M. Hoffer; UTEP, NASA, NMSBMMR.

Geologic mapping 41-89 follows



GEOLOGIC MAPPING
(PROJECTS 41-89)

Project

41 (SG,IMP) Precambrian geology of the upper Gallinas Creek and surrounding area: G. W. Book; TTU.

The principal objective of this thesis is to determine the structural-metamorphic Precambrian history of the area, from field mapping, with an emphasis on small-scale structures, and from microscopic, petrographic and microtextural analysis of field samples.

42 (SG,IMP) Precambrian outcrops near Montezuma, New Mexico: C. A. Cathey; TTU.

Petrological and structural studies.

43 (G,IMP,SH,S,SP,SG) Systematic mapping of sedimentary and volcanic rocks northwest of Silver City, New Mexico: C. Norman, D. Van Siclen, J. Solliday, and others; UH, UHGF.

Systematic mapping and field technique training of undergraduate and graduate students. Sedimentological and petrological studies and interpretations of sedimentary and volcanic units.

44 (SH,SP,SG,AD,GC,G,MR,IMP,MRM) Geology of the Magdalena Mountains, North Baldy to South Baldy: D. A. Krewedl; UA, NMSBMMR.

Stratigraphy, structure, and magnetism in the central Magdalena Mountains with emphasis on mineral exploration.

45 (IMP,AD,SG) Geology of the Rayado Creek area, Philmont Ranch area, Cimarron, New Mexico: C. W. Barnes; NAU, BSA.

Geologic mapping and structural analysis of Precambrian igneous and metamorphic terrane in southwestern corner of Philmont Boy Scout Ranch.

46 (AD,GC,GPM,M,MRM,SG,SH) Geology of the Sierra Blanca igneous complex, New Mexico: T. B. Thompson; OSU, OSURF.

Detailed geologic mapping, geochemical studies for metals, hydrothermal alterations associated with the hypabyssal stocks of the area, volcanic stratigraphy and geochronology, ore mineral genesis by microscopy and sulfur isotopes, magnetic susceptibility of hydrothermally-altered rocks.

47 (IMP,M,GC) Precambrian history of the Sangre de Cristo Mountains, northern New Mexico: H. W. Day and P. D. Noland; UO, Society of Sigma Xi.

Detailed study of Precambrian rocks in vicinity of Comanche Point.

48 (IMP,MRI,SH,SG) Geology of the Ojo Caliente quadrangle, New Mexico: R. H. Jahns (SU) and W. R. Muehlberger (UTA); NMSBMMR.

Investigation of an area featured by Precambrian igneous and metamorphic rocks, a thick section of Tertiary strata, and complex structures.

49 (SG,AG,GPM,V) Geology and rock magnetism--Canjilon Hill diatreme, Bernalillo, New Mexico: F. E. Mutschler; EWSC.

50 (AD,SG) Polyphase deformation of the Picuris Range, New Mexico: D. E. Dunn and K. C. Nielsen; UNC.

Decipher the structural history of an area (Picuris Range) that has experienced three and possibly four discrete folding events.

51 (IMP,MR,SH,SG) Geology of southern Peloncillo Range and adjacent areas: R. V. McGehee, J. Yellick, D. Gebben; WMU, NMSBMMR.

Mainly volcanic geology, geologic mapping and interpretation of stratigraphy, structure and geologic history.

52 (SG,MG,MRM,V) Geology of the Kelly Mining district, Socorro County, New Mexico: R. Blakestad; UC, NMSBMMR.

Geologic mapping of the Kelly district with emphasis on the volcanic stratigraphy, structure and intrusives.

53 (G,SG) Geology of Phanerozoic rocks on the northern end of the San Pedro Mountains, New Mexico: G. G. Gibson; CC, NMSBMMR.

54 (SG,MP,IMP) Precambrian rocks of the Hopewell Lake area, Rio Arriba County, New Mexico: R. B. Parker; UWY.

Structural mapping of Precambrian rocks.

55 (MRI,V) Geology and extrusion history of the No Aqua perlite domes, Taos County, New Mexico: K. A. Naert; PASU, NMSBMMR, JMPC.

Aside from geologic mapping and the determination of the extrusion history of the No Agua perlite domes, emphasis is being placed on factors which control the expansion characteristics of perlite.

56 (GC,SG,AD,GP,GPG,GPM,MP,IMP,ST,SH,TM) Geology, petrochemistry, and geophysics of the Zuni Salt Lake volcanic crater, Catron County, New Mexico: D. Cummings (OC) and R. D. Regan (USGS); USGS, NASA.

Geologic mapping, petrography and petrochemistry of igneous rocks and geophysical studies (magnetic, gravity, and seismic refraction) of the volcanic crater and immediate vicinity. Interpretations are based on all above aspects of the study.

57 (AD,GC,SG,G,IMP,V,SH) Geology of the San Luis Hills, south-central Colorado: R. L. Burroughs; ASC.

The San Luis Hills cover an area of 428 square miles in the center of the San Luis basin located at the northern end of the Rio Grande depression. They consist of volcanic rocks of the Tertiary Conejos Formation intruded by Late Oligocene stocks dated at 27.7 m.y. Three local members of the Conejos Formation were recognized. The volcanics are of intermediate composition having a SiO_2 content ranging from 53 to 65 percent. Large dikes intruded along fracture zones produced in conjunction with faulting. Blocks east of the Rio Grande were tilted in that direction. Beginning in Early Miocene time the San Luis basin began to subside. The San Luis Hills were "left behind," and perhaps partially uplifted to form an intrarift horst. The hills were subsequently eroded to a mature topography and surrounded by sediments of the Santa Fe and Alamosa formations as the basin continued to subside. In Late Pliocene time tholeiitic olivine basalts of the Servilleta Formation were erupted along deep-seated fractures in the Rio Grande rift. These plateau basalts flooded around the southern and eastern margins of the San Luis Hills. After faulting of the Servilleta basalts and further deposition of sediments around the hills the area was rejuvenated, resulting in superposition of the Rio Grande across the hills and formation of the La Sauses gorge. The San Luis Hills are presently being exhumed.

58 (P,SH,S,SP,SG) Stratigraphy of the La Ventana area: J. W. Parker; AC.
Stratigraphy of what is assumed to be a delta of upper Cretaceous age in La Ventana area.

59 (V,GPG,SG,SH) Geology of strip across Mogollon Plateau (near Mogollon to north of Winston): P. J. Coney; MC, NASA.
General geology, especially volcanic stratigraphy and structure. Gravity survey.

60 (MRC,SH,SG) Geology of Capitan 15' quadrangle, New Mexico: J. E. Allen; PSU, NMSBMMR.
Geology and coal deposits of the Capitan area.

61 (MRC) Western Raton coal field: C. L. Pillmore; USGS(BOFCR).
Geologic mapping of east-half and coal-bearing part of west-half of Ash Mountain 15' quadrangle.

62 (MRU,SG) Geologic map, Colorado Plateau, Gallup 2° quadrangle: R. J. Hackman; USGS(BRMEG).
Geology, structure, and uranium deposits of the Gallup 2° quadrangle.

63 (MRC) Sampson Lake 7-1/2' quadrangle: J. E. Fassett; USGS(CDBMC).
Quadrangle geologic mapping of the Gallup-West area, New Mexico. Detailed geologic mapping of lands currently in outstanding coal land withdrawals to determine the occurrence of leasable minerals meeting standards of classification to avoid alienation of Public lands available for such minerals. Includes measuring and mapping of coal beds and collecting coal samples for analysis. Prime object in mapping this area is to obtain sufficient data on coal occurrence to justify formal reclassification of those lands now in Public Land withdrawals.

64 (MRC) Gallup West 7-1/2' quadrangle: J. E. Fassett; USGS(CDBMC).
See Sampson Lake quadrangle.

65 (MRC) Manuelito 7-1/2' quadrangle: J. E. Fassett; USGS(CDBMC).
See Sampson Lake quadrangle.

66 (MRC) Twin Buttes 7-1/2' quadrangle: J. E. Fassett; USGS(CDBMC).
See Sampson Lake quadrangle.

67 (MRU,MRI,MRC,SP,SG,M,SH) Church Rock 7-1/2' quadrangle: M. W. Green; USGS(BRMMR).
Wingate project. To provide background information as an aid to exploration and development of uranium resources and other commodities such as coal and limestone within the southern part of the Gallup mining district, New Mexico, by the following means: (1) completion of geologic mapping within the designated area, and (2) study of the stratigraphic relationships within the district and the adjacent region.

68 (MRU,MRI,MRC,SP,SH,M,SG) Gallup East 7-1/2' quadrangle: M. W. Green; USGS(BRMMR).
See Church Rock quadrangle.

69 (MRU,MRI,MRC,SP,SH,M,SG) Continental Divide 7-1/2' quadrangle: M. W. Green; USGS(BRMMR).
See Church Rock quadrangle.

70 (MRU,MRI,MRC,SP,SH,M,SG) Mariano Lake 7-1/2' quadrangle: M. W. Green; USGS(BRMMR).
See Church Rock quadrangle.

71 (MRU,SP,M,SH,SG) Thoreau 7-1/2' quadrangle: J. F. Robertson; USGS(BRMMR).
Thoreau area project. Determine by detailed mapping of four 7-1/2' quadrangles the stratigraphy and structure in the Gallup-Thoreau area, McKinley County, New Mexico that will provide important geologic information in the exploration for and development of uranium and other actual and potential mineral and fuel commodities. Studies of sedimentary and tectonic structures particularly within the Morrison Formation and the overlying Dakota Sandstone that might provide clues with respect to the favorable environment of deposition for uranium.

72 (MRU,SP,M,SH,SG) Pinedale 7-1/2' quadrangle: J. F. Robertson; USGS(BRMMR).
See Thoreau quadrangle.

73 (MRU,SP,M,SH,SG) Hosta Butte 7-1/2' quadrangle: J. F. Robertson; USGS(BRMMR).
See Thoreau quadrangle.

74 (MRU,SP,M,SH,SG) Casamero Lake 7-1/2' quadrangle: J. F. Robertson; USGS(BRMMR).
See Thoreau quadrangle.

75 (MRU,GC,SH,M,SP) McCartys 7-1/2' quadrangle: C. H. Maxwell; USGS(BRMMR).
The project includes detailed mapping of six 7-1/2' quadrangles across the Jurassic overlap south and updip from the Laguna district, southern San Juan Mineral Belt, and correlation of stratigraphy and litho-facies with adjacent areas; petrographic, chemical, and mineralogic studies of uranium bearing formations and of alteration zones in sandstones across the overlap, and a search for evidence of source and movement of uranium and of conditions during deposition of uranium in the deposits to the north.

76 (MRU,GC,SH,M,SP) Cubero 7-1/2' quadrangle: C. H. Maxwell; USGS(BRMMR).
See McCartys quadrangle.

77 (MRU,GC,SH,M,SP) Acoma Pueblo 7-1/2' quadrangle: C. H. Maxwell; USGS(BRMMR).
See McCartys quadrangle.

78 (MRU,GC,SH,M,SP) East Mesa 7-1/2' quadrangle: C. H. Maxwell; USGS(BRMMR).
See McCartys quadrangle.

79 (MRU,GC,SH,M,SP) Broom Mountain 7-1/2' quadrangle: C. H. Maxwell; USGS(BRMMR).
See McCartys quadrangle.

80 (MRU,GC,SH,M,SP) Pueblo Viejo Mesa 7-1/2' quadrangle: C. H. Maxwell; USGS(BRMMR).
See McCartys quadrangle.

81 (SH,SG) Madrid 15' quadrangle: G. O. Bachman; USGS(BRMEG).
Geologic mapping and stratigraphic studies.

82 (SH,SG) Bull Canyon 7-1/2' quadrangle: R. B. Johnson; USGS(BRMEG).
Geology, structure, mechanics of deformation, and sedimentary history of area.

83 (MRU,SG) Geologic map, Colorado Plateau, Albuquerque 2° quadrangle: D. G. Wyant; USGS(BRMEG).
Geology, structure, and uranium deposits of the Albuquerque 2° quadrangle.

84 (SH,S) Capilla Peak 7-1/2' quadrangle: D. A. Myers; USGS(BRMEG), and E. J. McKay; USGS(BOFCR).
West Manzano Mountains. Geologic mapping and facies relationships.

85 (SH,S) Torreon SW 7-1/2' quadrangle: D. A. Myers; USGS(BRMEG).
See Capilla Peak quadrangle.

86 (SH,S) Tijeras 7-1/2' quadrangle: D. A. Myers; USGS(BRMEG).
See Capilla Peak quadrangle.

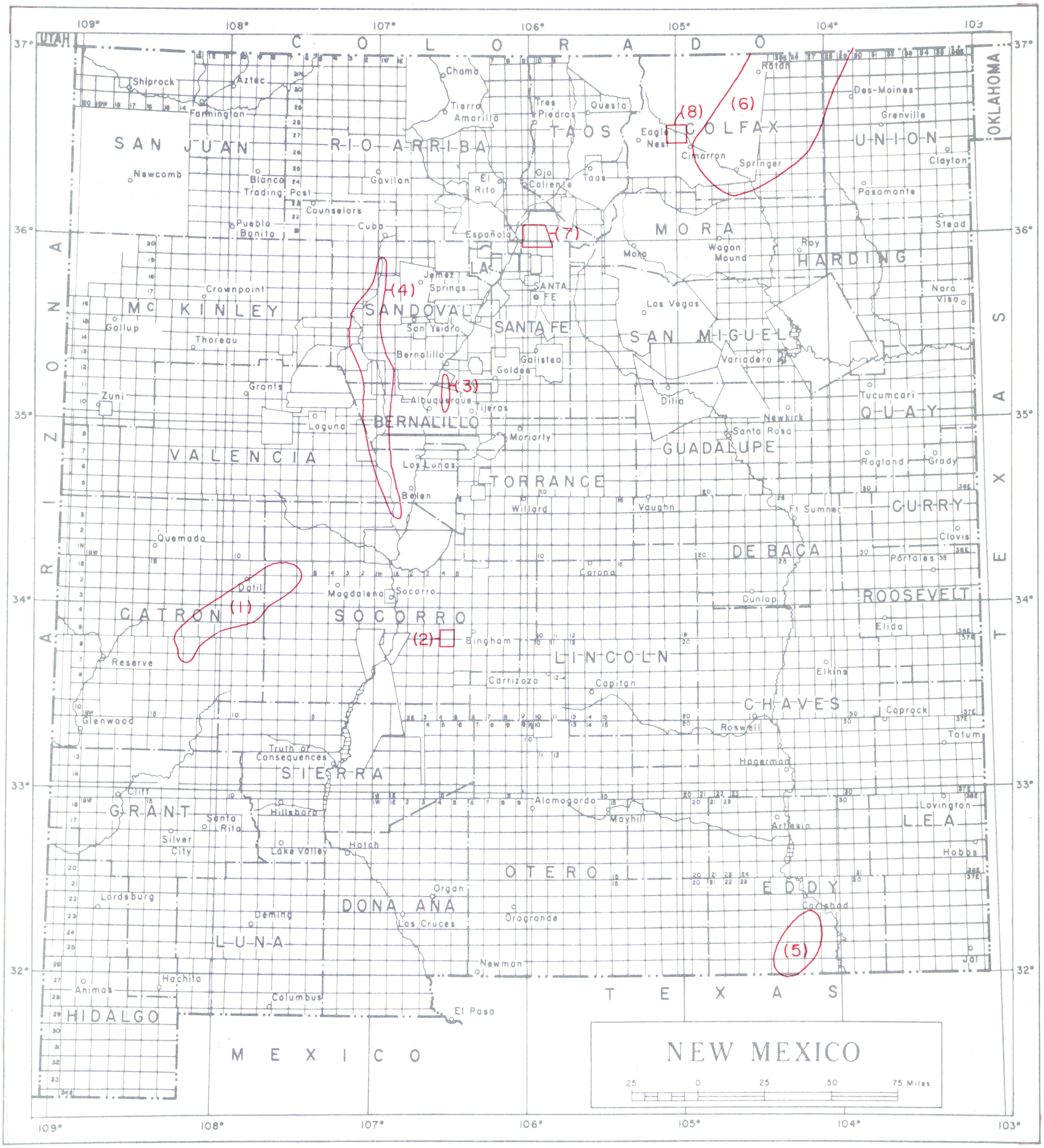
87 (SH,S) Sedillo 7-1/2' quadrangle: D. A. Myers; USGS(BRMEG).
See Capilla Peak quadrangle.

88 (MRM,GC) Genesis placer gold deposits: K. Segerstrom; USGS(BRMMR).
Geologic mapping of the Ancho-Jicarilla mining district.

89 (MR) Pinos Altos Range, New Mexico: T. L. Finnell; USGS(BCMR).
A revision of the Twin Sisters quadrangle to include the mapping and resources study of the adjoining Reading Mountain 7-1/2' quadrangle.

Not Plotted (GMNP)

1 (G,GP,H,IMP,MRM,SG,S,SP) Geologic analysis and evaluation of ERTS-A imagery for the State of New Mexico: F. E. Kottlowski, C. E. Chapin, A. R. Sanford, F. B. Titus, K. Linden, M. E. Willard; NMSBMMR, NMIMT, NASA.
To study ERTS-A satellite imagery to increase our understanding of the geology of New Mexico and to evaluate telemetered satellite imagery as a geologic tool.



GEOMORPHOLOGY

GEOMORPHOLOGY (G)

Project

1 (AD,EVG,GM,P,S,SP,SH,SG) Geomorphology of Plains of San Agustin: R. H. Weber; NMSBMMR.

Mapping of Pleistocene shoreline features and investigation of sedimentation, soil morphology, paleontology, and archeological adaptations in White Lakes and C bar N basins and correlations with related features in Lake Agustin basin.

2 CEVG,AD,S,SP,SH) Geology and archeology of Mockingbird Gap site: R. H. Weber (NMSBMMR) and G. A. Agogino (ENMU).

Geology, soils morphology, archeology of large Early Man camp site in Jornada del Muerto.

3 (GC,S,SP) Evolution of arkosic sediments in an arid climate: C. T. Siemers and J. R. Dickson; UNM.

Weathering of Sandia Granite near Albuquerque and textural and mineralogical changes of arkosic sediments during transport from source area (up to 10 miles transport on pediment).

4 (AD,SH) Geology (geomorphology) of Rio Puerco: F. L. Nials; ENMU.

Study by series of cross sections, C14 dating, description of lithology, and relation to anthropology sites.

5 (SH) Solutional processes and Quaternary history of the Guadalupe Escarpment, southeastern New Mexico: D. Deal; SRSU, NPS, GCS.

A long-term series of small investigations aimed at understanding the cave-forming erosional and depositional history of the Guadalupe Escarpment, with special attention to those details that reflect on the Quaternary climatic fluctuations and erosional history of the area. Work concentrated mainly in Carlsbad Caverns National Park and the Lincoln National Forest southwest of the park.

6 Pediments: A regional overview and interpretation: K. M. Hussey; ISU.

Pediments have been observed east of the southern Rockies and in the Big Horn Basin of Wyoming (from north-central New Mexico to north-central Wyoming), certain similarities suggest a common regional process. It is hoped that data gathered in the near future will allow for further substantiation of a reasonable interpretation.

7 (AD,MP,V,ST,S) Late Cenozoic history of the Espanola Basin, New Mexico: K. Manley; UC, GSA.

The project concerns the stratigraphic relationships of the post Santa Fe Group deposits and the erosional-depositional history of the basin, including the inception of through-flowing drainage (the ancestral Rio Grande). Correlation will be on the basis of radiometric dating and the identification of volcanic ashes.

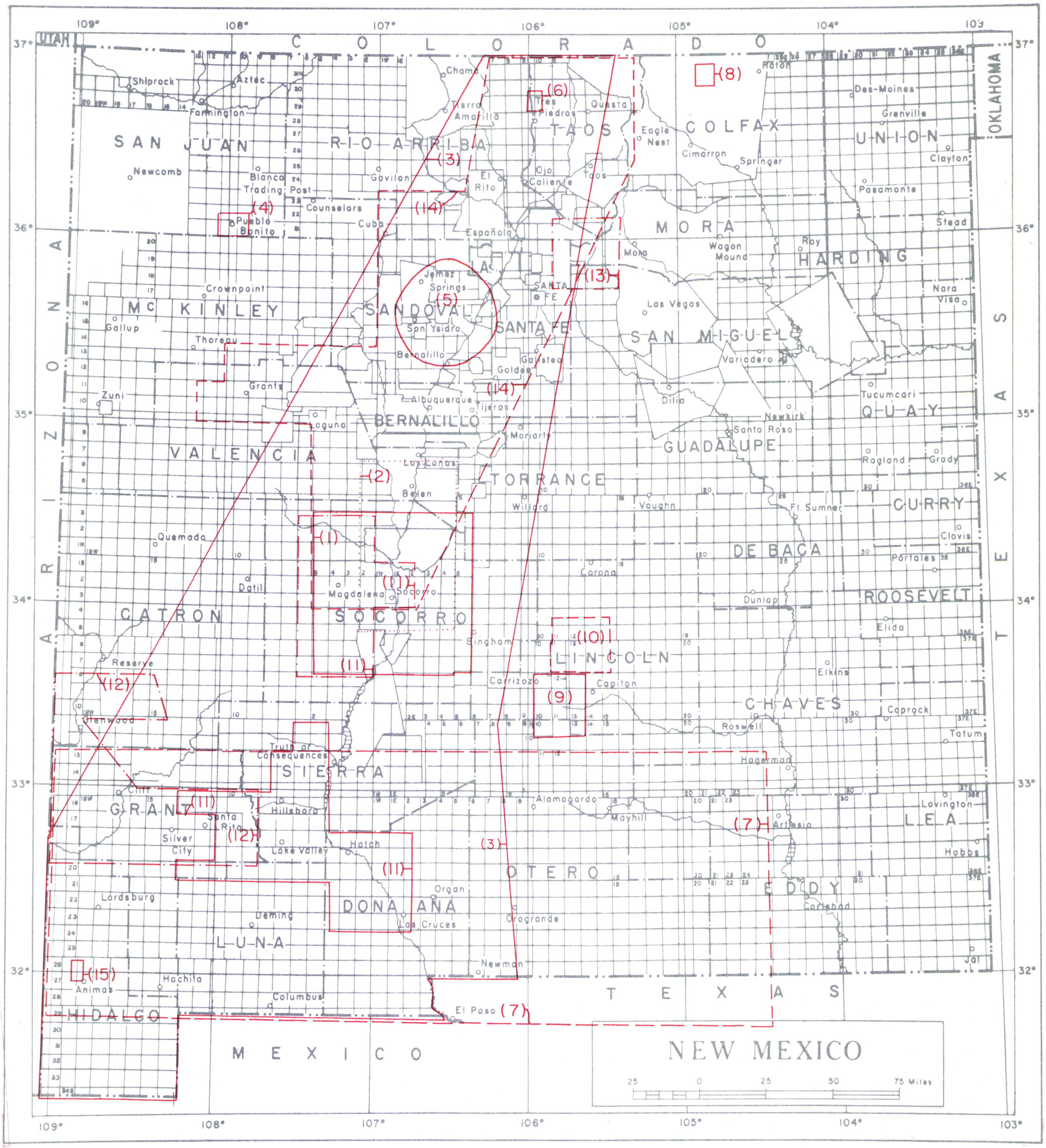
8 (EVG,EG,GM,H) Large-scale mass-movement in Cimarron Canyon, Colfax County, New Mexico: R. C. Anderson; AUG, ISU.

This is an investigation of the mechanics, topographic expression, and chronology of a series of large slumps (toreva-blocks of Reiche, 1937) on the north side of Deer Lake Mesa, in Cimarron Canyon, Colfax County. The area is of particular interest because the slumping was accompanied, perhaps dependent upon, extensive piping of the mesa-capping Poison Canyon conglomerate. As a result, two large, closed depressions formed on the top of the mesa: depressions whose origin has hitherto been tentatively ascribed to wind action (Robinson and others, 1964). Backward rotation of the slump blocks has produced numerous closed depressions below the mesa along the sides of Cimarron Canyon. A significant late Quaternary pollen record from this climatically sensitive area is probably preserved in the sediments of these ponds.

Not Plotted (GNP)

1 The geomorphic evolution of the Pecos River: R. G. Thomas; BU.

The geomorphic evolution of the Pecos River was controlled by a sequence of tectonic events of both regional and local extent. The events are recorded in the Pecos Valley by alluvial deposits, cave systems, and anomalous valleys.



COLORADO
ARIZONA
TEXAS
OKLAHOMA
MEXICO
UTAH
NEW MEXICO
SAN JUAN
RIO ARRIBA
TAOS
COLFAX
UNION
MC KINLEY
SANDOVAL
SANTA FE
MORA
HARDING
SAN MIGUEL
VALENCIA
BERNALILLO
TORRANCE
GUADALUPE
QUAY
CATRON
SOCORRO
LINCOLN
DE BACA
CURRY
ROOSEVELT
CHAVES
GRANT
SIERRA
OTERO
LEA
EDDY
DONA ANA
LUNA
HIDALGO
Shiprock
Aztec
Farmington
Newcomb
Blanco Trading Post
Counselors
Gavilan
Cuba
Pueblo Bonito
Chama
Tierra Amarillo
Tres Piedras
Questa
Taos
El Rito
Ojo Caliente
Española
Eagle Nest
Cimarron
Springer
Raton
Des Moines
Grenville
Clayton
Pasamonte
Stead
Roy
Mora
Wagon Mound
Nara Visa
Crownpoint
Gallup
Thoreau
Jemez Springs
San Ysidro
Bernalillo
Santa Fe
Las Vegas
Galisteo
Golden
Grants
Zuni
Laguna
Albuquerque
Tijeras
Moriarty
Dilia
Variadero
Newkirk
Santa Rosa
Tucumcari
Los Lunas
Belen
Willard
Vaughn
Ft. Sumner
Ragland
Grady
Clovis
Portales
Quemado
Datil
Magdalena
Socorro
Corona
Dunlap
Elida
Bingham
Carrizozo
Capitan
Elkins
Reserve
Glenwood
Roswell
Caprock
Tatum
Truth or Consequences
Hagerman
Cliff
Hillsboro
Santa Rita
Silver City
Lake Valley
Alamogordo
Mayhill
Artesia
Lovington
Hobbs
Hatch
Organ
Lordsburg
Deming
Las Cruces
Orogrande
Carlsbad
Newman
Jal
Hachita
Animas
Columbus
El Paso
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GEOPHYSICS

GEOPHYSICS (GP)

Gravity (GPG), Magnetic (GPM), Heat Flow (GPH), Earthquake Seismology (GPS), Infrared (GPI)

Project

1 (GPG) Gravity survey of the Rio Grande rift zone, Socorro County, New Mexico: A. R. Sanford and students; NMIMT.

The gravity survey is a continuation of work reported in New Mexico Bureau of Mines Circular 91. The purpose is to determine (1) the near-surface structure of the Rio Grande rift zone (in particular, positions and character of faults, and thickness of Santa Fe Formation), and (2) the variation in thickness of the crust across the rift. Eventually we hope to relate the structural characteristics of the rift to seismicity, heat flow, etc.

2 (GPS,SG) Determination of crustal structure in the Rio Grande rift zone: A. R. Sanford; NMIMT.

The purpose of the proposed research is to determine crustal structure in the Socorro to Albuquerque segment of the Rio Grande rift zone. The primary data for this study is arrival times of prominent phases other than direct P and S that appear on seismograms with epicenters near Socorro. Other information on crustal structure will come from Socorro Station records of earthquakes near Albuquerque.

3 (MRG, H, GPH, SG, IMP, EVG) Geothermal investigations of the Rio Grande rift, New Mexico and Colorado: M. A. Reiter; NMIMT, BR, USBM, USGS, NSF, OSW, NMSE, ISC, NMSBMMR, NMSU, UNM.

The Rio Grande rift is one of the more prominent geological features in the western U.S. It extends from the San Luis Valley in Colorado in approximately a south-southwest direction through New Mexico. The Rio Grande follows this rift from Alamosa, Colorado, to El Paso, Texas. Results of previous heat flow measurements include various geothermal anomalies along the rift. Investigations are now underway by the New Mexico Institute of Mining and Technology under grant from National Science Foundation. This investigation includes a preliminary examination of the thermal region of the Rio Grande rift system and its potential as a large geothermal water reservoir. The investigation consists primarily of collecting heatflow data in existing drill holes. Appropriate conclusions and recommendations will be made for more detailed investigations of potential areas.

4 (GPS,S) Seismic profiles of the Pleistocene-Holocene alluvial canyon-fill sediments of Chaco Canyon National Monument area, north-west New Mexico: C. T. Siemers, G. R. Jiracek, D. Lewis, and T. L. Shipman; UNM, NPS.

Detailed profiles of canyon-fill sediments using portable seismic equipment. This data to be compared with cores to be obtained in the near future. Purpose of study is to determine erosional and depositional history of the canyon and their effects on the historical ruins in the national monument.

5 (H,HG,MRG) Shallow electrical resistivity surveys in New Mexico: S. Brandwein; UNM.

Resistivity surveys near Albuquerque volcanoes, San Ysidro Warm Springs, and in Jemez Mountains.

6 (GPG,GPM) Gravimetric and magnetic ground survey of the No Agua perlite deposits: J. Kowatch; PASO, JMPC.

A Worden gravimeter and flux gate magnetometer were used in an attempt to determine the lateral extent of the volcanic vents through which the perlites were extruded.

7 (GPG,GPM,GPH,MRG) Geophysical studies in the southern Rio Grande rift: E. R. Decker and S. B. Smithson; UWY, NSF.

Regional geophysics and radioactivity measurements related to geothermal anomalies. Geothermal measurements and two boreholes drilled to define the thermal structure associated with the Rio Grande rift.

8 (EG,GPI) Infrared investigation, York Canyon Mine, Colfax County, New Mexico: R. M. Stateham; USBM (DMRC).

Determination of loose slab thickness or failure rates by infrared techniques.

9 (GPM,MR) White Mountains magnetic study: USGS(RGB).

Aeromagnetic survey flown in 1970 in support of wilderness area mineral resource evaluation. Flown at 12,500 ft. barometric: scale 1:62,500. Contour interval 20 gammas.

10 (GPM,MR) Jicarilla Mountains magnetic study: USGS(RGB).

Aeromagnetic survey flown in 1970 in support of mineral resources study. Flown at 9,000 ft. barometric: scale 1:62,500. Contour interval 20 gammas.

11 (GPM,MRM) Aeromagnetic maps: USGS(RGB), NMSBMMR.

Aeromagnetic maps equivalent in area to 21, 15 minute quadrangles.

12 (GPG, MRM) Gravity study of Reserve, Silver City, San Lorenzo area: D. L. Peterson and G. P. Eaton; USGS(RGB).

Bouguer gravity map defining location and trend of what is interpreted as buried Precambrian, Paleozoic, and Laramide rocks beneath the younger volcanic rocks of the Mogollon Plateau and environs.

13 (GPM,MR) Pecos magnetic study: USGS(RGB).

Aeromagnetic survey flown in 1970 in support of wilderness area mineral resource evaluation. Flown at 13,500 ft. barometric: scale 1:62,500. Contour interval 20 gammas.

14 (GPG,GPM) Jemez Mountains and Rio Grande graben aeromagnetic and gravity studies: L. Cordell and H. R. Joesting (deceased); USGS(RGB).

Detailed gravity and aeromagnetic coverage of the Jemez Mountains and adjoining parts of the Rio Grande graben. Gravity data contoured at 2 mgals. Average station density 1 per 5 sq. miles. Magnetics flown at 9,000 and 11,000 ft. barometric. Contour interval is 20 gammas for both sets of data. Compiled at 1:250,000 scale.

15 (GPI,HG) Remote sensing-geothermal: K. Watson; USGS(RGB).

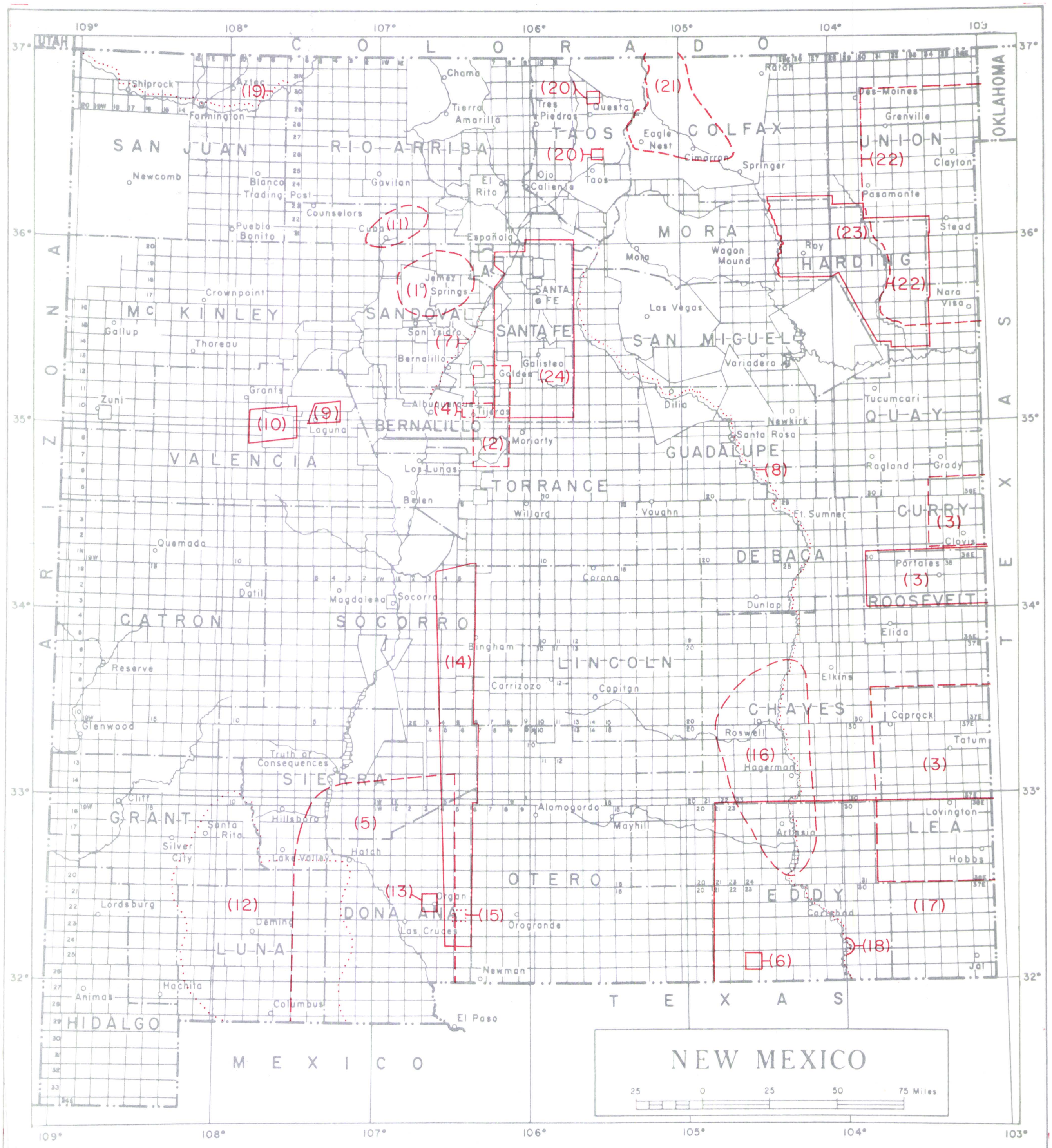
Interpretation of calibrated infrared imagery of the Lordsburg hot well area. Ground measurements will be made to evaluate the accuracy with which the geothermal flux is detected.

<u>Not Plotted</u> (GPNP)

1 (GPS) Instrumental study of New Mexico earthquakes: A. R. Sanford and T. Toppozada; NMIMT.

The research involves the location and determination of strength of earthquakes in New Mexico. This is a continuation of research that has been reported in New Mexico Bureau of Mines Circulars 78 and 102. Ultimately we hope to correlate seismic activity with geologic and geophysical characteristics of the crust and upper mantle.

Hydrology projects 1-24 follow



HYDROLOGY
(PROJECTS 1—24)

HYDROLOGY (H)

Water Resources (HR), Surface Water (HS), Ground Water (HG), Water Chemistry (HC), Hydrodynamics (HH) Project

1 (HC, GM, SG, GP, GPM) The chemistry of groundwaters in the Jemez area and a magnetic survey of a potential source of magmatic fluids: D. Woltz; UNM.

2 (EVG,HG) Geology and ground-water resources of the Sandia, Manzanita, and Manzano mountains: F. B. Titus (NMIMT); USGS(WRD), NMSBMMR, NMSE.

Hydrogeology of a rapidly developing mountain-residential area, with particular attention to availability of domestic water supplies and the probable effects of that development on availability and potability of ground water.

3 (HR,HG) Guideline maps for tax-depletion purposes, southern High Plains, Curry, Roosevelt, and Lea counties, New Mexico: USGS(WRD), NMSE.

A series of maps for each of the three areas has been constructed and consists of maps of period water-level change, saturated thickness of post-Mesozoic deposits (1962), and annual delineated areas of decline (1962-72).

4 (HR) Effects of highway construction on water supply in parts of Tijeras Canyon, New Mexico: J. D. Hudson, Project Chief; USGS(WRD), NMSHD.

To observe ground-water levels, well yields, spring yields, and the chemical quality of water along the path of highway construction, before, during, and after construction in order to determine if construction work has affected aquifer conditions or individual water sources.

5 (HR,HS,HG,HC,HH) A comprehensive study of the water resources of the lower Rio Grande Valley area, New Mexico: C, A. Wilson, Project Chief; USGS(WRD), LC, EBID, NMSE.

To collect, analyze, and interpret water-resource data in the Rio Grande Valley, and adjacent area, from Elephant Butte Reservoir southward to El Paso, Texas. Obtain data that will aid the city of Las Cruces to plan for the orderly development of municipal supplies. Evaluate the availability, quantity, quality, and uses of ground and surface water and considerations for the design and operation of a combined ground- and surface-water system for year-round irrigation.

6 (EVG) The effect of reducing air circulation on the micro-climate in Carlsbad Caverns, New Mexico: J. S. McLean; USGS(WRD), NPS.

The study will evaluate the effectiveness of sealing the elevator shaft upon the humidity in the cave and water level in pools. In addition other effects such as heat from the lighting systems will be evaluated to determine if other remedial measures are necessary to completely restore humidity and pool levels.

7 (HS,S) Channel adjustments downstream from Cochiti Dam on the Rio Grande, New Mexico: J. D. Dewey, Project Chief; USGS(WRD).

To define time and space changes in cross sections and changes in size and distribution of bed material from Cochiti Dam to Isleta Diversion Dam.

8 (EG,HS,HG,HH) Miscellaneous reach studies, Pecos River: G. E. Welder; USGS(WRD), PRC.

Special studies of the relation of surface and ground waters for inflow-outflow computations for use in apportioning waters of the Pecos River equitably among users.

9 (HR,HS,HG,HC,HH) Water resources investigation of Laguna Indian Reservation: J. W. Mercer, Project Chief; USGS(WRD), BIA.

Identification of water-bearing formations both horizontally and vertically. Distribution of the various chemical types of water throughout the area. Identification of possible sources of contamination to ground water. Distribution of surface water throughout the area. The relation between surface and ground water. Estimate of total precipitation for the area. Chemical quality of surface water. Identification of partial sources of contamination to surface water.

10 (HR,HS,HG,HC,HH) Water resources investigation of Acoma Indian Reservation: J. W. Mercer, Project Chief; USGS(WRD), BIA.

See Laguna Indian Reservation.

11 (GC,HC,MRG) Geothermal hydrology of the Jemez Mountains, New Mexico: F. W. Trainer; USGS(WRD).

The objectives of the study are (1) to develop or test reconnaissance hydrologic methods useful in the study of geothermal areas. (2) to describe the hydrologic environment of the Jemez Mountains, as a basis for study of the elements of no. 3. And (3) to identify areas of ground-water recharge and discharge in and around the Caldera, and to determine ground-water gradients and temperatures, in order to develop a conceptual model of the hydrologic flow system, particularly as it relates to heat flow.

12 (GP, GM, HG, HR) Water resources of the Mim bres Basin, New Mexico: J. S. McLean; USGS(WRD), NMSE.

Collect and analyze quantitative data on extent and hydrologic properties of aquifers in Mimbres Basin to determine long-term effects of ground-water withdrawals. Includes geological and geophysical mapping.

13 (HR,HG) Hydrology of Jornada Experimental Range: J. P. Borland, Project Chief; USGS(WRD), AR.

Collect flood-hydrograph records, rainfall data, water-level data, and soil-moisture data. The project will establish background information on the local hydrologic regime for reference in WSMR meterologic research, as well as ground truth for satellite studies of arid lands.

14 (HR, HG) Continuing reconnaissance and evaluation of water resources on the White Sands Missile Range, New Mexico: J. A. Basler, Project Chief; USGS(WRD), AR, WSMR.
Evaluation of total water resources of area and effect of withdrawals on potable and saline waters.

15 (HG,HH) Long-term availability of water in the Post Headquarters area, White Sands Missile Range: T. E. Kelley; USGS(WRD), AR, WSMR.
Provide reasonable guidelines for long-term operation of wells, and optimum withdrawal of fresh water in relation to water-level declines and migration of saline water.

16 (HG,SH) Quantitative analysis of the ground-water system in the Roswell Basin, Chavez and Eddy counties, New Mexico: G. E. Welder and F. P. Lyford; USGS(WRD), NMSE.
Determine aquifer boundaries and lithologic characteristics by study of electric and lithologic logs of wells, well sample cuttings and surface geology. Aquifer tests made of key wells.

17 (HR,SH,HG) Stratigraphy and ground-water hydrology of the Capitan Limestone and associated formations in southeastern New Mexico and western Texas: W. L. Hiss, Project Chief; USGS (WRD), NMSE.
Study of the total water resources available in the Capitan aquifer and effects of withdrawals as a by-product of oil production and use for secondary recovery projects.

18 (HS,HC) Evaluation of pumping effects in the Malaga Bend area, Eddy County, New Mexico: C. C. Cranston; USGS(WRD), PRC.
To evaluate the effectiveness of an experimental project to improve the quality of water in the Pecos River by diverting prime inflow in a short reach of the river.

19 (HS) Hydrology of the San Juan River Valley, New Mexico: F. P. Lyford and K. Ong; USGS(WRD), NMSE.
Determine the interrelation of surface and ground water in the valley, and the chemical quality of the water.

20 (HG,HR) Ground water investigation in the Taos and Cerro irrigation units: F. C. Koopman, Project Chief; USGS(WRD), NMSE.
Determine availability of ground water in Taos and Cerro irrigation units where supplemental water is needed for irrigation. Most of the area is irrigated with surface water.

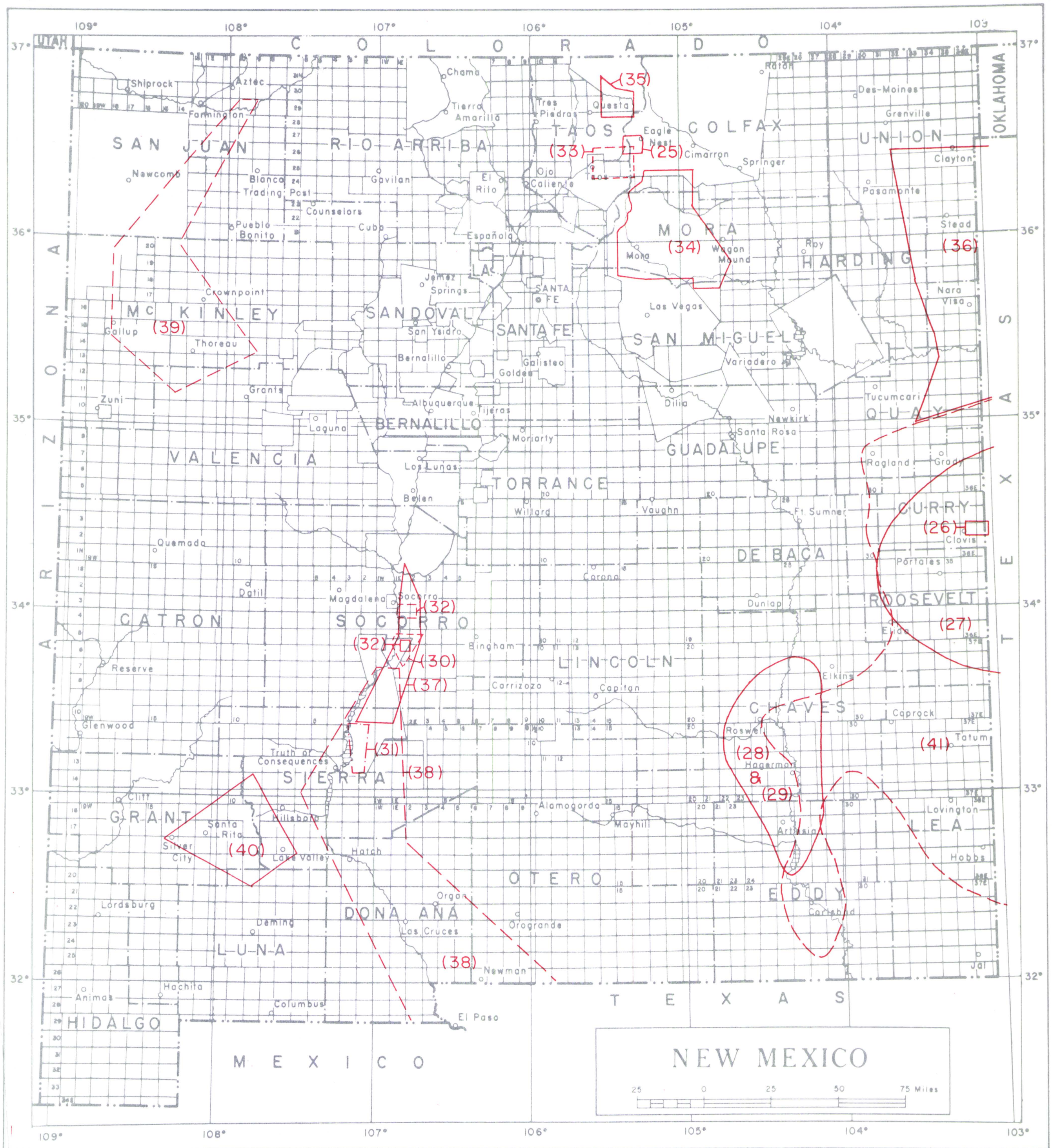
21 (HS) Quantitative analysis of principal river basins: E. D. Cobb; USGS(WRD), NMSE.
Development of a model of the surface water system on the Cimarron River above Springer.

22 (HG,HR) Irrigation potential of the Ogallala Formation and associated Cretaceous and Jurassic sediments, northern High Plains, New Mexico: E. G. Lappala; USGS(WRD), NMSE.
Assess ground-water conditions in northern High Plains including parts of Union, Quay, and Harding counties, New Mexico, Cimarron County, Oklahoma, and Dallum, Hartley, and Oldham counties, Texas. Determine potential from Ogallala, Dakota, Purgatoire, Morrison and Entrada formations for irrigation development.

23 (HR,HG,GM) Ground-water resources and geology of Harding County, New Mexico: F. D. Trauger and R. W. Clement; USGS(WRD), NMSBMMR, NMSE.
Determine general availability and quality of ground water, areal extent and areas of recharge and discharge of principal aquifers. Geologic map included.

24 (HG,HR,GM,HS) Water resources of Santa Fe County, New Mexico: W. A. Mourant; USGS (WRD), NMSE.
Obtain basic and quantitative geohydrologic data for evaluation of aquifer yields, chemical quality, relationship between surface and ground water, and effects of water-use developments. Includes geologic mapping.

Hydrology projects 25-41 follow



HYDROLOGY
(PROJECTS 25-41)

Project

25 (HC) Hydrologic-nutrient cycle interaction in undisturbed and man-manipulated ecosystems (watersheds): J. R. Gosz (UNM); NMWRRI.

Mineral cycling and stream water chemistry as influenced by vegetation, climate, weathering, and man.

26 (HR) Utilization of water in a semi-arid region: H. D. Fuehring (NMSU); NMWRRI.

Develop a system of water concentration whereby normal rainfall of the High Plains area would be sufficient for dependable dry land cropping.

27 (HG,HS,HR) An interdisciplinary analysis of the water resources of the High Plains of New Mexico: R. R. Lansford, B. J. Creel (NMSU) and W. Brutsaert, F. B. Titus (NMIMT); NMWRRI.

To estimate availabilities and interchanges of ground water and surface water in the High Plains by mathematical model analysis and to simulate current and future water use for irrigated agriculture using parametric programming.

28 (HC,HG) Irrigation returns and residence time of recharge by a tracer technique: D. D. Rabinowitz and G. W. Gross (NMIMT); NMWRRI.

Tritium profiles will be examined with known hydrologic data of the aquifers in the Roswell Basin to determine the residence time of the replenished water.

29 (HC,HG) Aquifer parameters by a chemical tracer technique: A. Mercado, G. K. Billings, and G. W. Gross (NMIMT); NMWRRI.

To develop mathematical model capable of reproducing more faithfully aquifer conditions; investigate the effects of physical and chemical variables on the dissolution process, and to investigate the usefulness of this method as a tracer technique by applying it to the Roswell Basin in southeastern New Mexico.

30 (HC) Study of the effects of contaminants from birds on the chemical and biological character of Rio Grande water: D. K. Brandvold, J. A. Brierley, and C. J. Popp (NMIMT); NMWRRI.

Present baseline condition of ecosystem, changes in water as it passes through system, and results that can be expected by continued use of system at present level.

31 (NC) Analysis of mercurials in Elephant Butte Reservoir: J. Garcia, D. Kidd, and G. Johnson (UNM); NMWRRI.

Determine concentration in water, sediments, and trophic levels and extent to which primary productivity may be inhibited.

32 (HC,HG) Environmental controls on ground water chemistry: I. the effect of phreatophytes: F. B. Titus (NMIMT); NMWRRI.

The objectives of the project are: (I) to determine the distribution and concentration of soluble salts in ground water beneath a shallow water table under conditions of consumptive use by phreatophytes, (2) to investigate the hypothesis of seasonal, cyclic variation of this concentration, (3) to investigate the relative influence of dispersion-diffusion versus lateral ground-water flow in removing the concentrated water from the water table zone, and (4) to determine whether monitoring of water levels and water chemistry in a single piezometer nest, or a group of nests, will allow calculation of transpiration rates.

33 (HS,HG,E,EG,EVG,GM) San Juan-Chama Project, Taos Unit Pumping System, New Mexico: BR, USGS, BIA, NMSE.

At the time of authorization, it was contemplated that the Taos Unit would furnish irrigation water to 20,550 acres through regulation of surface flows of the Rio Grande del Rancho and Rio Hondo by construction of the Valdez Dam and the Indian Camp Dam. It was determined during preconstruction studies that the Valdez site was geologically unfavorable and no alternative site could be found. Negotiations are underway for constructing the Indian Camp Dam to serve as much of the original acreage as possible. Investigations of the possibility of using ground water to serve irrigation water to more of the original area are being made. These investigations include drilling and testing to determine the location and availability of the ground water supply and development of a plan complementing the Indian Camp System.

34 (HS, E, EG, EVG, GM, G, S) Mora Project, New Mexico: BR, USGS, BLM, BSFW, BOR, NMSE, ISC.

Located on the Mora River and tributaries in Mora, San Miguel, and Colfax counties, the project will consist of construction of three dams and reservoirs for water regulation to serve recreation and possibly municipal and industrial purposes. Some of the presently irrigated lands (about 10,000 acres) would have to be retired to make up new operational losses and new purposes served by the reservoirs. Damsites that will be investigated include Black Lake, Loma Parda, and Rociada. The irrigated areas which experience extreme water shortages are Coyote Creek, Mora River below Coyote Creek, Cebolla River, and Sapello River.

35 (HG,EG,EVG,GM,GP) San Juan-Chama Project, Cerro Unit, New Mexico: BR, USGS(WRD), NMSE.

Located in Taos County north of the community of Cerro in the Sunshine Valley area. In the authorizing report it was contemplated to provide a firm irrigation supply through regulation of surface flows of the Red River at the Zwergle damsite, but it was determined in preconstruction studies that the site was geologically unfavorable. No favorable alternative site could be found. The possibility of using ground water in place of surface storage is now under study. The investigation includes drilling and testing to determine the availability of ground water and development of a plan to serve irrigation water to as much as possible of the original acreage proposed for service in the Cerro Unit.

36 (HS,HG,GC) Lake Meredith Salinity Study, New Mexico-Texas: BR, USGS(WRD), ISC, NM.

The area being studied is the Canadian. River drainage area from Ute Dam, New Mexico, to Lake Meredith, Texas. Feasibility investigations are scheduled to start in F. Y. 1974. Lake Meredith is the storage facility for the Canadian River project which supplied municipal and industrial water to 11 cities. The investigation is expected to identify the sources contributing water highly concentrated with sulfates and chlorides to Lake Meredith and determine methods to alleviate the contamination of the water supply.

37 (HR,HS,E) Rio Grande Water Salvage Project, New Mexico Division: BR, USGS(WRD), BLM, BOR, NPS, BSFW, NM, ISC.

Located on the Rio Grande between the Colorado-New Mexico state line and Caballo Reservoir. The feasibility-grade report of a plan to restore to the Rio Grande a substantial portion of the water now consumed by noncommercial vegetation by vegetative management of about 20,600 acres of phreatophyte growth. Drains would be included as necessary to maintain a lower water table to recover salvaged water and discourage regrowth. The feasibility study is essentially complete.

38 (HS,HG,EG,EVG,GC,G,GP) Elephant Butte Reservoir, Fort Quitman Project, New Mexico-Texas: BR, USGS(WRD), ELM, USBM, CE, BSFW, BOR, NASA, SCS, WRC, TTU, UTA, UTEP, TAM, UH, NMSU, TX, NM, EBID, EPCWI, ISC.

Project is located in the Rio Grande Valley between the upper end of Elephant Butte Reservoir in New Mexico and Fort Quitman in Texas and the surrounding region of southern New Mexico and far west Texas. The reconnaissance investigation is a study for the development of a regional plan for orderly, rational, long-term development of available natural and human resources to achieve the regional economic potential within an environmental and ecological setting of the highest possible quality. All of the surface water resources of the area have been committed. Ground water for municipal use is being withdrawn faster than it is being replenished. Due to phreatic infestation of the upper channels and river valleys, aggradation of the channels by silt, and drought conditions, the yield of surface water delivered to Elephant Butte Reservoir has in recent years been only 65 percent of the longterm average inflow to the reservoir. This situation has caused tremendous economic losses to both the New Mexico and Texas portion of the area. The investigation is needed to develop new water supply sources, determine means to provide for better utilization of existing water supplies, and to develop new recreation and fish and wildlife areas.

39 (HG,HS,E,EG,EVG) Gallup Project, New Mexico: BR, BIA, BLM, BOR, BSFW, USGS(WRD), G.

In McKinley, Valencia, and San Juan counties in northwest and west-central New Mexico. The reconnaissance investigations, completed in F. Y. 1973, are directed toward development of an additional municipal and industrial water supply for the city of Gallup and other possible customers in the general area. Gallup is located in a basin with limited water resources of poor quality. The existing and planned development of the Yah-Ta-Hey well field will meet the projected needs for the city for only about 10 to 20 years. At that time an additional supply will be required to meet the future needs.

A supply of water of excellent quality is available from the Navajo Reservoir on the San Juan River, and 7,500 acre-feet of New Mexico's entitlement under the Upper Colorado River Compact has been reserved for Gallup. The water reservation is tentative at this time, and assurance of its availability in perpetuity is necessary before a plan for delivery of the surface supply can be recommended. Also, ground water of acceptable quality may be available from potential well field areas nearer to Gallup than the surface supply.

40 (HS,HG,E,EG,EVG,GM) Mimbres Project, New Mexico: BR, USFS, BSFW, BOR, USGS, NM, SWNMRCD, CG.

The project is located on the upper reach of the Mimbres River within the Mimbres Closed Basin in the general vicinity of the mining communities of Silver City, Santa Rita, Central, and Hurley, New Mexico. The report will include recommendations for construction of a 14,300 acre-foot Mimbres Dam and Reservoir on the Mimbres River about 11 miles upstream from San Lorenzo for fish and wildlife and recreational purposes; for investigating the feasibility of furnishing municipal and industrial water to Silver City, Bayard, Central, and Hurley via a pipeline and pumping plant system from a well collection system on the Mimbres River near Faywood gage to a central reservoir terminal storage point near Silver City; as well as investigating the feasibility of constructing a 1,540 acre-foot-capacity Cooney Dam and Reservoir on the Mimbres River about 7 miles upstream from Mimbres Dam and a 2,250 acre-foot Noonday Dam and Reservoir on Noonday Canyon, a tributary to Mimbres River, about 5 miles north of San Lorenzo. These two reservoirs would provide unique recreational and wildlife opportunities. The Mimbres, Cooney, and Noonday reservoirs are located within the Gila National Forest. Purchase of water rights to replace additional depletions would be required to implement the project plan. Engineering geology investigations of feasibility grade have been completed on the Mimbres Dam and Reservoir site, but only cursory geologic inspections of the Cooney and Noonday sites have been made.

41 (HS,HG,E,EG,EVG,GM,G,GP) West Texas and eastern New Mexico Import Project, New Mexico Portion: BR, CE, MRC, USGS, BSFW, BOR, NPS, BLM, SCS, EPA, TTU, UNM, NMSU, NM, TX, WATER, TWDB, NMSE.

The project water use area embraces that part of eastern New Mexico which lies south of the Canadian River and east of the Pecos River, and lands along the Pecos River in the Roswell and Carlsbad areas. Facilities are to be constructed for the conveyance of water from the Mississippi River system. The investigation consists of studies for importing water from the Mississippi River system to satisfy water requirements in West Texas and eastern New Mexico. Water requirements for New Mexico to the point of delivery for the year 2020 are estimated to be 963,000 acre-feet for irrigation, 232,000 for municipal and industrial use, and 53,000 for recreation, or a total of 1,248,000 acre-feet. Allowing for distribution losses that would occur from point of delivery at Salt-Coyote Lake results in an estimated New Mexico demand at Salt-Coyote Lake of 1,418,000 acre-feet for the year 2020.

Not Plotted (HNP)

1 (HR) Analysis of water characteristics of manufacturing industries and their adaptability to semi-arid regions: S. Ben-David (UNM) and H. G. Folster (NMSU); NMWRRI.

Make operational judgements about the relative abilities of various industries to adjust to water use conditions in semi-arid region. Study interaction among effluent withdrawal, and consumptive use.

2 (HS,HC) Stream organics to evaluate land management: J. R. Gosz and M. L. Barr (UNM); NMWRRI.

A study of the stream organics in the Tesuque water sheds to evaluate land management practices.

3 (HG,HC) Calcium carbonate equilibria in irrigation waters: G. A, O'Connor (NMSU); NMWRRI.

Work on equations to describe calcium carbonate equilibria in water.

4 (HC) Time parameter in the mechanism of flocculation: W. A. Barkley (NMSU); NMWRRI.

To develop a procedure for the usage of flocculanta agents in small treatment plants.

5 (HR,HS,HG) Water use and urban development in Albuquerque: P. Lupsha and D. P. Schlegel (UNM); NMWRRI.

A study of water use as a social as well as a natural resource in the Albuquerque, New Mexico area.

6 (HR,HG,HC,HH) Application of environmental tritium in the measurement of recharge: D. D. Rabinowitz and G. W. Gross (NMIMT); NMWRRI.

The use of tritium as a tool in the determination of hydrologic parameters.

7 (HS,HC) Quality and quantity of return flow as influenced by trickle and surface irrigation: P. J. Wierenga (NMSU); NMWRRI, EPA.

To determine the effect of amount and frequency of irrigation water applied on water and solute movement within the soil profile under surface irrigation; to determine the effects of treatments on composition and quality of percolating water from field plots under trickle irrigation and to determine the feasibility of minimizing percolation losses by trickle irrigation; to compare the results of this study with the quality of water in the Del Rio Drain, and relate this to the quality of irrigation water applied.

8 (HC) Predicting the quality of irrigation return flow: P. J. Wierenga (NMSU); NMWRRI, NMSU(AES).

Develop a computer simulation model under field conditions in conjunction with an existing project on measurement of the quality and quantity of return flow.

9 (HS,HG,HC) The determination of content and origin of lead in surface and ground waters in northeastern New Mexico: S. Maestas (NMHU); NMWRRI.

To determine the content, origin, and ultimate fate of lead in surface and ground water systems of northeastern New Mexico. The effect on aquatic systems will be assessed and an attempt will be made to determine the rate at which contamination of waters in the area is increasing.

10 (HR) Cropland uses and agricultural water depletions in New Mexico: R. R. Lansford (NMSU); NMWRRI, NMSU(AES), NMSE, NMSRS, USDA.

To develop procedures for obtaining reliable county estimates of cropland acreage and depletions and diversions of irrigation water.

11 (HR) Water resource problems and research needs of New Mexico: B. J. Creel (NMSU); NMWRRI.

Inventory federal, state, and local agencies, institutions, and organizations interested in water resources research; to collect information on agency history, responsibilities, jurisdictions, programs, and water research needs; and to analyze and rank the needed water resources research in New Mexico.

12 (HG,GPH) Measurement of groundwater flow using an in-situ thermal probe: M. A. Reiter (NMIMT); NMWRRI.

In-situ thermal probes can be used to determine rate of groundwater flow more quickly and at less expense than conventional techniques (e.g. pumping tests). The objective of the present research is to construct a thermal probe for in-situ measurement of rate of groundwater flow, and to test the probe in areas where the rate of flow has been determined by pumping tests.

13 (HS,EG) Reservoir trap efficiency studies at selected sites: J. D. Dewey, Project Chief; USGS(WRD), SCS.

Determine efficiency of reservoirs in trapping sediment through measurement of quantity and size of sediment leaving reservoir.

14 (HC,HG,HS) Collection of basic records—quality of water: J. D. Dewey and K. Ong, Project Chiefs; USGS(WRD), NMSE, ISC, PRC, CE, FWQA, BR, AF, NMSBMMR.

Collect and analyze samples from selected sites. Collection frequencies scheduled to detect any changes in water quality and/or to compute annual loads. Chemical data from 100 surface water stations, biochemical data from 20 stations, suspended sediment data from 37 stations. Also data from 250 ground water sites. Published annually.

15 (HS,HR) Duties for the Rio Grande Compact Commission: E. D. Cobb, Project Chief; USGS(WRD), RGCC.

Compilation of stream flow and storage data for publication in annual reports of the Commission.

16 (HS,EG) Investigation and analysis of floods for small drainage areas in New Mexico: A. G. Scott, Project Chief; USGS(WRD), NMSHD.

Obtain and analyze hydrologic data for use in design of highway drainage structures. Magnitude, volume, and frequency of floods for drainage areas of less than 15 square miles.

17 (HS) Collection of basic records; stream flow: L. J. Reiland, Project Chief; USGS (WRD), BIA, BR, CE, AR, WSMR, FWS, SCS, *NWS*, CCCC, ISC, NMSE, NMSHD, PRC, NMSGFC.

Collect records of flow of all important streams and storage of all major reservoirs. About 200 stream gaging stations and 15 reservoir stage stations. Published annually.

18 Miscellaneous activities under the State Engineer Program: J. B. Cooper, Project Chief; USGS(WRD), NMSE.

Spot reconnaissance studies, reports on inquiries, compilation of specific data, and revision of reports for publication.

19 (HG,EG) Water levels in observation wells: J. D. Hudson, Project Chief; USGS(WRD), NMSE.

Monitoring fluctuation of ground-water levels in approximately 1,500 observation wells. Most wells located in irrigation areas. Aerial photographic surveys made to determine irrigated acreage. Water-level change maps and tabulations of water-level measurements published annually.

20 (HR) New Mexico District Data Bank: J. B. Peterson, J. Sparks, and W. L. Hiss; USGS (WRD), NMSE.

Processing all types of past records relating to water resources of the state for inclusion in a data bank.

21 (HR,HS,HG,HC,HH) Regional ground-water appraisal in the Rio Grande Basin: W. L. Broadhurst; USGS (WRD), USDI.

The purpose of this project is to develop a succinct exposition placing ground water in perspective as an element of the total water resources available in the basin to provide assurance that management of the water resources will not overlook opportunities to use aquifers. This report will demonstrate that ground water within the basin is an important, and exploitable resource, that in many places it can play a more significant role in meeting water needs, and that it warrants further quantitative study and fuller consideration.

22 (HR,HS,HG,HC,HH) Reconnaissance of water resources available to urban areas: W. E. Hale, Project Chief; USGS (WRD), NMSE.

To evaluate certain urban areas and attempt to determine if a suitable supply of water for domestic and industrial uses, projected against anticipated future population growth, will be available when needed. Attempt to define influences that may affect the future quality and quantity of the available water.

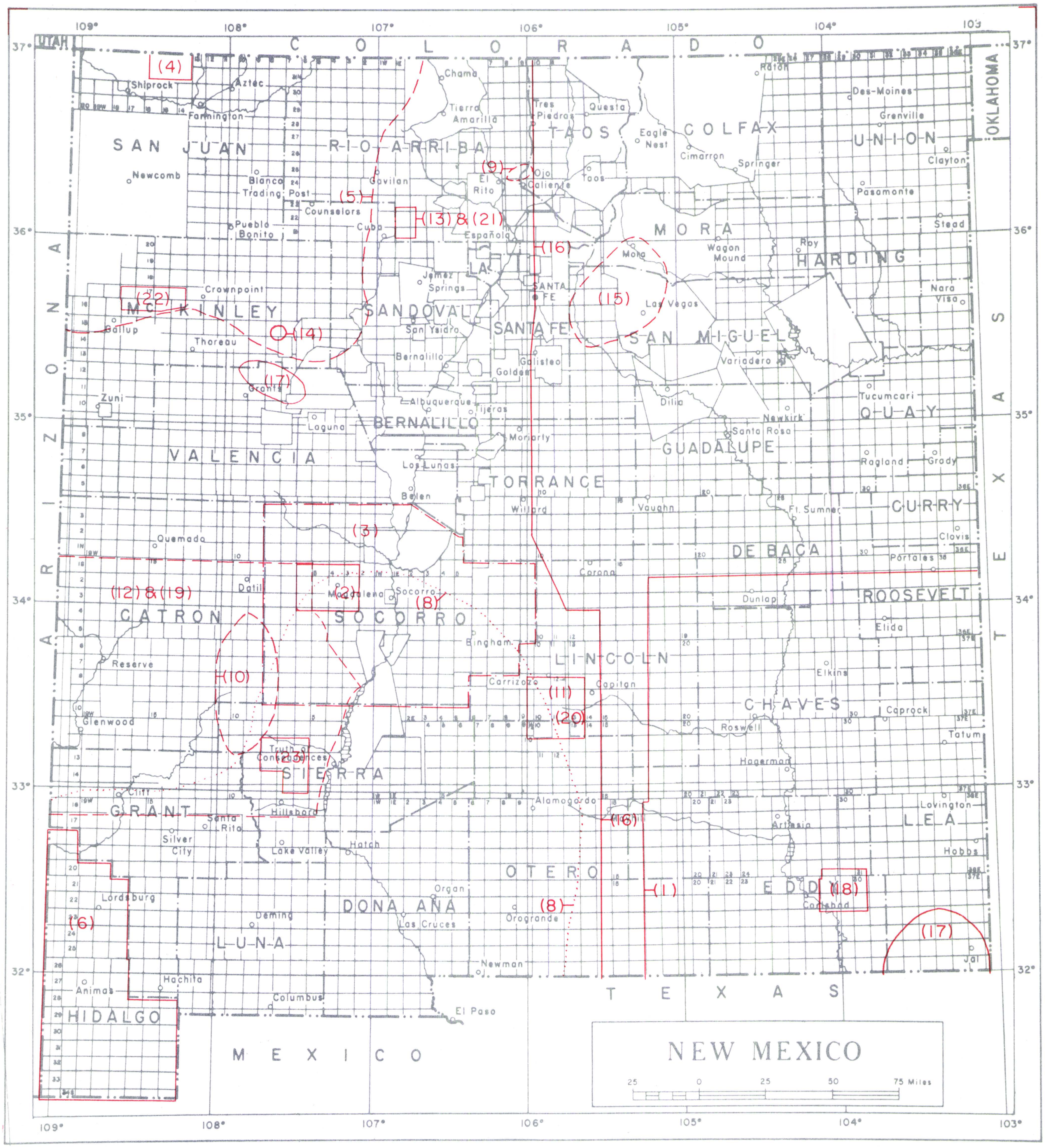
23 (HG) Investigation of special ground-water problems: J. B. Cooper; USGS(WRD), NMSE.

Investigate sites, or small areas, in the state where unusual or special ground-water problems exist.

24 (HR,EG,EVG,GM,G,GP) New Mexico State Water Plan: BR, J. B. Cooper, Project Chief; USGS(WRD), ISC.

A reconnaissance-grade study of the State of New Mexico which will cover a generalized analysis of water and related resources as well as problems and needs. It is a comprehensive study considering all types of water uses, including existing and anticipated. The plan will include economic, social, and environmental considerations in an effort to provide for the best use of the State's water and related land resources for the general well-being of all the people.

Mineral resources map follows



MINERAL RESOURCES

MINERAL RESOURCES (MR)

Mining Geology (MG), Industrial Rocks and Minerals (MRI), Metallic Deposits (MRM), Oil and Gas (MRP), Coal (MRC), Uranium (MRU), Geothermal (MRG)

Project

1 (MRP,ST,SG) Oil and gas resources of the Delaware Mountain Group, southeastern New Mexico: R. W. Foster and students; NMSBMMR.
Detailed study of geology, exploration, production, and reserves of petroleum.

2 (MRM,GM,MG,IMP,G,GC,AD,ST,SG) Geology of the Magdalena-Tres Montosas area, Socorro County, New Mexico: C. E. Chapin; NMSBMMR.
Geology and mineral resources of the Magdalena-Tres Montosas area.

3 (GM, IMP, ST, SG, MR, AD, MRI, MRM, MRC, MRU) Mineral resources of Socorro County, New Mexico: C. E. Chapin; NMSBMMR.
Compilation of the geology of Socorro County with an evaluation of its mineral resources.

4 (MRC,H,EL) Water Requirement Availability and Coal Deposits Study (project UTECOAL): J. W. Shomaker (NMSBMMR), R. D. Holt (CGS); BIA.
Determine reserves, chemical and physical characteristics, and present and future uses of coal deposits on Ute Mountain, Ute and Southern Ute Indian reservations, New Mexico and Colorado, together with amount and quality of water that will be required for development.

5 (MRP,S,SP,SH) Deep Pennsylvanian petroleum potential of the San Juan Basin: S. A. Wengerd; UNM.

6 (MRI,MRM,MG,GM) Mineral resources of Hidalgo County, New Mexico: W. E. Elston; UNM, NMSBMMR.
Mineral resources, description of mining districts, some geologic mapping.

7 (MRU,GC) Geochemical investigation of uranium deposits near Grants, New Mexico: S. Hafenfeld and D. G. Brookins; UNM, CON.
Eh-pH study of uranium deposits; authigenesis and allogenesis.

8 (MRM,MG,SH,SP) Paleozoic stratigraphy as an ore control for lead, zinc, and copper in New Mexico: J. Sullivan and P. D. Proctor; UMR, NMSBMMR.
The study is an attempt to find possible relationships between stratigraphy and hydrothermal deposits of lead, zinc, and copper. Literature, field and laboratory studies are being made on the Paleozoic stratigraphy related to hydrothermal deposits in marine carbonates and shales in thirteen New Mexico mining districts. Also non-mineralized Paleozoic sections in the Caballo and Sacramento mountains are being studied for contrasts between mineralized and non-mineralized rocks. The laboratory study is primarily on the carbonate petrology of the ore-bearing horizons.

9 (MRI,GM,IMP,M,SG) Pegmatites of the Ojo Caliente District, New Mexico: R. H. Jahns; SU, NMSBMMR.
Detailed study of developed and undeveloped feldspar-mica-beryl pegmatites, with economic appraisals.

10 (GM, IMP, M, MRM, SG) Tin deposits of the Black Range District, southwestern New Mexico: R. H. Jahns and J. F. Lufkin; SU, NMSBMMR.
Detailed investigation and economic appraisal of placer and lode deposits of cassiterite associated with Tertiary rhyolites.

11 (MRM,MRI,MRC,MRU) Mineral resources of the White Mountain Wilderness area, Lincoln County, New Mexico: USBM, USGS.
Sampling and evaluation of mineral resources.

12 (MRM,MRI,MRC,MRU) Mineral resources of Gila Wilderness area: R. B. Stotelmeyer; USBM (IFOCS).
Sampling and evaluation of mineral resources.

13 (MRM, MRI, MRC, MRU) Mineral resources of San Pedro Parks Wilderness area, Rio Arriba County, New Mexico: USBM, USGS.
Sampling and evaluation of mineral resources.

14 (MRU,HG) Improved processing of uranium and radium: SLCMRC; USBM, GOVT.
Periodic and specific samples of water from different strata encountered by Ranchers Exploration and Development Corporation's shaft being sunk in the Ambrosia Lake area are being analyzed for uranium content. Possibility of economic recovery is being investigated.

15 (MRI) Target report: Mineral resources of the Las Vegas, New Mexico area: W. Bejnar; NMHU, NMSBMMR.
General survey of mineral products found in the Las Vegas area.

16 (MRU, SH) Southern High Plains uranium studies: W. I. Finch; USGS(BRMMR).
Study of samples from various conglomerate beds in the Dockum Group. E-W and N-S geologic sections across the southwest Triassic basin showing correlation of various formations of the Dockum Group.

17 (MRI,M,SP) Geology of sulfur deposits, New Mexico and Texas: A. J. Bodenlos; USGS (BOFCR).
Reconnaissance field work in mineralized areas of the Delaware Basin and Central Basin Platform. Logging of drill cores of sulfur ore and detailed mineralogic and petrologic studies.

18 (MRI, M) New Mexico potash: C. L. Jones; USGS(BOFCR).
A report on potassium-rich deposits of the McNutt potash zone in southeastern New Mexico.

19 (GC, GM, MRI, MRM, GPM, GPG) Gila Primitive and Wilderness areas: J. C. Ratté; USGS(BRMMR).
Appraisal of mineral resources of area including geologic mapping, geochemical reconnaissance survey, aeromagnetic mapping, and reconnaissance gravity survey.

20 (MRI,MRM,GM,GC,MG,GPM) White Mountain Wilderness area: K. Segerstrom; USGS(BRMMR).
Evaluation of mineral potential through geologic mapping, geochemical exploration, aeromagnetic survey, and examination of mines, prospects, and other mineralized areas.

21 (MRM,GC,GM,SH) San Pedro Parks Wilderness area: E. S. Santos; USGS (BRMMR).
Reconnaissance mapping of the Paleozoic and Tertiary strata of a 64 square mile wilderness area. Analysis of trace elements to determine if geochemical anomalies are present.

22 (MRU,M,GM,MG,SP,SG,SH) Church Rock-Smith Lake area, New Mexico: C. T. Pierson; USGS (BRMMR).
To determine by selected mine mapping, sampling of uranium ore and country rock, lithofacies study of the Morrison Formation, and various laboratory studies of the habits and controls of the uranium deposits around and between Church Rock and Smith Lake--the principal mining areas in the southeastern part of the Gallup and the western part of the Ambrosia Lake mining districts, McKinley County, New Mexico.

23 (GM) Hermosa, New Mexico: C. H. Maxwell; USGS(BRCMR).
To map and determine resources and potential mineral resources of the Sugarloaf Peak, Thumb Tank Peak and Bell Mountain 7-1/2' quadrangles, and if expedient, extend study into parts of the Chise and Winston quadrangles.

Not Plotted (MRNP)

1 (MRP) Petroleum developments in New Mexico for years 1963 and 1964: R. A. Bieberman; NMSBMMR.
Yearly oil and gas well data reports.

2 (MRP) Computerization of well sample library index: R. A. Bieberman; NMSBMMR.

3 (MRP) Petroleum exploration maps: R. A. Bieberman; NMSBMMR.
Maintenance of up-to-date county petroleum exploration maps. Data used in revision of oil and gas fields map of New Mexico.

4 (IMP) Fluorspar in New Mexico: W. N. McAnulty; UTEP, NMSBMMR.
Study of fluorspar deposits.

5 (MRI) Utilization of Laguna Reservation clay for ceramic products: M. E. Tyrrell, C. B. Davison, and M. A. Schwartz; USBM (TMRL), NMSBMMR.
The suitability of utilizing the clay for producing such products as pottery, tile, brick, etc., is being investigated in order to help develop the economy of the area.

6 (MRI) Evaluation of clay samples from New Mexico: M. E. Tyrrell, C. B. Davison, and M. A. Schwartz; USBM(TMRL), NMSBMMR.
Nineteen clay samples from various Indian reservations were tested to determine suitability for clay products. Analyses were submitted.

7 (MRS) Recovery of brine from potash operation slimes: C. E. Jordan and G. V. Sullivan; USBM(TMRL).
A study to develop methods to improve recovery of brine from slimes generated in processing of New Mexico potash ores.

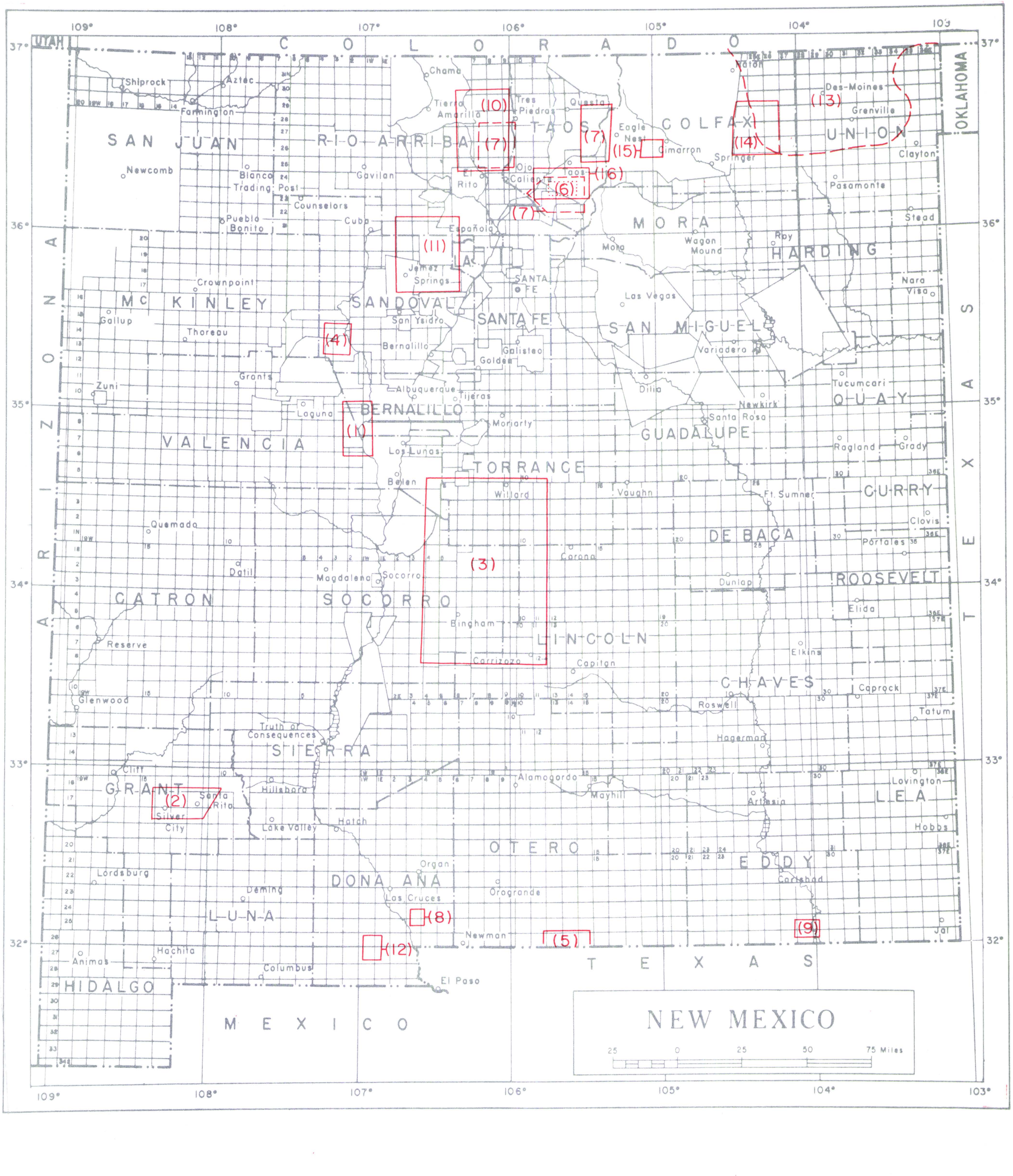
8 (MRI) Continuous flotation of high-clay potash ores: T. 0. Llewellyn and G. V. Sullivan; USBM(TMRL).
The objective of this project, which will conclude this fiscal year, is to demonstrate on-site the feasibility of the Bureau-developed flotation process for economically recovering potash from high-clay ores.

9 (MRU) Colorado Plateau summary report: R. P. Fischer; USGS(BRMMR).
Compilation of a summary report on the geology and uranium-vanadium deposits of the Colorado Plateau.

10 Mineral resources, West: L. S. Hilpert; USGS(BRMMR).
Compilation of mineral resource data for Utah and parts of adjacent states.

11 (MRI,GC,HC,EG) Correlation of the sulfate ion concentration of surface water with the gypsum deposits of New Mexico: J. H. Puffer; RSU.
It has been demonstrated that the sulfate ion concentration of the surface waters of New Mexico can be directly correlated with the distribution of gypsum deposits throughout the state.

Mineral and petrology map follows



MINERALOGY & PETROLOGY

MINERALOGY AND PETROLOGY (MP)

Igneous and Metamorphic Petrology (IMP), Volcanology (V), Mineralogy (M)

Project

1 (IMP,GC) Relationship of basalts to Rio Grande rift tectonics: J. Renault, C. Chapin; NMSBMMR.
Petrology and geochemistry of Rio Grande basalts.

2 (M) Mineralogy of copper concentrates of New Mexico: R. Roman; NMSBMMR.
Quantitative mineralogy of flotation concentrates to assist in developing hydrometallurgical process for treating concentrates.

3 (GC,GP,MRM) Reconnaissance geology of mineral deposits associated with upper Paleozoic sedimentary rocks in Socorro and Torrance counties, New Mexico: G. K. Billings and R. E. Beane and graduate students; NMIMT, NMSBMMR.

4 (GC,IMP,V) Ultramafic nodules in Puerco necks, New Mexico: A. M. Kudo and D. G. Brookins; UNM.
Petrology and geochemistry of nodules to determine their origin.

5 (AD,GC,GM,IMP,M) Petrology and geochronology of Cenozoic intrusive rocks, Trans-Pecos Texas and New Mexico: D. S. Barker and L. E. Long; UTA, NSF.
The Cornudas Mountains (Otero County) are included as the extreme northern portion of a tract, extending to Big Bend National Park, being studied by field, mineralogical, chemical, isotopic and experimental methods. The aim is to explain the diversity of roughly contemporaneous igneous rocks within a 450-kilometer long segment of crust.

6 (IMP,GM,SG) The Embudo igneous complex, northern New Mexico: P. E. Long; SU, GSA, NMSBMMR.
Detailed field and petrologic study of Precambrian plutonic, hypabyssal, and volcanic rocks of contrasting ages, modes of emplacement, and crystallization histories.

7 (IMP,GC) Petrology of piemontite-bearing rocks from the Precambrian of northern New Mexico: H. L. Stensrud; CSUC, GSA.
Field and laboratory investigation of piemontite-bearing Precambrian metamorphic rocks from the San Juan Mountains, Picuris Range, and the Sangre de Cristo Mountains of northern New Mexico.

8 (GC, M, MRI, GM) Epithermal zoning: R. G. Worl; USGS (BRMMR).
Geologic mapping and laboratory investigations of the Bishop's Cap fluorspar deposits.

9 (M,MRI) Mineralogy of nonmetallic deposits: B. M. Madsen; USGS(BOFCR).
Study of a core of the Castile Formation from southeastern New Mexico.

10 (IMP,GC) Metamorphism in the southern Rocky Mountains: F. Barker; USGS(BFGP).
Study of Precambrian metabasalt and metarhyolite of northern New Mexico.

11 (IMP,GC,V,SH) Valles Mountains: R. L. Smith; USGS(BFGP).
Examination of road cuts along new logging roads in the Valles caldera and study of cuttings from a 5000 foot drill hole in the caldera. Laboratory studies of the Bandelier Tuff.

12 (GC,IMP,AG) Inclusions of deep-seated origin: H. G. Wilshire; USGS(BAS).
Detailed modal, structural, and textural analyses of mafic and ultramafic xenoliths at Kilbourne and Hunts Hole maar craters in southeastern New Mexico.

13 (GC,IMP,M) Mineralogy and petrology of the volcanic rocks of the Raton-Clayton region, northeastern New Mexico: J. C. Stormer; UG, NSF, GSA, NMSBMMR.
A study of the chemistry and mineralogy of the volcanic rocks in Colfax and Union counties, including the Raton Basalt, Red Mountain Dacite, Sierra Grande Andesite, Clayton Basalt, and Capulin Basalt.

14 (IMP,M) Mineralogy of the Tertiary phonolite sills of Colfax County, New Mexico: J. C. Stormer; UG.
Microprobe and crystallographic studies of the rare mineral assemblage found in the phonolite sills exposed near Farley, Colfax County, New Mexico. Interpretation of the origin.

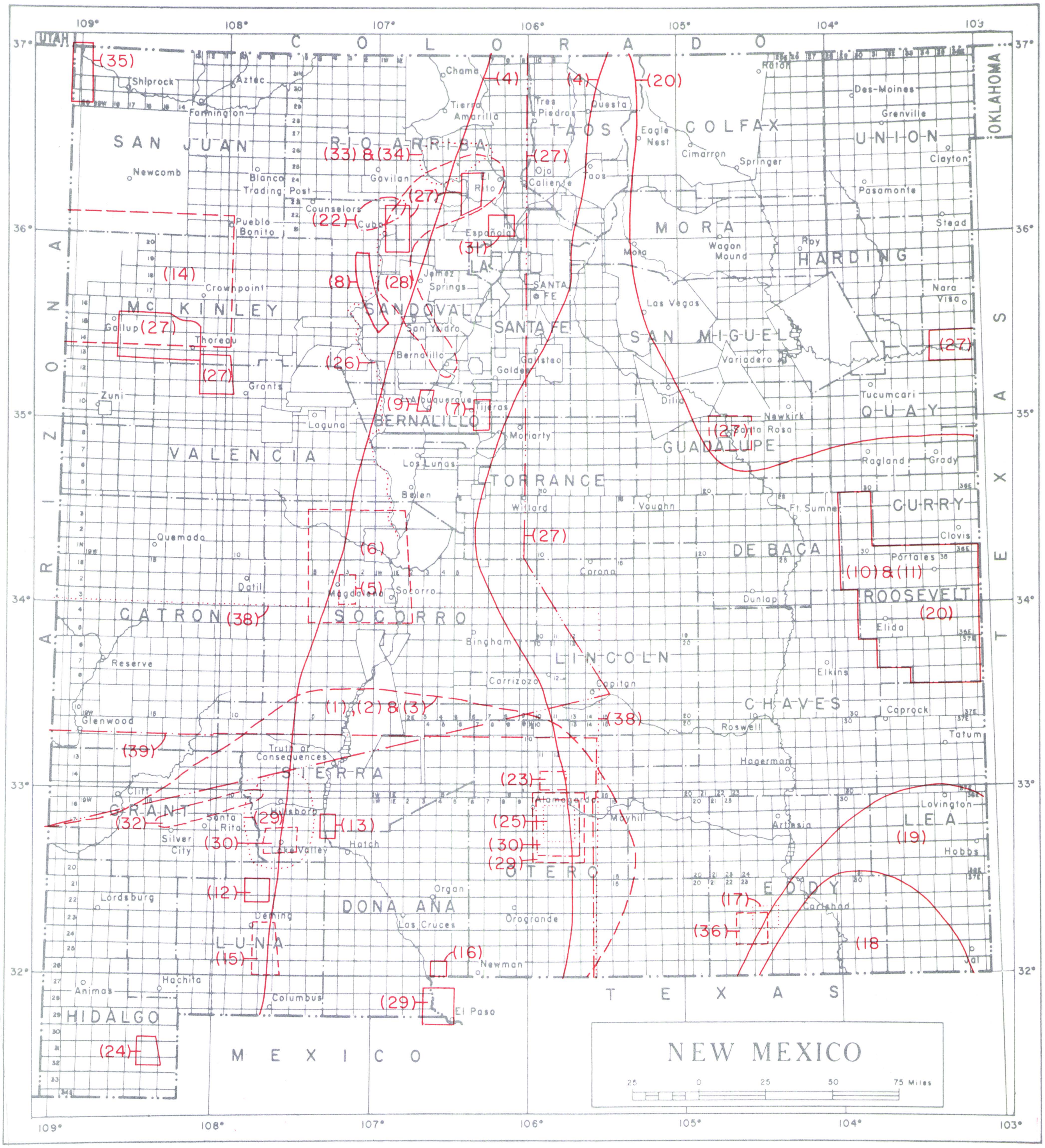
15 (M,GC,G) Mineralogy of natrolite occurrence in lamprophyre dikes, Philmont Ranch, New Mexico: E. A. King, Jr.; OH.
Systematic mineralogy and crystallography of large single crystals of natrolite and the genesis of the occurrence.

16 (IMP,GM) Metamorphic petrology of the Picuris Range, Taos County, New Mexico: H. Dailey; SMU.

Not Plotted (MPNP)

1 (M,IMP,MRI,S,SP) Zeolites of New Mexico: R. H. Weber, NMSBMMR.
Distribution, mode of occurrence, genesis, economic potential of zeolite group minerals throughout New Mexico.

2 (GC,M,SP,HC) Diagenetic alterations in the valley-fill deposits of the Santa Fe and Gila groups: T. R. Walker and graduate students; UC, NSF.
The research will be divided into 3 parts: (1) a study of the geochemical relationships between the ground waters and authigenic minerals (e.g. clays, feldspars, zeolites, etc.) from selected basins. (2) A study of the distribution and textural characteristics of "primary" matrix clay (i.e. mechanically deposited detrital clay) in modern fluvial sands which are likely counterparts of the Late Cenozoic deposits. This part of the investigation will try to establish criteria by which this type of clay matrix can be distinguished in older rocks from authigenic clay matrix that has formed by intrastratal alteration of framework silicate grains. (3) The third phase will involve regional petrographic studies of successively older sequences (recent to late Cenozoic age) of sediments that have been derived from different lithologic types of source areas (i.e. plutonic, volcanic, and sedimentary rocks) to determine the effect of both time and lithology on diagenetic alterations.



STRATIGRAPHY

STRATIGRAPHY (ST)

Historical Geology (SH), Sedimentation (S), Sedimentary Petrology (SP), Paleontology (P)

Project

1 (P) Stratigraphic sections and faunal succession of the El Paso Limestone: R. H. Flower; NMSBMMR, USGS, USNM.

The El Paso embraces all but the very sandy base of the Canadian system. The study of sections, the collecting, preparation and description of fossils has been a work involving some years- roughly from 1951 - but necessarily sporadic. Cephalopods proved significant in the zonation, and on the basis of these forms correlations have been possible with Texas, Colorado, Utah and Nevada, and in a broader sense throughout the world. Problems of collecting, preparing, and final description have been partially dealt with. Materials of special groups have been submitted to various specialists for the conodonts, gastropods, brachiopods, where such help can be obtained. The El Paso consists of a series of discrete faunas; work on them is advanced, but it will be many years before the faunas are completely known. Sparsity of good specimens, and occurrence of specimens where they cannot be extracted are complications. Faunas have thus far been found to be composed largely of undescribed species, though belonging to genera and species groups within genera known elsewhere.

2 (P) Fauna of the Bliss Sandstone: R. H. Flower; NMSBMMR.

The Bliss Sandstone has been studied as to its various faunas. Large collections have been made; specimens are largely photographed. It is evident that the Bliss represents a series of sandy beds, with significant breaks in some places. We can recognize (1) Elvinia zone (2) Billings area zone (3) Franconian deposition (4) Trempealeauan deposition - present only west of the Black Range front (5) widespread early Canadian deposition.

Completion of the work requires assembly of descriptions and plates, with possibly a revisit to some localities to check previous measurements. Significant sections are described in manuscript.

3 (P) Faunal succession of the Montoya Dolomite: R. H. Flower; NMSBMMR, USGS, USNM.

The Montoya has proved to represent three discrete periods of deposition: (1) limited residual beds of possibly Harding equivalence, (2) the Second Value comprising the Cable Canyon Sandstone and Upham Dolomite containing a fauna of Red River age, (3) the Aleman or Par Value of early Richmond age (possibly beginning in the late Maysville), a minor break separates the Cutter of late Richmond age.

Main sections measured and collected; need to collect more for some specific material, and more work is needed on the sections at El Paso and in the Hueco Mountains. Corals have been completed - only a few have turned up since. Illustrations (photographs) advanced on other groups. Conodonts are being submitted to specialists elsewhere. Cephalopod work advanced; brachiopod work has been done elsewhere and so badly that it will have to be done again. Stromatoporids described. The Aleman and most of the Cutter faunas are dominated by silicified brachiopods; extensive etching has been done. A few more sections need to be collected.

4 (SH, S, GM, SG, AD, GC, G, GP, IMP, MRI, MRM) Origin of the Rio Grande rift: C. E. Chapin; NMSBMMR.

Compilation and synthesis of geological, geochemical, and geophysical data on the Rio Grande rift to derive a model for its origin and evolution.

5 (SH,S,P,MRM,MG) Stratigraphy and sedimentary petrology of Paleozoic formations in the Magdalena Mining District, Socorro County, New Mexico: W. T. Siemers; NMIMT, NMSBMMR.

A stratigraphic and petrologic investigation of Paleozoic formations in the Magdalena area with emphasis on their control of base-metal replacement deposits.

6 (SH,S,SG,GM) Origin of the Popotosa Formation, Socorro County, New Mexico: J. Brunning; NMIMT. NMSBMMR.

Stratigraphy, areal extent, and lithologic characteristics of the Popotosa Formation (Miocene-Pliocene) and its relationship to the late Tertiary structural history of central New Mexico.

7 (S,SP,P) The use of daily growth lines in Aviculopecten in the study of fossil population dynamics and paleoecological reconstruction of a Pennsylvanian lagoonal sequence: J. F. Dillon; UNM.

8 (P,S,SP,SH) Sedimentology and trace fossils of Dakota Formation, north-central New Mexico: C. T. Siemers, with G. Flesch and R. Ruetschilling; UNM.

Detailed study of sedimentary facies of Dakota Formation and overlying and underlying formations. Emphasis on stratigraphy, sedimentology, and paleontology (mainly trace fossils) with conclusion on environment of deposition.

9 (S,P) Recent insect tracks, trails and burrows in the Rio Grande fluvial sediments, central New Mexico: C. T. Siemers; UNM.

Detailed description of Recent trace structures produced by insects living in and on the sediments of the Rio Grande near Albuquerque. Comparisons will be made with similar structures in the Morrison Formation (Jurassic), Chinle Formation (Triassic), and Abo and Yeso Formation (Permian), which represent in part non-marine fluvial depositional environments.

10 (SH,SG,MRP) Pennsylvanian geology of Roosevelt County, New Mexico: W. D. Pitt; ENMU.

Stratigraphic study of buried Pennsylvanian rocks. Isopach and structural contour maps.

11 (SH,SG,MRP) Pre-Pennsylvanian geology of Roosevelt County, New Mexico: W. D. Pitt; ENMU.

Stratigraphic study of buried pre-Pennsylvanian rocks. Isopach and structural contour maps.

12 (S,SP,SH,SG) Study of the Lobo-Abo strata in the Fluorite Ridge, Cook's Range area, Luna County, New Mexico: L. J. Corbitt; ENMU.

This investigation is an attempt to understand the relationship between the Lobo-Abo conglomerates in the Cook's Range area and the Hueco Limestone in the Florida Mountains.

13 (P) Morrowan fusulinids of the type Derryan (Derry Hills, New Mexico) and the type Marble Falls (Texas): W. E. King; NMSU.

14 (P,SH,S) Microfauna of Upper Cretaceous strata in southwest San Juan Basin: R. H. Lessard; NMHU, NMSBMMR.

Marine microfauna, mainly foraminifera and ostracods, will be used to help date marine transgressions and regressions.

15 (SH,S,SP,P) Florida Mountains Formation: D. V. Lemone and R. H. Flower; UTEP, NMSBMMR.

Stratigraphy, depositional environments, sedimentary petrology and paleontology of a part of the El Paso Group.

16 (SP,P) Aleman Formation of Franklin Mountains and Bishop Cap area: M. Urbach; UTEP.

17 (P) Dark Canyon Cave, Guadalupe Mountains, New Mexico: E. L. Lundelius, jr.; UTA.

Description of a rich assemblage of Pleistocene mammals.

18 (SP,SH,S) Sedimentary petrography and depositional environments of the Bell Canyon Formation in the Delaware Basin: M. W. Payne; TAM.

Information obtained primarily from well cores will be integrated and compared to recent depositional models. Petrography will be studied qualitatively and also with discriminant function analysis to evaluate it as an environmental indicator.

19 (S,SP) Basinal sandstone facies in the Delaware Mountain Group, West Texas and southeast New Mexico: M. W. Payne; TAM, GO.

Information obtained primarily from well core will be integrated to define and describe the deep basinal facies of the Guadalupian sands. Petrography, texture, and sedimentary structures will be interpreted in terms of sedimentary processes.

20 (SH,S,SP,P) Pre-Graneros Cretaceous of northeastern New Mexico: J. P. Brand and A. D. Jacka (TTU) and L. R. Wilson (UO); TTUMRI, TTUHF.

Paleontology, micropaleontology, palynology, and sedimentology of Dakota, Mesa Rica, Purgatoire, Pajarito, Tucumcari, and Cheyenne formations.

21 (P) Conodont biostratigraphy and paleoecology of the Lake Valley Formation (Mississippian, Osage) in the vicinity of Hillsboro, New Mexico: F. H. Behnken; TTU.

The purpose of this study is two-fold: (1) to define the details of the conodont biostratigraphy of the Lake Valley Formation and (2) to test the amount of control which paleoecologic factors exerted upon the lateral distribution of conodonts in this sequence. Confirmation of conodont and crinoid biostratigraphy may show that the previous correlations based upon crinoids are not time-equivalents but faunal-equivalents because of their diachronous nature.

Because conodonts have a rapid and wide dispersal in the Mississippian, the nature of these potentially diachronous boundaries based on crinoids should be clarified. This aspect of the study will be a significant contribution to understanding the dispersal of crinoids during the Mississippian, as well as clarifying the conodont biostratigraphy.

22 (P) Early Tertiary vertebrate fossils in the San Jose Formation in the San Juan Basin, New Mexico: L. L. Jacobs and E. H. Lindsay; UA, NSF.

23 (S,SP,GM) Diagenesis of carbonate surfaces in Laborcita Formation (Permian) of Sacramento Mountains, New Mexico: P. Winchester; RU, UNCA.

These are petrographic studies basic to carbonate diagenesis. The derived basic information is important to understanding petroleum accumulations, not only in New Mexico but in other strata in other areas.

24 (S,SP,P,SH) Reef facies in Big Hatchet Mountains: M. Schupbach; RU, NMSBMMR, UNCA.

Study of Late Paleozoic basinal and slope facies and organic composition of shelf margin bioherms.

25 (S,SP,GM) Carbonate cementation and chertification in the Mississippian Lake Valley Formation, Sacramento Mountains, New Mexico: W. J. Meyers; RU, UNCA.

Investigates relationship of chert distribution to depositional facies and unconformities. Relates time of chertification to time of carbonate cementation; dates both of these events relative to post-Lake Valley unconformities; and interprets diagenetic environments of chertification and carbonate cementation.

26 (S,GC) Origin and emplacement of clay matrix in arid climate Recent and Quaternary fluvial sediments: A. J. Crone; UC, NSF.

A thesis study utilizing field and laboratory data to determine if and/or how primary clay matrix may be deposited with fluvial sands. In particular, the possibility of muddy waters infiltrating into sandy sediments and depositing clay as matrix on the grains will be investigated in detail. Thin-section and SEM (stereoscanning electron microscope) data will be used in the research. Field data from the Rio Puerco will be used in the project.

27 (P,SH) Evolution of land plants found in the Late Triassic Chinle Formation of southwestern United States: S. R. Ash; WSC.

This project centers on a study of land plants found in the Late Triassic Chinle Formation of southwestern U.S. It seeks to obtain new data on the evolution of land plants for a geologic time period notable for its paucity of fossil floras. However, the development of new techniques to study cuticles of leaves permits a new look at known fossils and opens the door to new insights into Triassic land plant history. This study of cuticular and epidermal structures is expected to add significantly to our meager knowledge of Triassic flora and of plant evolution during a very critical time in plant history.

28 (SH,S,SP,SG,GM) Paleogeography of parts of New Mexico: W. F. Tanner; FSU.

Paleogeography and geological history of parts of New Mexico (especially the northern half, largely in the areas centered around Las Vegas, El Rito, Cuba, Navajo, Gallup, Thoreau, Grants, Laguna, and San Ysidro) (primarily for late Paleozoic and Mesozoic time).

29 (SP,S,SH,P) Genesis of the Rancheria and Las Cruces (?) formations (Mississippian) of south-central New Mexico and adjacent parts West Texas: D. A. Yurewicz; UWI, UNSBMMR.

Depositional environment and diagenesis, Franklin, Hueco, and Sacramento mountains area.

30 (P,SH) Investigation of Lake Valley (MISSIPPIAN) crinoids at Lake Valley and in the Sacramento Mountains: D. B. Macurda, jr.; UM, NMSBMMR.

This project has three main objectives: (1) a study of the regional variation of a crinoid fauna in a transitional environment, (2) to determine the course of evolution between Lower and Middle Mississippian crinoid faunas, (3) to describe and illustrate the 30 species of this fauna based upon a quantitative study. This study of growth and variation will provide a model for restudy of other Mississippian crinoid faunas.

31 (S,P,AD) Miocene fauna and sedimentation of the Zia Sand Formation: C. Gawne; CU, AMNH.

The Zia Sand Formation and its early and middle Miocene vertebrate fauna are described.

32 (P) Microfossils of the Percha Shale, Grant County, New Mexico: C. R. Parker (CSCLB); UCLA.

Chiefly a study of the Ostracoda. Fossils such as linguloid Brachiopods, acritarchs, and *Tasmanites* sp. have been found in the Ready Pay Member, previously thought to be unfossiliferous. Three zones in the Ready Pay and Box Members have been defined on the basis of faunal differences. Several new species of Ostracoda have been found and will be described.

33 Depositional environments and trace fossils of the upper part of the Dakota Sandstone in north-central New Mexico: D. E. Owen; BGSU.

A study of the trace fossils and sedimentary structures in the upper sandstone and middle shale units of the Dakota Sandstone concentrated in the southern part of the Chama Basin where these units are well developed. The area will probably be expanded from the Chama Basin.

34 (SH,S,SP,P) Fluvial rocks of the Dakota Sandstone in the Chama Basin, New Mexico: K. Grant; BGSU.

Detailed measurements, including thicknesses, cross-bedding, channel orientation, orientation of other sedimentary structures will be made on the complex of braided-stream sandstone bodies and associated flood plain shales.

35 (GM) Fluvial rocks of the Dakota Sandstone in the Four Corners area, New Mexico: J. R. Kostura; BGSU.

Detailed measurements of thickness, lithology, facies changes, channel orientation, and sedimentary structures will be made. This information will make it possible to prepare maps with cross-sections and determine paleo-flow and paleo-geography of the area.

36 (S,SP,SH,P) Reef and backreef beds of Capitan and Magnesian Limestone reefs, New Mexico and County Durham, England: D. B. Smith; IGS, NMSBMMR.

A comparison of these reef and reef-related beds in southeast New Mexico and northeast England.

37 (S,SP,SH) Cretaceous stratigraphy; western New Mexico and adjacent areas: E. R. Landis; USGS(BOFCR).

Study of the lower part of the Cretaceous sequence in west-central New Mexico, adjacent Arizona, and southwestern Colorado to determine the geometry, lithology, depositional environment, and shore-line trends.

38 (SH,SP,MRP) Fuels potential of Lower Paleozoic of southern Arizona and New Mexico: P. T. Hayes; USGS(BOFCR)

Petrographic study of surface sections in southern Arizona and New Mexico and examinetion of cuttings and electric logs of selected drill holes. isopach and facies maps.

39 (P,SH,GM) Mississippian biostratigraphic studies: A. K. Armstrong; USGS(BPS).

Geologic mapping and detailed biostratigraphic studies of the Carboniferous carbonates of southeast Arizona and southwest New Mexico.

<u>Not Plotted</u> (STNP)

1 (P) Regional correlation of cephalopod faunas: R. H. Flower; NMSBMMR, USNM, GSC, USGS, BMNH, GSGB, and others.

This involves collecting, preparing, and describing large amounts of material, with other specimens submitted for study by various institutions and individuals; parallel with this is correlation of cephalopod faunas and ranges of genera and species. Results indicate a combination of (1) cephalopod types of widespread stratigraphic value (2) cephalopods confined to or extending beyond limits of faunal provinces determined largely on the basis of other fossils. Results will include monographs of the orders Endoceratida and Tarphyceratida.

2 (P) Devonian mollusca of New Mexico: R. H. Flower; NMSBMMR.

3 (P) Fossil Porifera from the Permian and Ordovician: J. K. Rigby; BYU.

Systematic and paleoecologic investigations are being conducted on a recently collected Capitanian fauna near Carlsbad. Ordovician sponges and sponge-like forms occur in several outcrops of the El Paso Group and are being described and evaluated from a paleoecologic viewpoint.

4 (SH,S) The Zuni Sequence of the southwestern United States: P. L. Kehler; ETSU, UALR.

Interregional investigation of Jura-Cretaceous strata in Texas, New Mexico, Arizona, Utah, Colorado, and Wyoming. Areas of study include northeastern New Mexico, northwestern New Mexico, and southwestern New Mexico where these strata outcrop. These have not been plotted on the map due to the regional nature of the study.

5 (P) Permian floras, southwestern United States: S. H. Mamay; USGS(BPS).

Collection and study of Permian plants and associated organisms from known fossiliferous localities and reconnaissance for new localities in New Mexico.

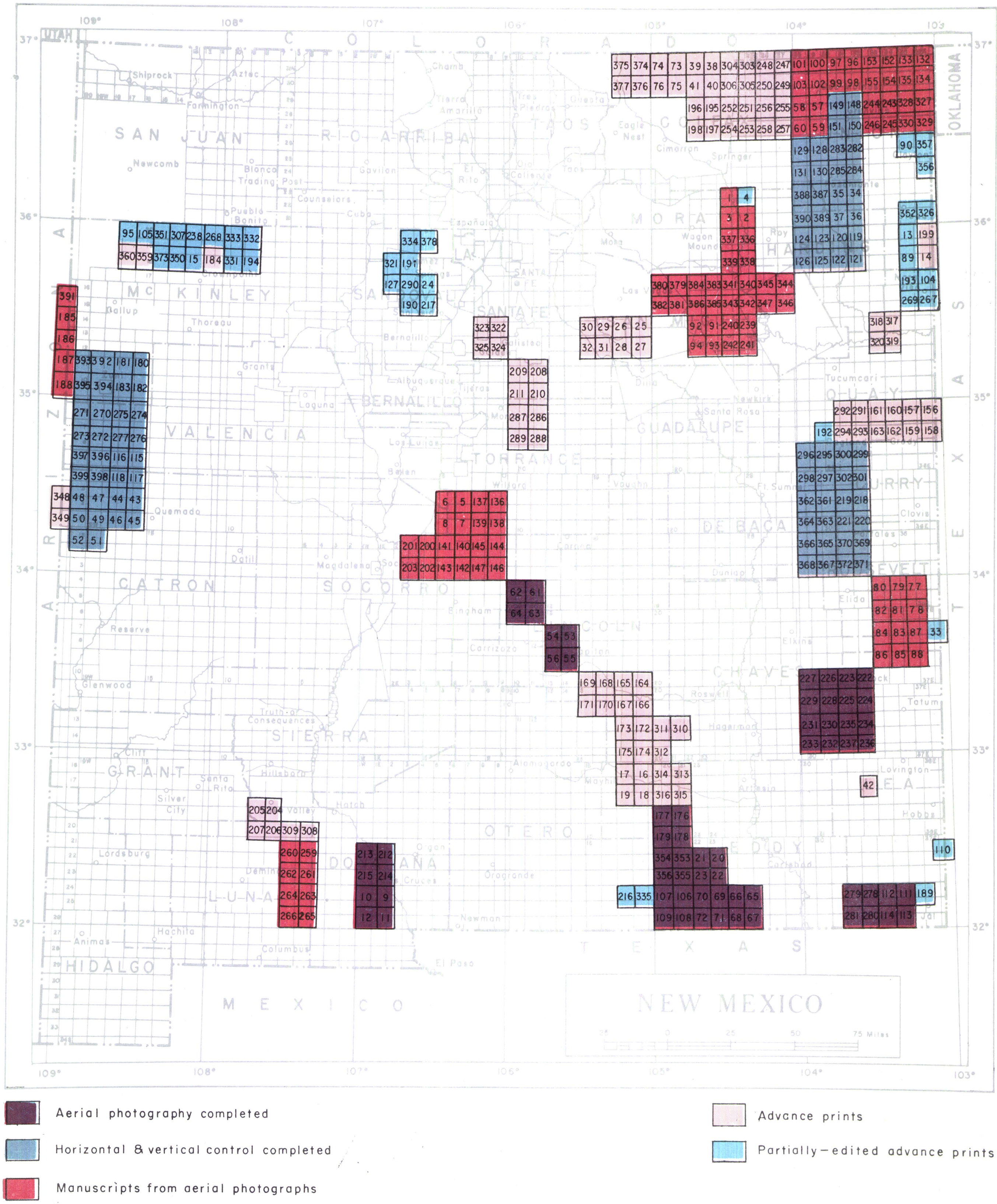
6 (P,SP,SH) Cretaceous faunas and stratigraphy; Western Interior: W. A. Cobban; USGS(BPS).

Study of sandstones in the lower part of the Mancos Shale in western New Mexico and northeastern Arizona.

7 (P,SH) Mesozoic palynology; western United States: B. D. Tschudy; USGS(BPS).

Study of Late Cretaceous palynomorph assemblages from the Gasbuggy cores from the San Juan Basin.

Topographic mapping follows



TOPOGRAPHIC MAPPING

TOPOGRAPHIC MAPPING

USGS topographic mapping in progress as of June 1, 1973.

Abbott 3 NW
Abbott 3 SE
Abbott 3 SW
Abbott Lake
Abo NE
Abo NW
Abo SE
Abo SW
Afton NE
Afton NW
Afton SE
Afton SW
Amistad
Amistad SE
Antelope Lookout Mesa
Avis 1 NE
Avis 1 NW
Avis 1 SE
Avis 1 SW
Bandanna Point NE
Bandanna Point NW
Bandanna Point SE
Bandanna Point SW
Bear Springs Peak
Bernal 1 NE
Bernal 1 NW
Bernal 1 SE
Bernal 1 SW
Bernal 2 NE
Bernal 2 NW
Bernal 2 SE
Bernal 2 SW
Bledsoe NE
Bluefront Ranch NE
Bluefront Ranch NW
Bluefront Ranch SE
Bluefront Ranch SW
Brillant NE
Brillant NW
Brillant SE
Brillant SW
Buckeye
Canon Largo 1 NE
Canon Largo 1 NW
Canon Largo 1 SE
Canon Largo 1 SW
Canon Largo 2 NE
Canon Largo 2 NW
Canon Largo 2 SE
Canon Largo 2 SW
Canon Largo 3 NE
Canon Largo 3 NW
Capitan NE
Capitan NW
Capitan SE
Capitan SW
Capulin NE
Capulin NW
Capulin SE
Capulin SW
Carizozo Peak 1 NE
Carizozo Peak 1 NW
Carizozo Peak 1 SE
Carizozo Peak SW
Carlsbad Caverns East NE
66 Carlsbad Caverns East NW
67 Carlsbad Caverns East SE
68 Carlsbad Caverns East SW
69 Carlsbad Caverns West NE
70 Carlsbad Caverns West NW
71 Carlsbad Caverns West SE
72 Carlsbad Caverns West SW
73 Catskill NE
74 Catskill NW
75 Catskill SE
76 Catskill SW
77 Causey 1 NW
78 Causey 1 SW
79 Causey 2 NE
80 Causey 2 NW
81 Causey 2 SE
82 Causey 2 SW
83 Causey 3 NE
84 Causey 3 NW
85 Causey 3 SE
86 Causey 3 SW
87 Causey 4 NW
88 Causey 4 SW
89 Centerville Corner
90 Clayton
91 Corazon 1 NE
92 Corazon 1 NW
93 Corazon 1 SE
94 Corazon 1 SW
95 Coyote Canyon NW
96 Cross-L Ranch NE
97 Cross-L Ranch NW
98 Cross-L Ranch SE
99 Cross-L Ranch SW
100 Des Moines NE
101 Des Moines NW
102 Des Moines SE
103 Des Moines SW
104 Doyle Hill
105 Ear Rock
106 El Paso Gap NE
107 El Paso Gap NW
108 El Paso Gap SE
109 El Paso Gap SW
110 Eunice NE
111 Eunice 3 NE
112 Eunice 3 NW
113 Eunice 3 SE
114 Eunice 3 SW
115 Fence Lake NE
116 Fence Lake NW
117 Fence Lake SE
118 Fence Lake SW
119 Gallegos 1 NE
120 Gallegos 1 NW
121 Gallegos 1 SE
122 Gallegos 1 SW
123 Gallegos 2 NE
124 Gallegos 2 NW
125 Gallegos 2 SE
126 Gallegos 2 SW
127 Gillman
128 Gladstone NE
129 Gladstone NW
130 Gladstone SE
131 Gladstone SW
132 Goodson School NE
133 Goodson School NW
134 Goodson School SE
135 Goodson School SW
136 Gran Quivira 1 NE
137 Gran Quivira 1 NW
138 Gran Quivira 1 SE
139 Gran Quivira 1 SW
140 Gran Quivira 3 NE
141 Gran Quivira 3 NW
142 Gran Quivira 3 SE
143 Gran Quivira 3 SW
144 Gran Quivira 4 NE
145 Gran Quivira 4 NW
146 Gran Quivira 4 SE
147 Gran Quivira 4 SW
148 Grenville NE
149 Grenville NW
150 Grenville SE
151 Grenville SW
152 Guy NE
153 Guy NW
154 Guy SE
155 Guy SW
156 Hollene 1 NE
157 Hollene 1 NW
158 Hollene 1 SE
159 Hollene 1 SW
160 Hollene 2 NE
161 Hollene 2 NW
162 Hollene 2 SE
163 Hollene 2 SW
164 Hondo 1 NE
165 Hondo 1 NW
166 Hondo 1 SE
167 Hondo 1 SW
168 Hondo 2 NE
169 Hondo 2 NW
170 Hondo 2 SE
171 Hondo 2 SW
172 Hondo 4 NE
173 Hondo 4 NW
174 Hondo 4 SE
175 Hondo 4 SW
176 Hope 3 NE
177 Hope 3 NW
178 Hope 3 SE
179 Hope 3 SW
180 Horsehead Canyon NE
181 Horsehead Canyon NW
182 Horsehead Canyon SE
183 Horsehead Canyon SW
184 Hosta Butte 1 SE
185 Houck 1 NE
186 Houck 1 SE
187 Houck 4 NE
188 Houck 4 SE
189 Jal NW
190 Jemez Pueblo
191 Jemez Springs
192 Jordan
193 Kerlin Hill
194 Kin Nahzin Ruins
195 Koehler NE
196 Koehler NW
197 Koehler SE
198 Koehler SW
199 Koger Ranch
200 La Joya 4 NE
201 La Joya 4 NW
202 La Joya 4 SE
203 La Joya 4 SW
204 Lake Valley NE
205 Lake Valley NW

206 Lake Valley SE
207 Lake Valley SW
208 Lamy 3 NE
209 Lamy 3 NW
210 Lamy 3 SE
211 Lamy 3 SW
212 Las Cruces NE
213 Las Cruces NW
214 Las Cruces SE
215 Las Cruces SW
216 Lewis Canyon
217 Loma Creston
218 Melrose NE
219 Melrose NW
220 Melrose SE
221 Melrose SW
222 Mescalero Valley 1 NE
223 Mescalero Valley 1 NW
224 Mescalero Valley 1 SE
225 Mescalero Valley 1 SW
226 Mescalero Valley 2 NE
227 Mescalero Valley 2 NW
228 Mescalero Valley 2 SE
229 Mescalero Valley 2 SW
230 Mescalero Valley 3 NE
231 Mescalero Valley 3 NW
232 Mescalero Valley 3 SE
233 Mescalero Valley 3 SW
234 Mescalero Valley 4 NE
235 Mescalero Valley 4 NW
236 Mescalero Valley 4 SE
237 Mescalero Valley 4 SW
238 Milk Lake
239 Montoya 2 NE
240 Montoya 2 NW
241 Montoya 2 SE
242 Montoya 2 SW
243 Mt. Dora NE
244 Mt. Dora NW
245 Mt. Dora SE
246 Mt. Dora SW
247 Mt. Loughlin 1 NE
248 Mt. Loughlin 1 NW
249 Mt. Loughlin 1 SE
250 Mt. Loughlin 1 SW
251 Mt. Loughlin 3 NE
252 Mt. Loughlin 3 NW
253 Mt. Loughlin 3 SE
254 Mt. Loughlin 3 SW
255 Mt. Loughlin 4 NE
256 Mt. Loughlin 4 NW
257 Mt. Loughlin 4 SE
258 Mt. Loughlin 4 SW
259 Myndus 2 NE
260 Myndus 2 NW
261 Myndus 2 SE
262 Myndus 2 SW
263 Myndus 3 NE
264 Myndus 3 NW
265 Myndus 3 SE
266 Myndus 3 SW
267 Nara Visa
268 Nose Rock
269 Obar
270 Ojo Caliente NE
271 Ojo Caliente NW
272 Ojo Caliente SE
273 Ojo Caliente SW
274 Ojo Caliente 1 NE
275 Ojo Caliente 1 NW
276 Ojo Caliente 1 SE
277 Ojo Caliente 1 SW
278 Paduca Breaks NE
279 Paduca Breaks NW
280 Paduca Breaks SE
281 Paduca Breaks SW
282 Pasamonte NE
283 Pasamonte NW
284 Pasamonte SE
285 Pasamonte SW
286 Pedernal Mountain 2 NE
287 Pedernal Mountain 2 NW
288 Pedernal Mountain 2 SE
289 Pedernal Mountain 2 SW
290 Ponderosa
291 Quay 1 NE
292 Quay 1 NW
293 Quay 1 SE
294 Quay 1 SW
295 Quay 3 NE
296 Quay 3 NW
297 Quay 3 SE
298 Quay 3 SW
299 Quay 4 NE
300 Quay 4 NW
301 Quay 4 SE
302 Quay 4 SW
303 Raton NE
304 Raton NW
305 Raton SE
306 Raton SW
307 Red Lake Well
308 Rincon 3 SE
309 Rincon 3 SW
310 Roswell 2 NE
311 Roswell 2 NW
312 Roswell 2 SW
313 Roswell 3 NE
314 Roswell 3 NW
315 Roswell 3 SE
316 Roswell 3 SW
317 Sand Spring 2 NE
318 Sand Spring 2 NW
319 Sand Spring 2 SE
320 Sand Spring 2 SW
321 San Miguel Mountain
322 San Pedro 1 NE
323 San Pedro 1 NW
324 San Pedro 1 SE
325 San Pedro 1 SW
326 Sedan SE
327 Seneca NE
328 Seneca NW
329 Seneca SE
330 Seneca SW
331 Seven Lakes
332 Seven Lakes NE
333 Seven Lakes NW
334 Seven Springs
335 Sheep Draw
336 Solano 2 NE
337 Solano 2 NW
338 Solano 2 SE
339 Solano 2 SW
340 Solano 3 NE
341 Solano 3 NW
342 Solano 3 SE
343 Solano 3 SW
344 Solano 4 NE
345 Solano 4 NW
346 Solano 4 SE
347 Solano 4 SW
348 Springerville 1 NE
349 Springerville 1 SE
350 Standing Rock
351 Standing Rock NW
352 Stead
353 Texas Hill NE
354 Texas Hill NW
355 Texas Hill SE
356 Texas Hill SW
357 Texline North
358 Texline South
359 Tohatchi 1 SE
360 Tohatchi 1 SW
361 Tolar 2 NE
362 Tolar 2 NW
363 Tolar 2 SE
364 Tolar 2 SW
365 Tolar 3 NE
366 Tolar 3 NW
367 Tolar 3 SE
368 Tolar 3 SW
369 Tolar 4 NE
370 Tolar 4 NW
371 Tolar 4 SE
372 Tolar 4 SW
373 Toyee
374 Ute Creek 1 NE
375 Ute Creek 1 NW
376 Ute Creek 1 SE
377 Ute Creek 1 SW
378 Valle San Antonio
379 Watrous 3 NE
380 Watrous 3 NW
381 Watrous 3 SE
382 Watrous 3 SW
383 Watrous 4 NE
384 Watrous 4 NW
385 Watrous 4 SE
386 Watrous 4 SW
387 Yates NE
388 Yates NW
389 Yates SE
390 Yates SW
391 Zithtusayan Butte 4 SE
392 Zuni NE
393 Zuni NW
394 Zuni SE
395 Zuni SW
396 Zuni Plateau NE
397 Zuni Plateau NW
398 Zuni Plateau SE
399 Zuni Plateau SW

MISCELLANEOUS (MISC)

Not Plotted

Project

1 A History of Mining in New Mexico: P. W. Christiansen; NMIMT, NMSBMMR.
Historical review of mining activity during Indian, Spanish, and American periods. The people, companies, towns, and development of the mining districts.

2 The impact of water technology on the history of New Mexico: P. W. Christiansen (NMIMT); NMWRRI.
Determining the level of technology applied to the quest for the development of water. Evolution of scientific ideas in geology and hydrology.

3 (HR) Preliminary evaluation of Professor C. E. Jacob's contribution in the field of water resources in New Mexico: W. Brutsaert (NMIMT); NMWRRI.

4 Bibliography of Solid Waste Stabilization: J. E. Lease; NMSU, NMSBMMR.

5 State Park Brochures: Staff; NMSBMMR, NMSPRC.
Preparation of guides to the geology and other features of New Mexico's state parks.

6 Annual Report: New Mexico State Bureau of Mines and Mineral Resources: Director; NMSBMMR.
Summary of current activities and publications of the past fiscal year.

7 Annual Report of Commissioner of Public Lands: State Land Commissioner; NMSLO.
Summary with statistical data on land income and revenue distribution.

8 Annual Report by the State Inspector of Mines: NMSIM.
Mineral statistics for metals, nonmetallics, sand, gravel, clay, caliche, and coal. Directory of mines and number of employees.

9 Monthly statistical report: NMOCC, NMOGEC.
Monthly allowables, production and disposition, pool creations and bottom hole pressures.

10 Annual report of the New Mexico Oil and Gas Engineering Committee: NMOCC.
Statistical monthly, annual, and cumulative oil, gas, and water production by county, pool, and operator.

11 Scenic trips to the geologic past: Las Vegas, New Mexico area: W. Bejnar; NMHU, NMSBMMR.