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A PRELIMINARY EVALUATION OF 30 POTENTIAL GRANITIC ROCK SITES FOR A RADIOACTIVE WASTE STORAGE FACILITY IN SOUTHERN NEVADA

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PREFACE

The preliminary study presented here was performed under subtask 2.7 of the NTS Terminal Waste Storage Program Plan for FY 1978. Subtask 2.7 examines the feasibility of locating a nuclear wast repository in a granitic stock or pluton in southern Nevada near the Nevada Test Site (NTS).

It is assumed strictly for the purposes of this study that such a respository cannot be located at NTS. This assumption may or may not be correct. In fact, five potential sites are being studied at NTS in the Twin Ridge Stock, Climax Stock, Gold Meadows Stock, Timer Mountain area, and Calico Hills area. The study reported here was conducted to answer the question, "If the sites at NTS are found to be unsuitable, could a suitable granitic site be found nearby?" The answer arrived at appears to be "yes".

This preliminary report does not identify a particular site as being a suitable location for a repository. Nor does it absolutely eliminate a particular site from further consideration. It does, however, answer the basic question of probable suitability of some of the sites and present a systematic method for site evaluation. Since the findings of this initial study have been favorable, it will be followed by more exhaustive and detailed studies of the original 30 sites and perhaps others. In future studies some of the evaluation criteria used in the preliminary study may be modified or eliminated, and new criteria may be introduced.

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I. INTRODUCTION

C. K. GeoEnergy Corporation (CKG), under contract to the Lawrence Livermore Laboratory (LLL), P. O. number 9567703, has developed a preliminary set of criteria for screening granitic plutons as potential radioactive waste storage sites. These criteria have been employed in an exercise to evaluate 30 potential sites in Nye, Esmeralda, Lincoln, and Clark counties, Nevada. It should be noted that as an exercise, this study is not intended to provide results that might be used by the Nevada Operations Office (NV) for decision making. The granitic plutons were selected by LLL (Stone, 1977), and the considerations used in the evaluation were developed by CKG under the supervision of LLL, utilizing considerations, factors, and criteria previously discussed by Stone (1978) and Burton and McClain (1977). One specific 40-ha site location was selected for each pluton, and used as the basis for the quantitative evaluations of distances, relief, etc.

Two sites were evaluated initially in order to check out the feasibility of the evaluation technique. These sites were the Climax Stock on the Nevada Test Site, NTS, (not one of the 30 potential sites considered in this study) and Site #1 in the Lucy Grey Range in Clark County.

There are other granitic plutons in southern Nevada that were not included in this study. When these are studied

some of them may prove to be suitable repository candidates.

A. EVALUATION CONSIDERATIONS

The following 10 broad categories encompassing the socio-economic/institutional and technical/environmental areas were used in the development of the evaluation considerations:

Topography	Safety/Security
Geology	Seismicity
Hydrology	Logistics
Demography	Meterology
Land Status	Archeological/Historical Sites

Topography

1. The site should include a 20- to 40-ha above-ground operations area near the underground facility's portal with as low relief as possible.

2. The access route should also be characterized by low relief.

Geology

1. The mass of granitic rock exposed should be sufficient to contain the underground facility. (At least 4 km^2 should be available in the rock mass at depths of 300-1,500 m.)

2. The host rock should be competent.

3. Faults and surface lineaments should be at a minimum.

4. Open joints should be at a minimum.

5. A granitic rock mass in an overthrust should be avoided.

6. Joint frequency should be at a minimum.

7. Historic and Upper Cenozoic faults should be as far away from the site as practicable.

8. Volcanism risk should be low. Site should be located as far as practicable from vents younger than 6,000,000 years.

9. Abnormally stressed rocks should be avoided.

10. Younger rock masses are preferred if less fractured.

11. Geothermal resource areas should be avoided

12. Sites potentially attractive for mineral development should be avoided.

13. The granitic rock mass should not be heavily dissected by valleys and crevasses. (Heavy dissection could indicate that the rock may be either incompetent or heavily faulted/open-jointed or both.)

Hydrology

1. The portion of the rock mass which is to contain the facility should be above the water table, if possible. If not possible, the fracture permeability should be at a minimum.

2. The site should be located as far away as practicable from existing water wells in use.

3. Areas with springs should be avoided.

4. Areas with perennial streams should be avoided if possible, and the 20 to 40-ha facility area should be located so as to obviate any damage from flash floods.

5. Lakes, man-made reservoirs, and paleolakes should be avoided.

6. Sufficient water should be available for the operation.

7. The site should be located in a recharge area and as far as practicable from discharge areas.

8. Closed groundwater basins are preferable.

9. Groundwater and surface water should not move into metropolitan areas, the Colorado River drainage basin, or the Owens basin.

Demography

1. Population density should be minimal near the site.

2. An established town should not be located too close to the site, and a support town with a reasonable population should be located within 150 km of the site.

3. Occupied human habitations should be minimal in the site area.

4. The site should be located as far as practicable from the state boundary.

5. The site should be located as far as practicable from existing mining operations or industrial activities.

6. It should be located as far as practicable from public recreation areas.

7. It should be located as far as practicable from currently-used farm lands.

Land Status

1. The site should not be located within a national or state park, wilderness or primitive area, withdrawn water sheds, federal or state wildlife reserve, national monument, national recreation area, Indian reservation, BLM or Bureau of Reclamation withdrawn lands, or near a wild or scenic river.

2. The site should be located as far as practicable from any of the foregoing types of land.

3. The site should preferably be located on federal land, not under lease.

4. Minimal mineral claims should exist on the site.

5. Minimal drilling and mining should have occurred within the 4 km^2 site area.

Safety/Security

1. The site should be located as far as practicable from airline corridors.

2. It should be located as far as practicable from military ranges.

3. The site should preferably be situated so as to allow the facility to be out of view from well-traveled paved roads.

Seismicity

1. The site should be located in an area with a minimal number of recorded earthquakes.

2. The magnitude of the largest natural earthquake with an epicenter located in the vicinity of the site should be minimal and the distance to that epicenter should be maximal.

3. The site should be expected to undergo minimal accelerations from NTS explosions or natural earthquakes (less than .5 g).

4. The site should be located as far as possible from any historic earthquake damage or fault movement.

Logistics

1. The site should be as close as practicable to a railroad.

2. It should be as close as practicable to a major paved road and still preferably out of view from the road.

3. The site should be located as near as practicable to existing power transmission lines.

4. It should also be located as near as practicable to an existing gas transmission line.

Meterology

1. Sites with extremes in weather conditions should be avoided.

Archeology/History

1. Known sites of archeological or historical interest should be avoided, if possible.

Using these considerations, a list of about 60 characteristics was established for each site. Completely subjective distances, areas, etc., were used as limits in the descriptions

of site characteristics. Consequently, these limits should not be used in any context which requires theoretically, experimentally, or empirically-derived limiting criteria.

B. SCREENING TECHNIQUE

Site characteristics were compared and subjectively assigned weights. In addition, a number of characteristics were considered by the authors of this memorandum to be of such importance that a particular site could be eliminated entirely from preliminary consideration if it failed to meet the subjectively assigned standard for any one of these characteristics.

It is suggested that a second screening be conducted using more detailed information developed by an on-the-ground survey of each site. This second screening might utilize a different set of critical factors and coefficients that have resulted from additional field observations and the dialogue which would take place in the interim between this preliminary and the recommended follow-up evaluations.

II. SITE DESCRIPTIONS

A. INTRODUCTION

Information from each site is summarized in a four-page "Data Sheet" format (see Appendix A). Photographs of the sites taken in the course of an aerial reconnaissance are presented in Appendix B. The sources of data used to provide the information and a generalized description of the southwestern and southeastern sections of Nevada, in which the sites are located, are discussed in the following portions of this section of the report.

B. DATA SOURCES

Rapid assessment of many of the features of the sites was facilitated by a number of very helpful reports that have been published by the USGS and several State of Nevada agencies, the Nevada Bureau of Mines and Geology, the Nevada Division of Water Resources, and the Nevada Department of Conservation and Natural Resources.

Generalized geological information was found in the following data sources:

"Million-scale Geologic Map of Nevada," J. H. Stewart and J. E. Carlson, Nev. Bu M&G Map 57 (1977) included as Plate I.

"Preliminary Geologic Map of Nevada," J. H. Stewart and J. E. Carlson, USGS MF 609 (1974)

"Preliminary Map of Volcanic Hazards in the 48 Conterminous United States," D. R. Mullineaux, USGS MF 786 (1976)

"A Probabilistic Estimate of Maximum Acceleration in Rock in the Contiguous United States," S. T. Algermissen and D. M. Perkins, USGS Open File Report 74-416 (1976) (see Figure 1).

"Cenozoic Rocks of Nevada," J. H. Stewart and J. E. Carlson Nev Bu M&G Map 52 (1976) (see Figure 2).

"Water for Nevada - Hydrologic Atlas," Nev. State Division of Water Resources (1972)

Map S3 - Precipitation

Map S8 - Natural Ground Water Discharge Areas, (see Figure 3).

Map S13 - "...Interbasin Flow," (see Plate II).

Map L2 - "Pleistocene Lakes," (see Figure 4).

"Pleistocene Lakes in the Great Basin," C. T. Snyder, G. Hardman, F. F. Zdenek, USGS MI-416

"Prediction of Ground Motion Characteristics of Underground Nuclear Detonations," E.R.C. NVO-1163-239-UC11 (1974). (A 1-megaton shot on Pahute Mesa (see Figure 5) was used to calculate maximum acceleration at each site from nuclear events.)

"A Preliminary Assessment of the Seismic Hazard of the Nevada Test Site Region," A. M. Rogers, D. M. Perkins, F. A. McKeown, Bull Seis Soc of Amer, Vol. 67, No. 6, pp1587-1607 (1977)

"Catalog of Nevada Earthquakes, 1852-1960," D. B. Slemmons, A. E. Jones, J. I. Gimlett, Bull Seis Soc Amer, Vol. 55 No. 2, pp519-567 (1965)

"Earthquake Data File Summary," N.O.A.A. (1978) (see Plate III).

"Hot Springs, Sinter Deposits, and Volcanic Cinder Cones in Nevada," R. C. Horton, Nev Bu M&G Map 25 (1964)

"Map of Intrusive Rocks in Nevada," R. V. Wilson, R. R. Paul, Nev Bu M&G Map 30 (1965) (see Figure 6).

"Geothermal Energy Resources of the Western United States," NOAA (1977) (see Figure 7).

"Geologic and Water-Supply Reports and Maps - Nevada," USGS Circ (1976)

"Geologic Map Index of Nevada," L. Boardman, R. J. Brown, USGS Circ (1955)

"Geological Map Index of Nevada, 1955-1970," I.A.Lutsey, Nev Bu M&G Map 42 (1971)

"Nevada Ground-Water Resources-Reconnaissance Series-Reports No. 9, 10, 12, 13, 14, 16, 18, 21, 24, 25, 27, 28, 30, 31, 36, 38, 45, 46, 50, 51, 52, 54, 58, 60," Nev. Dept Cons & Nat Res.

"Inventory of Printed Information and Data Pertaining to Water and Related Resource of Nevada," H. A. Shamberger, Nev Dept Cons & Nat Res. (Oct. 1967)

"Correlation of Great Basin Stratigraphic Units," R. L. Langenheim, Jr., E. R. Larson, Nev. Bu M&G Bull 72 (1973)

"Mineral and Water Resources of Nevada," by USGS and Nev Bu M&G, Nev Bu M&G Bull 65 (1964)

"Isotopic Age Determinations of Nevada Rocks," J. H. Schilling, Nev Bu M&G Report 10, (1965)

"Interbasin Ground Water Flow in Southern Nevada," R. L. Naff, G. B. Maxey, R. F.Kaufmann, Nev Bu M&G Report 20 (1974)

"Bibliography of Nevada Mining and Geology," M. B. Ansari Nev Bu M&G Report 24 (1975)

"Geothermal Exploration and Development in Nevada Through 1973," L. J. Garside Nev Bu M&G Report 21 (1974)

"Oil and Gas Developments In Nevada 1968-1976," L. J. Garside, B. S. Weimer, I. A.Lutsey, Nev Bu M&G Report 29 (1977)

"Directory of Nevada Mine Operations Active During Calendar Year 1976," Nev Industrial Comm. (1977)

"Wells Drilled for Oil and Gas in Nevada Through 1976," L. J. Garside, H. H. Schilling, Nev Bu M&G Map 56 (1977) (see Figure 8)

"Active Mines and Oil Fields in Nevada, 1976," A. L. Payne, K. G. Papke, Nev Bu M&G Map 55 (1977), (see Figure 9)

"East-Trending Structural Lineaments in Central Nevada," E. B. Ekren et al, USGS Prof Paper 986 (1976)

"Chronology of Emplacement of Mesozoic Batholithic Complexes in California and Western Nevada," J. F. Evernden, R. W. Kistler, USGS Prof Paper 623 (1970)

A number of additional reports, maps, papers, etc., were used in geological evaluations of the specific sites. These specific data sources are listed as references on page four of each site's set of "Data Sheets."

General references used to evaluate demographic data are found in the following list:

"Nevada's Weather and Climate," J. G. Houghton, C. M. Sakamoto, R. O. Gifford, Nev Bu M&G Spec. Pub. No. 2 (1975)

"Topographic Map of Nevada," S.L. Nichols, I. A. Lutsey Nev Bu M&G Map 43 (1972) (see Plate IV).

"Land Status Map of Nevada," I. A.Lutsey, S. L. Nichols Nev Bu M&G Map 40 (1972) (see Plate V).

"Transmission and Transportation Facilities in Nevada," K. Lockard Nev Bu M&G Map 41 (1970) (see Figure 10).

"Rand McNally Map of Nevada," 1977 Edition

"Sectional Aeronautical Charts," (Las Vegas and San Francisco) NOAA - Oct 1977

"Nevada Ghost Towns & Mining Camps," S. W. Paher, Howell-North Books, Berkeley, Ca, 1970 (see Figure 11).

C. EASTERN NEVADA SITES

The thirty sites can be conveniently divided into two groups, a western group (sites 2-9, 20-26, and 30) and an eastern group (sites 1, 10-19, 27-29). The geological characteristics of these groups are somewhat different. The eastern sites will be discussed in this section of the report and the western sites in the following section.

Nevada has been divided into four subprovinces by some economic geologists (Osmond and Elias, 1971). The eastern sites are located in the area typified by older sediments which were laid down in a volcanic "miogeosyncline." This miogeosynclinal area is divided into a stable and an orogenic component. (Subprovince I and II in Figure 12.)

Some of the later eastern granitic sites, 12, 13, 15, 16, 27, and 28, that seem to lie along four lineaments or their extensions, have been identified in Central Nevada (Ekren et al, 1976; see Figure 13). Sites 14, 15, 19, 25, 29 are north of the western branch of the Intermountain Seismic Zone (see Plate III) and sites 12, 13, 14, 15, 17, 19, 27, 28, and 29 are west of the Sevier Orogenic Zone, Figure 12. A number of the eastern locations seem to be in a generally stable environment (Western part of Osmand and Ellis' Subprovince I).

The Precambrian granitic sites, 1, 10, and 11, are in the Sevier Orogenic Zone. However, there are no historic faults in the immediate vicinity of these sites and they are also remote from other indicators of instability such as geothermal areas, (see Figure 7), relatively recent volcanism, (see Figure 2), seismic activity* (see Plate III), etc. Thus, these sites generally reflect a geologically stable environment.

Site 1

Site 1 is located in Clark County south of Las Vegas in the Lucy Grey Range. See Figure 14 (Bingler and Bonham, 1973). The range is a faulted Precambrian block capped with a layer of Tertiary volcanics of the Mount Davis Formation. The 40-ha site was arbitrarily located on the east side of the range in a granitic augen gneiss area. The rock appeared to be more resistant than the leucocratic quartz monzonite that occurs at several

* One 15-70 km deep $\leq$ 4.5 earthquake has been reported with a epicenter about 10 km northwest of site 10.

locations or the quartzo-feldspathic biotite gneiss/foliated gneissic granite that comprises the western portion of the range.

The McCullough fault separating the Lucy Grey from the McCullough Range has an apparent displacement of about 6 km (20,000 ft) using the projection of the Precambrian-Mount Davis contract (Longwell et al, 1965). This fault is Tertiary in age. There are no post-Tertiary faults nearer the site than the Late Cenozoic State Line Fault located about 10 km (6 mi) to the southwest.

This site is generally technically favorable except that the groundwater drains, via several other basins, into the Las Vegas Valley and thus into the Colorado River.

The site is favorable from a logistic standpoint, being near transportation and support facilities. However, this reduces the favorability from a security standpoint.

Figure 15a is a view of the site taken from the south. Figure 15b is a veiw of the volcanic cap on the promontory east of the site.

Figure 15c and 15d illustrate some of the recreational and grazing activities in the area.

A microwave tower is located about a kilometer south of the site. The access road and the power line to this Bell Telephone facility pass through the site (see Figure 15a).

Site 10

Site 10 is located on the west side of the Mormor Mountains in Lincoln County. Precambrian granite, amphibolite and gneiss

are exposed along a 6 km (4 mi) section adjacent to the arbitrarily chosen 40-ha site. Precambrian rocks are exposed through a window in the Tule Springs Thrust (see Figure 16). However, recent work (Dixon personal communication) indicates that the rock at this site has an appreciable gneiss and schists fraction, hence this site requires detailed field evaluation. Thus, the structural geological features of this site require an additional field study before a determination of favorability can be made. Furthermore, both the surface water and groundwater drain into the Colorado River system. In addition a moderate depth ≤ 4.5 earthquake has been reported about 10 km northeast of the site (Plate III).

Otherwise, site 10 is generally favorable from the logistic and security standpoint.

Site 11

Site 11 is located on the southeastern end of the East Mormon Mountains (see Figure 16). Precambrian amphibolites and gneisses are exposed along a 10 km (6 mi) stretch east of the eastern edge of the Tule Springs Thrust Fault. Recent work (Dixon personal communication) indicates that this site is predominantly gneiss and schists with lesser amounts of pre-Cenozoic granite, hence a detailed field evaluation would be required. Like Site 10, the structural geological factors must be studied before favorability can be determined. Furthermore, the surface and groundwater drain into the Colorado River system.

However, this is generally favorable from a logistic and security standpoint.

The 40-ha site was arbitrarily located near the southern end of the outcrop area near a road and power line that service a microwave tower.

Site 12

The Site 12 rocks consist of several small granitic stocks near the north end of the Groom Range. The stock arbitrarily chosen for the 40-ha site is a porphyritic quartz monzonite with chlorite sericite and calcite as alteration product (Tschanz and Pampeyan-1970). The stocks are rather small and unless they coalesce at depth there may not be a 4 km^2 pluton area at a depth of from 300-1,500 m below the surface. A moderate depth $\leq$ 4.5 earthquake has been reported less than 10 km northwest of the site (Plate III).

Site 12 is rather remote from any town or center of population. Thus this site has a problem from the standpoint of logistics.

Site 13

The Site 13 plutons are two Tertiary granitic intrusives located on the northwestern margin of the Timpahute Range. The northern pluton (see Figure 17) was selected as the arbitrary site location because it is more competent and because of the mineralization and active mining along the western margin of the southern stock.

Site 13 will not have 4 km^2 at depth unless the plutons

increase in cross sectional area with increasing distance from the land surface. The site is located within the Timpahute Lineament, and this aspect should be carefully evaluated.

Site 13 is somewhat remote from support facilities; thus representing a logistical problem. It is also near a new large tungsten mine which may be a problem from the standpoint of interference with mineral development.

Site 14

Site 14 comprises two Tertiary granitic intrusives located on the north end of the Worthington Range in Lincoln County. The eastern stock was arbitrarily chosen as the site. This stock is described as a leucocratic granite cut by many small mafic dikes. A view of the general topographic expression of the stock is presented as Figure 18a and a view of some of the veining is presented as Figure 18b.

The western stock is described as being quite heterogeneous with a highly altered and intruded wall rock (Tschanz and Pampeyan 1970). There is a tungsten prospect on the contract of the western stock and some mines in the contact rock near the eastern stock.

The site is remote and would represent somewhat of a logistical problem. However the site appeared to be favorable from a evaluation of the technical aspects described in the literature, and was one of the sites selected for a ground visit.

Site 15

The site's pluton is a north-south elongated quartz diorite stock which appears to have its eastern margin along one of the

major faults in the southern Schell Creek Range in Lincoln County. The principle mineralization in the area is associated with a small quartz diorite porphyry located about 1.2 km (3/4 mi) northeast of the main stock.

The principle technical problem associated with this site is the reported movement of groundwater from the Cave Valley into the Colorado River drainage (Nevada Hyrdologic Atlas Map S-13, see Plate II).

The site is somewhat remote, but probably represents a reasonable compromise with respect to logistical and security aspects.

Site 16

Site 16 is located along the southern margin of a good size diorite/monzonite porphyry stock located in the Cedar Range, Lincoln County. The stock is typified by altered shear zones, along which the rock has low competency and some mineralization. There is a possibility that the stock represents a disseminated low grade copper/lead/zinc/silver "ore". (Tschanz and Pampeyan, 1970.)

A technical problem associated with this site is the transport of surface and groundwater into the Colorado River drainage. A $\leq$ 4.5 medium depth earthquake was deported with a epicenter about 10 km north of this site.

The site is good from a logistic and security standpoint.

Site 17

Site 17 on the western side of the Delmar Range in Lincoln

County was originally thought to be a quartz monzonite/granitic porphyry, but it has since been characterized as consisting of Tertiary rhyolitic plugs that intrude the Kane Springs volcanic center (Twenhofel, 1978). Therefore, the structural geological factors are not favorable for site 17. Furthermore, groundwater from the site discharges into the Colorado River system.

Site 17 is moderately remote from support facilities, but it would probably be acceptable from a logistic and security standpoint.

Site 18

Site 18 in the predominantly volcanic rocks of the Clover Mountains in Lincoln County was at first identified as dioritic stock. It has since been mapped by Ekren and others as intrusive rhyolites associated with the Caliente volcanic center ring fracture zone (Twenhofel, 1978). Consequently, the structural geology of site 18 makes it unsuitable.

The ground and surface waters from the site drain into the Colorado River system and a shallow ≤ 4.5 earthquake within a few kilometers of the site are factors that further reduces the acceptability of the site.

The site seems acceptable only from a logistic and security standpoint.

Site 19

The pluton of Site 19 is a quartz monzonite stock intruded into a complexly faulted Cambrian sequence in the southern part

of the Bristol Range in north central Lincoln County. The bulk of the mineralization in the Bristol Range occurs at least several kilometers north of the pluton. Water was encountered at an elevation of 1,765 m (5,790 ft) in this mining district, and provided a significant problem for economic recovery of the ore. The reported water level is only 155 m (510 ft) below the surface elevation of the arbitarily selected 40-ha location on Site 19; thus it could be a technical problem for this site's development.

Another technical/environmental problem is the discharge of groundwater from the Site 19 basin into the Colorado River system.

The security and logistic characteristics for this site are generally satisfactory.

Site 27 and Site 28

The exact nature of the igneous bodies at sites 27 and 28 is in question. Twenhofel (1978) cites work by Moores, Scott, and Lumsden describing the rocks as granite porphyry and conflicting work by Stewart and Carlson and by Kleinhampl and Ziony describing the rocks as rhyolite porphyry. Further field work would be required to resolve these conflicting interpretations.

If the latter interpretation is correct, then these sites would not be suitable based on their rock type. Even if the first interpretation is correct, and the two bodies are granitic stocks, they are rather small and they are separated widely enough that

there is not a high probability that they coalesce at a depth of 300-1500 m. Thus, they may not represent a sufficiently large mass at the depth of interest.

There is an additional stock along the western margin of the range that should be evaluated and considered as a replacement for these sites.

The other technical, logistic and security factors associated with these stocks are generally favorable, and would be favorable for the alternate location.

Site 29

The Site 29 pluton is the Troy quartz monzonite intrusion of Cretaceous (?) age, located along the southwest margin of the Grant Range. The area is rather intensely deformed with major faulting reported after the time of emplacement of the Troy Stock (Cebull, 1970) (see Figure 19). The northern part of the stock is sheared, but the body is large enough so that competent rock occurs in a 4 square kilometer area near Troy Canyon (see Figure 20). The Troy stock is cut by large dikes of both acidic and basic composition; however, the contacts appear to be stable. Thus,the dikes should not represent structural discontinuities that would preclude the construction of stable underground workings.

The groundwater and surface water drain into Railroad Valley, which has no reported discharge into adjacent areas.

The stock seems generally favorable from a technical,

logistical, and security standpoint.

D. WESTERN NEVADA SITES

The rocks exposed in western Nevada consist predominantly of Tertiary volcanics. The rocks which the western Nevada plutons have intruded are primarily eugeosynclinal Paleozoic volcanic and sedimentary rocks in contrast to the predominantly miogeosynclinal rocks intruded by the eastern Nevada pluton. Earthquake activity and the incidence of historic surface breaks in western Nevada have been relatively high compared to that in eastern Nevada (see Figure 27 and Plate III).

Sites 2-9 and 30 are located just inside the Approximate Eastern Limit of Area of Abundant Jurassic Cretaceous Intrusions defined by Osmund and Elias (1971). Sites 20-26 are located to the east and outside this limit in a region of relatively sparse occurrences of intrusive granitic rocks.

Sites 5, 6, 7, 8, 9 are located in or near the Death Valley-Furnace Creek - Fish Lake Valley fault zone and constitute especially high risk seismic areas.

Site 2

Site 2 was visited on the ground. A photograph of the site is presented in Figure 21. The site is located on the southwest flank of Lone Mountain. The rock is a biotite quartz monzonite of Jurassic to Tertiary age. It intrudes the Precambrian Wymam Formation shales and limestones and the Precambrian Reed Dolomite.

The rock is competent, and it exhibits good exposures of the joint system. This site and site 3 are located in a "window" in the western high seismicity trend (Plate III), and also in a "window" in the Walker Lane - Las Vegas Valley Fault zone.

The hydrology of the site is favorable. The site is out of view from existing paved roads, but it is on an airline corridor. The logistics are particularly favorable; Tonopah is only 61 km (road distance) away, and the nearest railroad is within 78 km.

Site 3

Site 3 was also examined on the ground. A photograph is presented in Figure 22. The site is located on the northwest flank of the Weepah Hills just across the valley from Site 2. The rock is also a biotite quartz monzonite of Jurassic to Tertiary age. The pluton intrudes the Precambrian Wyman Formation and Reed Dolomite as well as the Cambrian Campito Formation (shales).

The quartz monzonite is more variable in competency (and generally less competent) than that of the Lone Mountain pluton. This site is also located in a window in the Walker Lane- Las Vegas Valley zone and western Nevada high seismicity area.

The hydrology of the site is favorable. The logistics are similar to those of the Lone Mountain pluton--generally favorable.

Site 4

Site 4 is located about 2 km west of the town of Silver Peak. The pluton is a biotite quartz monzonite of Jurassic to Tertiary age which intrudes the Precambrian Wyman Formation (siltstones and limestones).

The pluton has been displaced by high-angle normal faults. The site is located only 4 km from a known geothermal resource area (KGRA). Also, the Silver Peak Lithium Mine, operated by the Foote Mineral Company, is located only 5 km to the east. A < 6 m.y. old volcanic vent lies 8 km north of the site.

The hydrology is generally favorable. Safety, security and logistics are generally favorable. However, the existence of the town of Silver Peak only 2 km away is considered quite unfavorable.

The Site is approximately 25 km northeast of the Nevada seismic zone.

Site 5

Site 5 is located on the western edge of the Silver Peak Range near Fish Lake Valley. The Dyer pluton is composed of biotite quartz monzonite of Jurassic to Tertiary age. It intrudes the Cambrian Harkless Formation (shale).

The structural geology is unfavorable; the pluton lies within the area effected by the Death Valley-Furnace Creek-Fish Lake Valley fault zone.

Except for a groundwater discharge area lying within 3 km

of the site, the hydrology is favorable. The Dyer Ranch is in view of the site, being located 2 km to the north. The town of Dyer is located only 8 km from the site - closer than is desirable.

Safety and security are acceptable. However, the rather long distance to the nearest support town (Tonopah) of 120 km makes the logistics somewhat unfavorable.

Site 6

Site 6 is located on the eastern flank of the White Mountains, just northwest of Dyer, Nevada. The rock is biotite quartz monzonite of Jurassic to Tertiary age. It intrudes the Precambrian Wyman shales and limestones and the Cambrian Harkless Siltstones.

The rock mass is extensive. However, it lies right on the California-Nevada border. An Upper Cenozoic fault lies only 3 km from the site, and the Death Valley-Furnace Creek fault zone appears to be present in the alluvium along the eastern edge of the pluton.* Thus seismicity is unacceptable. Except for there being perennial creeks within 3.5 km of the site and a Pleistocene lake within 3 km (Lake White Mountain), the hydrology is favorable.

Unfortunately, the site is located only 3.3 km from the state of California. Logistics are somewhat unfavorable; with the support town of Tonopah being 112 km distant from the site.

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* Personal communication- Gary Dixon, U.S.G.S., Denver.

Site 7

Site 7 is located on the western flank of the Silver Peak Range in Fish Lake Valley. The pluton is almost 100 km in exposed area. It consists of biotite quartz monzonite of Jurassic to Tertiary age. The intruded formations include the Cambrian Harkless Siltstone and the Ordovician Palmetto Shale.

The pluton is located in an area that is probably affected by the Death Valley-Furnace Creek fault zone. Thus seismicity is unfavorable.

The hydrology is generally favorable, except that the White Mountain Pleistocene lake is located within 5 km of the site.

There is an active tungsten mine, the Jaca Mine run by J. G. J. Minerals Company, only 5 km away. Safety and security are satisfactory but logistics would be somewhat unfavorable, with the nearest support town of Tonopah located a route distance of 139 km away.

Site 8

Site 8 is located on the eastern flank of an arm of the Silver Peak Range near the California border. The pluton is 43 km^2 in exposed area and consists of biotite quartz monzonite of Jurassic to Tertiary age. It intrudes the Harkless Siltstone of Cambrian age.

Site 8 is in an overthrust and is located in an area probably

effected by the Death Valley-Furnace Creek fault zone*, consequently it is unfavorable from the standpoint of structural geology. Hydrology is generally favorable. Seismicity is unacceptable; the site is located in the Nevada seismic zone. In addition the state of California is only 3.1 km to the west and an active lead/silver mine, the Sylvania Mine operated by the Sylvania Mining Company, is located 6 km from the site.

Safety and security are excellent. However, logistics are less desirable, with the support town of Tonopah being located 118 route kilometers to the northeast.

Site 9

Site 9 is located on the Sylvania pluton which has an exposed area in Nevada of more than 280 km^2. The site is on the northern flank of Slate Ridge just a few kilometers west of Gold Point. The pluton consists of biotite quartz monzonite of Jurassic to Tertiary age. It intrudes the Precambrian Wyman Formation which consists primarily of siltstones and limestones.

The site is located in an area probably effected by the Death Valley-Furnace Creek Fault zone,* and a fault more than 5 km long which extends to within 1 km of the site. The hydrology is generally favorable, except for significant surface discharge. There is an active gold mine within 3 km - the Penny Mine operated by Norman Bailey. Seismicity is unacceptable; the pluton is located in the Nevada seismic zone. Logistics are not entirely favorable; Tonopah is located at a distance greater

* Personal communication -Gary Dixon, U.S.G.S. Denver.

than 100 km and the nearest railroad is located 175 km away.

Site 20

The site chosen on the "Round Mountain Pluton" is located 1.5 km east of the town of Round Mountain in the southern portion of the Toquima Range. The pluton is composed of granite of Jurassic (?) age and intrudes the slates and cherts of the Ordovician Palmetto Formation.

Site 20 is generally favorable from a structural geology and hydrology standpoint. However its close proximity to the active Round Mountain Gold Mine of the Smoky Valley Mining Company and the town of Round Mountain is unfavorable. Except for its remoteness from a railroad, the logistic situation is rather favorable.

Site 21

Site 21 on the "Manhattan District intrusive," is located on the southeastern edge of the Toquima Range. It consists of Cretaceous quartz monzonite and granodiorite and intrudes Ordovician shales, cherts and limestones.

Site 21 is generally favorable from standpoints of structural geology, hydrology, logistics (except for distance to nearest railroad) and safety. However, its close proximity to the town of Manhattan (8.5 km) is considered to be unfavorable. Particularly favorable, however, is the relatively close proximity to the nearest support town of Tonopah of only 47 km. The pluton is sufficiently large to allow a number of alternate sites to be

chosen which might prove to be acceptable.

Site 22

Site 22 on the "Clipper Gap Pluton" is located on the western side of the Toquima Range in the Big Smoky Valley, just south of the Nye/Lander County boundary. The pluton consists of biotite quartz monzonite and granodiorite of Jurassic age. It intrudes the Ordovician Vinini Formation which is composed of shale, chert, limestone, and quartzite.

This site is generally favorable from the standpoint of structural geology and hydrology except that the nearest groundwater discharge area is located only 5 km away. Also, the edge of Pleistocene Lake Toiyabe is only 3 km from the site. Logistically, Site 22 is generally unfavorable in that the nearest support town of Tonopah is located 155 km to the south and the nearest railroad is almost 200 km distant by an acceptable route.

Site 23

Site 23 was examined on the ground. A photograph is shown in Figure 23. It is located just south of Aiken Creek on the eastern edge of the Toiyabe Range in Big Smoky Valley. The rock is Jurassic-Tertiary granodiorite and adamellite. It intrudes Cambrian formations composed primarily of quartzite.

The pluton is fairly extensive and may be continuous with another pluton located just north of the site. Competency of the exposed rock varies from place to place.

From a structural geology standpoint, the site is less than favorable. A 5+ km-long fault transects the site and a Quaternary/Upper Cenozoic fault lies within 2 km. Hydrology of the site is somewhat unfavorable in that a groundwater discharge area is located 3 km away and 7 perennial streams are located within 5 km. Pleistocene Lake Toiyabe lies 2 km to the east of the site.

Logistically, the site is less than desirable. The nearest support town, Tonopah, is located 139 km to the south and the nearest railroad is 188 km by an acceptable route.

Site 24

Site 24 was also investigated on the ground. A photograph of the pluton is presented in Figure 24. The site is located on the eastern slope of Toiyabe Range in Big Smoky Valley within several kilometers of Carver's Corner. The pluton is quartz monzonite of Jurassic age. It intrudes the Ordovician Palmetto Formation.

The competence of the quartz monzonite is generally fair on the lower slopes of the pluton. However, it appears to be more competent and possibly silicified higher up in the range. The joints are generally not obvious sharp linear features. They exhibit more of a curly or wavy appearance. Slickenslides are not uncommon.

This rock mass is also transected by a 5+ km long fault. A Quaternary/Upper Cenozioc fault lies 2 km away. There are 50 springs and 3 perennial streams within 5 km of the site. Also, the nearest groundwater discharge area is located only 2 km away from the site. Pleistocene Lake Toiyabe extends to within 5 km of the site.

Probably 100 to 200 people reside at Carver's Corner, only a kilometer or so from the site. Logistics are not favorable.

Site 25

Site 25 was investigated on the ground. A photograph is presented in Figure 25. The site is located on the eastern slope of the Toiyabe Range in Big Smoky Valley. The rock is microcline granite of Jurassic (?) age which intrudes the conglomerate of the Permian Diablo Formation.

The rock is generally competent and is highly silicified in places. Its structural geology is not particularly favorable. Two perennial streams are located within 5 km. Otherwise, the hydrology is not unfavorable. Logistics are not particularly favorable in that the nearest railroad is 172 km away (route distance). There are four ranches in Big Smoky Valley in view of the site.

Site 26

Site 26 was also investigated on the ground. A photograph is presented in Figure 26. The site is located on the eastern

flank of the Toiyabe Range in Big Smoky Valley. The rock is a quartz monzonite of Jurassic (?) age which intrudes the Cambrian Goldhill Formation (quartzite and schist) and other Paleozoic rocks.

Its structural geology is similar to that of the other three Toiyabe Range sites; rather unfavorable. There are 4 perennial streams and 3 springs within 5 km of the site. It is located 3 km from a groundwater discharge area and 4 km from the Pleistocene Lake Toiyabe. There are a couple of ranches in view of the site. The logistics situation is not particularly favorable, as is the case with the other Toiyabe Range sites.

Site 30

Site 30 is located north of Gabbs, Nevada in the Gabbs Valley. The pluton is composed of granodiorite and diorite of Mesozoic to Tertiary age. It intrudes Upper Triassic to Lower Jurassic limestones, dolomites and siltstones.

The pluton is relatively small - about 9 km^2 of exposed area. Its structural geology is somewhat unfavorable in that a historic surface break is located within 11 km. Hydrology is favorable although there is a groundwater discharge area located within 9 km.

An active tungsten mine, the El Capital operated by B. L. Hedgecorth is located within 1 km of the site. Safety and security are satisfactory while seismicity is highly unfavorable. Logistics are excellent - the support town of Gabbs being located only 15 route kilometers to the south.

There are five other granitic plutons in the vicinity that were not included in this study, but which might be worthy of future consideration.

Sites 20, 22, 23, 24, 25 are located on the eastern margin of the Western Nevada high seismicity area, and site 30 is located well within the area, thus these sites have a higher than average seismic risk. This seismic risk as well as a number of other factors were evaluated in the screening process discussed in the following section.

III. SCREENING PROCESS

Values for some of the more important site characteristics were extracted from the site data sheets and placed in a matrix to provide a basis for screening. This matrix, presented in Plate VI, includes sixty-three characteristics. The data sources used in the preparation of this plate are presented in Appendix C.

Subjective assessments of the sites relative suitability were made in terms of technical/environmental, socio-institutional and economic factors. For purposes of the initial screening, it was assumed that there were no economic factors which would totally eliminate a site from consideration. However, three critical socio-institutional and nine critical technical/environmental limitations were used, any one of which could eliminate a particular site from further consideration.

The technique utilized to generate a specific value that could be used to rank each site was to set up an equation of the form:

$$v = (a_1 \cdot a_2 \cdot a_3)\ (b_1 \cdot b_2 \cdot \ldots b_9) \sum_{i=1}^{32} c_i x_i$$

where:

v = relative score for site, the higher the score the more favorable the site.

a = the product of all the critical socio-institutional factors. Each of these factors was assigned a value of zero if found to be unfavorable and one if favorable.

b = the product of all the critical technical/ environmental factors. Each of these factors was assigned a value of zero if unfavorable and one if favorable.

c_i = the subjectively selected coefficient of the non critical factors. The coefficients were assigned a value that would yield a $c_i x_i$ product commensurate with the importance of the factor as subjectively determined by the authors of this memorandum.

x_i = the quantitative value assigned to the ith of the 32 factors used in this scoring exercise.

If either a or b is found to be zero, then the site is eliminated from further consideration, and assigned a "value" of E. This is done because the summation $c_i x_i$ (i = 1 - 30) could have a value of more than zero, zero, or less than zero. Thus, the E serves to distinguish between a fortuitous $\sum c_i x_i = 0$ with product a·b = 1 and a site with an a or b = 0.

A. SOCIO-INSTITUTIONAL SCREENING

The socio-institutional parameters used in this assessment and their subjectively assigned weights are listed in Table 1. The rationale used in assigning the various weights is presented in the following sections.

1. Distance to Nearest Town

Because of the nature of the contemplated facility, it was assumed that a minimum acceptable distance of 10 km should be set between the site and the nearest established town.

This would allow for the presence of a buffer zone in which there would be no mutual interference. As distance from the nearest town increased beyond 10 km, however, it was assumed that the added commute time would be a negative factor. Consequently, for sites located further than 10 km from the nearest town (and which were therefore not eliminated) a negative coefficient of -0.03 was applied to the distance in km. The resulting product had a maximum negative value of -3.3 and a maximum range of 3.0.

2. Distance to Nearest State Boundary

While technical considerations were also weighted which deal with sites located near a state boundary, it was assumed that a minimum acceptable distance of 10 km should be established to provide a buffer zone which could serve to avoid potential interstate problems which might delay development of a facility. Distances of 10 km or less to a state boundary were assigned an a value of zero. Distances beyond 10 km were not considered to be of any positive or negative impact and were assigned an a value of one.

3. Distance To Nearest Active Mine

Active mines were deemed to be a sufficient potential source of interference to completely eliminate from consideration those sites located within 5 km of one. Distances of 5 km or less from the site were assigned an a value of zero. Distances greater than 5 km were assigned an a value of one.

4. Distance To Nearest Military Range

For safety reasons, it was assumed that the further a

site was located from a military range, the better. However, the range activities could be modified if necessary, hence a rather low coefficient of 0.01 was assigned to this factor resulting in a range and maximum value of 2.7.

5. Potential Interference From Mineral Development

A subjective assessment of the potential for mineral development was made for each site. Ratings of "high, moderate and low" were assigned. Primarily because of the subjectivity of this assessment, no sites were eliminated from consideration with a "high" potential for mineral development. However, this characteristic was assigned the maximum range of potential weights of all the characteristics not assigned a minimum standard. A positive cx value of 5 points was assigned for low potential, a 0 for moderate and a negative 5 points for a high potential.

6. Number of Old Mines Within 10 km

A fairly objective indicator of potential for mineral development in the vicinity of a potential site was assumed to be provided by the number of inactive "mines" within 10 km. Actually, some of the "mines" counted were merely prospects and most were rather small. A coefficient of -0.05 was applied to the number of "mines" within 10 km to determine the cx value for this characteristic, with a negative cutoff value for the cx product of -5, and a resulting range of 5.

7. Distance To Nearest Restricted Land

Strictly because of potential conflicts with activities on restricted land, it was deemed appropriate to apply a negative weight for sites located within 10 km of such lands. No weight was given for distances in excess of 10 km. cx values of -2 and -1 were assigned for distances of <5 km and $<10 >5$ km, a 0 for distances ≥ 10 km; thus resulting in a maximum range of 2 for this factor.

8. Distance To Nearest Airline Corridor

From a safety standpoint, it was assumed that the further a site is located from an airline corridor, the better. However, it was also assumed that airline corridors could be adjusted, if necessary. Therefore, this characteristic was assigned a rather low maximum range of 2. A coefficient of +0.02 was applied with a cx cutoff of +2 points.

9. Site Visibility From Paved Roads

For the sake of both safety and security, an inconspicuour site was judged to be more favorable than one that is exposed. If a site were not visible from paved roads, it was given a cx value of 3, and 0 if it was exposed. This of course, results in a maximum range of 3.

10. Route Distance To Nearest Support Town

A site that is remote from its support town is not only expensive in terms of commute travel and freight costs but is also objectionable from the standpoint of workers' commute

time. For these reasons, this factor was given a relatively heavy weight -- a coefficient value of -.05 resulting in a minimum cx value of -8 and a range of 7.

11. Population of Nearest Support Town

The support towns of Las Vegas, Ely, and Tonopah were assigned cx values of 8, 4 and 1 respectively; since the larger support towns would be less affected by diversion of manpower to the contemplated storage operation. These weighting values were applied primarily because of the considerably larger populations in these towns than those in the smaller Nevada communities. All other towns were given a cx value in this category of 0. This, of course, would result in a range of 8 for this factor.

B. ECONOMIC SCREENING

Five considerations shown on Plate VI were used in the preliminary economic assessment for screening purposes. These considerations and the subjectively chosen weighting factors used are presented in Table 2. Obviously, there are many other economic considerations that should be evaluated after more detailed field investigations have been conducted.

1. Maximum Relief Of A 40-ha Area

A number of the sites do not have relatively flat operations area immediately adjacent to a potential adit or shaft location. It was felt that this condition could result in some added construction and operating costs. Therefore, a rather small weight was given to this factor - a coefficient of -0.01 yielding a minimum cx value of -1.5, and a range of 1.2.

2. Distance To Nearest Power Line

This factor was considered to be of minor economic impact and was therefore weighted about the same as the foregoing - a coefficient of -0.02, a minimum cx value of -1.7, and a range of 1.7.

3. Route Distance To Nearest Railroad

A number of the western Nevada sites are located near abandoned railroad beds. The condition of these beds is quite variable - from excellent to almost entirely washed away in some areas. In addition, the title to the land has reverted to the BLM. Because of this uncertainty with respect to their utility, no advantage was ascribed to sites near such abandoned beds. Only currently active railroad lines were considered.

Since a railroad bed and associated trackage would cost on the order of $200,000/km, the proximity of a site to an existing track was given a rather heavy weight. A coefficient Of -.03 was used. This resulted in a minimum cx value of -7.6 and a range of 7.4.

4. Route Distance To Nearest Paved Highway

A weighting coefficient of - 0.02 was applied to the distance to the nearest paved highway. Because the sites are located relatively close to paved roads, application of this coefficient resulted in a minimum cx value of only -1.4 and a range of 1.4.

5. Route Distance To Nearest Commercial Airport

For purposes of this assessment a "commercial airport" was defined as one with regularly scheduled airline service.

These airports for the southern Nevada sites include those located in Las Vegas, Ely, Bishop (CA), and Cedar City (UT).

A weighting coefficient of 0.01 was used. Because of the extremely long distances involved, the minimum cx value for this factor was -2.7 and a range of 2.1.

C. TECHNICAL/ENVIRONMENTAL SCREENING

A total of 22 site characteristics were extracted from the matrix in Plate VI for use in the technical/environmental screening. Nine of these characteristics were considered to be sufficiently important so that a site could be eliminated from consideration if it failed to meet the subjectively established minimum standard for any one of these nine characteristics, i.e., the characteristics would have a b value of zero and thus eliminate the site.

The remaining 13 characteristics were subjectively assigned coefficients so that the cx product would have appropriate volumes.

The 22 characteristics used, minimum standards, coefficient values, and maximum/minimum cx products are listed in Table 3. A discussion of the rationale used in establishing the weighting factors follows for each site characteristic.

1. Site Characteristics With a Minimum Standard

a. Does the rock mass occur outside an overthrust and is there 4 km^2 at depths of 300 - 1,500 m?

A pluton in an overthrust would be suspect as to vertical continuity as well as possibly the degree of deformation it has undergone. Also, a

pluton of limited surface exposure with resulting questionable area at depth would be of somewhat limited utility for the proposed facility. For these reasons, at least for the preliminary screening, it was deemed appropriate to assign a b value of 0 to either of these eventualities, thus eliminate any such plutons.

b. The groundwater and surface water do not drain into the Colorado River basin?

The potential problems associated with discussions about movement of groundwater and surface water from the basin in which a site was located to the Colorado River basin could be significant and all plutons so located were assigned b values of zero and were consequently eliminated. This limitation caused a number of otherwise acceptable sites to be eliminated. On any successive screenings, it might be appropriate to reconsider this limitation in light of the distance and time that the groundwater, at least, would be required to travel to enter the Colorado River basin.

c. Distance to nearest volcanic vent < 6 m.y. and < 10 m.y.

Sites located within 10 km of either a < 6 or < 10 m.y. volcanic vent were assigned a b value of zero and eliminated because of the potential for future volcanic activity to interfere with storage operations.

It is believed that any interference caused by ejecta from a vent located more than 10 km away from a site would be acceptable. Thus, positive cx values were given to sites with vents located at the more remote distances. A coefficient of 0.05 was applied to distances from 10 m.y. vents. A maximum cx cutoff value of 5 points was set. For 6 m.y. vents, a coefficient of .01 was used with a maximum cx cutoff value of 10 points. This resulted in a range of 5 for the 10 m.y. vent locations and a range of 10 for the 6 m.y. vents.

d. Distance to nearest known Geothermal Resource Area

Because of potential interference with future geothermal energy development operations, the indication of recent orogenic activity, and the potential for elevated temperatures to affect storage operations in the pluton, it was deemed appropriate to assign a b value of zero and to eliminate from consideration those sites within 10 km of a known Geothermal Resource Area, (KGRA).

A positive cx value was given those sites located more remote from KGRA's. A coefficient of 0.1 was used resulting in a maximum cx value of 5 points, and a range of 4.

e. Distance to nearest historic faults

Historic faults (see Figure 27) were considered to be of sufficient concern to assign a b value of

zero to all sites within 5 km of such a break, thus eliminating them.

A coefficient of 0.1 was used to weight sites with faults located beyond 5 km. A maximum cx value cutoff of 10 points was ascribed to this factor, resulting in a range of 9.5.

f. Estimated maximum acceleration from future earthquakes

All sites located in regions which are expected to sustain ground accelerations of more than 0.4 g from future earthquakes were deemed to be vulnerable to damage. These sites were assigned a b value of zero and were eliminated entirely from consideration.

Those sites located in regions of potential minor ground accelerations were given cx values. A coefficient of -30 was applied to the expected ground motion. This resulted in a minimum cx cutoff value of -10 points, and a range of 9.7.

2. Site Characteristics With No Minimum Standard

a. Degree of rock mass resistance to erosion

Based upon the nature of the elevation contours on the topographic maps, a subjective high-moderate-low assessment of the pluton's resistance to erosion was made. It was reasoned that this characteristic was somewhat correlatable with overall rock mass competency at depth. A cx value of +3 was assigned

to a high resistance, 0 to moderate and -3 to low resistance. This resulted in a range of 6 for this characteristic.

b. Area of exposed rock mass

The larger the outcrop of the pluton, the less uncertainty exists as to its comprising a sufficient area at depth for a facility. Also, a number of potential sites can be chosen on large plutons. For these reasons, a maximum cx value of +5 points was ascribed to this factor. This +5 value was assigned to plutons with exposure of >100 km^2. The following lesser weights were used: <5 km^2 = 0, 5-10 km^2 = 2, 10-30 km^2 = 3, 30-100 km^2 = 4. This resulted in a range of 5 for this factor.

c. Volcanic hazard

D. R. Mullineaux's Preliminary Overview Map of Volcanic Hazards in the 48 Conterminous United States (1976) was used to determine values for regions of volcanic hazards. An x hazard value of 1 was applied to his "Zone C." (Area subject to 5 cm or more of ash from a "very large" eruption similar to the Mt. Macama (Crater Lake) eruption about 6,600 years ago.) And an x value of 2 was applied to his "Zone B." (Area subject to 5 cm or more of ash from a "large" eruption, similar to the Mt. St. Helens eruption about 3,400 years ago.)

These x hazard values were multiplied by a coefficient of -1 to obtain incremental cx hazard weights for sites located in these respective regions and a range of 1.

d. Distance to nearest 5+ km - long fault trace

An arbitrary minimum fault trace length of 5 km was set for consideration of faults with unspecified pre-Upper Cenozoic age. For distances less than 5 km, a cx weight of zero was given; for distances greater than 5 km and less than 10 km, a cx value of one was ascribed; and for distances beyond 10 km, the cx value was 2. The range for this factor was 2.

e. Distance to nearest Upper Cenozoic Fault

Twice as much maximum weight was given to this factor (see Figure 27) as was the case for pre-Upper Cenozoic "age - unspecified" faults. A coefficient of 0.2 was applied to all distances and a maximum cx value of 4 was allowed. This resulted in a range of 4.

f. Annual groundwater discharge

The less groundwater discharged from the pluton's groundwater basin, the better. Therefore, sites in basins with relatively small discharges should be given incrementally more favorable cx weights. A coefficient of -0.1 was applied, resulting in a minimum cx value of -4 and a range of 4.

g. Distance to nearest groundwater discharge area

Since the further groundwater travels from a site before discharge, the better; positive weight was applied to sites far removed from discharge areas. A coefficient of 0.1 was used. This resulted in a maximum cx value of 5.4 points for this factor, and a range of 5.2.

h. Annual surface water discharge

Screening weight was given to annual surface water discharge for the same reasons as those asserted for groundwater. A cx value of +2 was ascribed for 0 discharge, 0 for minor discharge and -2 for significant discharge, resulting in a range of 4 for this factor.

i. Distance to nearest perennial stream, nearest lake/reservoir and nearest spring within 5 km

It was assumed that potential surface water problems could be avoided by selecting a site removed from surface streams, lakes, and springs. Perennial streams and springs were weighted equally in this regard. The absence of either feature within 5 km was associated with a cx value of +2, and the absence of both received a value of +4. If one occurred within 1 km, a cx value of -2 ascribed and if both occurred within 1 km, a value of -4 was used. This resulted in a range of 8 for these factors.

If a site had a lake/reservoir within 5 km it was assigned a cx value of -2, and beyond 5 km a cx value of 0. This resulted in a range of 2 for this factor.

j. Estimated maximum horizontal acceleration from future NTS explosions

In order to obtain this estimate, it was assumed that a 1 megaton buried explosive would be detonated at Pahute Mesa (see Figure 5). The Pahute Mesa regression equation was used to determine peak vector acceleration (ERC-1974) for each site. This vector acceleration was multiplied by .9 to obtain an estimate of the horizontal acceleration. Finally the 1 sigma value was determined by multiplying this value by 2.3. A coefficient of -30 was applied to the 1 sigma values. The resulting minimum cx value was -5, and the range was 4.7.

IV. SUMMARY AND CONCLUSIONS

This report represents an attempt to apply some of the geological, engineering and socioeconomic considerations, factors and criteria, previously discussed by Stone (1978) and Burton and McClain (1977), to a preliminary screening of the 30 granitic sites in Southern Nevada previously identified by Stone (1977), as well as the Climax Stock located on the NTS.

The technique used for the preliminary screening was to construct a four-page "data sheet" which listed a number of considerations/factors/criteria in two broad categories - Technical/Environmental and Socioeconomic/Institutional. The factors selected were those that might be at least partially evaluated with information obtainable from the literature. A data source file was developed and the sheets were completed. The data sheets for the 30 sites and the Climax Stock are presented as Appendix A.

A number of factors (63) were selected for inclusion in a matrix (see Plate VI). Thirty-nine of these factors were selected for further processing.

The numeric technique selected for the final preliminary screening was a linear type equation of the form:

$$v = (a_1 \cdot a_2 \cdot a_3)\,(b_1 \cdot b_2 \cdot \ldots b_9) \sum_{i=1}^{32} c_i x_i$$

where:

v = relative score from site, the higher the score the more favorable the site.

a = the product of all the socio-institutional "show stoppers."* Each of these factors was assigned a value of zero if found to be unfavorable.

b = the product of the Technical/Environmental "show stoppers."

c_i = the value of the coefficient selected to yield a subjective value for the factor

x_i = one of the 32 factors used in this scoring exercise.

It should be stressed that the critical or multiplying factors were selected on an entirely subjective basis by the authors of this memo. Other evaluators might generate a quite different list. The critical factors were selected from the technical, environmental, socio-institutional areas. None of the economic factors were deemed critical in this analysis.

Coefficients for the additive portion of the screening equation were also selected on a subjective basis. The values of the coefficients were chosen so that the range of the product $c_i x_i$ reflected the authors ideas about the overall importance of factor x_i. This range varied from 1 for factors deemed to be minor to 10 for factors deemed to be of major importance. The results of this evaluation are presented as Tables 4, 5, 6, and 7.

The screening values for the nine sites that were not eliminated are tabulated as follows:

*Show stoppers is a slang expression for all the factors that were believed to be important enough to eliminate the site if found to be unfavorable.

Site Designation	Screening Value
2	9.0
3	9.8
14	9.4
22	23.9
23	12.7
24	9.1
25	15.0
26	12.1
29	-4.4.

These nine sites were selected for an on-the-ground evaluation. This evaluation and the aerial examination and photographic flight over all the sites, (see Appendix B) made in conjunction with the field trips, significantly changed the opinions about the suitability of some of the sites.

Site 21 should be reconsidered and perhaps added to the acceptable list since the pluton appears to be large enough so that the 40-ha site could be relocated to prevent encroaching on the town of Manhattan. (The mines at Manhattan appear to be closed, thus further reducing any conflict between any existing culture and a waste storage site.)

Site 23 should be questioned as suitable because of nearby ranches that were not located on available literature.

Site 24 probably should be eliminated because (1) the population at Carver has greatly increased, and (2) the evidence of a later Quaternary/Historic (?) fault near the eastern margin of the pluton.

Sites 25 and 26 should be questioned because of the nearby ranches.

Site 27 should be reconsidered because an alternate location may be available at a larger stock a few kilometers to the west.

Site 28 should be reevaluated because the stock may be larger than figured for this exercise.

Some suggestions about future activities for this project are:

(1) On-the-ground studies should be made of all the sites to upgrade the information in the Site Characteristics Matrix.

(2) A second selection of critical factors and coefficients could be made based on the additional information developed by the field studies and the dialogue about site selection that will occur subsequent to this preliminary study.

Based on this Preliminary Evaluation it appears that there are several granitic plutons in Southern Nevada that would constitute potential nuclear waste storage site locations.

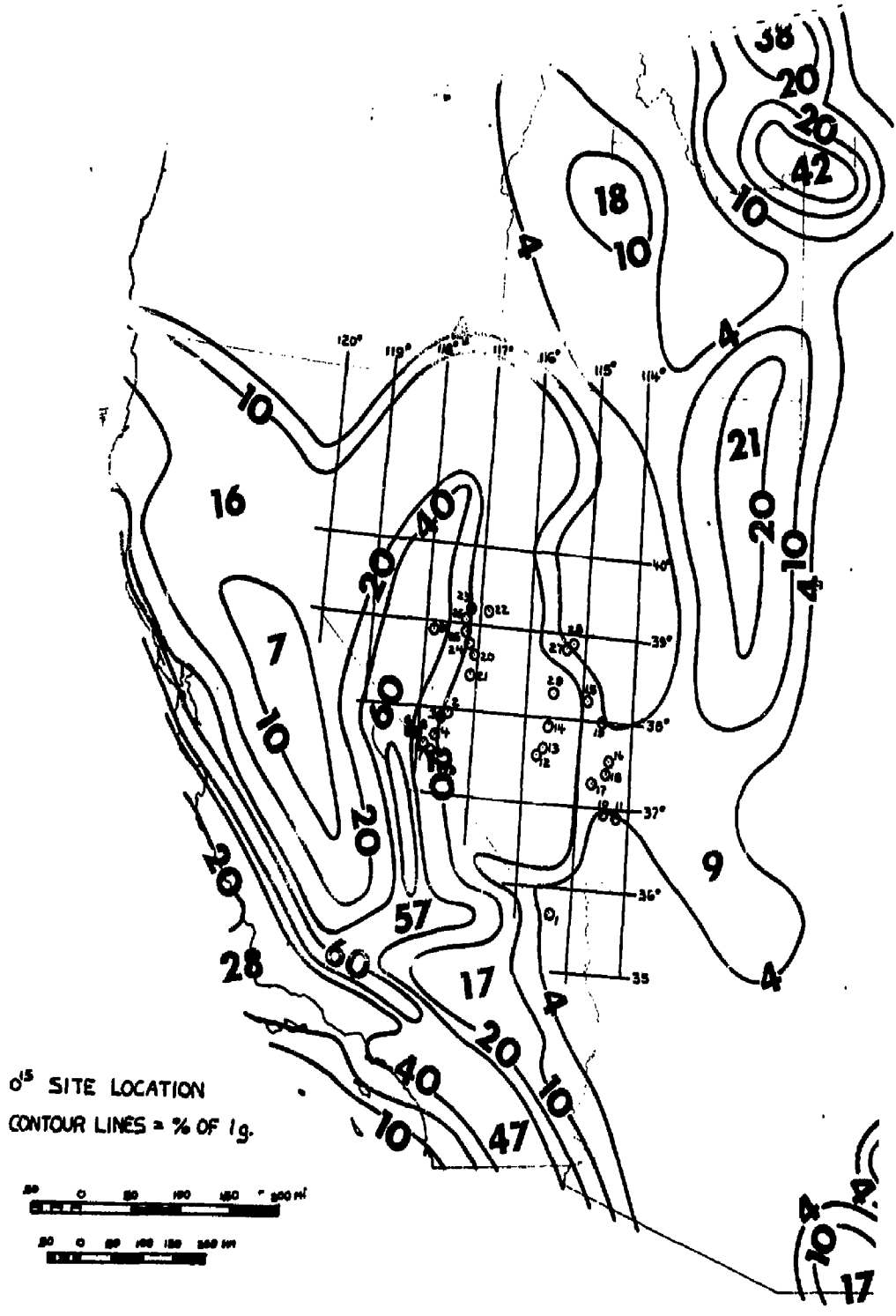
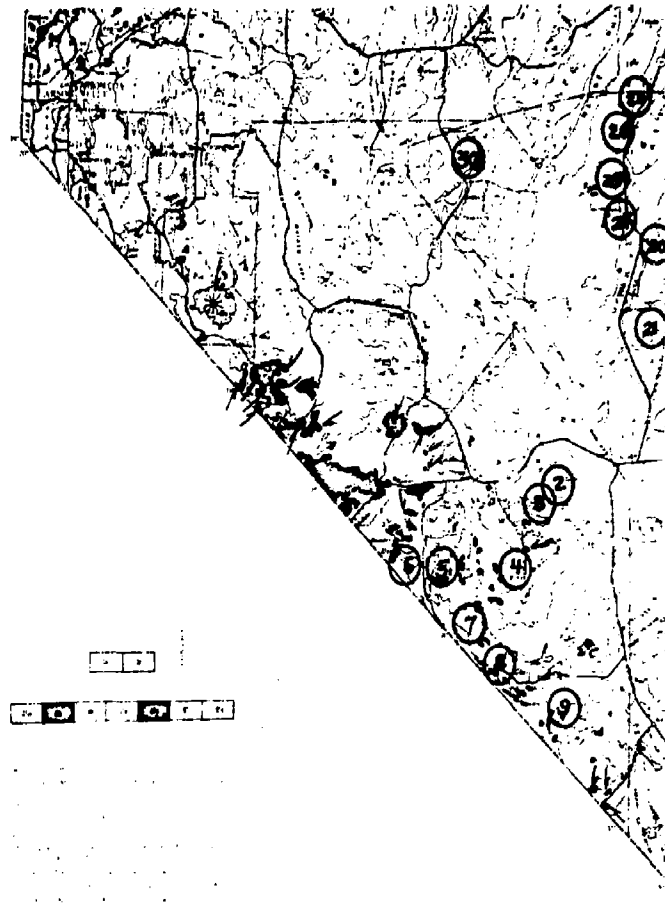


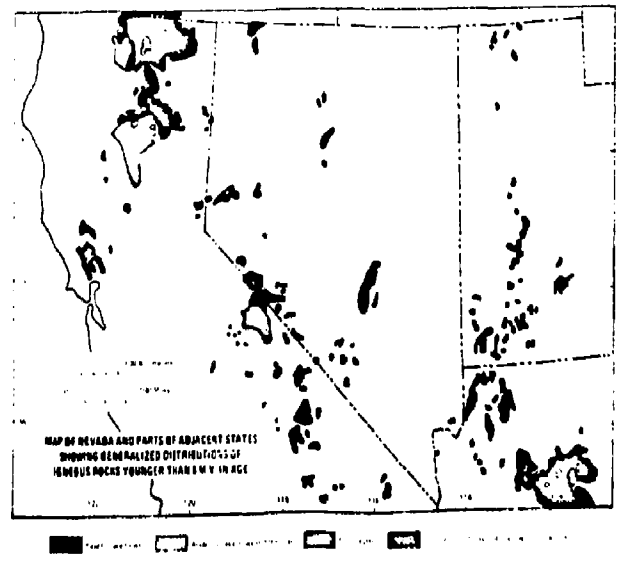
Fig. 1

PRELIMINARY MAP OF HORIZONTAL ACCELERATION

REF.: USGS OPEN-FILE REPORT 76-416, 1976.



(17) SITE LOCATION



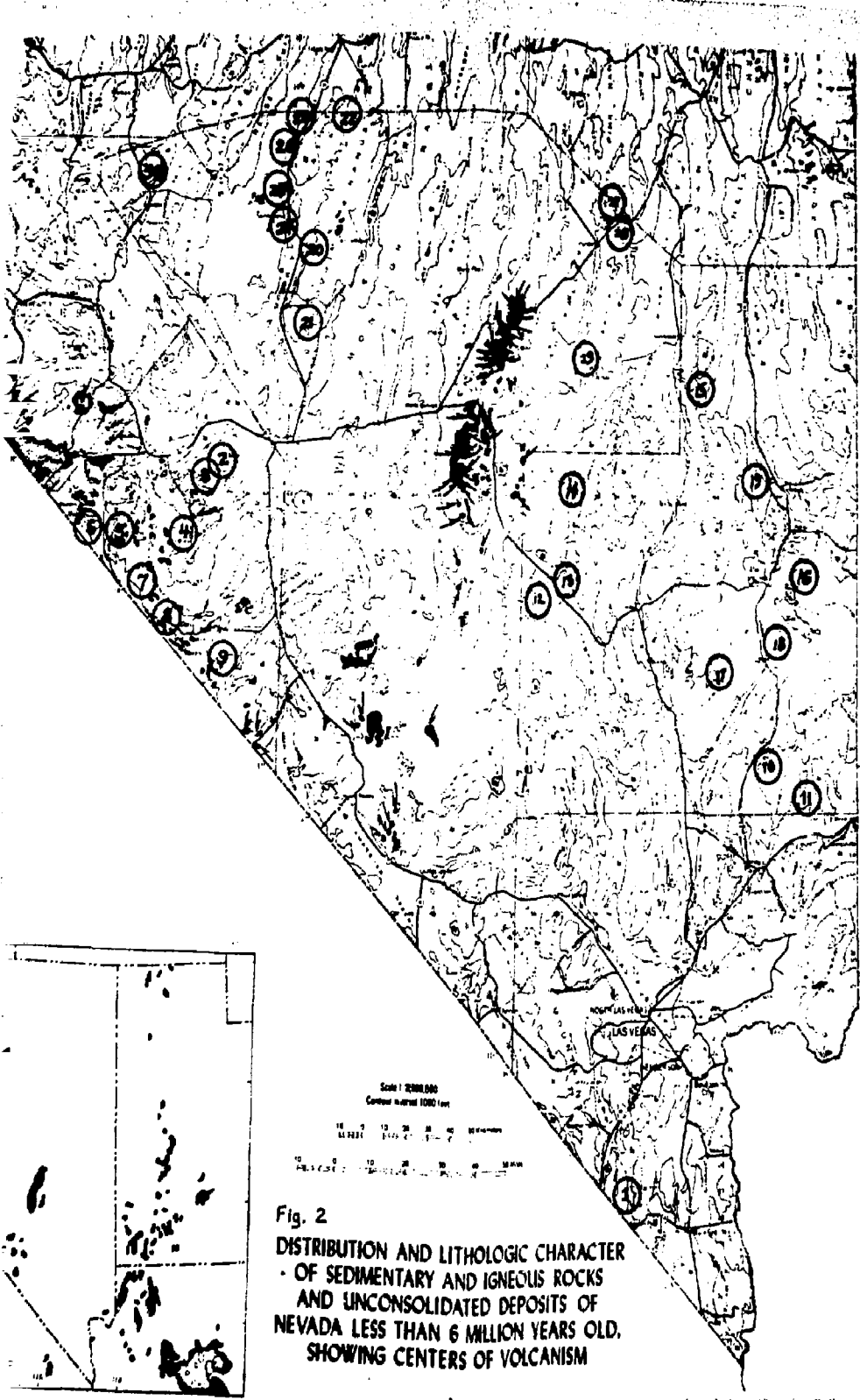


Fig. 2

DISTRIBUTION AND LITHOLOGIC CHARACTER OF SEDIMENTARY AND IGNEOUS ROCKS AND UNCONSOLIDATED DEPOSITS OF NEVADA LESS THAN 6 MILLION YEARS OLD, SHOWING CENTERS OF VOLCANISM

by

John H. Stewart and John E. Carlson

1978

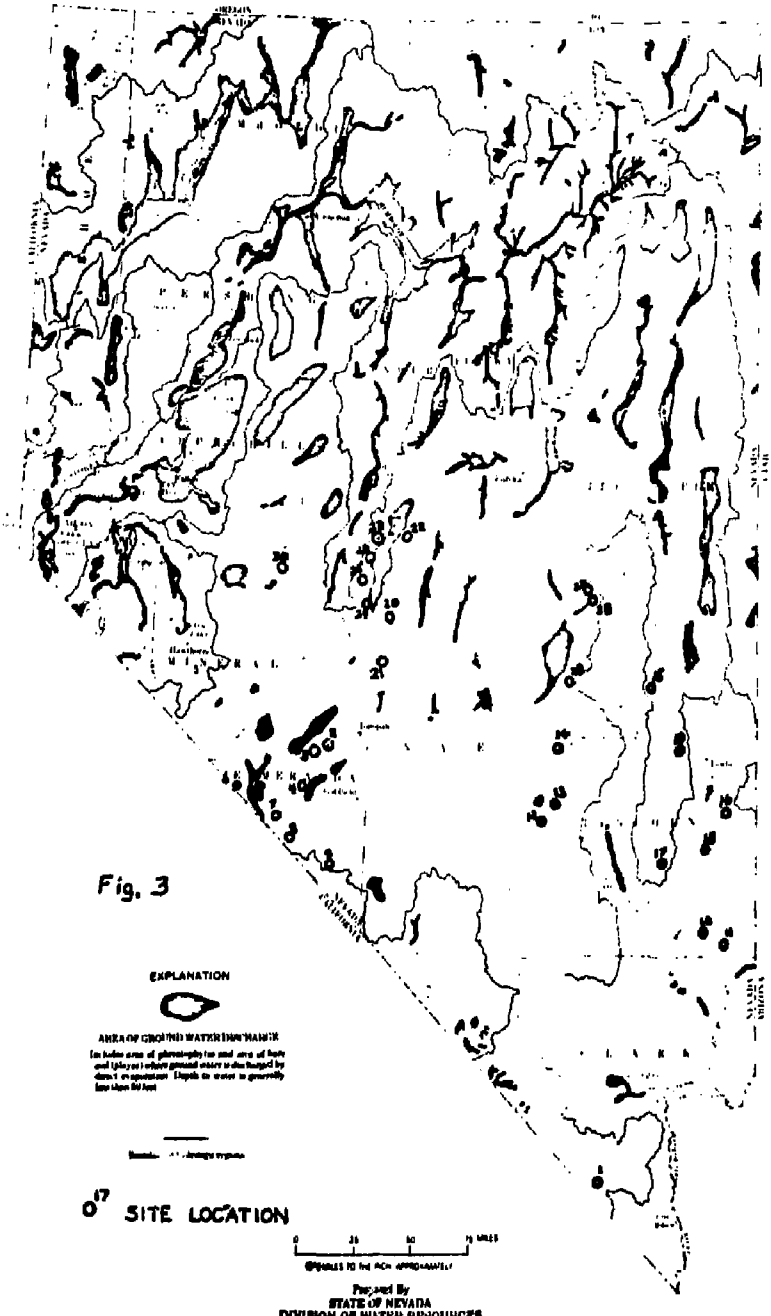


Fig. 3

EXPLANATION

AREA OF GROUND WATER DISCHARGE

SITE LOCATION

Prepared By
STATE OF NEVADA
DIVISION OF WATER RESOURCES
STATE ENGINEER'S OFFICE
1971

PRINCIPAL AREAS OF NATURAL
GROUND WATER DISCHARGE

Cartography by L. M. Hauch, Jr.
with cooperation of
Branch of Technical Illustrations
(USGS, Menlo Park, California.

BASED ON STATE FEDERAL COMPREHENSIVE FRAMEWORK STUDIES

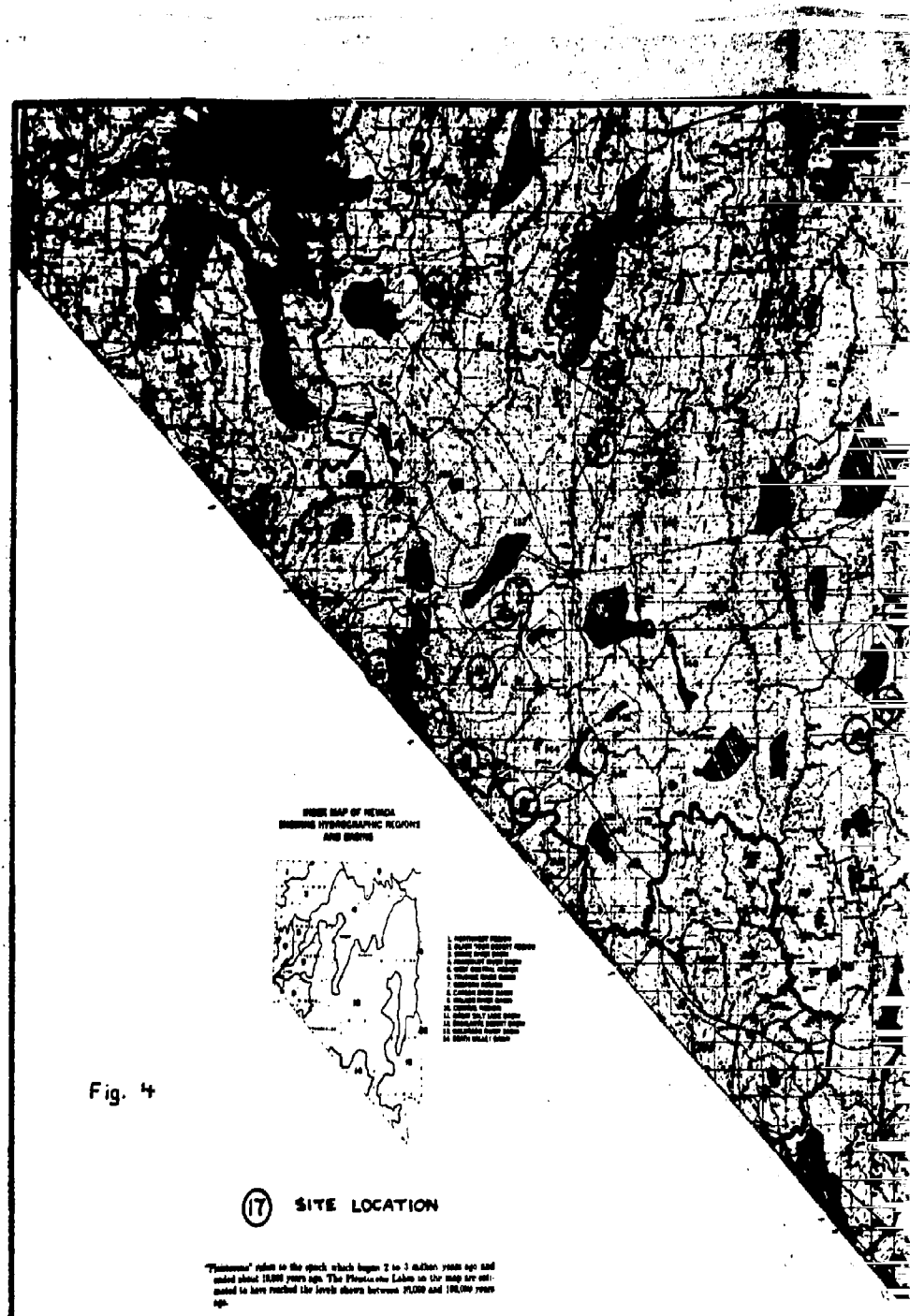
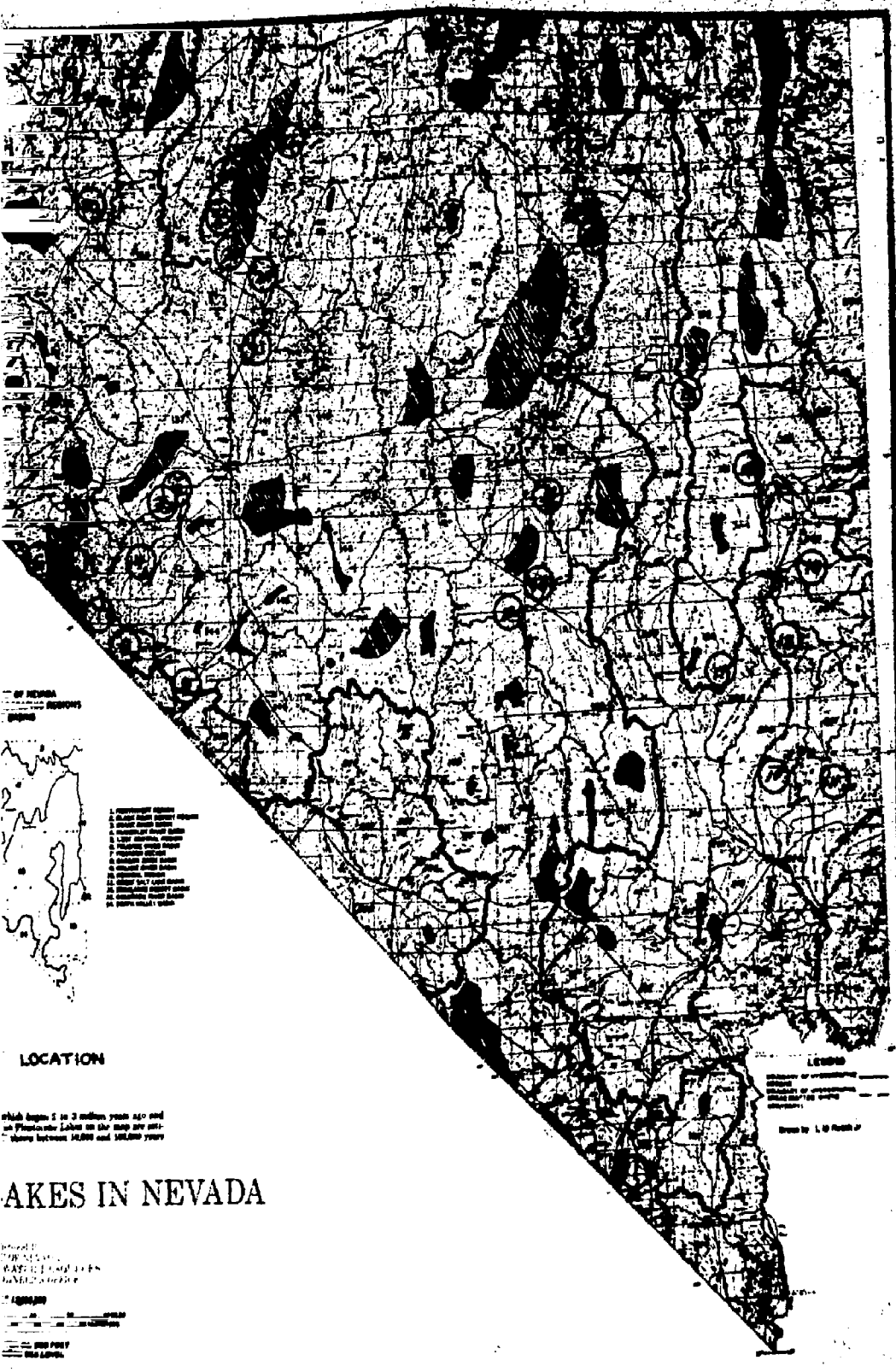


Fig. 4

(17) SITE LOCATION

"Pluvium" refers to the epoch which began 2 to 3 million years ago and ended about 10,000 years ago. The Pleistocene Lakes in the map are estimated to have reached the levels shown between 35,000 and 100,000 years ago.

PLEISTOCENE LAKES IN NEVADA



LOCATION

AKES IN NEVADA

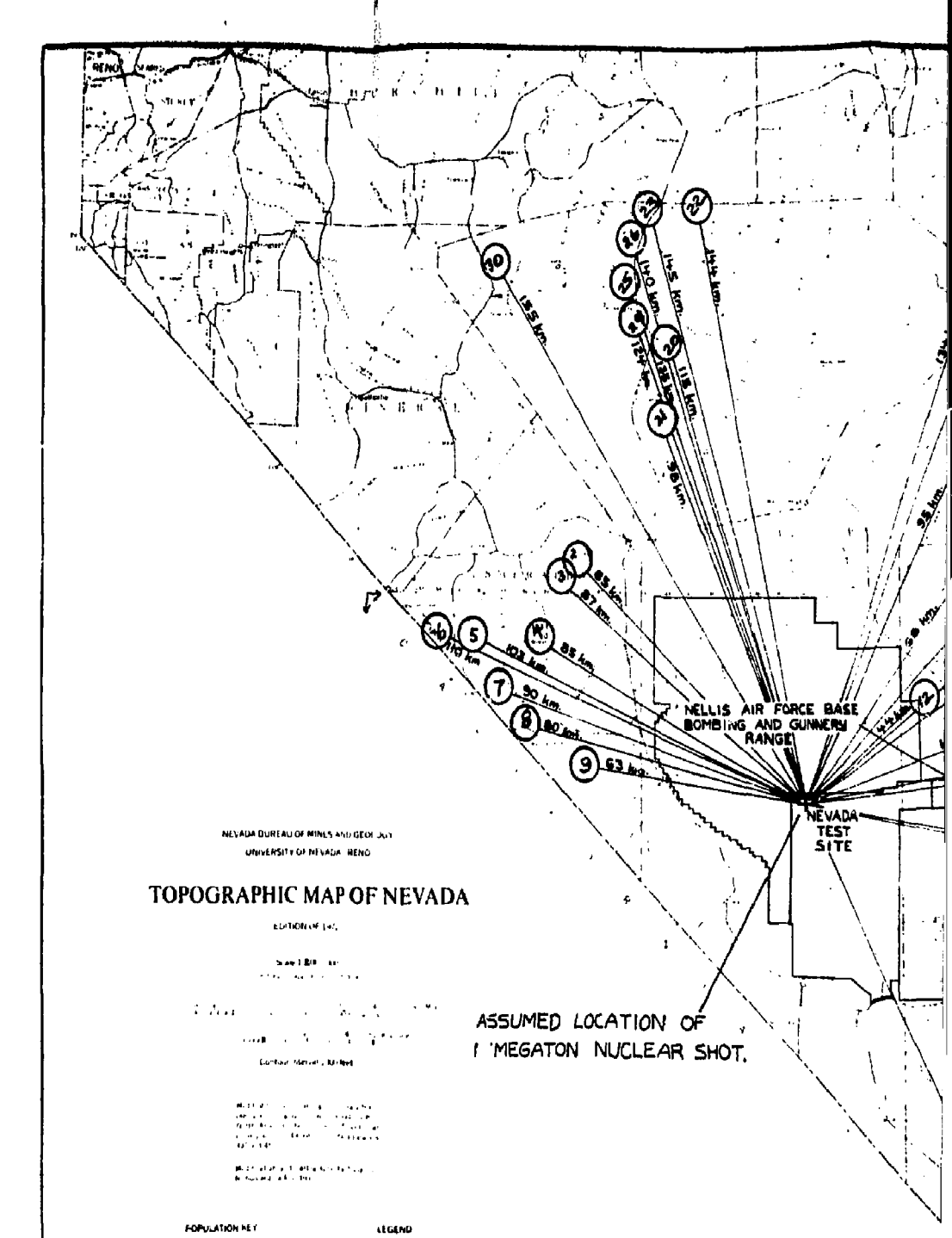


Fig. 5

DISTANCES FROM SITES TO HIGH YIELD NUCLEAR EXPLOSIV TEST SITE

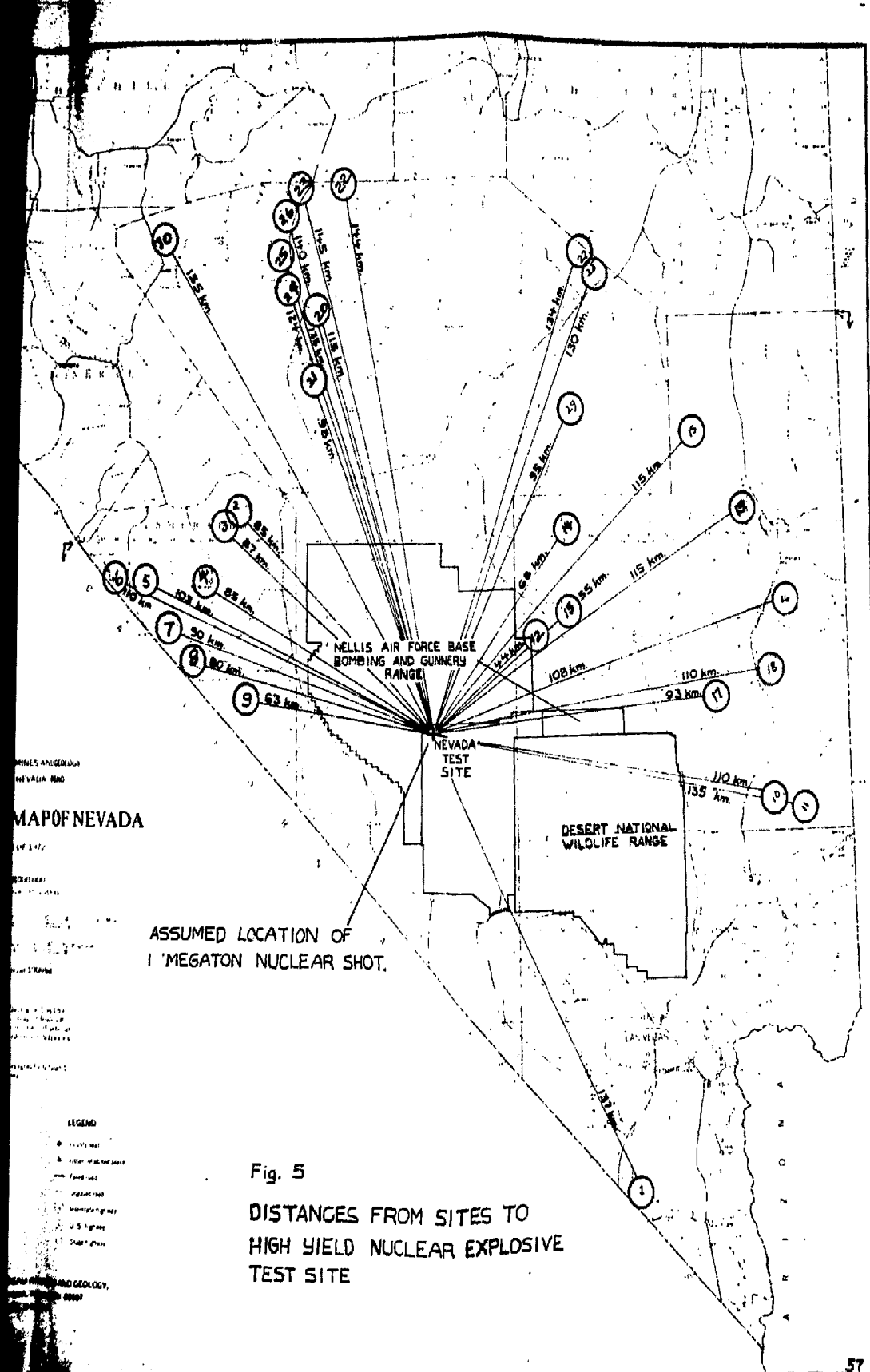
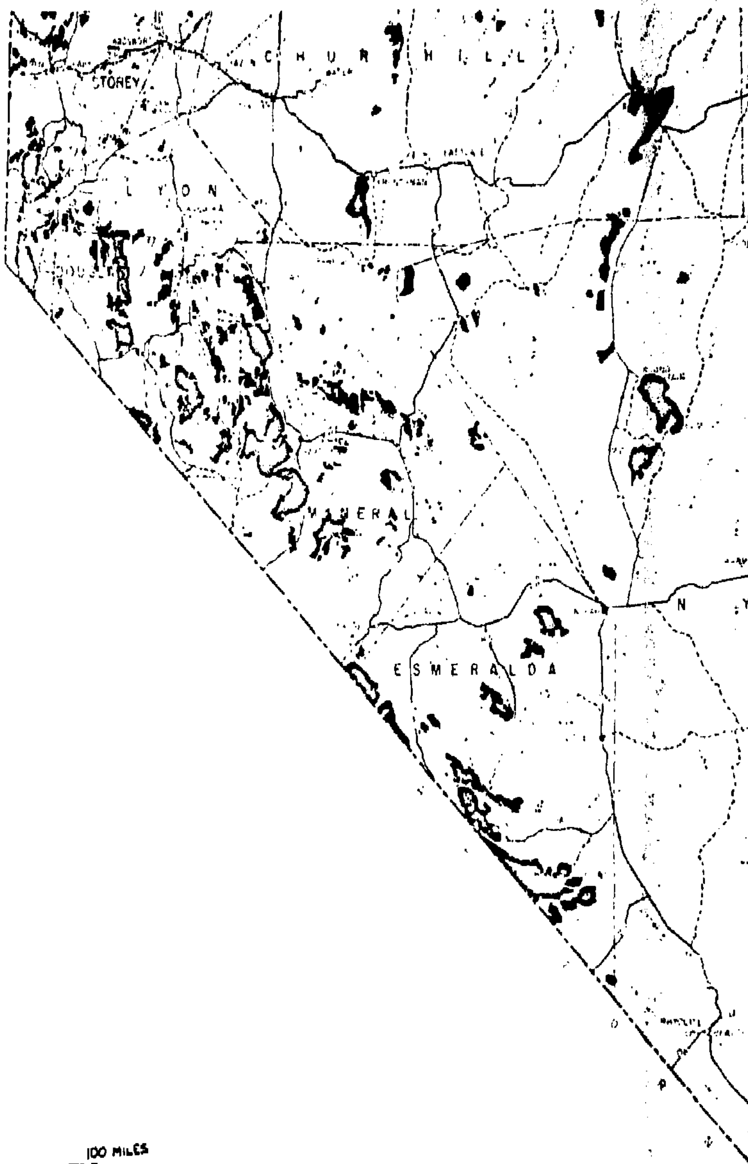


Fig. 5

DISTANCES FROM SITES TO HIGH YIELD NUCLEAR EXPLOSIVE TEST SITE



EXPLANATION

Contour, number represents elevation in thousands of feet. Only the first digit of elevation is shown on the contour line

Depression contour

State boundary

County boundary

County seat

Town

Paved highway

Secondary road

Railroad

Interstate route

U.S. highway

State highway

Perennial or intermittent stream

Open water ... reservoir

Dry lake

INTRUSIVE ROCKS

Post Precambrian

Precambrian

NOTE

Compiled and modified from sources too numerous to credit individually. The Nevada Bureau of Mines will appreciate receiving additions or corrections to the data shown.

Nevada Bureau of Mines Report ... the isotopic age determinations run on the above intrusive rocks.

SCALE 1 2,000,000

0 10 20 30 40 50 100 MILES

0 10 20 30 40 50 100 km.

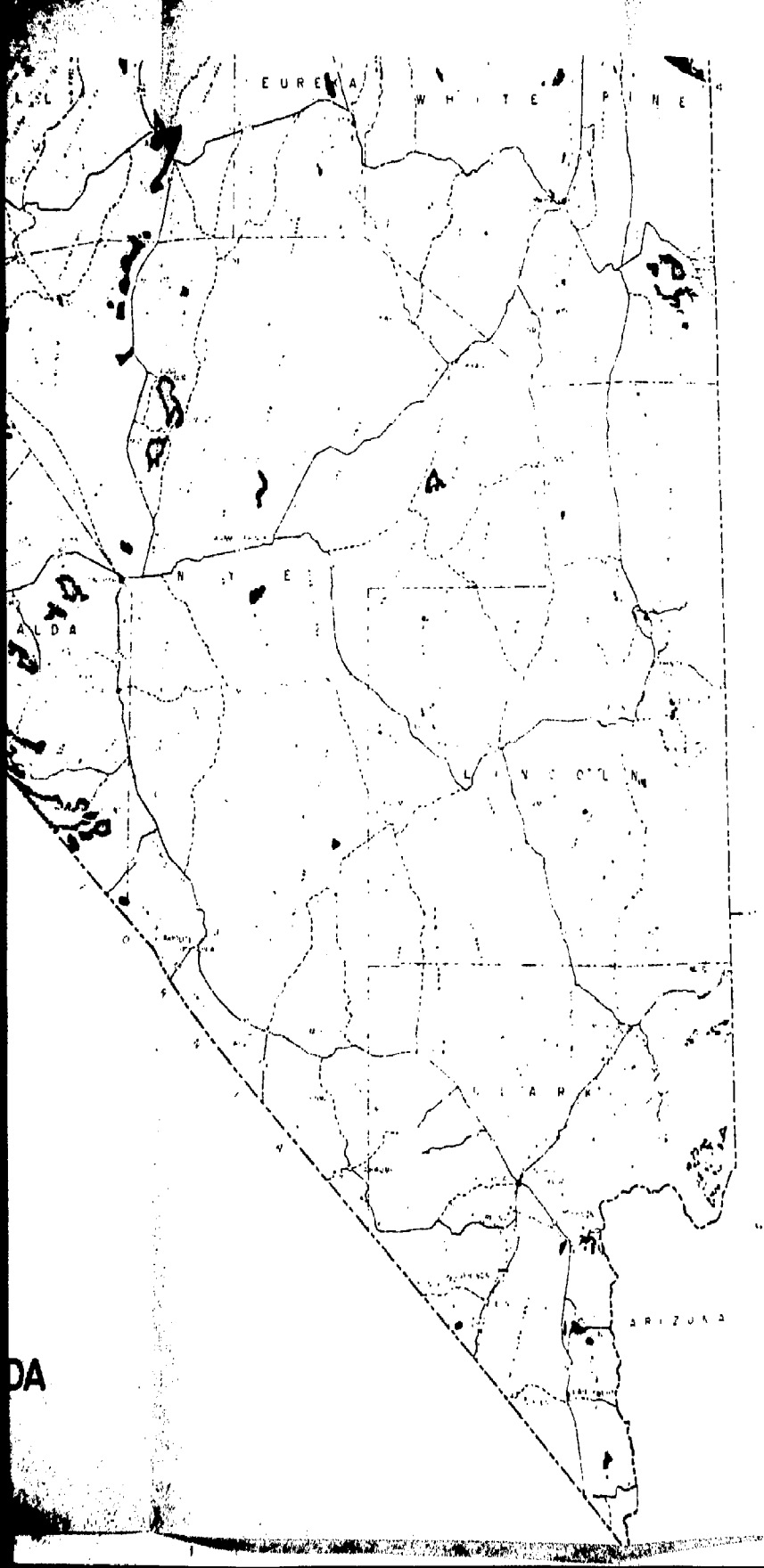
CONTOUR INTERVAL 1000'

ONE MILLION SCALE SET

Fig. 6

INTRUSIVE ROCKS OF NEVADA

BY ROLAND V. WILSON AND RICHARD R. PAUL



DA

SEPTEMBER 1965

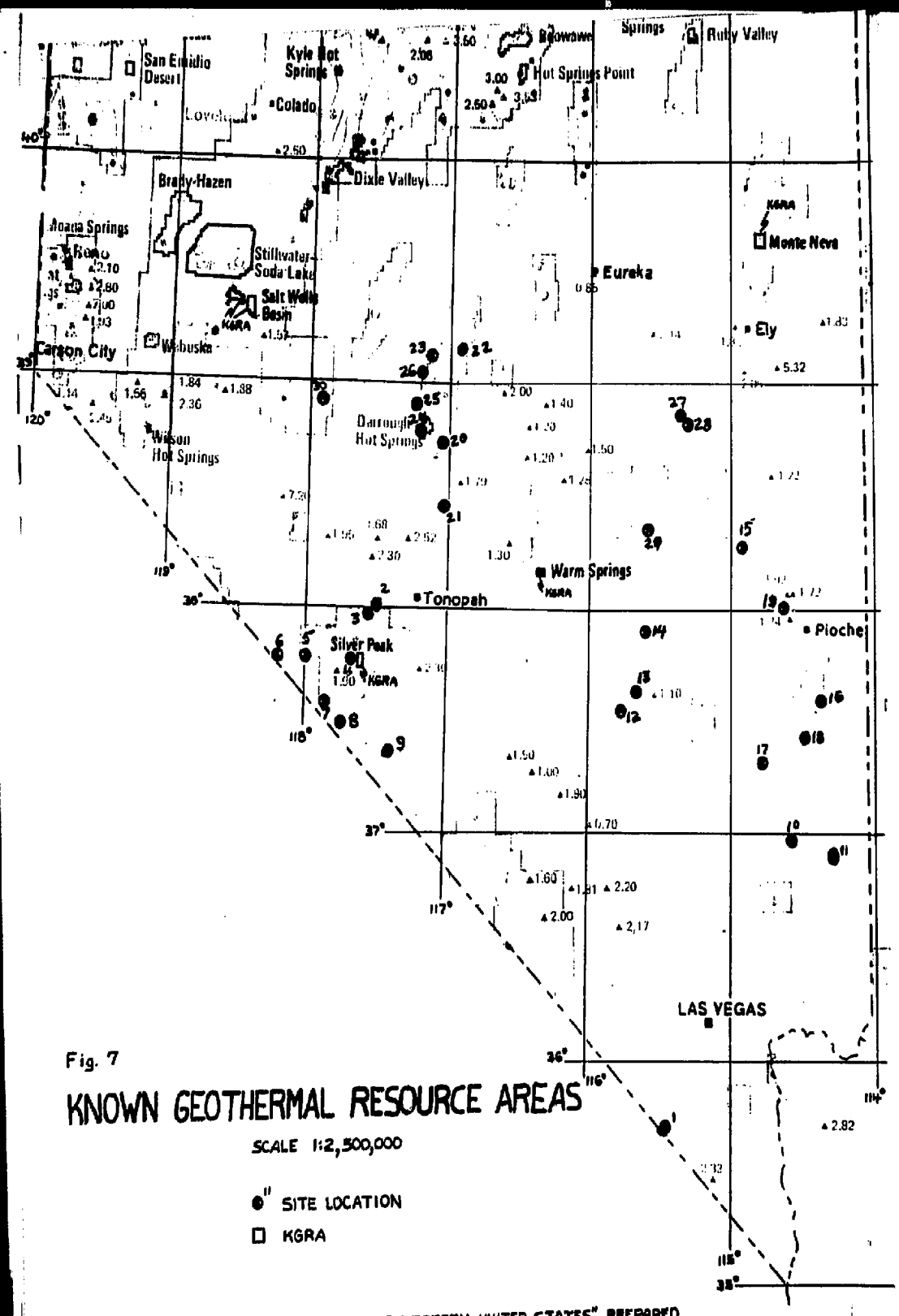


Fig. 7

KNOWN GEOTHERMAL RESOURCE AREAS

SCALE 1:2,500,000

● SITE LOCATION

□ KGRA

AFTER "GEOTHERMAL ENERGY RESOURCES OF THE WESTERN UNITED STATES," PREPARED BY NATIONAL GEOPHYSICAL & SOLAR-TERRESTRIAL DATA CENTER, NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION, 1977.

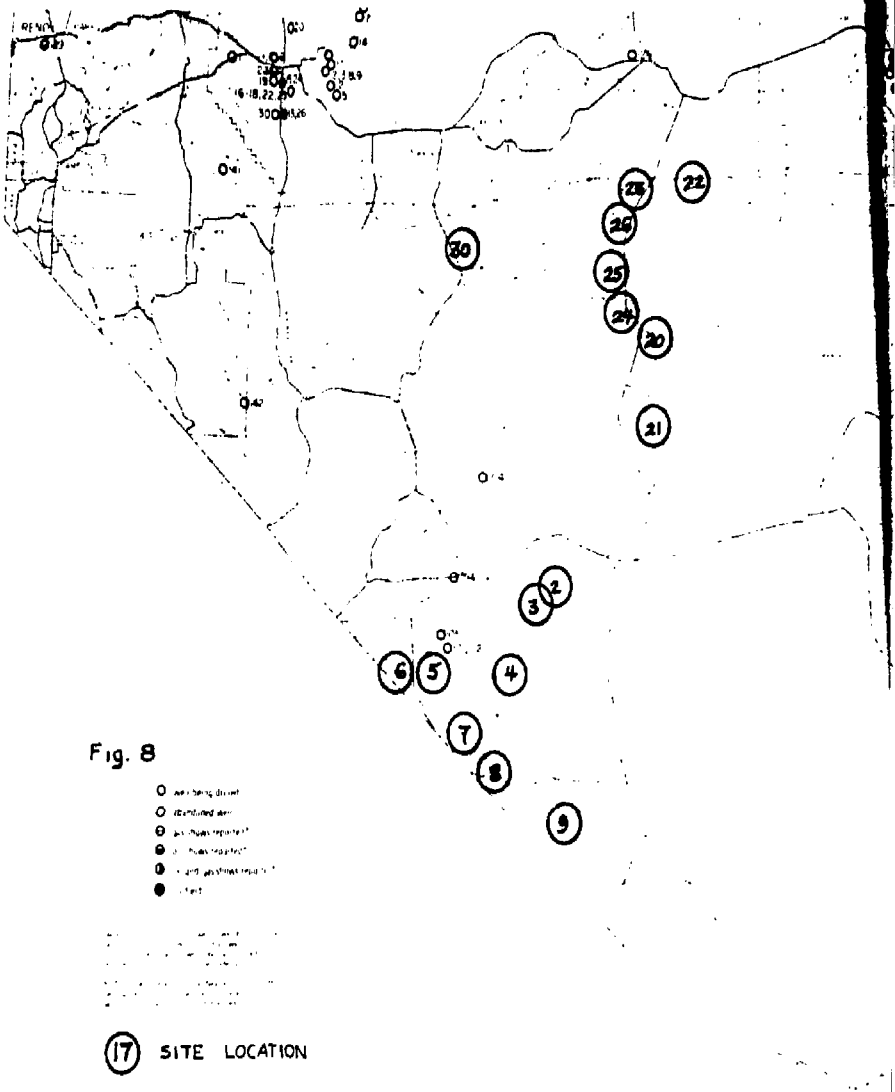


Fig. 8

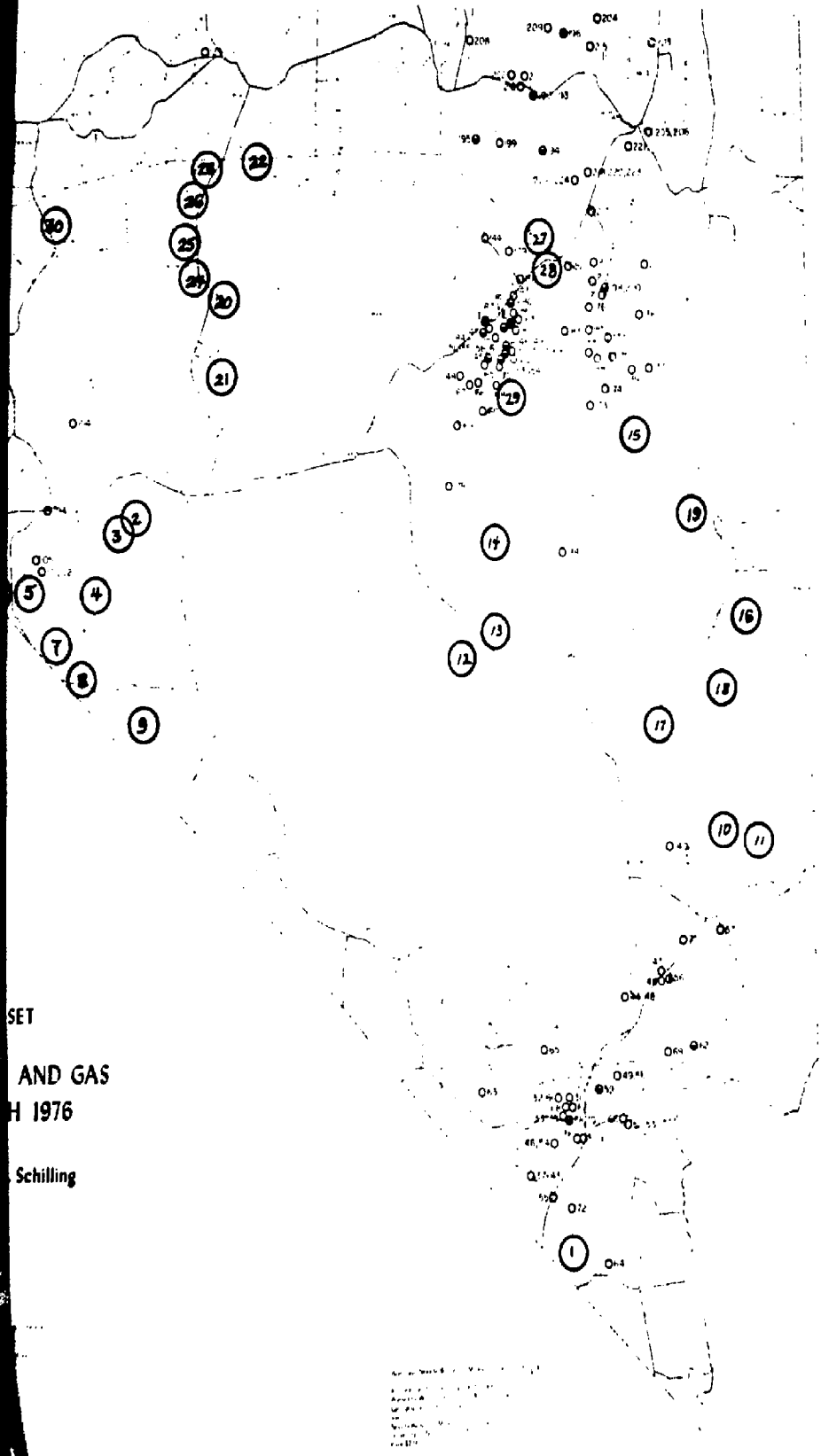
(17) SITE LOCATION

ONE MILLION SCALE SET

WELLS DRILLED FOR OIL AND GAS IN NEVADA THROUGH 1976

Larry J. Garside and John H. Schilling

1977



SET

AND GAS
H 1976

Schilling

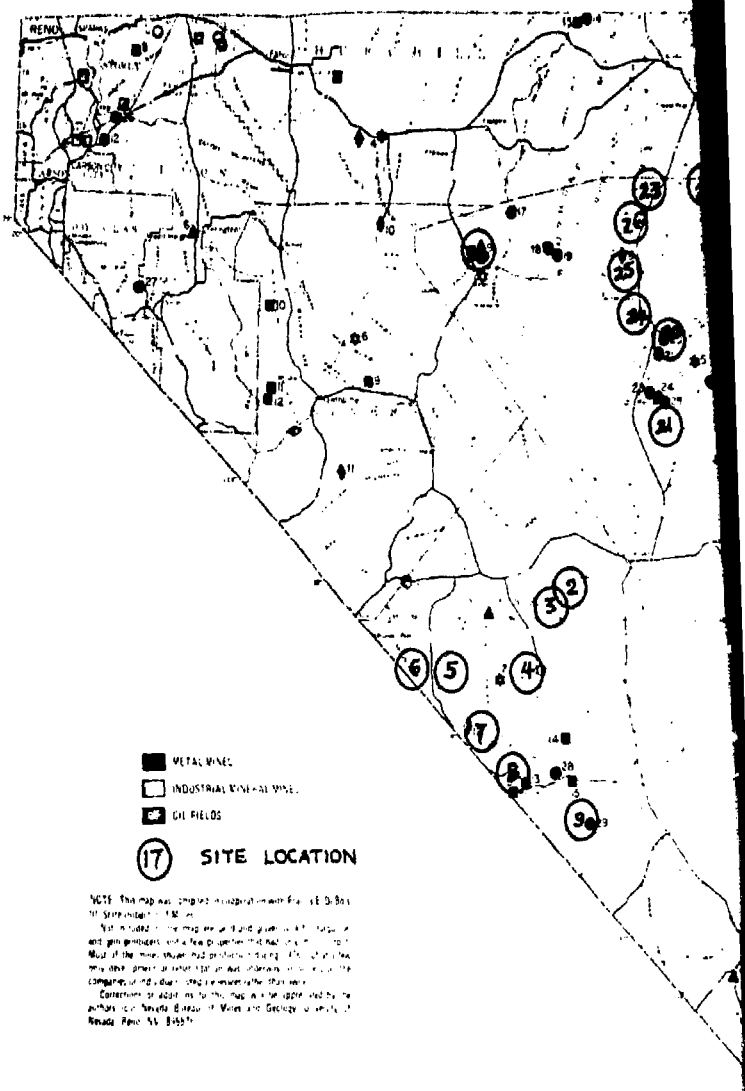


Fig. 9

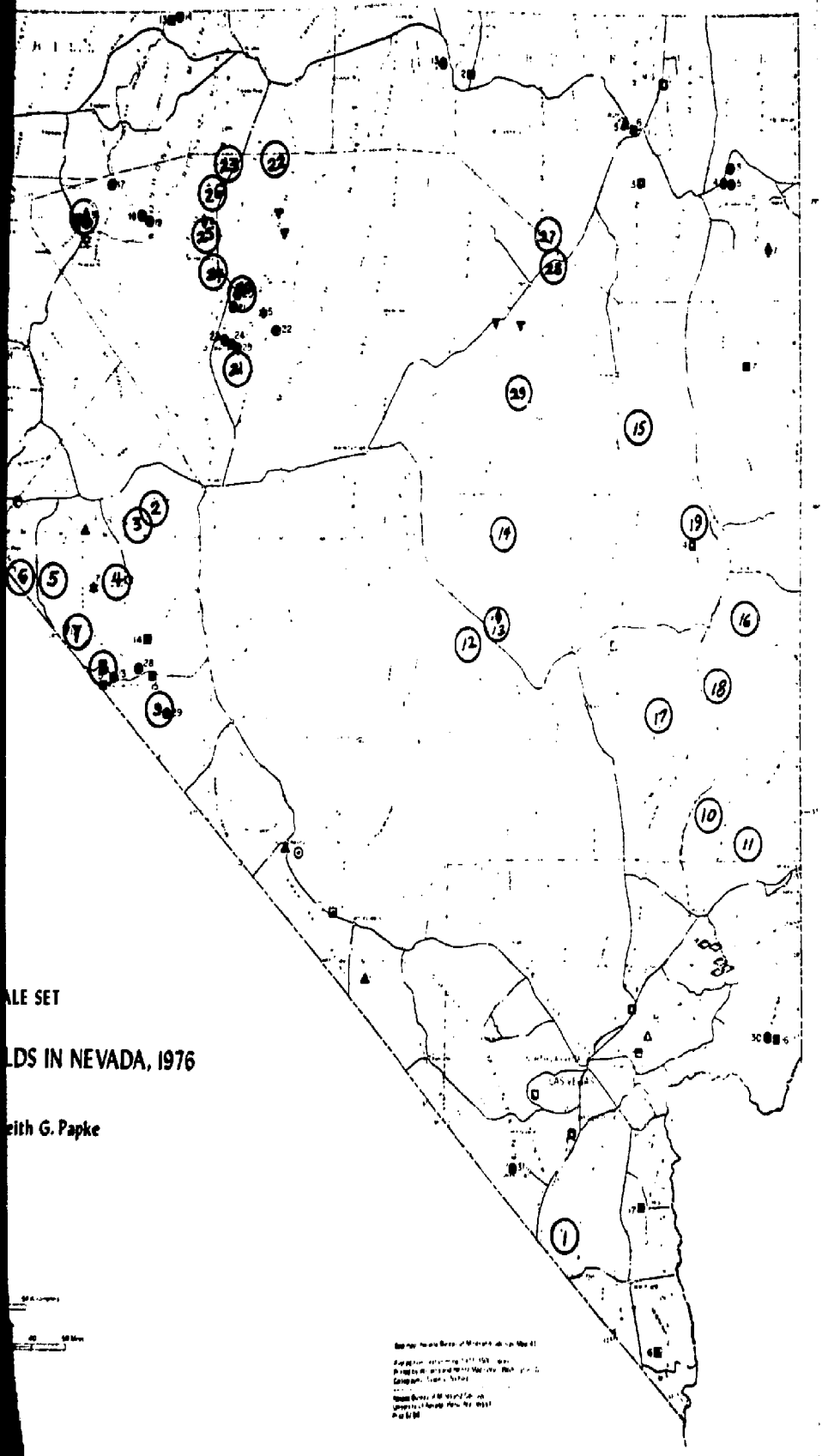
ONE MILLION SCALE SET

ACTIVE MINES AND OIL FIELDS IN NEVADA, 1976

Anthony L. Payne and Keith G. Papke

1977

Scale 1:1000 000



LE SET

LDS IN NEVADA, 1976

ith G. Papke

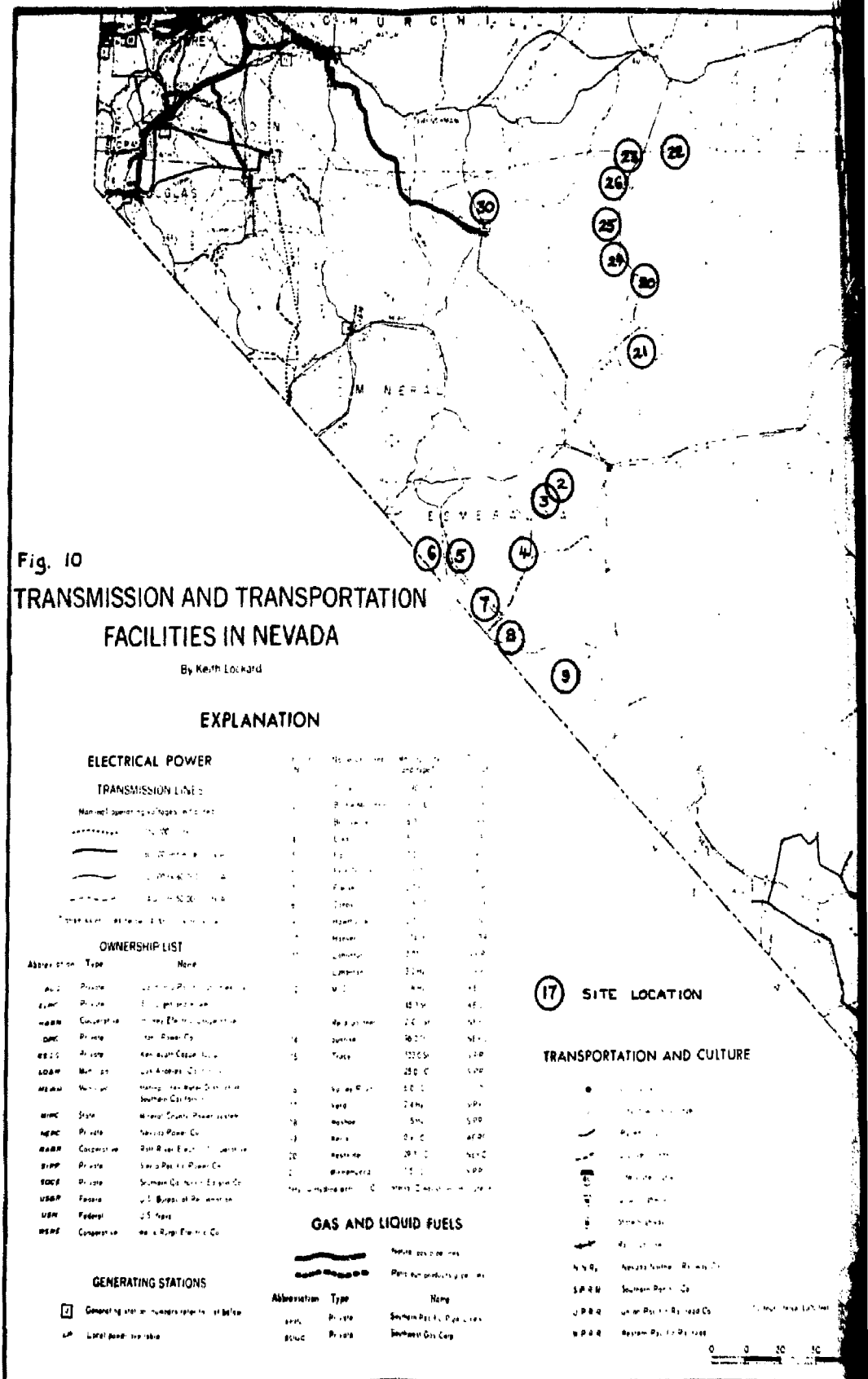
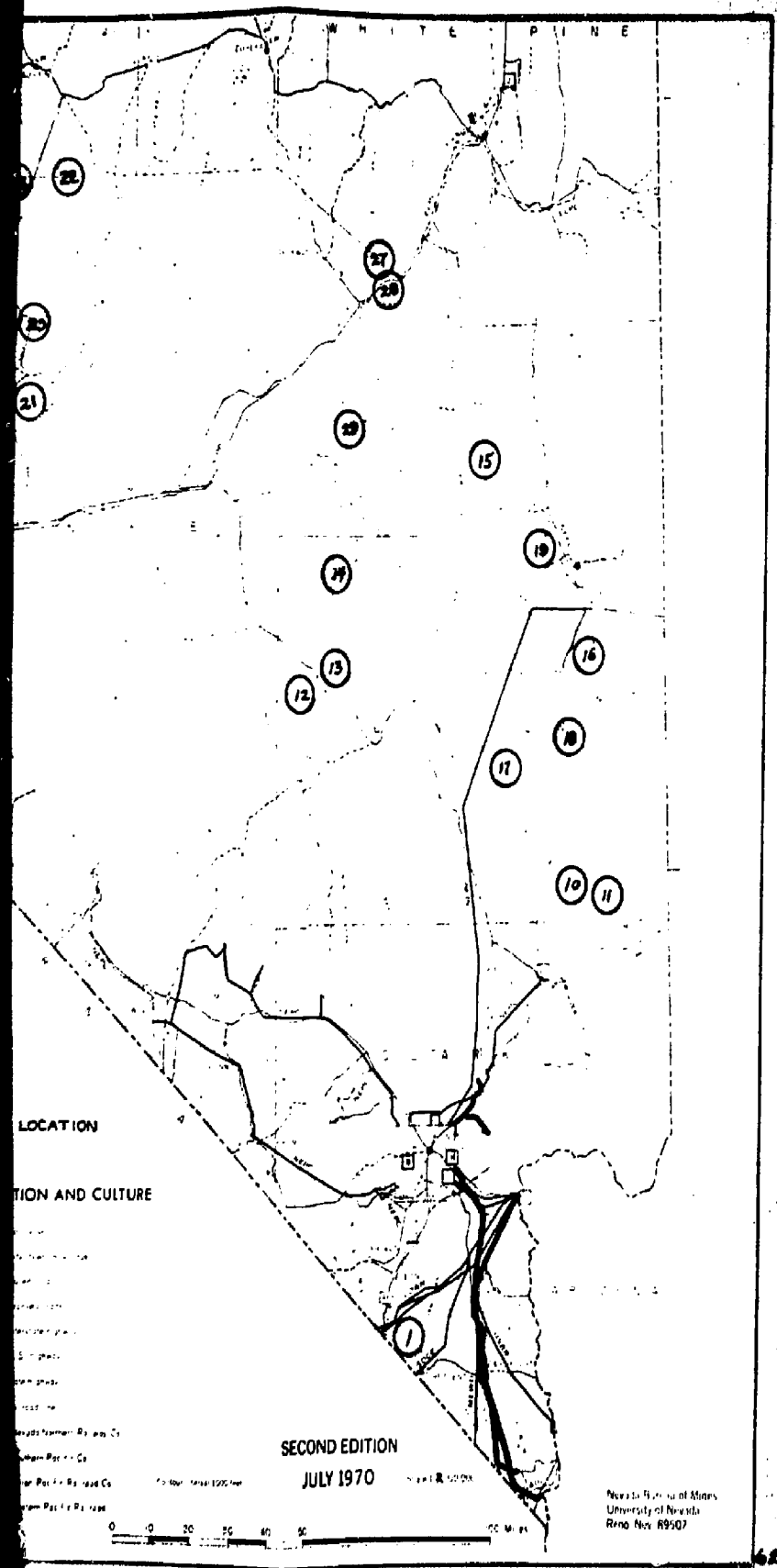


Fig. 10
TRANSMISSION AND TRANSPORTATION FACILITIES IN NEVADA
By Keith Lockard
EXPLANATION
ELECTRICAL POWER
TRANSMISSION LINES
OWNERSHIP LIST
Abbreviation Type Name
GENERATING STATIONS
GAS AND LIQUID FUELS
Abbreviation Type Name
SITE LOCATION
TRANSPORTATION AND CULTURE


WHITE PINE
LOCATION
TION AND CULTURE
SECOND EDITION
JULY 1970
Nevada Bureau of Mines
University of Nevada
Reno, Nev. 89507

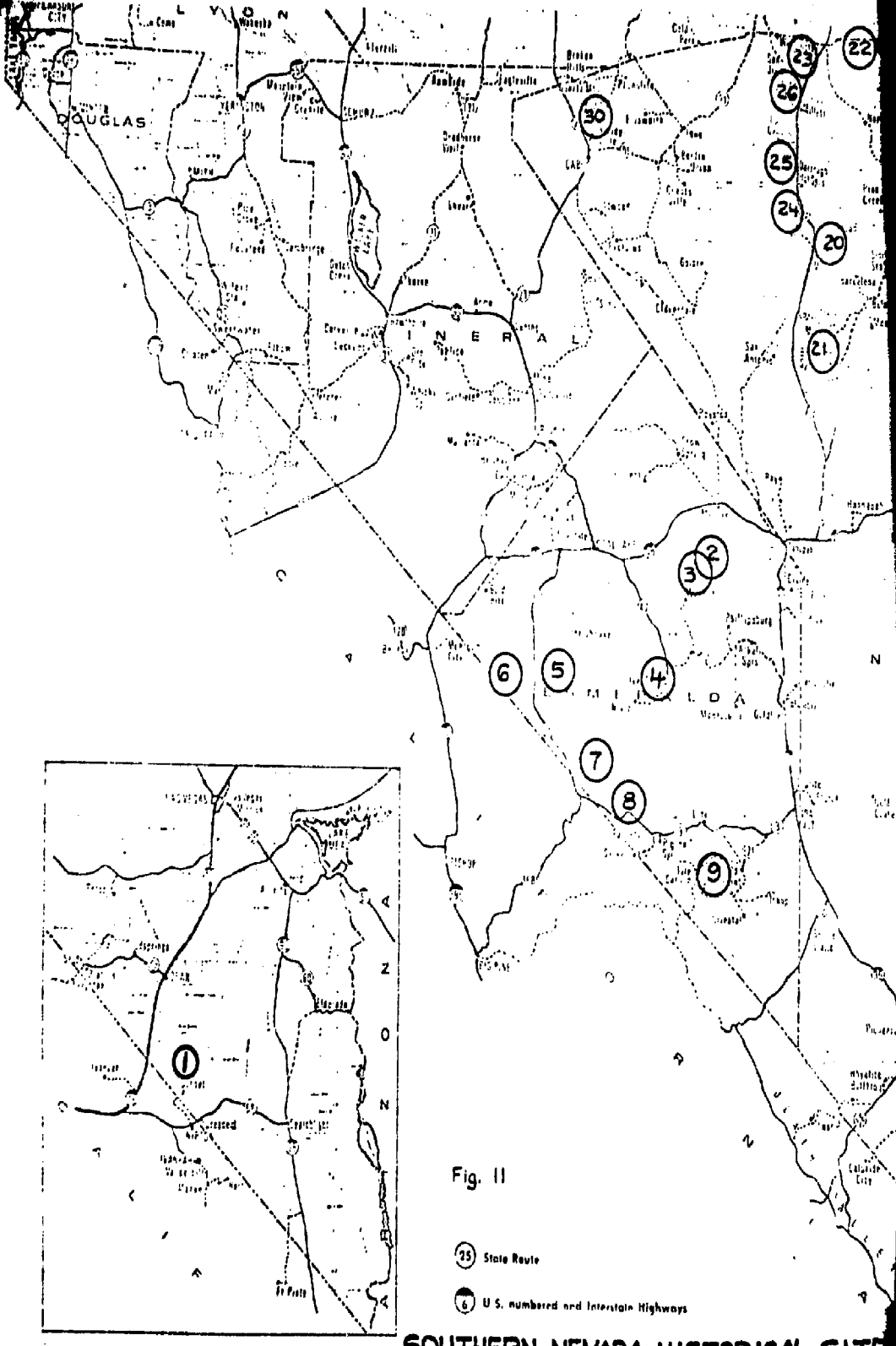


Fig. 11

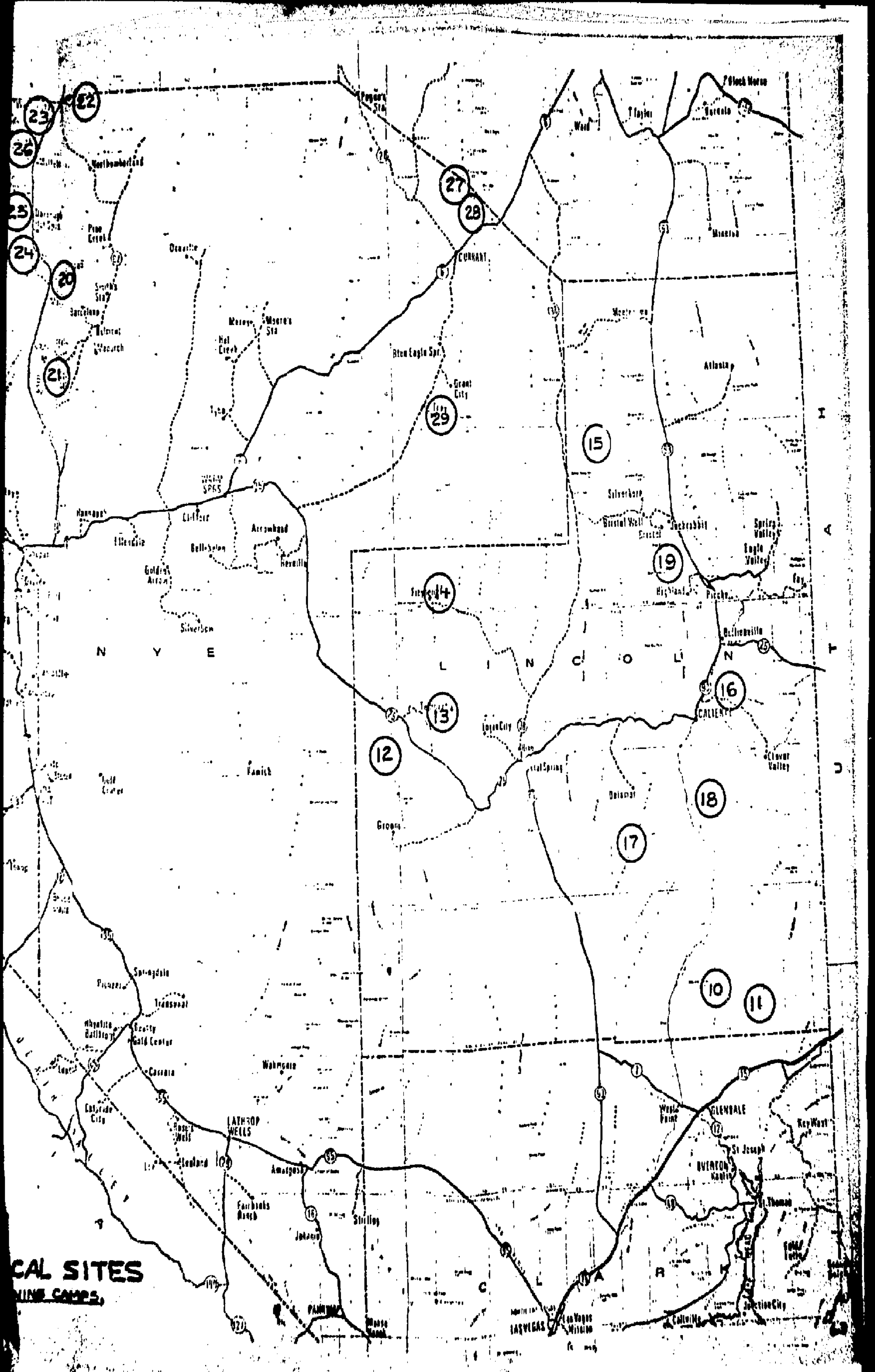
(25) State Route

(6) U.S. numbered and Interstate Highways

SOUTHERN NEVADA HISTORICAL SITE

REF.: S.W. PAHER; NEVADA GHOST TOWNS & MINING CAMPS, HOWELL-NORTH BOOKS, BERKELEY, CA, 1970.

NO SCALE



N Y E
L I N C O L N
C L A R K
U T A H
CURRANT
Pioche
CALIENTE
Caliente
Glendale
GLENDALE
OVERTON
St. Thomas
St. Joseph
LAS VEGAS
Las Vegas Mission
LATHROP WELLS
Beatty
Gold Center
Carrara
Rhyolite
Springdale
Transvaal
Amargosa
Johnnie
Pahrump
Fairbanks Ranch
Tybo
Reveille
Arrowhead
Belle Helen
Golden Arrow
Silverbow
Clifford
Ellendale
Hannapah
Warm Springs
Troy
Grant City
Silverhorn
Bristol Well
Jackrabbit
Highland
Atlanta
Spring Valley
Eagle Valley
Delamar
Clover Valley
Stirling
Wahmonie
Key West
Junction City
Callville
Gold Butte
Lincoln
Pueblo
Quartz Mt.
Ward
Taylor
Osceola
Cherry Creek
Black Horse
Northumberland
Pine Creek
Belmont
Moore's Sta.
Hot Creek
Blue Eagle Spr.
Tempiute
Logan City
Hiko
Crystal Spring
Groom
Fay
Bullionville
Ash Meadows
West Point
Kaolin
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CAL SITES
MINING CAMPS

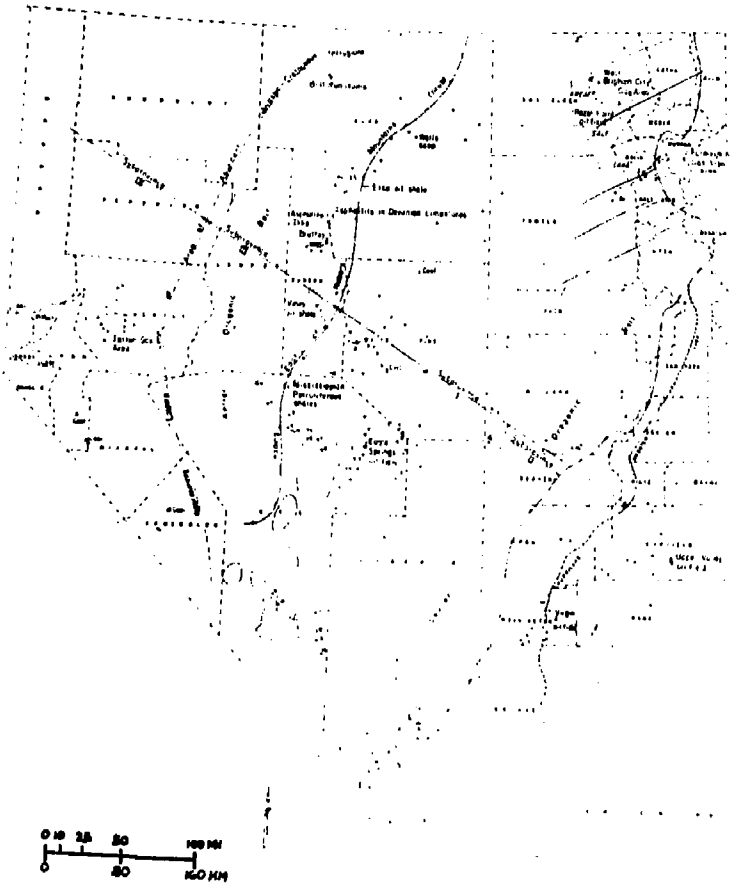

Fig. 12

PETROLEUM SUBPROVINCES OF THE GREAT BASIN

REF.: J.C. OSMOND & D. W. ELLIS, "POSSIBLE FUTURE PETROLEUM RESOURCES OF GREAT BASIN – NEVADA AND WESTERN UTAH;" AAPG MEM. 15, V. 1, P. 418, Fig. 8.

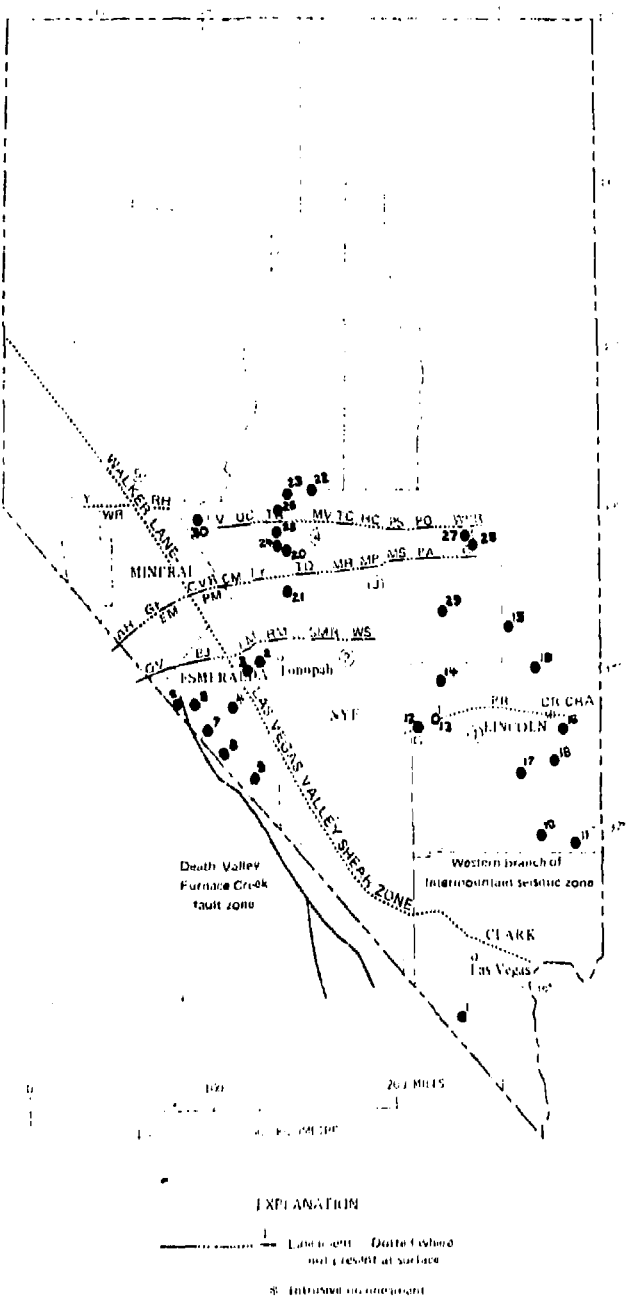

Fig. 13

CENTRAL NEVADA STRUCTURAL ELEMENTS

AFTER E.B. EKREN, ET. AL., EAST-TRENDING STRUCTURAL LINEAMENTS IN CENTRAL NEVADA, USGS PROFESSIONAL PAPER 986, 1976.

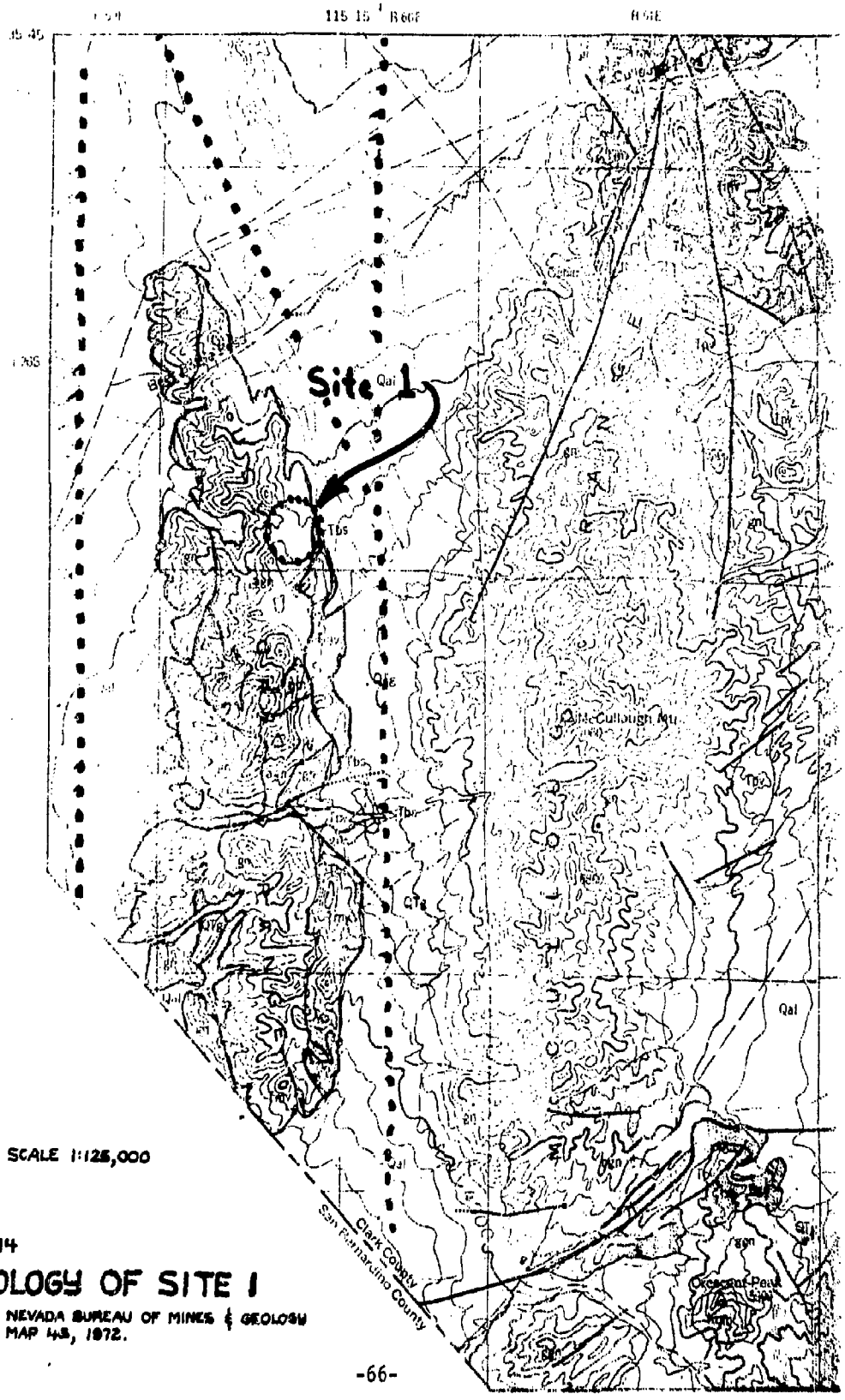

Fig. 14

GEOLOGY OF SITE 1

REF.: NEVADA BUREAU OF MINES & GEOLOGY MAP 48, 1972.

Figure 15a. Site 1, looking west.

Figure 15b. Basalt capped ridge east of Site 1.

Figure 15c. Grazing north of Site 1.

Figure 15d. Example of recreational activities near Site 1.

Fig. 16

GEOLOGIC MAP SHOWING MORMON MOUNTAIN AREA

REF: NEVADA BUREAU OF MINES & GEOLOGY BULLETIN 73, 1970

SCALE 1:250,000

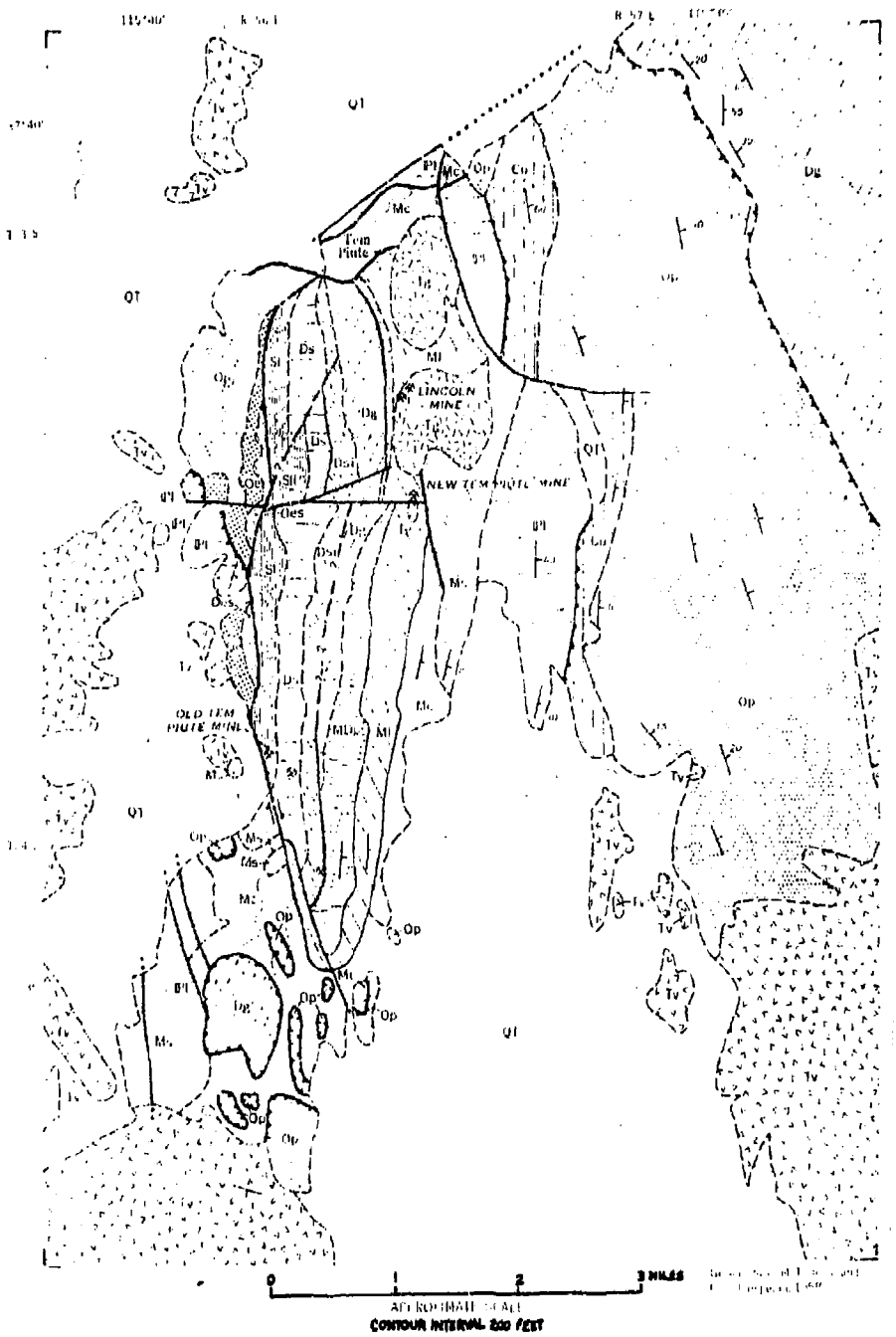

Fig. 17

GEOLOGIC MAP OF THE TEM PIUTE DISTRICT

REF.: NEVADA BUREAU OF MINES & GEOLOGY BULLETIN 73, 1970.

Figure 18a. Site 14, looking west.

Figure 18b. Site 14, looking east.

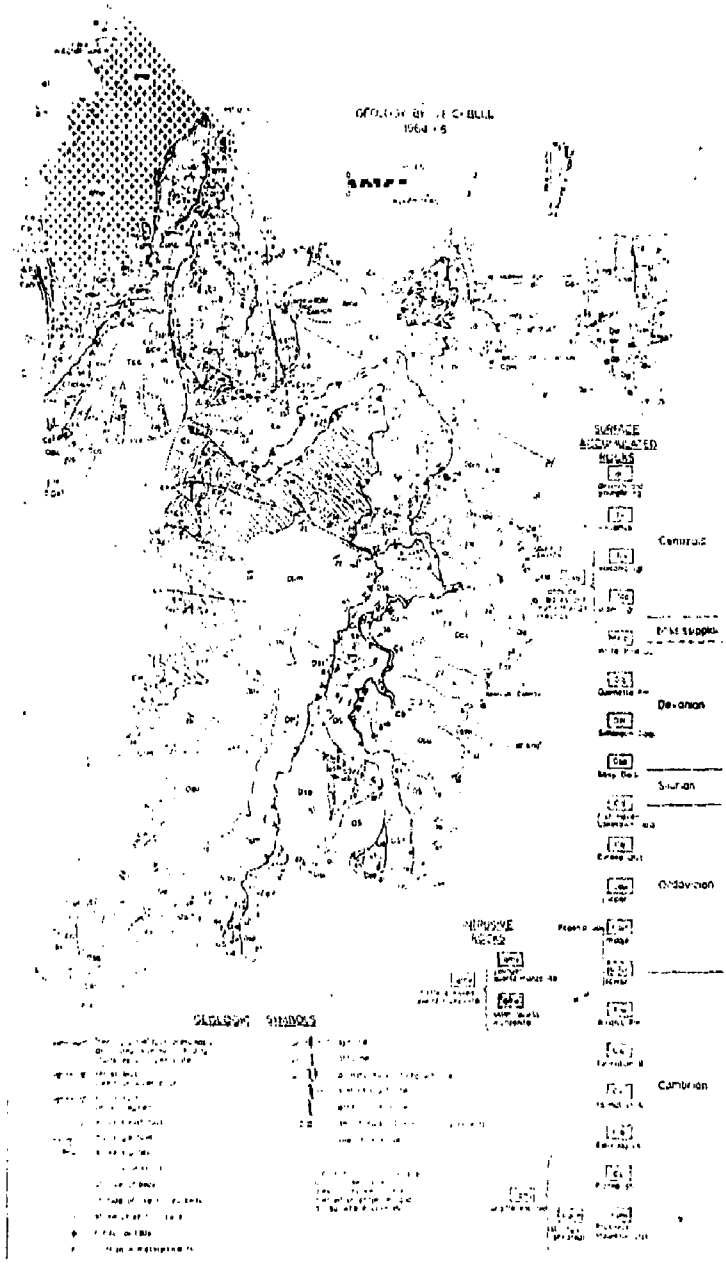

Fig. 19

GEOLOGIC MAP OF THE SOUTHERN GRANT RANGE

REF.: S.E. CEBULL, "BEDROCK GEOLOGY & OROGENIC SUCCESSION IN SOUTHERN GRANT RANGE, NYE CO., NV.;" AAPG V. 54, No. 10, Pg. 1832, Fig. 4.

Figure 20. Site 29 (Troy Stock) looking east.

Figure 21. Site 2, looking east.

Figure 22. Site 3, looking west.

Figure 23. Site 23, looking west.

Figure 24. Site 24, looking west.

Figure 25. Site 25, looking west.

Figure 26. Site 26, looking west.

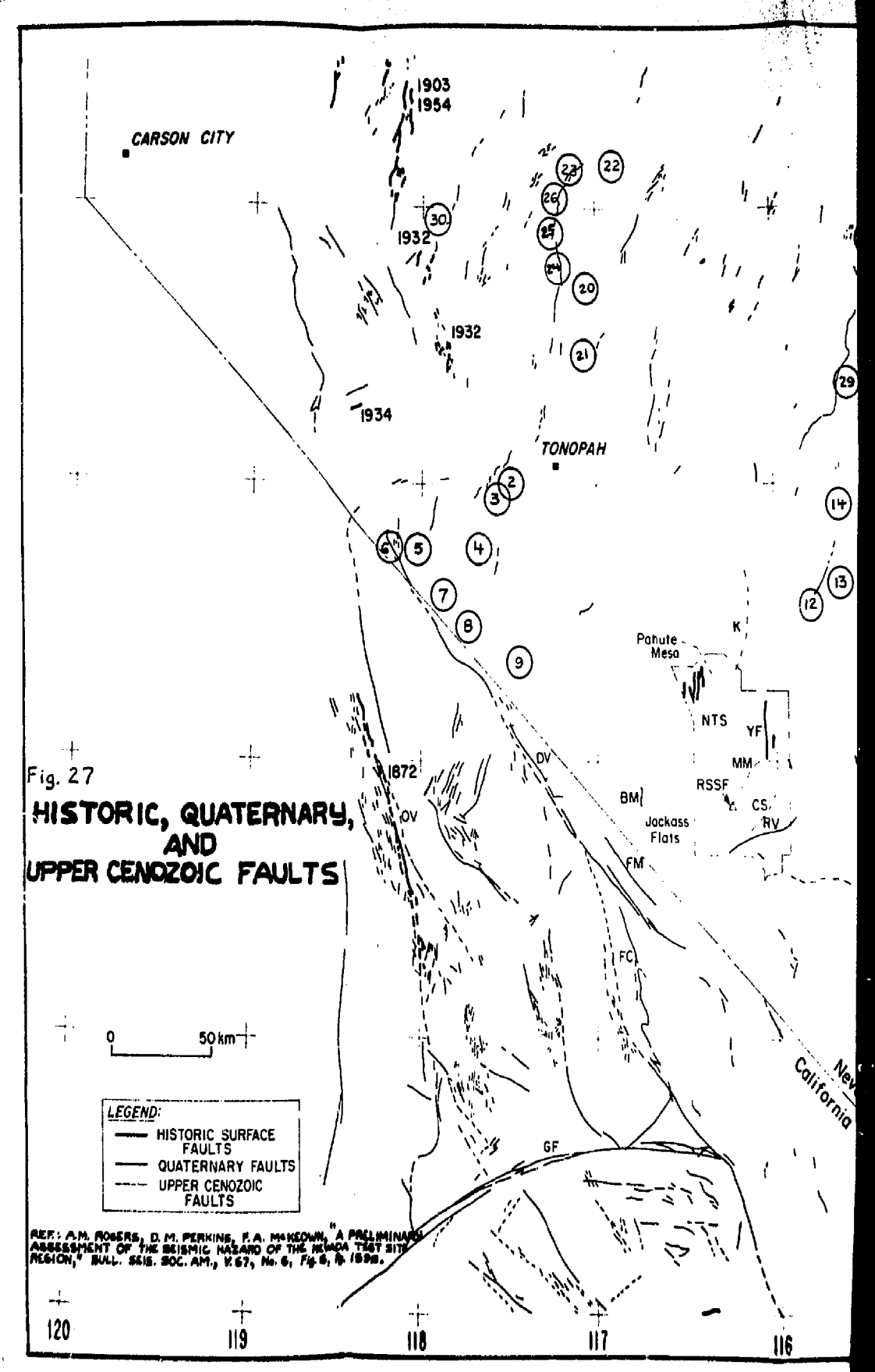

Fig. 27

HISTORIC, QUATERNARY, AND UPPER CENOZOIC FAULTS

REF: A.M. ROGERS, D.M. PERKINS, F.A. McKEOWN, "A PRELIMINARY ASSESSMENT OF THE SEISMIC HAZARD OF THE NEVADA TEST SITE REGION," BULL. SEIS. SOC. AM., V.67, No. 6, Fig 5, p. 1598.

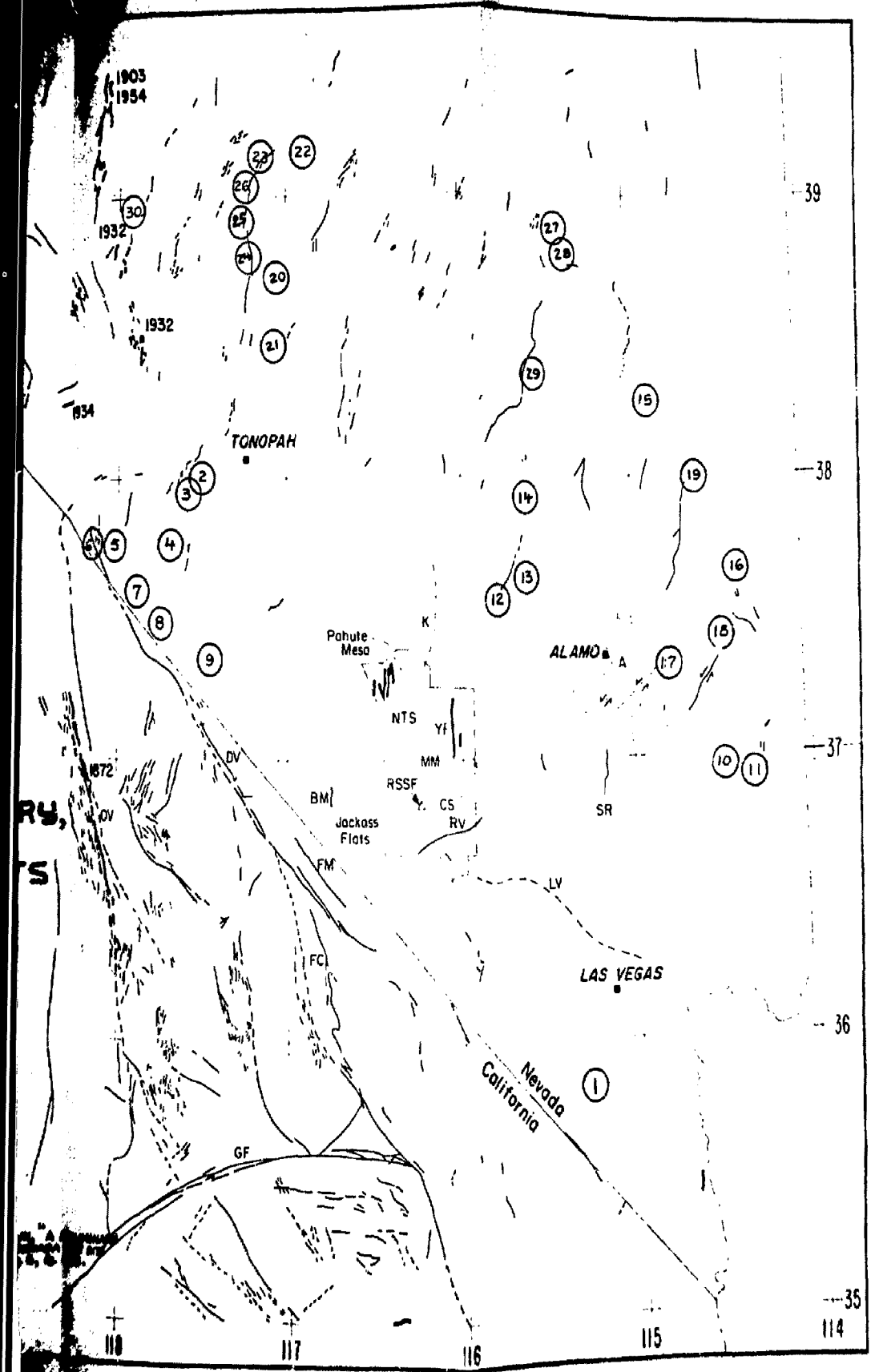
1903
1954
1932
1932
1934
TONOPAH
Pahute Mesa
K
ALAMO
A
NTS
Yf
MM
RSSF
BM
CS
Rv
Jackass Flats
SR
DV
DV
FM
LV
FC
LAS VEGAS
Nevada
California
GF
39
38
37
36
35
118
117
116
115
114

Table 1. Socio-Institutional Site Characteristics and Screening Weights

Site Char. Number	Site Characteristic	Minimum Standard	Weighting Coefficient	Maximum Weight	Minimum Weight
12	Potential interference from mineral development (1)	-	-	+5	-5
32	Distance to nearest town	>10 km	-0.003	-0.1	-3.3
37	Distance to nearest state boundary	>10 km	-	-	-
38	Dist. to nearest active mine w/in 25 km	> 5 km	-	-	-
39	No. of old mines within 10 km	-	-0.05	0	-5.0
42	Dist. to nearest restricted land (2)	-	-	0	-2
44	Dist. to nearest military range	-	0.01	2.7	0
45	Dist. to nearest airline corridor	-	0.02	2.0	0
47	Site hidden from view of roads? (3)	-	-	+3	0
61	Route dist. to nearest support town	-	-0.05	-1.0	-8.0
62	Population of nearest support town (4)	-	-	8	0

(1) Moderate = 0, Low = +5, High = -5

(2) 5 to 10 km = 1, 10 km = 0, 5 km = -2

(3) Yes = +3, No = 0

(4) Las Vegas = 8, Ely = 4, Tonopah = 1, Others = 0

Table 2. Economic Site Characteristics And Screening Weights

Site Char. Number	Site Characteristic	Weighting Coefficient	Maximum Weight	Minimum Weight
3	Maximum Relief of a 40-ha Area	- 0.01	- 0.3	- 1.5
58	Distance to Nearest Power Line	- 0.02	0.0	- 1.7
59	Route Distance to Nearest Railroad	- 0.03	- 0.2	- 7.6
60	Route Distance to Nearest Paved Highway	- 0.02	0.0	- 1.4
63	Route Distance to Nearest Commercial Airport	- 0.01	- 0.7	- 2.7

Table 3. Technical/Environmental Site Characteristics And Screening Weights

Site Char. Number	Site Characteristic	Minimum Standard	Weighting Coefficient	Maximum Weight	Minimum Weight
5	Degree of Rock Mass Resistance to Erosion(1)	-	-	+3	-3
6	Area of Exposed Rock Mass(2)	-	-	+5	0
8	Volcanic Hazard	-	-1	-1	-2
9	Distance to Nearest Volcanic Vent <10 my	>10 km	0.05	+5	0.3
10	Rock Mass Outside an Overthrust?	Yes	-	-	-
11	Distance to Nearest Volcanic Vent <6 my	>10 km	.01	+10	0.3
13	Distance to Nearest 5+km Long Fault Trace(3)	-	-	+2	+1
14	4 km^2 Area at Depth of 300-1,500 m?	Yes	-	-	-
15	Distance to Nearest KGRA Within 40 km(4)	>10 km	0.1	+5	0.4
16	Distance to Nearest Historic Surface Break	> 5 km	0.1	+10	0
17	Distance to Nearest Upper Cenozoic Fault	-	0.2	+4	0
19	Groundwater Discharge (Annual)	-	-0.1	0	-4.0
20	Groundwater does not drain into Colorado River Basin	Yes	-	-	-
22	Distance to Nearest Groundwater Discharge Area	-	0.1	5.4	0.2
25	Surface Water Remains in State?	Yes	-	-	-
26	Surface Water Discharge(5)	-	-	+2	-2
27	Distance to Nearest Perennial Stream w/in 5 km(6)	-	-	+2	-2
28	Distance to Nearest Spring Within 5 km(6)	-	-	+2	-2
29	Number of Springs Within 5 km	-	-0.1	0	-5.0
30	Lake/Reservoir Within 5 km?(7)	-	-	0	-2.0
50	Est. Maximum Acceleration From Future Earthquakes	<0.4 g	-30	-1.0	-10
51	Est. Maximum Acceleration From Future NTS Explosion	-	-30	0	-5

(1) Moderate = 0, High = 3, Low = -3

(2) <5 = 0, 5-10 = 2, 10-30 = 3, 30-100 = 4, >100 km^2 = 5

(3) <5 km = 0, >10 km = +2, 5-10 km = +1

(4) None = 5

(5) 0 = 2, Minor = 0, Significant = -2

(6) None = +2, 1 to 2 km = -1, <1 km = 2, >2 km = 0

(7) Yes = -2, No = 0

Table 4. Economic Screening Factor Evaluation

Site	cx Values					Total Economic Weight
	Factor #3	Factor #58	Factor #59	Factor #60	Factor #63	
Climax	- .4	0	- 5.1	0	- 1.7	- 7.7
1	- .8	- .1	- 0.4	- .3	- .7	- 2.3
2	- .5	- .2	- 2.3	- .3	- 1.6	- 4.9
3	- .7	- .1	- 2.3	- .3	- 1.6	- 5.0
4	- .7	.0	- 2.6	0	- .8	- 4.1
5	- .8	- .1	- 2.5	- .2	- 1.1	- 4.7
6	- 1.2	- .2	- 2.5	- .1	- 1.1	- 5.1
7	- .8	0	- 3.4	- .1	- .7	- 5.0
8	- .5	- .2	- 3.8	- .1	- .6	- 5.2
9	- .5	-1.0	- 5.3	- .2	- 1.3	- 8.3
10	- .9	- .7	- .2	- .8	- 1.3	- 3.9
11	- 1.2	- .8	- 1.1	- .4	- 1.3	- 4.8
12	- .7	-1.6	- 3.9	- .3	- 2.2	- 8.7
13	- .7	-1.4	- 4.1	- .3	- 2.2	- 8.7
14	- .7	-1.7	- 4.0	- 1.4	- 2.2	-10.0
15	- .4	- .5	- 0.4	- .2	- 1.7	- 3.2
16	- .5	- .2	- 0.6	- .4	- 1.7	- 3.4
17	- .7	- .2	- 1.7	- .6	- 1.5	- 4.8
18	- .7	- .4	- .2	- .6	- 1.7	- 3.6
19	- .6	- .1	- .3	- .2	- 1.9	- 3.1
20	- .6	0	- 4.7	0	- 2.6	- 7.9
21	- .5	- .2	- 4.0	- .2	- 2.3	- 7.2
22	- 1.5	- .9	- 5.9	- .3	- 2.5	-11.1
23	- 1.3	- .9	- 5.6	0	- 2.5	-10.3
24	- 1.1	- .4	- 4.8	0	- 2.7	- 9.0
25	- 1.1	- .6	- 5.2	- .1	- 2.8	- 9.8
26	- 1.2	- .9	- 5.6	- .1	- 2.7	-10.5
27	- .3	- .2	- 6.9	- .2	- .8	- 8.4
28	- .3	- .1	- 6.6	- .1	- .7	- 7.9
29	- 1.5	- .6	- 7.6	- 1.0	- 1.3	-12.0
30	- .4	- .2	- 1.7	- .1	- 2.1	- 4.6

Table 5. Socio/Institutional Screening Factor Evaluation

Site	α Values			cx Values									Total Socio/Inst. Weight
	Factor #32	Factor #37	Factor #38	Factor #12	Factor #32	Factor #39	Factor #42	Factor #44	Factor #45	Factor #47	Factor #61	Factor #62	
Climax	1	1	1	5	-1.9	- .1	-2	0	1.4	0	-8.0	8	2.4
1	1	1	1	5	-1.2	- .2	0	1.6	0	3	-3.8	8	12.4
2	1	1	1	5	- .8	-1.1	0	.4	0	3	-3.1	1	4.4
3	1	1	1	0	- .9	- .7	0	.4	0	3	-3.0	1	- .2
4	0	1	1	0	- .1	-2.9	0	.5	0	3	-4.5	1	E
5	0	1	1	0	- .2	- .5	0	.8	.5	0	-6.0	1	E
6	1	0	1	5	- .4	- .2	0	1.0	.4	0	-5.6	1	E
7	1	0	1	0	- .6	-1.5	0	.7	.3	0	-7.0	1	E
8	1	0	1	5	- .7	-2.5	0	.6	0	3	-5.9	1	E
9	0	1	0	5	- .2	-1.9	0	.3	0	0	-4.9	1	E
10	1	1	1	5	- .4	-0.1	0	.6	.4	3	-6.0	8	10.5
11	1	1	1	0	- .7	- .1	0	.9	.2	3	-6.0	8	5.3
12	1	1	1	-5	-1.3	- .4	-1	.1	1.1	0	-7.5	0	E
13	1	1	0	-5	-1.1	- .2	0	.2	1.0	3	-7.5	0	E
14	1	1	1	-5	-1.3	- .3	0	.4	.3	3	-6.7	0	-9.6
15	1	1	1	5	-1.5	- .1	0	1.1	0	3	-1.0	0	6.5
16	1	1	1	-5	- .5	- .4	0	.9	1.1	3	-1.1	0	-2.0
17	1	1	1	5	- .7	- .1	0	.5	1.3	3	-2.8	0	6.2
18	0	1	1	-5	- .3	- .3	0	.7	.9	3	-1.5	0	E
19	1	1	1	0	- .5	- .8	0	.7	.2	3	-1.0	0	1.6
20	0	1	0	0	- .1	-5.0	-1	.9	1.1	0	-4.5	1	E
21	0	1	1	5	- .3	-5.0	0	.6	.5	0	-2.4	1	E
22	1	1	1	5	-1.1	- .2	0	1.1	2.0	0	-7.8	1	0
23	1	1	1	5	-1.1	- .9	0	.9	1.9	0	-7.0	1	- .2
24	1	1	1	5	- .4	0	-2	1.0	1.3	0	-4.8	1	1.1
25	1	1	1	5	- .8	- .1	-2	.9	1.5	0	-5.7	1	- .2
26	1	1	1	0	-1.1	-1.2	0	.8	1.6	3	-6.3	1	- 2.2
27	1	1	1	0	-1.1	- .1	0	2.7	.9	3	-3.8	4	5.6
28	1	1	1	0	-1.0	- .1	0	2.2	1.0	0	-3.4	4	2.7
29	1	1	1	-5	-3.3	- .2	0	.8	.4	3	-6.7	4	- 4.6
30	1	1	0	0	- .3	-5.0	0	.3	.7	0	-0.8	0	E

Table 6a. Technical/Environmental Screening Factor Evaluation

Site Number	b Values*								
	Function #9	Function #10	Function #11	Function #14	Function #15	Function #16	Function #20	Function #25	Function #50
Climax						0			
1							0		
2									
3									
4			0		0				
5	0								0
6									0
7		0		0					
8		0		0					
9									
10							0	0	
11							0	0	
12				0					
13									
14									
15							0		
16							0	0	
17							0		
18							0	0	
19				0			0		
20									
21									
22									
23									
24									
25									
26									
27				0					
28				0					
29									
30									0

*NOTE: Where there are no values listed, the b value is 1.

Table 6b. Technical/Environmental Screening Factor Evaluation

Site Number	cx Values								
	Function #5	Function #6	Function #8	Function #9	Function #11	Function #13	Function #15	Function #16	Function #17
Climax	0	0	-1	1.8	.3	0	5	0	4
1	0	4	-1	2.7	4.6	0	5	6	1
2	-3	4	-2	1.0	2.5	1	2.2	6	2
3	+3	4	-2	.6	1.7	1	1.8	6	2
4	-3	2	-2	.8	.8	0	0.4	8	3
5	+3	2	-2	.3	2.5	1	3.3	7	1
6	-3	4	-2	1.1	1.9	1	4.0	6	1
7	-3	4	-2	1.3	3.3	1	2.8	6	2
8	+3	4	-2	1.1	4.1	0	3.4	6	2
9	-3	5	-2	.9	3.0	0	5	9	4
10	0	2	-1	3.6	9.2	0	5	10	4
11	0	2	-1	3.9	7.2	0	5	10	2
12	-3	2	-1	4.0	3.3	0	5	5	1
13	0	0	-1	4.3	4.0	0	5	6	1
14	0	2	-1	3.2	2.6	0	5	10	3
15	+3	2	-1	4.6	9.0	0	5	10	3
16	0	3	-1	3.7	10.0	0	5	10	1
17	0	0	-1	4.8	10.0	0	5	10	1
18	0	3	-1	3.6	9.9	0	5	10	2
19	0	0	-1	5.0	10.0	0	5	10	1
20	0	5	-2	4.3	9.0	1	5	8	2
21	-3	4	-2	4.1	8.3	2	5	7	2
22	-3	3	-1	5.0	10.0	1	5	9	3
23	0	3	-2	5.0	10.0	0	5	8	0
24	+3	2	-2	4.9	10.0	0	5	7	0
25	0	3	-2	5.0	10.0	0	5	6	0
26	0	3	-2	5.0	10.0	0	5	7	1
27	0	0	-1	2.8	6.0	0	5	8	3
28	0	0	-1	2.7	6.0	1	5	8	2
29	0	3	-1	1.7	3.5	0	5	7	0
30	-3	2	-2	3.0	9.0	0	5	1	1

Table 6c. Technical/Environmental Screening Factor Evaluation

Site Number	Function #19	Function #22	Function #26	Function #27	Function #28	Function #29	Function #30	Function #50	Function #51	Total
	ex Values									
Climax	-.1	5.4	2	2	-2	-.3	0	-4	-5	E
1	-.2	5.2	2	2	2	0	0	-1	0	E
2	-.8	1.0	2	2	-1	-.4	0	-6	-1	9.5
3	-.8	.8	2	2	0	-.1	0	-6	-1	15.0
4	0	.4	2	2	2	0	0	-8	-1	E
5	0	.3	-2	2	0	-.2	-2	-10	0	E
6	0	.8	-2	0	0	-.2	0	-10	0	E
7	0	.9	-2	2	2	0	0	-10	-1	E
8	0	2.1	-2	2	2	0	0	-9	-1	E
9	-.1	2.9	-2	2	2	0	0	-6	-1	E
10	-.7	1.8	0	2	2	0	0	-1	0	E
11	-4.0	2.1	-2	2	2	0	0	-1	0	E
12	0	1.5	2	2	2	0	0	-4	-2	E
13	0	1.3	2	2	2	0	0	-4	-1	21.6
14	0	3.2	2	2	2	0	0	-4	-1	29.0
15	-1.4	2.7	2	2	2	0	0	-3	0	E
16	0	1.5	-2	2	2	0	0	-2	0	E
17	-.6	3.0	2	2	0	-.1	0	-2	-1	E
18	-.7	2.8	0	2	2	0	0	-2	0	E
19	-.5	3.2	2	2	-2	-.3	0	-2	0	E
20	-.8	1.1	2	0	0	-.2	0	-6	0	28.4
21	-.6	1.9	2	2	0	-.5	0	-6	0	26.2
22	-.8	.5	2	2	0	-.2	0	-5	0	35.0
23	-.8	.3	2	-1	0	-.3	0	-6	0	23.2
24	-.8	.2	2	-2	-1	-5.0	0	-6	0	17.3
25	-.8	.8	2	0	2	0	0	-6	0	25.0
26	-.8	.3	2	0	0	-.3	0	-6	0	24.8
27	0	1.2	0	-1	2	0	0	-2	0	E
28	0	1.0	0	-1	0	-.3	0	-1	0	E
29	0	.4	0	-2	0	-1.4	0	-4	0	12.2
30	0	.9	2	2	2	0	0	-10	0	E

Table 7. Summary of Screening Factor Evaluations

Site Number	Economic (cx Values)	Socio/Institutional (a Values)	Socio/Institutional (cx Values)	Technical/Environmental (b Values)	Technical/Environmental (cx Values)	Total
Climax	- 7.7	1	2.4	0		E
1	- 2.3	1	12.4	0		E
2	- 4.9	1	4.4	1	9.5	9.0
3	- 5.0	1	-0.2	1	15.0	9.8
4	- 4.1	0		0		E
5	- 4.7	0		0		E
6	- 5.1	0		0		E
7	- 5.0	0		0		E
8	- 5.2	0		0		E
9	- 8.3	0		1		E
10	- 3.9	1	10.5	0		E
11	- 4.8	1	5.3	0		E
12	- 8.7	1		0		E
13	- 8.7	0		1	21.6	E
14	-10.0	1	-9.6	1	29.0	9.4
15	- 3.2	1	6.5	0		E
16	- 3.4	1	-2.0	0		E
17	- 4.8	1	6.2	0		E
18	- 3.6	0		0		E
19	- 3.1	1	1.6	0		E
20	- 7.9	0		1	28.4	E
21	- 7.2	0		1	26.2	E
22	-11.1	1	0	1	35.0	23.9
23	-10.3	1	-0.2	1	23.2	12.7
24	- 9.0	1	1.1	1	17.0	9.1
25	- 9.8	1	-0.2	1	25.0	15.0
26	-10.5	1	-2.2	1	24.8	12.1
27	- 8.4	1	5.6	0		E
28	- 7.9	1	2.7	0		E
29	-12.0	1	-4.6	1	12.2	- 4.4
30	- 4.6	0		0		E

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APPENDIX A

SITE DATA SHEETS

(Numerical Order)

DATA SHEET
CLIMAX STOCK
SITE NO.

I. GENERAL

Location Nye County, 37° 14' N. Lat. 116° 3' W. Long

Geomorphic Feature Climax Stock

Elevation 1,493-1,859m (4,900'-6,100')

Vegetation Types Salt desert shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 34m

Maximum Relief of 40 ha Operations Area 38m

Degree of Rock Mass Dissection moderate

Maximum Relief Between Paved Road & Site 0m

III. GEOLOGY

Rock Type, Name, Age Granodiorite/Quartz monzonite, Cretaceous

Intruded Rock Type, Name, Age Pogonip gp lms/dol Ord, Stirling Quartzite, pC

Area of Exposed Rock Mass $2.8km^2$

Surface Rock Mass Competency Low to high (underground - high)

Faults (Underground: 4 faults/meter)

Joints (Underground freq: 2.7 Joints/meter) (Surface density: 2 to $20/m^2$)

Distance to Nearest Historic Surface Break 0.4 km

Distance to Nearest Upper Cenozoic Fault 22 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 0km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 29 km

Distance to Nearest KCRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region Yucca Flat Basin

Groundwater Discharge 1000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within basin

Where Does Groundwater Go? California

Distance to Nearest Spring Within 5 km 0.8 km Tub Spring

Number of Springs Within 5 km 3

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 15 km - Groom, 20 km - Papoose, 27 km - Yucca, 25 km - Kawich

Distance to Nearest Water Well In Use 2 km

Depth to Water in Nearest Well ?

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 54 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Mercury, 64 km, population unknown

Nearest Human Habitation and Number of People 2 km - PHS complex

Distance to State Boundary 90 km

Distance to and Name of Nearest Active Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km None

VI. LAND STATUS

Is Site Located on Restricted Land? Yes

Type of Restricted Land NTS

Distance to and Types of Restricted Lands Within 20 km (Within restricted area)

Land Ownership (State, Federal, Private) Federal

Land Use Nuclear explosive testing

Number of Old Mines Within 10 km 1 District Mo, Au, Ag, W (Oak Springs District)

Number of Oil and Gas Exploratory Holes Within 10 km None

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 72 km

Distance to Nearest Military Range From Boundary 2.5 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 64 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 14*

Record Period 1932-1960

Magnitude of Largest Earthquake Within 100km 6 +

Distance to Largest Earthquake's Epicenter Within 100 km 95 km

Maximum Expected Acceleration From NTS Blasts 0.15 g

Reported or Observed Recent Fault Scarp Within 5 km? Yes, Yucca Fault (.4 km)

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Beatty 62.4° - 99.7°F (JUL)

Average Daily Temperature Range, Coldest Month At Beatty 27.7° - 55.3°F (JAN)

Annual Precipitation < 8"

* NTS Shots Excluded.

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 146° - 142km BIOCHE 59° - 160 km HENDERSON 146° - 162 km

BOULDER CITY 139° - 176km TONOPAH 310° - 139km ELY - - FALLON - -

HAWTHORNE - - RENO - - CARSON CITY - -

Distance to And Location of Nearest Meteorological Station (NTS) On Site

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Probably

Reported or Observed Historical Site Within 5 km? Yes, Mining camp on site

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 160 km, Southwest Gas

Distance to and Name of Nearest Power Line 0 km, DDA

Route Distance to and Ownership of Nearest Railroad 170 km, Union Pacific

Route Distance to and Name of Nearest Paved Highway 0 km

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town Las Vegas, 160 km

Population of Support Town 375,000 (1975 est)

Route Distance to and Name of Nearest Commercial Airport 170 km, Las Vegas

*Only locations within 200 km are evaluated.

REFERENCES 1. Geol map of the Wheelbarrow Peak - Rainier Mesa Area - Nye Co., Nev by K.A. Sargent and P.O. Orkild(1973)USGS Map 1-754

2. Summary of the Geology and Physical Properties of Climax Stock, NTS Open File Report 77-356 (1977)

* For cities within 200 km only.

DATA SHEET

SITE NO.1

I. GENERAL

Location T 26 & 27S, R 60 E, Clark County 35° 37'N, 115° 14' W

Geomorphic Feature Lucy Grey Range

Elevation 1,356 m (4,450')

Vegetation Types Sagebrush, Blackrush, Cactus, Rabbitbrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 61 m (200')

Maximum Relief of 40 ha Operations Area 76 m (250')

Degree of Rock Mass Dissection mod

Maximum Relief Between Paved Road & Site Rd 795 m (2,608') pass1,052 m (2,350') site 1,356 m (4,450'), Δh=561 m (1,842')/16 km, Ave 35 m/km, Figure 1-1

III. GEOLOGY

Rock Type, Name, Age Grey Granitic Augen Gneiss, Precambrian

Intruded Rock Type, Name, Age Range is basement rk.

Area of Exposed Rock Mass 36 km^2 Figure 1-2

Surface Rock Mass Competency Moderate

Faults 60 km to Historic, 10 km to U. Cenozoic

Joints variable, 0.6-1/m^2 in resistant granitic augen gneiss to 10/m^2 in fracture dikes and gray gneiss.

Distance to Nearest Historic Surface Break 60 km

Distance to Nearest Upper Cenozoic Fault 10 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace ½ km Sheep Mt. Roach, McCullough, Figure 1-3

Site Potencial for Mineral Development Low, Figure 1-4

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 46 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? Yes Water comes from California and goes to Las Vegas Valley & Colorado River

Name of Site's GW Region & Basin (10) Central Region - (164A) North Ivanpah Valley

Groundwater Discharge 2000 ac. ft/yrs

Surface Discharge No

Where Does Surface Water Go? Roach and North Ivanpah Dry Lakes

Where Does Groundwater Go? Indirectly into Colorado River Region (Las Vegas Valley)

Distance to Nearest Spring Within 5 km None within Lucy Grey Range

Number of Springs Within 5 km None

Distance To and Names of Perennial Streams Within 5 km None (5 intermittent streams drain range, 1 has alt. course into Ivanpah dry lake, rest into Roach Lake)

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 3 km Ivanpah, 13 km Jean 17 km East Jean, 20 km Mesquite

Distance to Nearest Water Well In Use 9 km

Depth to Water in Nearest Well 35 m (116 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 52 km (Las Vegas Valley)

V. DEMOGRAPHY

Nearest Town, Population, and Distance Jean, 99, 40 km (route dist.)

Nearest Human Habitation and Number of People 11 km, State Line Stations (25)

Distance to State Boundary 10 km

Distance to and Name of Nearest Active Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km None

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use Some grazing, limited recreation, access to Bell Microwave Facility

Number of Old Mines Within 10 km 3

Number of Oil and Gas Exploratory Holes Within 10 km (Sandia Int. Met. Corp. Duff #1) (1971, 438' @ 11 km)

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary (within)

Distance to Nearest Military Range From Boundary 160 km

Distance to Nearest Non-Restricted Paved/Paved Road in Use From Boundary 9 km

Site Out of View of Existing Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 8

Record Period 1881-1977

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 56

Maximum Expected Acceleration From NTS Blasts 0.01 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Las Vegas 23 to 40.6°C(73.4to 105°F)

Average Daily Temperature Range, Coldest Month At Las Vegas-.7 to 13.7°C(30.7to 56.6°F)

Annual Precipitation 15 cm (6 inches)

IX. METEOROLOGY (Continued)

Azimuth and Distance To: LAS VEGAS 10°/60km PIOCHE 15°/266 HENDERSON 20°/53

BOULDER CITY 22°/57 TONOPAH 327°/320 ELY 4°/410 FALLON 324°/525

HAWTHORNE 316°/438 RENO 317°/588 CARSON CITY 314°/557

Distance to And Location of Nearest Meteorological Station McCarran Airport, 50 km

Prevailing wind direction is from SW @ 14 km/hr (9mi/hr)

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? No

Reported or Observed Historical Site Within 5 km? No

XI. LOGISTICS (702) 643-3944 (8½km, 14" products line - CalNev Pet Co)

Distance to and Name of Nearest Gas Line 30 km, Southwest Gas Company

Distance to and Name of Nearest Power Line 5 km, Los Angeles Municipal

Route Distance to and Ownership of Nearest Railroad 14 km, Union Pacific

Route Distance to and Name of Nearest Paved Highway 16 km, Interstate 15

Type of Nearest Paved Highway Interstate

Route Distance to and Name of Support Town 75 km, Las Vegas, Nevada

Population of Support Town 375 k (1975)

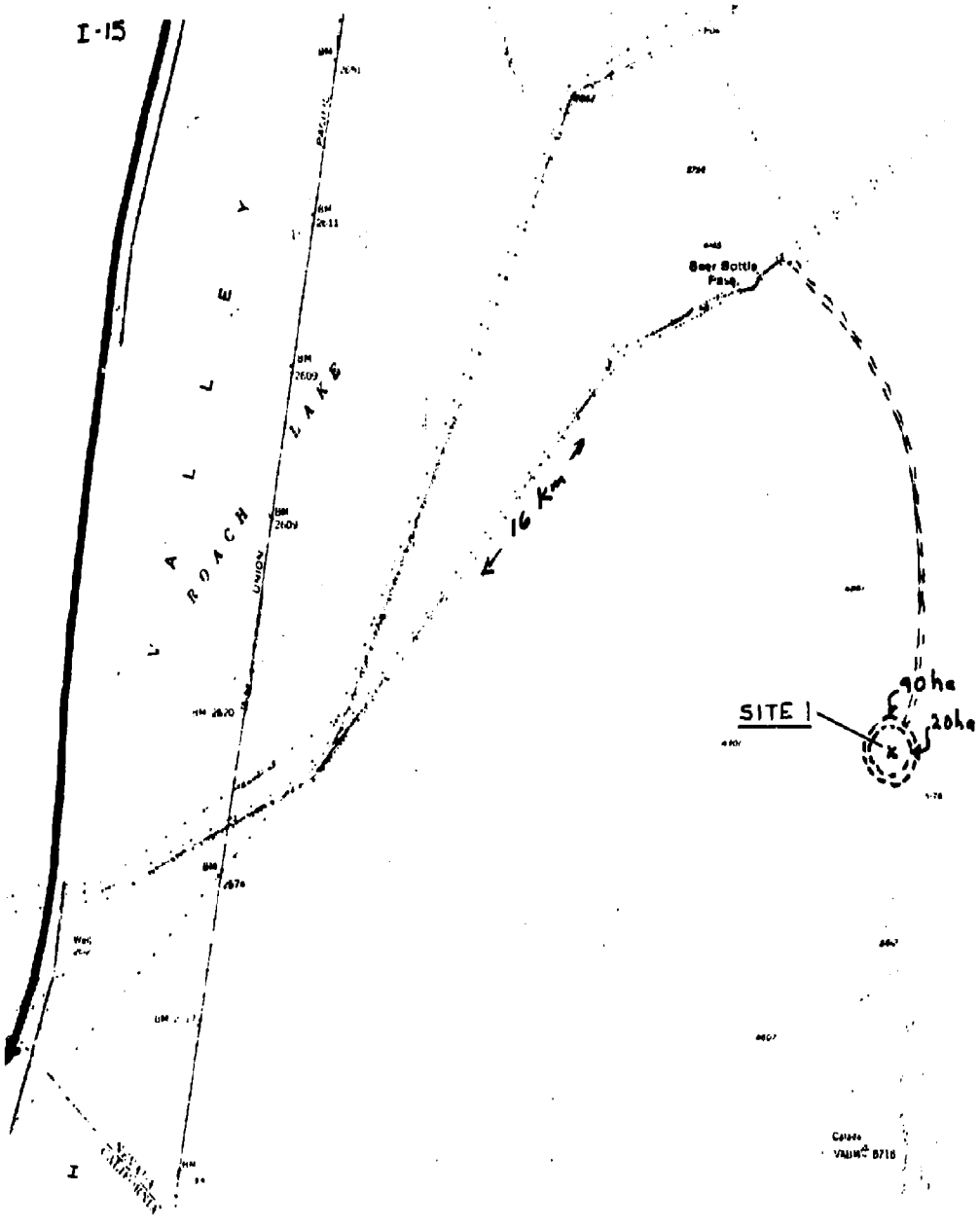
Route Distance to and Name of Nearest Commercial Airport 69 km McCarran Field

REFERENCES Hewett, D.F. "Geology and Mineral Resources of the Ivanpah Quadrangle, California and Nevada" USGS Prof Paper 275 (1956)

Bingler, E.C. and H.F. Bonham " Reconnaissance Geologic Map of the McCullough Range and Adjacent Areas" Nev. Bu M&G Map 45 (1972)

Longwell, C.R., E.H. Pampegan, B. Bowyer, R.I. Roberts " Geology and Mineral Deposits of Clark County, Nevada "Nev. Bu M&G Bull 62 (1965)

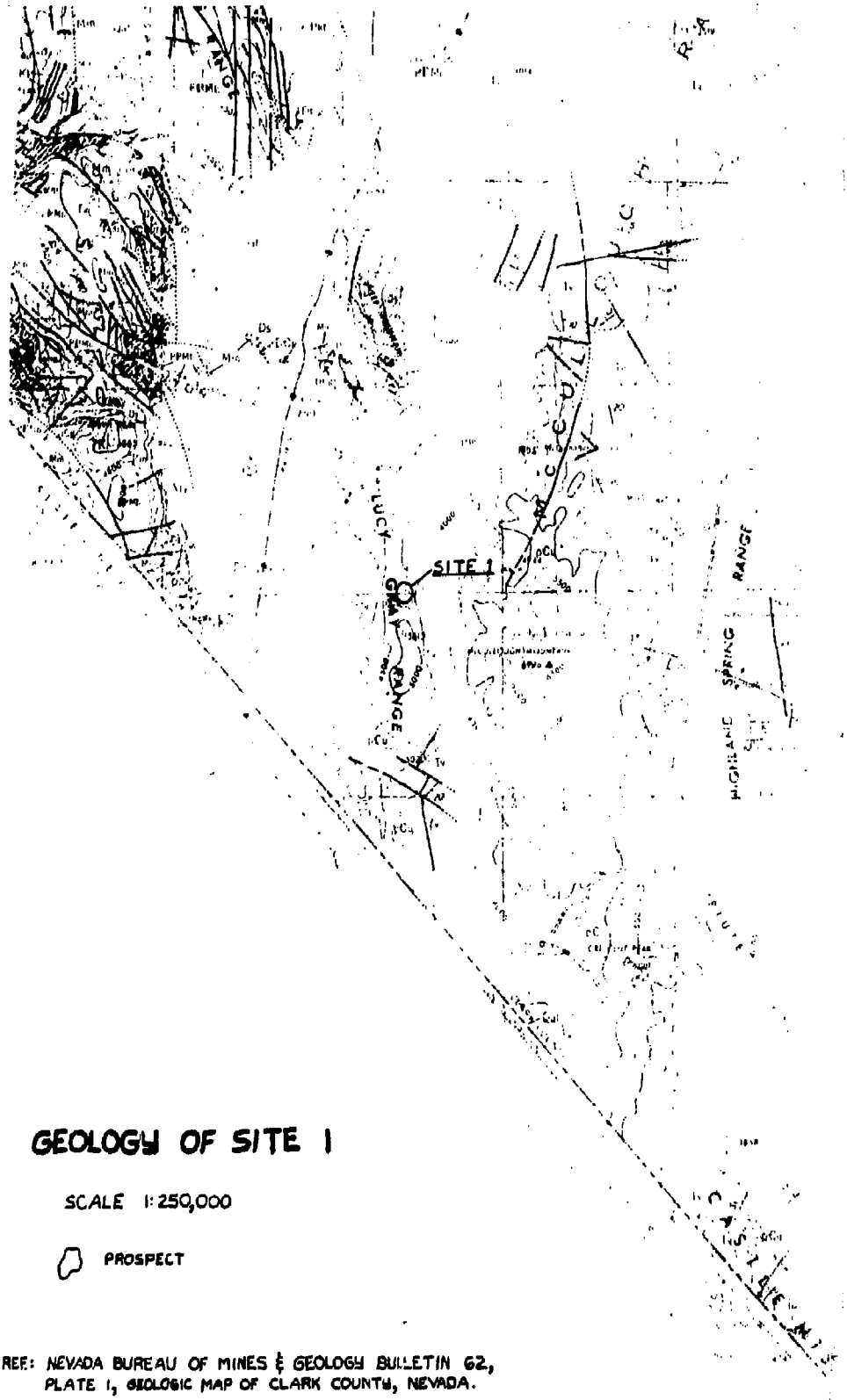
"Clark County Nevada, Data File" Nev. Dept Econ. Dev (1977)
"Roach Lake 15 Min Quadrangle" USGS (1955)



TOPOGRAPHY OF SITE I

REF: USGS TOPOGRAPHIC SHEET, ROACH LAKE QUADRANGLE, NEVADA, 15'

SCALE 1:62,500

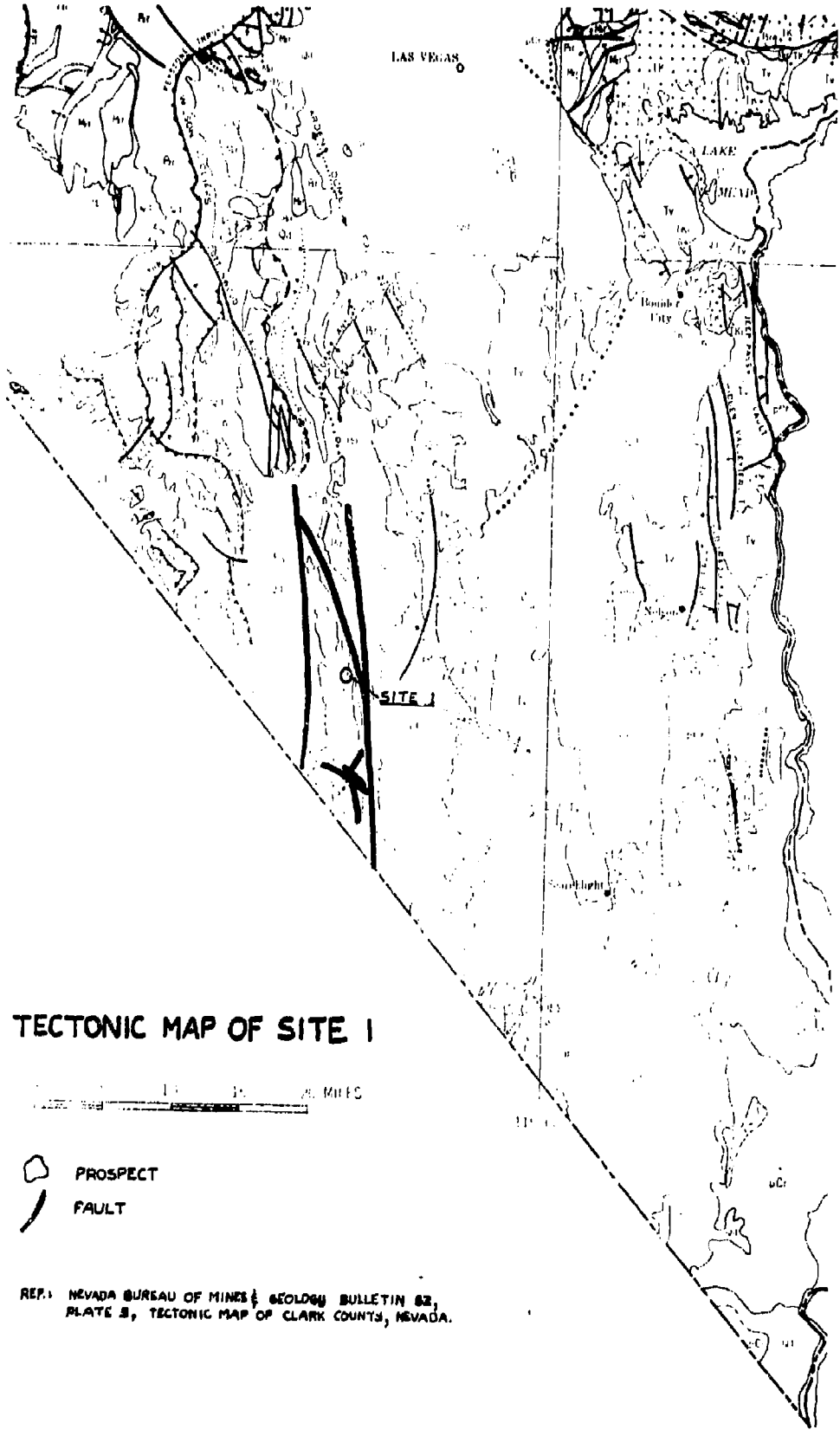


GEOLOGY OF SITE 1

SCALE 1:250,000

PROSPECT

REF: NEVADA BUREAU OF MINES & GEOLOGY BULLETIN 62, PLATE 1, GEOLOGIC MAP OF CLARK COUNTY, NEVADA.



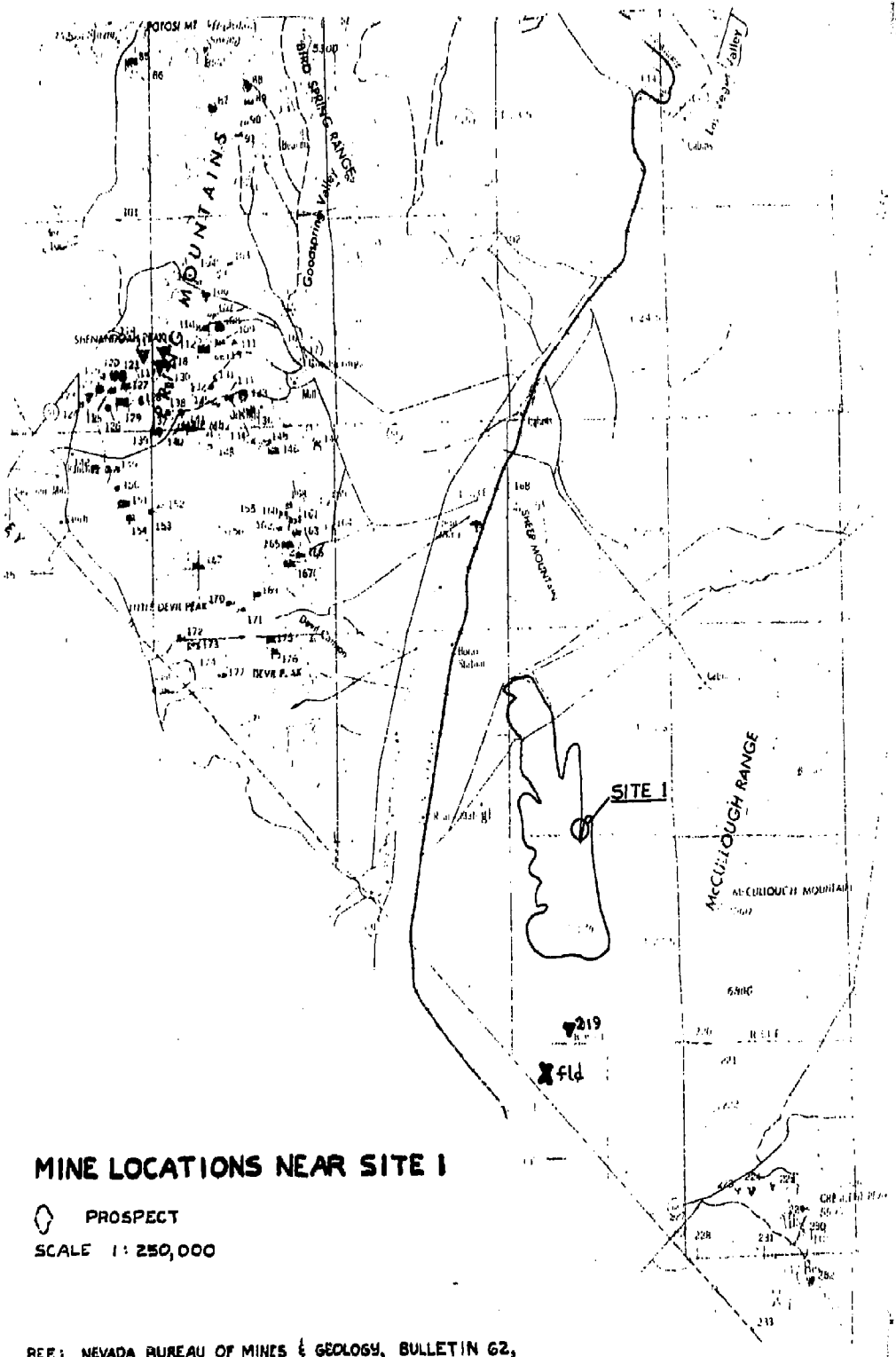
TECTONIC MAP OF SITE 1

MILES

PROSPECT

FAULT

REF.: NEVADA BUREAU OF MINES & GEOLOGY BULLETIN 82, PLATE 3, TECTONIC MAP OF CLARK COUNTY, NEVADA.

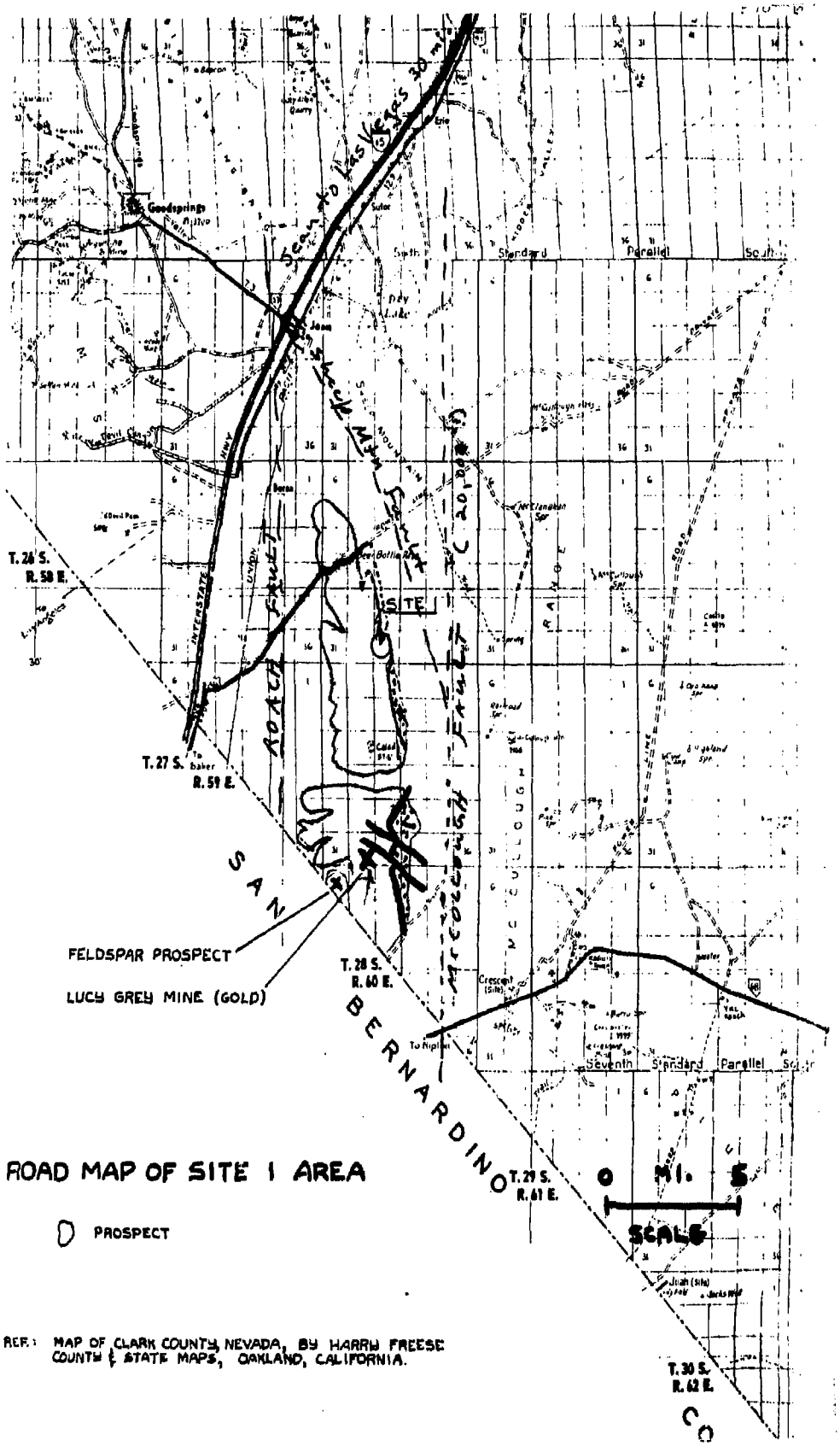


MINE LOCATIONS NEAR SITE 1

◊ PROSPECT

SCALE 1 : 250,000

REF: NEVADA BUREAU OF MINES & GEOLOGY, BULLETIN 62, PLATE 2, MINERAL RESOURCE MAP OF CLARK CO., NEVADA.



ROAD MAP OF SITE 1 AREA

PROSPECT

REF.: MAP OF CLARK COUNTY, NEVADA, BY HARRY FREESE COUNTY & STATE MAPS, OAKLAND, CALIFORNIA.

DATA SHEET

SITE NO. 2

(SILVER PEAK QUAD-15')

I. GENERAL

Location Esmeralda Co. T2N R40E 37° 59'N 117° 31'W

Geomorphic Feature Lone Mountain

Elevation 1853 M (6080')

Vegetation Types Salt Desert/Northern Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 37m (120')

Maximum Relief of 40 ha Operations Area 48m (160')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 61m (200')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary, Lone Mtn. Pluton

Intruded Rock Type, Name, Age Wyman fm, sh,ls pC, Reed Dolomite, pC

Area of Exposed Rock Mass 59 km^2

Surface Rock Mass Competency

Faults None reported w/in stock

Joints

Distance to Nearest Historic Surface Break 59 km

Distance to Nearest Upper Cenozoic Fault 10 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 5 km Overthrust

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 25 km

Distance to Nearest KGRA Within 40 km 22.5 km - inside prospective area (Silver Peak)

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Big Smoky Valley Basin (137)

Groundwater Discharge 8,000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Columbus Salt Marsh (118) & Clayton Valley (143)

Distance to Nearest Spring Within 5 km 1.4 km

Number of Springs Within 5 km 4

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 15 km - Tonopah, 15 km - Goldfield, 17 km - Clayton

Distance to Nearest Water Well In Use 23 km

Depth to Water in Nearest Well 14 m (47ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 10 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Tonopah, 1,716 (1970), 26 km

Nearest Human Habitation and Number of People

Distance to State Boundary 63 km

Distance to and Name of Nearest Active Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 22

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 0 km

Distance to Nearest Military Range From Boundary 36 km - Nellis

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 15.5 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 86

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 97

Maximum Expected Acceleration From NTS Blasts 0.01 g

Reported or Observed Recent Fault Scarp Within 5 km? None.

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14°-32°C

Average Daily Temperature Range, Coldest Month At Goldfield -7° to 6°C

Annual Precipitation 30 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 70°/27km ELY - FALLON 326°/192 km

HAWTHORNE 302°/111km RENO - ~~BLANDING CITY~~ BISHOP 230°/100 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 128 km Southwest Gas

Distance to and Name of Nearest Power Line 10 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 78 km - sp (12 km - Oldbed)

Route Distance to and Name of Nearest Paved Highway 15.5 km US 95 US 6

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 61 km Tonopah

Population of Support Town 1,716 (1970)

Route Distance to and Name of Nearest Commercial Airport 157 km - Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES Bull 78 Geol & Mineral Deposits of Esmeralda Co. NV. NevBuMinGs (1972)

TOPOGRAPHY OF SITE 2

REF: USGS TOPOGRAPHIC SHEET, SILVERPEAK QUADRANGLE, NV., 15'
SCALE 1:62,500

DATA SHEET

SITE NO. 3

(SILVER PEAK QUAD - 15')

I. GENERAL

Location T1N, R39E & R40E 37° 58'N 117° 33'W

Geomorphic Feature Weepah Hills

Elevation 1774m (5820')

Vegetation Types Salt Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 55 m (180')

Maximum Relief of 40 ha Operations Area 67 m (220')

Degree of Rock Mass Dissection Low

Maximum Relief Between Paved Road & Site 0 m

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary, Weepah Hills Pluton

Intruded Rock Type, Name, Age Wyman fm,sh,ls,pG; Reed dol, pG, Campito fm,sh,G

Area of Exposed Rock Mass 30 km^2

Surface Rock Mass Competency

Faults None reported w/in stock

Joints

Distance to Nearest Historic Surface Break 60 km

Distance to Nearest Upper Cenozoic Fault 9 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 5 km Overthrust

Site Potential for Mineral Development Med

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 Years 17 km

Distance to Nearest KGRA Within 40 km 17.5 km - inside prospective area (SILVER PEAK)

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10) Big Smoky Valley Basin (137)

Groundwater Discharge 8,000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Columbus Salt Marsh (118) & Clayton Valley (143)

Distance to Nearest Spring Within 5 km 3.4 km

Number of Springs Within 5 km 1

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 10 km - Tonopah, 12 km - Clayton, 14 km - Goldfield

Distance to Nearest Water Well In Use 12 km

Depth to Water in Nearest Well 14 m (47ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 8 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Tonopah, 1,716 (1970) 30 km

Nearest Human Habitation and Number of People

Distance to State Boundary 60 km

Distance to and Name of Nearest Active Mine Within 25 km 21 km - Silver Peak Mine - Foote Mineral Company (lithium)

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 14

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 0 km

Distance to Nearest Military Range From Boundary 40 km - Nellis

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 15.5 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 98

Record Period 1881-1977

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 97 km

Maximum Expected Acceleration From NTS Blasts 0.018 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14^{o}-32^{o}C

Average Daily Temperature Range, Coldest Month At Goldfield -7^{o} to 6^{o}C

Annual Precipitation 20 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 64°/31km ELY - FALLON 327°/195 km

HAWTHORNE 305°/113km RENO - ~~CARSON CITY~~ Bishop 230° / 96 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 125 km Southwest Gas

Distance to and Name of Nearest Power Line 5 km - Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 78 km - sp (Oldbed - 12 km)

Route Distance to and Name of Nearest Paved Highway 15.5 km US 95 US 6

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 59 km Tonopah

Population of Support Town 1, 716 (1970)

Route Distance to and Name of Nearest Commercial Airport 156 km - Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES Bull 78 NevBumines & Geol 1972

W E E P A H

TOPOGRAPHY OF SITE 3

REF.: USGS TOPOGRAPHIC SHEET, SILVERPEAK QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO.4

(LIDAWASH QUAD -15')

I. GENERAL

Location T2S R39E 37° 45'N 117° 40'W

Geomorphic Feature Silver Peak Range

Elevation 1402m (4600')

Vegetation Type Salt Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 67 m (220')

Maximum Relief of 40 ha Operations Area 73m (240')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 73m (240')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary, Mineral Ridge Pluton.

Intruded Rock Type, Name, Age Wyman fm, slt, ls, pC

Area of Exposed Rock Mass 6 km^2

Surface Rock Mass Competency

Faults None w/in stock

Joints

Distance to Nearest Historic Surface Break 81 km

Distance to Nearest Upper Cenozoic Fault 14 km

Rock Mass in an Overthrust? NO

Distance to and Name of Nearest 5+km-Long Fault Trace 1.3 km

Site Potential for Mineral Development MED

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 8 km

Distance to Nearest KGRA Within 40 km 4 km - inside prospective area (Silver Peak)

IV. HYDROLOGY

Site in a Closed Groundwater Basin? Yes

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10) Clayton Valley Basin (143)

Groundwater Discharge None

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Within Basin

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 30 km - Whitemtn

4 km - Clayton 28 km - Tonopah 24 km - Goldfield

Distance to Nearest Water Well In Use

Depth to Water in Nearest Well

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 4 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Silver Peak, 1.8 km, pop 150

Nearest Human Habitation and Number of People

Distance to State Boundary 34 km

Distance to and Name of Nearest Active Mine Within 25 km 5 km - Silver Peak

Mine (Lithium) Foote Mineral Company

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 57

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 1 km

Distance to Nearest Military Range From Boundary 49 km - Nellis

Distance to Nearest Non-Restricted Road in Use From Boundary 2 km

Site Out of View of Existing Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 117

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 83 km

Maximum Expected Acceleration From NTS Blasts 0.019 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14^{o} - 32^{o}C

Average Daily Temperature Range, Coldest Month At Goldfield -7^{o} to 6^{o}C

Annual Precipitation 20 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 47°/52km ELY - FALLON -

HAWTHORNE 327°/115km RENO - ~~CARSON CITY~~ BISHOP 238°/75 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 150 km - Southwest Gas

Distance to and Name of Nearest Power Line 1 km - Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 87 km -SP (Old Bed - 6 km)

Route Distance to and Name of Nearest Paved Highway 2 km Nev 47

Type of Nearest Paved Highway 2 Lane

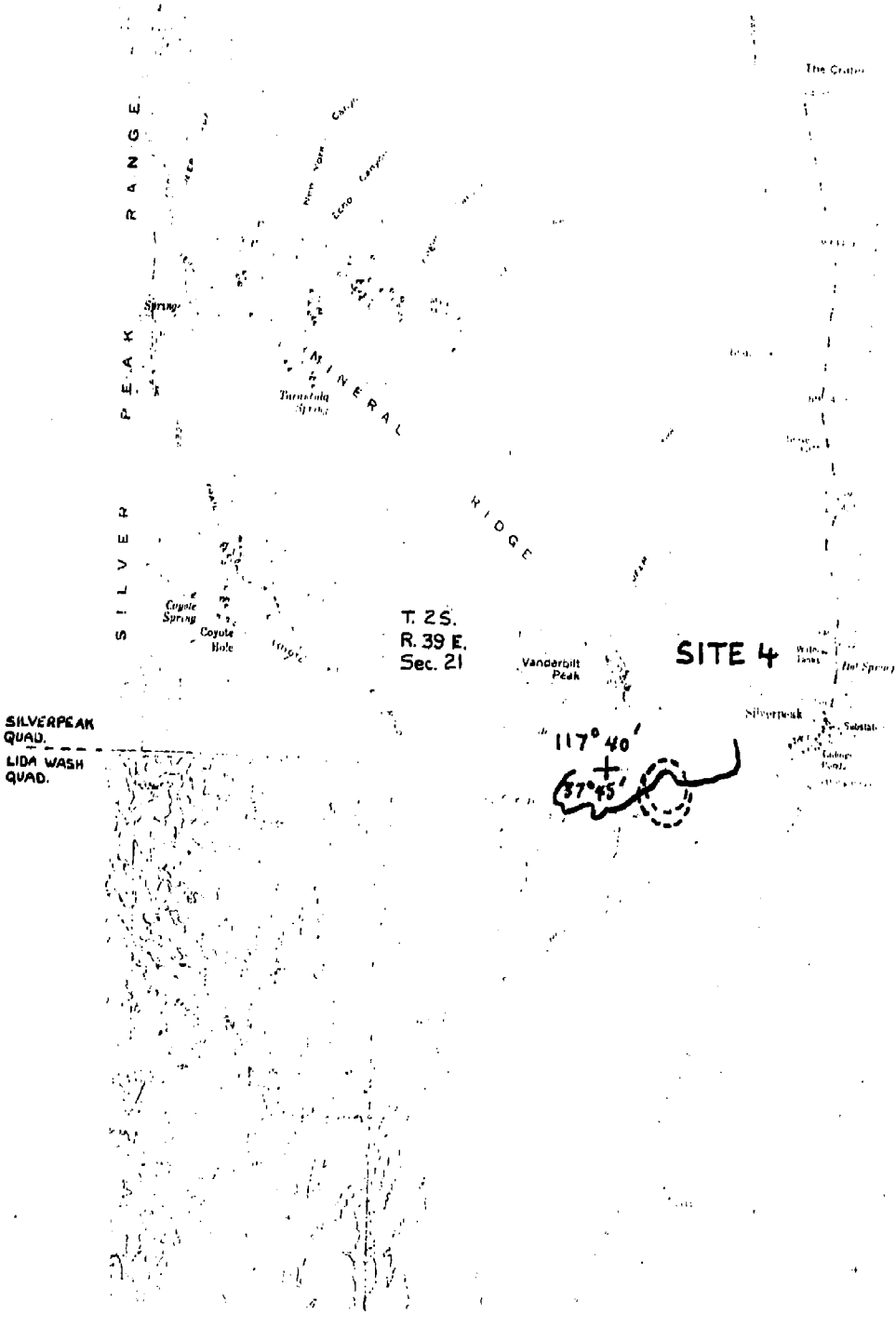
Route Distance to and Name of Support Town 90 km, Tonopah

Population of Support Town 1,716 (1970)

Route Distance to and Name of Nearest Commercial Airport 80 km - Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES Bull 78, NevBumines & GEOL (1972)



TOPOGRAPHY OF SITE 4

REF: USGS TOPOGRAPHIC SHEET, LIDA WASH & SILVER PEAK QUADRANGLES, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 5

(Mt. Barcroft Quad, 15')

I. GENERAL

Location T 2S R36E 37° 45'N 118° 1' W

Geomorphic Feature Silver Peak Range

Elevation 1609 m (5280')

Vegetation Types Northern Desert Shrub/Pinon Juniper

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 49 m (160')

Maximum Relief of 40 ha Operations Area 73 m (240')

Degree of Rock Mass Dissection Low

Maximum Relief Between Paved Road & Site 122 m (400')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary , Dyer Pluton

Intruded Rock Type, Name, Age Harkless fm,sh,G

Area of Exposed Rock Mass 5 km^2

Surface Rock Mass Competency

Faults None reported w/in Pluton

Joints

Distance to Nearest Historic Surface Break 67 km

Distance to Nearest Upper Cenozoic Fault 9 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 10 km overthrust

Site Potential for Mineral Development MED

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 25 km (NV 6)

Distance to Nearest KGRA Within 40 km 32.5 km (Silver Peak)

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? Yes

Name of Site's GW Region & Basin Central Region (10), Fish Lake Valley Basin (117)

Groundwater Discharge 500 ac ft/yr

Surface Discharge Significant

Where Does Surface Water Go? Columbus Salt Marsh (118) NV

Where Does Groundwater Go? Columbus Salt Marsh (118) NV

Distance to Nearest Spring Within 5 km 3 km

Number of Springs Within 5 km 2

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km 3.2 km Fish Lake

Distance to and Names of NV Paleo Lakes Within 30 km 5 km - White Mtn

29 km - Clayton

Distance to Nearest Water Well In Use 2.5 km

Depth to Water in Nearest Well 46 m 150 ft

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 3 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Dyer, NV, Pop 10, 8 km

Nearest Human Habitation and Number of People

Distance to State Boundary 14 km

Distance to and Name of Nearest Active NV Mine Within 25 km 19 km - Sixteen to

One Mine (Silver) Sunshine Mining Company

Distance to Nearest Farm/Ranch Within 25 km 2 km Dyer Ranch

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 10

Number of Oil and Gas Exploratory Holes Within 10 km 2

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 23 km

Distance to Nearest Military Range From Boundary 78 km - Nellis

Distance to Nearest Non-Restricted Road in Use From Boundary 10 km

Site Out of View of Existing Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 143

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 66 km

Maximum Expected Acceleration From NTS Blasts 0.015 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14^{o} - 32^{o}C

Average Daily Temperature Range, Coldest Month At Goldfield -7^{o} to 6^{o}C

Annual Precipitation 20 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS -- PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 65°/80km ELY - FALLON 347°/195 km

HAWTHORNE 331°/96km RENO - CARSON CITY 216°/52 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 150 km Southwest Gas

Distance to and Name of Nearest Power Line 5 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 83 km SP (42 km - Old Bed)

Route Distance to and Name of Nearest Paved Highway 10 km, Nev 3A

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 120 km Tonopah

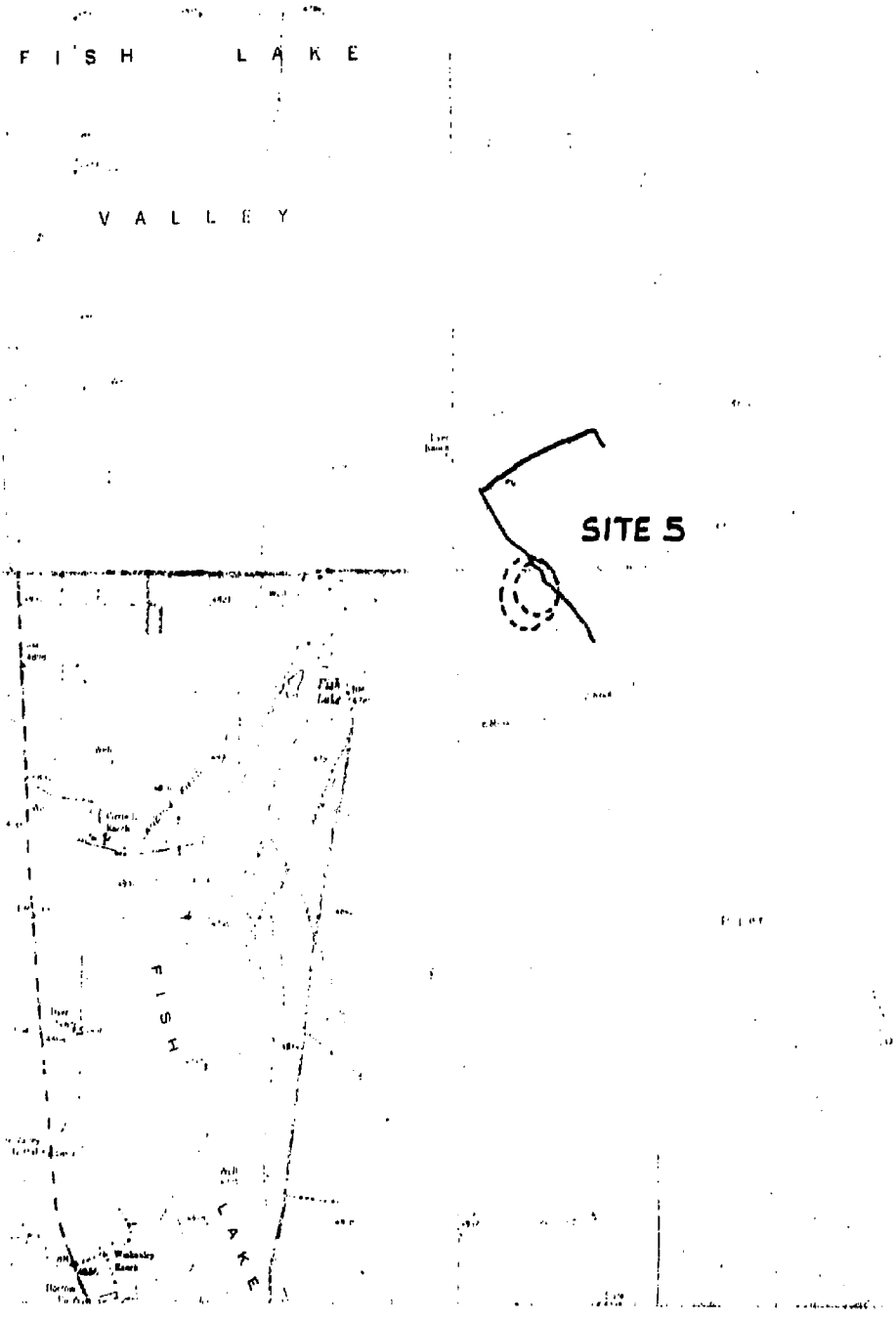
Population of Support Town 1,716 (1970)

Route Distance to and Name of Nearest Commercial Airport 110 km Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES GQ-960, USGS (1971) GEOL Map of Mt. Barcroft Quad, CA-NV, K.B. Ktauskopf

Bull 78 NevBumines & GEOL (1972)



TOPOGRAPHY OF SITE 5

REF. 1 USGS TOPOGRAPHIC SHEET, MT. BARCROFT QUADRANGLE, NV., 15'

SCALE 1: 62,500

DATA SHEET

SITE NO. 6

(Davis Mtn Quad - 15')

I. GENERAL

Location T2S R34E, T1S R33E 37° 45'N 118° 12'N

Geomorphic Feature White Mtns.

Elevation 1804 m (5920')

Vegetation Types Northern Desert Shrub/Salt Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 73 m (240')

Maximum Relief of 40 ha Operations Area 116 m (380')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 317 m (1040')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary, Inyo Batholith

Intruded Rock Type, Name, Age Wyman fm, sh, ls, pG, Harkless fm, slt G

Area of Exposed Rock Mass 100 km^2 (in NV)

Surface Rock Mass Competency

Faults None reported w/in stock

Joints

Distance to Nearest Historic Surface Break 64 km

Distance to Nearest Upper Cenozoic Fault 3 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 10 km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 m Years 19 km

Distance to Nearest KGRA Within 40 km 40 km (Mono-Long Valley)

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? Yes

Name of Site's GW Region & Basin Central Region (10), Fish Lake Valley Basin (117)

Groundwater Discharge 500 ac ft/yr

Surface Discharge Significant

Where Does Surface Water Go? Columbus Salt Marsh (118) NV

Where Does Groundwater Go? Columbus Salt Marsh (118) NV

Distance to Nearest Spring Within 5 km 4.6 km

Number of Springs Within 5 km 2

Distance To and Names of Perennial Streams Within 5 km 3.8 km - Leidy Creek, 3.5 km - Indian Creek (Both drain into NV)

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of NV Paleo Lakes Within 30 km 3 km - White Mountain

Distance to Nearest Water Well In Use 8 km

Depth to Water in Nearest Well 46 m (150 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 8 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Dyer, Pop 10, 11.5 km

Nearest Human Habitation and Number of People

Distance to State Boundary 3.3 km

Distance to and Name of Nearest Active NV Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km 9 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use Nat. Forest

Number of Old Mines Within 10 km 4

Number of Oil and Gas Exploratory Holes Within 10 km None

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 20 km

Distance to Nearest Military Range From Boundary 95 km - Nellis

Distance to Nearest Non-Restricted Road in Use From Boundary 6.7 km

Site Out of View of Existing Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 145

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 60 km

Maximum Expected Acceleration From NTS Blasts 0.013 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14° - 32°C

Average Daily Temperature Range, Coldest Month At Goldfield -7° to 6°C

Annual Precipitation 28 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 65°/88km ELY - FALLON 343°/195 km

HAWTHORNE 333°/96km RENO - BISHOP 210°/45 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 150 km Southwest Gas

Distance to and Name of Nearest Power Line 11 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 83 km SP (42 km - Old Bed)

Route Distance to and Name of Nearest Paved Highway 6.7 km Highway 3A

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 112 km, Tonopah

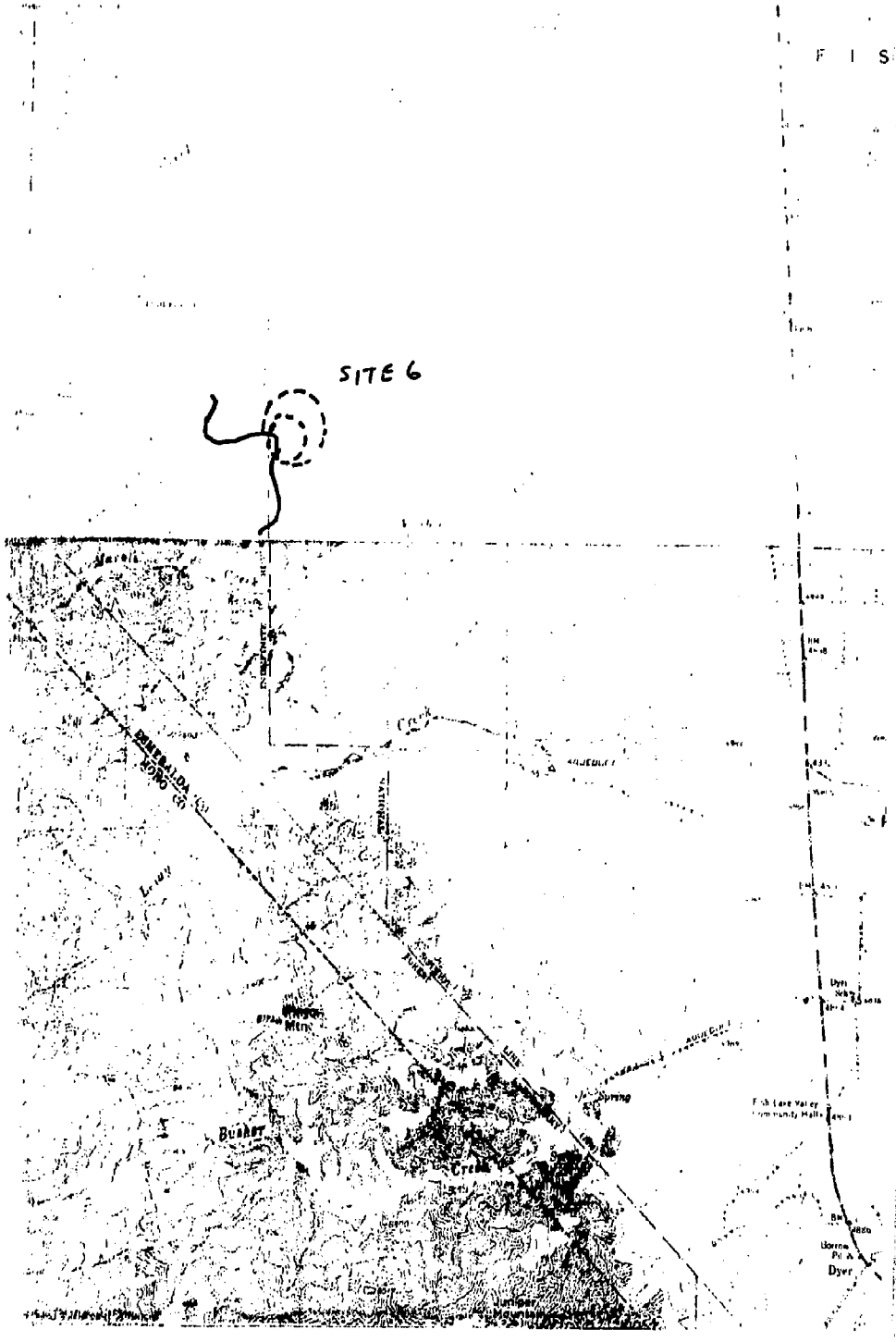
Population of Support Town 1,766

Route Distance to and Name of Nearest Commercial Airport 110 km - Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES GQ 1078 USGS (1973) GEOL Map of Davis Mtn Quad, P.T. Robinson et al

Bull 78 Nev BuMines & GEOL (1972)



TOPOGRAPHY OF SITE 6

REF.: USGS TOPOGRAPHIC SHEET, DAVIS MTN. QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 7

(Piper Peak Quad - 15")

I. GENERAL

Location T4S R37E Esmeralda Company $37^{o}34'N, 117^{o}52'W$

Geomorphic Feature Silver Peak Range

Elevation 1756m (5760')

Vegetation Types Northern Desert Shrub/Pinon Juniper

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 49m (160')

Maximum Relief of 40 ha Operations Area 76m (250')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 244m (800')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary, Palmetto Pluton

Intruded Rock Type, Name, Age Harkless fm,slt,G Palmetto fm,sh,ordovician

Area of Exposed Rock Mass 96 km^2

Surface Rock Mass Competency

Faults None reported w/in Pluton

Joints

Distance to Nearest Historic Surface Break 63 km

Distance to Nearest Upper Cenozoic Fault 11 km

Rock Mass in an Overthrust? Yes

Distance to and Name of Nearest 5+km-Long Fault Trace 5 km Overthrust

Site Potential for Mineral Development Med

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 m Years 33 km

Distance to Nearest KGRA Within 40 km 27.5 km (Silver Peak)

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? Yes

Name of Site's GW Region & Basin Central Region (10) Fish Lake Valley (117)

Groundwater Discharge Minor

Surface Discharge Significant

Where Does Surface Water Go? Columbus Salt Marsh Basin, NV (119)

Where Does Groundwater Go? Columbus Salt Marsh Basin, NV (119)

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of NV Paleo Lakes Within 30 km 5 km - White Mtn

22 km - Clayton

Distance to Nearest Water Well In Use 6 km

Depth to Water in Nearest Well 18 m

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 9 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Dyer, pop 10, 21.3 km

Nearest Human Habitation and Number of People

Distance to State Boundary 5.8 km

Distance to and Name of Nearest Active Mine Within 25 km 5 km - Paca Mine (Tungsten) J.G.J. Minerals Company

Distance to Nearest Farm/Ranch Within 25 km 15.4 km McAfee Ranch

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

NV

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 29

Number of Oil and Gas Exploratory Holes Within 10 km None

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 13 km

Distance to Nearest Military Range From Boundary 67 km - Nellis

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 7.3 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 127

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 65

Maximum Expected Acceleration From NTS Blasts 0.018

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14° - 32°C

Average Daily Temperature Range, Coldest Month At Goldfield -7 to 6°C

Annual Precipitation 20 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 52°/82km ELY - FALLON -

HAWTHORNE 331°/115km RENO - ~~CARSON CITY~~ BISHOP 237°/45km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 172 km Southwest Gas

Distance to and Name of Nearest Power Line 1 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 112 km-SP (35km - Old Bed)

Route Distance to and Name of Nearest Paved Highway 7.3 km Highway 3A

Type of Nearest Paved Highway 2 Lane

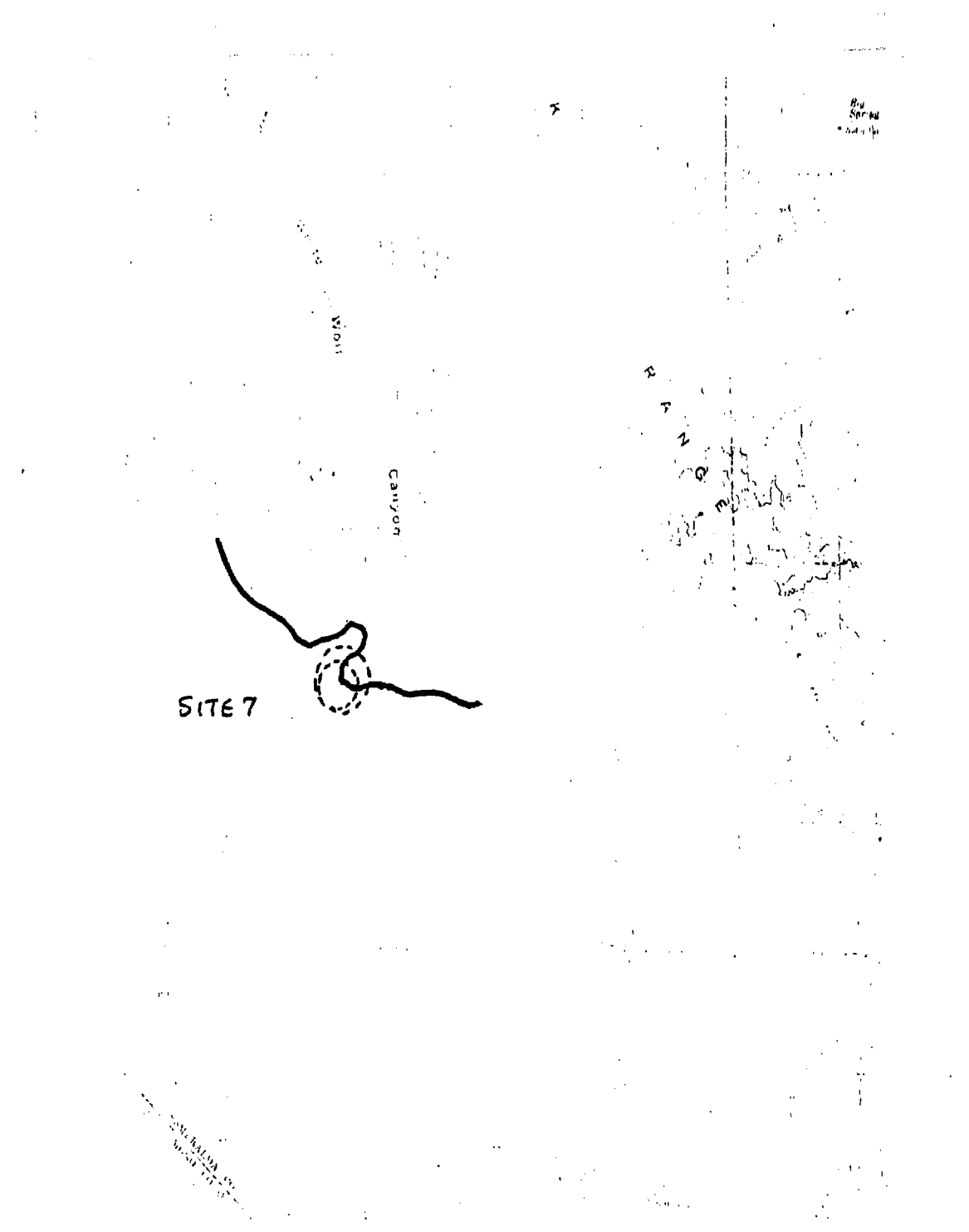
Route Distance to and Name of Support Town 139 km, Tonopah

Population of Support Town 1716

Route Distance to and Name of Nearest Commercial Airport 70 km, Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES Bull 78 NevBumines & GEOL (1972)



TOPOGRAPHY OF SITE 7

REF.: USGS TOPOGRAPHIC SHEET, PIPER PEAK QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 8

(Soldier Pass Quad - 15")

I. GENERAL

Location Esmeralda Company T5S R38E SEC 29, 37°28'N 117°47'W

Geomorphic Feature Palmetto Mtns.

Elevation 1755 m (5760')

Vegetation Types Salt Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 30 m (100')

Maximum Relief of 40 ha Operations Area 43 m (140')

Degree of Rock Mass Dissection Low

Maximum Relief Between Paved Road & Site 30 m (100')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary, Palmetto Wash Pluton

Intruded Rock Type, Name, Age Harkless Fm, slt, ϵ

Area of Exposed Rock Mass 43 km^2

Surface Rock Mass Competency

Faults None reported w/in stock

Joints

Distance to Nearest Historic Surface Break 61 km

Distance to Nearest Upper Cenozoic Fault 9 km

Rock Mass in an Overthrust? Yes

Distance to and Name of Nearest 5+km-Long Fault Trace 2.6 km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? ?

Distance to Nearest Volcanic Vent Younger Than 10^6 Years 41 km

Distance to Nearest KGRA Within 40 km 31 km (Silver Peak)

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? Yes

Name of Site's GW Region & Basin Central Region (10) Fish Lake Valley (117)

Groundwater Discharge Minor

Surface Discharge Significant

Where Does Surface Water Go? Columbus Salt Marsh Basin, NV (119)

Where Does Groundwater Go? Columbus Salt Marsh Basin, NV (119)

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of NW Paleo Lakes Within 30 km 14 km - White Mtn

24 km - Clayton

Distance to Nearest Water Well In Use 13 km

Depth to Water in Nearest Well 66 m

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 21 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Lida, Nv, pop 15, 24 km

Nearest Human Habitation and Number of People

Distance to State Boundary 3.1 km

Distance to and Name of Nearest Active Mine Within 25 km 6 km - Sylvania Mine (Lead Silver) - Sylvania Mining Company

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km NV None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 50 (NV)

Number of Oil and Gas Exploratory Holes Within 10 km None

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 1 km

Distance to Nearest Military Range From Boundary 57 km - Nellis

Distance to Nearest Non-Restricted Road in Use From Boundary Paved 2.5 km

Site Out of View of Existing Roads? Paved Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 120

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 87

Maximum Expected Acceleration From NTS Blasts 0.02 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14° - 32°C

Average Daily Temperature Range, Coldest Month At Goldfield -7 to 6°C

Annual Precipitation 20 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 37°/80km ELY - FALLON -

HAWTHORNE 326°/134km RENO - ~~GIBSON CITY~~ BISHOP 258°/57 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 190 km Southwest Gas

Distance to and Name of Nearest Power Line 10 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 128 km - SP (48 km - Old Bed)

Route Distance to and Name of Nearest Paved Highway 2.5 km Highway 3

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 118 km Tonopah

Population of Support Town 1716

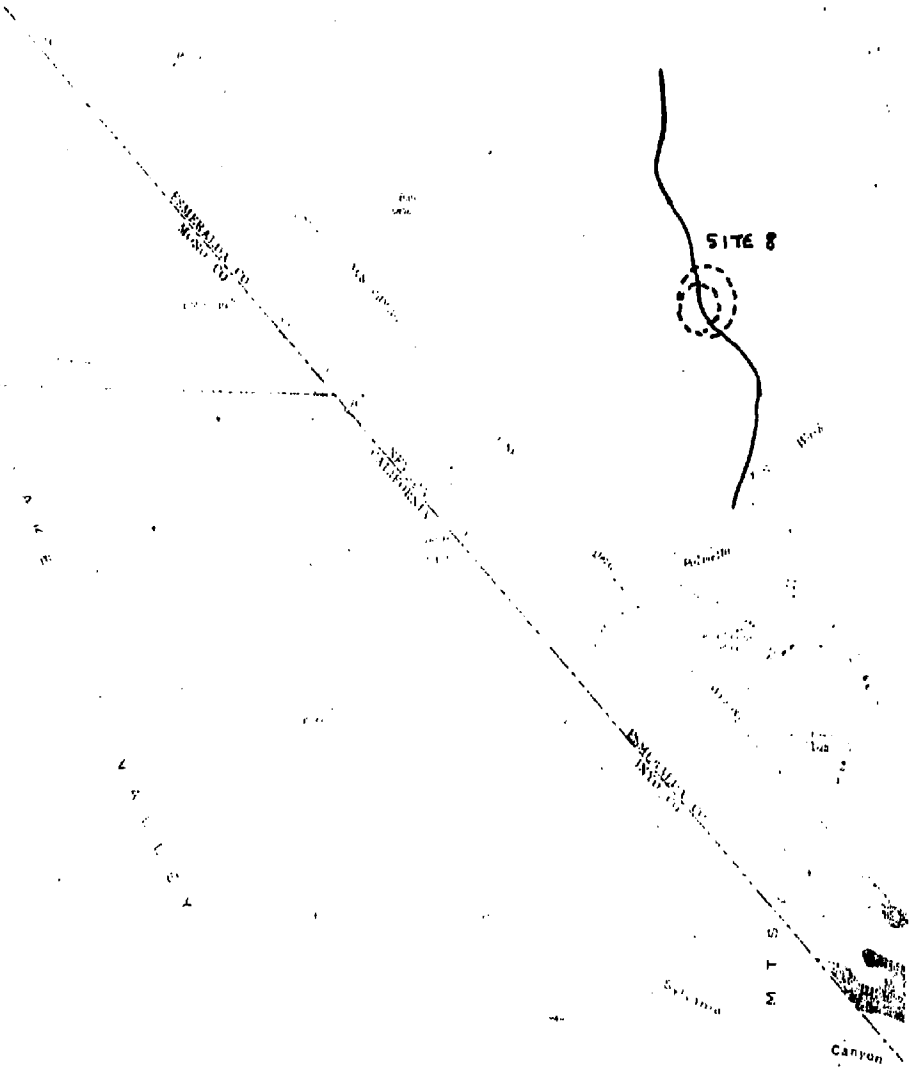
Route Distance to and Name of Nearest Commercial Airport 62 km, Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES GQ-654 USGS (1967)" GEOL. Map of Soldier Pass Quad Ca & NV" E.H. McKee et al

USGS Bull 1251-H" GEOL of Hagruder Mtn area NV-CA" (1968)

Bull 78 Nev Bumines & GEOL



TOPOGRAPHY OF SITE 8

REF: USGS TOPOGRAPHIC SHEET, SOLDIER PASS QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 9

(Gold Point SW Quad - 7½')

I. GENERAL

Location T7S R41E SEC 9 37°21'N 117° 26'W

Geomorphic Feature Sylvania Hills

Elevation 1646 m (5400')

Vegetation Types Salt Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 40 m (130')

Maximum Relief of 40 ha Operations Area 49 m (160')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 76 m (250')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite, Jurassic to Tertiary, Sylvania Pluton

Intruded Rock Type, Name, Age Wyman Fm, slt, ls, pG

Area of Exposed Rock Mass 280 + km^2 (in NV)

Surface Rock Mass Competency

Faults None reported w/in stock

Joints

Distance to Nearest Historic Surface Break 93 km

Distance to Nearest Upper Cenozoic Fault 22 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 1 km High Angle

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest NV Volcanic Vent Younger Than 10^6 m Years 30 km

Distance to Nearest KGRA Within 40 km -

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Lida Valley Basin (144)

Groundwater Discharge 1000 ac ft/yr

Surface Discharge Significant

Where Does Surface Water Go? Sarcobatus Flat (146)

Where Does Groundwater Go? California Eventually

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 21 km - Lida 28 km - Bonnie Claire NV

Distance to Nearest Water Well In Use 28 km

Depth to Water in Nearest Well 81 m (265 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 29 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Gold Point, Pop. 25, 5.5 km

Nearest Human Habitation and Number of People

Distance to State Boundary 14.5 km

Distance to and Name of Nearest Active Mine Within 25 km 3 km - Penny Mine (Gold) Norman Bailey

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted NV Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 38

Number of Oil and Gas Exploratory Holes Within 10 km None

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 0 km

Distance to Nearest Military Range From Boundary 32 km - Nellis

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 12.5 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 76*

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 42

Maximum Expected Acceleration From NTS Blasts 0.028 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Goldfield 14° - 32°C

Average Daily Temperature Range, Coldest Month At Goldfield -7° to 6°C

Annual Precipitation 23 cm

* excludes NTS Shots

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 13°/79km ELY - FALLON 0

HAWTHORNE 319°/164km RENO - BISHOP ~~CARSON CITY~~ 270°/85 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 200 km Southwest Gas

Distance to and Name of Nearest Power Line 48 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 175 km - SP (95 km: Old Bed)

Route Distance to and Name of Nearest Paved Highway 12.5 km Highway 3 (State)

Type of Nearest Paved Highway 2 lane

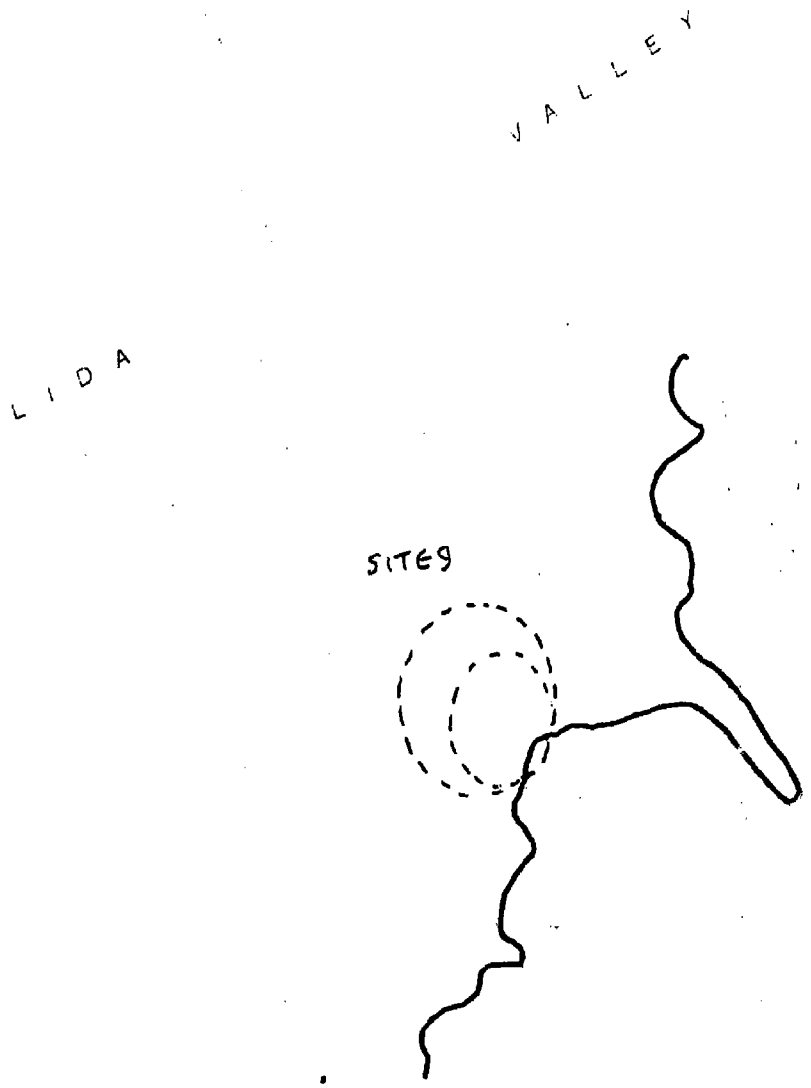
Route Distance to and Name of Support Town 98 km Tonopah

Population of Support Town 1716 (1970 pop.)

Route Distance to and Name of Nearest Commercial Airport 131 km, Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES Bull 78 NevBumines & GEOL (1972)



TOPOGRAPHY OF SITE 9

REF: USGS TOPOGRAPHIC SHEET, GOLD POINT SW QUADRANGLE, NV., 7½'

SCALE 1:24,000

DATA SHEET

SITE NO. 10

I. GENERAL

Location 36°58'N, 114°35'W, T11S , R66.67E, Lincoln Co

Geomorphic Feature Mormon Mtns

Elevation 1097 m 3600'

Vegetation Types Sagebrush, Cactus

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 46 m (150ft)

Maximum Relief of 40 ha Operations Area 85m (280ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 533m (1750ft)

III. GEOLOGY

Rock Type, Name, Age Predominatly Gneiss and Schists some Granite-Precambrian

Intruded Rock Type, Name, Age (Basement)

Area of Exposed Rock Mass 7.7 km^2 (3 mi^2)

Surface Rock Mass Competency Mod

Faults None reported

Joints

Distance to Nearest Historic Surface Break 136 km

Distance to Nearest Upper Cenozoic Fault 26 (Quat)

Rock Mass in an Overthrust? No, It is a window in the Tule Sp. Thrust

Distance to and Name of Nearest 5+km-Long Fault Trace At boundry, Tule Sp.

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 92 km (Utah)

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Lower Meadow Wash Valley, Colorado River Region

Groundwater Discharge 7000 ac. ft

Surface Discharge Yes 500 ac. ft

Where Does Surface Water Go? to Muddy River & Colorado River

Where Does Groundwater Go? to Muddy River

Distance to Nearest Spring Within 5 km -

Number of Springs Within 5 km -

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km -

Distance to Nearest Water Well In Use 9 km

Depth to Water in Nearest Well 7 m (22 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 18 km, Muddy River

V. DEMOGRAPHY

Nearest Town, Population, and Distance Carp, 35, 14 km

Nearest Human Habitation and Number of People -

Distance to State Boundary 19 km

Distance to and Name of Nearest Active Mine Within 25 km -

Distance to Nearest Farm/Ranch Within 25 km -

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land Ownership (State, Federal, Private) BLM

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 1

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 19 km

Distance to Nearest Military Range From Boundary 65 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary Road 25 km to site

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 23

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 58

Maximum Expected Acceleration From NTS Blasts 0.013g

Reported or Observed Recent Fault Scarp Within 5 km? No

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Caliente 13 to 36°C (56 to 96°F

Average Daily Temperature Range, Coldest Month At Caliente -9 to 8°C (16 to 46°F)

Annual Precipitation 30 cm (12in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 211°,106 PIOCHE 4°,106 HENDERSON 200°,112

BOULDER CITY 193°,116 TONOPAH _____ ELY _____ FALLON _____

HAWTHORNE _____ RENO _____ CARSON CITY _____

Distance to And Location of Nearest Meteorological Station 70 km Caliente

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? 0

Reported or Observed Historical Site Within 5 km? 0

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 75 km Southwest Gas Company

Distance to and Name of Nearest Power Line 36 km Nevada Power Company

Route Distance to and Ownership of Nearest Railroad 8 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 41 km State 1

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 120 km Las Vegas

Population of Support Town 375,000 (1975)

Route Distance to and Name of Nearest Commercial Airport 130 m McCarran

*Only locations within 200 km are evaluated.

REFERENCES

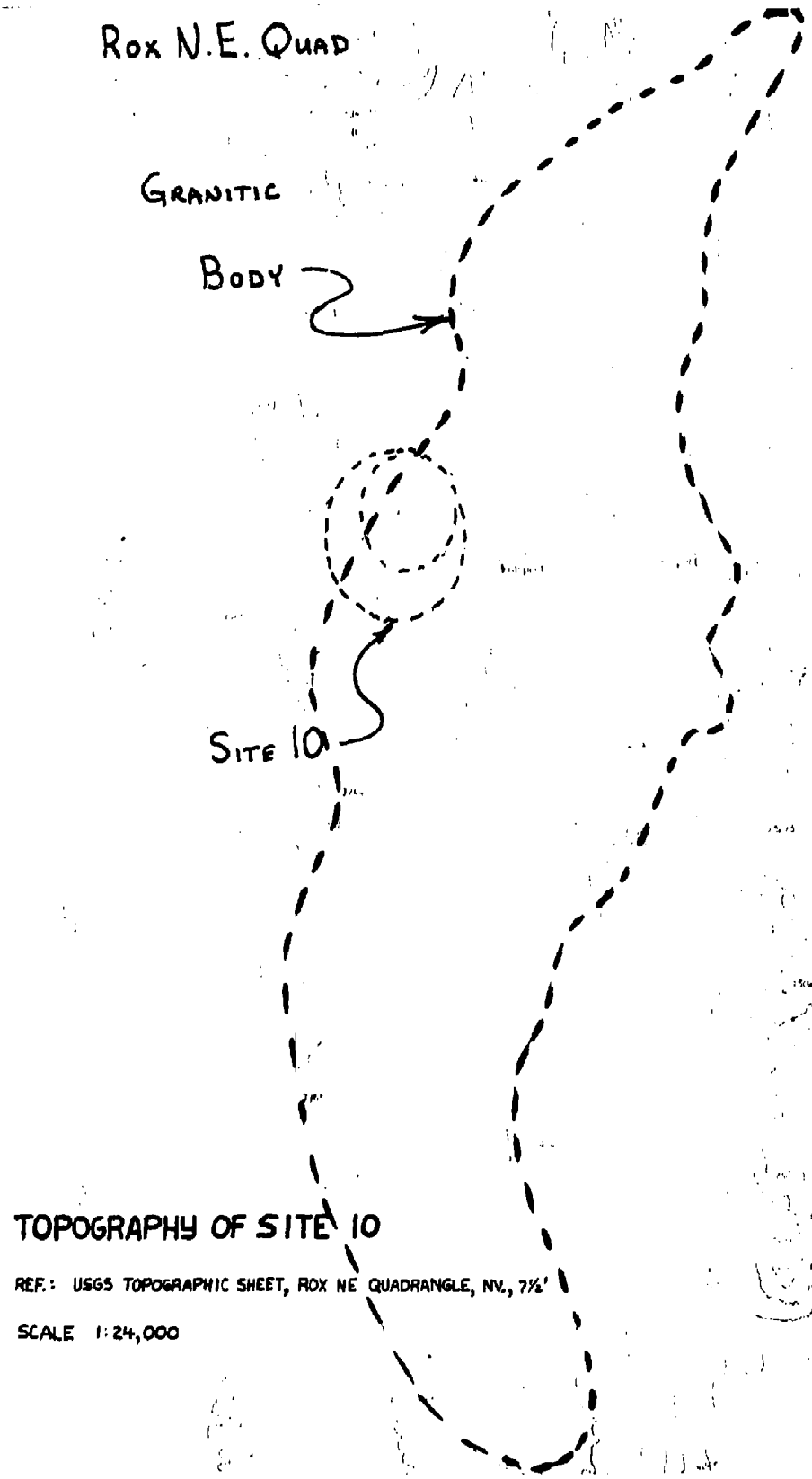
1) Tschanz, C.M. & E.H. Pampeyan, "Geology and Mineral Deposits of Lincoln Co. NV' Nev. Bu. Mines & Geol. Bul 73 (1970)

2) Olmone, S.D. "Style & Evolution of thrusts in the Region of the Mormon Mtn, Nev." U. Utah, PHD Thesis (1971)

3) "Rox, N-E 7½' Quadrangel" USGS (1969)

4) "Lincoln County Nevada Data File" Nevada Dept Economic Develop

5) Stewart, J.H. & J. E. Carlson, "Geologic Map of Nevada" unpublished.



TOPOGRAPHY OF SITE 10

REF.: USGS TOPOGRAPHIC SHEET, ROX NE QUADRANGLE, NV., 7½'

SCALE 1:24,000

DATA SHEET

SITE NO.11

I. GENERAL

Location $36^{o}55'N$, $114^{o}16W$ T11,12S , R69E, Lincoln, Co.

Geomorphic Feature East Mormon Mtn.

Elevation 927 m (3040 ft)

Vegetation Types Sagebrush, Creosote bush, black brush and cactuses

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 64 m (210ft)

Maximum Relief of 40 ha Operations Area 122 m (400ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 287 m (940ft)

III. GEOLOGY

Rock Type, Name, Age Predominatly Gneiss and Schists some granite~ Precambrian

Intruded Rock Type, Name, Age above rock mass is "basement".

Area of Exposed Rock Mass 6.4 km^2 (2.5 mi^2)

Surface Rock Mass Competency Mod

Faults None reported

Joints

Distance to Nearest Historic Surface Break 168 km

Distance to Nearest Upper Cenozoic Fault 9 km (Quat.)

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace ½ km, Gourd Springs

Site Potencial for Mineral Development Mod

4 km^2 Area at Depths of 300~1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 72 km (Utah)

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? Yes

Name of Site's GW Region & Basin Colorado River Region, Virgin River Basin

Groundwater Discharge 40,000 ac ft/yr

Surface Discharge Yes (80,000 ac ft/yr)

Where Does Surface Water Go? Virgin River to Colorado River

Where Does Groundwater Go? Lake Mead

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km None

Distance to Nearest Water Well In Use 13 km

Depth to Water in Nearest Well 57 m (220 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 21 km (Virgin River Valley)

V. DEMOGRAPHY

Nearest Town, Population, and Distance 23 km, Bunkerville, 180

Nearest Human Habitation and Number of People

Distance to State Boundary 24 km

Distance to and Name of Nearest Active Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km 20 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) BLM

Land Use Access to radio tower, grazing

Number of Old Mines Within 10 km 2

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 12 km (within central area)

Distance to Nearest Military Range From Boundary 87 km

Distance to Nearest Non-Restricted PAVED Road in Use From Boundary 11 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 20

Record Period 81-77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 57

Maximum Expected Acceleration From NTS Blasts 0.011 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Caliente - 13-36°C (95.8 - 56.0 °F)

Average Daily Temperature Range, Coldest Month At Caliente - 9 to 8°C (45.7 - 16.1 °F)

Annual Precipitation 20 cm (8 in.)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To. LAS VEGAS 222°-108km PIOCHE 354°-116km HENDERSON 211° - 112km

BOULDER CITY 204° 112km TONOPAH _____ ELY _____ FALLON _____

HAWTHORNE _____ RENO _____ CARSON CITY _____

Distance to And Location of Nearest Meteorological Station 80 km, Caliente

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? - None.

Reported or Observed Historical Site Within 5 km? - None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 78 km, Southwest Gas Company

Distance to and Name of Nearest Power Line 35 km, Nevada Power Company *

Route Distance to and Ownership of Nearest Railroad 38 km, Union Pacific

Route Distance to and Name of Nearest Paved Highway 20 km, Interstate 15

Type of Nearest Paved Highway 4 lanes, Interstate

Route Distance to and Name of Support Town 120 km, Las Vegas

Population of Support Town 375,000 (1975)

Route Distance to and Name of Nearest Commercial Airport 130 km, McCarran

*Only locations within 200 km are evaluated.

REFERENCES Nev.Bu. Mines & GEOL Bul 73 (1970)

1) Tschanz C.M. and E.H. Pampeyan "Geology and Mineral Deposits of Lincoln Co. Nv"

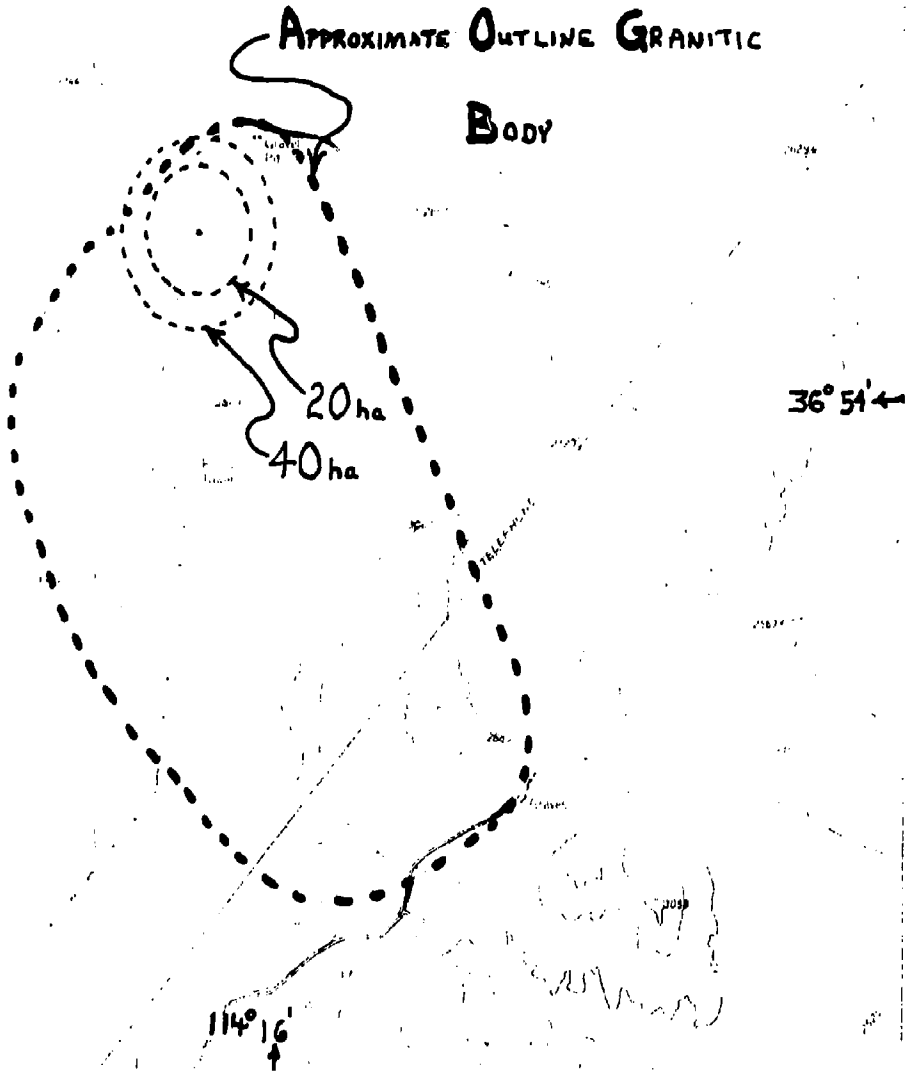
2) Olmone, S.E. "Style & Evolution of thrusts in the region of the Mormon Mtn, Nev."

U. Utah, PHD Thesis (1971)

3) "Davidson Peak 7½ minute Quadrangle" USGS (1969)

4) "Lincoln Co NV Data File" Nevada Dept. Economic Develop.

5) Stewart, J. H. & J. E. Carlson, "Geologic Map of Nevada," unpublished



TOPOGRAPHY OF SITE II

REF: USGS TOPOGRAPHIC SHEET, DAVIDSON PEAK QUADRANGLE, NV., 7½'

SCALE 1:24000

DATA SHEET

SITE NO.12

I. GENERAL

Location 37°34'N, 115° 45'W T4S , R55E, Lincoln Co.

Geomorphic Feature Groom Range

Elevation 1737 m (5700 ft)

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 55 m (180 ft)

Maximum Relief of 40 ha Operations Area 67 m (220 ft)

Degree of Rock Mass Dissection Hi

Maximum Relief Between Paved Road & Site 263 m (863 ft)

III. GEOLOGY

Rock Type, Name, Age Granite, Tertiary

Intruded Rock Type, Name, Age Quartzite, Prospect Mtn, Precambrian

Area of Exposed Rock Mass Total of 5.1 km^2 (2 mi^2)

Surface Rock Mass Competency Mod

Faults None Reported

Joints

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 3 km (Quat)

Rock Mass In an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 1.5 km, Tem Piute

Site Potential for Mineral Development Mod

4 km^2 Area at Depths of 300-1,500 m? Prob. Not

Distance to Nearest Volcanic Vent Younger Than 10 m Years 33 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? Yes

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Penoyer (Sand Springs) Central

Groundwater Discharge 0

Surface Discharge 0

Where Does Surface Water Go? Sand Springs Dry Lake

Where Does Groundwater Go? No Reported discharge

Distance to Nearest Spring Within 5 km -

Number of Springs Within 5 km -

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km 15 km, Penoyer

Distance to Nearest Water Well In Use 4.5 km (45,sse, 136)

Depth to Water in Nearest Well 105 m (329 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 15 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Hiko, 15, 43 km

Nearest Human Habitation and Number of People

Distance to State Boundary 146 km

Distance to and Name of Nearest Active Mine Within 25 km 15 km, Tempiute

Distance to Nearest Farm/Ranch Within 25 km 13 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km 4.6 km Nellis Air Force Bombing and Gunnery Range

Land Ownership (State, Federal, Private) BLM

Land Use Grazing

Number of Old Mines Within 10 km 7

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 56 km

Distance to Nearest Military Range From Boundary 4.6 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 8 km

Site Out of View of Existing Paved Roads?

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 24

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 87

Maximum Expected Acceleration From NTS Blasts 0.05 g

Reported or Observed Recent Fault Scarp Within 5 km? No

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Caliente 13-36°C (56-96°F)

Average Daily Temperature Range, Coldest Month At Caliente -9 to 8°C (16 to 46°F)

Annual Precipitation 20 cm (8in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 128°,162 PIOCHE 71°,125 HENDERSON 125°,182

BOULDER CITY 123°,193 TONOPAH 295°,138 ELY 24°,220 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station 113, Caliente

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? No

Reported or Observed Historical Site Within 5 km? No

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 150 km Southwest Gas

Distance to and Name of Nearest Power Line 84 km Nevada Power Company

Route Distance to and Ownership of Nearest Railroad 130 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 15 km State 25

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 150 km Caliente

Population of Support Town 916

Route Distance to and Name of Nearest Commercial Airport 222 km McCarran

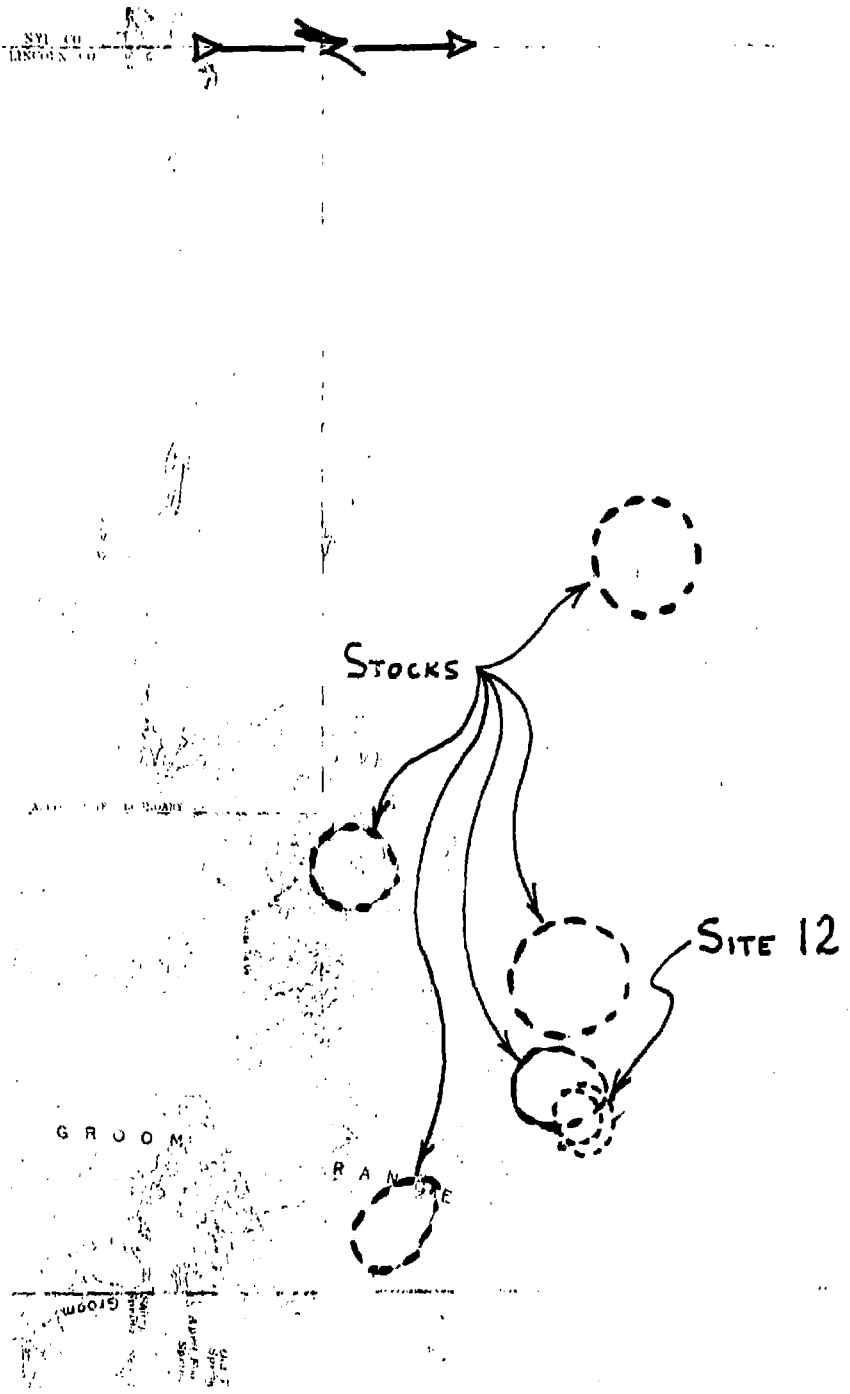
*Only locations within 200 km are evaluated.

REFERENCES 1) Nev, Bu. Mines & Geol Bull #73

2) Barnes, H, R.L. Christiansen "Cambrian and PreCambrian Rocks from the Groom District" USGS Bull 1244-G (1967)

3) "Lincoln County Nevada Data File" Nev Dept Econ Dev (1977)

4) "White Blotch Springs 15 minute Quadrangle" USGS (1952)



TOPOGRAPHY OF SITE 12

REF: USGS TOPOGRAPHIC SHEET, WHITE BLOTCH SPRINGS QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 13

I. GENERAL

Location 37° 38'N, 115° 38'W, T3S, R 56-57E

Geomorphic Feature Timpahute Range

Elevation 1829 m (6000 ft)

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 49 m (160 ft)

Maximum Relief of 40 ha Operations Area 67 m (220 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 357 m (1170ft)

III. GEOLOGY

Rock Type, Name, Age Granite Tertiary

Intruded Rock Type, Name, Age Upper Paleozoic Clastics & Carbonates

Area of Exposed Rock Mass 3.8 km^2 (1.5 mi^2)

Surface Rock Mass Competency Mod

Faults None reported in Pluton

Joints

Distance to Nearest Historic Surface Break 60 km

Distance to Nearest Upper Cenozoic Fault 6 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 1 km, Tem Piute

Site Potential for Mineral Development Good

4 km^2 Area at Depths of 500-1,500 m? Prob

Distance to Nearest Volcanic Vent Younger Than 10 m Years 40 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? Yes

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Penoyer , Central

Groundwater Discharge 0

Surface Discharge 0

Where Does Surface Water Go? Sand Springs Dry Lake

Where Does Groundwater Go? Closed Basin

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 8 km, Penoyer

Distance to Nearest Water Well In Use 7.2 km

Depth to Water in Nearest Well 32 m (104 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 13 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Hiko, 15, 35

Nearest Human Habitation and Number of People

Distance to State Boundary 139 km

Distance to and Name of Nearest Active Mine Within 25 km Tempiute, 3 km

Distance to Nearest Farm/Ranch Within 25 km 7 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km Nellis Range,16 km

Land Ownership (State, Federal, Private) BLM

Land Use Grazing, recreation

Number of Old Mines Within 10 km 4

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 48 km

Distance to Nearest Military Range From Boundary 22 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 7 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 22*

Record Period 1881-1977

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 87 km

Maximum Expected Acceleration From NTS Blasts 0.035 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Caliente 13-36°C (56-96°F)

Average Daily Temperature Range, Coldest Month At Caliente -9 to 8°C (16-46°F)

Annual Precipitation 30 cm (12in)

* Except NTS events

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 165°,168 PIOCHE 73°,106 HENDERSON 162°,187

BOULDER CITY 159,197 TONOPAH 288°,148 ELY 19°,188 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station 108 km, Caliente

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? Ghost Town of Tempiute

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 155 km Southwest Gas

Distance to and Name of Nearest Power Line 70 km Nevada Power

Route Distance to and Ownership of Nearest Railroad 138 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 14 km State 25

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 149 km Caliente

Population of Support Town 916

Route Distance to and Name of Nearest Commercial Airport 221 km McCarran

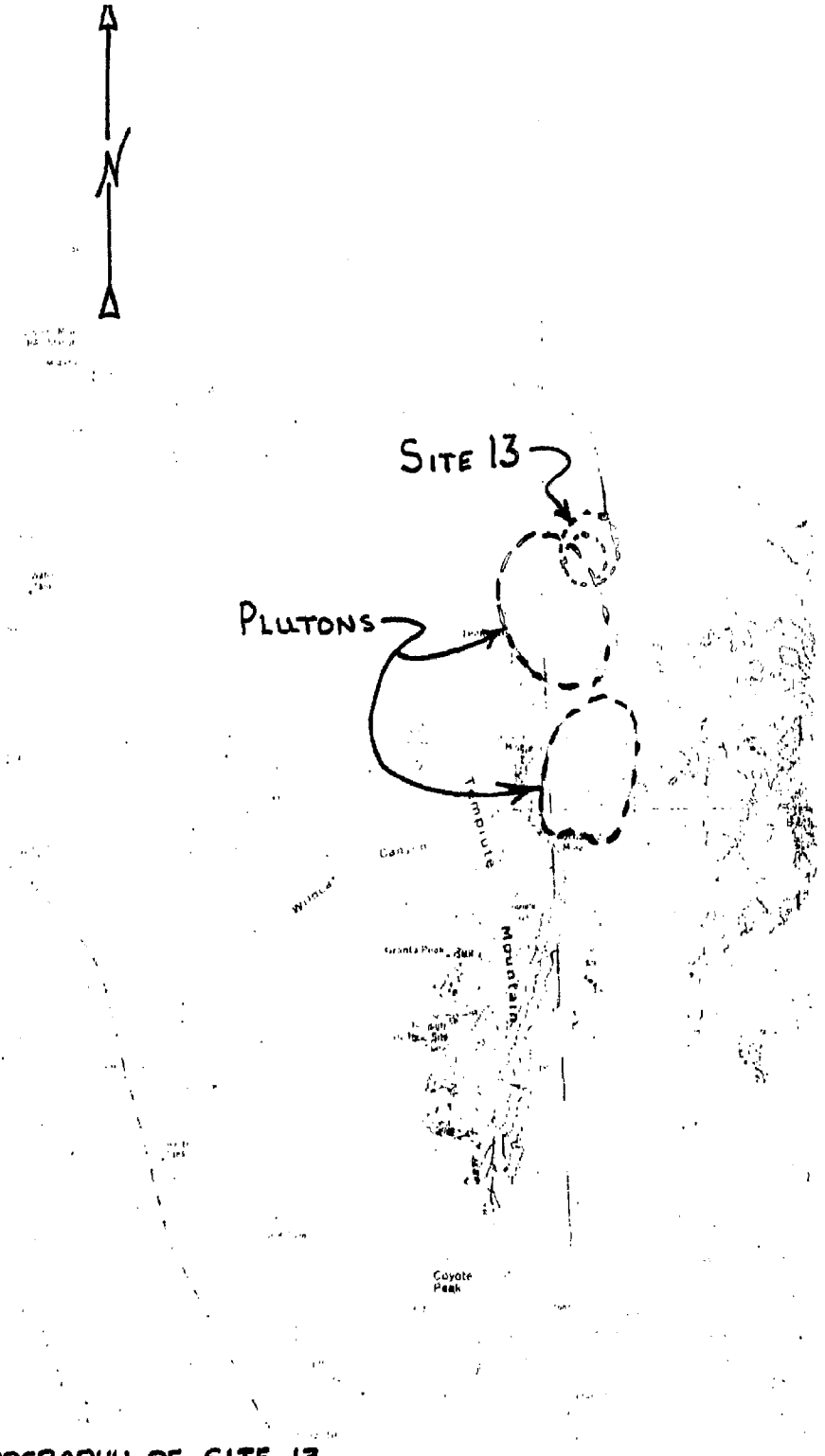
*Only locations within 200 km are evaluated.

REFERENCES 1) Nev Bu M & G Bull #73**

2)"Lincoln County Nevada Data File" Nevada Dept Econ Dev (1977)

3) "Tempiute Mtn 15 minute Quad" USGS (1964)

** Plate 6 - , Fig 25



TOPOGRAPHY OF SITE 13

REF.: USGS TOPOGRAPHIC SHEET, TEMPIUTE MTN. QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 14

I. GENERAL

Location 37° 55'N, 115° 35'W, T1N, R57E

Geomorphic Feature Worthington Mts.

Elevation 1981 m

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 49 m (160 ft)

Maximum Relief of 40 ha Operations Area 67 m (220 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 792 m (2600 ft)

III. GEOLOGY

Rock Type, Name, Age Granite, Tertiary

Intruded Rock Type, Name, Age Carbonate, Poponip Group, Ordovician

Area of Exposed Rock Mass 5.1 km^2 (2 mi sq)

Surface Rock Mass Competency Low

Faults None reported

Joints

Distance to Nearest Historic Surface Break 95 km

Distance to Nearest Upper Cenozoic Fault 16 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 1 km, Freiburg Fault

Site Potential for Mineral Development Good

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 26 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? Yes

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Penoyer, Central

Groundwater Discharge 0

Surface Discharge 0

Where Does Surface Water Go? Sand Spring Dry Lake

Where Does Groundwater Go? Closed Basin

Distance to Nearest Spring Within 5 km -

Number of Springs Within 5 km -

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km 14 km Penoyer, 21 km Coal

Distance to Nearest Water Well In Use 6 km

Depth to Water in Nearest Well 174 m (570 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 32 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Hiko, 15, 43 km

Nearest Human Habitation and Number of People

Distance to State Boundary 131 km

Distance to and Name of Nearest Active Mine Within 25 km -

Distance to Nearest Farm/Ranch Within 25 km 12 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land Ownership (State, Federal, Private) BLM

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 5

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 14 km

Distance to Nearest Military Range From Boundary 40 km

Distance to Nearest Non-Restricted, Paved Road in Use From Boundary 34 km

Site Out of View of Existing, Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 19*

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 75

Maximum Expected Acceleration From NTS Blasts 0.026 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Pioche 14-32°C (58-89°F)

Average Daily Temperature Range, Coldest Month A Pioche -6 to 5°C (21-41°F)

Annual Precipitation 30 cm (12in)

* Excludes NTS Shots

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 167°, 199 PIOCHE 91°, 101 HENDERSON 164°, 217

BOULDER CITY 161°, 227 TONOPAH 276°, 142 ELY 24°, 157 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? 0

Reported or Observed Historical Site Within 5 km? 1 (Old Mining Camp of Freiburg north of site)

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 182 km Southwest Gas

Distance to and Name of Nearest Power Line 85 km Nevada Power

Route Distance to and Ownership of Nearest Railroad 134 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 69 km State 25

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 134 km Caliente

Population of Support Town 916

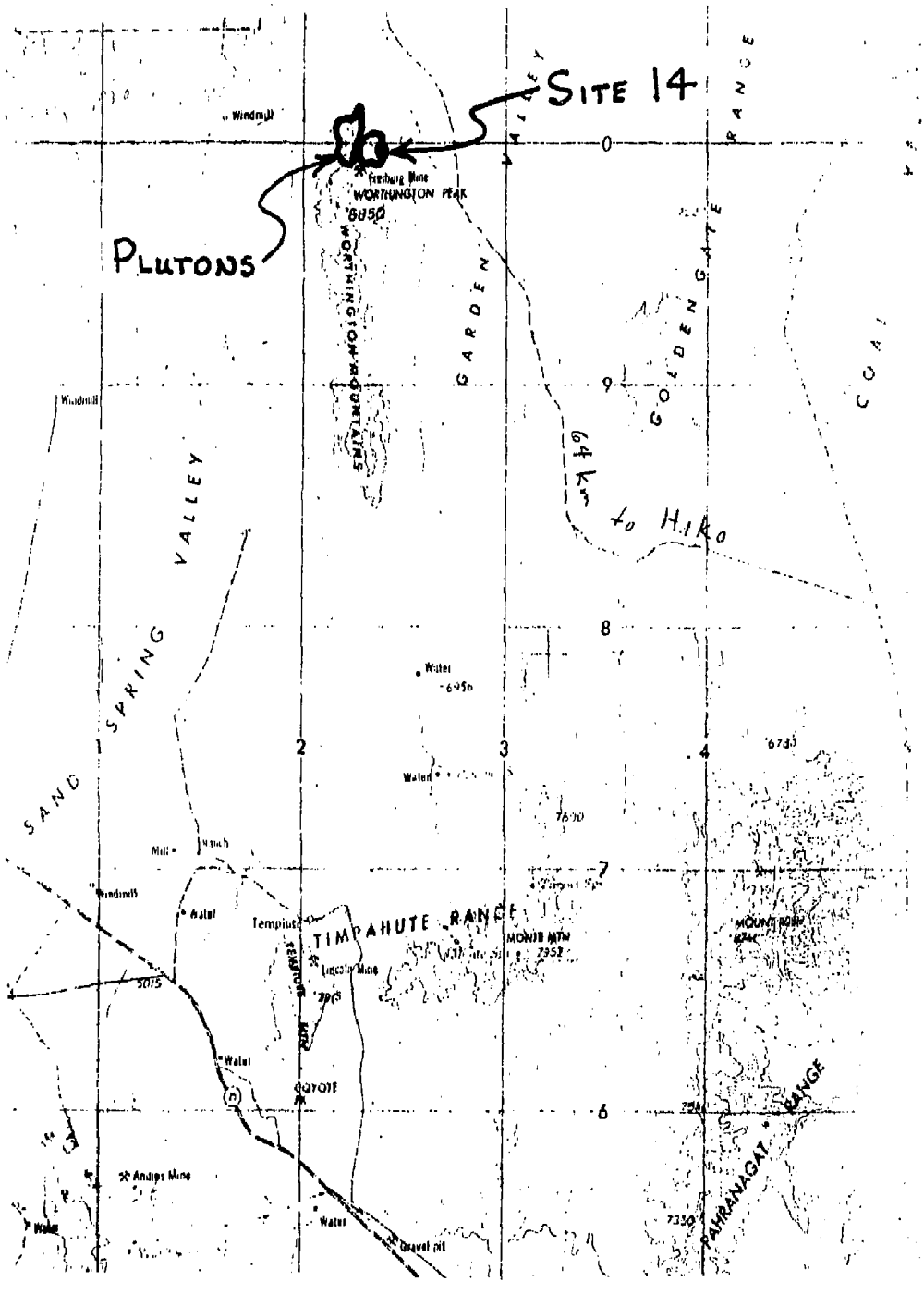
Route Distance to and Name of Nearest Commercial Airport 221 McCarran

*Only locations within 200 km are evaluated.

REFERENCES 1) Nev Bu M & G Bull #73

2) "Lincoln County Nevada Data File" Nev Dept Econ Dev (1977)

3) "Caliente 1x2 minute Map" USGS (1954-70)



TOPOGRAPHY OF SITE 14

REF: USGS TOPOGRAPHIC SHEET, CALIENTE QUADRANGLE, NV., 1° X 2°

SCALE 1:250,000

DATA SHEET

SITE NO. 15

I. GENERAL

Location 38° 16'N, 114° 55W, T5N, R63 E

Geomorphic Feature Schell Creek Range

Elevation 1902 m (6240 ft)

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 24 m (80ft)

Maximum Relief of 40 ha Operations Area 37 m (120ft)

Degree of Rock Mass Dissection Low

Maximum Relief Between Paved Road & Site 226 m (740 ft)

III. GEOLOGY

Rock Type, Name, Age Granodiorite Tert.

Intruded Rock Type, Name, Age Paleozoic Carbonates, Guilmette & Simpson Formations

Area of Exposed Rock Mass 5.1 km^2 (2 mi sq)

Surface Rock Mass Competency

Faults None reported

Joints

Distance to Nearest Historic Surface Break 134 km

Distance to Nearest Upper Cenozoic Fault U. Cenozoic - 16 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 0 km (on boundary)

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 90 km

Distance to Nearest KCRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Cave Valley, Central

Groundwater Discharge 14,000 ac ft

Surface Discharge 0

Where Does Surface Water Go? Cave Dry Lake

Where Does Groundwater Go? White River Valley

Distance to Nearest Spring Within 5 km -

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km 8 km, Cave

Distance to Nearest Water Well In Use [10 km] 20 km

Depth to Water in Nearest Well [Dry] 93 m (304 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 27 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Pioche, 600,50 km

Nearest Human Habitation and Number of People

Distance to State Boundary 74 km

Distance to and Name of Nearest Active Mine Within 25 km -

Distance to Nearest Farm/Ranch Within 25 km 17 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land Ownership (State, Federal, Private) BLM

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 1

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary w/in Corridor

Distance to Nearest Military Range From Boundary 112 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 25 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 7

Record Period 81-77

Magnitude of Largest Earthquake Within 100km 4-5

Distance to Largest Earthquake's Epicenter Within 100 km 59

Maximum Expected Acceleration From NTS Blasts 0.013 g

Reported or Observed Recent Fault Scarp Within 5 km? No

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Pioche 14-32°C (58-89°F)

Average Daily Temperature Range, Coldest Month At Pioche -6 to 5°C (21-41°F)

Annual Precipitation 30 cm (12in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 185°,228 PIOCHE 130°,53 HENDERSON 181°, 243

BOULDER CITY 178°, 248 TONOPAH 265°, 203 ELY 1°, 111 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station 53 Pioche

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? 0

Reported or Observed Historical Site Within 5 km? 0

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 212 km Southwest Gas

Distance to and Name of Nearest Power Line 26 km Nevada Power

Route Distance to and Ownership of Nearest Railroad 12 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 12 km 93 Bypass

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town Pioche 19 km

Population of Support Town 600

Route Distance to and Name of Nearest Commercial Airport 174 Cedar City

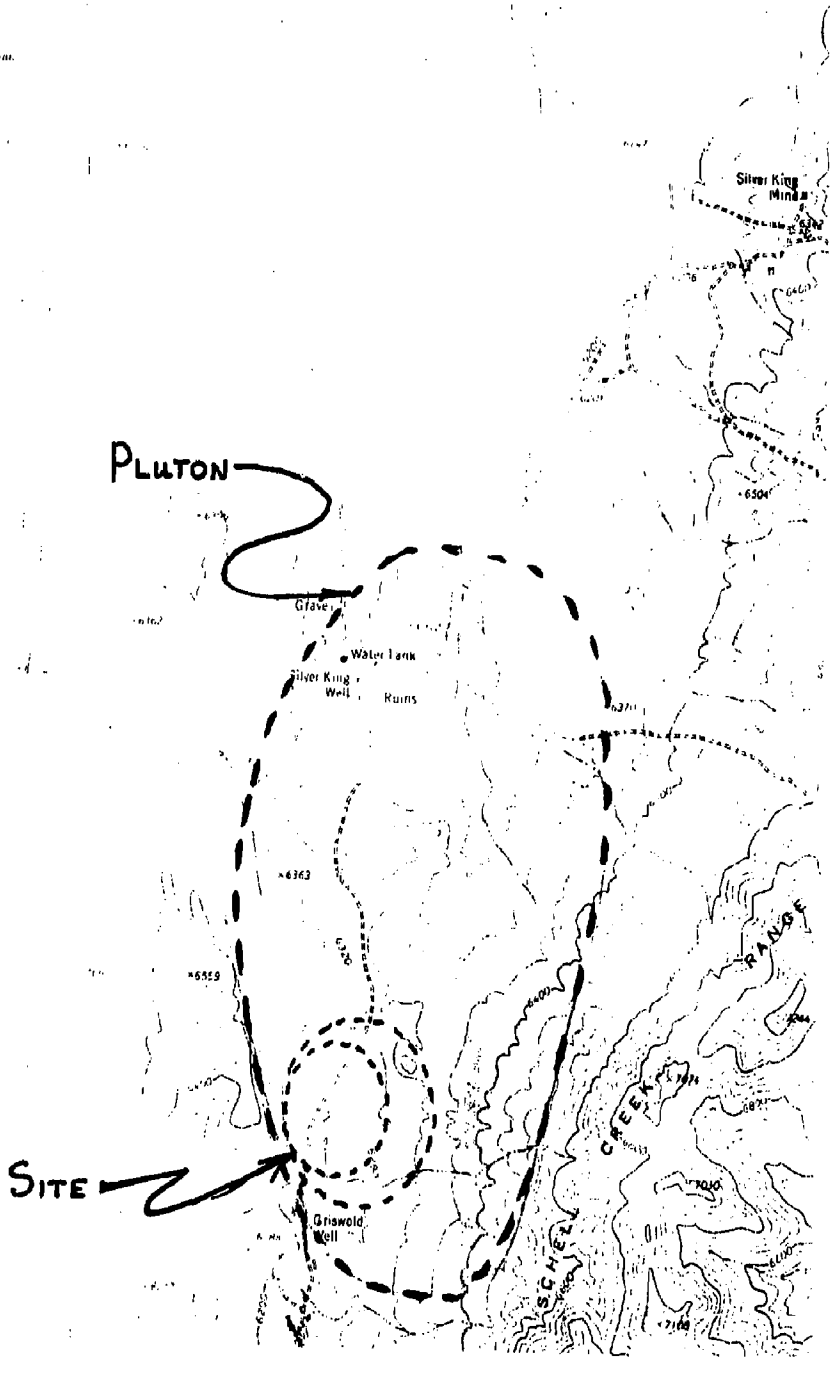
*Only locations within 200 km are evaluated.

REFERENCES 1) Nev Bu M & G Bull #73

2) Kellogg, H.E. (1964) "Cenozoic Stratigraphy and Structure of Southern Egan Range Nev" GSA Bull Vol 75 No.10.

3) " Lincoln County Nevada Data File" Nev Dept Econ Dev (1977)

4) "Silver King Well 7½ minute Quadrangle" USGS (1970)



TOPOGRAPHY OF SITE 15

REF: USGS TOPOGRAPHIC SHEET, SILVER KING WELL, NV., 7½'

SCALE 1:24,000

DATA SHEET

SITE NO. 16

I. GENERAL

Location 37°37'N, 114°22'W, T3-4 S, R 68-69E

Geomorphic Feature Cedar Range

Elevation 1768 m (5800ft)

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 37 m (120ft)

Maximum Relief of 40 ha Operations Area 49 m (160ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 305 m (1000ft)

III. GEOLOGY

Rock Type, Name, Age Diorite, Tertiary

Intruded Rock Type, Name, Age Volcanics, Tert/Cret.

Area of Exposed Rock Mass 15.4 km^2 (6mi^2)

Surface Rock Mass Competency Low to Mod

Faults None reported

Joints

Distance to Nearest Historic Surface Break 166 km

Distance to Nearest Upper Cenozoic Fault 5 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 1 km

Site Potential for Mineral Development Good

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 110 (Utah)

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Clover Valley, Colorado River Basin

Groundwater Discharge 500 ac ft

Surface Discharge Significant Volume

Where Does Surface Water Go? Meadow Valley Wash Colorado River

Where Does Groundwater Go? Colorado River Basin

Distance to Nearest Spring Within 5 km -

Number of Springs Within 5 km -

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km -

Distance to Nearest Water Well In Use 8 km

Depth to Water in Nearest Well 47 m (155 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 15 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Caliente, 916, 17 km

Nearest Human Habitation and Number of People -

Distance to State Boundary 24 km

Distance to and Name of Nearest Active Mine Within 25 km -

Distance to Nearest Farm/Ranch Within 25 km 14 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land Ownership (State, Federal, Private) BLM

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 7

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 55 km

Distance to Nearest Military Range From Boundary 90 km

Distance to Nearest Non-Restricted Road in Use From Boundary 11 km

Site Out of View of Existing Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m ≥ 4+ 21

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 25

Maximum Expected Acceleration From NTS Blasts 0.012 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Pioche 14-32°C (58-89°F)

Average Daily Temperature Range, Coldest Month At Pioche -6 to 5°C (21-41°F)

Annual Precipitation 30 cm (12in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 201°,177 PIOCHE 353°,30 HENDERSON 195°, 186

BOULDER CITY 191°,189 TONOPAH 281°,249 ELY 347°,178 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station 10 km Caliente

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? 0

Reported or Observed Historical Site Within 5 km? 0

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 150 km Southwest Gas

Distance to and Name of Nearest Power Line 8 km Nevada Power

Route Distance to and Ownership of Nearest Railroad 19 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 18 km US 93

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 22 km Caliente

Population of Support Town 916

Route Distance to and Name of Nearest Commercial Airport 174 Cedar City

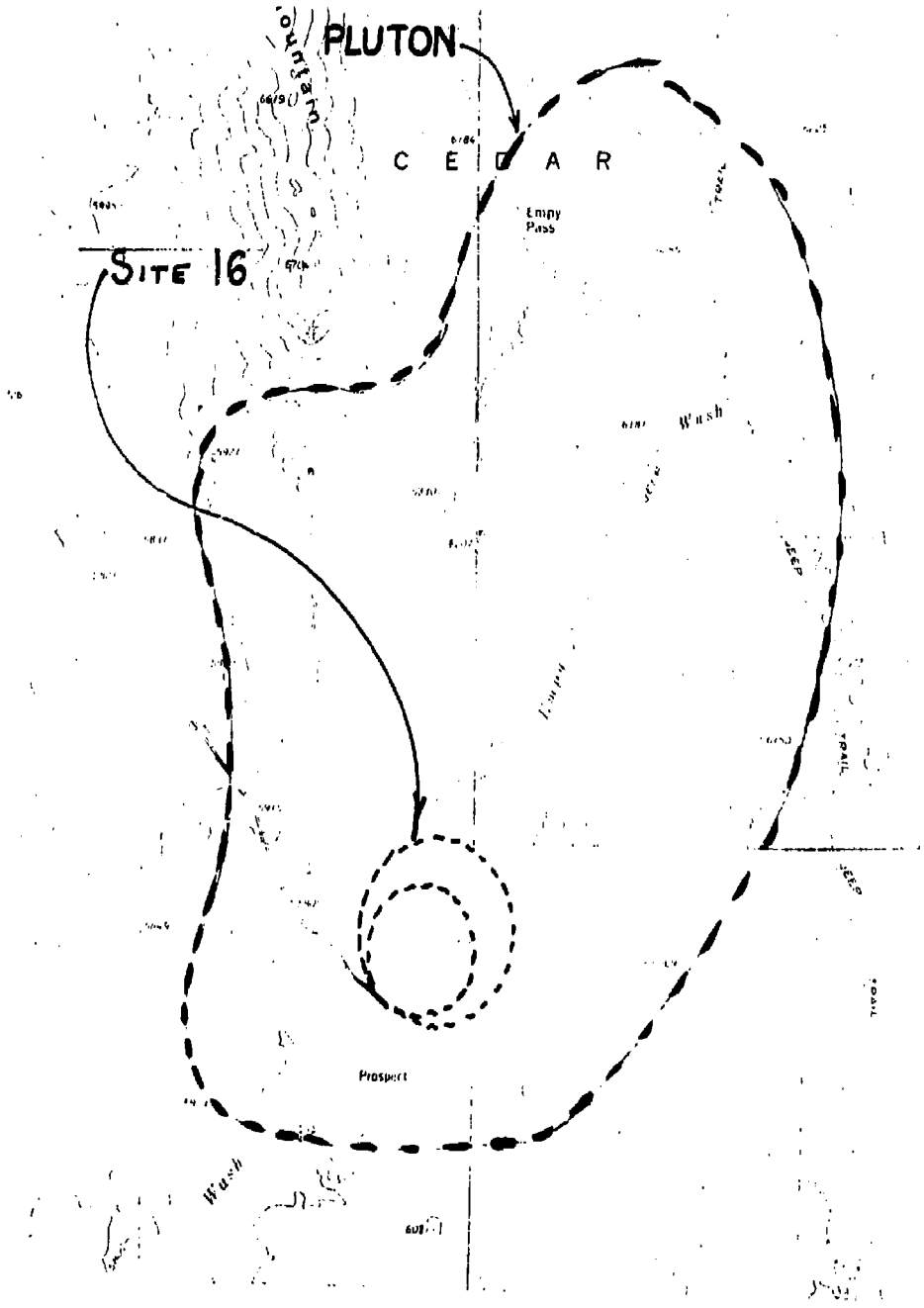
*Only locations within 200 km are evaluated.

REFERENCES 1) Tschanz, C.M. and E.H. Pampeyan (1970) "Geology and Mineral Deposits of Lincoln County, Nevada "Nev. Bu M & G Bull 73

2) "Lincoln County Data File" Nev, Dept Econ Dev (1977)

3) "Mosey Mtn 7½ minute Quadrangle" USGS (1972)

4) "Islen 7½ Minute Quadrangle" USGS (1972)



TOPOGRAPHY OF SITE 16

REF.: USGS TOPOGRAPHIC SHEET, MOSEY MTN. QUADRANGLE, NV., 7½'

SCALE 1:24,000

DATA SHEET

SITE NO. 17

I. GENERAL

Location 37°20'N, 114° 47'W, T7S, R65E

Geomorphic Feature Delamar Mountains

Elevation 1722 m (5650 ft)

Vegetation Types Pinon, Sagebrush, Juniper

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 43m (140 ft)

Maximum Relief of 40 ha Operations Area 67m (220 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 686 m (2250 ft)

III. GEOLOGY

Rock Type, Name, Age Rhyolite Porphyry Tertiary

Intruded Rock Type, Name, Age Volcanic, Undifferentiated, Cret/Tert.

Area of Exposed Rock Mass 3.8 km^2 (1,5 mi^2)

Surface Rock Mass Competency

Faults None reported

Joints

Distance to Nearest Historic Surface Break 125 km

Distance to Nearest Upper Cenozoic Fault 4 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 3+km-Long Fault Trace Border, Menard Lake

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 100 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No (But discharges into one)

Name of Site's GW Region & Basin Delamar Valley, Central Region

Groundwater Discharge 6,000 ac ft/yr

Surface Discharge 0

Where Does Surface Water Go? Delamar Dry Lake

Where Does Groundwater Go? Into White River Valley

Distance to Nearest Spring Within 5 km 2.9 km

Number of Springs Within 5 km 1

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km 12 km Delamar

Distance to Nearest Water Well In Use 19 km

Depth to Water in Nearest Well 6 m (21 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 30 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Elgin, 15, 24 km

Nearest Human Habitation and Number of People

Distance to State Boundary 65 km

Distance to and Name of Nearest Active Mine Within 25 km -

Distance to Nearest Farm/Ranch Within 25 km -

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land Ownership (State, Federal, Private) BLM

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 1

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 65 km

Distance to Nearest Military Range From Boundary 45 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 24 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 28

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 53

Maximum Expected Acceleration From NTS Blasts 0.019 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Caliente 13-36°C (56-96°F)

Average Daily Temperature Range, Coldest Month At Caliente -9 to 8°C (16-46°F)

Annual Precipitation 25 cm (10in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 193°,129 PIOCHE 24°,75 HENDERSON 186°,142

BOULDER CITY 181°,147 TONOPAH 292°,228 ELY 358°,213 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station 40 km Caliente

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes, Probably @ Jumbo Springs

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 106 km Southwest Gas

Distance to and Name of Nearest Power Line 10 km Nevada Power

Route Distance to and Ownership of Nearest Railroad 56 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 32 km US 93

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 56 km Caliente

Population of Support Town 916

Route Distance to and Name of Nearest Commercial Airport 150 km McCarran

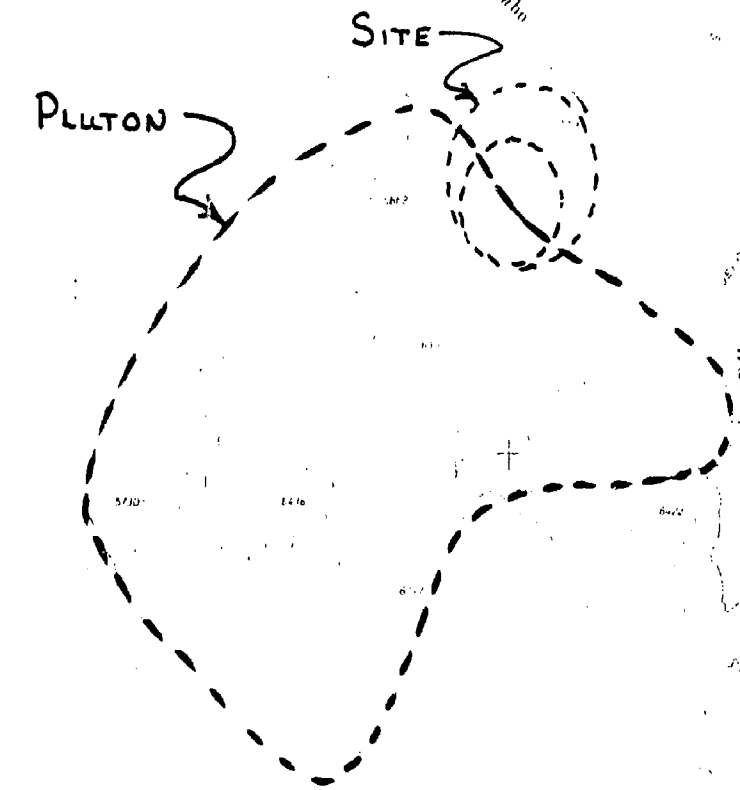
*Only locations within 200 km are evaluated.

REFERENCES 1) Tschanz.... Nev Bu M & G Bull 73

2) "Lincoln County Nevada Data File" Nev. Dept Econ Dev (1977)

3) "Gregerson Basin 7½ minute Quadrangle" USGS (1969)

GREGERSON BASIN QUAD



TOPOGRAPHY OF SITE 17

REF: USGS TOPOGRAPHIC SHEET, GREGERSON BASIN QUADRANGLE, NV., 7½'.

SCALE 1:24,000

DATA SHEET

SITE NO. 18

I. GENERAL

Location 37°25'N, 114°28'W, T6.S, R67E

Geomorphic Feature Clover Mtns

Elevation 1585 m 5200'

Vegetation Types Pinon, Juniper, Sagebrush, Cactus

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 55 m (180 ft)

Maximum Relief of 40 ha Operations Area 67 m (220 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 411 m (1350 ft)

III. GEOLOGY

Rock Type, Name, Age Rhyolite Phorphry Tertiary

Intruded Rock Type, Name, Age Volcanics Cretaceous/Tertiary

Area of Exposed Rock Mass 12.8 km^2 (5 mi^2)

Surface Rock Mass Competency

Faults None reported

Joints

Distance to Nearest Historic Surface Break 153 km

Distance to Nearest Upper Cenozoic Fault 9 km U. Cenozoic Faults

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace on Boundary

Site Potential for Mineral Development Good

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 97 km (Utah)

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Lower Meadow Wash Valley, Colorado

Groundwater Discharge 7,000 ac ft.

Surface Discharge 500 ac ft

Where Does Surface Water Go? Colorado River

Where Does Groundwater Go? Colorado River

Distance to Nearest Spring Within 5 km -

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km None

Distance to Nearest Water Well In Use 7.5 km

Depth to Water in Nearest Well 6 m (21 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 28 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Elgin, 15, 9 km

Nearest Human Habitation and Number of People

Distance to State Boundary 38 km

Distance to and Name of Nearest Active Mine Within 25 km -

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land *Ownership* (State, Federal, Private) BLM

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 5

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 46 km

Distance to Nearest Military Range From Boundary 74 km

Distance to Nearest Non-Restricted Road in Use From Boundary 19 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 23

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 25

Maximum Expected Acceleration From NTS Blasts 0.013 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Caliente 13-36°C (56-96°F)

Average Daily Temperature Range, Coldest Month At Caliente -9 to 8°C (10-46°F)

Annual Precipitation 25 cm (10 in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 203°,146 PIOCHE 2°,58 HENDERSON 196°,157

BOULDER CITY 191°,160 TONOPAH 287°,249 ELY _____ FALLON _____

HAWTHORNE _____ RENO _____ CARSON CITY _____

Distance to And Location of Nearest Meteorological Station 21 km

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 120 km Southwest Gas

Distance to and Name of Nearest Power Line 22 km Nevada Power

Route Distance to and Ownership of Nearest Railroad 8 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 30 km US 93

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 30 km Caliente

Population of Support Town 916

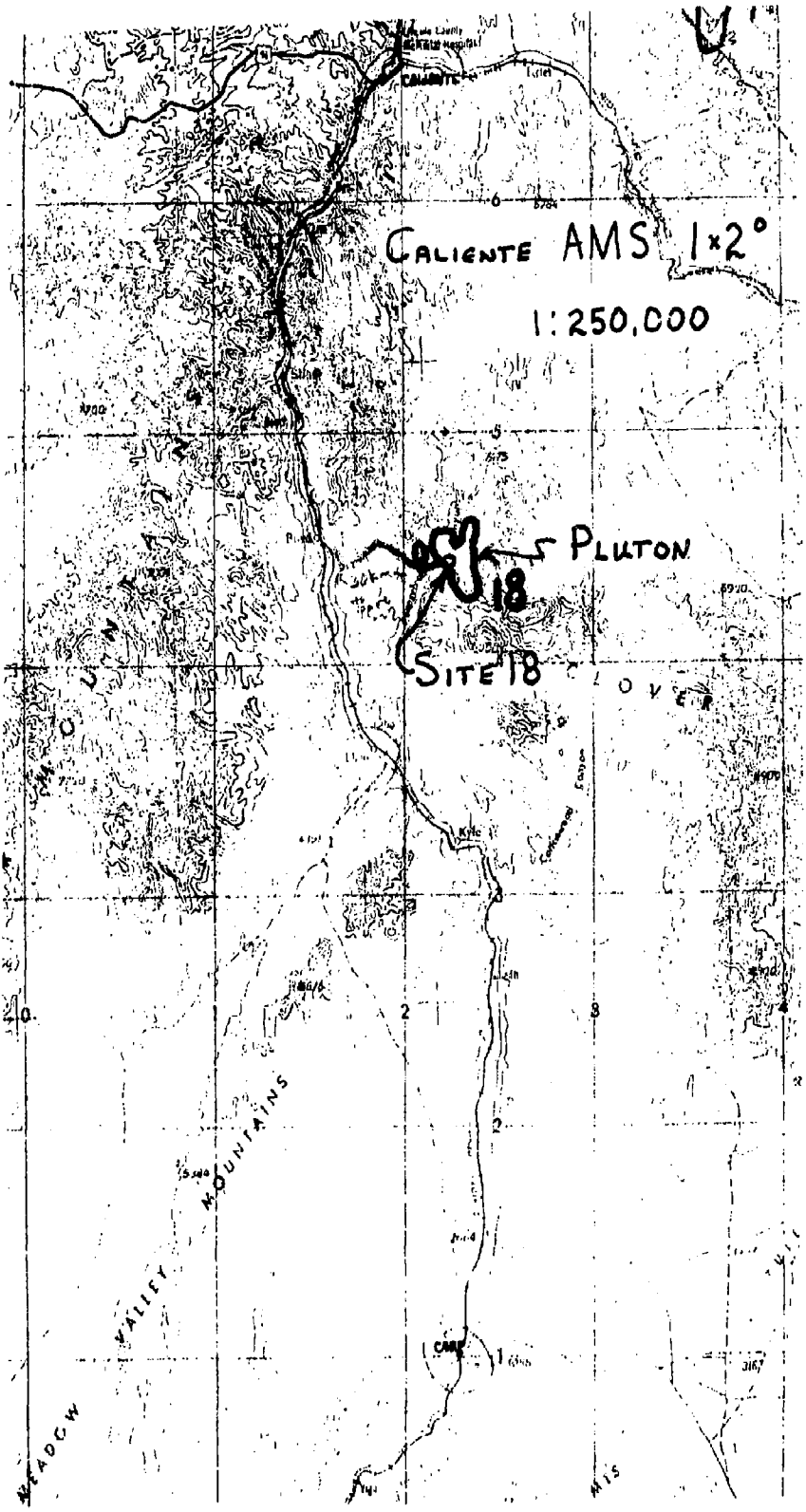
Route Distance to and Name of Nearest Commercial Airport 174 km McCarran

*Only locations within 200 km are evaluated.

REFERENCES 1) Tschanz.... Nev Bu M & G Bull 73

2) "Lincoln County Nevada Data Sheet" Nev Dept Econ Dev

3) " Caliente 1 x 2 Degree Topographic Map" USGS (1954-1970)



TOPOGRAPHY OF SITE 18

DATA SHEET

SITE NO. 19

I. GENERAL

Location 38°,00'N, 114°39'W, T2N, R66E

Geomorphic Feature Bristol Range

Elevation 1920 m (6300 ft)

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 49 m (160 ft)

Maximum Relief of 40 ha Operations Area 61 m (200 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 380 m (1249 ft)

III. GEOLOGY

Rock Type, Name, Age Quartz Monzonite - Tertiary

Intruded Rock Type, Name, Age Cambrian Sediments & Carbonates

Area of Exposed Rock Mass 2.6 km^2 (1 mi^2)

Surface Rock Mass Competency Mod

Faults none reported

Joints

Distance to Nearest Historic Surface Break 162 km

Distance to Nearest Upper Cenozoic Fault 5 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace forms part of boundary

Site Potential for Mineral Development Mod

4 km^2 Area at Depths of 300-1,500 m? No

Distance to Nearest Volcanic Vent Younger Than 10 m Years 111 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No #181 Central Region

Site in an Interstate GW Basin? No (But drains into one eventually)

Name of Site's GW Region & Basin Dry Lake Valley, Central

Groundwater Discharge 5000 ac ft/yr

Surface Discharge 0

Where Does Surface Water Go? Dry Lake

Where Does Groundwater Go? Into White River Drainage

Distance to Nearest Spring Within 5 km 0.7 km

Number of Springs Within 5 km 3

Distance To and Names of Perennial Streams Within 5 km -

Distance to and Names of Lakes/Reservoirs Within 5 km -

Distance to and Names of Paleo Lakes Within 30 km 20 km, Bristol 76B

Distance to Nearest Water Well In Use 3 km

Depth to Water in Nearest Well 3m (10 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 32 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Pioche, 600, 16 km

Nearest Human Habitation and Number of People 14.5 km (?)

Distance to State Boundary 49 km

Distance to and Name of Nearest Active Mine Within 25 km Pan American, 10 km

Distance to Nearest Farm/Ranch Within 25 km 14.5 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land Ownership (State, Federal, Private) BLM

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 16

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 9 km

Distance to Nearest Military Range From Boundary 71 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 7 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 19

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 6-7

Distance to Largest Earthquake's Epicenter Within 100 km 77

Maximum Expected Acceleration From NTS Blasts 0.013 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Pioche 14-32°C (58-89°F)

Average Daily Temperature Range, Coldest Month At Pioche -6 to 5°C (21-41°F)

Annual Precipitation 25 cm (10in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 195°,225 PIOCHE 113°,17 HENDERSON 190°,218

BOULDER CITY 187°,222 TONOPAH 350°,229 ELY 350°,140 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station 17 km. Pioche

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 100 km Southwest Gas

Distance to and Name of Nearest Power Line 7 km Nevada Power

Route Distance to and Ownership of Nearest Railroad 10 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 10 km US 93 Bypass

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 20 km Pioche

Population of Support Town 600

Route Distance to and Name of Nearest Commercial Airport 193 Cedar City

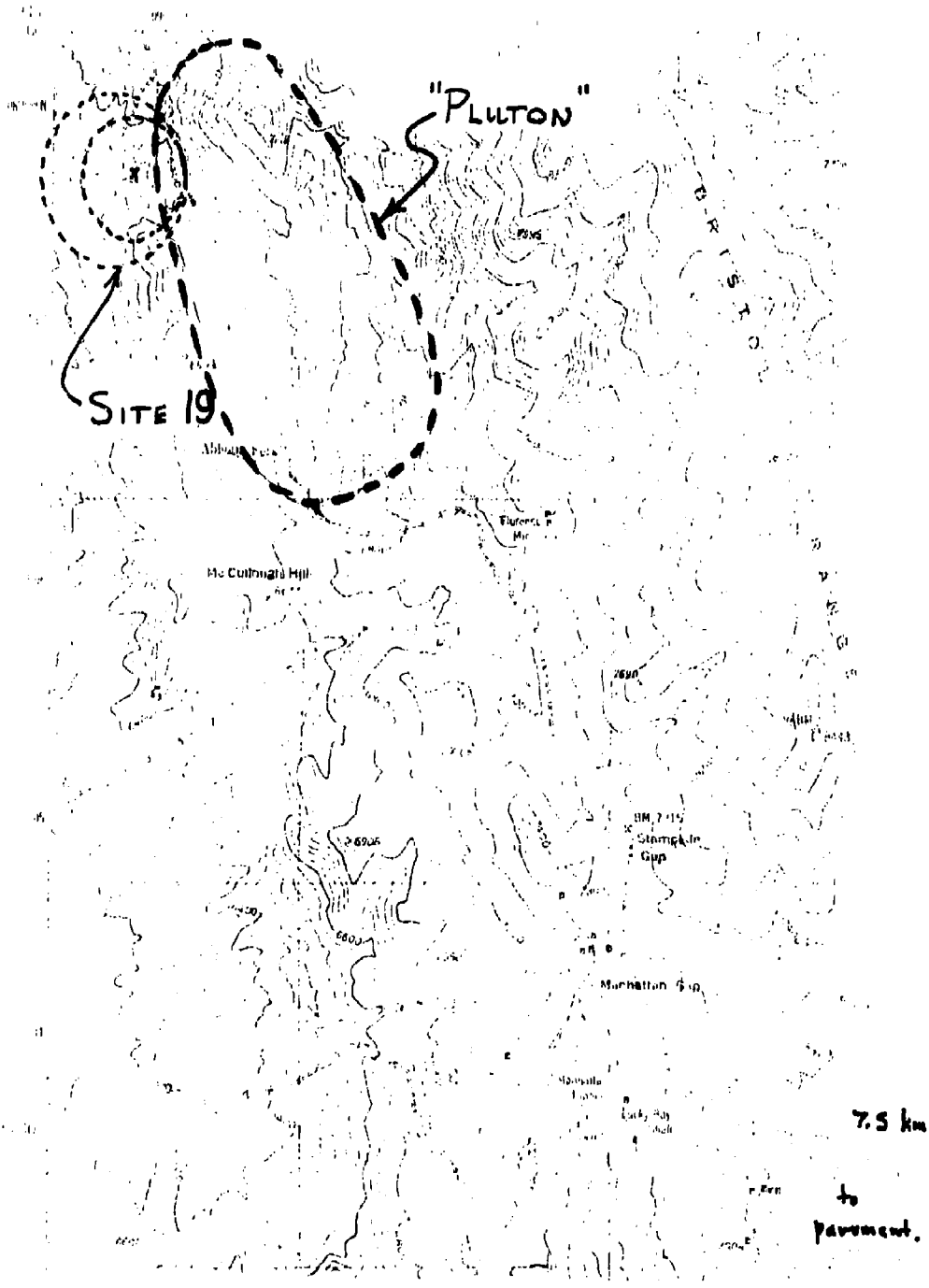
*Only locations within 200 km are evaluated.

REFERENCES 1) Tschanz... Nev Bu M & G Bull 73

2) "Lincoln County Nevada Data File" Nev Dept Econ Dev.

3) "Highland Peak 7½ minute Quadrangle" USGS (1953-1969)

4) Westgage, L.G. & A. Knopf (1932)"Geology and Ore Deposits of the Pioche District. Nevad USGS Prof Paper 171



TOPOGRAPHY OF SITE 19

REF.: HIGHLAND PEAK QUADRANGLE, NV. USGS 7½' TOPOGRAPHIC MAP

SCALE 1:24,000

DATA SHEET

SITE NO. 20

(Round Mtn Quad - 7½)

I. GENERAL

Location Nye Co. T10N R 44E Sec 21, 38° 43'N, 117°3'W

Geomorphic Feature Round Mountain

Elevation (6640')

Vegetation Types Pinon, Juniper/Northern Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 37 m (120')

Maximum Relief of 40 ha Operations Area 61 m (200')

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 93 m (320')

III. GEOLOGY

Rock Type, Name, Age Granite, Jurassic (?), Round Mtn. Pluton

Intruded Rock Type, Name, Age Palmetto Fm. Slate/Chert, Ordovician

Area of Exposed Rock Mass 175 km^2

Surface Rock Mass Competency

Faults

Joints

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 12 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 7.5 km

Site Potential for Mineral Development Mod

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 a Years 90 km

Distance to Nearest KGRA Within 40 km inside prospective area

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Basin: Big Smoky Valley (137)

Groundwater Discharge 8000 acft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Clayton Valley (143) and Columbus Salt Marsh (118) NV

Distance to Nearest Spring Within 5 km Hot Spring 17 km 4 km Inkhouse Spring

Number of Springs Within 5 km 2

Distance To and Names of Perennial Streams Within 5 km 1.6 km Jefferson Cr

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 13 km Toiyabe

Distance to Nearest Water Well In Use 20 km

Depth to Water in Nearest Well 2 m (17 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 11 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Round Mountain, NV pop. 100, 1.5 km

Nearest Human Habitation and Number of People 1.5 km 100

Distance to State Boundary 145 km (CA)

Distance to and Name of Nearest Active Mine Within 25 km 2 km - Round Mtn Gold Mine Smoky Valley Mining Co.

Distance to Nearest Farm/Ranch Within 25 km 11 km Wood's Ranch

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km 10 km - Indian Res (Yomba)

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km ~ 100

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 54 km

Distance to Nearest Military Range From Boundary 91 km - Nellis

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 1.5 km

Site Out of View of Existing Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 49

Record Period '31-'77

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 82

Maximum Expected Acceleration From NTS Blasts 0.013 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15°C - 32°C

Average Daily Temperature Range, Coldest Month At Tonopah -7° - 4°C

Annual Precipitation 35 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 192°/70km ELY 70°/190km FALLON 300°/165 km

HAWTHORNE 260°/135 RENO - ~~CARSON~~ BISHOP CITY 217°/183 km

Distance to And Location of Nearest ~~Meteorological~~ County Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Probably

Reported or Observed Historical Site Within 5 km? No

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 80 km Southwest Gas

Distance to and Name of Nearest Power Line 1 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 158 km - SP (63 km Old Bed)

Route Distance to and Name of Nearest Paved Highway 1.5 km State Highway 92

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town Tonopah, 90 km

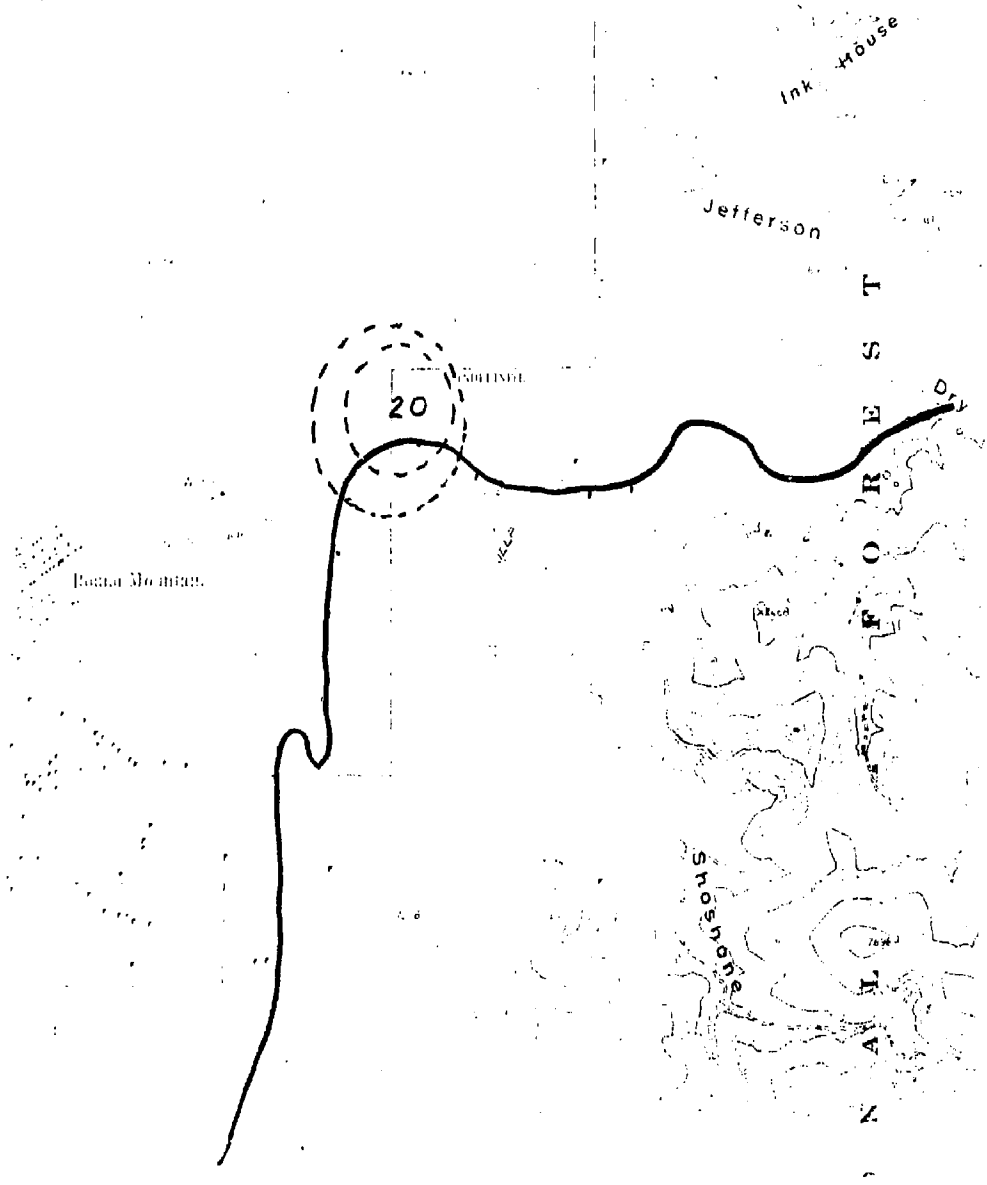
Population of Support Town 1,716

Route Distance to and Name of Nearest Commercial Airport 258 km, Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES GQ 40 USGS (1954) "Geol. of Round Mtn Quad"

Prelim, Recon. Geol, Map of Central Nevada, R.E. Anderson, et. al. (1967)



TOPOGRAPHY OF SITE 20

REF: USGS TOPOGRAPHIC SHEET, ROUND MOUNTAIN QUADRANGLE, NV, 7½'

SCALE 1:24,000

DATA SHEET

SITE NO. 21

(Baxter Spring Quad -15')

I. GENERAL

Location Nye Co. T7N R44E Sec 17. 38°27'N. 117°4'W

Geomorphic Feature Toquima Range South

Elevation 2085 m (6840')

Vegetation Types Pinion Juniper/Northern Desert shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 37 m (120')

Maximum Relief of 40 ha Operations Area 49 m (160')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 244 m (800')

III. GEOLOGY

Rock Type, Name, Age Quartz Monzonite/Granodiorite. Cretaceous. Manhattan Dist. Intrusive

Intruded Rock Type, Name, Age Ordovician Shale, Chert, and Limestone

Area of Exposed Rock Mass 50 km^2

Surface Rock Mass Competency

Faults

Joints

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 12 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 18.2 km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 m Years 83 km

Distance to Nearest KGRA Within 40 km

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Ralston Valley Basin (141)

Groundwater Discharge 6000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Clayton Valley (143) and Alkali Spring Valley (142) NV

Distance to Nearest Spring Within 5 km 2.5 km Mud Spring

Number of Springs Within 5 km 5

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km None

Distance to Nearest Water Well In Use

Depth to Water in Nearest Well

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 19 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Manhattan, 30 pop, 8.5 km

Nearest Human Habitation and Number of People

Distance to State Boundary 126 km (CA)

Distance to and Name of Nearest Active Mine Within 25 km 7 km - Manhattan Gold Mine - Formerly Summa Corp.

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km ~ 100

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 26 km

Distance to Nearest Military Range From Boundary 63 km - Nellis

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 12 km

Site Out of View of Existing Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 42

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 88

Maximum Expected Acceleration From NTS Blasts 0.016 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15°-32°C

Average Daily Temperature Range, Coldest Month At Tonopah -7to 4°C

Annual Precipitation 30 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 193°/41km ELY - FALLON 308°/178 km

HAWTHORNE 275°/128 RENO - BISHOP, CA 223°/160 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? No

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 82 km - Southwest Gas

Distance to and Name of Nearest Power Line 10 km - Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 132 km - SP (38 km - Old Bed)

Route Distance to and Name of Nearest Paved Highway 12 km, State Highway 82

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 47 km Tonopah

Population of Support Town 1716

Route Distance to and Name of Nearest Commercial Airport 225 km - Bishop, California

*Only locations within 200 km are evaluated.

REFERENCES "Prelim. Recon. Geol Map of Central Nevada," R.E. Anderson et. al. (1967)

"Prelim. Geol Map of Nevada," John H. Steward and Johne Carlson (1974)

TOPOGRAPHY OF SITE 21

REF.: USGS TOPOGRAPHIC SHEET, BAXTER SPRING QUADRANGLE, NV., 15'

SCALE 1162,500

DATA SHEET

SITE NO. 22

(Wildcat Peak Quad - 15')

I. GENERAL

Location Nye Co. T15N, R45E, Sec 22, 39° 9'N, 116°54'W

Geomorphic Feature Toquima Range North -

Elevation 1865 m (6120')

Vegetation Types Pinion Juniper

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 116 m (380')

Maximum Relief of 40 ha Operations Area 146 m (480')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 183 m (600')

III. GEOLOGY

Rock Type, Name, Age Biotite Quartz Monzonite/Granodiorite, Jurassic, Clipper Gap Pluton

Intruded Rock Type, Name, Age Vinini Fm, sh, ch, ls, qtzite, Ordovician

Area of Exposed Rock Mass 22 km^2

Surface Rock Mass Competency

Faults

Joints Steeply Dipping: 1 every few meters

Gently Dipping: Twice that of the steep ones

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 50 km: 13 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 4.6 km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10 m Years 132 km

Distance to Nearest KGRA Within 40 km inside prospective area

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Big Smoky Valley Basin (137)

Groundwater Discharge 8000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Columbus Salt Marsh (118) & Clayton Valley (143)

Distance to Nearest Spring Within 5 km 2.2km

Number of Springs Within 5 km 2

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 3 km - Toiyable 21 km - Diana

Distance to Nearest Water Well In Use 15 km

Depth to Water in Nearest Well 52 m (170 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 5 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Austin, NV Pop 300, 38 km

Nearest Human Habitation and Number of People

Distance to State Boundary 187 km

Distance to and Name of Nearest Active Mine Within 25 km 20 km - P & S Mine (Barite) Standard Slag Co.

Distance to Nearest Farm/Ranch Within 25 km 16.4 km, Kingston Ranch

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 3

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 100 km

Distance to Nearest Military Range From Boundary 108 km - NAAS

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 13 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 36

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 87

Maximum Expected Acceleration From NTS Blasts 0.01 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15-32°C

Average Daily Temperature Range, Coldest Month At Tonopah -7 to 4°C

Annual Precipitation 25 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 190°/118km ELY 85°/172km FALLON 283°/158

HAWTHORNE 244°/155km RENO - BISHOP, CA -

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? No

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 92 km - Southwest Gas

Distance to and Name of Nearest Power Line 47 km - Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 198 km - Sp (120 km Old Bed)

Route Distance to and Name of Nearest Paved Highway 13 km, State Highway 8A

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 155 km Tonopah

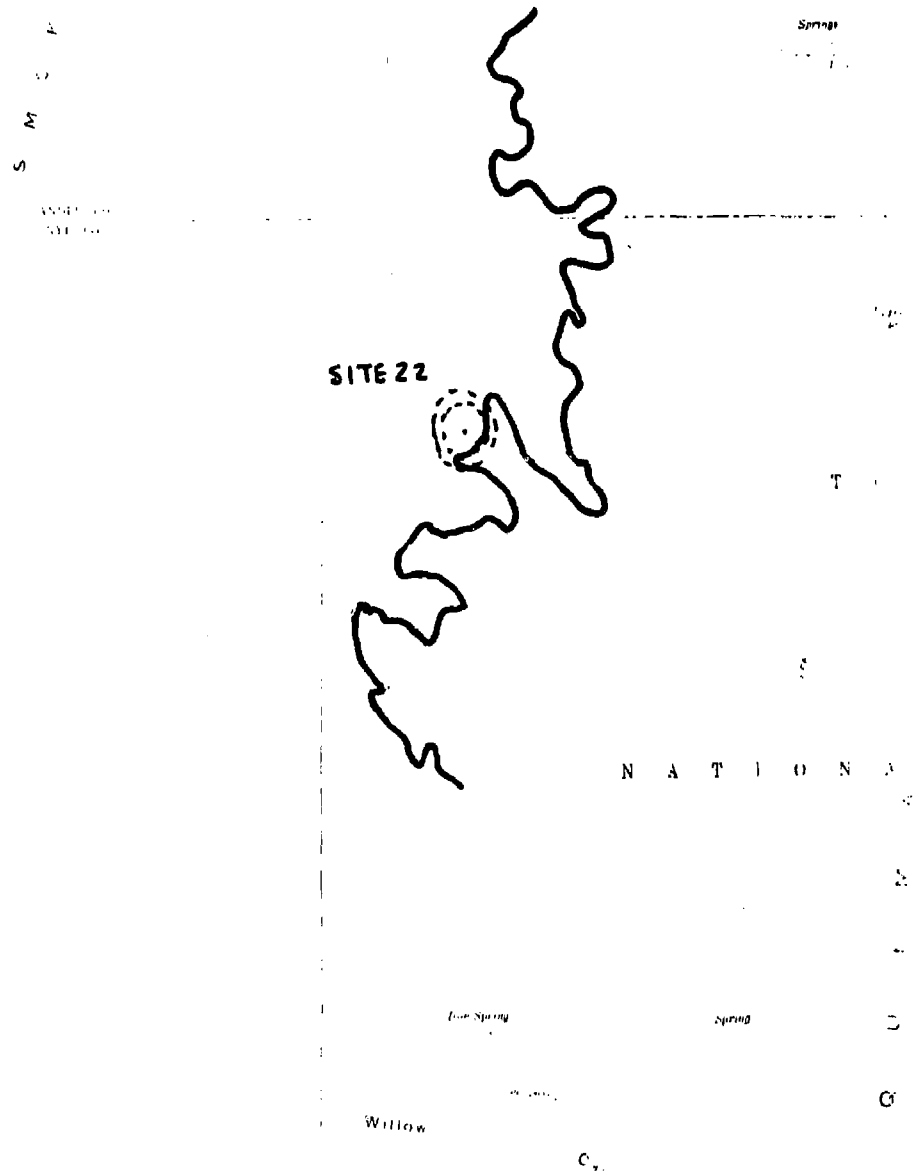
Population of Support Town 1716

Route Distance to and Name of Nearest Commercial Airport 254 km - Ely, NV

*Only locations within 200 km are evaluated.

REFERENCES "Preliminary Recon Geol Map of Central Nevada," R.E. Anderson, et.al. (1967)

"Geol. of No. part of Toquima Range, Lander, Eureka, and Nye Co. Nev." USGS Prof Paper 931 E.H. McKee (1976)



TOPOGRAPHY OF SITE 22

REF.: USGS TOPOGRAPHIC SHEET, WILDCAT PEAK QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 23

Millet Ranch Quad - 15'

I. GENERAL

Location Nye Co. T15N R43E Sec 27, 39°7'N, 117°8'W

Geomorphic Feature - Central Toiyabe Range.

Elevation 1877 m (6160')

Vegetation Types Northern Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 98 m (320')

Maximum Relief of 40 ha Operations Area 128 m (420')

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 170 m (560')

III. GEOLOGY

Rock Type, Name, Age Granodiorite/Adamellite, Mesozoic-Tertiary , Aiken Creek Pluton

Intruded Rock Type, Name, Age Paleozoics

Area of Exposed Rock Mass 25 km^2

Surface Rock Mass Competency

Faults

Joints

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 50 km: 2 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 0 km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes.

Distance to Nearest Volcanic Vent Younger Than 10^6 m Years 123 km

Distance to Nearest KGRA Within 40 km

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10) Big Smoky Valley Basin (137)

Groundwater Discharge 8,000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Columbus Salt Marsh (118) & Clayton Valley (143)

Distance to Nearest Spring Within 5 km 4.5 km

Number of Springs Within 5 km 3

Distance To and Names of Perennial Streams Within 5 km 4.3 km - Carlsey Cr
1.0 km - Aiken Cr. 10-unnamed, 1.3 km - unnamed, 1.8-Decker Cr, 3.7 - 2 unnamed, total 7

Distance to and Names of Lakes/Reservoirs Within 5 km None
Salt Marsh - 4.5 km

Distance to and Names of Paleo Lakes Within 30 km 2 km - Toiyabe

Distance to Nearest Water Well In Use 18 km

Depth to Water in Nearest Well 20 km (64 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 3 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Austin, Nev, 300 pop, 38 km

Nearest Human Habitation and Number of People

Distance to State Boundary 119 km

Distance to and Name of Nearest Active Mine Within 25 km 23 km - Bobbie #4
(Tungsten) A & B Mining & Milling Co.

Distance to Nearest Farm/Ranch Within 25 km 2 km (?) could be mine bldgs.

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 18

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 95 km

Distance to Nearest Military Range From Boundary 90 km NAAS

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 2 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 89

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 87

Maximum Expected Acceleration from NTS Blasts 0.01 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15^{o}-32^{o}C

Average Daily Temperature Range, Coldest Month At Tonopah -7^{o} to 4^{o}C

Annual Precipitation 30 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 184°/115km ELY 84°/192km FALLON 285°/142 km

HAWTHORNE 243°/140 RENO - CARSON CITY -

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? No

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 72 km - Southwest Gas

Distance to and Name of Nearest Power Line 45 km - Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 188 km - SP (112km - Old Bed)

Route Distance to and Name of Nearest Paved Highway 2 km Highway 8 A

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 139 km Tonopah

Population of Support Town 1716

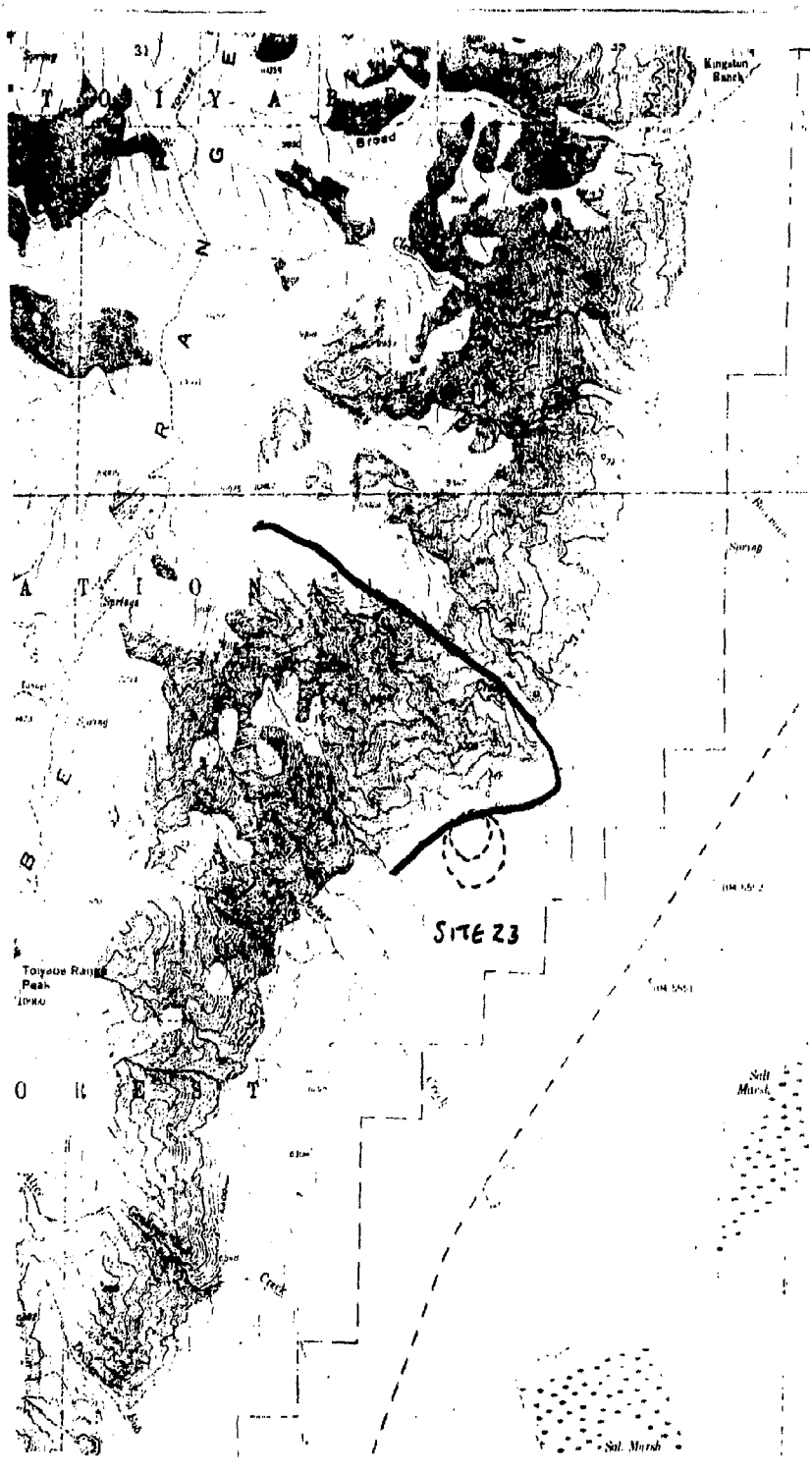
Route Distance to and Name of Nearest Commercial Airport 251 km - Ely, NV

*Only locations within 200 km are evaluated.

REFERENCES "Structure and Stratigraphy in the Central Toiyabe Range Nevada", W.D. Means, U of Calif Press (1962)

"Geologic Map of Nevada", Map 57, Nev Bumines & Geol (1977)

J.H. Steward & J.E. Carlson



TOPOGRAPHY OF SITE 23

REF.: USGS TOPOGRAPHIC SHEET, MILLET RANCH QUADRANGLE, NV., 15'

SCALE 1:62,500

DATA SHEET

SITE NO. 24

(Carvers Quad - 7½)

I. GENERAL

Location Nye Co T11N R43E 38° 48'N, 117° 12'W

Geomorphic Feature Toiyabe Range

Elevation 1829 m (6000')

Vegetation Types Northern Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 79 m (260')

Maximum Relief of 40 ha Operations Area 107 m (350')

Degree of Rock Mass Dissection Low

Maximum Relief Between Paved Road & Site 107 m (350')

III. GEOLOGY

Rock Type, Name, Age Quartz Monzonite, Jurassic, "Woods Ranch" Pluton

Intruded Rock Type, Name, Age Palmetto fm,

Area of Exposed Rock Mass 7.3 km^2

Surface Rock Mass Competency

Faults

Joints

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 50km : 2km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace o km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 m Years 106 km

Distance to Nearest KGRA Within 40 km -

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Big Smoky Valley Basin (137)

Groundwater Discharge 8,000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Columbus Salt Marsh (118) & Clayton Valley (143)

Distance to Nearest Spring Within 5 km 1.4 km

Number of Springs Within 5 km 50

Distance To and Names of Perennial Streams Within 5 km .5 km - Broad C.K.,
4 km - Cove Canyon CK., 4 km Jell Ck.

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 5 km Toiyabe

Distance to Nearest Water Well In Use NA

Depth to Water in Nearest Well NA

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 2 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Round Mountain, pop. 100, 14 km

Nearest Human Habitation and Number of People

Distance to State Boundary 91 km, (CA)

Distance to and Name of Nearest Active Mine Within 25 km 14 km Round Mtn
Gold Mine - Smoky Valley Mining Co.

Distance to Nearest Farm/Ranch Within 25 km 2 km Winelgass Ranch

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km 2 km - Yomba Indian Reservation

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 0

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 65 km

Distance to Nearest Military Range From Boundary 95 km - NAA5

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 1.2 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 73

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 72

Maximum Expected Acceleration From NTS Blasts 0.012 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15°-32°C

Average Daily Temperature Range, Coldest Month At Tonopah -7° to 4°C

Annual Precipitation 30 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 179°/75 km ELY 75°200 km FALLON 299°/150 km

HAWTHORNE 255°/122km RENO - ~~CARSON CITY~~ BISHOP, CA 213°/180 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 62 km Southwest Gas

Distance to and Name of Nearest Power Line 18 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 160 km - SP (78 km - Old Bed)

Route Distance to and Name of Nearest Paved Highway 1.2 km, State Highway 8A

Type of Nearest Paved Highway 2 lane

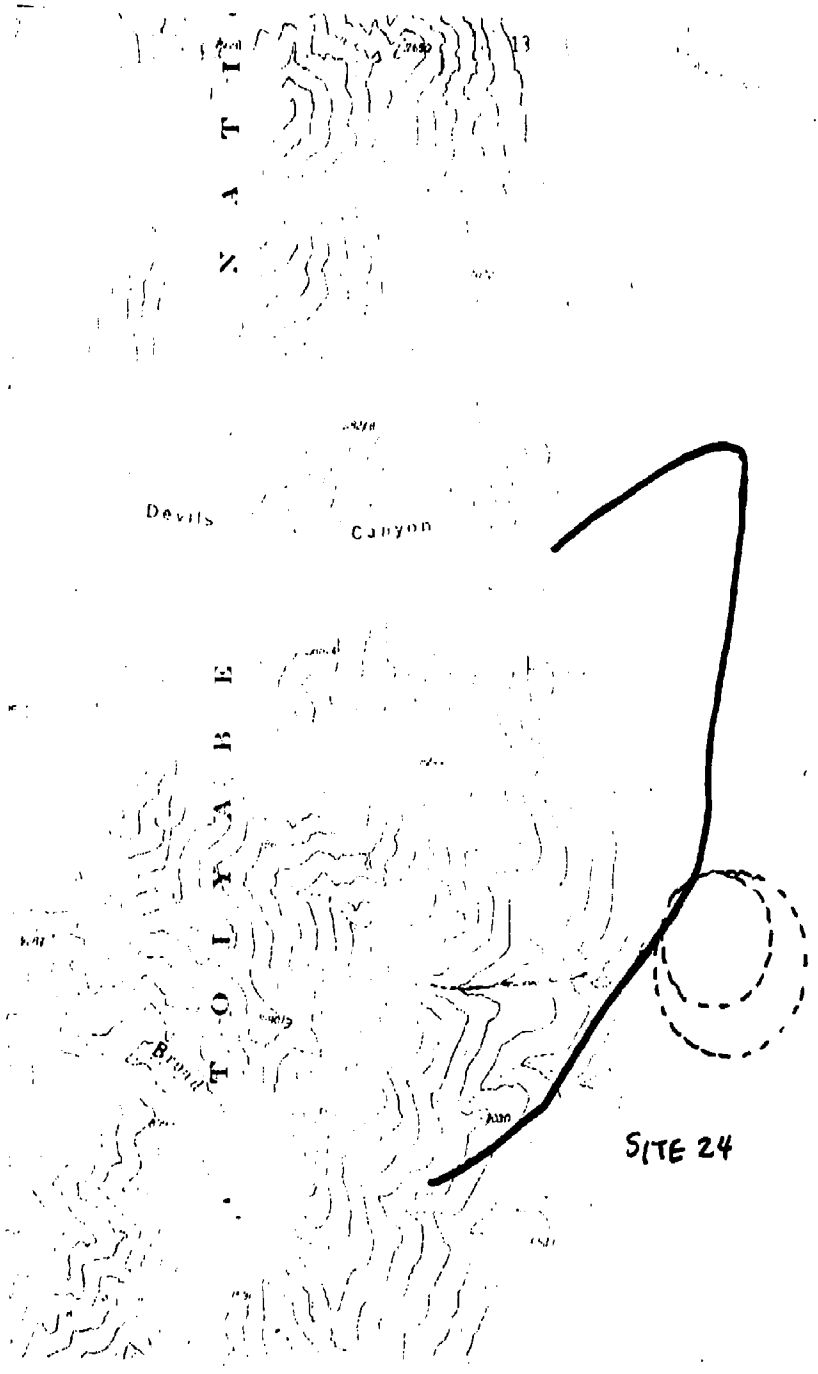
Route Distance to and Name of Support Town 96 km Tonopah

Population of Support Town 1716

Route Distance to and Name of Nearest Commercial Airport 268 km - Bishop, CA

*Only locations within 200 km are evaluated.

REFERENCES GQ40 - Geol Map of the Round Mountain Quadrangle, Nevada," M.G. Ferguson & S.H. Cathcart (1954)



TOPOGRAPHY OF SITE 24

REF.: USGS TOPOGRAPHIC SHEET, CARVERS QUADRANGLE, NV., 7½'

SCALE 1:24,000

DATA SHEET

SITE NO. 25

(Carvers NW Quad 7½')

I. GENERAL

Location Nye County T1Zn R42E Sec 10, 38°54'N, 117° 15'W

Geomorphic Feature Toiyabe Range East.

Elevation 1920 m (6300')

Vegetation Types Pinon, Juniper

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 79 m (260')

Maximum Relief of 40 ha Operations Area 104 m (340')

Degree of Rock Mass Dissection Med

Maximum Relief Between Paved Road & Site 183 m (600')

III. GEOLOGY

Rock Type, Name, Age Microcline Granite, Jurassic (?), "Millets Ranch" Pluton

Intruded Rock Type, Name, Age Diablo Fm, Conglomerate, Permain

Area of Exposed Rock Mass 15 km^2

Surface Rock Mass Competency

Faults

Joints

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 2km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 0 km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 years 113 km

Distance to Nearest KGRA Within 40 km -

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Big Smoky Valley Basin (137)

Groundwater Discharge 8,000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Columbus Salt Marsh (118) & Clayton Valley (143)

Distance to Nearest Spring Within 5 km None(?) 1:250,000 scale topo coverage

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km Ophir Cr - 3 km
Twin River - 2 km

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 7 km - Toiyabe

Distance to Nearest Water Well In Use 20 km

Depth to Water in Nearest Well 6 m (19 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 8 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Round Mountain, pop 100, 27.5 km

Nearest Human Habitation and Number of People

Distance to State Boundary 105 km

Distance to and Name of Nearest Active Mine Within 25 km 5 km Bobbie #4
(Tungsten) A & B Mining & Milling Co.

Distance to Nearest Farm/Ranch Within 25 km 8 km RO Ranch

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km 2 km - Yomba Indian Reservation

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 2 (1:250,000 topo)

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 75 km

Distance to Nearest Military Range From Boundary 88 km - NAAS

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 4 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 78

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 66

Maximum Expected Acceleration From NTS Blasts 0.009 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15°-32°C

Average Daily Temperature Range, Coldest Month At Tonopah -7 to 4°C

Annual Precipitation 30 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 177°/90 km ELY 78°/250 km FALLON 255°/144km

HAWTHORNE 250°/122km RENO - BISHOP, CA CARSON CITY 210°/192 km

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 62 km Southwest Gas

Distance to and Name of Nearest Power Line 30 km Sierra Pacific

Route Distance to and Owner ship of Nearest Railroad 172 km - SP 90 km OldBed

Route Distance to and Name of Nearest Paved Highway 4 km - State Highway 8A

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 113 km - Tonopah

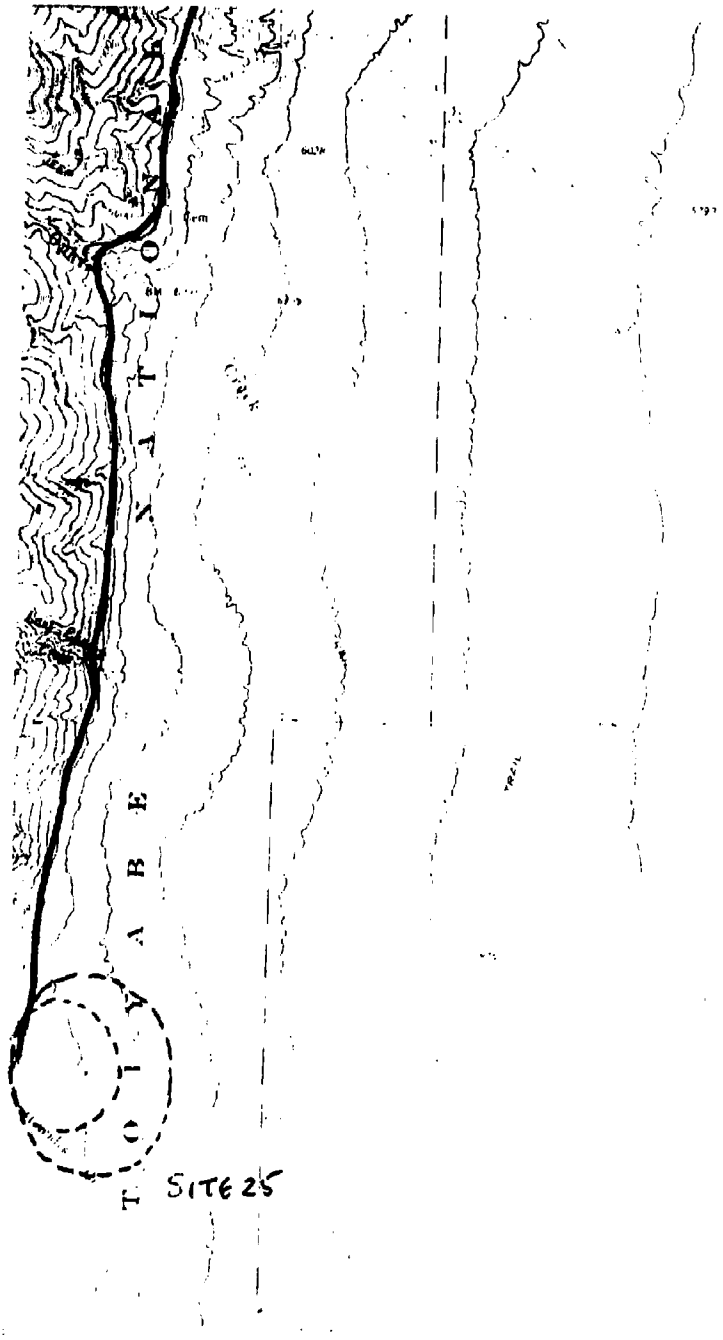
Population of Support Town 1716

Route Distance to and Name of Nearest Commercial Airport 275 km Ely, NV

*Only locations within 200 km are evaluated.

REFERENCES "Geol of Round Mtn Quad, NV", GQ 40, USGS, 1954,

M.G. Ferguson and S.M. Cathcart



TOPOGRAPHY OF SITE 25

REF.: USGS TOPOGRAPHIC SHEET, CARVERS N.W. QUADRANGLE, NV., 7½'

SCALE 1:24,000

DATA SHEET

SITE NO. 26

(Carvers NW Quad - 7½)

I. GENERAL

Location Nye Co. T14N, R42E, Sec 25, 39°3'N, 117°13'W

Geomorphic Feature Toiyabe Range East

Elevation 1963 m (6440')

Vegetation Types Northern Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 98 m (320')

Maximum Relief of 40 ha Operations Area 122 m (400')

Degree of Rock Mass Dissection Med

Maximum Relief Between Paved Road & Site 274 m (900')

III. GEOLOGY

Rock Type, Name, Age Quartz Monzonite, Jurassic (?), "Alkali Flat" Pluton

Intruded Rock Type, Name, Age Paleozoics, including € Goldhill fm, qtzite, schist

Area of Exposed Rock Mass 23 km^2

Surface Rock Mass Competency

Faults

Joints

Distance to Nearest Historic Surface Break 50 km

Distance to Nearest Upper Cenozoic Fault 50 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 0 km

Site Potential for Mineral Development Mod

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 m Years 123 km

Distance to Nearest KGRA Within 40 km -

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Big Smoky Valley Basin (137)

Groundwater Discharge 8,000 ac ft/yr

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Columbus Salt Marsh (118) & Clayton Valley (143)

Distance to Nearest Spring Within 5 km 3.7 km

Number of Springs Within 5 km 3

Distance To and Names of Perennial Streams Within 5 km 2.8 km - Deckbob Cr, 2.3 km - McLeod Cr, 4.3 km Tierney Cr 4.5 km Unnamed Cr.

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 4 km - Toiyabe

Distance to Nearest Water Well In Use 18 km

Depth to Water in Nearest Well 6 m (21 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 3 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Round Mountain, pop. 100, 37.5 km

Nearest Human Habitation and Number of People

Distance to State Boundary 118 km

Distance to and Name of Nearest Active Mine Within 25 km 10 km - Bobbie #4 (Tungsten) A & B Mining & Milling Co.

Distance to Nearest Farm/Ranch Within 25 km 4.3 km Millet Ranch

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km

15 km - Yomba Indian Reservation

Land Ownership (State, Federal, Private) Federal

Land Use National Forest

Number of Old Mines Within 10 km 24

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 80 km

Distance to Nearest Military Range From Boundary 85 km NAAS

Distance to Nearest Non-Restricted (Paved A) Road in Use From Boundary 3.7 km

Site Out of View of Existing (Paved A) Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 101

Record Period 1881-1977

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 75

Maximum Expected Acceleration From NTS Blasts 0.01 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15°-32°C

Average Daily Temperature Range, Coldest Month At Tonopah -7° to 4°C

Annual Precipitation 25 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - HENDERSON -

BOULDER CITY - TONOPAH 179°/100km ELY 81°/196km FALLON 290°/139 km

HAWTHORNE 246°/128km RENO - CARSON CITY -

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Yes

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 68 km Southwest Gas

Distance to and Name of Nearest Power Line 46 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 187 km - SP (105 km Old Bed)

Route Distance to and Name of Nearest Paved Highway 3.7 km, State Highway 8A

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 125 km, Tonopah

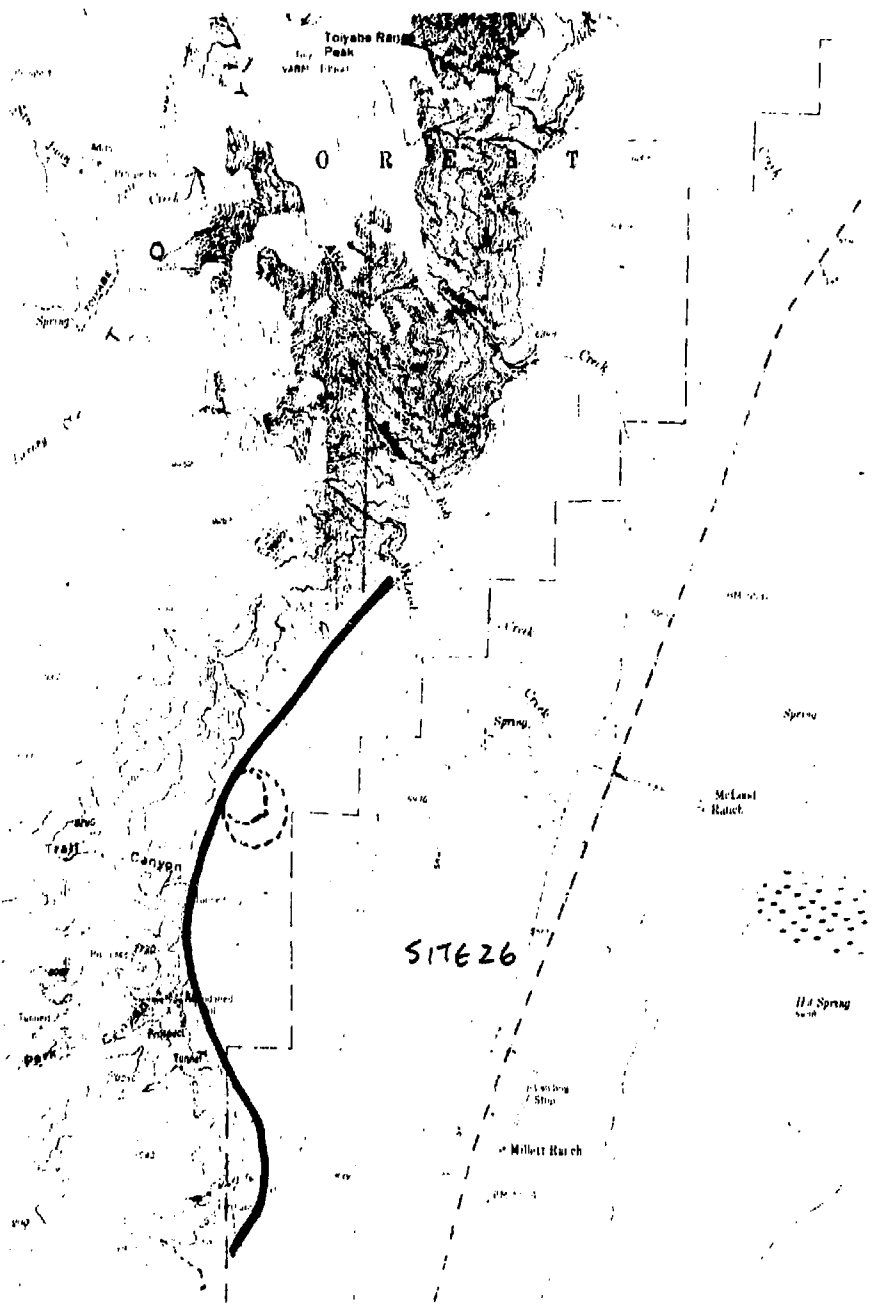
Population of Support Town 1716

Route Distance to and Name of Nearest Commercial Airport 265 km, Ely, NV

*Only locations within 200 km are evaluated.

REFERENCES 1) Geologic Map of Nevada, 1:1,000,000, J.M. Stewart and John E. Carlson - Nev Bumines & Geol, Map 57 (1977)

2) Geol. Map of Round Mtn Quad, NV, GQ-40 USGS, H.G. Ferguson and S.M. Cathcart. (1954)



TOPOGRAPHY OF SITE 26

REF.: USGS TOPOGRAPHIC SHEET, CARVERS NW QUADRANGLE, NV., 7½'

SCALE 1:24,000

DATA SHEET

SITE NO.27

I. GENERAL

Location 38° 51'N 15°22'W, T11N, R59E

Geomorphic Feature White Pine Range

Elevation 2057 m (6750 ft)

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 18 m (60 ft)

Maximum Relief of 40 ha Operations Area 24 m (80 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 61 m (200 ft)

III. GEOLOGY

Rock Type, Name, Age Granite Porphyry (or possibly Rhyolite Porphyry) Northern Currant stock, Tertiary

Intruded Rock Type, Name, Age Carboniferous Sediments and Tertiary Volcanics

Area of Exposed Rock Mass 2 km^2 (0.8m^2)

Surface Rock Mass Competency

Faults None reported

Joints

Distance to Nearest Historic Surface Break 83 km

Distance to Nearest Upper Cenozoic Fault 10 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 1 km

Site Potential for Mineral Development Low

4 km^2 Area at Depths of 300-1,500 m? Prob if 27 & 28 combine

Distance to Nearest Volcanic Vent Younger Than 10 m Years 56 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Northern Railroad Valley, Central Region

Groundwater Discharge 0

Surface Discharge 0

Where Does Surface Water Go? Railroad Dry Lake

Where Does Groundwater Go? Railroad Dry Lake

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km 0

Distance To and Names of Perennial Streams Within 5 km Flows through site Little Currant Creek

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 19 km Railroad

Distance to Nearest Water Well In Use 4 km

Depth to Water in Nearest Well NA

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 12 km Currant Cr

V. DEMOGRAPHY

Nearest Town, Population, and Distance Duckwater, 20, 35 km

Nearest Human Habitation and Number of People

Distance to State Boundary 115 km

Distance to and Name of Nearest Active Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km 6.9 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) National Forest

Land Use Grazing, Lumber, Recreation

Number of Old Mines Within 10 km 2

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 45 km

Distance to Nearest Military Range From Boundary 268 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 5.5km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 8

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 76

Maximum Expected Acceleration From NTS Blasts 0.011 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15-32°C (59-89°F)

Average Daily Temperature Range, Coldest Month At Tonopah -7 to 4°C (20-40°F)

Annual Precipitation 30 cm (12in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE 141°,132 HENDERSON -

BOULDER CITY - TONOPAH 242°,180 ELY 48°,61 FALLON -

HAWTHORNE - RENO - CARSON CITY -

Distance to And Location of Nearest Meteorological Station 61 km, Ely

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 216 km Southwest Gas

Distance to and Name of Nearest Power Line 10 km Ely Power & Light

Route Distance to and Ownership of Nearest Railroad 230 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 8 km US 6

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 75 km Ely

Population of Support Town 2616

Route Distance to and Name of Nearest Commercial Airport 75 km Ely

*Only locations within 200 km are evaluated.

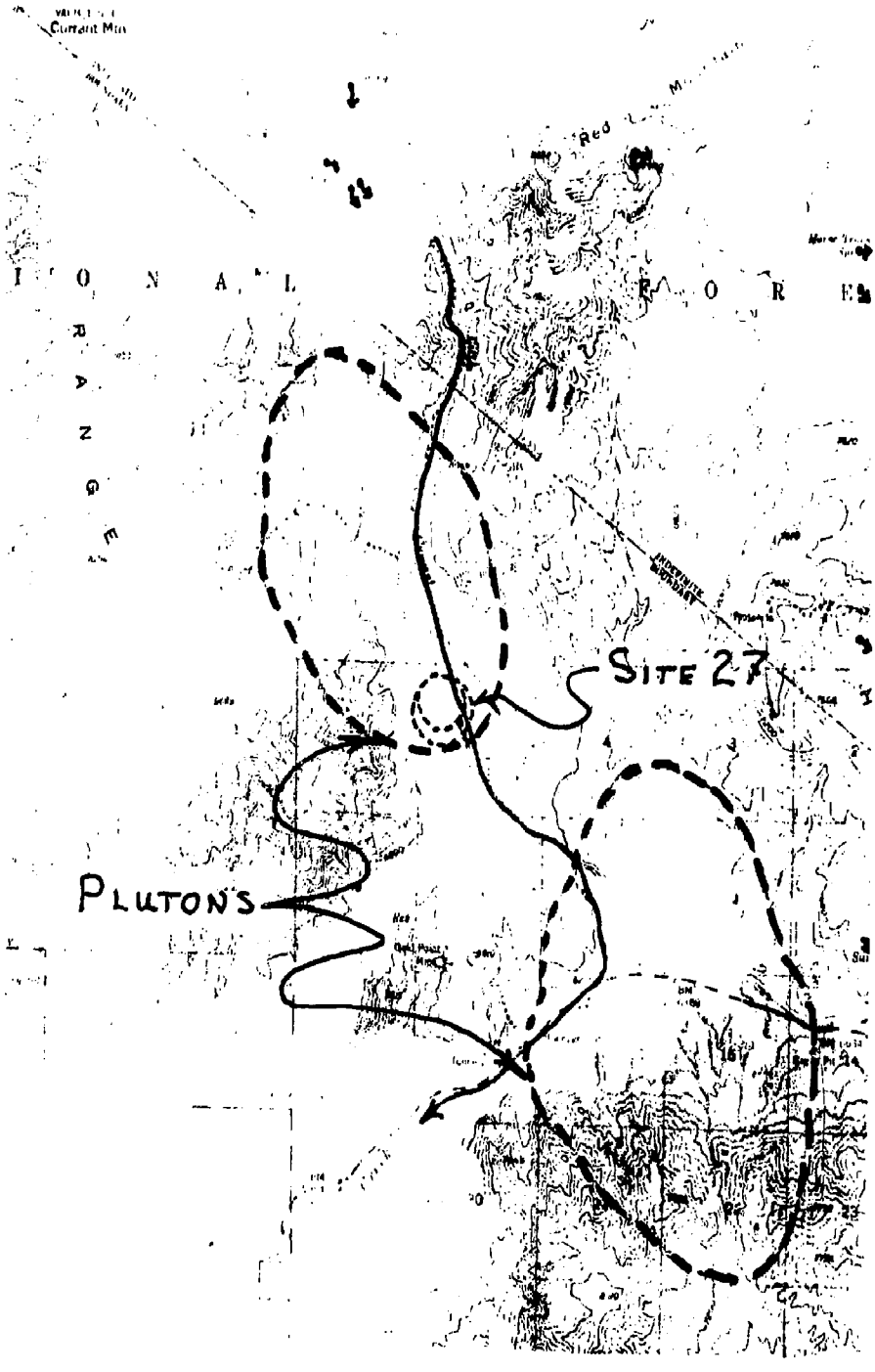
REFERENCES 1) Moores EM, RB. Scott, WW Lumsden (1968) "Tertiary Tectonics of the White Pine- Grant Range Region, East-Central Nevada, and some Regional Implications "GSA Bull 79 No 12 pp 1703-1726

2) Stewart, JH, JE Carlson "Preliminary Geologic Map of Nevada" USGS MF 609

3) Kleinhampl, FJ, JI Ziony (1967) "Preliminary Geological Map of Northern Nye County, NV" USGS Open File Map

4) "NYE County Nevada Data File" Nev Dept Econ Dev (1977)

5) "Currant Mtn 15 minute Quadrangle" USGS (1952)



TOPOGRAPHY OF SITE 27

REF: USGS TOPOGRAPHIC SHEET, CURRANT MOUNTAIN QUADRANGLE, NV., 15'.

SCALE 1:62,500

DATA SHEET

SITE NO. 28

I. GENERAL

Location 38°50'N, 115° 20'W, T11N, R59E

Geomorphic Feature Horse Range

Elevation 1966 m (6450 ft)

Vegetation Types Pinon, Juniper, Sagebrush

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 18 m (60 ft)

Maximum Relief of 40 ha Operations Area 24 m (30 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 12 m (40 ft)

III. GEOLOGY

Rock Type, Name, Age Granite Porphyry, (or possibly Rhyolite Porphyry) Southern Currant Stock, Tertiary

Intruded Rock Type, Name, Age Carboniferous Sediments & Tertiary Volcanics

Area of Exposed Rock Mass 2.6km^2 (1 mi^2)

Surface Rock Mass Competency

Faults None reported

Joints

Distance to Nearest Historic Surface Break 85 km

Distance to Nearest Upper Cenozoic Fault 13km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 1 km Currant Summit

Site Potential for Mineral Development Mod

4 km^2 Area at Depths of 300-1,500 m? Prob

Distance to Nearest Volcanic Vent Younger Than 10 m Years 53 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Northern Railroad Valley, Central Region

Groundwater Discharge 0

Surface Discharge 0

Where Does Surface Water Go? Railroad Dry Lake

Where Does Groundwater Go? Railroad Dry Lake

Distance to Nearest Spring Within 5 km 2.9 km

Number of Springs Within 5 km 3

Distance To and Names of Perennial Streams Within 5 km 1.2 km Little Currant Creek

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 21 km Railroad

Distance to Nearest Water Well In Use 4 km (11N, 59E, 16b)

Depth to Water in Nearest Well NA

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 10 km Currant Cr

V. DEMOGRAPHY

Nearest Town, Population, and Distance Duckwater, 20, 33 km

Nearest Human Habitation and Number of People

Distance to State Boundary 110 km

Distance to and Name of Nearest Active Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km 3.8 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km 0

Land Ownership (State, Federal, Private) National Forest

Land Use Grazing, Lumber, Recreation

Number of Old Mines Within 10 km 2

Number of Oil and Gas Exploratory Holes Within 10 km 1

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 48 km

Distance to Nearest Military Range From Boundary 260 km

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 1.2 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 8

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 69

Maximum Expected Acceleration From NTS Blasts 0.01lg

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15-32°C (59-89°F)

Average Daily Temperature Range, Coldest Month At Tonopah -7 to 4°C 920-40°F)

Annual Precipitation 30 cm (12in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE 141°126 HENDERSON -

BOULDER CITY - TONOPAH 243°,183 ELY 40°,60 FALLON

HAWTHORNE - RENO - CARSON CITY -

Distance to And Location of Nearest Meteorological Station 60 km Ely

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Probably

Reported or Observed Historical Site Within 5 km? None

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 219 km Southwest Gas

Distance to and Name of Nearest Power Line 5 km Ely Light & Power

Route Distance to and Ownership of Nearest Railroad 221 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 5 km US 6

Type of Nearest Paved Highway 2 Lane

Route Distance to and Name of Support Town 68 km Ely

Population of Support Town 6216

Route Distance to and Name of Nearest Commercial Airport 68 km Ely

*Only locations within 200 km are evaluated.

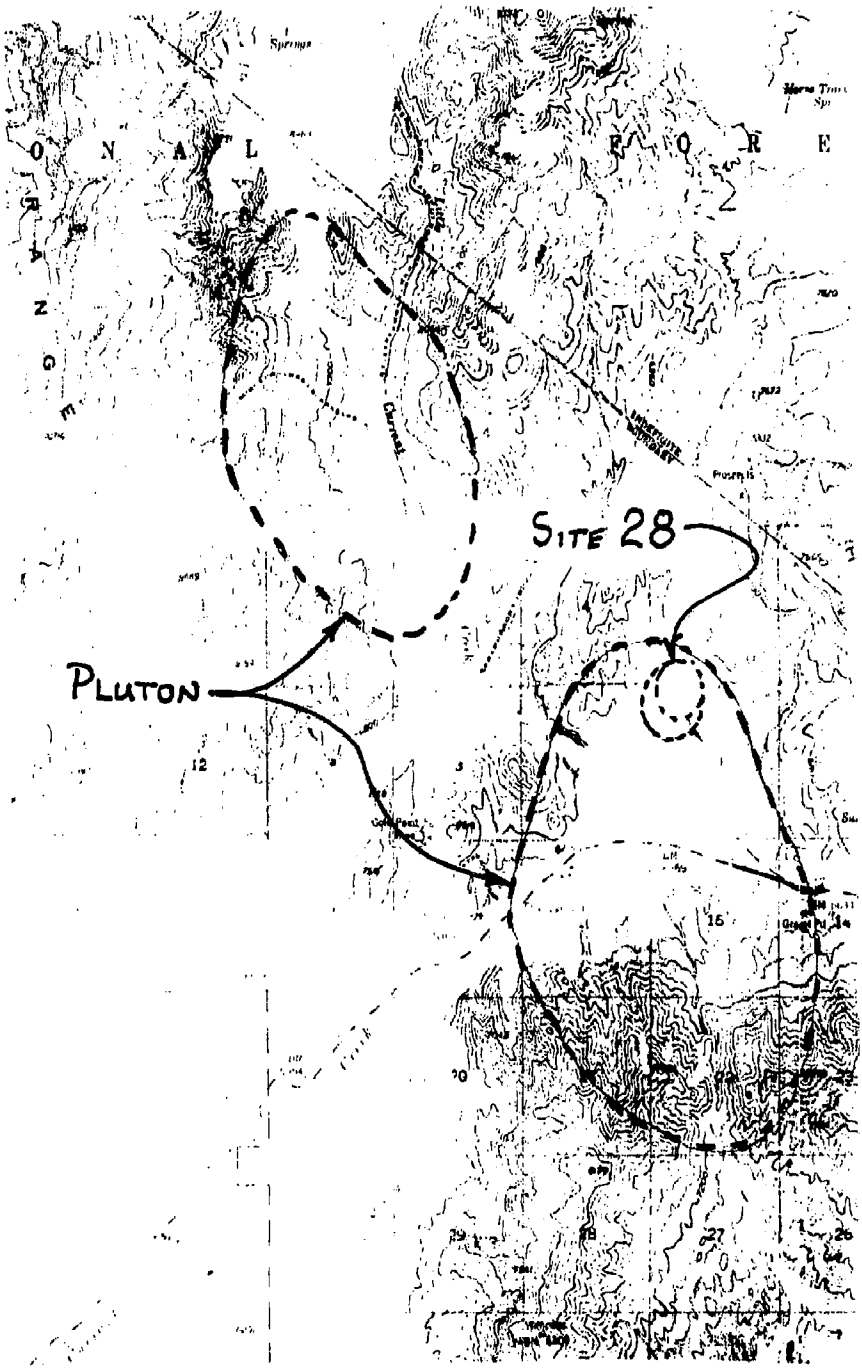
REFERENCES 1) Morres EM, RB, Scott, WE Lumsden (1968) "Tertiary Tectonics at the White Pine-Grant Range Region, East-Central Nevada, and some regional implications "GSA Bull 79 No 12 pp 1703 - 1726)

2) Stewart, JH, JE Carlson "Preliminary Geologic Map of Nevada" USGS MF 609

3) Kleinhampl, FJ, JI Ziony (1967)"Preliminary Geological Map of Northern Nye County, NV" USGS Open File Map.

4)"NYE County Nevada Data File" Nev Dept Econ Dev (1977)

5) "Currant Mtn 15 minute Quadrangle" USGS (1952)



TOPOGRAPHY OF SITE 28

REF.: USGS TOPOGRAPHIC SHEET, CURRANT MOUNTAIN QUADRANGLE, NV., 15'.

SCALE 1:62,500

DATA SHEET

SITE NO. 29

I. GENERAL

Location $38^{o}22'N, 115^{o}35'W$ T6N, R57E

Geomorphic Feature Grant Range

Elevation 1676 m (5500 ft)

Vegetation Types Sagebrush, Pinon, Juniper

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 122 m (400 ft)

Maximum Relief of 40 ha Operations Area 145 m (400 ft)

Degree of Rock Mass Dissection Mod

Maximum Relief Between Paved Road & Site 98 m/50 km (320 ft)

III. GEOLOGY

Rock Type, Name, Age Quartz Monzonite, Troy Peak Stock, Cretaceous/L.Tert.

Intruded Rock Type, Name, Age Precambrian & Paleozoic Clastics & Carbonates

Area of Exposed Rock Mass 23 km^2 (9mi^2)

Surface Rock Mass Competency Mod

Faults none reported

Joints

Distance to Nearest Historic Surface Break 68 km

Distance to Nearest Upper Cenozoic Fault 1 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace Forms Boundry, Irwin Canyon Thrust

Site Potential for Mineral Development Good

4 km^2 Area at Depths of 300-1,500 m? YES

Distance to Nearest Volcanic Vent Younger Than 10 m Years 35 km

Distance to Nearest KGRA Within 40 km None

IV. HYDROLOGY

Site in a Closed Groundwater Basin? No

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Northern Railroad Valley, Central Region

Groundwater Discharge None reported

Surface Discharge None

Where Does Surface Water Go? To Railroad Valley Dry Lake

Where Does Groundwater Go? No Discharge Reported

Distance to Nearest Spring Within 5 km 4 km

Number of Springs Within 5 km 14

Distance To and Names of Perennial Streams Within 5 km Troy Creek

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 3 km Railroad

Distance to Nearest Water Well In Use 2 flowing wells @ 5 km

Depth to Water in Nearest Well above surface

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 4½ km

V. DEMOGRAPHY

Nearest Town, Population, and Distance 110 km, 250 Lund

Nearest Human Habitation and Number of People -

Distance to State Boundary 134 km

Distance to and Name of Nearest Active Mine Within 25 km None

Distance to Nearest Farm/Ranch Within 25 km 10 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land -

Distance to and Types of Restricted Lands Within 20 km -

Land Ownership (State, Federal, Private) National Forest

Land Use Grazing, Recreation

Number of Old Mines Within 10 km 4

Number of Oil and Gas Exploratory Holes Within 10 km 1

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 22 km

Distance to Nearest Military Range From Boundary 80

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 24 km

Site Out of View of Existing Paved Roads? Yes

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km; m = 4+ 17

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 5-6

Distance to Largest Earthquake's Epicenter Within 100 km 59

Maximum Expected Acceleration From NTS Blasts 0.016g

Reported or Observed Recent Fault Scarp Within 5 km? none

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15032°C (59-89°F)

Average Daily Temperature Range, Coldest Month At Tonopah -7 to 4°C (20-40°F)

Annual Precipitation 30 cm (12 in)

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS 172°,245 PIOCHE 75°,102 HENDERSON

BOULDER CITY TONOPAH 258°,146 ELY 30°,118 FALLON

HAWTHORNE RENO CARSON CITY

Distance to And Location of Nearest Meteorological Station 108 Pioche

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? Probably are along Troy Cr

Reported or Observed Historical Site Within 5 km? Yes, Mining Camp of Troy

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 208 km Southwest Gas

Distance to and Name of Nearest Power Line 30 km Sierra Pacific Power

Route Distance to and Ownership of Nearest Railroad 253 km Union Pacific

Route Distance to and Name of Nearest Paved Highway 50 km, US 6

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 134 km Ely

Population of Support Town 6216

Route Distance to and Name of Nearest Commercial Airport 134 Ely

*Only locations within 200 km are evaluated.

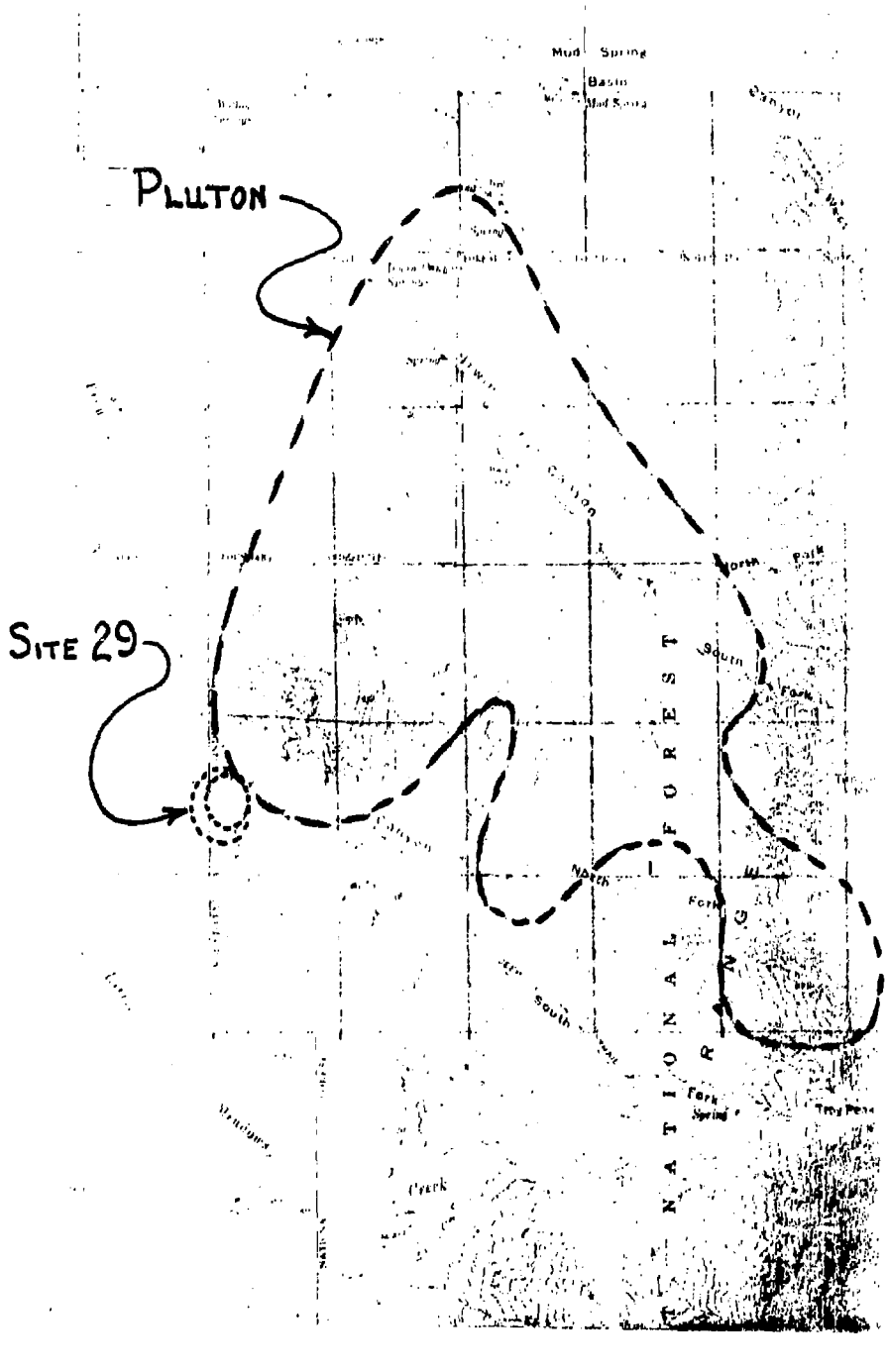
REFERENCES 1) Cebull, Sec (1967) "Bedrock Geology of the Southern Grant Range, Nye County, Nevada" Univ. Wash Thesis

2) Cebull, S.E. "Bedrock Geology and Orogenic Seccession in Southern Grant Range, Nye County, Nevada" AAPG Bull Vol 54 pp 1828-1842

3) Kleinhampl, F.J., J.I. Ziony (1967) "Preliminary Geologic Map of Northern Nye County, NV" USGS Open File Map

4) "Nye County Nevada Data File" Nev Dept Econ Dev (1977)

5) "Troy Canyon 15 minute Quadrangle" USGS (1964)



TOPOGRAPHY OF SITE 29

REF.: USGS TOPOGRAPHIC SHEET, TROW CANYON QUADRANGLE, NV., 15'.

SCALE 1:62,500

DATA SHEET

SITE NO. 30

(Paradise Peak Quad- 15')

I. GENERAL

Location Nye Co. T13N, R36E, 38°55'N, 117°54'W

Geomorphic Feature Paradise Range

Elevation 1524 m (5000')

Vegetation Types Salt Desert Shrub

II. TOPOGRAPHY

Maximum Relief Of 20 ha Operations Area 30 m (100')

Maximum Relief of 40 ha Operations Area 40 m (130')

Degree of Rock Mass Dissection High

Maximum Relief Between Paved Road & Site 60 m (200')

III. GEOLOGY

Rock Type, Name, Age Granodiorite, diorite Mesozoic - Tertiary

Intruded Rock Type, Name, Age ls, dol, slt Upper Triassic - Lower Jurassic

Area of Exposed Rock Mass 9 km^2

Surface Rock Mass Competency

Faults

Joints

Distance to Nearest Historic Surface Break 11 km

Distance to Nearest Upper Cenozoic Fault 5 km

Rock Mass in an Overthrust? No

Distance to and Name of Nearest 5+km-Long Fault Trace 4.4 km (?)

Site Potential for Mineral Development Mod

4 km^2 Area at Depths of 300-1,500 m? Yes

Distance to Nearest Volcanic Vent Younger Than 10^6 Years 90 km

Distance to Nearest KGRA Within 40 km - inside prospective area

IV. HYDROLOGY

Site in a Closed Groundwater Basin? Yes

Site in an Interstate GW Basin? No

Name of Site's GW Region & Basin Central Region (10), Gabbs Valley (122)

Groundwater Discharge None

Surface Discharge None

Where Does Surface Water Go? Within Basin

Where Does Groundwater Go? Within Basin

Distance to Nearest Spring Within 5 km None

Number of Springs Within 5 km None

Distance To and Names of Perennial Streams Within 5 km None

Distance to and Names of Lakes/Reservoirs Within 5 km None

Distance to and Names of Paleo Lakes Within 30 km 19 km - Gabbs

Distance to Nearest Water Well In Use 5 km (2 wells)

Depth to Water in Nearest Well 43 m (143 ft)

Site in Groundwater Recharge Area? Yes

Distance to Nearest Groundwater Discharge Area 9 km

V. DEMOGRAPHY

Nearest Town, Population, and Distance Gabbs, 874 pop, 11 km

Nearest Human Habitation and Number of People

Distance to State Boundary 73 km

Distance to and Name of Nearest Active Mine Within 25 km 1 km - El Capitan (Tungsten) Bus. L. Hedgecorth

Distance to Nearest Farm/Ranch Within 25 km

VI. LAND STATUS

Is Site Located on Restricted Land? No

Type of Restricted Land

Distance to and Types of Restricted Lands Within 20 km None

Land Ownership (State, Federal, Private) Federal

Land Use

Number of Old Mines Within 10 km 100

Number of Oil and Gas Exploratory Holes Within 10 km 0

VII. SAFETY/SECURITY

Distance to Nearest Airline Corridor From Boundary 37 km (within restricted area)

Distance to Nearest Military Range From Boundary 34 km (NAAS)

Distance to Nearest Non-Restricted Paved Road in Use From Boundary 3.7 km

Site Out of View of Existing Paved Roads? No

VIII. SEISMICITY

Number of Recorded Earthquakes Within 100 km: m = 4+ 157

Record Period '81-'77

Magnitude of Largest Earthquake Within 100km 7-8

Distance to Largest Earthquake's Epicenter Within 100 km 27

Maximum Expected Acceleration From NTS Blasts 0.009 g

Reported or Observed Recent Fault Scarp Within 5 km? None

IX. METEOROLOGY

Average Daily Temperature Range, Hottest Month At Tonopah 15°-32°C

Average Daily Temperature Range, Coldest Month At Tonopah -7° to 4°C

Annual Precipitation 20 cm

IX. METEOROLOGY (Continued)

* Azimuth and Distance To: LAS VEGAS - PIOCHE - - HENDERSON -

BOULDER CITY - TONOPAH 146°/113km ELY - FALLON 309°/90km

HAWTHORNE 232°/73km RENO 293°/170km CARSON CITY 280°/156 km Bishop 194°/174

Distance to And Location of Nearest Meteorological Station

X. ARCHEOLOGY/HISTORY

Reported or Observed Archeological Site Within 5 km? None

Reported or Observed Historical Site Within 5 km? Yes

XI. LOGISTICS

Distance to and Name of Nearest Gas Line 8 km - Southwest Gas

Distance to and Naae of Nearest Power Line 3 km Sierra Pacific

Route Distance to and Ownership of Nearest Railroad 55 km - SP

Route Distance to and Name of Nearest Paved Highway 5.5 km State Highway 23

Type of Nearest Paved Highway 2 lane

Route Distance to and Name of Support Town 15 km Gabbs, NV

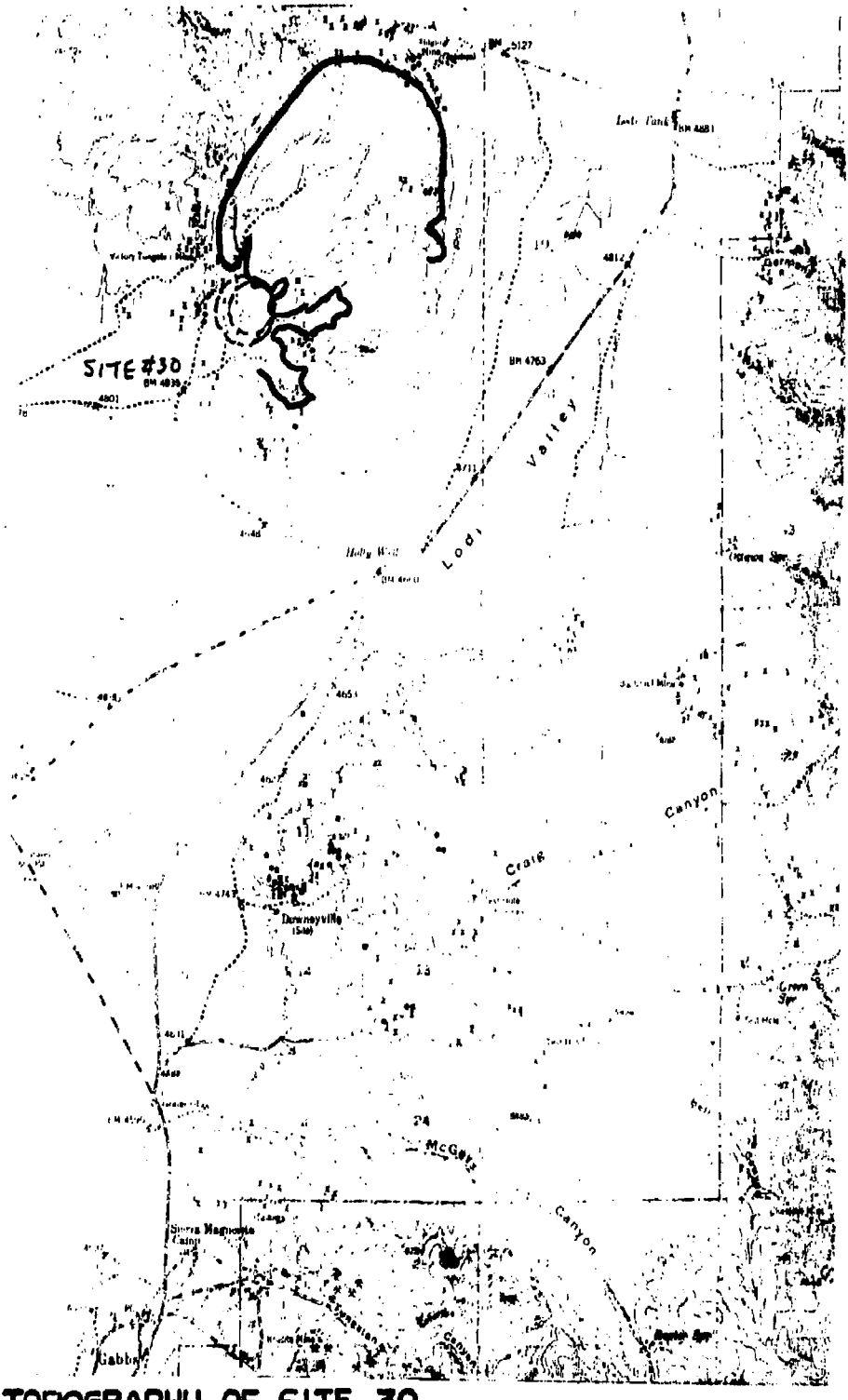
Population of Support Town 874

Route Distance to and Name of Nearest Commercial Airport 205 km - Bishop, CA

*Only locations within 200 km are evaluated.

REFERENCES GQ-250 "Geol, of the Paradise Peak Quad, Nev."

USGS, C.J. Vitaliano & E. Callaghan



TOPOGRAPHY OF SITE 30

REF: USGS TOPOGRAPHIC SHEET, PARADISE PEAK QUADRANGLE, NV., 15'

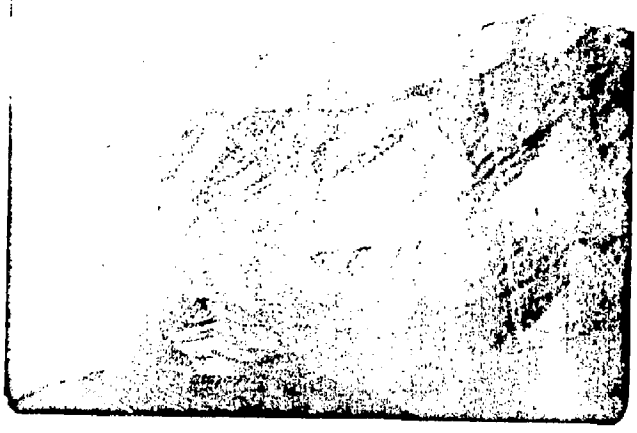
SCALE 1: 62,500

APPENDIX B

SITE AERIAL PHOTOGRAPHS

(Numerical Order)

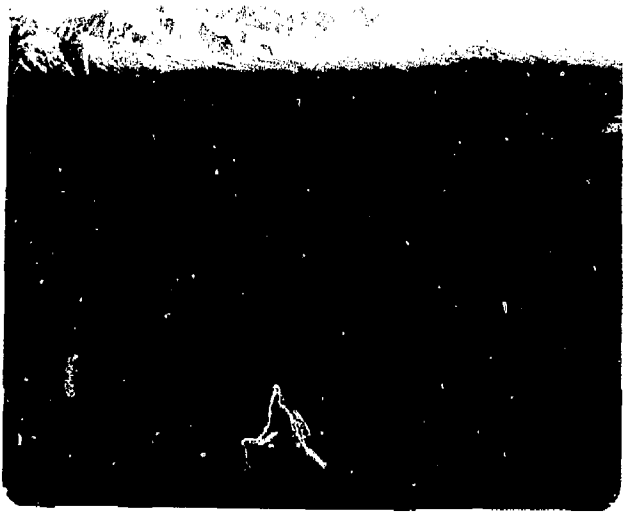
Site 1. Lucy Grey Range, Precambrian gneiss.



Site 2. Lone Mountain Pluton.

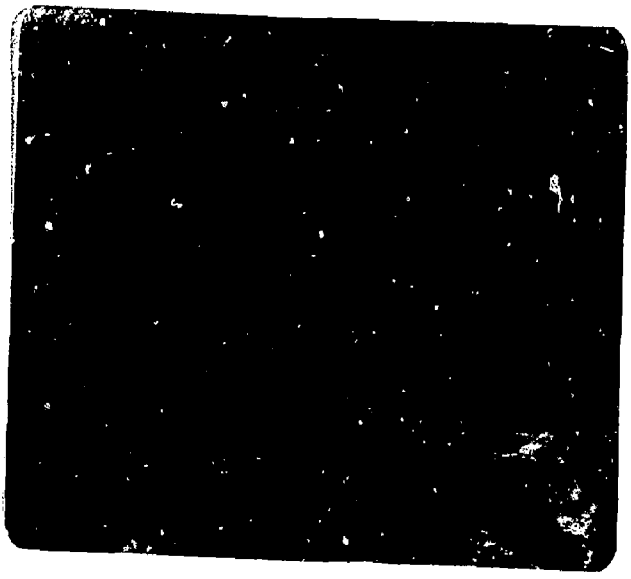
Site 3. Weepah Pluton.

Site 4. Mineral Ridge Pluton.

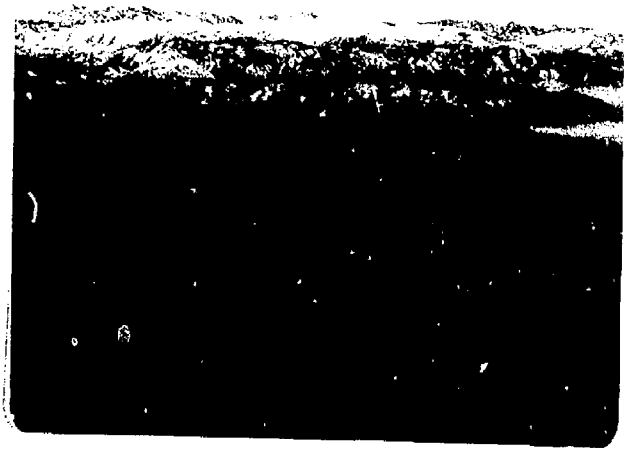


Site 5. Dyer Pluton.

Site 6. Inyo Batholith.



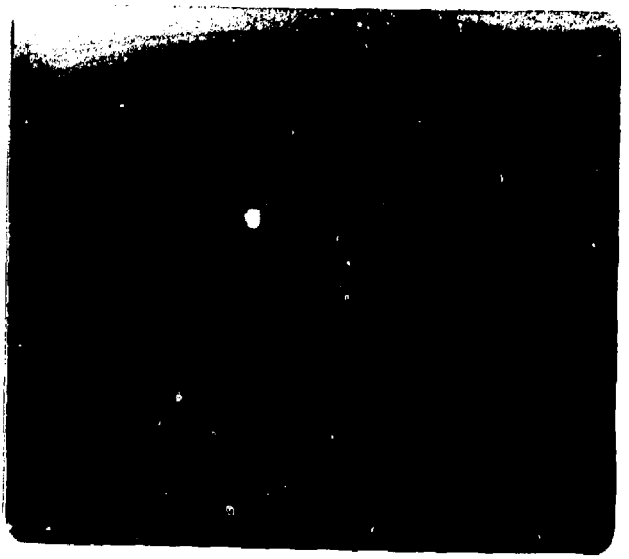
Site 7. Palmetto Pluton.



Site 8. Palmetto Wash Pluton.

Site 9. Sylvania Pluton.

Site 10. Mormon Mountains, Precambrian igneous and metamorphic rocks.



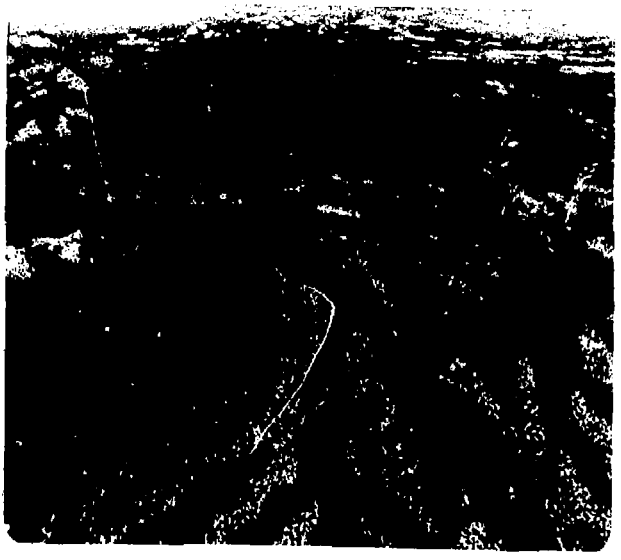
Site 11. East Mormon Mountains, Precambrian igneous and metamorphic rocks.

Site 12. Five small stocks in northern Groom Range.

Site 13. Two small stocks in Timpahute Range.

Site 14. Two small stocks at north end of Worthington Mountains.

Site 15. Stock at south end of Schell Creek Range.



Site 16. Dioritic stocks of the Cedar Range.

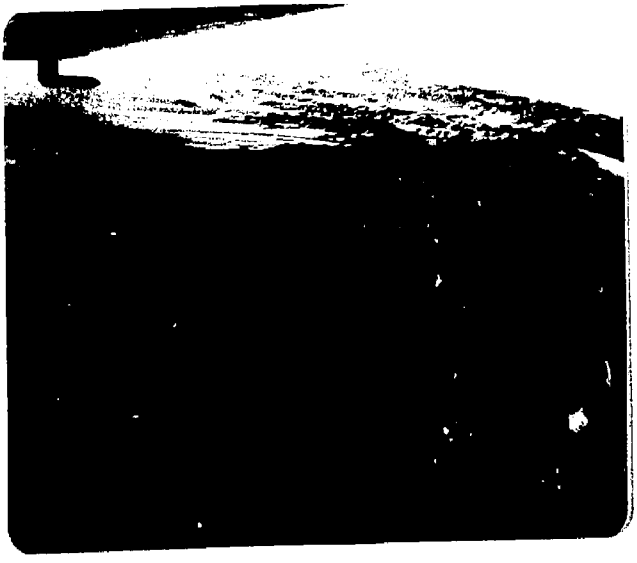
Site 17. Granite porphyry stock on west side of Delamar Mountains.

Site 18. Diorite stock in Clover Mountains.

Site 19. Quartz monzonite stock in southern Bristol Range.

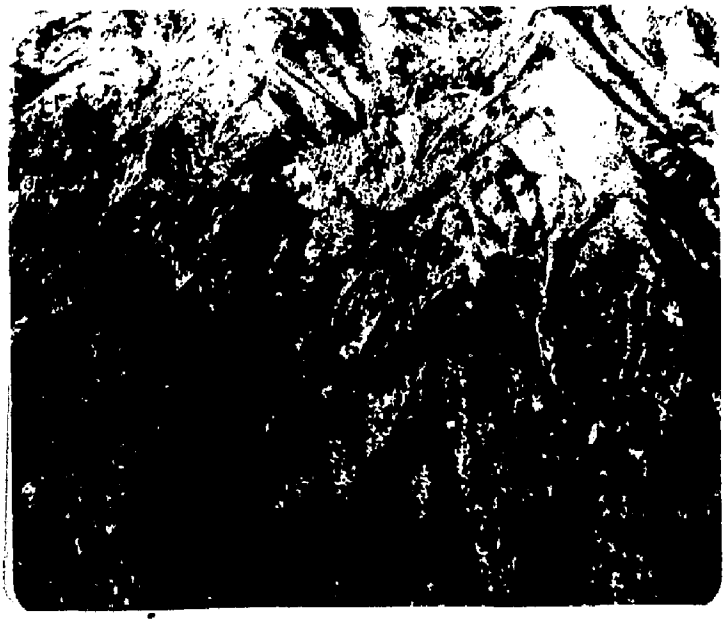
Site 20. Round Mountain pluton, southern Toquima Range.

Site 21. Manhattan district intrusive, southern Toquima Range.



Site 22. Clipper Gap Pluton, northern Toquima Range.

Site 23. Carseley Creek and Aiken Creek Plutons, central Toiyabe Range.



Site 24. "Wood's Ranch" pluton, east of Toiyabe Range.

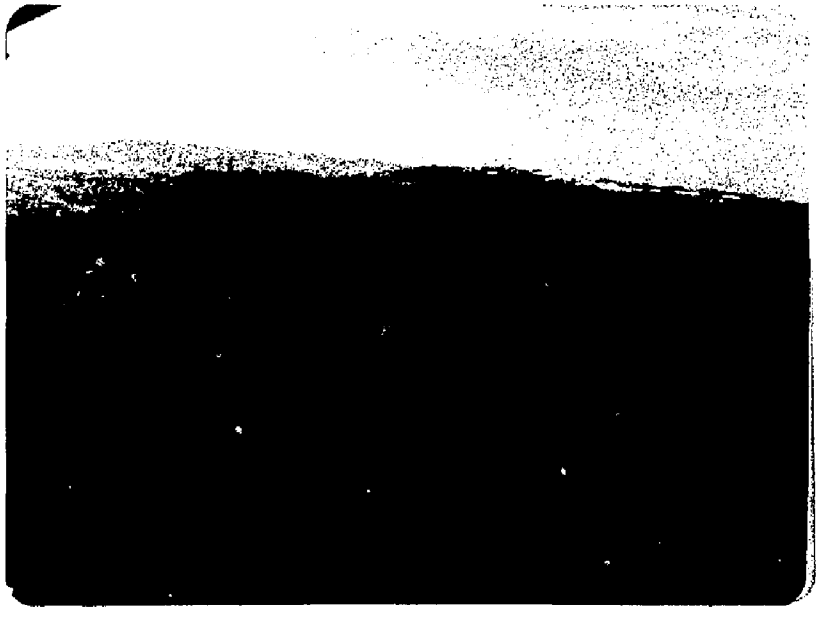
Site 25. "Millett's Ranch" pluton, east side of Toiyabe Range.

Site 26. "Alkali Flat" pluton, east side of Toiyabe Range.

Site 27. Railroad Stock, southern White Pine Range.

Site 28. Currant Stock, southern White Pine Range.

Site 29. Troy Peak Stock, Grant Range.



Site 30. Plutons of Paradise Range, northwestern corner of Nye County.

APPENDIX C

DATA SOURCES USED TO DETERMINE SITE CHARACTERISTICS LISTED IN PLATE VI

Site Characteristic Number	Data Source
1- 5	USGS Topographic Sheets
6	Geologic Maps Referenced on Site Data Sheets
7	On-Site Investigations and Geologic Reports Referenced on Site Data Sheets
8	Mullineaux - 1976 (Zone B=2, Zone C=1)
9	Mullineaux-1976
10	Geologic Maps Referenced on Site Data Sheets
11	Stewart and Carlson - 1976 (Figure 2)
12-14	Geologic Maps Referenced on Site Data Sheets
15	NOAA - 1977 (Figure 7)
16-17	Rogers, etal - 1977 (Figure 27)
18-20	Nevada State Division of Water Resources - 1972 (Plate II)
21	Geologic Maps Referenced on Site Data Sheets
22	Nevada State Division of Water Resources - 1972 (Figure 3)
23-24	Nevada Department of Conservation and Natural Resources - Reconnaissance Series Reports
25-26	Nevada State Division of Water Resources - 1972 (Plate II)
27-30	USGS Topographic Sheets
31	Nevada State Division of Water Resources - 1972 (Figure 4)
32	USGS Topographic Sheets, State of Nevada Road Map
33	State of Nevada Road Map
34-35	On-Site Investigation
36	USGS Topographic Sheets and On-Site Investigation

APPENDIX C (Con't)

DATA SOURCES USED TO DETERMINE SITE CHARACTERISTICS LISTED IN PLATE VI

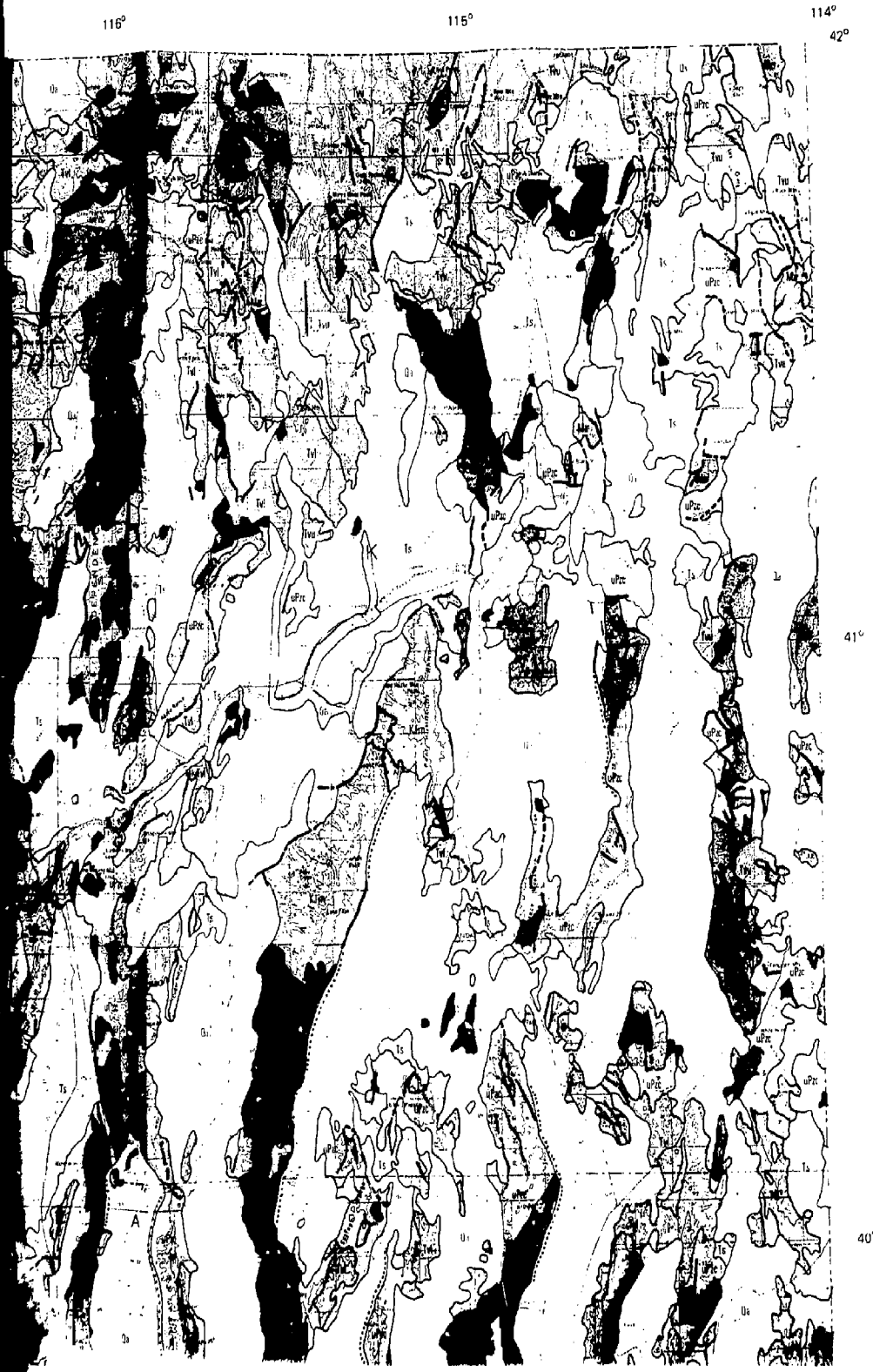
Site Characteristic Number	Data Source
37	USGS Topographic Sheets
38	Payne and Papke - 1977 (Figure 9)
39	USGS Topographic Sheets, County Geologic Maps
40	Garside & Schilling - 1977 (Figure 8)
41-44	Lutsey & Nichols - 1977 (Plate V)
45	NOAA - Oct. 1977
46	State of Nevada Road Map
47-48	USGS Topographic Sheets
49	Paher - 1970 (Figure 11)
50	Algermissen and Perkins - 1976
51	ERC - 1974
52-53	NOAA - 1978 (Plate III)
54-55	County Data Files (Nye, Clark, Esmeralda, Lincoln) Nevada State Department of Economic Development
56	Division of Water Resources - 1972
57-59	Lockard - 1970 (Figure 10)
60-62	Nevada State Road Map
63	USGS 1:250,000 Topographic Sheets


120°
119
42°
41°
40°

PREPARED IN COOPERATION WITH THE U. S. GEOLOGICAL SURVEY

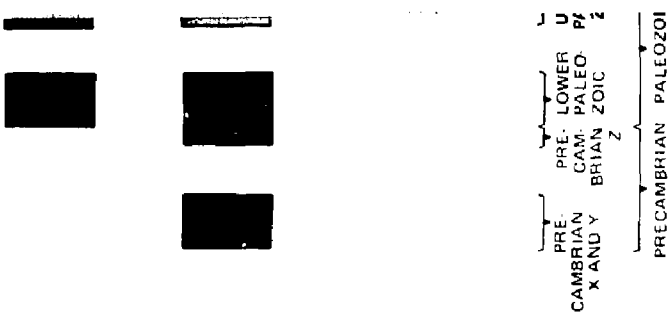
MAP 57 GEOLOGIC MAP OF NEVADA

PLATE I




JURASSIC OR
CRETACEOUS
mostly 6-17 less than
17-43 m.y. 6 m.y.
m.y. old
TERTIARY
QUATERNARY
MESOZOIC
CENOZOIC
119°
38°
118°

118°



Qe — ALLUVIAL AND PLAYA DEPOSITS Locally includes alluvial deposits that may be as old as Tertiary

VOLCANIC ROCKS (less than 6 m.y. old) Mostly basalt. Sparse andesite and rhyolite

Tvu — UPPER VOLCANIC ROCKS (6-17 m.y.) Basalt, andesite, rhyolite, silicic tuff, and related rocks. Sparse tuffaceous sedimentary rocks and gravel

Ts — TUFFACEOUS SEDIMENTARY ROCKS (6-17 m.y.) Locally includes minor amounts of tuff. In places, may include rocks of Quaternary age

Tvl — LOWER VOLCANIC ROCKS (Mostly 17-43 m.y.) Silicic tuff, rhyolite, andesite, and related rocks. Minor amounts of sedimentary rocks, mostly tuffaceous. Very sparse basalt. Includes some sedimentary rocks of Tertiary or Cretaceous age, older than 43 m.y.

INTRUSIVE ROCKS Granitic and dioritic rocks of Mesozoic and Tertiary age. Also includes silicic, intermediate, and mafic porphyritic or aphanitic intrusive rocks of Tertiary age

KJm — IGNEOUS AND METAMORPHIC COMPLEX (Jurassic or Cretaceous intrusive and metamorphic age) Complexly intermixed Mesozoic granitic rocks and metamorphosed lower Paleozoic and uppermost Precambrian sedimentary rocks. Southern Elko County

MTu — SEDIMENTARY, VOLCANIC, AND INTRUSIVE ROCKS (Mesozoic) Mostly claystone, shale, siltstone, sandstone, conglomerate, limestone, and dolomite, or their metamorphic equivalents. Includes abundant volcanic rocks or volcanogenic clastic rocks in western Nevada. Also includes volcanic rocks of the Lower Triassic Koipato Group and related leucogranite and rhyolite porphyry in central Nevada and Lower and Middle Jurassic gabbro and basalt in Churchill and Pershing Counties. Locally includes rocks as old as Permian

Osa — SILICEOUS AND VOLCANIC ASSEMBLAGE (Upper Paleozoic) Rocks of the eugeosynclinal belt of Cordilleran geosyncline in western and central Nevada. Consists of chert, argillite, shale, and minor amounts of siltstone, sandstone, conglomerate, and limestone. Mafic volcanic rocks locally abundant. Mainly allochthonous rocks thrust eastward in the upper plate of the Golconda thrust. May include some Triassic rocks in western Nevada

uPzc — CARBONATE AND SILICEOUS DETRITAL ROCKS (Upper Paleozoic) Includes thin sequences of conglomerate, siltstone, and limestone within the Antler orogenic belt; relatively thick sequences of shale, siltstone, sandstone, conglomerate, sandy limestone, and limestone along the eastern margin of the Antler orogenic belt or in foreland basin to east; and moderately thin to thick sequences of carbonate rock in foreland basin or on shelf. Includes Candelaria Formation (Early Triassic) in Mineral, Esmeralda, and northern Nye Counties

SILICEOUS AND VOLCANIC ASSEMBLAGE (lower Paleozoic) Rocks in the eugeosynclinal belt of the Cordilleran geosyncline in western and central Nevada. Consists of chert, shale, argillite, siltstone, sandstone, quartzite, limestone, and greenstone. Mainly allochthonous rocks in upper plate of Roberts Mountains thrust. Includes some strata that may be para-autochthonous or autochthonous and in lower plate

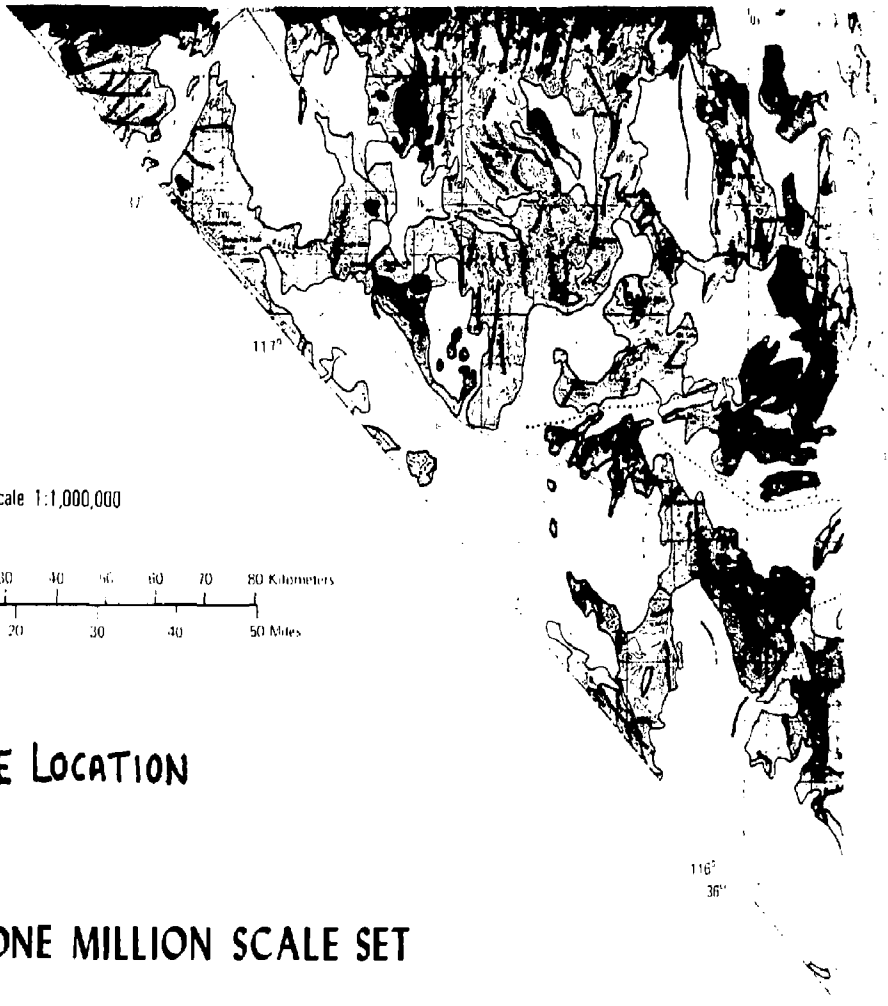
Pzlc — CARBONATE AND TRANSITIONAL ASSEMBLAGES (Precambrian Z and lower Paleozoic) Rocks of the miogeosynclinal belt of the Cordilleran geosyncline. The carbonate assemblage (eastern and part of central Nevada) consists of limestone, dolomite, and minor amounts of shale, siltstone, sandstone, and quartzite. The transitional assemblage (central and western Nevada) consists of shale, limestone, and minor amounts of chert, silty limestone, and limy siltstone. Precambrian Z and Lower Cambrian rocks associated with the carbonate assemblage consists of quartzite, sandstone, conglomerate, siltstone, and minor amounts of limestone and dolomite. Precambrian and Lower Cambrian rocks associated with the transitional assemblage consist of phyllitic siltstone and lesser amounts of limestone, dolomite, sandstone, and quartzite

METAMORPHIC AND INTRUSIVE ROCKS (Precambrian X and Y) Gneiss and schist, including folded granitic lenses 1,740±25 m.y. old (L. T. Silver, oral commun., 1973), intruded by porphyritic rapakivi granite 1,450±25 m.y. old (L. T. Silver, oral commun., 1973)

HIGH-ANGLE FAULT Dashed where approximately located or uncertain; dotted where concealed.

STRIKE-SLIP FAULT Dashed where approximately located or uncertain, dotted where concealed. Arrows indicate relative movement.

LOW-ANGLE FAULT Dashed where approximately located or uncertain, dotted where concealed. Sawteeth on upper plate.



(15) SITE LOCATION

ONE MILLION SCALE SET

GEOLOGIC MAP OF NEVADA

John H. Stewart and John E. Carlson

1977

Geologic map generalized
Nevada" by J. H. Ste
logical Survey Miscel
1974)

Base from U.S. Geological
scale, 1965

First edition, first printing
Printed by Williams and Hi
Cartography by Susan L. N

Nevada Bureau of Mines ar
University of Nevada, Reno
Price $3.50

Geologic map generalized from "Preliminary geologic map of Nevada" by J. H. Stewart and J. E. Carlson (U.S. Geological Survey Miscellaneous Field Studies map MF-609, 1974)

Base from U.S. Geological Survey State of Nevada, 1:500,000 scale, 1965

First edition, first printing, 1977. 2000 copies
Printed by Williams and Heintz Map Corp., Washington, D. C.
Cartography by Susan L. Nichols

Nevada Bureau of Mines and Geology
University of Nevada, Reno, NV 89557
Price $3.50

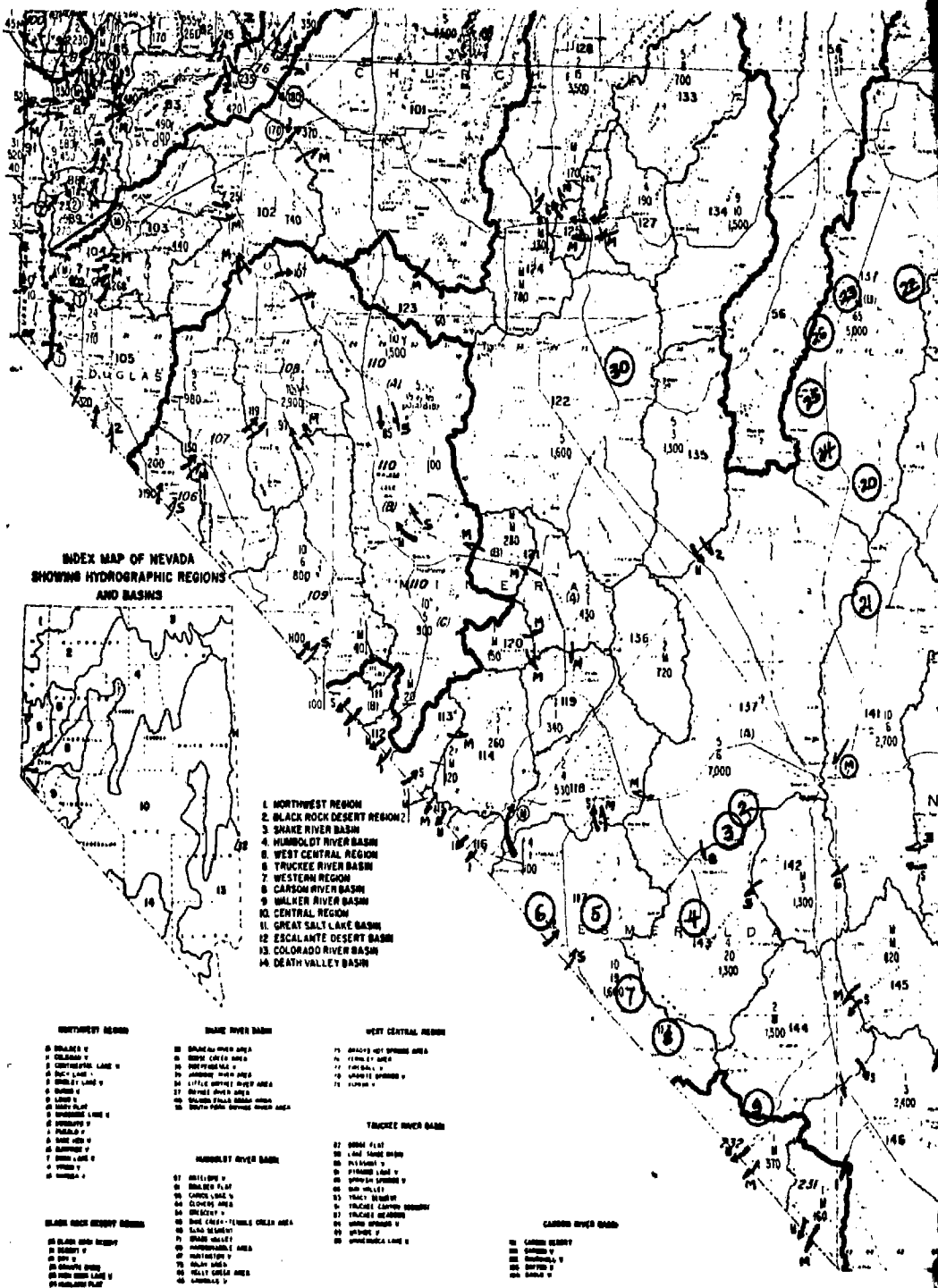
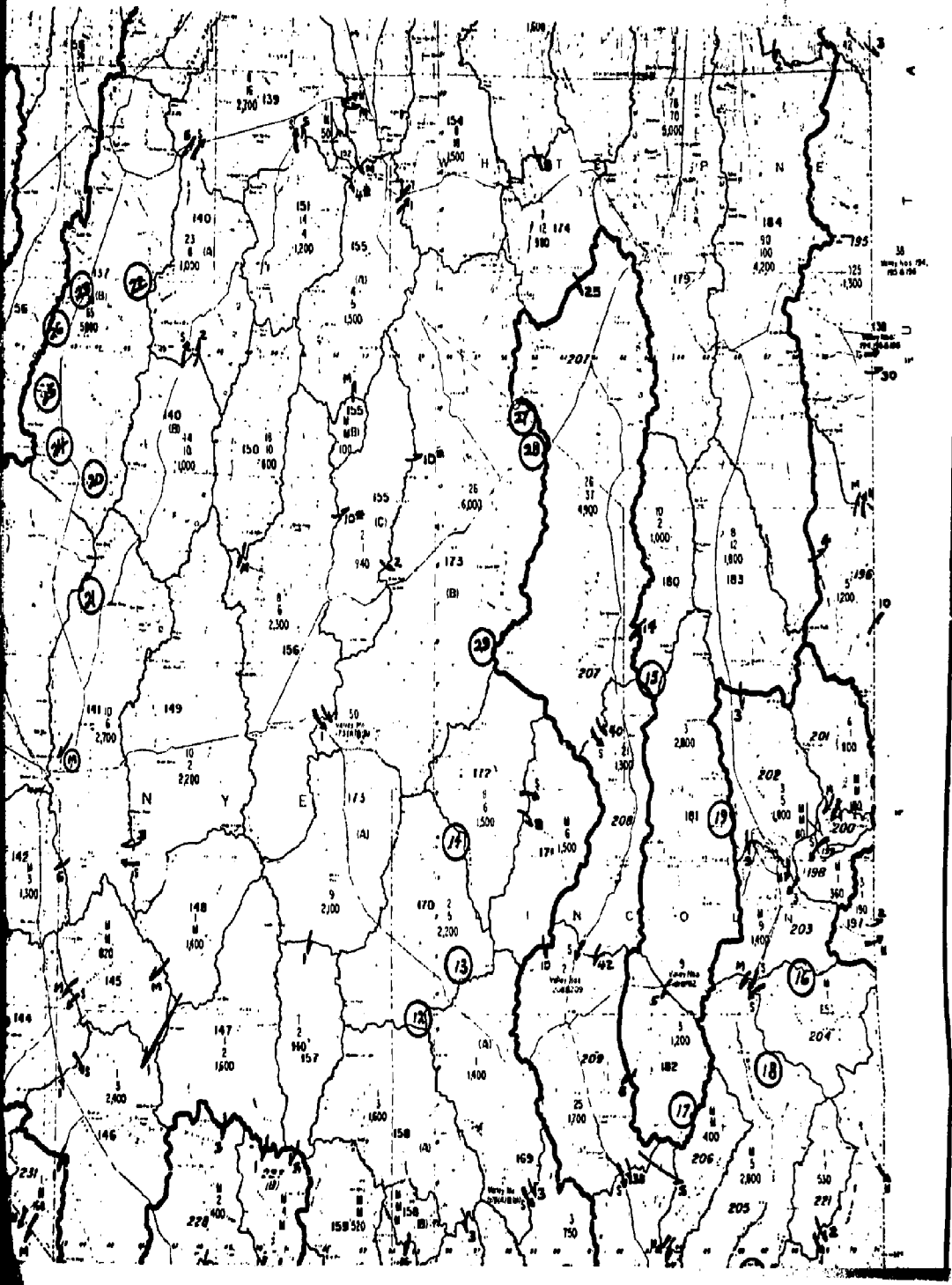
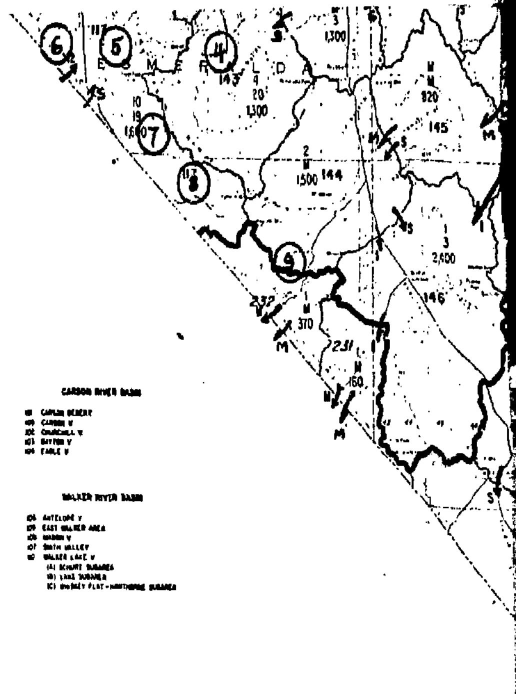

INDEX MAP OF NEVADA
SHOWING HYDROGRAPHIC REGIONS
AND BASINS
1. NORTHWEST REGION
2. BLACK ROCK DESERT REGION
3. SNAKE RIVER BASIN
4. HUMBOLDT RIVER BASIN
5. WEST CENTRAL REGION
6. TRUCKEE RIVER BASIN
7. WESTERN REGION
8. CARSON RIVER BASIN
9. WALKER RIVER BASIN
10. CENTRAL REGION
11. GREAT SALT LAKE BASIN
12. ESCALANTE DESERT BASIN
13. COLORADO RIVER BASIN
14. DEATH VALLEY BASIN

PLATE II.



8. CARSON RIVER BASIN
9. WALKER RIVER BASIN
10. CENTRAL REGION
11. GREAT SALT LAKE BASIN
12. ESCALANTE DESERT BASIN
13. COLORADO RIVER BASIN
14. DEATH VALLEY BASIN



NORTHWEST REGION

SNAKE RIVER BASIN

WEST CENTRAL REGION

TRUCKEE RIVER BASIN

HUMBOLDT RIVER BASIN

BLACK ROCK DESERT REGION

CARSON RIVER BASIN

WESTERN REGION

WALKER RIVER BASIN

CENTRAL REGION

GREAT SALT LAKE BASIN

ESCALANTE DESERT

COLORADO RIVER BASIN

DEATH VALLEY BASIN

LEGEND

(All figures are in thousands of acre feet)

2 → Estimated annual surface water flow

2 → Estimated annual groundwater flow

② → Man made diversion. Surface water source - estimated annual amount

② → Man made diversion. Groundwater source - estimated annual amount.

② → Man made diversion. Spring source - estimated annual amount.

M M / M M Minor quantity. An amount which is either less than 500 acre feet per year, or small in comparison to other quantities in the particular hydrologic area.

S S Significant size. However, sufficient information is not currently available to make an estimate.

* Quantity uncertain. Figure shown represents annual discharge of springs which this flow is known to supply, at least in part.

12 Estimated annual runoff

12 Estimated perennial yield

1,200 Estimated storage

(17) SITE LOCATION

BASE: USGS TOPOGRAPHIC MAP OF NEVADA, EDITION OF 1965

EX

This map shows estimate[d] between hydrologic are[as] for each area where d[...] runoff, perennial yield o[...] the groundwater reserv[...] mated annual amount [...] mountains to the alluvi[...] Perennial yield is the a[...] moved from a hydrogra[...] the groundwater reser[...] able system yield is sh[...] yield is the maximum a[...] which can be removed f[...] for an indefinite period[...]

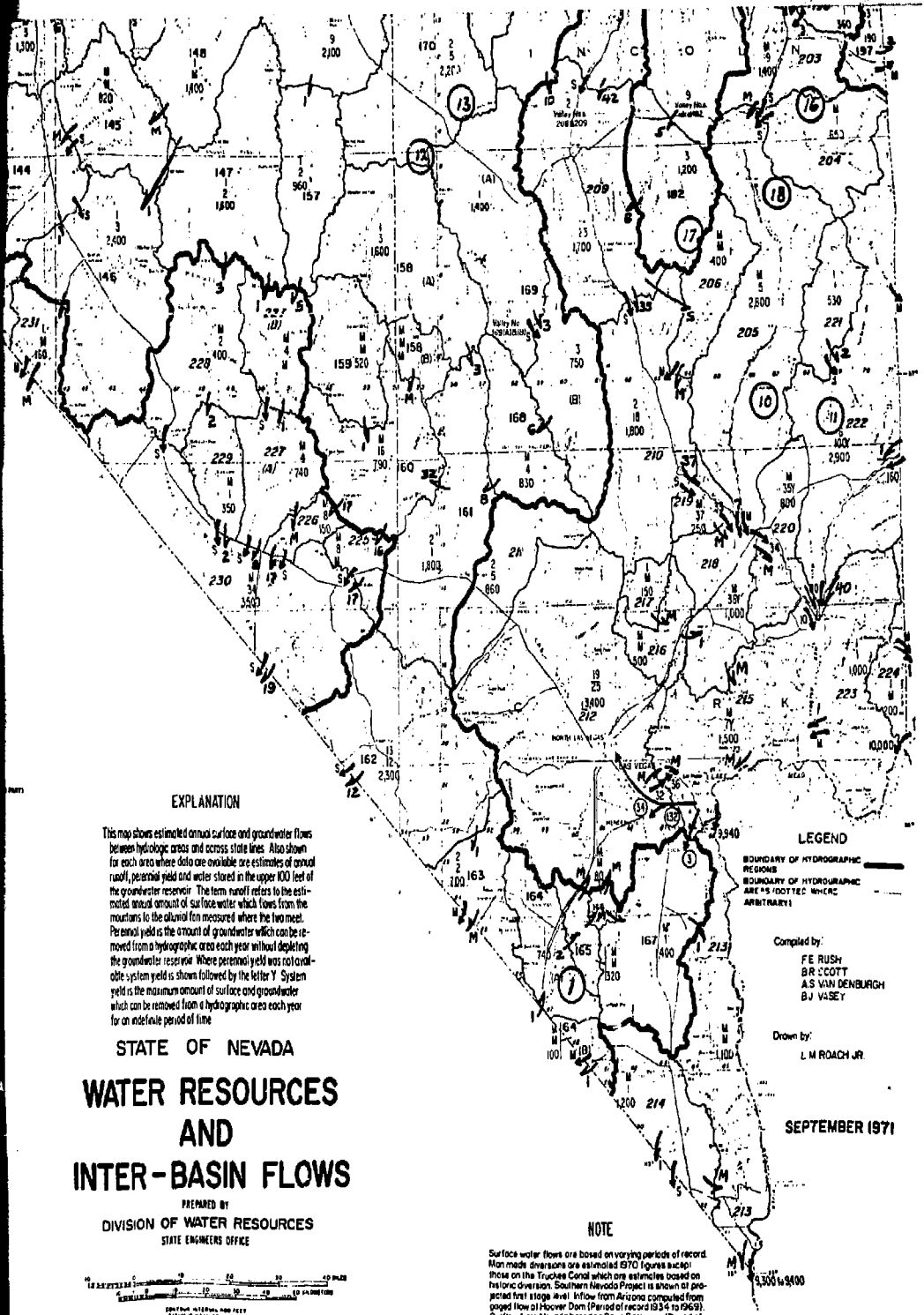
STATE

WATER R[...]

INTER-B[...]

DIVISION OF W[...]

STATE E[...]



EXPLANATION

This map shows estimated annual surface and groundwater flows between hydrologic areas and across state lines. Also shown for each area where data are available are estimates of annual runoff, perennial yield and water stored in the upper 100 feet of the groundwater reservoir. The term runoff refers to the estimated annual amount of surface water which flows from the mountains to the alluvial fan measured where the two meet. Perennial yield is the amount of groundwater which can be removed from a hydrographic area each year without depleting the groundwater reservoir. Where perennial yield was not available system yield is shown followed by the letter Y. System yield is the maximum amount of surface and groundwater which can be removed from a hydrographic area each year for an indefinite period of time.

STATE OF NEVADA

WATER RESOURCES AND INTER-BASIN FLOWS

PREPARED BY

DIVISION OF WATER RESOURCES

STATE ENGINEER'S OFFICE

LEGEND

BOUNDARY OF HYDROGRAPHIC REGIONS

BOUNDARY OF HYDROGRAPHIC AREAS (DOTTED WHERE ARBITRARY)

Compiled by:

F E RUSH

B R SCOTT

A S VAN DENBURGH

B J VASEY

Drawn by:

L M ROACH JR.

SEPTEMBER 1971

NOTE

Surface water flows are based on varying periods of record. Man made diversions are estimated 1970 figures except those on the Truckee Canal which are estimates based on historic diversion. Southern Nevada Project is shown at projected first stage level. Inflow from Arizona computed from gaged flow at Hoover Dam (Period of record 1934 to 1969). Outflow from Nevada based on Davis Dam gage (Period of record 1949-1969). Incline Village diversion estimated for 1971.

PREPARED WITH THE COOPERATION OF THE GEOLOGICAL SURVEY, U.S. DEPARTMENT OF INTERIOR

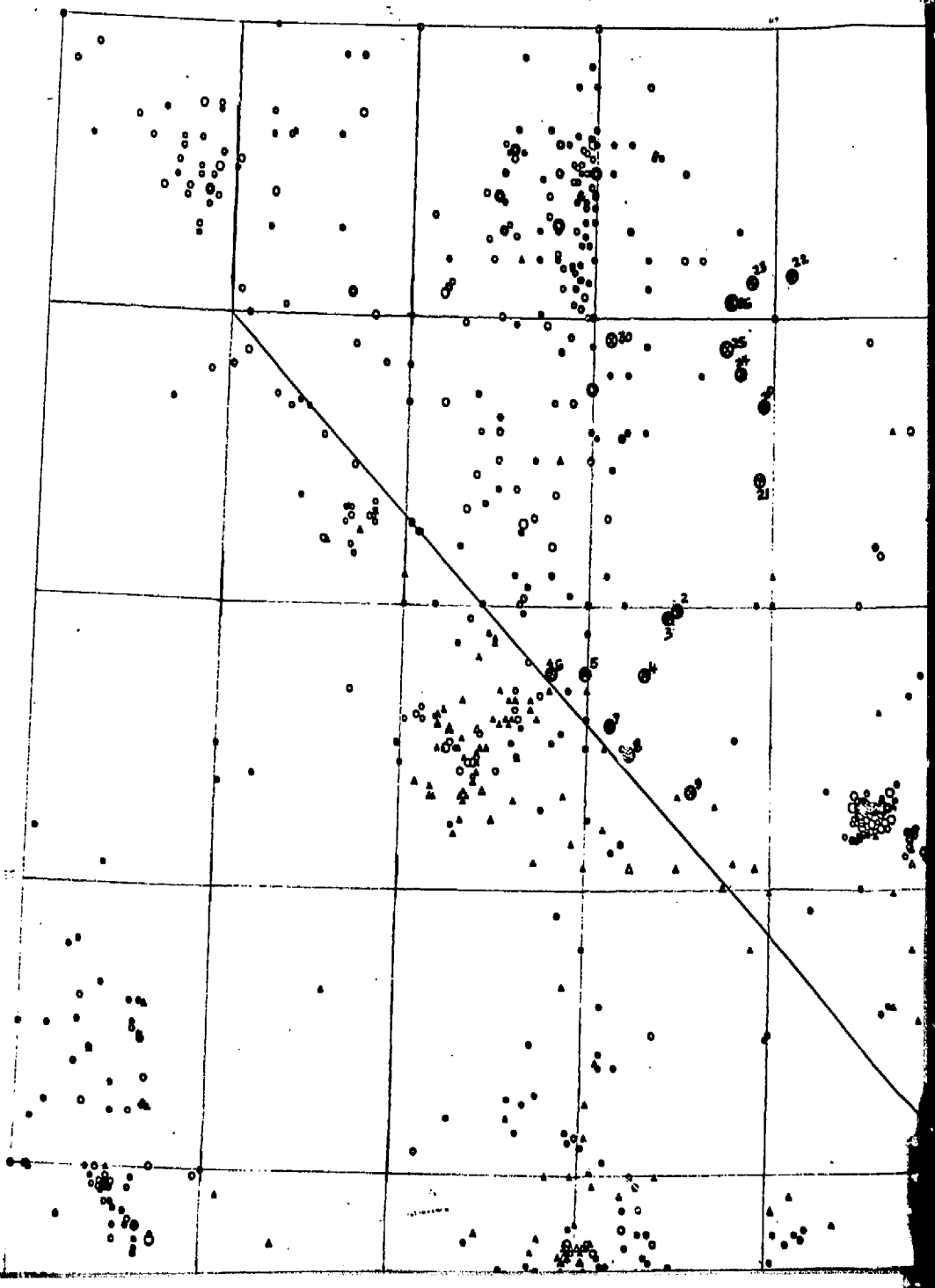
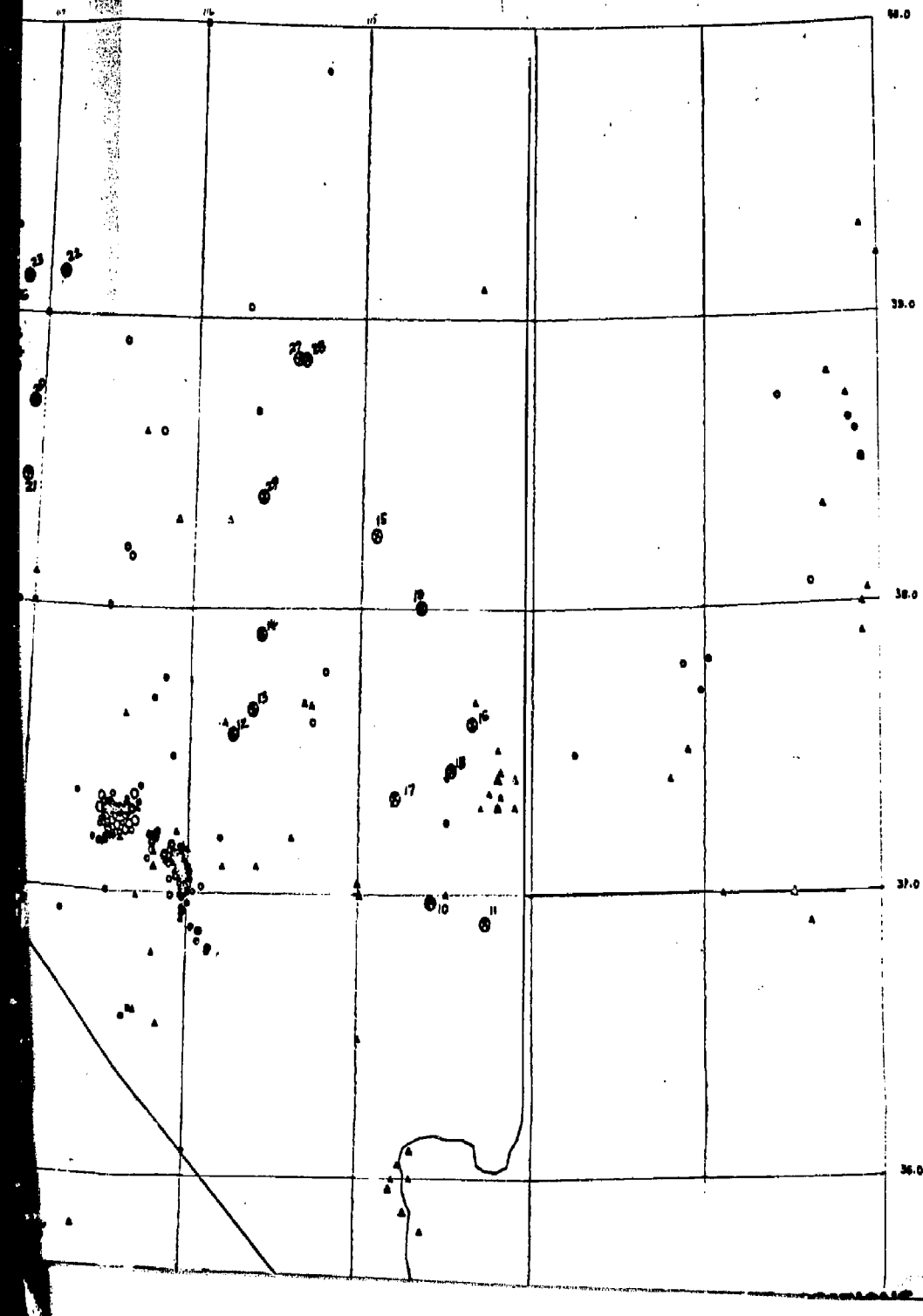
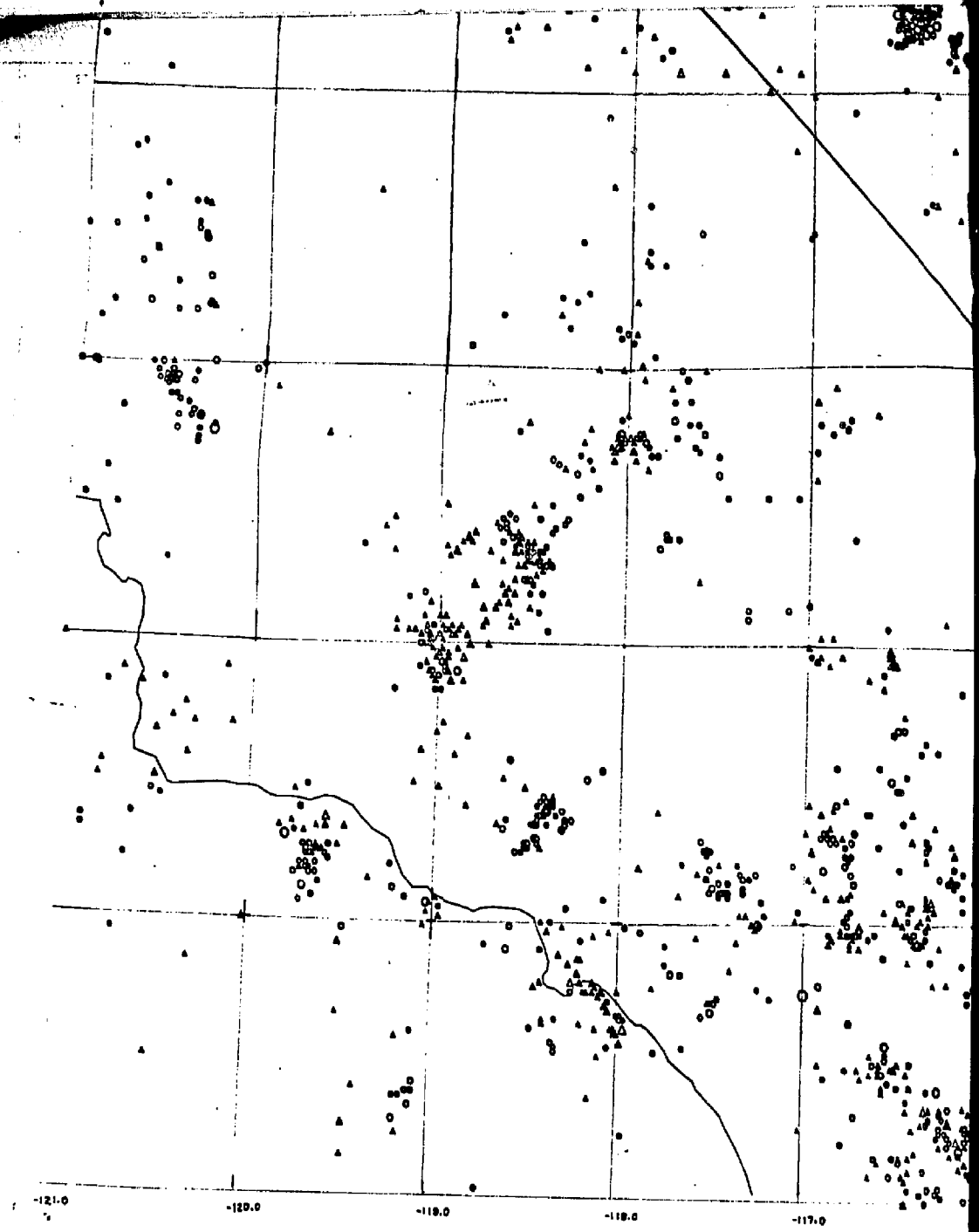
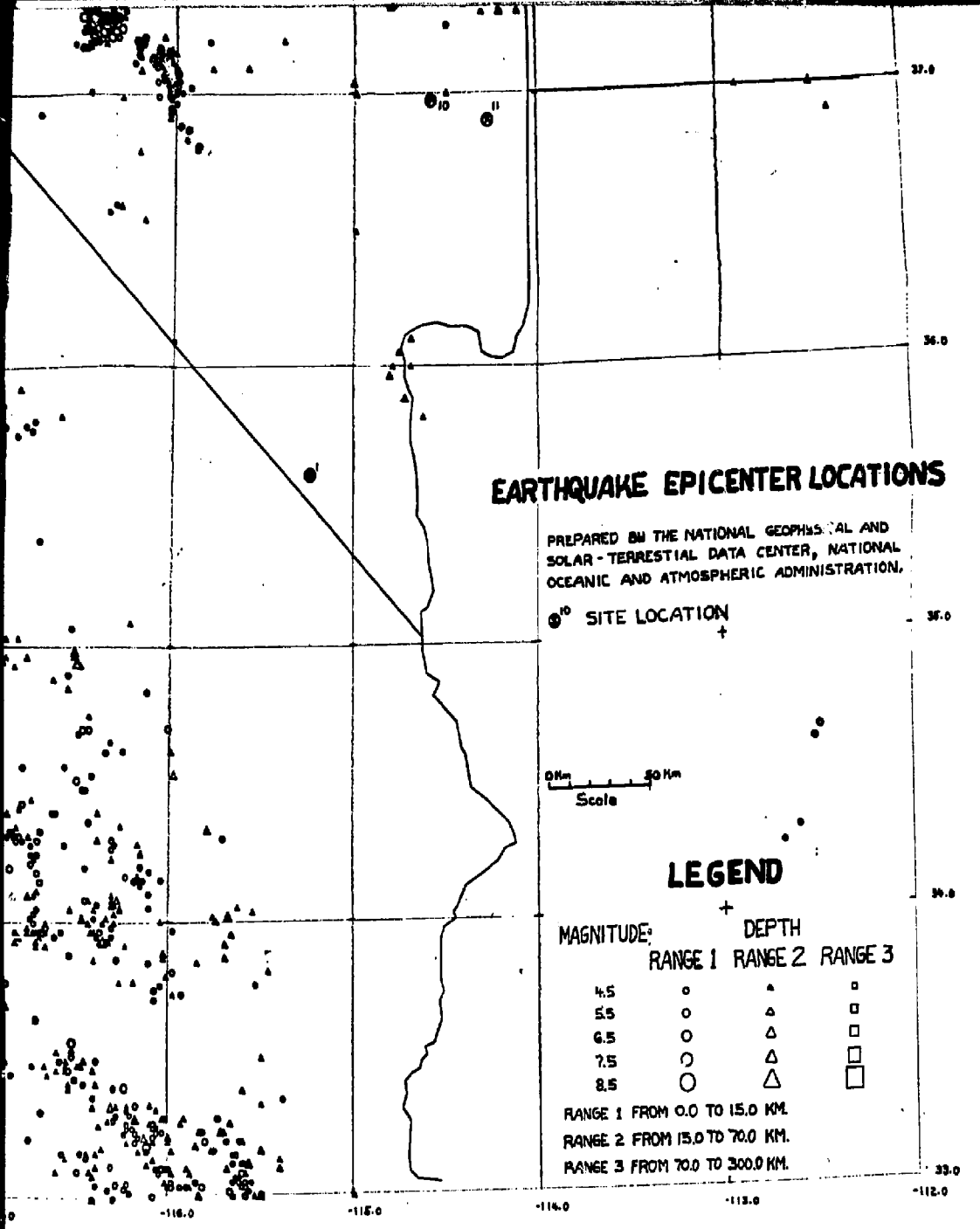
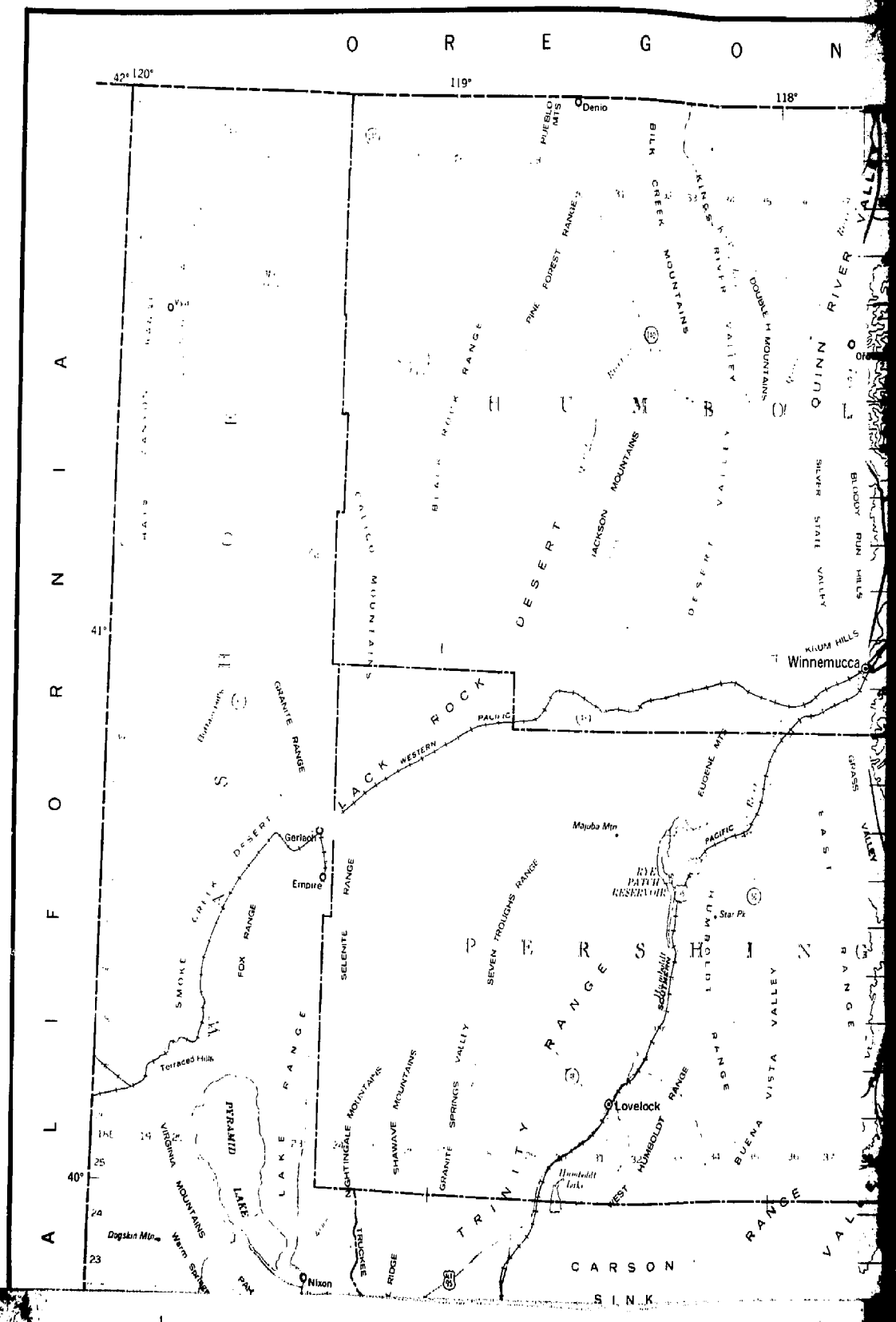


PLATE III.




-121.0
-120.0
-119.0
-118.0
-117.0

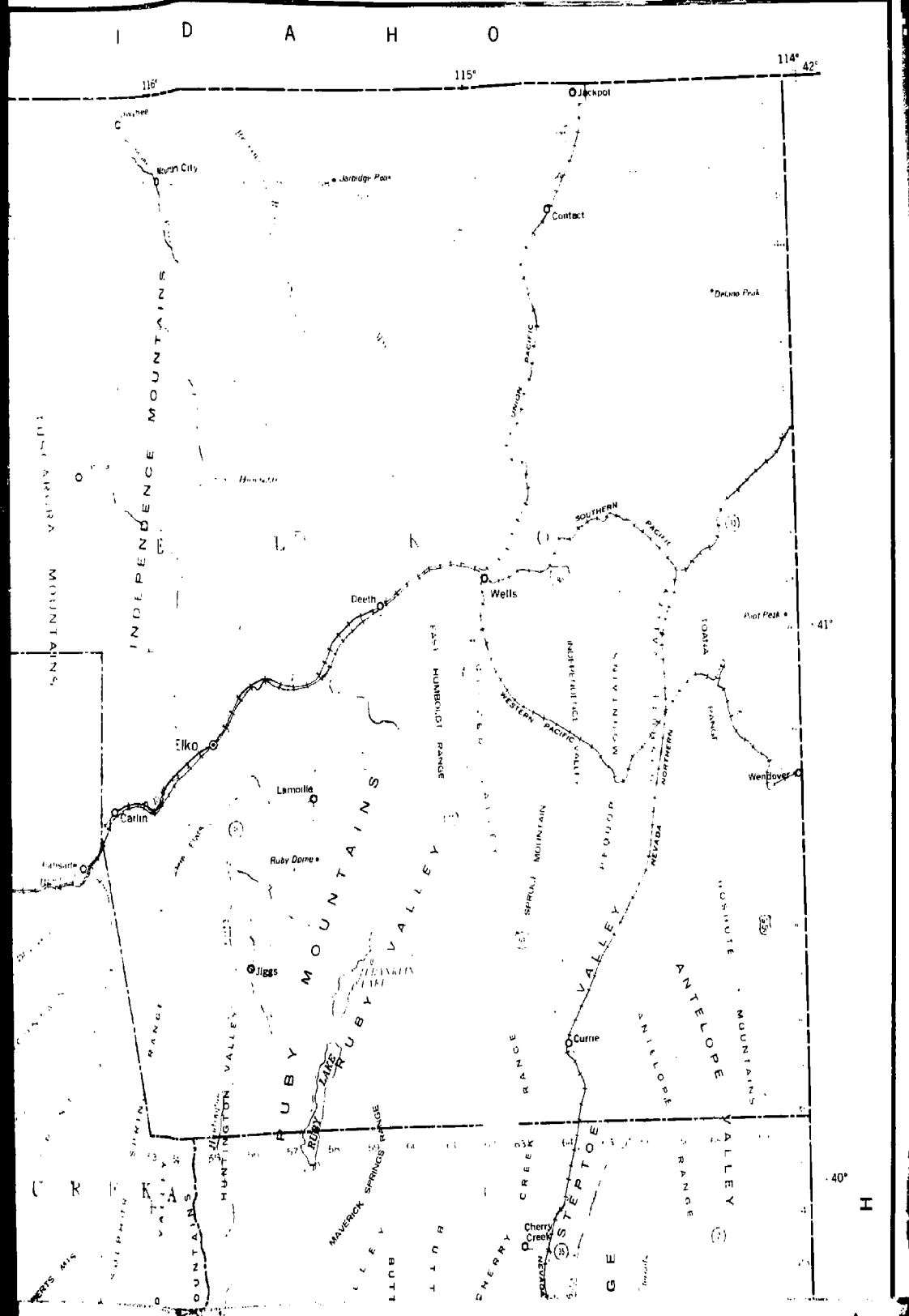

EARTHQUAKE EPICENTER LOCATIONS
PREPARED BY THE NATIONAL GEOPHYSICAL AND SOLAR-TERRESTIAL DATA CENTER, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION.
⊛10 SITE LOCATION
0Km 50 Km
Scale
LEGEND
MAGNITUDE
DEPTH
RANGE 1 RANGE 2 RANGE 3
4.5
5.5
6.5
7.5
8.5
RANGE 1 FROM 0.0 TO 15.0 KM.
RANGE 2 FROM 15.0 TO 70.0 KM.
RANGE 3 FROM 70.0 TO 300.0 KM.
37.0
36.0
35.0
34.0
33.0
-116.0
-115.0
-114.0
-113.0
-112.0

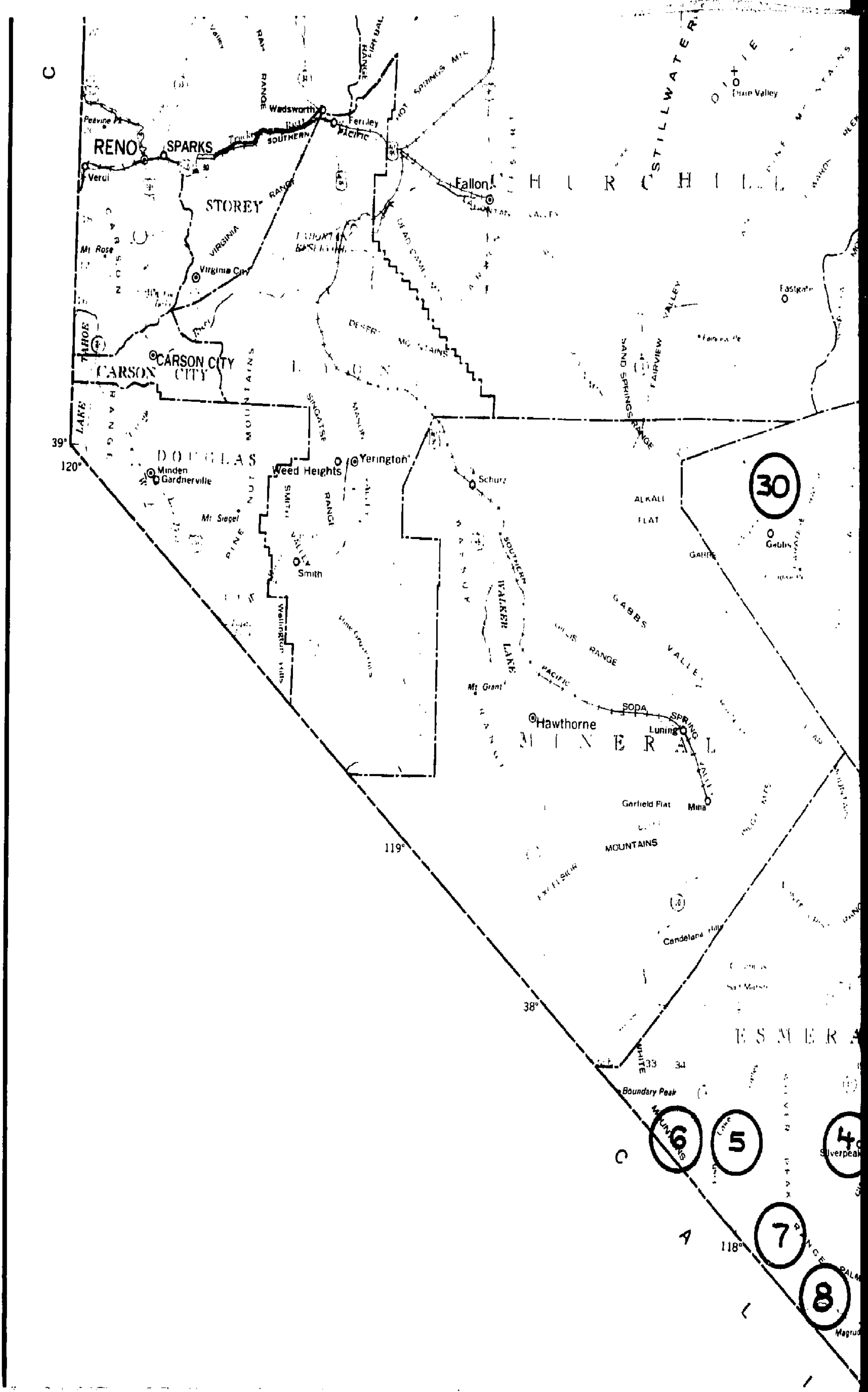

OREGON
42° 120°
119°
118°
Denio
PUEBLO MTS
BILK CREEK MOUNTAINS
KINGS RIVER VALLEY
DOUBLE H MOUNTAINS
QUINN RIVER VALLEY
PINE FOREST RANGE
BLACK ROCK RANGE
HUMBOLDT
DESERT
JACKSON MOUNTAINS
DESERT VALLEY
SILVER STATE VALLEY
BLOODY RUN HILLS
KRUM HILLS
Winnemucca
41°
CALIFORNIA
SONOMA
GRANITE RANGE
LOUISIANA
PACIFIC
WESTERN
EUGENE MTS
GRASS VALLEY
Majuba Mtn
Gerlach
Empire
SMOKE CREEK DESERT
FOX RANGE
SELENITE RANGE
SEVEN TROUGHS RANGE
RYE PATCH RESERVOIR
Star Pk
PERSHING
Terraced Hills
LAKE RANGE
SHAWAVE MOUNTAINS
SPRINGS VALLEY
GRANITE
TRINITY RANGE
Lovelock
HUMBOLDT RANGE
BUENA VISTA VALLEY
PYRAMID LAKE
VIRGINIA MOUNTAINS
Dogskin Mtn
Warm Springs
PAH
Nixon
TRUCKEE RIDGE
WEST HUMBOLDT RANGE
Humboldt Lake
CARSON SINK
40°

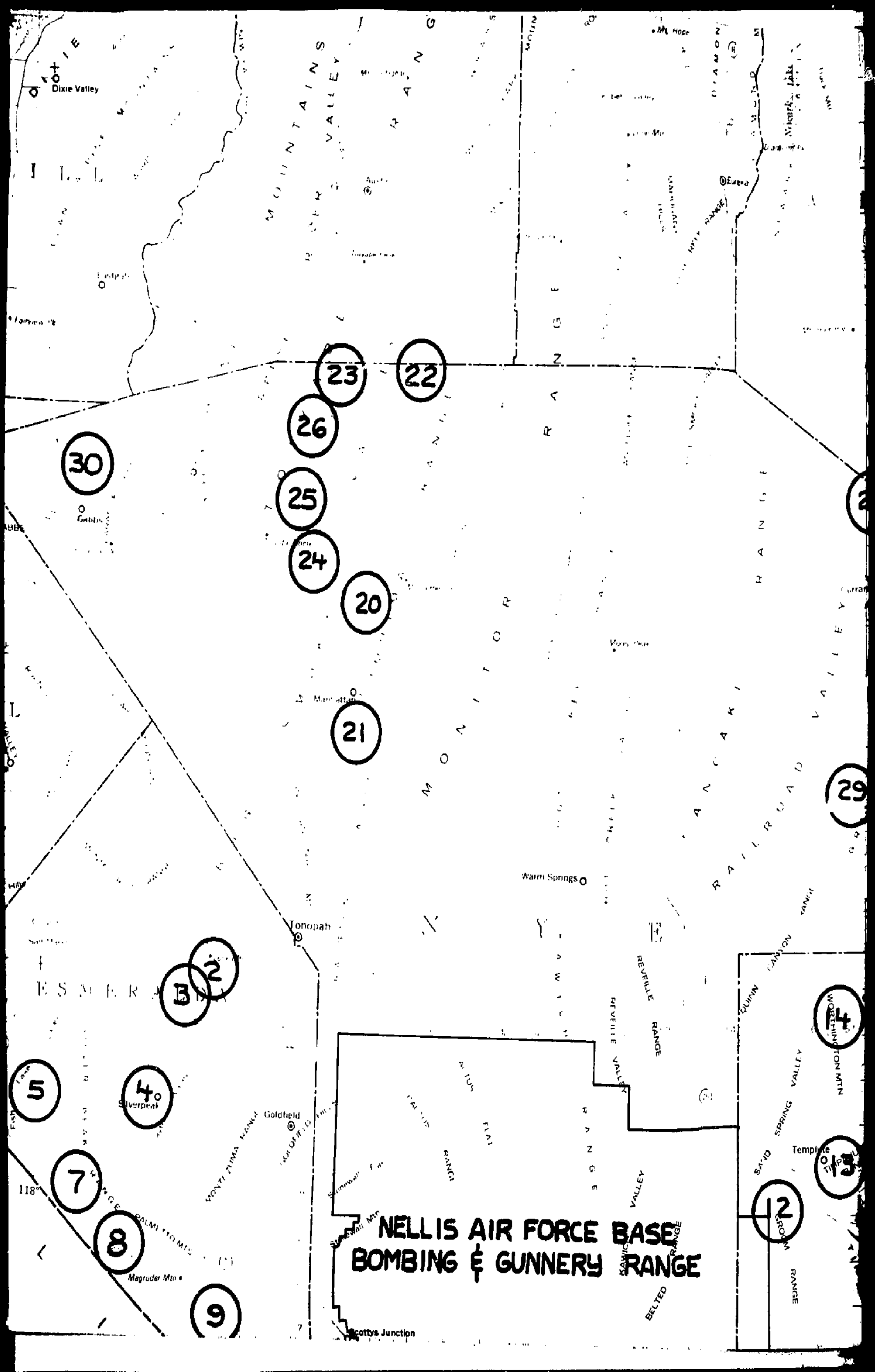

O
N
I
D
118°
117°
116°
McDermitt
Owyhee
Mountain City
Capitol Peak
KINGS RIVER
MOUNTAINS
DOUBLE H MOUNTAINS
QUINN RIVER VALLEY
SANTA ROSA RANGE
Granite Pk
Orovada
Paradise Valley
SILVER STATE VALLEY
BLOODY RUN HILLS
PARADISE
HOT SPRINGS RANGE
OSGOOD MOUNTAINS
DESERT VALLEY
Midas
TUSCARORA MOUNTAINS
Tuscarora
INDEPENDENCE MOUNTAINS
KRUM HILLS
Winnemucca
Golconda
Sonoma Peak
SONOMA RANGE
GRASS VALLEY
EAST
PUMPERNICKEL VALLEY
WESTERN PACIFIC
SOUTHERN PACIFIC
EUGENE MTS
PACIFIC
Elko
Carlin
Battle Mountain
BATTLE MTN
Antler Pk
Palisade
Beowawe
Star Pk
HUMBOLDT RANGE
REESE RIVER VALLEY
BUFFALO VALLEY
Mt Lewis
Mt Tobin
TOBIN RANGE
PLEASANT VALLEY
BUENA VISTA VALLEY
FISH CREEK MOUNTAINS
Mt Moses
Mt Tenabo
Cortez
HUMBOLDT
RANGE
SPRING
53
54
EUREKA
LANDER
AUGUSTA MTS
CARICO LAKE VALLEY
SULPHUR SPRING VALLEY
RANGE
VALLEY
33
34
35
36
37
38
39
40
41
42
43
24

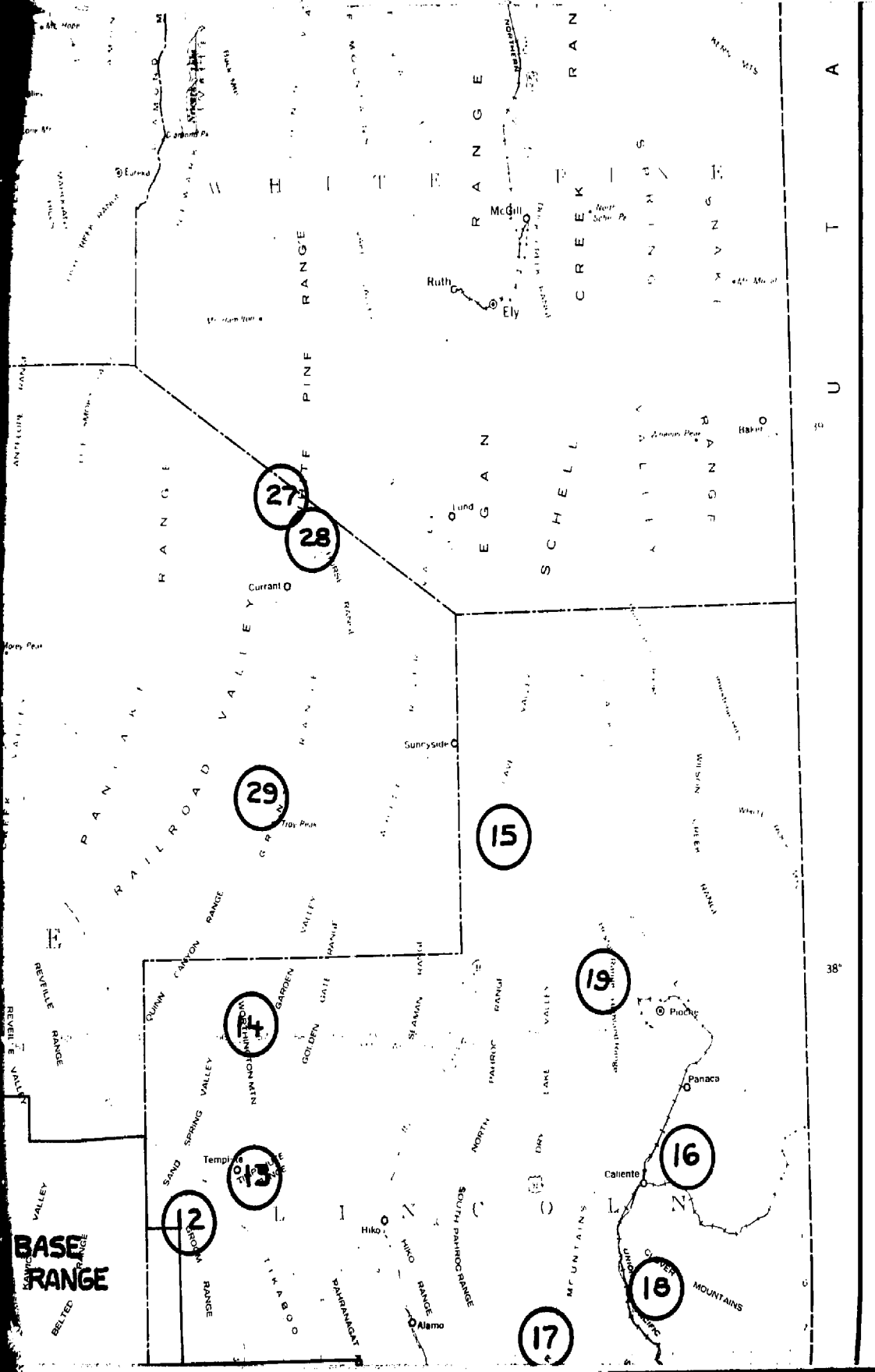
PLATE IV.

MAP 43 TOPOGRAPHIC MAP OF NEVADA




C
RENO
SPARKS
Verdi
Peavine Pk
Wadsworth
Fernley
SOUTHERN
PACIFIC
STOREY
VIRGINIA
Virginia City
Mt Rose
TAHOE
LAKE
CARSON CITY
CARSON
CITY
Fallon
C H U R C H I L L
STILLWATER
Dixie Valley
HOT SPRINGS MTS
SAND SPRINGS RANGE
FAIRVIEW
VALLEY
Eastgate
DESERT MOUNTAINS
SINGATSE
DOUGLAS
Minden
Gardnerville
Mt Siegel
PINE NUT MOUNTAINS
Weed Heights
Yerington
SMITH
VALLEY
Smith
Wellington Hills
Schurz
WALKER
LAKE
SOUTHERN
ALKALI
FLAT
30
Gabbs
GABBS
VALLEY
RANGE
Mt Grant
PACIFIC
SODA
SPRING
Hawthorne
Luning
M I N E R A L
Garfield Flat
Mina
MOUNTAINS
EXCELSIOR
Candelaria Hills
39°
120°
119°
38°
118°
E S M E R A
WHITE
33
34
Boundary Peak
MOUNTAINS
6
5
4
Silverpeak
7
8
C
A


Dixie Valley
Mt. Hope
Eureka
Tonopah
Warm Springs
Goldfield
Silverpeak
Magruder Mtn
Scottys Junction
Tempiute
MONITOR
RAILROAD VALLEY
NYE
REVEILLE RANGE
REVEILLE VALLEY
KAWICH
BELTED RANGE
MONTEZUMA RANGE
PALMETTO MTS
WORTHINGTON MTN
SAND SPRING VALLEY
QUINN CANYON
GROOM RANGE
Stonewall Mtn
118°
NELLIS AIR FORCE BASE
BOMBING & GUNNERY RANGE
30
23
22
26
25
24
20
21
29
2
3
4
5
7
8
9
12
13
14


WHITE PINE RANGE
EGAN RANGE
SCHELL CREEK RANGE
NEVADA
UTAH
Ely
McGill
Ruth
Currant
Lund
Baker
Sunnyside
RAILROAD VALLEY
GRANT RANGE
QUINN CANYON RANGE
REVEILLE RANGE
REVEILLE VALLEY
GARDEN VALLEY
GOLDEN GATE RANGE
SAMMAN HILLS
FAIRVIEW RANGE
DRY LAKE VALLEY
NORTH PANCAKE RANGE
SAND SPRING VALLEY
WORTHINGTON MTN
Tempiute
LINCOLN COUNTY
Hiko
HIKO RANGE
PAHRANAGAT RANGE
SOUTH PAHROC RANGE
PAHROC RANGE
TIKABOO
BELTED RANGE
Alamo
Pioche
Panaca
Caliente
MOUNTAINS
38°
27
28
29
15
19
14
13
12
16
18
17
BASE
RANGE

NEVADA BUREAU OF MINES AND GEOLOGY

UNIVERSITY OF NEVADA, RENO

TOPOGRAPHIC MAP OF NEVADA

EDITION OF 1972

Scale 1:1,000,000

Contour interval 1000 feet

POPULATION KEY

RENO

SPARKS

Fallon

Lovelock

LEGEND

County seat

Other incorporated place

Paved road

Unpaved road

Interstate highway

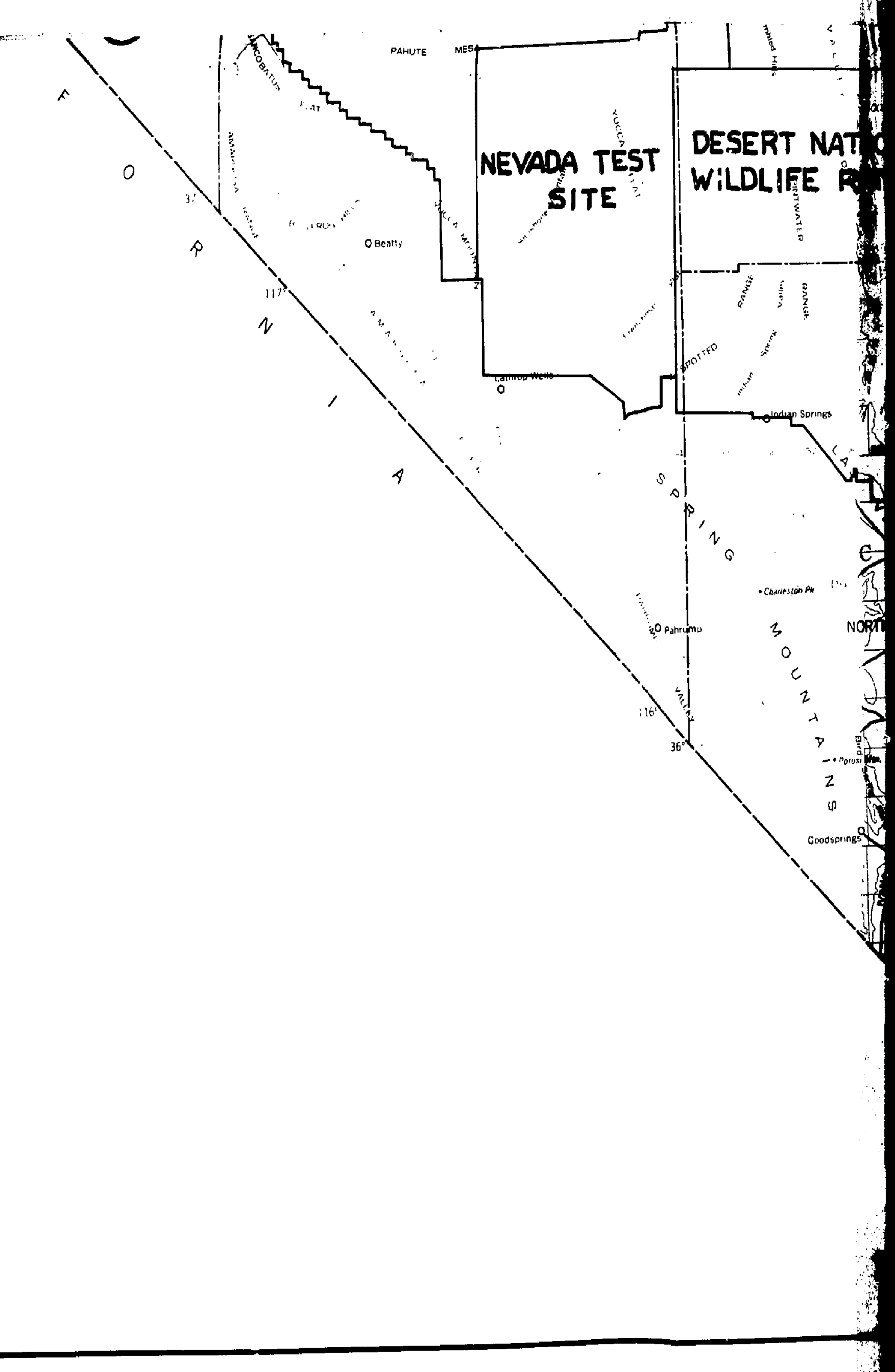
U.S. highway

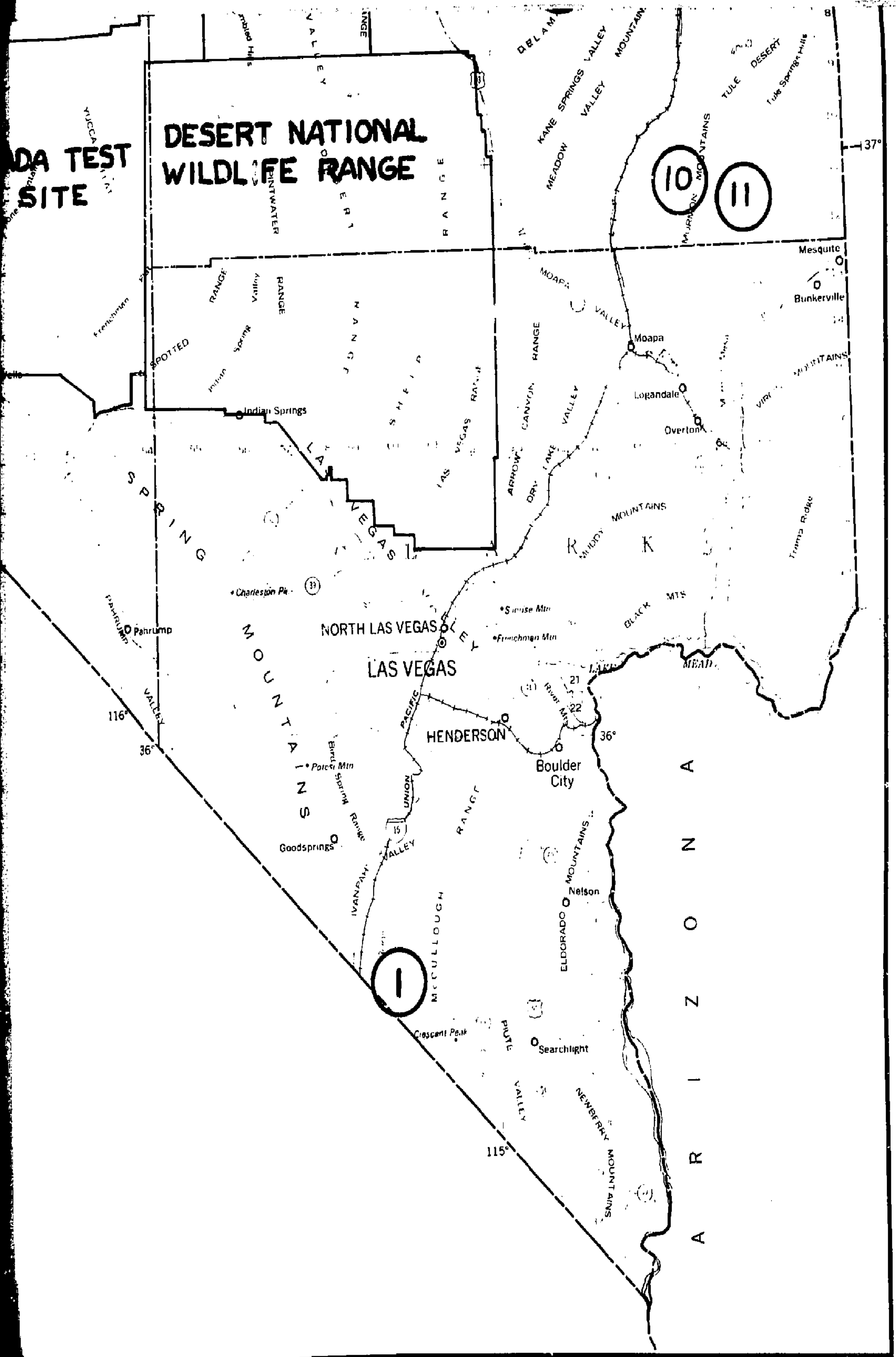
State highway

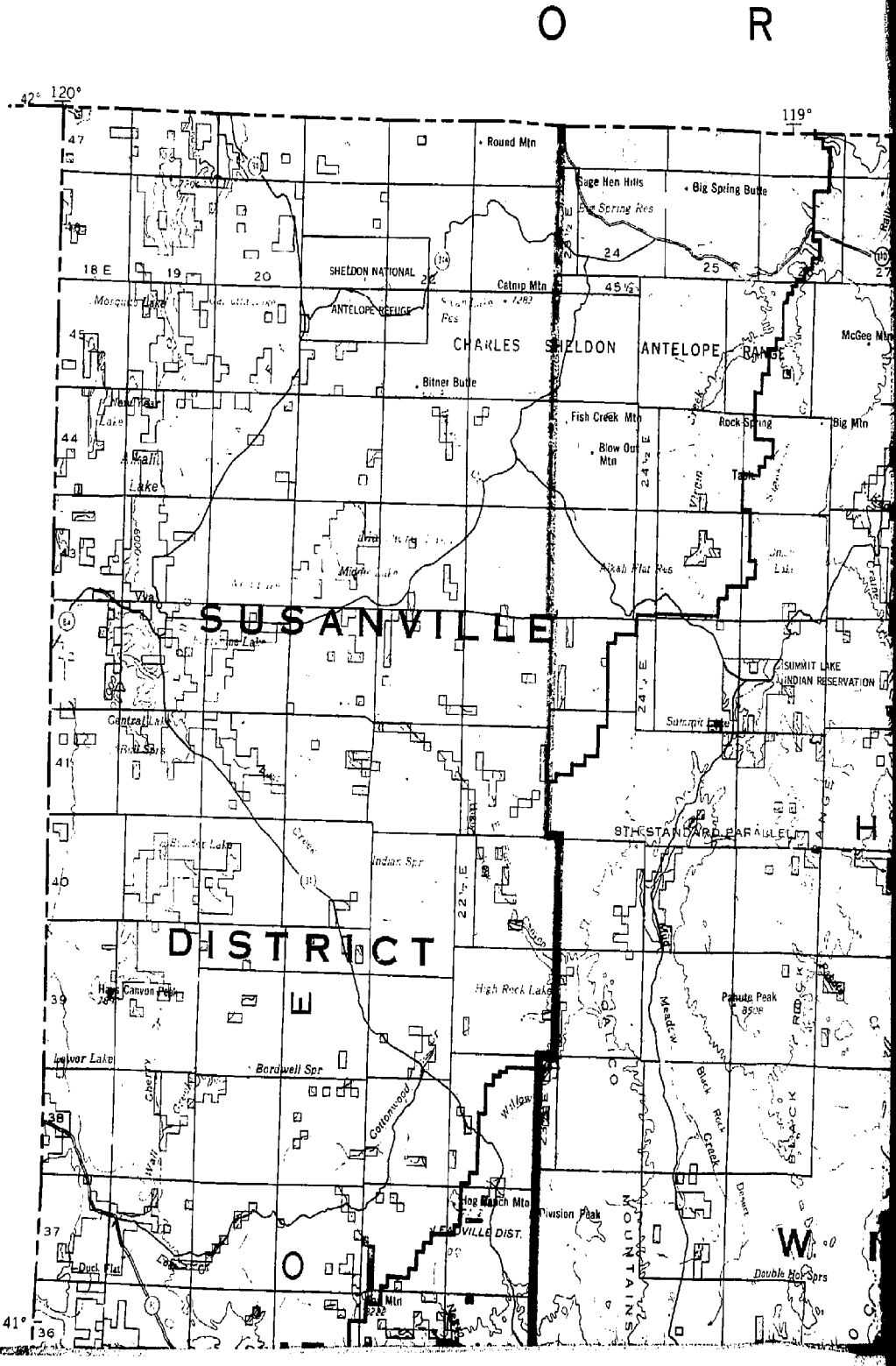
(15) SITE LOCATION

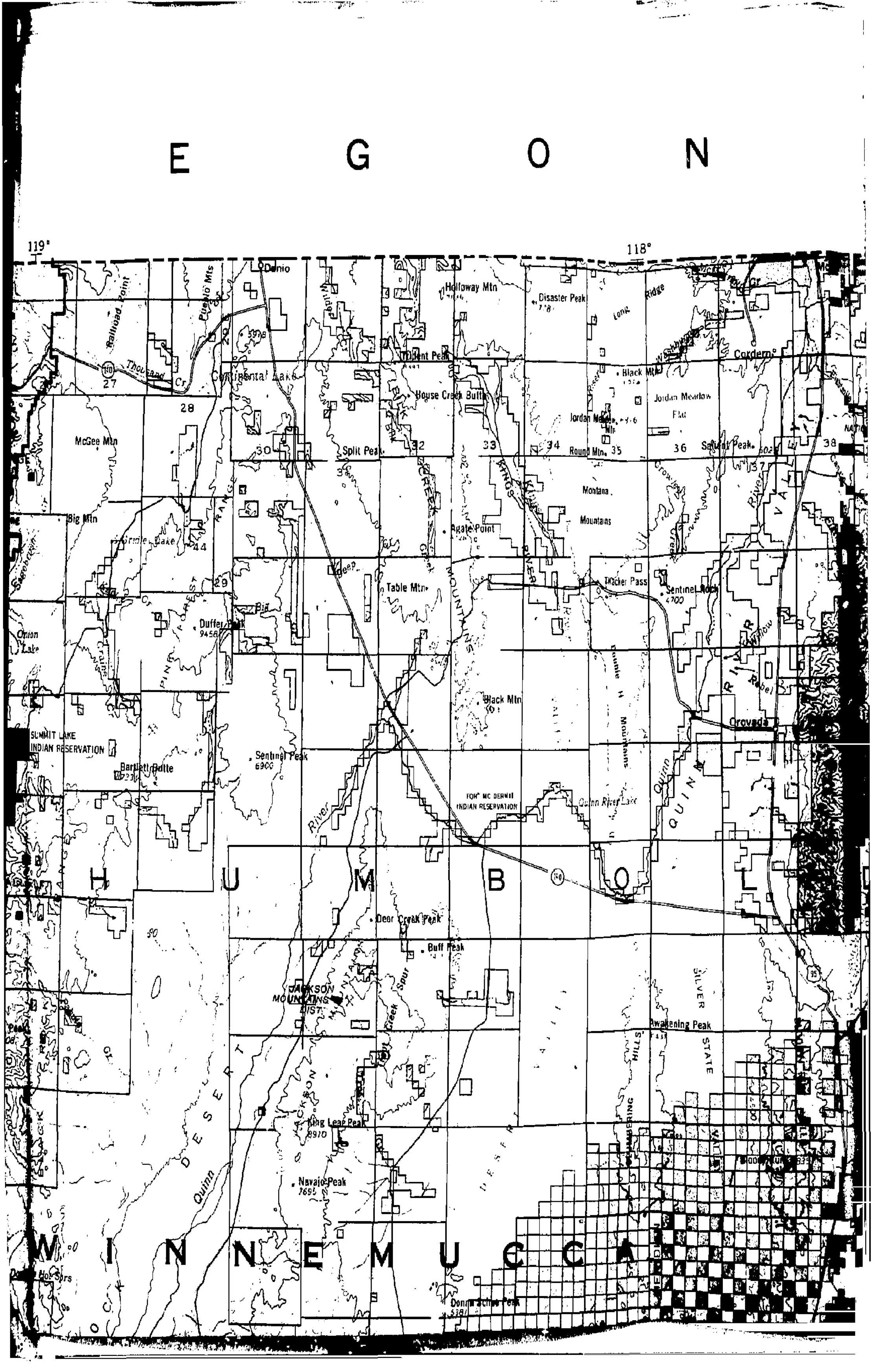
FOR SALE BY NEVADA BUREAU OF MINES AND GEOLOGY,
UNIVERSITY OF NEVADA, RENO, NEV. 89507
PRICE ONE DOLLAR

NEVADA TEST SITE
DESERT N
WILDLIFE
PAHUTE MES
PROBATUS FLAT
AMARGOSA RANGE
Beatty
117°
37°
116°
36°
SPRING
MOUNTAINS

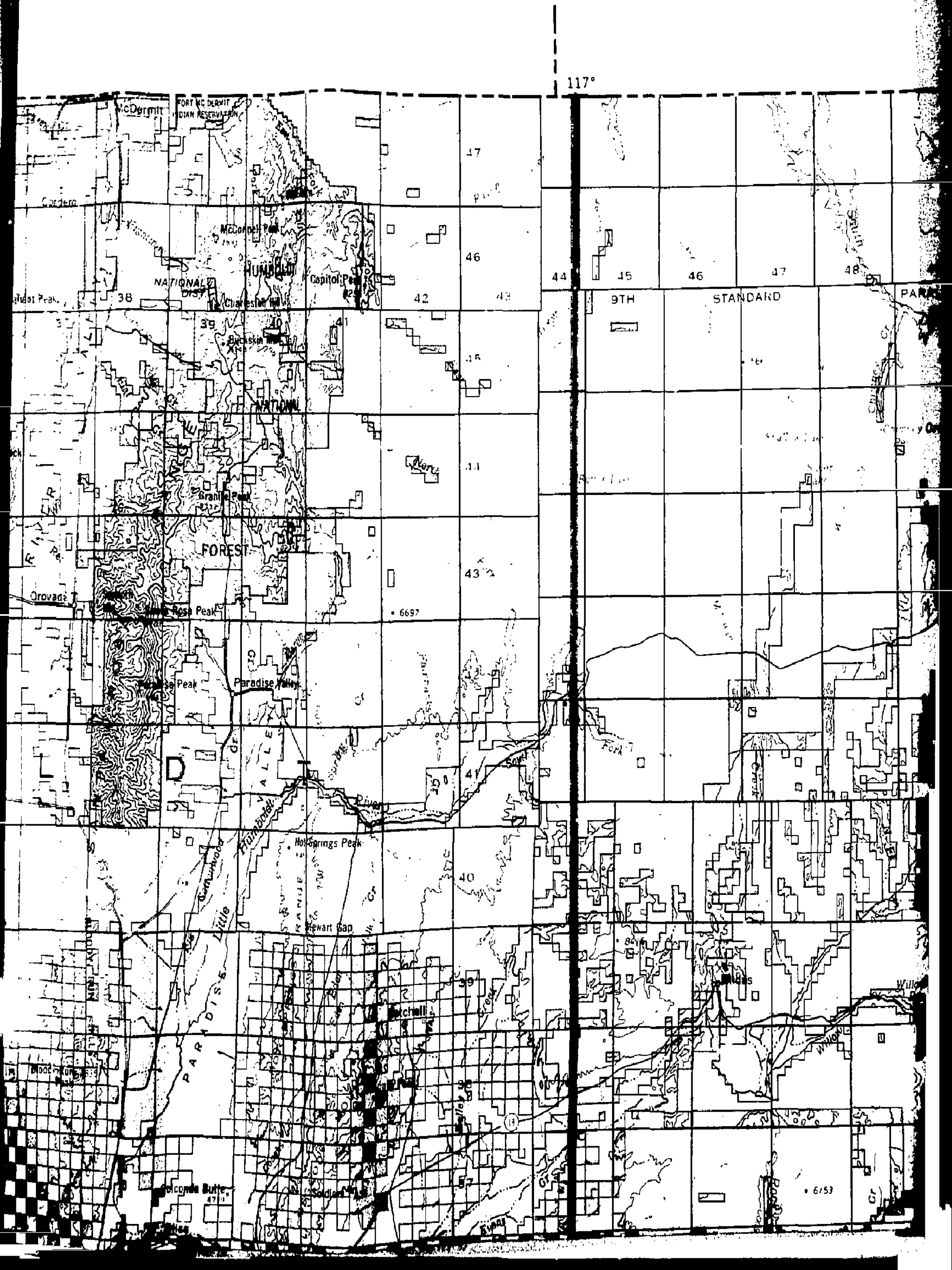

PAHUTE MESA
NEVADA TEST SITE
DESERT NAT
WILDLIFE R
SARCOBATUS
FLAT
YUCCA
O Beatty
Lathrop Wells
SPOTTED
RANGE
Indian Springs
SPRING MOUNTAINS
Charleston Pk
O Pahrump
VALLEY
Goodsprings
F O R N I A
37°
117°
116°
36°


DESERT NATIONAL
WILDLIFE RANGE
NEVADA TEST SITE
10
11
1
NORTH LAS VEGAS
LAS VEGAS
HENDERSON
Boulder City
Mesquite
Bunkerville
Moapa
Logandale
Overton
Indian Springs
Pahrump
Goodsprings
Nelson
Searchlight
SPRING MOUNTAINS
SHEEP RANGE
LAS VEGAS RANGE
ARROW CANYON RANGE
MUDDY MOUNTAINS
BLACK MTS
VIRGIN MOUNTAINS
MORMON MOUNTAINS
MEADOW VALLEY MOUNTAINS
KANE SPRINGS VALLEY
DELAMAR
TULE DESERT
Tule Springs Hills
MOAPA VALLEY
DRY LAKE VALLEY
LAS VEGAS VALLEY
PAHRUMP VALLEY
IVANPAH VALLEY
PIUTE VALLEY
McCULLOUGH RANGE
ELDORADO MOUNTAINS
NEWBERRY MOUNTAINS
Bird Spring Range
LAKE MEAD
UNION PACIFIC
Charleston Pk
Potosi Mtn
Sunrise Mtn
Frenchman Mtn
Crescent Peak
Trump Ridge
ARIZONA
37°
36°
116°
115°

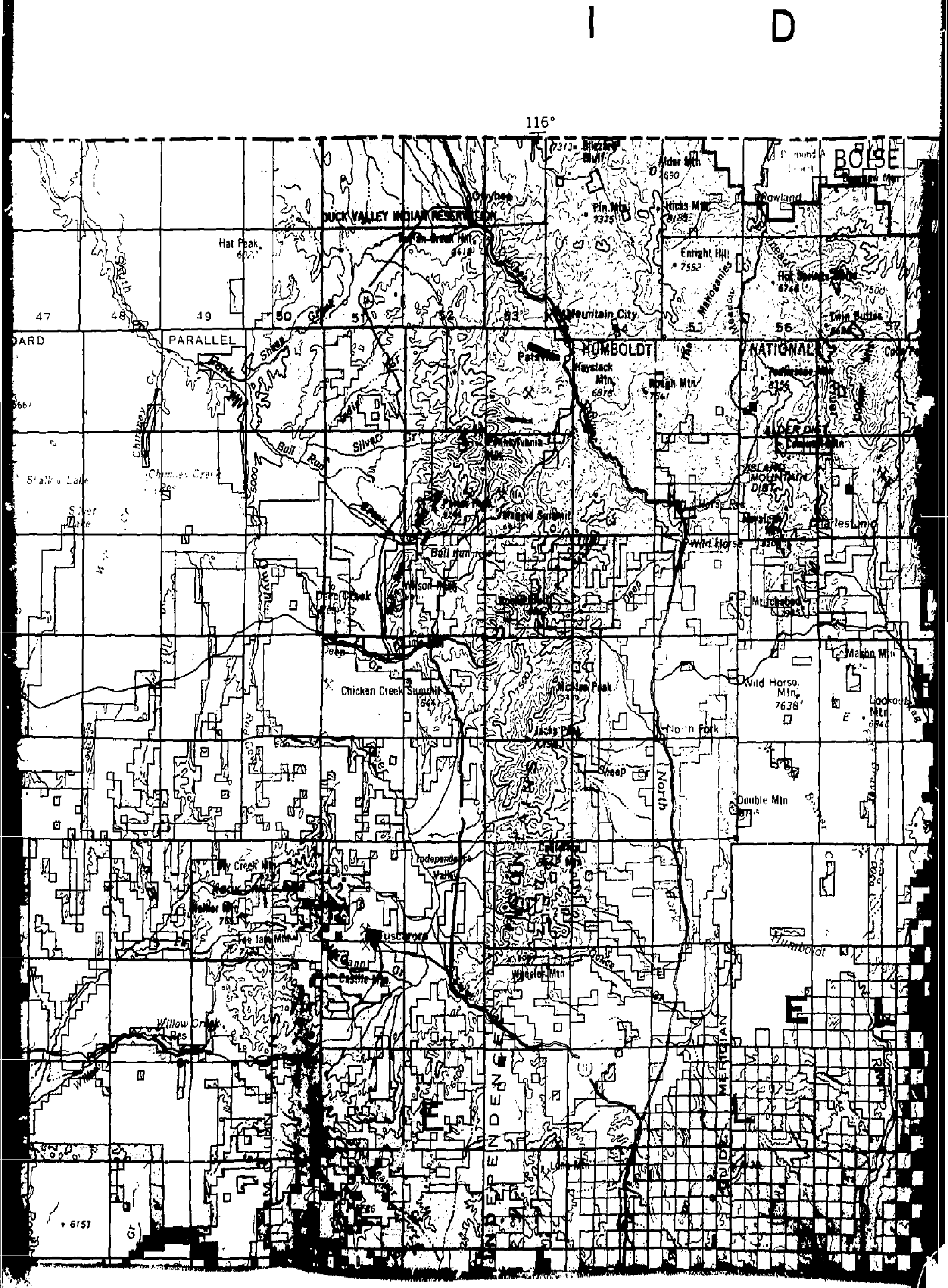

O R
42°
120°
119°
Round Mtn
Sage Hen Hills
Big Spring Butte
Big Spring Res
SHELDON NATIONAL ANTELOPE REFUGE
Catnip Mtn
CHARLES SHELDON ANTELOPE RANGE
McGee Mtn
Bitner Butte
Fish Creek Mtn
Blow Out Mtn
Rock Spring
Big Mtn
Alkali Flat Res
SUSANVILLE
SUMMIT LAKE INDIAN RESERVATION
Summit Lake
Indian Spr
STH STANDARD PARALLEL
DISTRICT
High Rock Lake
Pahute Peak
Lower Lake
Bordwell Spr
Cottonwood
Willow
Meadow
Black Rock Creek
Hog Ranch Mtn
Division Peak
SUSANVILLE DIST.
Duck Flat
Double Hot Spr
MOUNTAINS
ROCK
41°
T
A
I
O
W



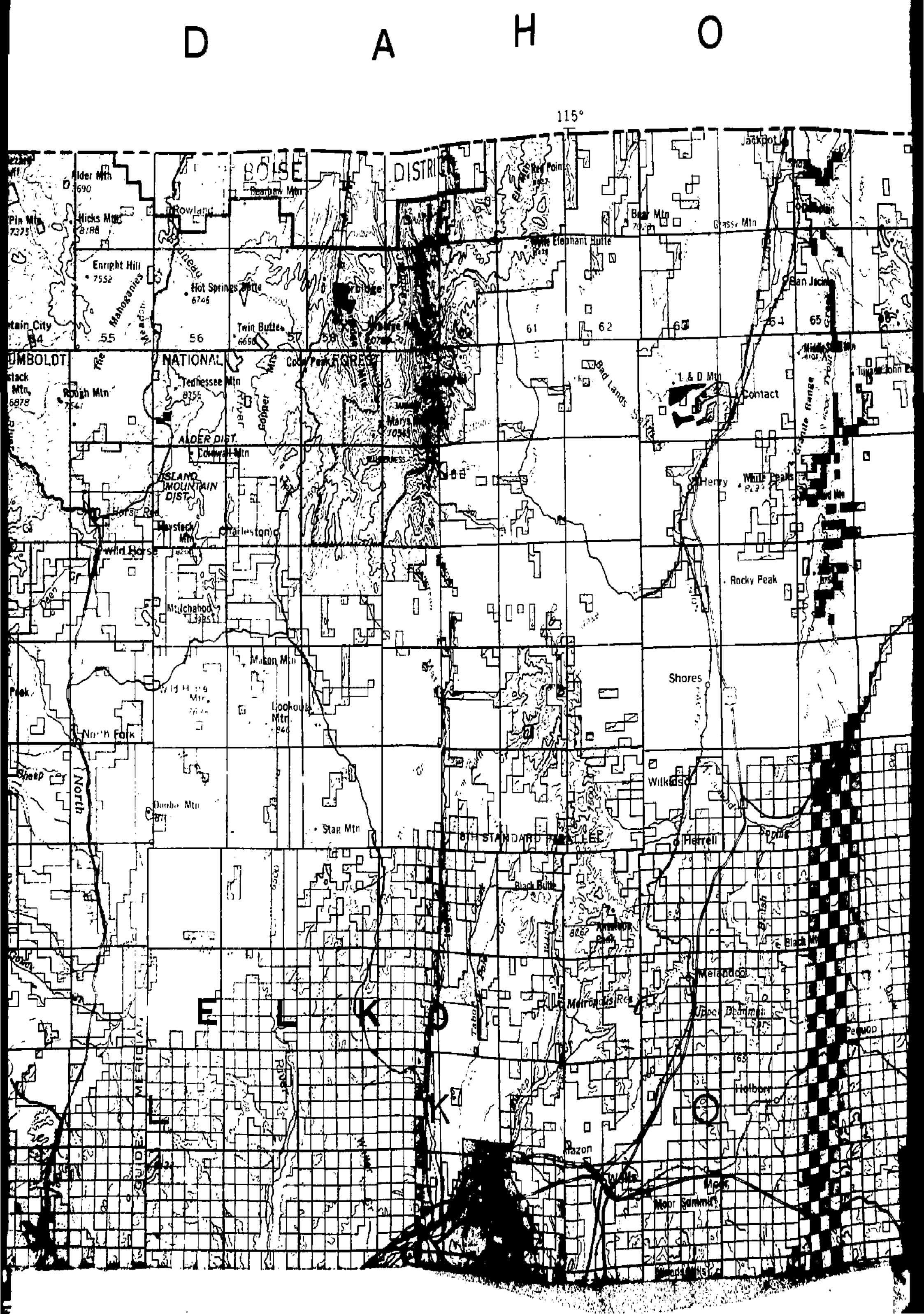
E G O N
119°
118°
Denio
Holloway Mtn
Disaster Peak
Long Ridge
Pueblo Mts
Railroad Point
Thousand Cr
Continental Lake
Trident Peak
House Creek Butte
Black Mtn
Jordan Meadow Flat
Cordero
McGee Mtn
Split Peak
Round Mtn.
Montana Mountains
Agate Point
Big Mtn
Table Mtn
Thacker Pass
Sentinel Rock 4700
Duffer Peak 9456
Onion Lake
Black Mtn
SUMMIT LAKE INDIAN RESERVATION
Bartlett Butte
Sentinel Peak 6900
Orovada
FORT MC DERMIT INDIAN RESERVATION
Quinn River Lake
Quinn River
H U M B O L
Deer Creek Peak
Buff Peak
JACKSON MOUNTAINS DIST.
Awakening Peak
SILVER STATE
King Lear Peak 8910
Navajo Peak 7695
W I N N E M U C C A



117°
McDermit
FORT MC DERMIT INDIAN RESERVATION
Cordero
McConnell Peak
HUMBOLDT
NATIONAL
Capitol Peak
Charleston Hill
Buckskin Mtn
NATIONAL
Granite Peak
FOREST
Orovada
Santa Rosa Peak
Paradise Peak
Paradise Valley
River
Hot Springs Peak
Stewart Gap
Mitchell
Golconda Butte
9TH
STANDARD
47
46
45
44
45
46
47
48
38
39
40
41
42
43
44
43
41
40
39
38
37



I D
116°
BOISE
Alder Mtn
Hicks Mtn
Pin. Mtn
Rowland
Owyhee
DUCK VALLEY INDIAN RESERVATION
Hat Peak
Entright Hill
Mountain City
47
48
49
50
51
52
53
54
55
56
PARALLEL
HUMBOLDT
NATIONAL
Haystack Mtn.
Rough Mtn
Bull Run
Silver Cr
Shallow Lake
Silver Lake
Chimney Cr
ISLAND MOUNTAIN DIST.
Horse Res
Wild Horse
Bull Run
Deep Creek
Deep Cr
Chicken Creek Summit
Wild Horse Mtn. 7636
Lookout Mtn.
North Fork
Jacks Peak
Sheep Cr
North
Double Mtn
Independence Valley
Tuscarora
Castle Mtn
Wheeler Mtn
Humboldt
Willow Creek Res
MERIDIAN
INDEPENDENCE
Lone Mtn
6757

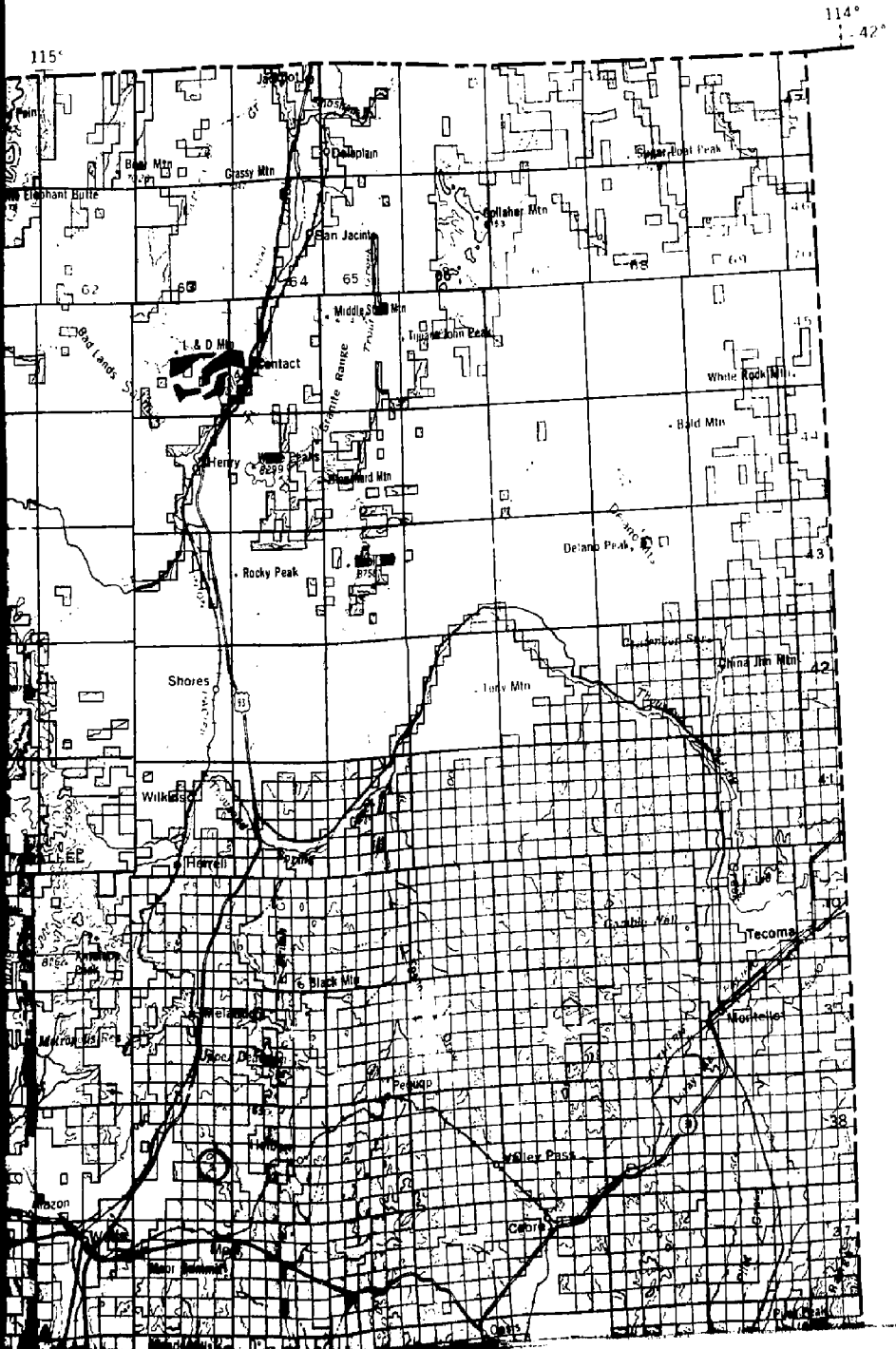


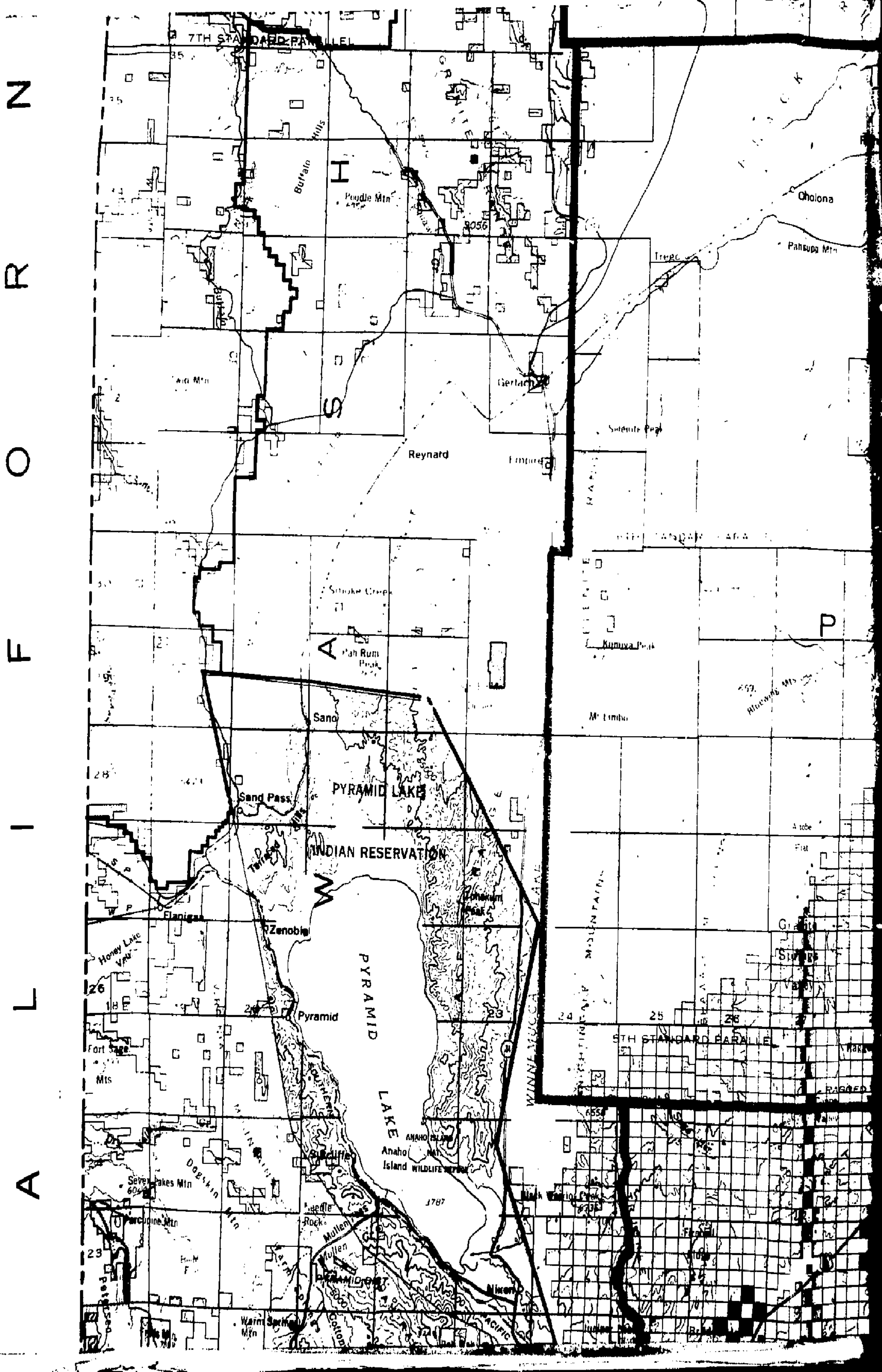
D A H O
115°
BOISE
DISTRICT
Jackpot
Alder Mtn
Hicks Mtn
Rowland
Bear Mtn
Grassy Mtn
Enright Hill
Hot Springs Butte
Twin Buttes
San Jacinto
55
56
57
61
62
65
NATIONAL
FOREST
Tennessee Mtn
Rough Mtn
Copper Mts
Bad Lands
I & D Mtn
Contact
Granite Range
ALDER DIST.
Coleman Mtn
ISLAND MOUNTAIN DIST.
Henry
White Peaks
Haystack Mtn
Charleston
Wild Horse
Rocky Peak
Mt Ichabod
Mason Mtn
Shores
Wild Horse Mtn
Lookout Mtn
North Fork
North
Wilkins
Dobbs Mtn
Stag Mtn
8TH STANDARD PARALLEL
Herrell
Black Butte
Metropolis Res
E L K O
GUIDE MERIDIAN
River
Holborn
Wells
Moor Summit

MAP 40

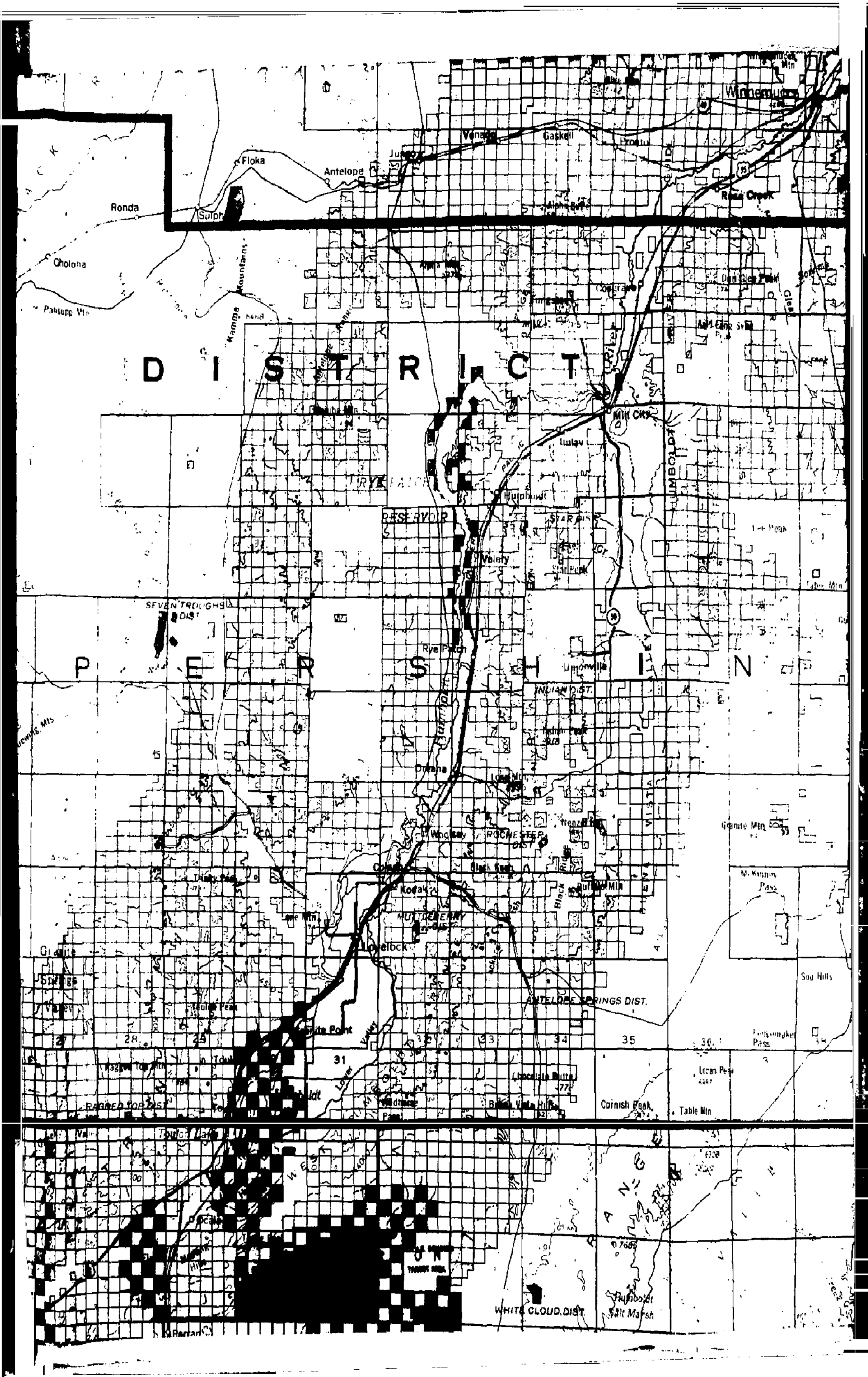
LAND STATUS MAP

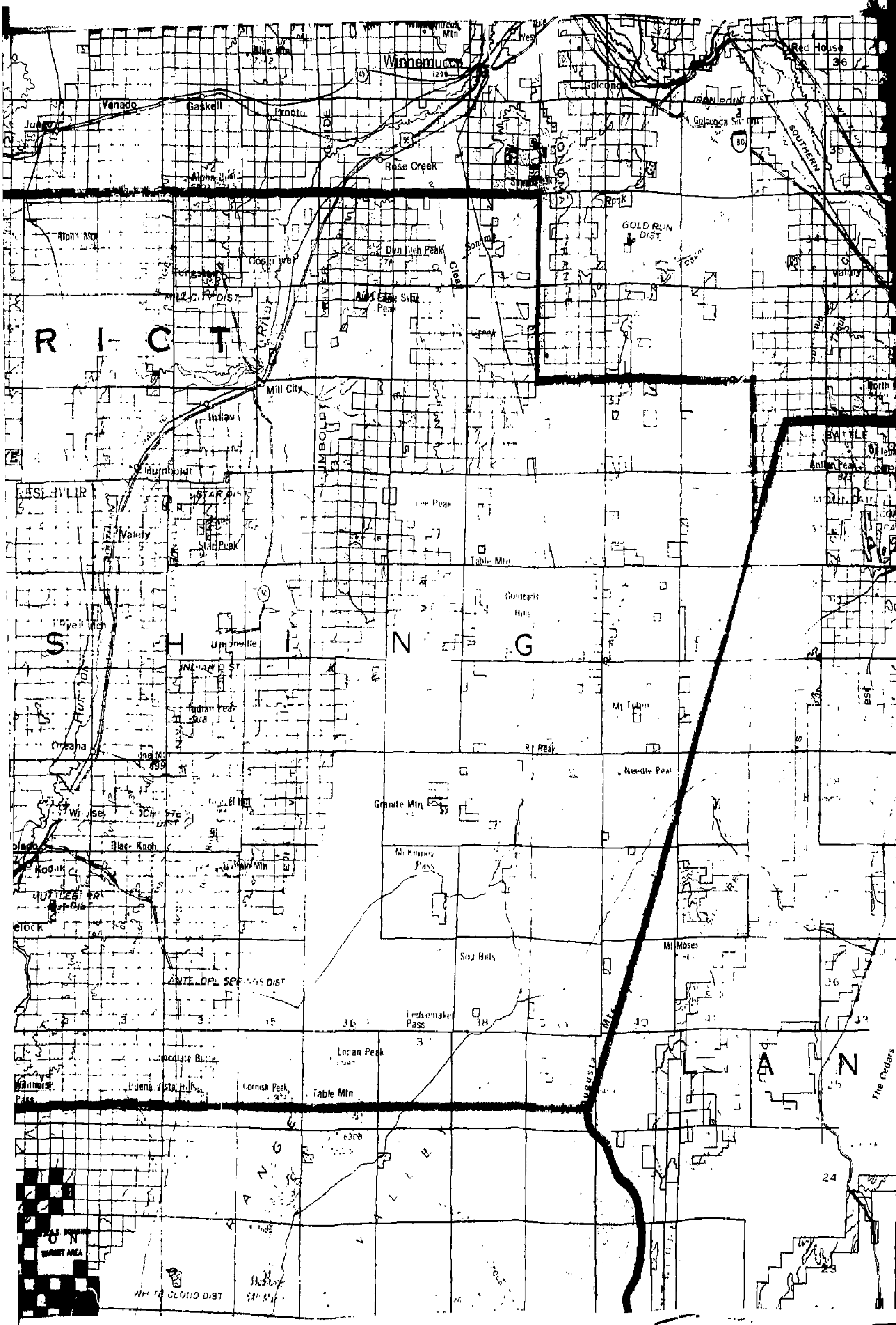
PLATE V.



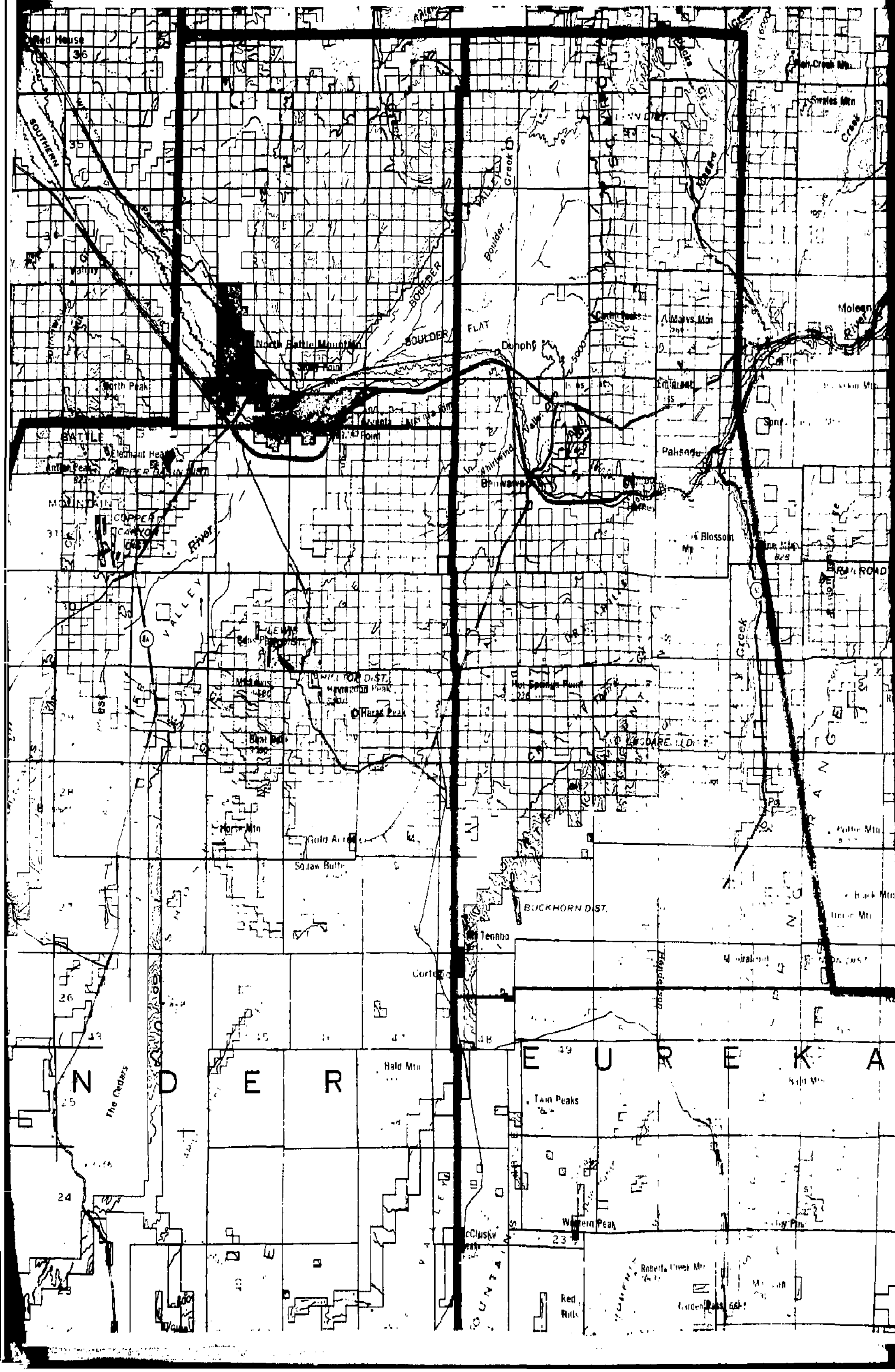


CALIFORNIA
7TH STANDARD PARALLEL
Buffalo Hills
Poodle Mtn
Cholona
Pahsupp Mtn
Trego
Gerlach
Reynard
Empire
Selenite Peak
Smoke Creek
Pah Rum Peak
Kumiva Peak
Mt Limbo
Sano
Sand Pass
PYRAMID LAKE
INDIAN RESERVATION
Terraced Hills
Tohakum Peak
Adobe Flat
Flanigan
Honey Lake Valley
Zenobia
PYRAMID LAKE
Pyramid
Fort Sage Mts
5TH STANDARD PARALLEL
WINNEMUCCA LAKE
Anaho Island
ANAHO ISLAND NAT WILDLIFE REFUGE
Sutcliffe
Seven Lakes Mtn
Dogskin Mtn
Needle Rock
Porcupine Mtn
Mullen Pass
Black Warrior Peak
Nixon
Warm Springs Mtn
Granite Springs Valley

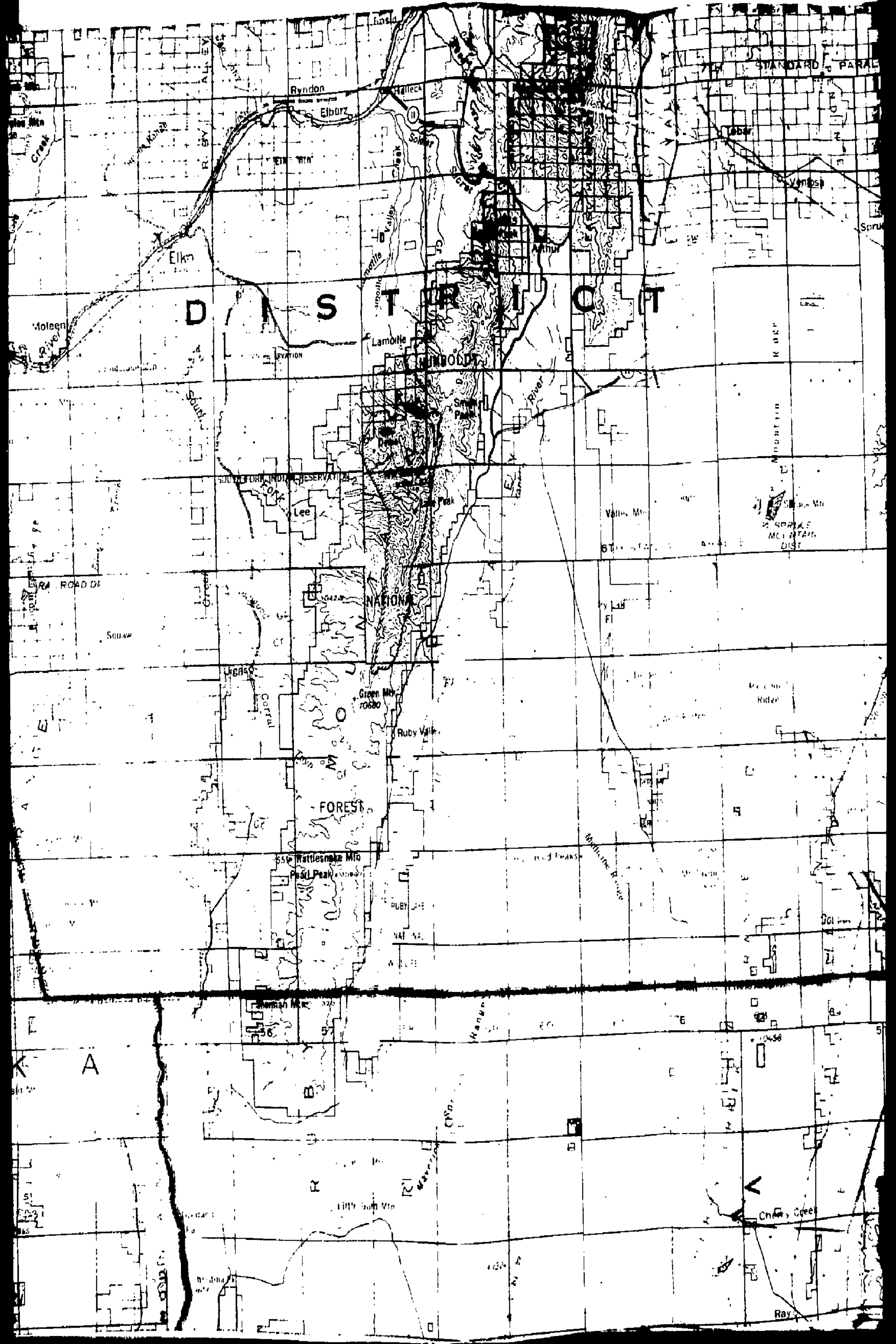

DISTRICT
PERSHING
Winnemucca
Venado
Gaskell
Golconda
Jungo
Antelope
Floka
Ronda
Sulphur
Choloha
Pahsupp Mtn
Kamma Mountains
Rose Creek
Cosgrave
Dun Glen Peak
Mill City
Imlay
RYE PATCH
RESERVOIR
Humboldt
STAR DIST
Star Peak
Valery
SEVEN TROUGHS DIST
Rye Patch
Unionville
INDIAN DIST.
Indian Peak
Oreana
Lone Mtn
Woolsey
ROCHESTER DIST.
Granite Mtn
Black Knob
Coal Canyon
Kodak
MULLBERRY DIST.
Lovelock
McKinney Pass
Granite Springs Valley
Sou Hills
ANTELOPE SPRINGS DIST.
White Point
Lower Valley
Ragged Top Mtn
RAGGED TOP DIST.
Toulon Peak
Toulon Lake
Chocolate Butte
Buena Vista Hills
Cornish Peak
Table Mtn
Loran Peak
Tablemaker Pass
WHITE CLOUD DIST.
Humboldt Salt Marsh
Rawhide
27
28
29
31
32
33
34
35
36



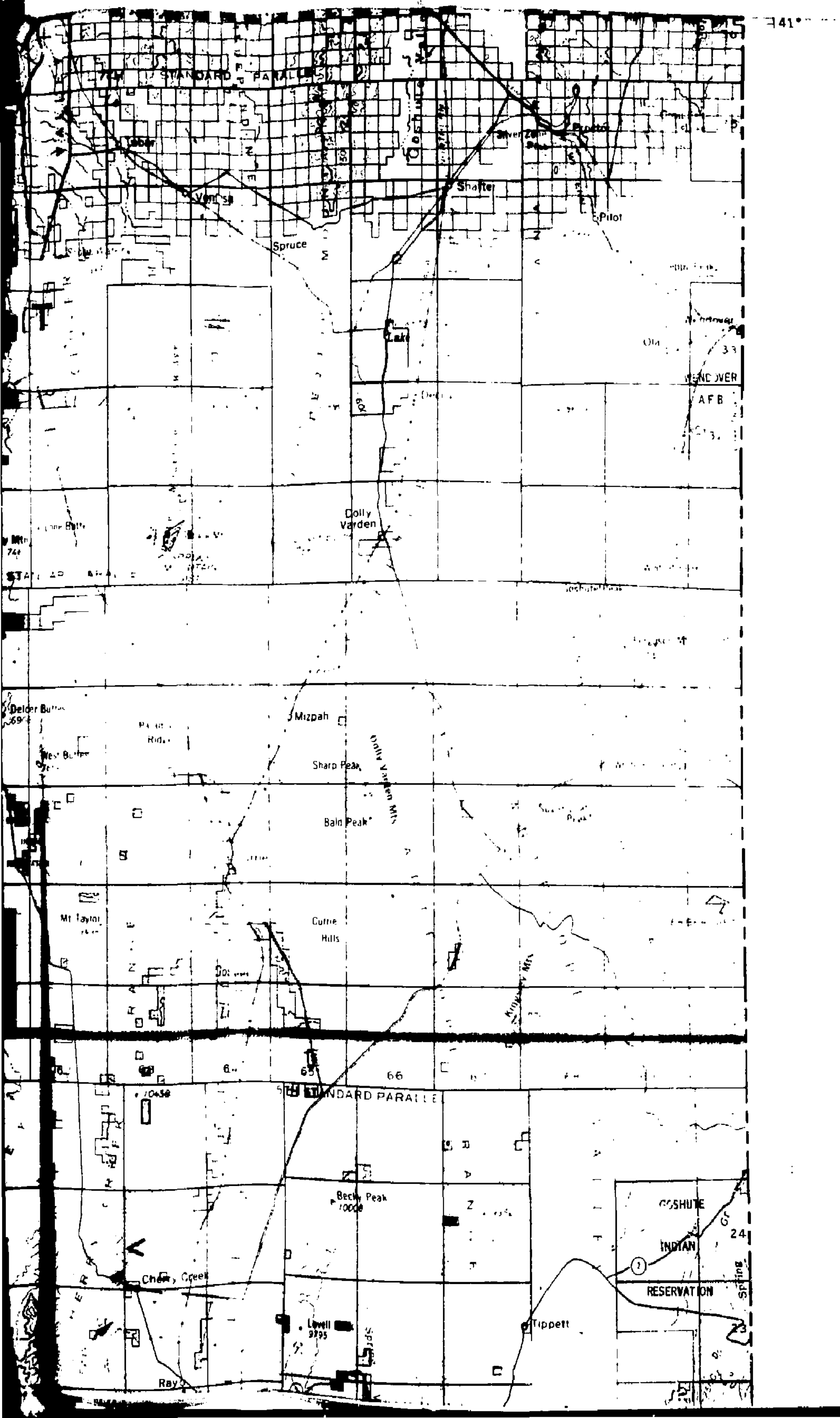
Winnemucca
Winnemucca Mtn
Blue Mtn
Red House
Golconda
Golconda Summit
IRON POINT DIST
SOUTHERN
Venado
Gaskell
Rose Creek
GOLD RUN DIST
Den Dich Peak
Sonoma
Clear
Creek
MILL CITY DIST
Tungsten
Valmy
R I C T
Mill City
Imlay
Humboldt
HUMBOLDT
BATTLE
Antler Peak
STAR DIST
Star Peak
Table Mtn
Goldbanks
Hills
S H I N G
Unionville
INDIAN DIST
Indian Peak
Mt Tobin
Needle Peak
Oreana
Granite Mtn
Black Knob
Kodak
McKinney
Pass
Mt Moses
Sou Hills
ANTELOPE SPRINGS DIST
Lovelock
Leach Peak
Table Mtn
Cornish Peak
Buena Vista Hills
A N
The Cedars
WHITE CLOUD DIST



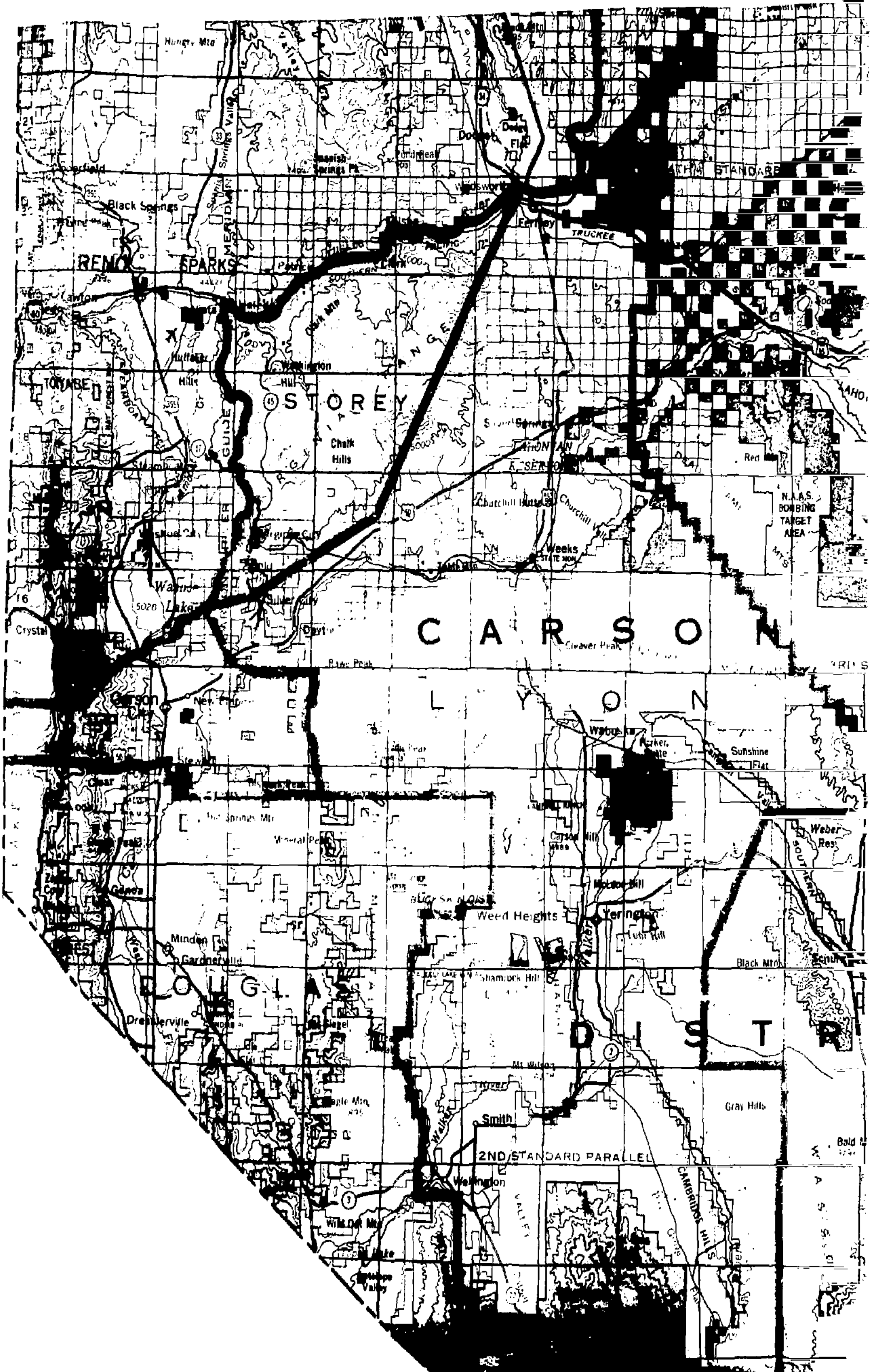
Red House
SOUTHERN
Swales Mtn
Creek
Boulder
Creek
BOULDER
BOULDER FLAT
North Battle Mountain
Dunphy
Moleen
River
Carlin
Emigrant
North Peak
BATTLE
Elephant Head
Antler Peak
COPPER BASIN DIST.
MOUNTAIN
COPPER
CANYON
River
VALLEY
Whirlwind
Valley
Beowawe
Palisade
Blossom
RAILROAD
Creek
Hot Springs Point
HILLTOP DIST.
Horse Mtn
Gold Acres
Squaw Butte
BUCKHORN DIST.
Tenabo
Cortez
N D E R
E U R E K A
The Cedars
Bald Mtn
Twin Peaks
Western Peak
Red
Hills

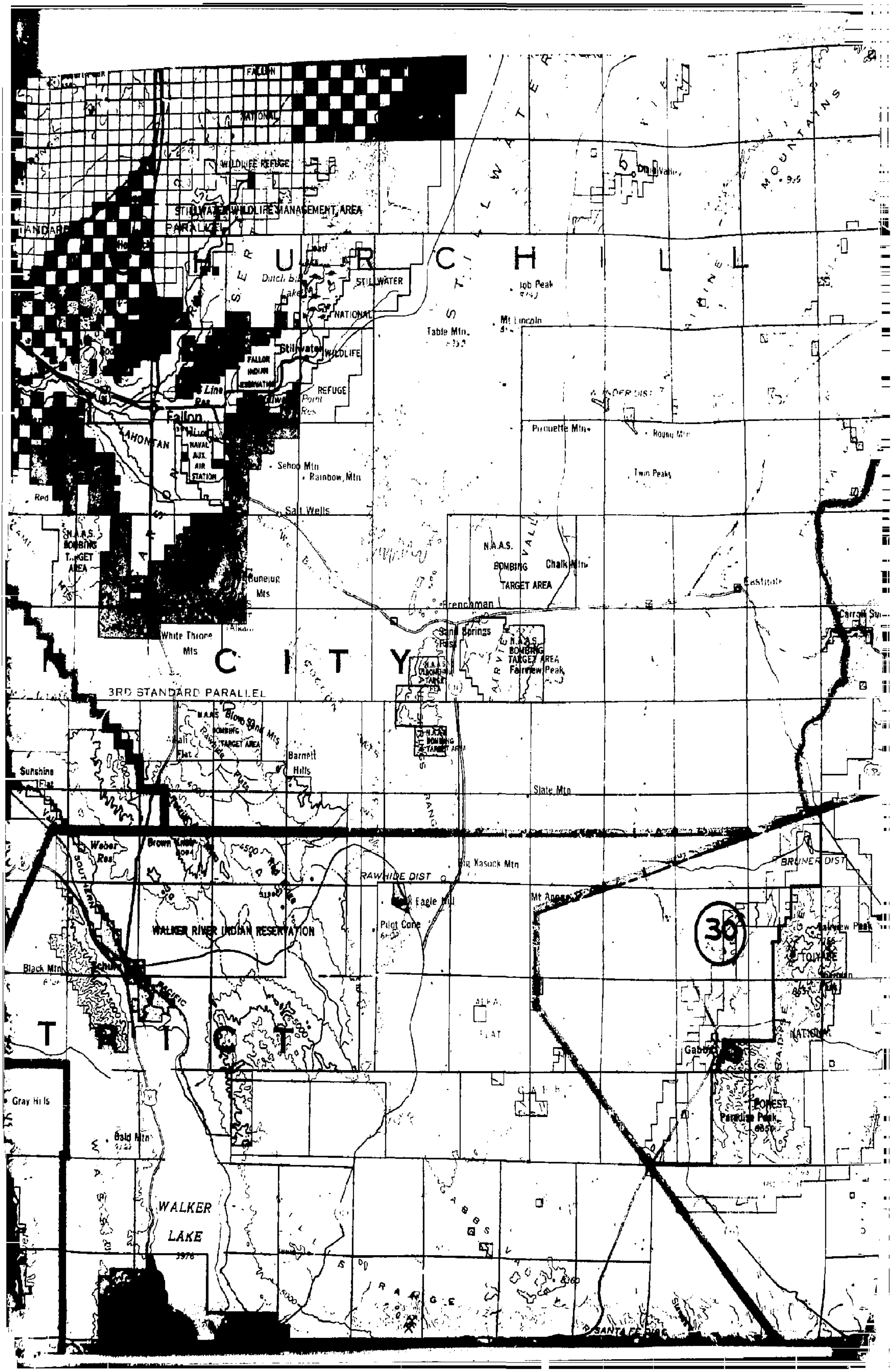


Ryndon
Halleck
Elburz
Elko
Moleen
River
Creek
D I S T R I C T
Lamoille
HUMBOLDT
Arthur
Ventosa
SOUTH FORK INDIAN RESERVATION
Lee
Valley Mtn
NATIONAL
Squaw
Green Mtn
10680
Ruby Valley
FOREST
Rattlesnake Mtn
Pearl Peak
RUBY LAKE
Cherry Creek
Ray
A

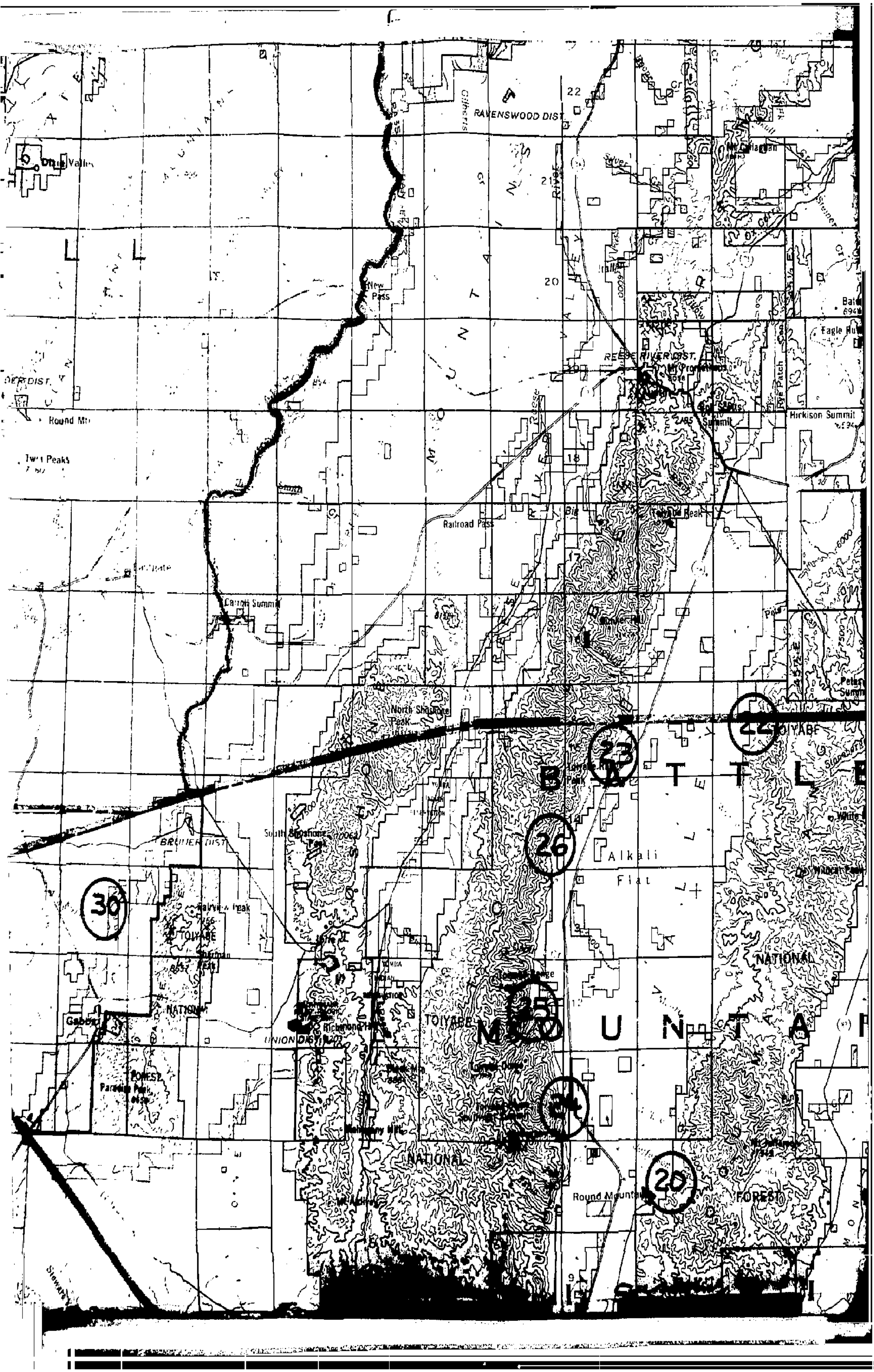

41°
Tobar
Ventosa
Spruce
Shafter
Pilot
Lake
WENDOVER
AFB
Dolly Varden
Mizpah
Sharp Peak
Dolly Varden Mts
Bald Peak
Currie
Hills
Mt Taylor
65
66
STANDARD PARALLEL
Becky Peak
10068
Cherry Creek
Lovell
9795
Tippett
GOSHUTE
INDIAN
RESERVATION
Ray
24
Spring

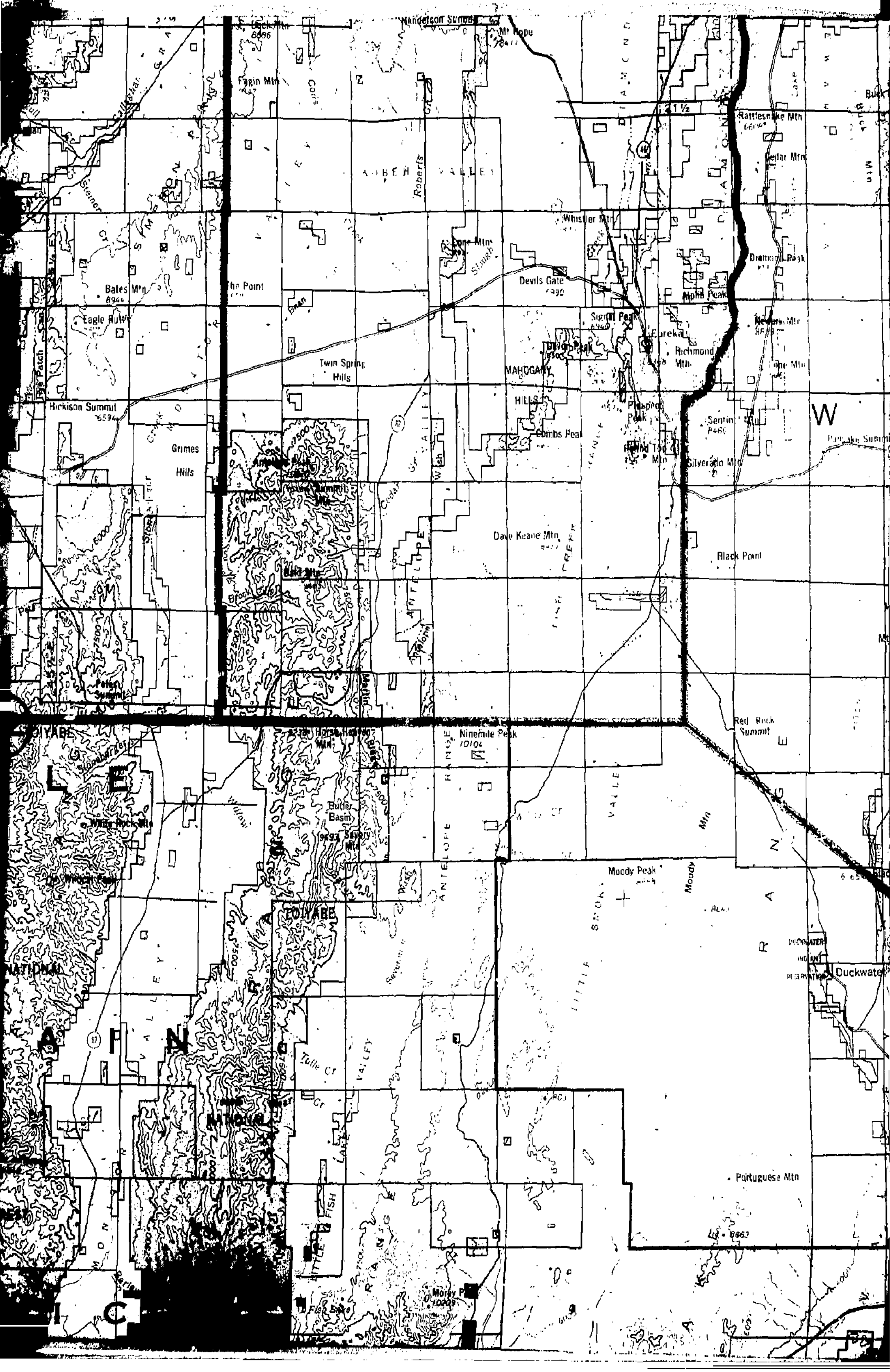
C


STOREY
CARSON
LYON
DIST
RENO
SPARKS
Black Springs
Hungry Mtn
Chalk Hills
Wadsworth
Fernley
TRUCKEE
Weeks
Virginia City
Silver City
Washoe Lake
Crystal
Carson
Cleaver Peak
Sunshine Flat
N.A.A.S. BOMBING TARGET AREA
Weber Res
Weed Heights
Yerington
Minden
Gardnerville
Dresslerville
Mt Wilson
Smith
2ND STANDARD PARALLEL
Wellington
CAMBRIDGE HILLS
Gray Hills
Black Mtn
Red Mtn
Antelope Valley

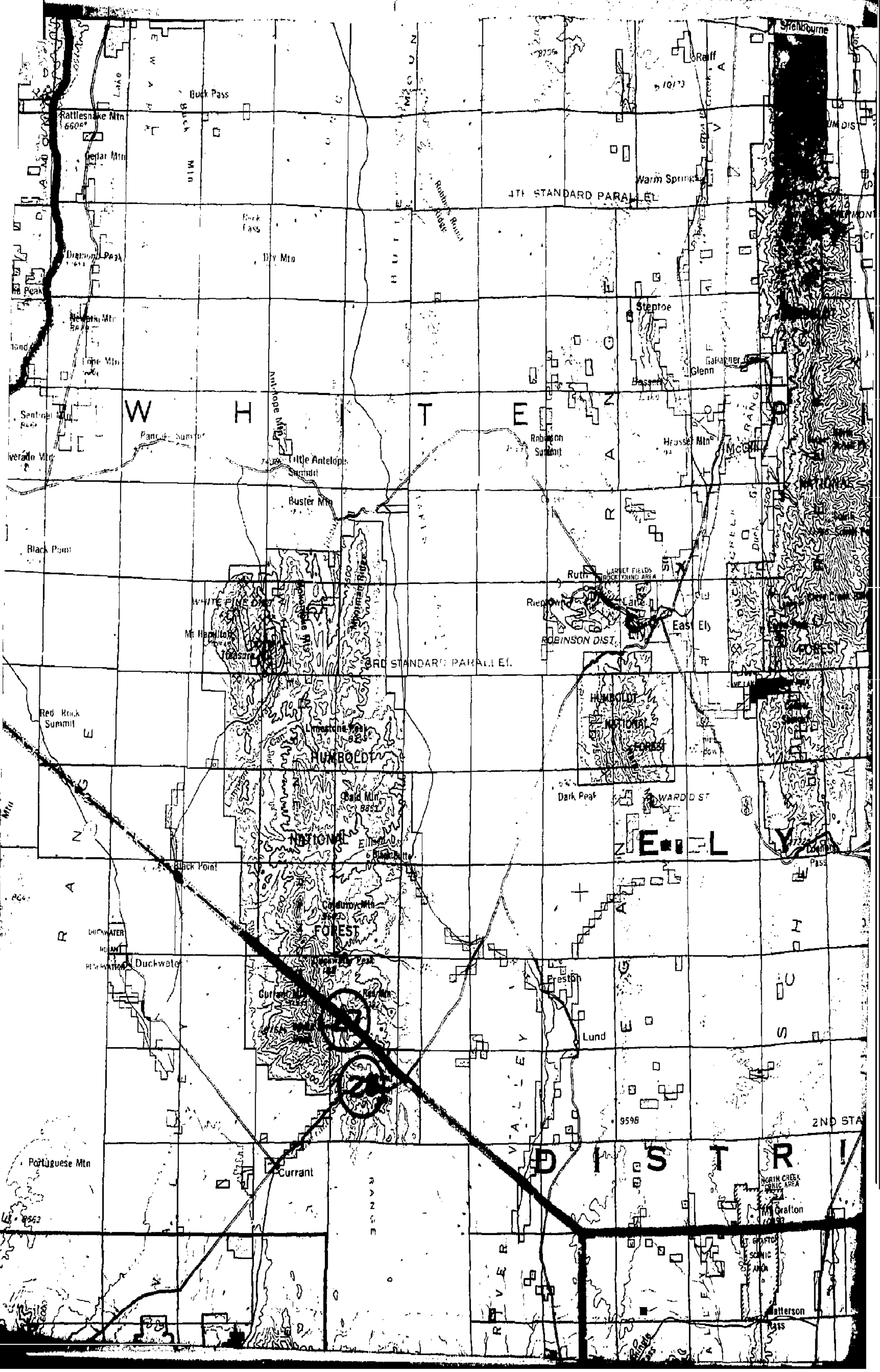


FALLON
NATIONAL
WILDLIFE REFUGE
STILLWATER WILDLIFE MANAGEMENT AREA
PARALLEL
C H U R C H I L L
Dutch Bill Lake
STILLWATER
NATIONAL
Stillwater
WILDLIFE
REFUGE
FALLON INDIAN RESERVATION
Fallon
FALLON NAVAL AUX. AIR STATION
Sehoo Mtn
Rainbow Mtn
Salt Wells
N.A.A.S. BOMBING TARGET AREA
Job Peak
Mt Lincoln
Table Mtn
Pirouette Mtn
Round Mtn
Twin Peaks
MOUNTAINS
Dixie Valley
Chalk Mtn
Eastgate
Frenchman
Sand Springs Pass
Fairview Peak
White Throne Mts
C I T Y
3RD STANDARD PARALLEL
Blow Sand Mts
Barnett Hills
Sunshine Flat
Slate Mtn
Weber Res
Brown Knob
RAWHIDE DIST
Big Kasock Mtn
Eagle Hill
Pilot Cone
Mt Annes
BRUNER DIST
WALKER RIVER INDIAN RESERVATION
Black Mtn
Schurz
T R I C T
TOIYABE
NATIONAL
FOREST
Paradise Peak
Gabbs
Gray Hills
Bald Mtn
WALKER LAKE
3976
SANTA FE DIST

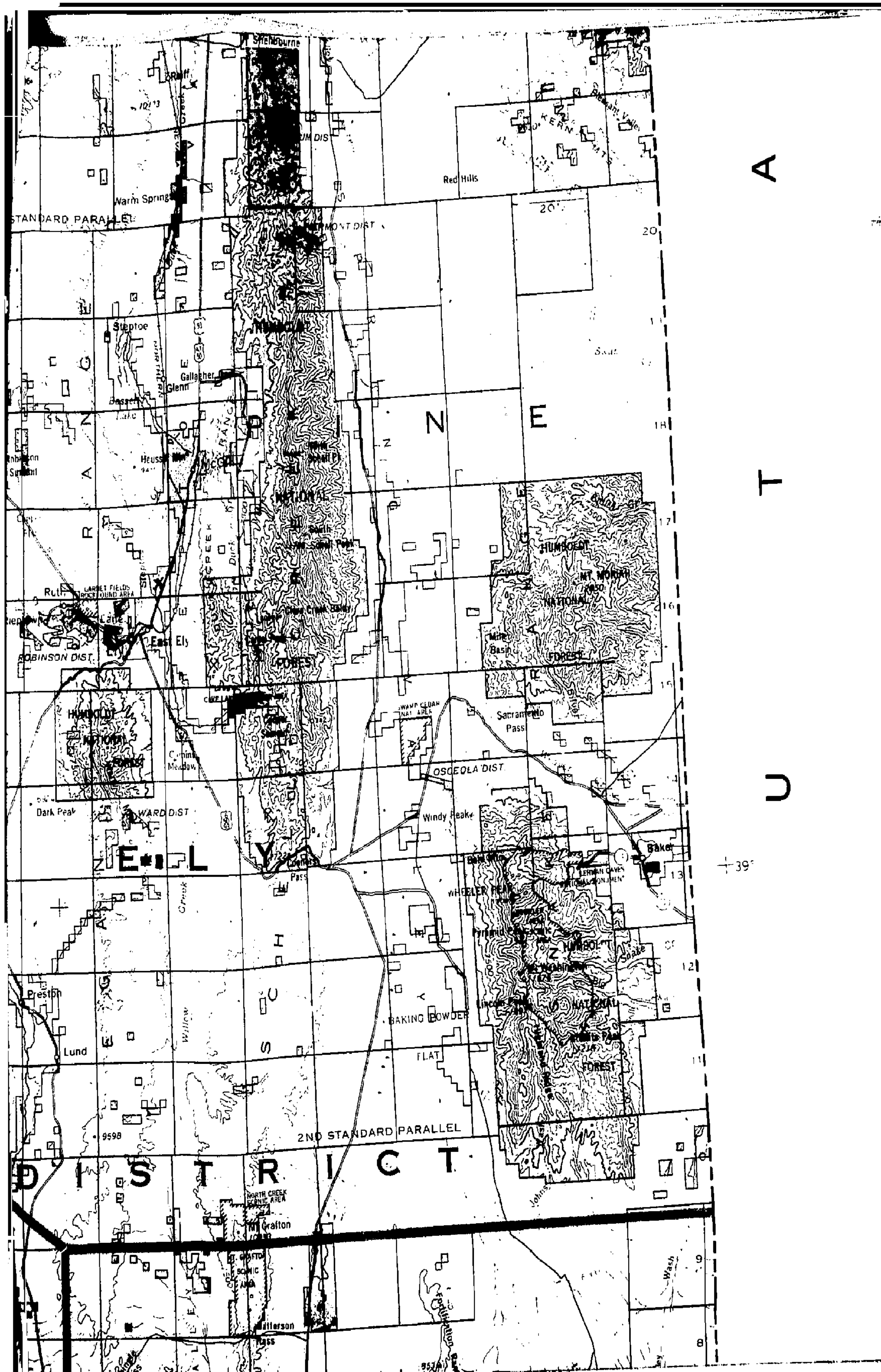

RAVENSWOOD DIST.
Mt Callaghan
New Pass
REESE RIVER DIST.
Round Mtn
Twin Peaks
Railroad Pass
Carroll Summit
Hickison Summit
Eagle Butte
North Shoshone Peak
South Shoshone Peak
BRUNER DIST.
Fairview Peak
TOIYABE
NATIONAL
FOREST
Gabbs
Paradise Peak
UNION DIST.
Alkali Flat
Round Mountain
30
26
25
24
23
22
20
B A T T L E
M O U N T A I

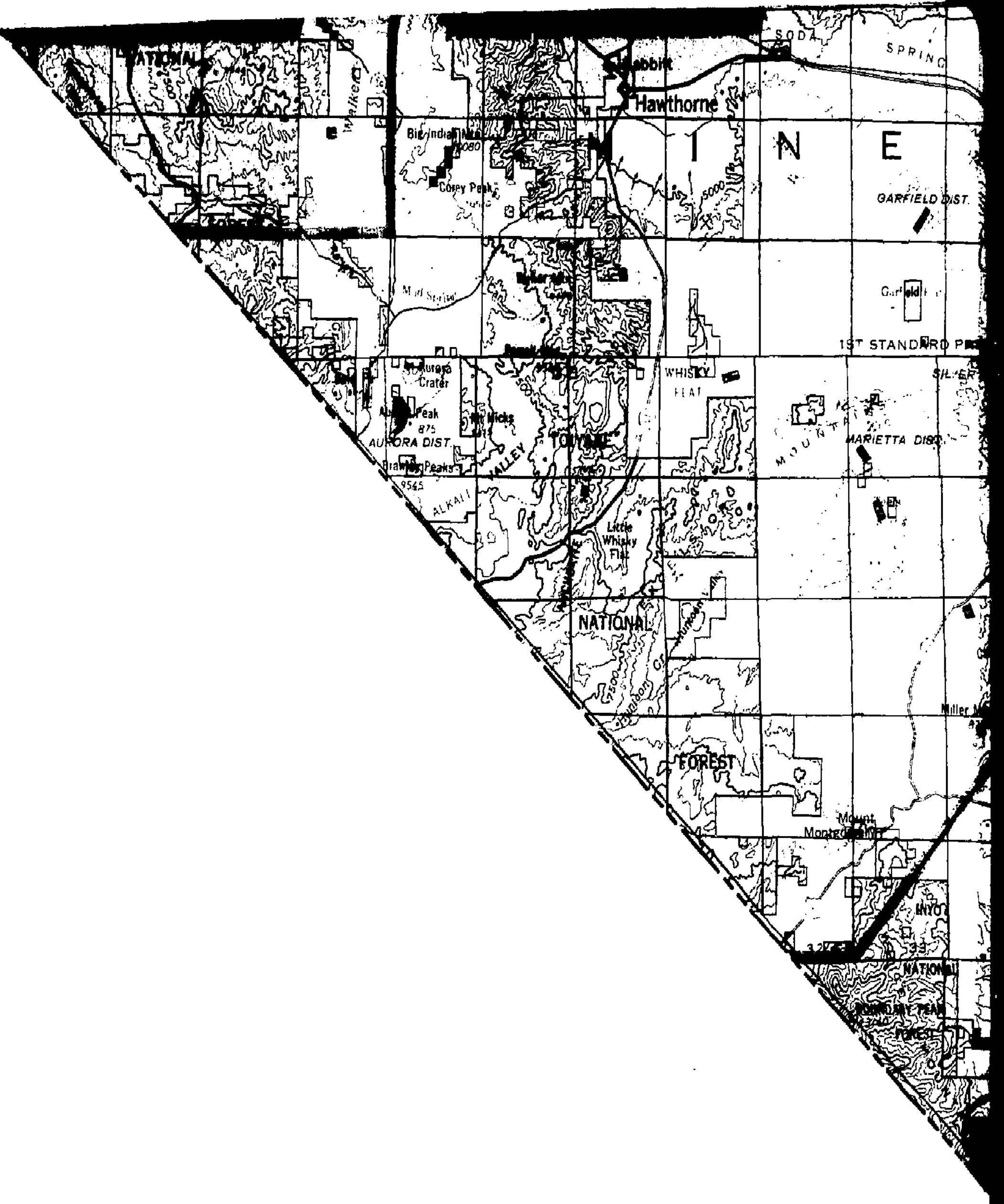


Henderson Summit
Buckhorn Mtn
8686
Mt Hope
Fagin Mtn
ROBERTS VALLEY
Roberts
Rattlesnake Mtn
Cedar Mtn
Whistler Mtn
Cone Mtn
Diamond Peak
Alpha Peak
Devils Gate
Bates Mtn
8944
The Point
Eagle Butte
Signal Peak
Eureka
Richmond Mtn
Newark Mtn
Twin Spring Hills
MAHOGANY HILLS
Hickison Summit
6594
Grimes Hills
Combs Peak
Sentinel Mtn
Silverado Mtn
Pancake Summit
W
Antelope Peak
Summit Mtn
Cedar
Dave Keane Mtn
Black Point
Bald Mtn
ANTELOPE
Brock
TOIYABE
Ninemile Peak
10104
Red Rock Summit
Horse Heaven Mtn
Butler Basin
Savory Mtn
Willow
White Rock Mtn
Moody Peak
Moody
Mtn
TOIYABE
DUCKWATER INDIAN RESERVATION
Duckwater
NATIONAL
Tulle Cr
VALLEY
NATIONAL
Portuguese Mtn
FISH
LITTLE
LAKE
Morey Peak
10203
Fish Lake

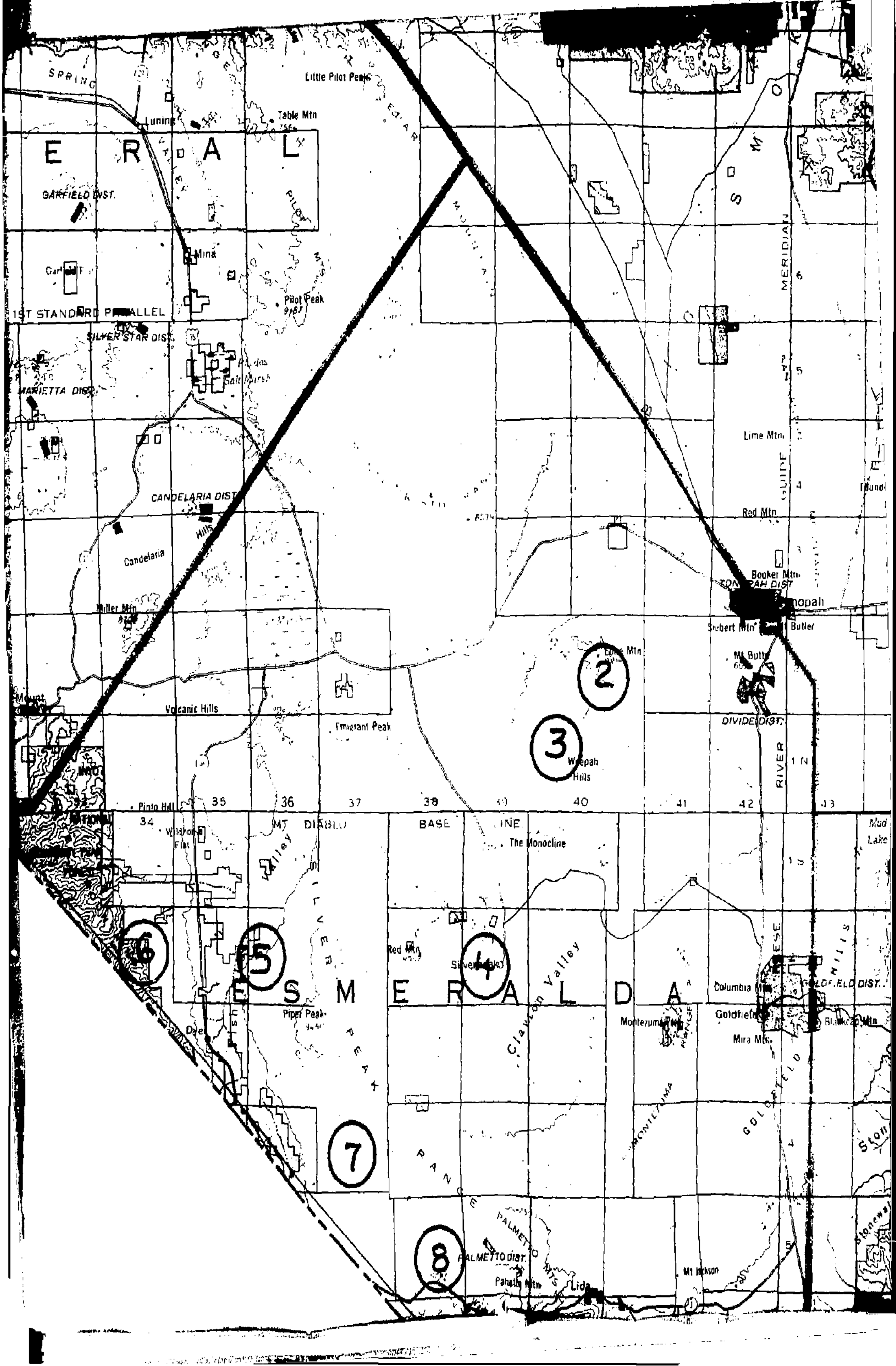


Shellbourne
Rattlesnake Mtn
6606
Buck Pass
Cedar Mtn
Reiff
Warm Springs
4TH STANDARD PARALLEL
Dry Mtn
Diamond Peak
Steptoe
Newark Mtn
Glenn
Bassett Lake
W H I T E
Sentinel Mtn
Pancake Summit
Little Antelope Summit
Robinson Summit
Antelope Mtn
Buster Mtn
Black Point
Ruth
Riepetown
East Ely
ROBINSON DIST.
WHITE PINE DIST
Mt Hamilton
Treasure
3RD STANDARD PARALLEL
HUMBOLDT
NATIONAL
FOREST
Red Rock Summit
Limestone Peak
Bald Mtn
8851
Dark Peak
WARD DIST
E L Y
Corduroy Mtn
Duckwater
Currant Mtn
Preston
Lund
2ND STA
Portuguese Mtn
Currant
RANGE
D I S T R I
NORTH CREEK SCENIC AREA
Mt Grafton
Patterson Pass


Sherbourne
Warm Springs
STANDARD PARALLEL
Red Hills
Steptoe
Gallagher
Glenn
McGill
Ruth
GARNET FIELDS ROCK HOUND AREA
East Ely
ROBINSON DIST.
HUMBOLDT NATIONAL FOREST
Cave Lake
Dark Peak
WARD DIST
OSCEOLA DIST
Windy Peak
Sacramento Pass
HUMBOLDT
MT. MORIAH
NATIONAL
FOREST
Baker
LEHMAN CAVES NATIONAL MONUMENT
WHEELER PEAK
Preston
Lund
BAKING POWDER
FLAT
2ND STANDARD PARALLEL
NORTH CREEK SCENIC AREA
Mt. Grafton
Patterson Pass
Connors Pass
S C H E L L   C R E E K
N E
U T A
E L Y
D I S T R I C T
9598



SODA
SPRING
Hawthorne
N
E
Big Indian Mtn
Corey Peak
GARFIELD DIST.
1ST STANDARD
WHISKY
FLAT
MARIETTA DIST.
Aurora Crater
Peak
AURORA DIST.
Peaks
9545
ALKALI
VALLEY
Little
Whisky
Flat
NATIONAL
FOREST
Mount
NATIONAL



Little Pilot Peak
Table Mtn
Luning
E R A L
GARFIELD DIST.
Mina
Pilot Peak
1ST STANDARD PARALLEL
SILVER STAR DIST.
MARIETTA DIST.
CANDELARIA DIST
Candelaria
Miller Mtn
Volcanic Hills
Emigrant Peak
Lime Mtn
Red Mtn
Booker Mtn
TONOPAH DIST
Siebert Mtn
Butler
DIVIDE DIST.
Weepah Hills
MERIDIAN
GUIDE
RIVER
1 N
Pinto Hill
34
35
36
37
38
40
41
42
43
MT DIABLO BASE LINE
The Monocline
Mud Lake
Red Mtn
Silver Peak
E S M E R A L D A
Clayton Valley
Columbia Mtn
GOLDFIELD DIST.
Goldfield
Montezuma Peak
Mira Mtn
Piper Peak
PALMETTO DIST.
PALMETTO MTS
Mt Jackson
Lida
2
3
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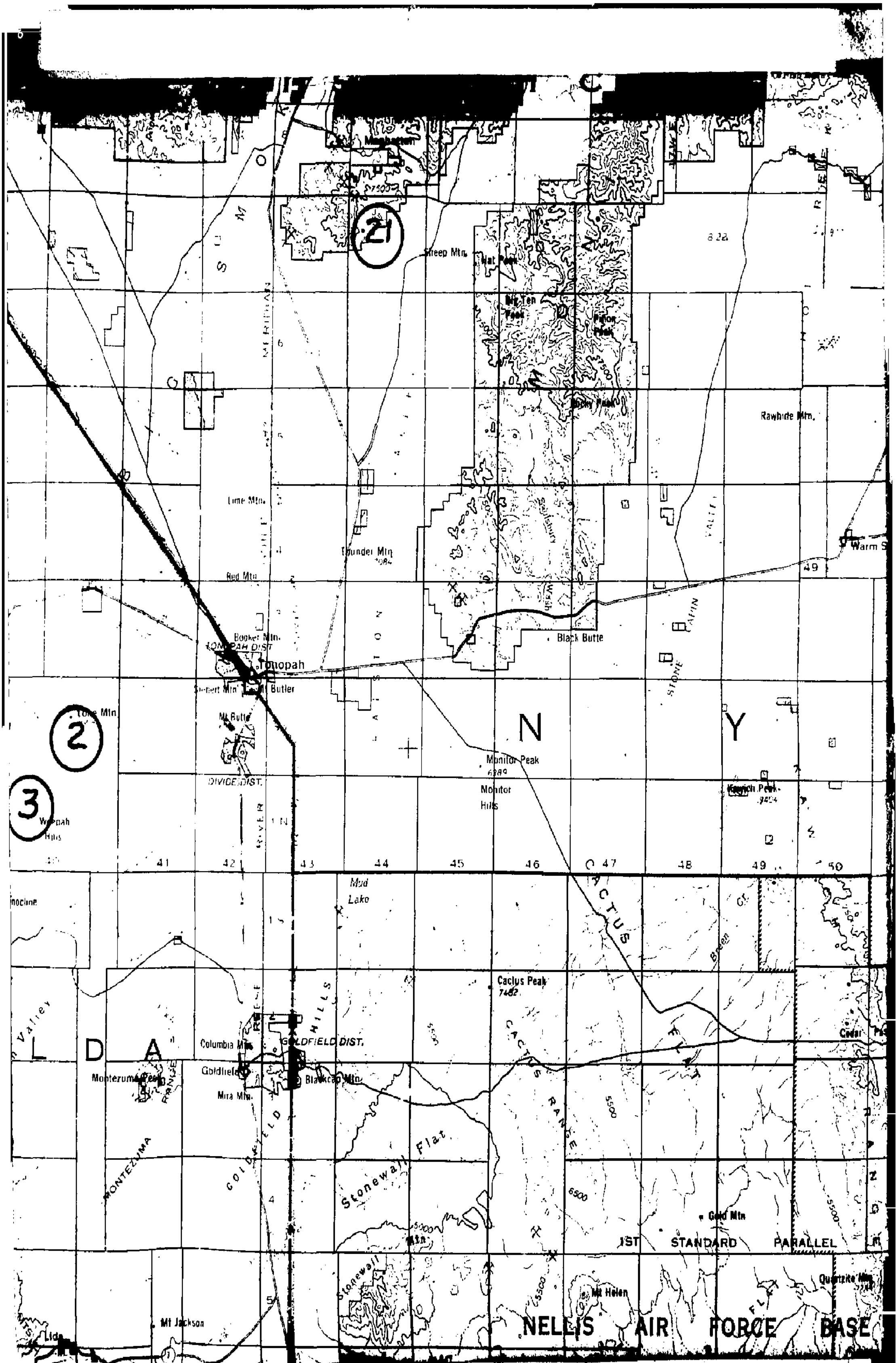
8



21
Sheep Mtn.
Hat Peak
Big Ten Peak
Pinon Peak
Rocky Peak
Rawhide Mtn.
Lime Mtn.
Thunder Mtn
Red Mtn
Warm S
Booker Mtn.
TONOPAH DIST
Tonopah
Black Butte
Siebert Mtn
Mt Butler
Lone Mtn
Mt Butte
2
N
Y
Monitor Peak
6989
Monitor Hills
DIVIDE DIST.
3
Weepah Hills
Mud Lake
Cactus Peak
7482
CACTUS RANGE
CACTUS FLAT
GOLDFIELD DIST.
Columbia Mtn
Goldfield
Blackcap Mtn
Mira Mtn
Montezuma Peak
MONTEZUMA
GOLDFIELD HILLS
Stonewall Flat
Stonewall
Gold Mtn
1ST STANDARD PARALLEL
Quartzite Mtn
Mt Helen
Mt Jackson
Lida
NELLIS AIR FORCE BASE
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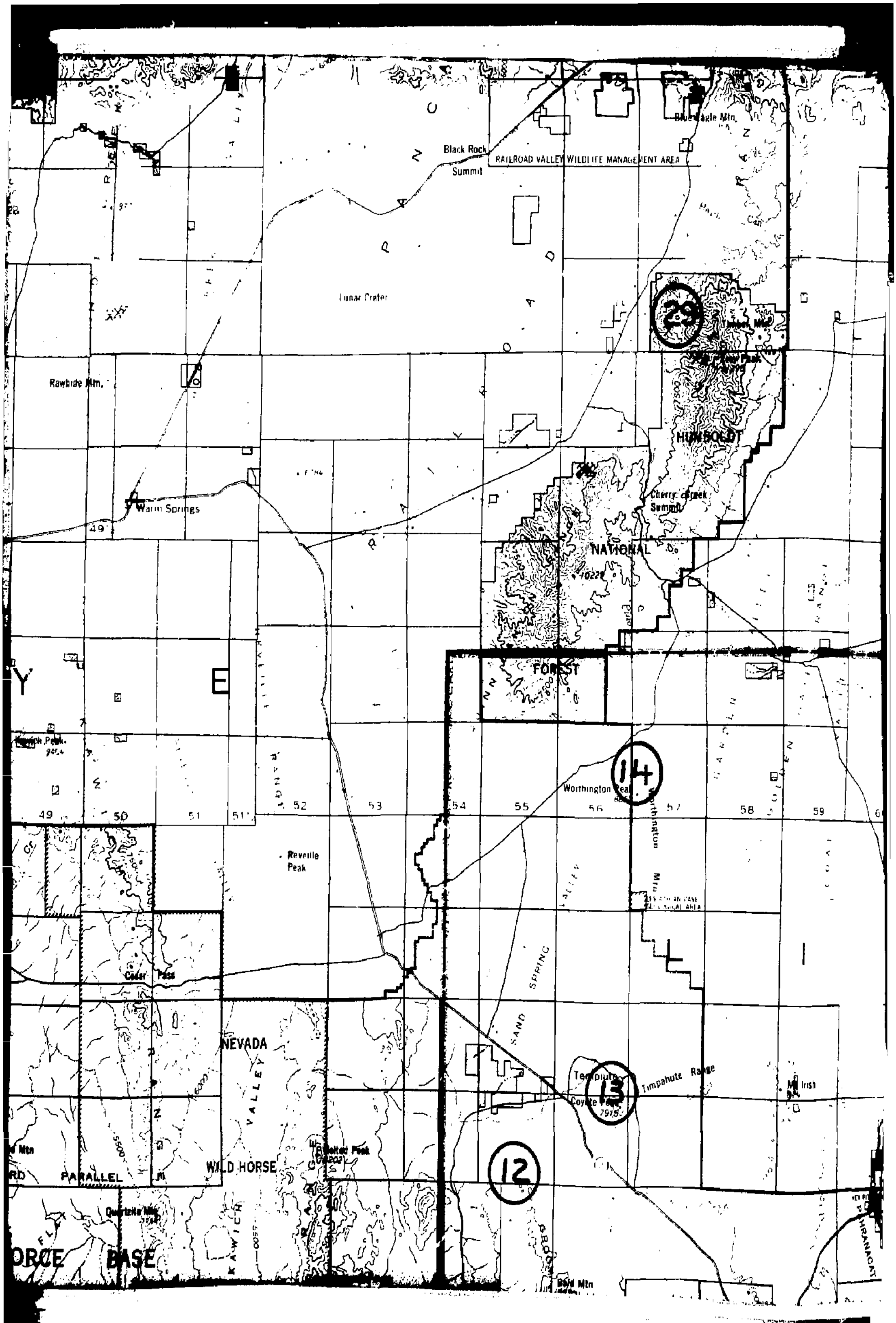
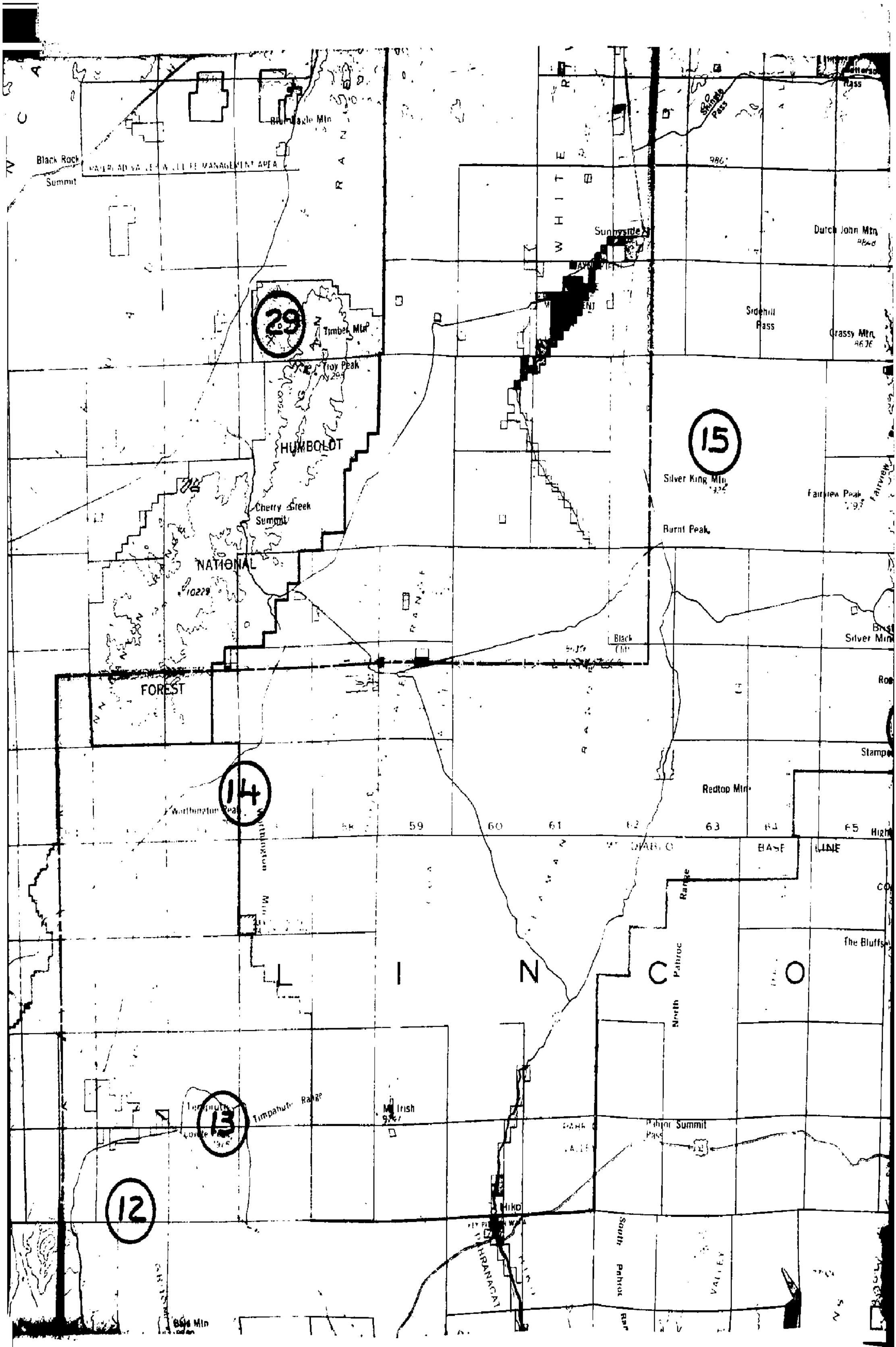
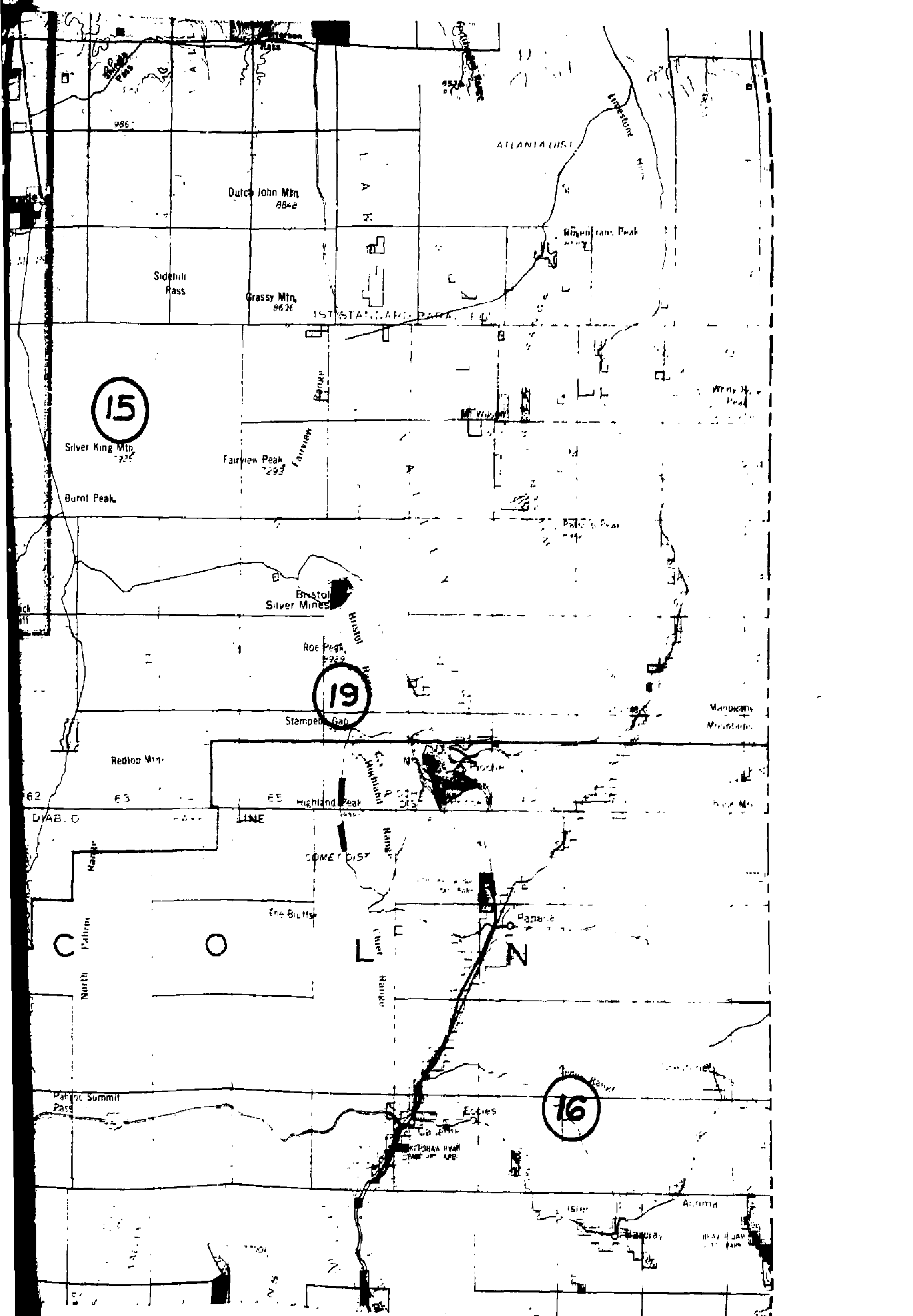


Black Rock
Summit
RAILROAD VALLEY WILDLIFE MANAGEMENT AREA
Blue Eagle Mtn.
Lunar Crater
29
Rawhide Mtn.
Warm Springs
49
HUMBOLDT
Cherry Creek
Summit
NATIONAL
10222
FOREST
14
Worthington Peak
Worthington
Mtn
49
50
51
52
53
54
55
56
57
58
59
Reveille
Peak
Cedar Pass
NEVADA
VALLEY
SAND
SPRING
Tempiute
Timpahute Range
Coyote Peak
7915
13
Mt Irish
WILD HORSE
PARALLEL
12
Quartzite Mtn
ORCE
BASE
KAWICH
Bald Mtn



Black Rock Summit
Blue Eagle Mtn
29
Timber Mtn
Troy Peak
HUMBOLDT
Cherry Creek Summit
NATIONAL
10229
FOREST
14
Sunnyside
Dutch John Mtn
Sidehill Pass
Grassy Mtn
8676
15
Silver King Mtn
Fairview Peak
Burnt Peak
Black Cliff
Redtop Mtn
Silver Mine
58
59
60
61
62
63
64
65
BASE
LINE
The Bluffs
L
I
N
C
O
North Pahroc Range
Timpahute Range
13
Mt Irish
Pahroc Summit Pass
12
Hiko
PAHRANAGAT
South Pahroc
VALLEY
Bald Mtn


Dutch John Mtn
8848
Sidehill
Pass
Grassy Mtn
8626
ATLANTA DIST
Rosencrans Peak
15
Silver King Mtn
Fairview Peak
Fairview
Burnt Peak
Range
Mt Wilson
Bristol
Silver Mines
Bristol
Roe Peak
19
Stampede Gap
Redlon Mtn
Mahogany
Mountains
Pioche
Highland Peak
Highland
COMET DIST
Range
The Bluffs
Panaca
C
O
L
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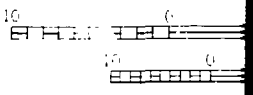
North
Pahroc
Chief
Range
Pahroc Summit
Pass
Eccles
Caliente
16
Acoma
Barclay

NEVADA

UN

LAND STA



Public Domain

Approximately 86 percent of Nevada's land area is under the jurisdiction of the Federal government, a greater percentage than any other state but Alaska. Much of this land is *public domain* public lands under Federal management which have not been reserved for special uses such as parks, National Forests, recreation areas, and military installations.

Public domain lands in Nevada total approximately 47 million acres, and are administered by the Bureau of Land Management of the U. S. Department of the Interior. The Bureau processes, adjudicates, and records all transactions involving public lands, and manages these lands for the benefit of the Nation. It is broadly concerned with the survey, engineering, inventory, classification, evaluation, administration, development, improvement, conservation, and multiple use of public lands.

An important and continuing function of the Bureau of Land Management is the cadastral survey of the Nation's public lands survey that creates, defines, reestablishes, and monuments boundaries of tracts of public lands. The Bureau also is legally responsible for the survey of lands administered by other Federal agencies. Many townships remain to be surveyed in Nevada, and some of the older surveys, made as long as 100 years ago, are so obliterated and erratic that extensive resurveys are necessary.

Public land records for the State are maintained in the State Office of the Bureau in **Reno, where they are available for public inspection. They consist of Master Title Plats, Use Plats, Historical Indexes, Survey Plats, Mineral Surveys, and Original Patents, which**

Wildlife ranges,
lands in several areas
kinds of game and wa
National Wildli
Fisheries and Wildlife,
Anaho Island in Pyra
other waterfowl. The
as well as the Ruby
and food for migrat
Washoe County was
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Range in southern N
portions of each of
will be permitted
may be restricted or
ing seasons. Further
headquarters offices
Other wildlife r
Nevada include th
Sport Fisheries a

NEVADA BUREAU OF MINES AND GEOLOGY

UNIVERSITY OF NEVADA, RENO

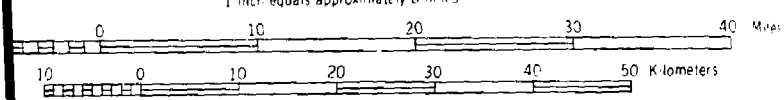
D STATUS MAP OF NEVADA

SECOND EDITION

1972

Compilation and Cartography
By
Ira A. Lutsey and Susan L. Nichols

Scale: 1:500,000
1 inch equals approximately 8 miles



Contour interval 500 feet

EXPLANATION

Federal wildlife ranges, refuges, and management areas

Wildlife ranges, refuges, and management areas have been established on Federal an l, in several areas of Nevada for the preservation, study, and management of various kinds of game and waterfowl.

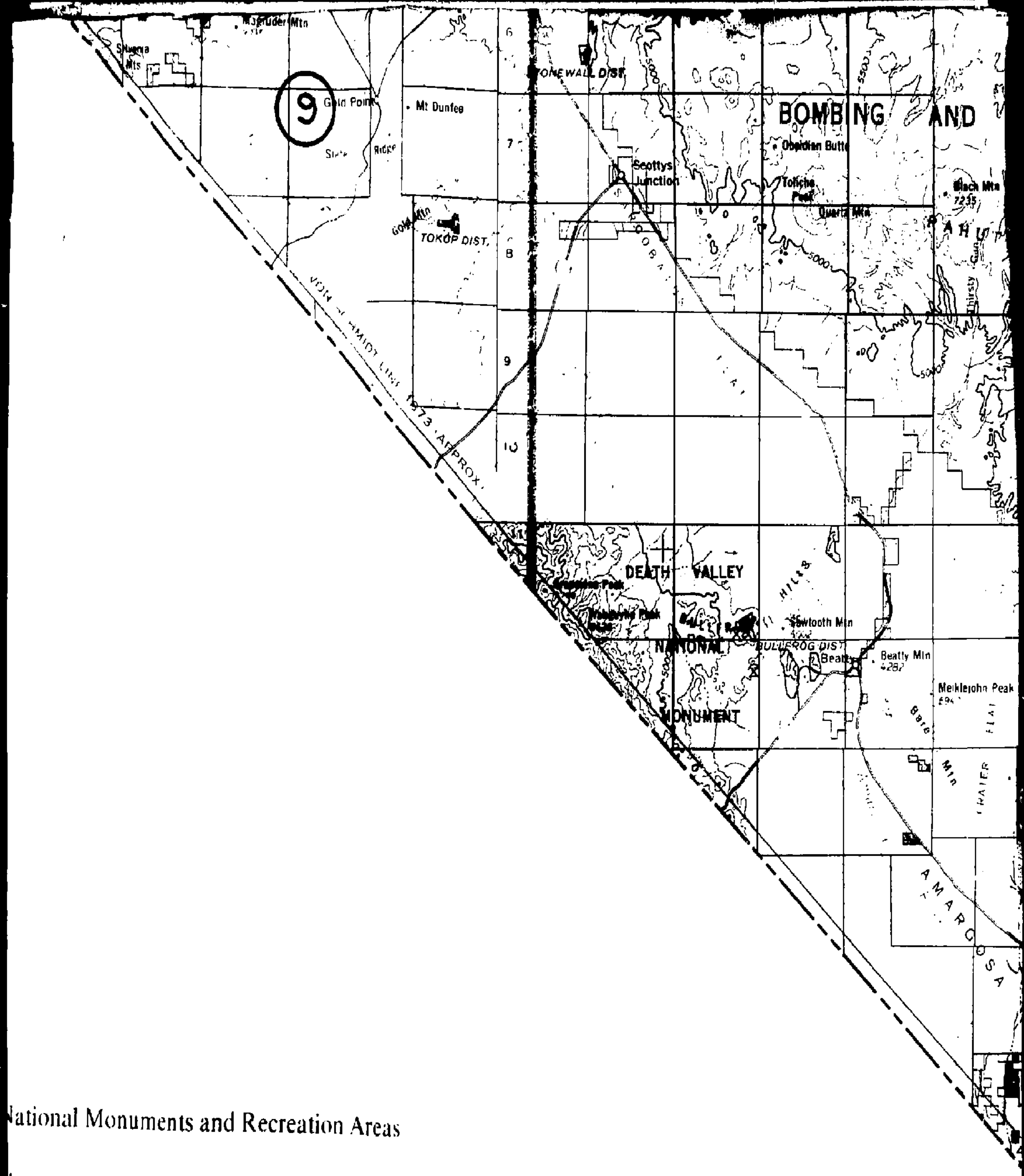
National Wildlife Ranges and Refuges are administered by the Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service, of the U. S. Department of the Interior. naho Island in Pyramid Lake was set aside in 1913 as a preserve for white pelicans and ther waterfowl. The Stillwater and Fallon National Wildlife Refuges in Churchill County, well as the Ruby Lake and Pahranagat Refuges in eastern Nevada, provide sanctuary d food for migratory waterfowl. The Sheldon National Antelope Refuge in northern shoe County was established for the protection of the pronghorn antelope. Desert big- rn sheep are provided a protective natural environment in the Desert National Wildlife nge in southern Nevada. Public use and enjoyment is permitted on certain designated tions of each of these areas. Public or private economic use, including mineral entry, be permitted under Special Use Permit obtained from the resident manager. Entry y be restricted or prohibited for reasons such as fire danger, animal migrations or lamb- seasons. Further information concerning use of these areas may be obtained from dquarters offices located on or nearby to the several Ranges and Refuges.

Other wildlife ranges and management areas on Federally administered lands in da include the Charles Sheldon Antelope Range, jointly managed by the Bureau of Fisheries and Wildlife, and the

National Monuments a

National Parks, Monuments and Recreation Areas Park Service, Department of the Interior. Lel man Cave White Pine County, only 1 square mile in ext ent, was e National Monument, only a relatively small part of whic 1933. Preservation of the often unique natural enviro and Monuments is one of the primary responsibilities hunting of wildlife, and destruction or remov l of flow objects is prohibited. Prospecting and location of mine man Caves National Monument, and are subject to spec ley National Monument.

The National Park Service has since 1936 admin recreational use of Lake Mead, which was formed by c Bureau of Reclamation in 1935. Lake Mead National authorized by Congress in 1964, and includes also Lake tion of Davis Dam in 1952. Hunting, fishing, camping an allowed at all suitable locations in the Recreation Area. W mining claims are not permitted, mineral leasing is allo ment of the Interior and National Park Service s



National Monuments and Recreation Areas

Monuments and Recreation Areas are administered by the National ent of the Interior. Lehman Caves National Monument in eastern y 1 square mile in extent, was established in 1922. Death Valley ly a relatively small part of which is in Nevada, was established in he often unique natural environments in natural category Parks of the primary responsibilities of the National Park Service, and destruction or removal of flowers, trees, rocks and other natural rospecting and location of mineral claims are prohibited in Lehnument, and are subject to special regulations within Death Val-

Service has since 1936 administered and managed the public Mead, which was formed by completion of Hoover Dam by the in 1935. Lake Mead National Recreation Area was formally in 1964, and includes also Lake Mohave, formed by the comple-52. Hunting, fishing, camping and other recreational activities are cations in the Recreation Area. While prospecting and location of ermitted, mineral leasing is allowable subject to special Depart- National Park Service stipulations.

County seat

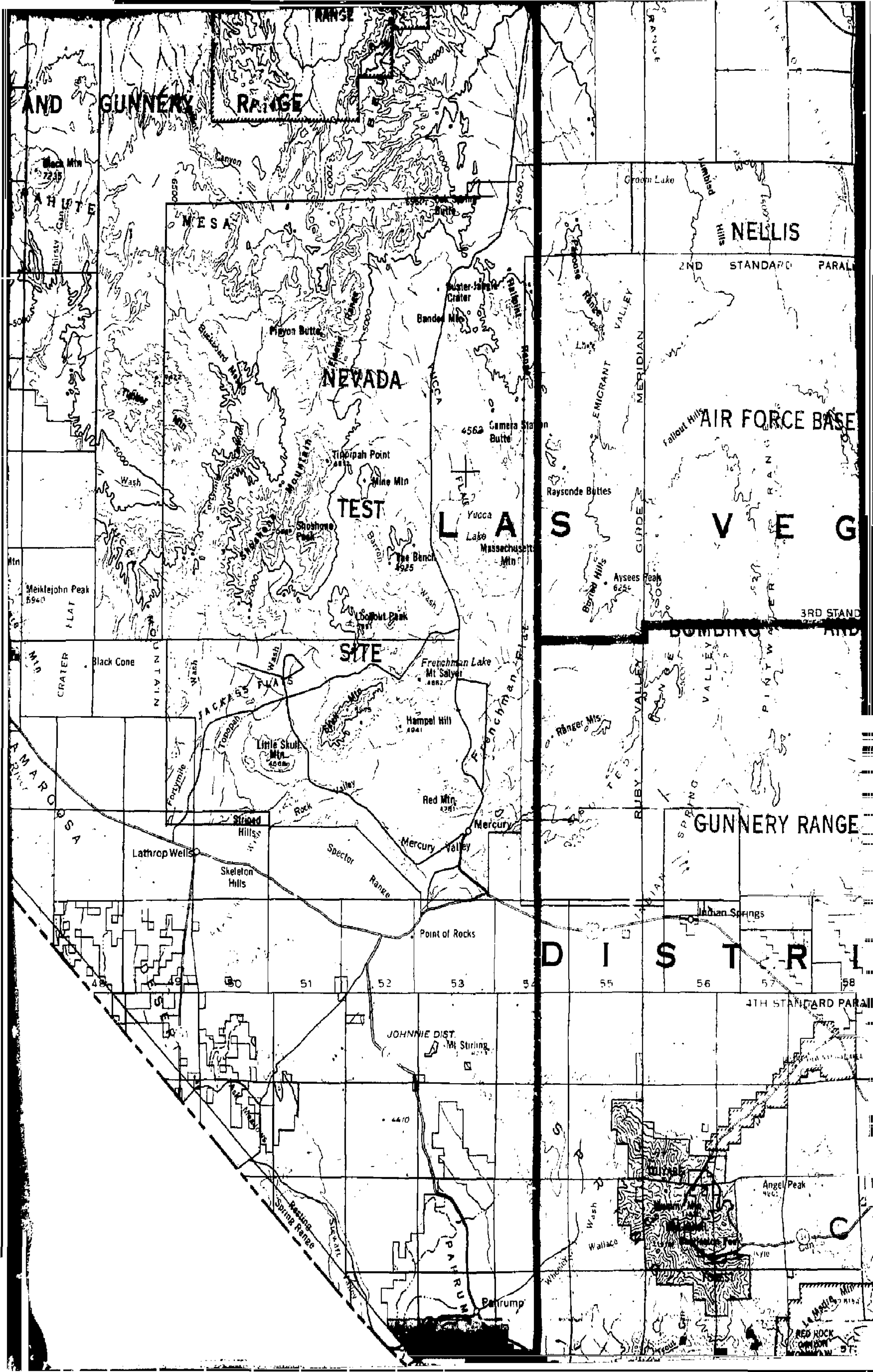
Scheduled service airport

Interstate highway

U. S. highway

State highway

Hard surfaced roads


AND GUNNERY RANGE
RANGE
PAHUTE
MESA
Black Mtn
Canyon
NEVADA
TEST
SITE
Pinyon Butte
Buckboard Mesa
Timber Mtn
Tippipah Point
Mine Mtn
Shoshone Peak
Shoshone Mountain
Banded Mtn
Buster-Jangle Crater
YUCCA
FLAT
Yucca Lake
Camera Station Butte
The Bench
Lookout Peak
Massachusetts Mtn
Wash
Meiklejohn Peak
Black Cone
CRATER
FLAT
JACKASS FLATS
Topopah
Little Skull Mtn
Skull Mtn
Hampel Hill
Frenchman Lake
Mt Salyer
Frenchman
Red Mtn
Rock Valley
Mercury
Mercury Valley
Fortymile
Striped Hills
Lathrop Wells
Skeleton Hills
Specter Range
Point of Rocks
AMARGOSA
JOHNNIE DIST.
Mt Stirling
Resting Spring Range
Stewart
PAHRUMP
Pahrump
NELLIS
AIR FORCE BASE
2ND STANDARD PARAL
3RD STAND
4TH STANDARD PARA
Groom Lake
Papoose Range
EMIGRANT VALLEY
Fallout Hills
Raysonde Buttes
LAS VEG
GURDE MERIDIAN
Buried Hills
Aysees Peak
BOMBING AND
Ranger Mts
RUBY VALLEY
INDIAN SPRING VALLEY
PINTWATER RANGE
GUNNERY RANGE
Indian Springs
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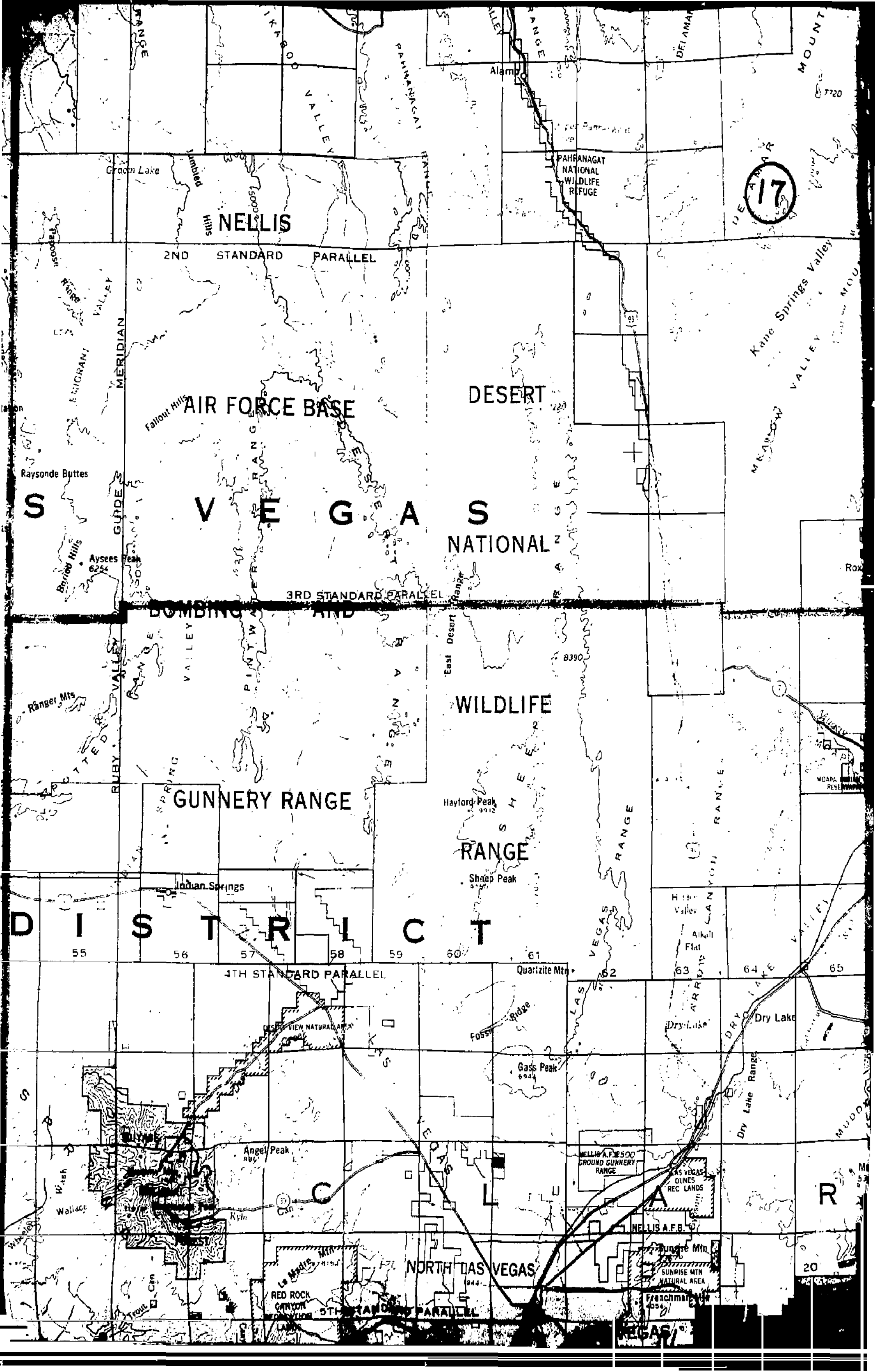
Angel Peak
Wallace
Wash
Wheeler
Kyle
Charleston Peak
Trout Can
La Madre Mtn
RED ROCK CANYON



17
NELLIS
2ND STANDARD PARALLEL
AIR FORCE BASE
DESERT
S VEGAS
NATIONAL
3RD STANDARD PARALLEL
BOMBING AND
WILDLIFE
GUNNERY RANGE
RANGE
DISTRICT
4TH STANDARD PARALLEL
5TH STANDARD PARALLEL
C L A R
Alamo
PAHRANAGAT NATIONAL WILDLIFE REFUGE
Groom Lake
Jumbled Hills
Papoose Range
Emigrant Valley
Gold Meridian
Fallout Hills
Raysonde Buttes
Aysees Peak 6254
Buried Hills
Ranger Mts
Spotted Range
Ruby Valley
Pintwater Range
Spring
East Desert Range
8390
Sheep Range
Hayford Peak
Sheep Peak
Las Vegas Range
Indian Springs
Kane Springs Valley
Meadow Valley
Hidden Valley
Alkali Flat
Arrow Canyon Range
Dry Lake Valley
Dry Lake
Dry Lake Range
Quartzite Mtn
Fossil Ridge
Gass Peak 6943
DESERT VIEW NATURAL AREA
Angel Peak
Kyle
Wallace
Wheeler Wash
Trout Can
La Madre Mtn
RED ROCK CANYON
NELLIS A.F. 2500 GROUND GUNNERY RANGE
LAS VEGAS DUNES REC LANDS
NELLIS A.F.B.
Sunrise Mtn
SUNRISE MTN NATURAL AREA
Frenchman Mtn 4054
NORTH LAS VEGAS
VEGAS
MOAPA INDIAN RESERVATION
55
56
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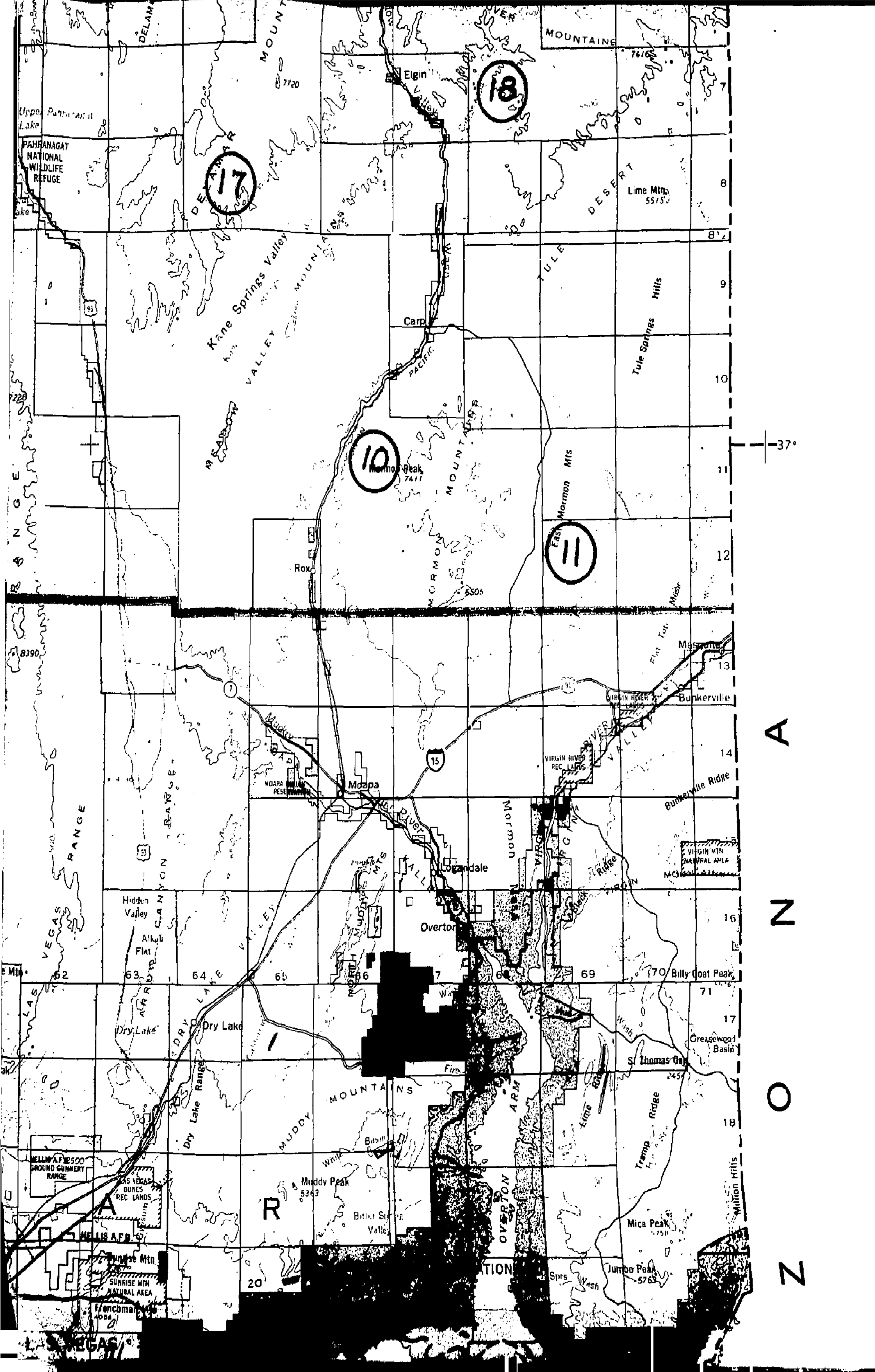
Elgin
MOUNTAINS
Upper Pahranagat Lake
PAHRANAGAT NATIONAL WILDLIFE REFUGE
DELAMAR
Kane Springs Valley
MEADOW VALLEY MOUNTAINS
Lime Mtn.
TULE DESERT
Tule Springs Hills
Carp
PACIFIC
Mormon Peak
MORMON MOUNTAINS
East Mormon Mts
Rox
Mesquite
Bunkerville
VIRGIN RIVER REC. LANDS
MOAPA INDIAN RESERVATION
Moapa
Muddy River
Logandale
Overton
Mormon Mesa
Bunkerville Ridge
VIRGIN MTN NATURAL AREA
Hidden Valley
Alkali Flat
Billy Goat Peak
Dry Lake
DRY LAKE VALLEY
Dry Lake Range
Greasewood Basin
St Thomas Gap
MUDDY MOUNTAINS
OVERTON ARM
Tramp Ridge
Million Hills
NELLIS A.F.B. GROUND GUNNERY RANGE
LAS VEGAS DUNES REC. LANDS
Muddy Peak
Bitter Spring Valley
Mica Peak
Jumbo Peak
NELLIS A.F.B.
Sunrise Mtn
SUNRISE MTN NATURAL AREA
Frenchman
LAS VEGAS
ARIZONA
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37°

Historical Indexes, Survey Plats, Mineral Surveys, and Original Patents, which together present a complete picture of title transactions and most authorized uses, involving public lands in Nevada.

Bureau resource management programs are conducted out of six District Offices located in Elko, Ely, Carson City, Winnemucca, Battle Mountain and Las Vegas. The Nevada State Office is located in the Federal Building, 300 Booth Street, Reno, Nevada.

The Bureau of Land Management has identified and formally set aside a number of areas of public land in Nevada to preserve their unique recreational, historical, archeological, and natural values. The areas have been variously segregated from disposal under one or more of the public land laws. The larger of these areas are identified and named on the map.

National Forests

The National Forests are administered by the Forest Service of the U. S. Department of Agriculture, and are dedicated to the principle of multiple use management of the Nation's forest resources, the protection and enhancement of the watersheds for quality water production for sustained yields of wood, forage, wildlife, and to provide outdoor recreation opportunities. National Forests in the eastern part of the State comprise the Humboldt National Forest, with headquarters in Elko, those in the central and western parts of Nevada comprise the Toiyabe National Forest, headquartered in Reno. The small part of the White Mountains that lie within Nevada's Mineral and Esmeralda Counties, are part of the Inyo National Forest, administered from Bishop, Calif. Each of the national Forests is divided into several Ranger Districts.

Several National Forest areas in Nevada have been formally set apart because of their unique scenic or wilderness opportunities. The Wheeler Peak Scenic Area in the Snake Range section of the Humboldt National Forest in eastern White Pine County contains Nevada's only glacier, and a stand of ancient bristlecone pines. The Ruby Mountain Scenic Area southeast of Elko is another area of outstanding scenic and recreational interest. The headwaters region of the Jarbidge River in north-central Elko County is one of a number of wilderness areas throughout the United States that has been set aside by Congress for preservation in their primitive state. Other outstanding scenic and recreational areas partly or entirely within National Forests include the Lake Tahoe basin, and the Mount Charleston area west of Las Vegas, both in the Toiyabe National Forest.

Hunting and fishing, camping, hiking, picnicking and other outdoor pursuits are encouraged in all National Forests. Swimming and winter sports are likewise encouraged wherever facilities are available. Cross country vehicle travel is discouraged and in some areas prohibited.

Vehicular travel is prohibited in the Jarbidge Wilderness, restricted in areas of fragile soil and the Scenic Areas mentioned above. Mining claims may be staked on all National Forests subject to compliance with the rules and regulations governing such forests. Some National Forest areas, however, have been withdrawn from mineral entry or are otherwise not subject to the mining laws. Information concerning these areas and the National Forest rules and regulations can be obtained from the district ranger or forest supervisor.

Atomic Energy Commission facilities

The U. S. Atomic Energy Commission's Nevada Test Site was established in December, 1950, after a survey of many possible locations where relatively low yield atmospheric detonations could be conducted with full assurance of public safety.

In succeeding years the Test Site has been used by the Commission for the testing of more than 400 nuclear devices for both defense and peaceful uses. All tests since the signing of the Limited Test Ban Treaty in August, 1963 have been conducted underground.

Unauthorized entry to the Nevada Test Site is prohibited both for security and personal safety reasons. Requests for permission to enter the Test Site should be made to the Manager of Nevada Operations, USAEC, P. O. Box 14100, Las Vegas, Nevada 89114.

Sport Fisheries an
Management Area,
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Valley Wildlife M
Game, through ag

Land in west
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Lands under
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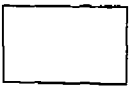

Only about 1
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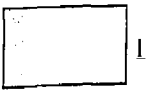

The U. S. Air Fo
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Unauthorized
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include the Charles Sheldon Antelope Range, jointly managed by the Bureau of Sport Fisheries and Wildlife and the Bureau of Land Management; the Stillwater Wildlife Management Area, managed jointly by the Bureau of Sport Fisheries and Wildlife and the Nevada Department of Fish and Game; and the Alkali Lake, Railroad Valley and Jacks Valley Wildlife Management Areas, managed by the Nevada Department of Fish and Game, through agreement with the Bureau of Land Management.

Bureau of Reclamation withdrawals

Land in western Churchill County and northern Lyon County, withdrawn from the public domain by the Bureau of Reclamation, Department of the Interior early in this century, is the site of the Newlands Project, one of the original reclamation developments begun as a result of the Reclamation Act of 1902. Much of the land originally withdrawn has since passed to private ownership, primarily for agricultural purposes, and some is now managed by the Bureau of Sport Fisheries and Wildlife in connection with wildlife refuges and management areas.

Lands under Bureau jurisdiction in the vicinity of Lake Mead are parts of a withdrawal of land in the 1920's in connection with the construction of Hoover Dam, first of the Bureau's huge multipurpose projects.

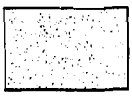
Other Bureau of Reclamation lands include those adjacent to Lahontan Reservoir west of Fallon, at Rye Patch Reservoir and near Battle Mountain on the Humboldt River.

Private lands

Only about 12 percent of the land area of Nevada, amounting to some 8 million acres, is held in private ownership, a smaller percentage than that of any other state but Alaska.

Nearly 5 million acres in Nevada were granted by the Federal government to the Central Pacific Railroad in the 1860's in return for the building of the first transcontinental rail line and free transport of government materials in ensuing years. This land appears on the map as alternating sections of a broad, 40-mile-wide, checkerboard band generally centered on the main line of the Southern Pacific Company, successor to the Central Pacific and present owner of much of the original grant. The Southern Pacific Company retains ownership of about 1.5 million acres; the remainder has been sold to other private owners.

The U. S. Congress, in its Nevada State Enabling Act of 1864, granted to Nevada sections 16 and 36 of each township the sale or use of which was intended for the support of the common schools, similar to land grants made to other western states. Through this Act the State acquired rights to about 3,800,000 acres of land, much of which was in unsurveyed, mountainous or barren areas. Only 62,000 acres had been sold by 1880, when Nevada agreed to relinquish the remainder in exchange for 2 million acres to be selected from among all surveyed public lands within its borders. Most selections consisted of valley lands in northern, western and southern Nevada suitable for agriculture. Other State acquisitions of Federal lands up to 1934 totalled more than 730,000 acres. Of these more than 2.7 million acres, but approximately 125,000 acres remained for sale by 1936. Aside from a relatively small percentage now included in urban areas, the land is presently devoted to private ranching and other agricultural uses.



Department of Defense facilities

The U. S. Air Force and Navy operate training facilities or munitions storage depots in several areas of Nevada. Alternating diagonal color bands in an area north of Las Vegas indicate an area jointly occupied by the Nellis Air Force Base Bombing and Gunnery Range, and the Desert National Wildlife Range.

Unauthorized entry to these installations is prohibited both for security and personal safety reasons. Requests for permission to enter should be made to the Commanding Officer of the installation concerned.

Indian Reservations

Indian Trust Allotmer

Indian lands in Nevada comprise about 1.6 pe
These include 10 small colonies, 15 reservations,
Indian Reservation lands and Indian Trust Allotmen
position of these properties requires approval of
of Indian Affairs, Trustee. The Bureau of Indian Aff
of the Interior. Inquiries concerning access to or use
to: U. S. Bureau of Indian Affairs, Stewart, Nevada.

State lands

Nearly half of all State-owned land consists of
System includes 13 units ranging in size from a few ac
is administered by the Division of State Parks, Depart
Resources. Several units consist of Bureau of Reclama
able through Fish and Game or Special Use Permits o
open to the public year around, and include picnic a
and hiking are permitted where adequate facilities exi

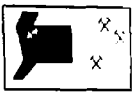
For further information, contact the Nevada St
Building, Carson City, Nev.

The Nevada Department of Fish and Game mana
Areas in the State. Only those Wildlife Management
nantly of State-owned land are shown on this map. E
accordance with proper wildlife management practice
the Nevada Fish and Game Commission.

Other State-owned lands include the Las Vegas
sity of Nevada, the Whittell Forest and Wildlife Area
State government agencies.

Stock driveways

Stock driveway withdrawals are public lands res
stock. Driveways generally cannot be disposed of under
open to location under mining and mineral leasing laws
dered for lease until needed for driveway purposes and
to improve the driveway pattern.



Patented lode mining clai

Claims are almost invariably located when valuabl
lands. An unpatented mining claim is a title which is m
tained by the annual expenditure in work and improve
ing promises to be commercially feasible, application fo
Federal government. Patent requirements are exacting
claims are patented title is perfected, and the claims are
other private lands. Patented mining claims are separate
a convenience to users interested in mineral resour

Indian Reservations

Indian Trust Allotments

ian lands in Nevada comprise about 1.6 percent of the total area of the State. clude 10 small colonies, 15 reservations, and scattered individual allotments. eservation lands and Indian Trust Allotments are private lands. Any use or dis- of these properties requires approval of the Indian owner and the Bureau Affairs, Trustee. The Bureau of Indian Affairs is part of the U. S. Department nterior. Inquiries concerning access to or use of Indian lands should be directed Bureau of Indian Affairs, Stewart, Nevada.

State lands

arly half of all State-owned land consists of State Parks. The Nevada State Park includes 13 units ranging in size from a few acres to more than 40,000 acres, and istered by the Division of State Parks, Department of Conservation and Natural es. Several units consist of Bureau of Reclamation withdrawals, or are made avail- ough Fish and Game or Special Use Permits of the U. S. Forest Service. Most are the public year around, and include picnic and camping sites. Fishing, boating, ng are permitted where adequate facilities exist.

r further information, contact the Nevada State Park Division, Room 221, Nye , Carson City, Nev.

e Nevada Department of Fish and Game manages numerous Wildlife Management the State. Only those Wildlife Management Areas consisting entirely or domi- of State-owned land are shown on this map. Entry may at times be restricted in nce with proper wildlife management practices, and is subject to regulations of ada Fish and Game Commission.

ther State-owned lands include the Las Vegas and Reno campuses of the Univer- Nevada, the Whittell Forest and Wildlife Area, and the facilities of the various overnment agencies.

Stock driveways

Stock driveway withdrawals are public lands reserved for the movement of live- Driveways generally cannot be disposed of under the non-mineral land laws but are o location under mining and mineral leasing laws. Withdrawn lands may be consi- for lease until needed for driveway purposes and may be considered for exchange rove the driveway pattern.

Patented lode mining claims

Claims are almost invariably located when valuable mineral is discovered on public An unpatented mining claim is a title which is never complete, and must be main- by the annual expenditure in work and improvements as required by law. If min- omises to be commercially feasible, application for patent is usually made with the al government. Patent requirements are exacting and must be fully met. When are patented title is perfected, and the claims are owned in fee simple as are any private lands. Patented mining claims are separately shown on this map mainly as venience to users interested in mineral resource discovery and development.

State highway

Hard surfaced roads

Other roads

County boundary

Bureau of Land Management district boundary

POPULATION KEY

RENO	more than 25,000
SPARKS	10,000 to 25,000
Carson City	2,500 to 10,000
Carlin	1,000 to 2,500
Minden	less than 1,000

Popular on indicated by size of letters

(15) SITE LOCATION

guway

ced roads

Other roads

y boundary

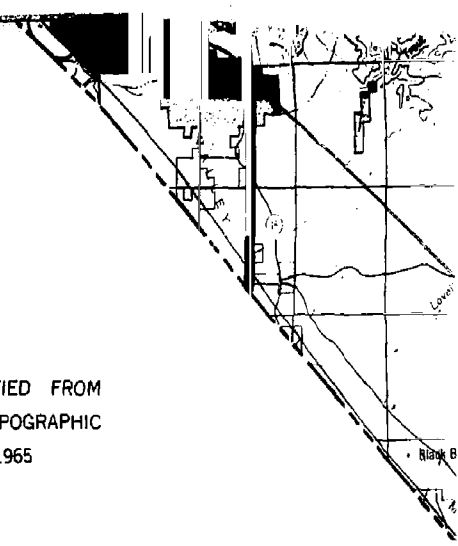
id Manage-
t boundary

EY

ore than 25,000
0,000 to 25,000
2,500 to 10,000
1,000 to 2,500
less than 1,000

or letters

OCATION



TOPOGRAPHIC BASE MODIFIED FROM
U. S. GEOLOGICAL SURVEY TOPOGRAPHIC
MAP OF NEVADA, EDITION OF 1965

METHOD OF COMPILATION

Land status was determined by inspection of the Master Title Plats on file at the Nevada State Office of the Bureau of Land Management, and by inspection of maps and other documents received from the several Federal and State agencies that administer Nevada lands.

The map scale, and errors inherent in the compilation and printing processes, combine to impose a lower limit on the size of land parcel that can be separately shown on this map. The quarter section of land (160 acres) was selected as the smallest individually mappable unit in most cases. If a particular status prevailed in half or more of a given quarter section, the entire quarter section was shown under that status classification. If a quarter section was evenly divided between two classifications, one of which is public domain, the other status classification was shown for that entire quarter section.

Leases, Special Land Use Permits, highway rights-of-way, and other land parcels that have not been patented, withdrawn, or segregated from the public domain, are not identified on the map.

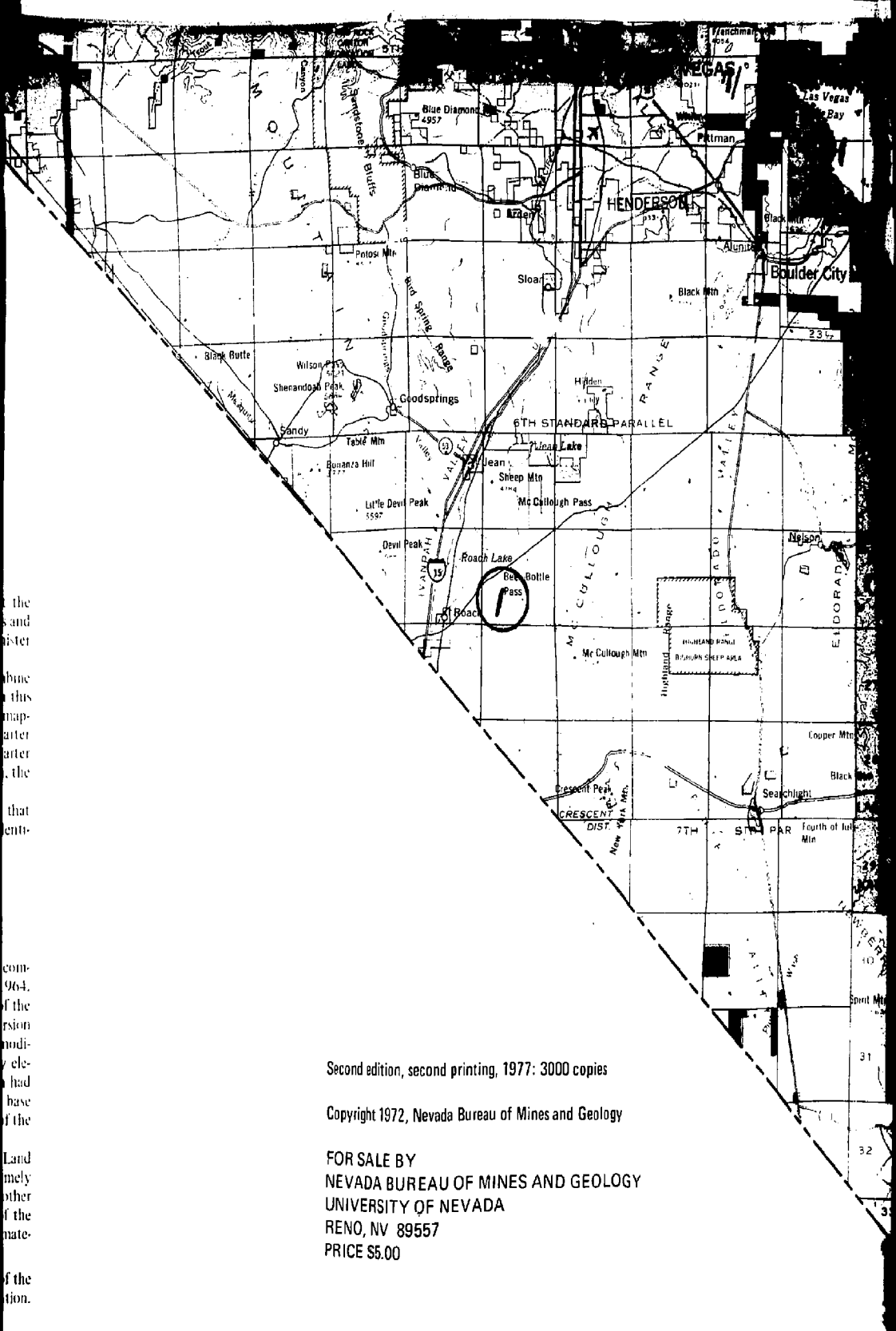
ACKNOWLEDGMENTS

This map is the successor to the first edition of the Land Status Map of Nevada, compiled by Roland V. Wilson and issued as Nevada Bureau of Mines Map 26 in 1964.

Many changes occurred in the status of Nevada lands subsequent to publication of the first edition, and planning for a second edition began shortly after the original version went out of print in 1969. It was decided to base the second edition on a slightly modified version of the 1:500,000 scale topographic map of Nevada, some preliminary elements of which had been made available by the U. S. Geological Survey and which had been used as a basis for the first edition. The most evident addition to the present base consists of the contours, which had not been available at the time the first edition of the Land Status Map was compiled.

The generous aid of personnel of the Nevada State Office of the Bureau of Land Management is acknowledged with gratitude; compilation would have been extremely difficult without their continued interest and help. The aid and cooperation of other Federal and State agencies that administer Nevada lands is also acknowledged; all of the agencies mentioned in the adjacent description of land status catagories contributed materially to the success of the project.

Thanks are also due to Thomas A. Smith and James R. Lee, former employees of the Nevada Bureau of Mines and Geology, who aided in the initial stages of data compilation.



Second edition, second printing, 1977: 3000 copies

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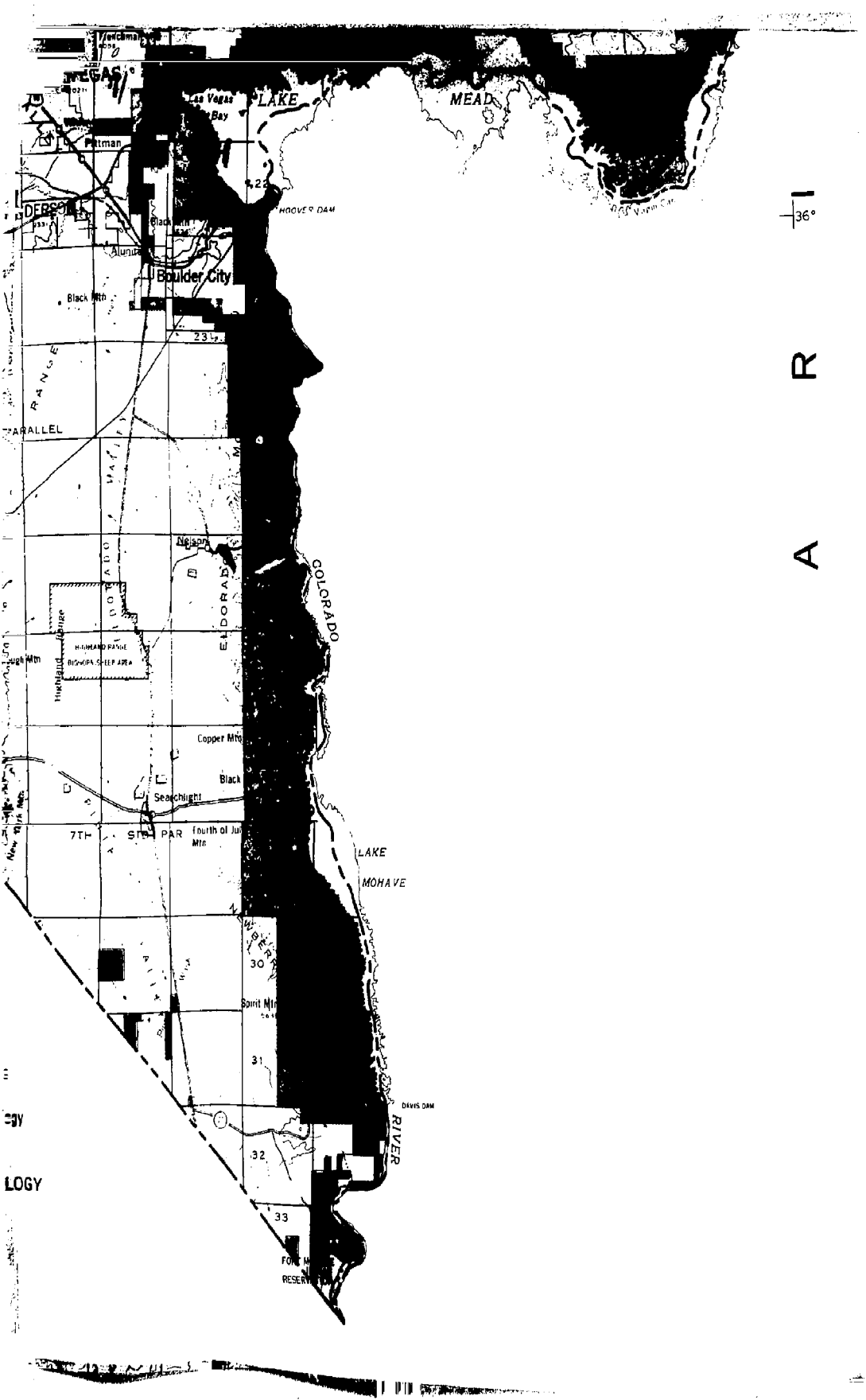
LAKE
MEAD
Las Vegas Bay
Pittman
HOOVER DAM
Boulder City
Black Mtn
RANGE
PARALLEL
COLORADO
Nelson
Copper Mtn
Black
Searchlight
7TH
STD PAR
Fourth of July Mtn
LAKE
MOHAVE
Spirit Mtn
DAVIS DAM
RIVER
36°
A R I

SITE (

	Site Characteristics	Climax	1	2	3	4	5
1	Elevation	1500	1356	1853	1770	1400	1610
2	Maximum Relief 20 ha. Area [1]	34	61	35	55	65	50
3	Maximum Relief 40 ha. Area [1]	38	72	50	65	75	75
4	Maximum Relief Paved Road to Site [1]	0	561	60	0	75	120
5	Degree Rock Mass Resistance to Erosion	mod.	mod.	low	high	low	high
6	Area of Exposed Rock Mass (km^2)	2.8	36	60	30	6	5
7	Surface Rock Competency	mod	mod				
8	Volcanic Hazards	1	1	2	2	2	2
9	Dist. to Nearest Vol. Vent < 10 m. y. [2]	36	53	19	12	16	5
10	Rock Mass Outside of Overthrust ?	yes	yes	yes	yes	yes	yes
11	Dist. to Nearest Vol. Vent < 6 m. y. [2]	29	46	25	17	8	25 [2]
12	Interference from Mineral Development	high	high	high	mod.	mod.	mod.
13	Dist. to Nearest 5+ km. Fault [2]	0	0.5	5	5	1.3	10
14	4 km^2 Area at Depth of 300-1500m?	yes	yes	yes	yes	yes	yes
15	Dist. to Nearest KGRA (w/in 40 km.) [2]	–	–	22	18	4	33

SITE CHARACTERISTICS MATRIX

3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1770	1400	1610	1800	1760	1760	1650	1100	930	1740	1830	1980	1900	1770	1720	1590	1920	202
55	65	50	75	50	30	40	45	65	55	50	50	25	35	45	55	50	35
65	75	75	115	75	45	50	85	120	65	65	65	35	50	65	65	60	60
0	75	120	320	245	30	75	535	285	265	355	790	225	305	685	410	380	100
high	low	high	low	low	high	low	mod	mod.	low	mod	mod.	high	mod.	mod	mod	mod	mod
30	6	5	100 (6)	96	43	280 (6)	8	6	5	4	5	5	15	4	13	3	175
							mod	mod.	mod	mod	low					mod	
2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2
12	16	5	21	25	22	17	72	77	81	86	67	91	77	96	71	110	86
yes	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
17	8	25 (6)	19 (6)	33 (6)	41 (6)	30 (6)	92	72	33	40	26	90	110	100	97	110	90
mod.	mod.	mod.	high	mod	high	high	high	mod	low	low	low	high	low	high	low	mod.	mod
5	1.3	10	10	5	3	1	0	0.5	1.5	1	1	0	1	0	0	0	8
yes	yes	yes	yes	?	?	yes	yes	yes	?	yes	yes	yes	yes	yes	yes	no	yes
18	4	33	40	28	34	—	—	—	—	—	—	—	—	—	—	—	—

MATRIX

PLATE VI.

t	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
80	1930	1770	1720	1590	1920	2320	2090	1870	1880	1830	1920	1960	2060	1970	1680	1520
0	25	35	45	55	50	35	35	115	100	80	80	100	20	20	120	30
5	35	50	65	65	60	60	50	145	130	105	105	120	25	25	145	40
00	225	305	385	410	380	100	245	180	170	105	185	275	60	10	100	60
od.	high	mod.	mod	mod	mod	mod	low	low	mod	high	mod	mod.	mod	mod	mod	low
5	5	15	4	13	3	.75	50	22	25	7	15	23	2	2.6	23	9
ow					mod											
	1	1	1	1	1	2	2	1	2	2	2	2	1	1	1	2
4	91	74	96	71	110	86	81	99	126	98	106	115	56	53	34	60
s	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6	90	110	100	97	110	90	83	132	123	106	113	123	60	60	35	90
ow	high	low	high	low	mod.	mod	high	high	high	high	high	mod	mod	mod	low	mod
	0	1	0	0	0	8	18	5	0	0	0	0	1	8	0	4
es	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	?	?	yes	yes
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

14	4 km² Area at Depth of 500-1500m							
15	Dist. to Nearest KGRA (w/in 40 km.) [2]	–	–	22	18	4	33	
16	Dist. to Nearest Historic Fault [2]	0	60	59	60	81	69	
17	Dist. to Nearest Upper Cenozoic Fault [2]	22	10	10	9	14	7	
18	Site in Closed GW Basin?	no	no	no	no	yes	no	
19	GW Discharge (1000 Ac.Ft./Yr.)	1	2	8	8	0	m [7]	
20	GW Remains in State	no	no	yes	yes	yes [8]	yes [9]	
21	Site in GW Recharge Area	yes	yes	yes	yes	yes	yes	
22	Dist. to Nearest GW Discharge [2]	54	52	10	8	4	2	
23	Dist. to Nearest Water Well [2]	2	9	23	12	8	2.5	
24	No. of Water Wells w/in 5 km.	.	0	0	0	0		
25	Surface Water Remains in State	yes	yes	yes	yes	yes	yes	
26	Surface Water Discharge (1000 ac.ft./yr)	0	0	0	0	0	S [6]	
27	Dist. to Nearest Perennial Stream (w/in 5km) [2]	–	–	–	–	–	–	
28	Dist. to Nearest Spring (w/in 5 km.) [2]	0.8	–	1.4	3.4	–	3	
29	Number of Springs (w/in 5 km.)	3	0	4	1	0	2	
30	Dist. to Nearest Lake/Reservoir (w/in 5 km) [4]	–	–	–	–	–	3.2	
31	Dist. to Nearest Paleolake (w/in 30 km) [2]	15	3	15	10	4	5	
32	Dist. to Nearest Town [1]	64	40	26	30	2	8	
33	Population of Nearest Town	7	99	1716	1716	150	10	
34	Dist. to Human Habitation [3]	2	11					
35	No. of People in Nearest Habitation	?	25					
36	Dist. to Nearest Farm/Ranch (w/in 25 km.) [5]						2	

yes	yes	?	?	yes	yes	yes	?	yes	yes	yes	yes	yes	yes	no	yes	yes
33	40	28	34	–	–	–	–	–	–	–	–	–	–	–	–	–
69	64	63	61	93	136 (A)	168 (A)	50	60	95	134 (A)	166 (A)	125 (A)	153 (A)	162 (A)	79	72
7	3	11	9	22	22	9	3	6	16	16	5	4	9	5	11	11
no	no	no	no	no	no	no	yes	yes	yes	no	no	no	no	no	no	no
m (T)	m (T)	m (T)	m (T)	1	7	40	0	0	0	14	m (T)	6	7	5	8	6
yes (S)	yes (S)	yes (S)	yes (S)	no	no	no	yes	yes	yes	yes	no	no	no	no	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3	8	9	21 (B)	29	18	21	15	13	32	27	15	30	28	32	11	19
2.5	8	6	13	28	9	13	4.5	32	6	20	8	19	7.5	3	20	–
	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	–
yes	yes	yes	yes	yes	no	no	yes	yes	yes	yes	no	yes	no	yes	yes	yes
S (A)	S (A)	S (C)	S (A)	S (A)	m (T)	S (A)	0	0	0	0	S (A)	0	m (T)	0	0	0
–	3.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
3	4.6	–	–	–	–	–	–	–	–	–	–	2.9	–	.7	4	2
2	2	0	0	0	0	0	0	0	0	0	0	1	0	3	2	5
3.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5	3	5	14	21 (C)	–	–	15	8	14	8	–	12	–	20	13	–
8	12	21	24	6	14	23	43	35	43	50	17	24	9	16	2	9
10	10	10	15	25	35	180	15	15	15	600	916	15	15	600	100	30
															2	
															100	
2	9	15					13	7	12	17	14			15	11	

ys	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	?	?	yes	yes
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
95	134[5]	166[6]	125[5]	153[4]	162[5]	79	73	94	84	70	63	73	83	85	68	11
16	16	5	4	9	5	11	11	15	1	2	2	3	13	10	0	5
yes	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes
0	14	m[7]	6	7	5	8	6	8	8	8	8	8	0	0	0	0
yes	yes	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
32	27	15	30	28	32	11	19	5	3	2	8	3	12	10	4	9
6	20	8	19	7.5	3	20	–	15	18	–	20	18	4	4	4	5
0	0	0	0	0	1	0	–	0	0	–	0	0	1	1	3	2
yes	yes	no	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
0	0	5[6]	0	m[7]	0	0	0	0	0	0	0	0	0	0	0	0
–	–	–	–	–	–	–	2	–	–	1	0.5	2	1	1	0	–
–	–	–	2.9	–	.7	4	2	2	4.5	1.4	–	3.7	–	3	4	–
0	0	0	1	0	3	2	5	2	3	50	0	3	0	3	11	0
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
14	8	–	12	–	20	13	–	3	2	5	7	4	19	21	3	19
43	50	17	24	9	16	2	9	38	3	14	28	38	35	33	110	11
15	600	916	15	15	600	100	30	300	300	100	100	100	20	20	250	874
						2										
						100		1								
12	17	14			15	11		16	9	2	8	4	7	4	10	

34	Dist. to Human Habitation ⑧	2	11				
35	No. of People in Nearest Habitation	?	25				
36	Dist. to Nearest Farm/Ranch (w/in 25 km.) ⑨						2
37	Dist. to Nearest State Boundary ②	90	10	63	60	34	14
38	Dist. to Nearest Active Mine (w/in 25 km.) ②	--	--	--	21	5	19 ⑥
39	No. of Old Mines (w/in 10 km.)	14	3	22	14	57	10
40	No. of Oil & Gas Wells (w/in 10 km.)	0	0	0	0	0	2
41	Site on Restricted Land ?	yes	no	no	no	no	no
42	Dist. to Nearest Restricted Land ⑧	0	--	--	--	--	---
43	Land Federally Owned ?	yes	yes	yes	yes	yes	yes
44	Dist. to Nearest Military Range ②	25	160	36	40	49	78
45	Dist. to Nearest Airline Corridor ②	72	0	0	0	1	23
46	Dist. to Nearest Paved Road ②	0	10	16	16	2	10
47	Hidden from Nearest Paved Road ?	no	yes	no	yes	yes	no
48	No Archeological Sites w/in 5 km.	no	yes	no	no	yes	no
49	No Historical Sites w/in 5 km.	no	yes	yes	no	yes	yes
50	Est. Max. Acc. from Earthquakes g.	0.14	0.04	0.2	0.2	0.25	0.4
51	Est. Max. Acc. from NTS Shots g.	0.15	0.01	0.018	0.018	0.019	0.015
52	Mag. Largest Earthquake (w/in 100 km.) ⑤ ⑩	6+	5+	7+	7+	6+	6+
53	Dist. to Largest Epicenter (w/in 100 km.) ②	95	56	97	97	83	66
54	Max. Ave. Daily Temp. °C.	38	41	32	32	32	32
55	Min. Ave. Daily Temp. °C	-2	-1	-7	-7	-7	-7

																	2
																	100
		2	9	15					13	7	12	17	14			15	11
60	34	14	4	6	3	14	19	24	146	139	131	74	24	68	38	49	17
21	5	19 (6)	— (6)	5	6	3	--	--	15	3	—	—	---	--	-	10	2
14	57	10	4	29	50 (6)	38	1	2	7	4	5	1	7	1	5	16	10
0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
--	--	---	--	--	--	-- (6)	--	.	5	16	--	--	--	--	--	---	10
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	ye
70	49	78	95 (6)	67 (6)	57 (6)	32	65	87	5	22	40	112	90	75	77	71	91
0	1	23	20	13	1	0	19	12	56	48	14	0	55	65	76	9	54
16	2	10	7	7	3	12	25	11	15	7	34	25	11	24	19	7	2
yes	yes	no	no	no	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	no
no	yes	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no
no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
0.2	0.25	0.4	0.5	0.35	0.3	0.2	0.04	0.04	0.14	0.13	0.12	0.1	0.05	0.06	0.05	0.05	0.
0018	0.019	0.015	0.013	0.018	0.020	0.028	0.013	0.011	0.050	0.035	0.026	0.013	0.012	0.019	0.013	0.013	0.01
7+	6+	6+	6+	6+	6+	5+	6+	6+	5+	5+	5+	4+	6+	6+	6+	6+	7+
97	83	66	60	65	87	42	58	57	87	87	75	59	25	53	25	77	82
32	32	32	32	32	32	32	36	36	36	36	32	32	32	36	36	32	32
-7	-7	-7	-7	-7	-7	-7	-9	-9	-9	-9	-6	-6	-6	-9	-9	-6	-7

						2										
						100		1								
12	17	14			15	11		16	9	2	8	4	7	4	10	
131	74	24	63	38	49	145	126	187	119	91	105	118	115	110	134	75
—	—	--	--	-	10	2	7	20	23	14	5	10	—	--	—	1
5	1	7	1	5	16	100	100	3	18	0	2	24	2	2	4	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
--	--	--	--	--	--	10	-	-	--	2	2	15	--	--	--	--
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
40	112	90	45	74	71	91	63	108	90	95	88	85	268	216	80	34
14	0	55	65	46	9	54	26	100	95	65	75	80	45	48	22	37
34	25	11	24	19	7	2	12	13	2	1	4	4	6	1	24	4
yes	yes	yes	yes	yes	yes	no	no	no	no	no	no	yes	yes	no	yes	no
yes	yes	yes	no	yes	no	no	no	no	no	no	yes	no	yes	no	no	yes
yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	no	yes
0.12	0.1	0.05	0.06	0.05	0.05	0.19	0.19	0.17	0.21	0.2	0.21	0.21	0.05	0.04	0.13	0.49
0.026	0.013	0.012	0.019	0.013	0.013	0.013	0.016	0.010	0.010	0.012	0.011	0.010	0.011	0.011	0.016	0.009
5+	4+	6+	6+	6+	6+	7+	7+	5+	7+	7+	7+	7+	5+	5+	5+	7+
75	59	25	53	25	77	82	88	87	87	72	66	75	76	69	59	27
32	32	32	32	36	32	32	32	32	32	32	32	32	32	32	32	32
-6	-6	-6	-9	-9	-6	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

58	Dist. to Nearest Power Line ⑤	0	5	10	5	1	5	1
59	Route Dist. to Nearest Railroad ②	170	14	78 ①	78 ②	87 ⑤	83 ⑤	8
60	Route Dist. to Nearest Paved Highway ②	0	16	16	16	2	10	
61	Route Dist. to Nearest Support Town ②	160	75	61	59	90	120	11
62	Population of Nearest Support Town	375 K	375 K	1716	1716	1716	1716	17
63	Route Dist. to Nearest Comm. Airport ②	170	69	157	156	80	110	1

① Distance in Meters

② Distance in Kilometers

③ Magnetude

④ Underground Fault Density

⑤ Old Railroad Road Bed Much Closer

⑥ In Nevada

⑦ m = Less Than 500 Ac. Ft / Yr

⑧ s = Significant but Not Measured Discharge

⑨ Manmade Diversion Out of Basin Could be Terminated in Case of Storage in Basin

⑩ 6+ Means 6.0 - 6.9

1	5	11	1	10	48	36	38	84	70	85	26	8	10	22	7	1	1
⑧ 87	⑤ 83	⑥ 83	⑤ 112	⑥ 128	⑤ 175	8	38	130	138	134	12	19	56	8	10	158	1
2	10	7	7	3	12	41	20	15	14	69	12	18	32	30	10	2	1
90	120	112	139	118	98	120	120	150	149	134	19	22	56	30	20	90	4
1716	1716	1716	1716	1716	1716	375 h	375 h	916	916	916	600	916	916	916	600	1716	17
80	110	110	70	62	131	130	130	220	221	221	174	174	150	174	193	258	22

0	80	82	92	72	62	62	68	216	219	208	8
	1	10	47	45	18	36	46	10	5	30	8
0	158	132	198	188	160	172	187	230	221	253	55
0	2	12	13	2	1	4	7	8	5	50	6
0	90	47	155	139	94	113	125	75	68	134	15
0	1716	1716	1716	1716	1716	1716	1716	6216	6216	6216	8716
8	258	225	254	251	268	275	265	75	68	134	205