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PROPOSED OPERATIONAL BASE SITE, SEVIER DESERT, DELTA AREA, UTAH--ETC(U)
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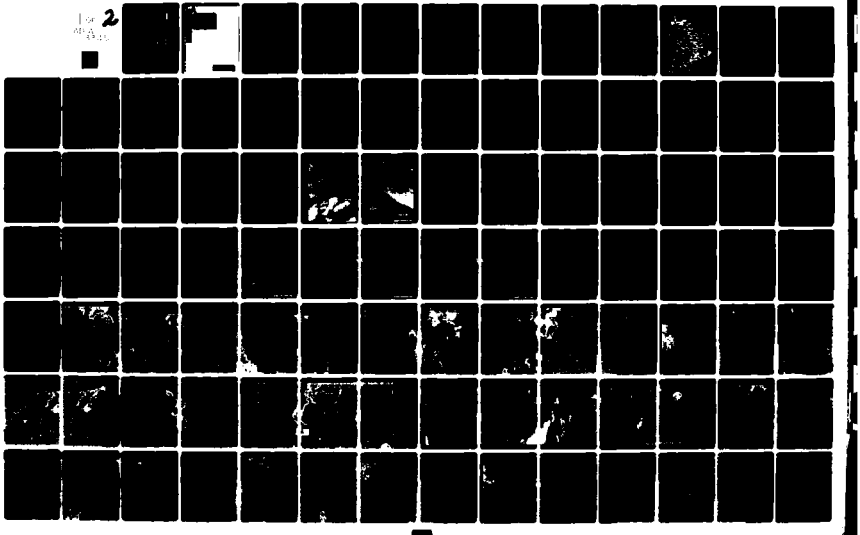

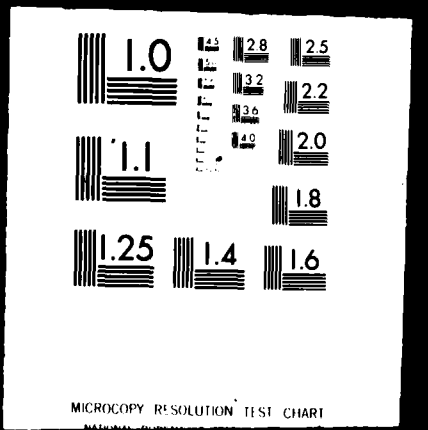

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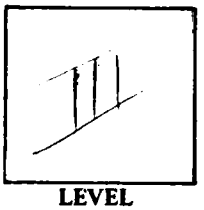

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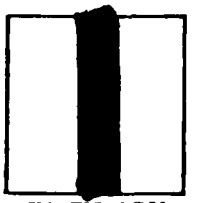

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PROPOSED OPERATIONAL BASE SITE

SEVIER DESERT

DELTA AREA, UTAH

Prepared for:

U.S. Department of the Air Force
Ballistic Missile Office (BMO)
Norton Air Force Base, California 92409

Prepared by:

Fugro National, Inc.
3777 Long Beach Boulevard
Long Beach, California 90807

15 May 1980

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The potential operational base site in the Sevier Desert, Delta Area, Utah, was evaluated to determine its geographic, cultural, geotechnical, + geohydrolic conditions.

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1.0 INTRODUCTION

In November 1979, Fugro National, Inc. (FNI) was tasked to conduct studies supporting the selection of an operational base location or locations. The studies were to include information about water supply, land ownership, existing and proposed transportation systems, terrain, and geotechnical conditions. Using this information, conceptual layouts were to be prepared showing the operational base, designated assembly area, missile assembly buildings, and operational base test site. The original work statement specified that the Pahroc/Pahranagat, Ely and Mina regions of Nevada, and the Delta region of Utah should be studied.

Following the preparation of the original work statement, there were several meetings and discussions concerning the location of the operational base. It was recognized at that time that extensive study would be required before a final selection could be made. It was decided, therefore, that it would be beneficial if FNI could provide as much information as possible about a number of sites, and do so as quickly as possible. In response, FNI submitted a preliminary report titled "Initial Operating Base Report" on 21 December 1979. Eleven possible sites were identified in that report and various conceptual layout options were presented.

In January 1980, FNI was informed by BMO that Strategic Air Command's preference for an operational base was the Coyote Spring/Kane Springs area in Nevada. FNI therefore concentrated

its continuing studies on this area. An interim report on Coyote Spring and Kane Springs valleys was submitted on 27 February 1980. Subsequently, FNI was asked to study possible operational base locations in the Milford area of Escalante Desert, Utah, the Ely area of Steptoe Valley, Nevada, and the Delta area of Sevier Desert, Utah. Reports on the Escalante Desert and Steptoe Valley sites were submitted to BMO on 10 March and 31 March 1980, respectively.

This fourth interim report contains data for the operational base site proposed for the Sevier Desert, Delta area, Utah (Figure 1-1). While this report was in preparation, FNI was requested to study a fifth location in the Escalante Desert, Beryl area, Utah; it is planned to prepare a report on that area in the near future.

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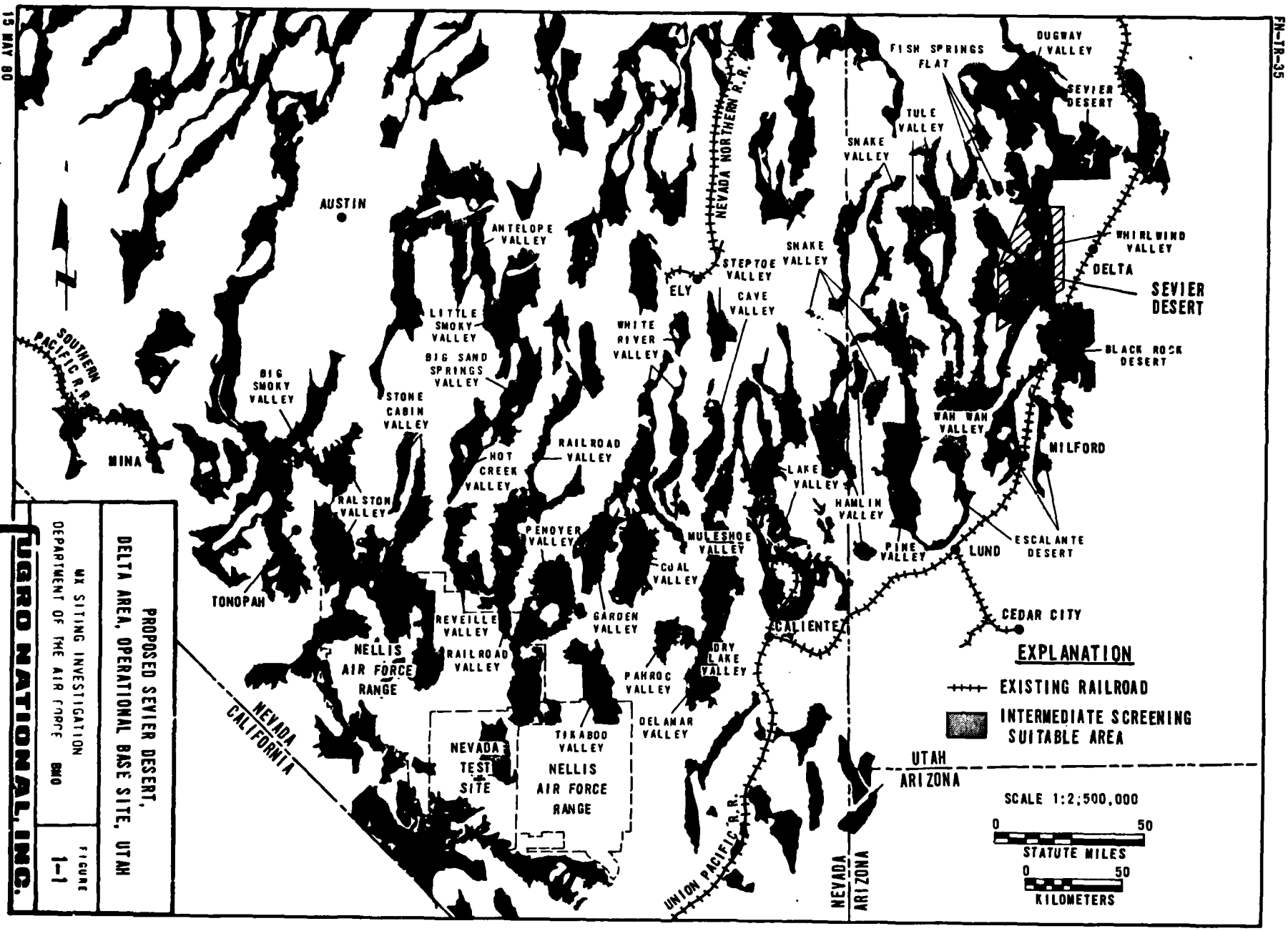

PROPOSED SEVIER DESERT, DELTA AREA, OPERATIONAL BASE SITE, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

FIGURE 1-1

FUGRO NATIONAL, INC.

2.0 SCOPE

The potential operational base site in the Sevier Desert, Delta area, Utah, was evaluated to determine its geographic, cultural, geotechnical, and geohydrologic conditions. Geographic and cultural conditions were compiled from Bureau of Land Management master title plats and available topographic maps which were either U.S. Geological Survey 7.5- or 15-minute sheets. Geotechnical and geohydrological conditions were evaluated by a review of geologic and hydrologic literature and maps and by interpretation of aerial photographs (1:25,000 scale).

This study was limited to the evaluation of the relative suitability of this area as a potential operational base using subjective geotechnical criteria. It was conducted without benefit of large-scale topographic maps or field studies and does not attempt to determine specific road or railroad alignments, structure location or design, and construction cost estimates. Proposed options for operational base layouts are based on best estimates of the actual conditions on site.

3.0 OPERATIONAL BASE - GENERAL DESCRIPTION AND LAYOUT CRITERIA

3.1 OPERATIONAL BASE STRUCTURES

Conceptually, the operational base consists of three main activity centers; 1) the operational base proper, 2) the designated assembly area, and 3) the operational base test site (Figure 3-1). Each of these centers has an estimated size and, in some cases, a specified distance from other centers or structures.

The Operational Base (OB) consists of technical facilities supporting the MX System, housing, attendant support facilities, and a 10,000-foot runway. The area needed for these facilities is estimated to be about 5500 acres or 8.6 mi^2.

The Designated Assembly Area (DAA) consists of the production Missile Assembly Building (MAB), the maintenance Missile Assembly Building (MAB), and the DAA support facility. The DAA support facility is estimated to occupy 640 acres or 1 mi^2. It will contain a munitions facility, missile stage storage area, special transport vehicle assembly area, cannister storage area, security area, and contractor support area. The maintenance MAB and the production MAB each would be approximately 10 acres in area. They would both be situated at least 2965 feet from the nearest structure. The two MABs must be a minimum of 5 statute miles apart, while the DAA as a whole should be no less than 1 statute mile from the OB.

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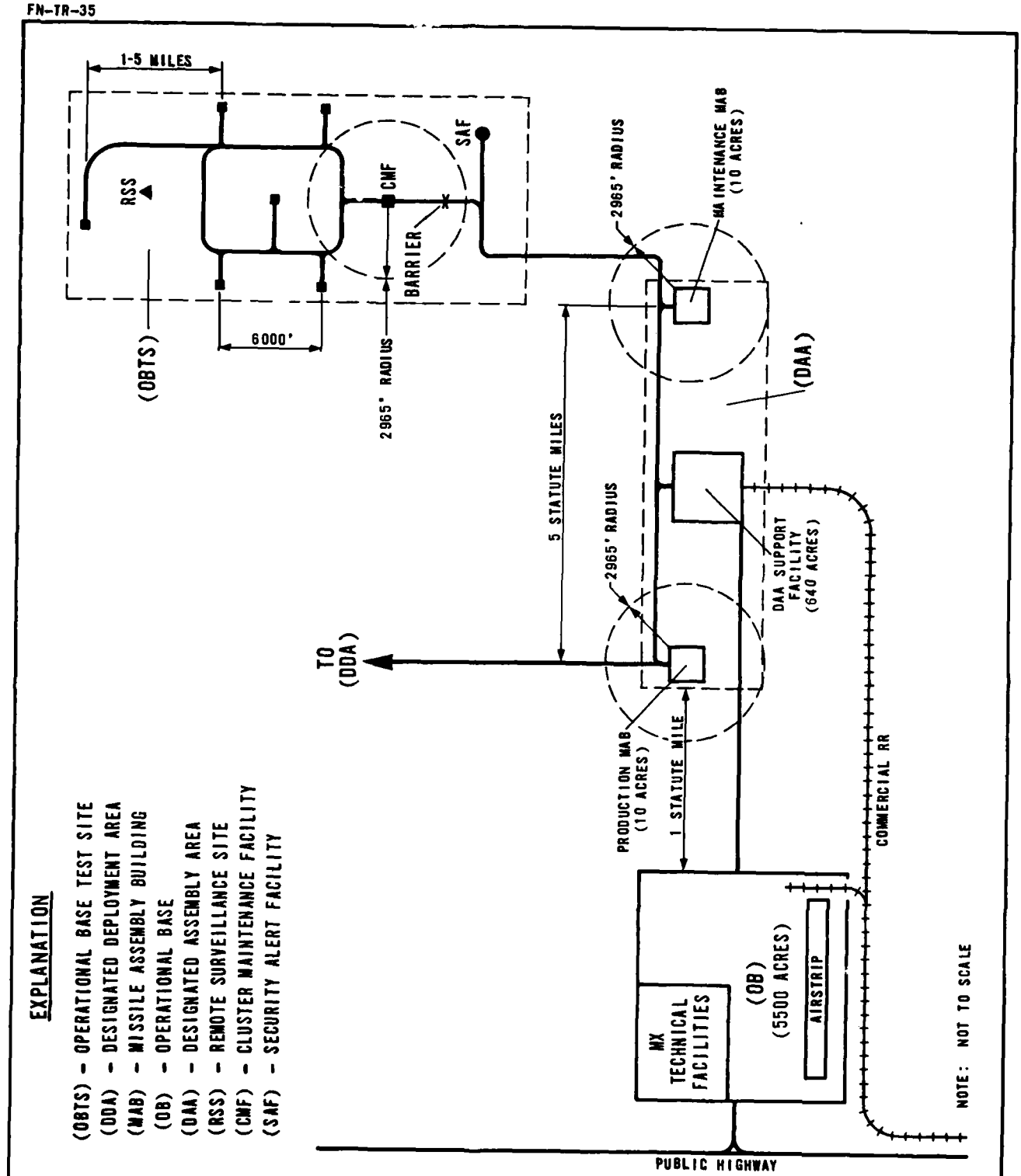

EXPLANATION

(OBTS) - OPERATIONAL BASE TEST SITE
(ODA) - DESIGNATED DEPLOYMENT AREA
(MAB) - MISSILE ASSEMBLY BUILDING
(OB) - OPERATIONAL BASE
(DAA) - DESIGNATED ASSEMBLY AREA
(RSS) - REMOTE SURVEILLANCE SITE
(CMF) - CLUSTER MAINTENANCE FACILITY
(SAF) - SECURITY ALERT FACILITY

CONCEPTUAL OPERATIONAL BASE LAYOUT

MX SITING INVESTIGATION
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FIGURE
3-1

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The Operational Base Test Site (OBTS) will consist of a Security Alert Facility (SAF) and a test cluster area. The test cluster area will have 1) a road barrier, 2) a Cluster Maintenance Facility, or CMF (situated at least 2965 feet from the nearest structure), 3) five shelters spaced 3000 to 7000 feet apart, 4) a dash track 1 to 5 miles long with a shelter at the end, and 5) a Remote Surveillance Site (RSS).

3.2 OPERATIONAL BASE AIRFIELD

The primary concerns in selecting an airfield site are the wind direction, the amount of unobstructed air space, and the flying conditions in the area.

The main runway should be oriented parallel to the predominant wind direction. Minor deviations in orientation are possible if there are problems because of terrain conditions or populated areas on the extended runway centerline. A crosswind runway should not be considered unless wind coverage on the primary runway is less than 90 percent, or when the beam wind component on the primary runway is 13 miles per hour during periods of restricted visibility. An extended meteorological study would be needed to determine these factors.

Airspace around an airfield should be free of obstructions to maintain a high level of safety. Criteria for ensuring unobstructed airspace have been developed by the Air Force (AFM 86-8) and the Federal Aviation Administration (FAR Vol XI), as shown in Figure 3-2 and discussed in the following paragraphs.

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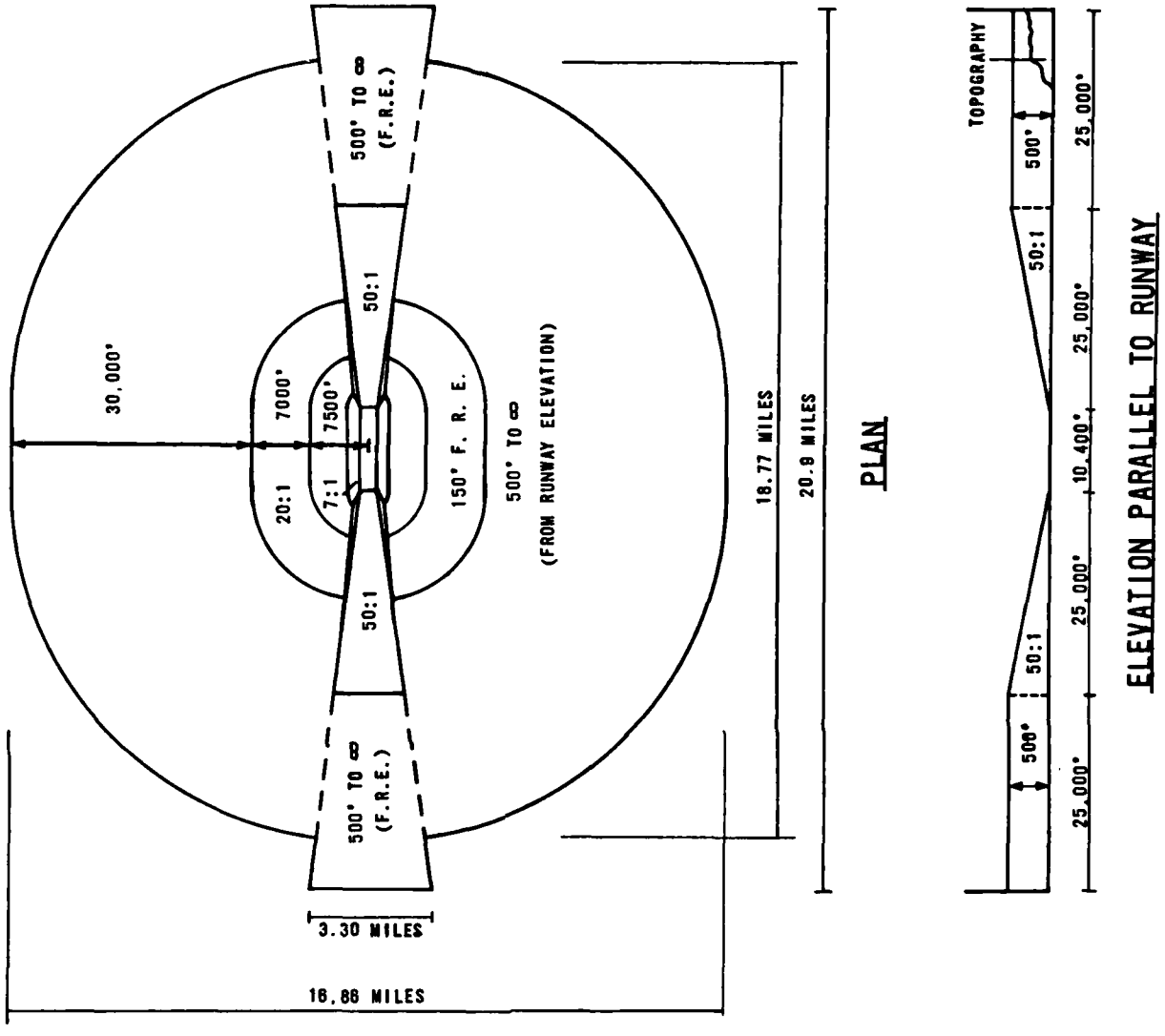
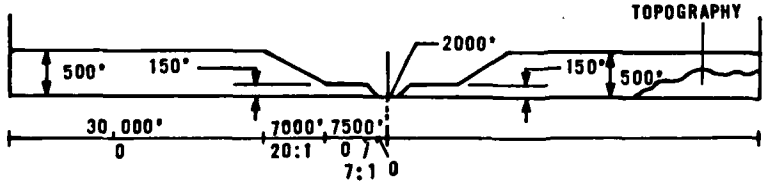
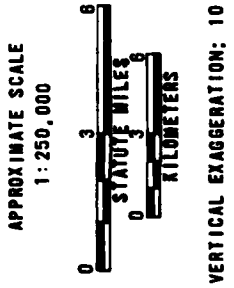




ELEVATION AT RIGHT ANGLES TO RUNWAY



UNOBSTRUCTED AIRSPACE
10,000' PRIMARY INSTRUMENT RUNWAY

MX SITING INVESTIGATION
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FIGURE 3-2

FUGRO NATIONAL, INC.

15 MAY 80

For both approach and departure, the unobstructed airspace begins 200 feet from the end of the paved runway. It rises at a slope of 50:1 for a horizontal distance of 25,000 feet, at which point it is 500 feet above the runway. This unobstructed airspace continues at 500 feet above the runway for another 25,000 feet. At the same time, the approach/departure corridor widens to 16,000 feet at the ends. The total length of the approach and departure airspace is 20.9 miles.

The airspace on either side of the runway should also be unobstructed. Beginning at the edge of the runway, the unobstructed airspace rises at a slope of 7:1 for a horizontal distance of 1050 feet at which point it is 150 feet above the runway. This elevation is maintained for another 5450 feet outward from the runway. At this point the slope again rises at a ratio of 20:1 so that over the next 7000 feet, an elevation of 500 feet above the runway surface is reached. This 500-foot elevation is maintained for an additional 30,000 feet outward from the runway. This condition must exist completely around the runway except where the approach/departure airspace takes precedence. No object (topographic or manmade) within 44,500 feet of the runway should be higher than 500 feet. The total width of the regional unobstructed airspace is approximately 17 miles.

The existing flying conditions in an area should also be evaluated. The impact on flight corridors, other airfields, and areas of military operation or restricted use should be determined.

The Federal Aviation Administration (FAA) is the responsible federal agency on this subject. All permit applications and follow-on studies (i.e., weather, wind, flight patterns, etc.) must go through the FAA, which in turn releases the results of this review as recommendations. The jurisdiction for permitting, airfield construction, and maintaining unobstructed airspace lies with the local government for each community.

3.3 TRANSPORTATION REQUIREMENTS

An operational base site must have the ability to be connected to a major highway and a major railroad while still being accessible through the Designated Transportation Network (DTN) to the Designated Deployment Area (DDA). The highway and a rail spur will connect the OB with the DAA. Transportation from the DAA to the DDA and the OBTS will be along the DTN.

4.0 GEOGRAPHIC AND CULTURAL CONDITIONS

4.1 LOCATION

Sevier Desert is an irregularly shaped valley, approximately 78 miles long and 44 miles wide, trending generally north-south. The valley is located in west-central Utah (Figure 1-1). The northern third of the valley is in Juab County and the southern two-thirds is in Millard County.

The largest communities within Sevier Desert are Delta, Fillmore, and Hinckley. Delta and Hinckley are located in the central portion of the valley and have populations of 2387 and 525, respectively (Church, 1980, personal communication). Fillmore is in the southeastern corner of the valley and has a population of 2158. There are seven other communities in Millard County with populations ranging from 135 at Lynndyl to 468 in Holden.

Delta is the juncture for State Highway 257 and U.S. Highways 6 and 50. State Highway 257 enters Delta from the south and is the route to Milford. U.S. Highway 6 enters Delta from the northeast and is the route from Santaquin and Provo. U.S. Highway 50 enters from the southeast and connects Delta with Holden and Fillmore. From Delta, U.S. Highways 6 and 50 become a single route which traverses southwesterly across Sevier Desert and Whirlwind Valley through Skull Rock Pass and into Tule Valley. In addition, access to the northwest and west (Dugway and Fish Springs valleys) is available via Brush Wellman Road north of Delta.

The Union Pacific Railroad parallels U.S. Highway 6 north of Delta and State Highway 257 south of Delta. A southeast trending spur exists out of Delta to Fillmore.

The Delta study area occupies only a small portion of the total Sevier Desert and is wholly within Millard County. The area is bounded on the west by Long Ridge, Red Knolls, and Little Drum mountains, and on the east by the 122°45' west longitude. The southern limits of the study area are Sevier River and Sevier Lake; the northern limit is the Juab-Millard County line.

4.2 LAND STATUS

The study area, for the most part, is public land administered by the Bureau of Land Management (BLM) from the Warm Springs Resource Area office in Fillmore. The Warm Springs Resource Area is a portion of the Richfield BLM District. Much of this public land is used as range land.

Approximately 19,200 acres (30 sq. mi.) of private property, mostly north of U.S. Highway 6 and 50, is within the eastern portion of the study area. This area, and those private properties eastward towards Delta, are currently being farmed. Additionally, there are several mining areas in the nearby mountains.

The state of Utah holds sections 2, 16, 32, and 36 for most townships within the study area. Also, in the northeastern corner of the study area, is the state Topaz Waterfowl Management Area.

Seven miles east of the northeastern corner of the study area is the proposed site of the Intermountain Power Project (IPP), a coal-fired power plant. Personnel on this project are now discussing land withdrawal with the BLM. The transmission line corridors for this project through the study area have not been finalized. These lines will be in addition to the existing east-west lines in the southern portion of the study area.

Within Sevier Desert and just north of the study area boundary, there is a Known Geothermal Resource Area (KGRA). The KGRA occupies approximately 17,280 acres (27 sq. mi.), (Utah Geologic and Mineral Survey, 1977). Large portions of the valley and some of the study area have potentially valuable geothermal resources.

5.0 GEOTECHNICAL CONDITIONS

5.1 TERRAIN

The Sevier Desert is part of a large basin located along the eastern edge of the Basin and Range physiographic province. The basin is bounded on the west by Long Ridge, Red Knolls, and the Little Drum and Drum mountains. The McDowell Mountains and Desert Mountain lie to the north. The southern boundary of the study area contains the northern end of the Cricket Mountains and Sevier Lake; the eastern boundary is wholly within the Sevier Desert.

Alluvial fans extend basinward from the above-mentioned mountains, with gradients ranging from 25 feet per mile to 300 feet per mile. The average fan gradient is less than 120 feet per mile, with the exception of the fans along the northern and eastern faces of the Drum Mountains. Incision depths on most fans are less than 10 feet, with relatively wide drainage spacing. The fan between Little Drum Mountain and Drum Mountain is incised deeper than 10 feet, with closely spaced drainages. Gradients exceed 10 percent only in small areas along the mountain fronts and locally along the Sevier River (Drawing 5-1).

Two areas of Quaternary volcanic activity, Smelter Knolls and Fumarole Butte, occur in the alluvial fans east of the Little Drum and Drum Mountains. A third major occurrence, Black Rock, is in the Sevier Desert lowland, northeast of the Cricket Mountains.

Eolian dunes are well developed and quite extensive in the northeastern corner of the study area. Smaller dune fields are located northeast of Sevier Lake, and sheet sands have been noted throughout much of the remaining study area.

The majority of the Sevier Desert lowland is almost flat and slopes gently southwest toward Sevier Lake. With the exception of Black Rock, relief over most of the lowlands is less than 100 feet.

5.2 FAULTING

The Quaternary Fault Map of Utah (Anderson and Miller, 1979) shows numerous faults within the study area. These faults strike roughly north-south. The largest group of faults is located between the Little Drum Mountains and Smelter Knolls and extends northward toward the McDowell Mountains (Drawing 5-1). These are the youngest faults in the area, being Holocene in age, as evidenced by steep, relatively unmodified scarps in the alluvium and the fact that they cut Lake Bonneville shoreline deposits (Anderson and Miller, 1979). The faults in the Fumarole Butte area strike subparallel to the aforementioned faults and are suspected to be of Quaternary age, as are the faults in Black Rock. Faults of Pleistocene age are located at the northern end of the Cricket Mountains and in an area 9 miles north of Delta.

The relatively young ages of faults within the study area suggest ongoing tectonic activity. According to Anderson and

Miller (1979), faults located within this area should be considered potentially hazardous.

5.3 FLOODING POTENTIAL

Major flooding within the study area would probably be confined to the flood plains of the Sevier and Beaver Rivers. Water in these rivers reaches Sevier Lake only during times of extremely high runoff, because most flow is diverted to irrigation and storage (Mower and Feltis, 1968). To the west of the lowlands, sheet flooding is likely to occur on many of the alluvial fan surfaces due to shallow, ill-defined drainages.

A considerable portion of the eastern Sevier Desert lowland is covered with mud flats, marshes, and other areas of standing or ponded water (Drawing 5-1). These areas are supplied, in part, by the drainage system of the irrigated lands near Delta (Mower and Feltis, 1968).

5.4 DEPTH TO GROUND WATER

Shallow ground water occurs throughout much of the Sevier Desert lowland, as indicated from well data and phreatophyte growth (Mower and Feltis, 1968). The water table is within 10 feet of the surface in an area roughly 12 miles wide, extending from near Black Rock to the northern end of Crater Bench (Drawing 5-1).

6.0 GROUND WATER CONDITIONS

6.1 GENERAL HYDROLOGY

The Sevier Desert, which covers about 3000 square miles is within the Sevier Hydrologic Unit as defined by Utah State University (1963). Mower and Feltis (1968) identified the three principal aquifers within this area as valley-fill deposits, fractured volcanic rocks of Tertiary age, and fractured carbonate rocks of Paleozoic age. The valley-fill deposits consist of interbedded gravel, sand, silt, clay, and evaporites. The evaporites are located primarily in the playa area in the west-central portion of the valley. Gravel and sand exist mainly in alluvial fans along the margins of the valley. Extensive cementation has occurred in the older valley-fill materials. The fractured volcanic rock aquifer is composed of tuffs and lava flows. The Paleozoic carbonate rocks crop out in the mountain ranges flanking the valley and provide conduits for transmitting water to the younger valley-fill deposits.

The water table within the valley-fill aquifer slopes to the southwest as well as toward the valley axis (Mower and Feltis, 1968). Records compiled by the U.S. Geological Survey (1979) and ground-water level measurements taken by Fugro National in 1979 and 1980 indicate that the depth to ground water is less than 10 feet in the Delta area, with several flowing wells reported. However, depths to water exceed 200 feet along the valley margins at higher topographic elevations. The Utah Division of Water Resources (UDWR, 1978) reported that a slight rise in

ground-water levels occurred between 1977 and 1978, but that an overall decrease of about 6 feet has occurred since 1955.

6.2 WATER AVAILABILITY

6.2.1 Perennial Yield

The perennial yield estimates discussed here apply to the Sevier Desert as a whole but are principally based upon pumping records and ground-water level decline rates for the Delta area. The precise perennial yield of ground water for the Sevier Desert is unknown. Eakin, Price, and Harrill (1976) made a provisional water system yield approximation of over 100,000 acre-feet per year, however, this quantity also includes the surface water system. Surface water discharge measurements recorded by Hahl and Mundorff (1968) for the Sevier River indicate that discharge between the towns of Lynndyl and Deseret decreased by 105.5 cfs or 72,600 acre-feet during 1968 due to diversion, evaporation, and losses to the ground-water system. This would reduce the water yield of the area to about 27,400 acre-feet per year, which is principally ground water. Using the Hill method described by Todd (1959, page 207), a perennial yield of 23,000 acre-feet is estimated for the ground-water system in the Sevier Desert area (Table 6-1). This method consists of plotting the change in ground-water levels versus the average annual withdrawal. The perennial yield is then estimated to be the annual pumpage which results in no ground water level change.

GROUND WATER AVAILABILITY (IN ACRE-FEET YE					
PERENNIAL YIELD [1]	PRESENT USE				SOURCE
23,000 [2]	50,300				1) ALLUVIAL VALLEY-FILL AQUI 2) FRACTURED TERTIARY VOLCANIC ROCKS 3) FRACTURED PALEOZOIC CARBONATE ROCKS
	IRRIGATION	INDUSTRIAL	MUNICIPAL	DOMESTIC AND STOCK	
	46,800	2000	1500		

[1] PERENNIAL YIELD IS THE AMOUNT OF GROUND WATER THAT CAN BE WITHDRAWN PER YEAR FROM A BASIN WITHO

[2] ESTIMATED BY FUGRO NATIONAL, INC.

RE-FEET YEAR)			POTENTIAL IMPACTS		
SOURCE	QUALITY		GROUND-WATER LEVELS	WATER QUALITY	SPRING DISCHARGE
VIAL EY-FILL AQUIFER TURED ARY MIC ROCKS TURED OZOIC NATE ROCKS	HIGH IN SULFATE, CHLORIDE, T.D.S HARDNESS		ACCELERATED DECLINE	INCREASED SO_4 Cl T.D.S. $CaCO_3$	PROBABLY NO IMPACT
	POTABILITY	CONSTRUCTION POTENTIAL			
	GOOD TO POOR	GOOD			

BASIN WITHOUT CAUSING UNDESIRABLE EFFECTS

SUMMARY TABLE OF GROUND-WATER CONDITIONS IN SEVIER DESERT, DELTA AREA, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

TABLE 6-1

FUGRO NATIONAL, INC.

6.2.2 Present Ground Water Use

According to UDWR (1978), ground water usage in the Sevier Desert averaged 28,000 acre-feet per year for the fifteen-year period from 1963 to 1977. Recent ground-water withdrawal has significantly increased, however, reaching 50,300 acre-feet in 1977. Of that amount, 46,800 acre-feet were used for irrigation, 2000 acre-feet were extracted for industrial use, and municipal and domestic pumpage used an additional 1500 acre-feet.

6.3 WATER QUALITY LIMITATIONS

Mower and Feltis (1968) reported that, with the exception of the Delta area, ground-water quality within the Sevier Desert is generally poor. Of 36 ground-water samples collected by Mower and Feltis, six exceeded the Environmental Protection Agency (EPA, 1976) quality criteria for sulfate (250 mg/l) and eight samples exceeded the EPA quality criteria for both chloride (250 mg/l) and total dissolved solids (500 mg/l for sulfate plus chloride). Locally, ground water may be hard, i.e., containing greater than 150 mg/l calcium carbonate ($CaCO_3$). The aforementioned ground-water samples from wells contained $CaCO_3$ concentrations ranging from 11 to 1120 mg/l with 16 samples out of 36 exceeding 150 mg/l. The sodium concentrations of twenty samples were found to exceed the U.S. Salinity Laboratory Staff (1954) limits for irrigation water. The use of such water for irrigation would require special management and treatment.

6.4 IMPACT OF WITHDRAWAL

The existing withdrawal of ground water in the Sevier Desert greatly exceeds the estimated perennial yield. The majority of the ground-water withdrawal occurs in the east-central part of the area near the towns of Delta and Oak City where the depths to water are shallow and the water quality is better than the ground water present in the surrounding area. If additional ground water is developed for an Operating Base, it is likely that water-level declines in the area would be accelerated. Mower and Feltis (1968) pointed out that a decrease in water quality would also occur in the area if there was significant additional ground-water withdrawal. It may be possible, however, to obtain an Operating Base water supply through the purchase or lease of existing surface or ground-water rights or a combination of both. If existing irrigation water rights are purchased and irrigated land is retired from agriculture, it is likely that the concentrations of total dissolved solids in the ground water will diminish as the leaching action of irrigation water will have been decreased.

The Director of the Utah Division of Water Rights has indicated that the purchase of irrigation water rights may be an unacceptable means of obtaining water in the Delta area (personal Communication, Dee Hansen, 8 April 1980). Mr. Hansen commented that the additional purchase of water rights in an area where the Intermountain Power Project has already purchased 48,000 acre-feet of water per year may cause too many farms to cease

operation, resulting in a detrimental effect on the local economy and lifestyle.

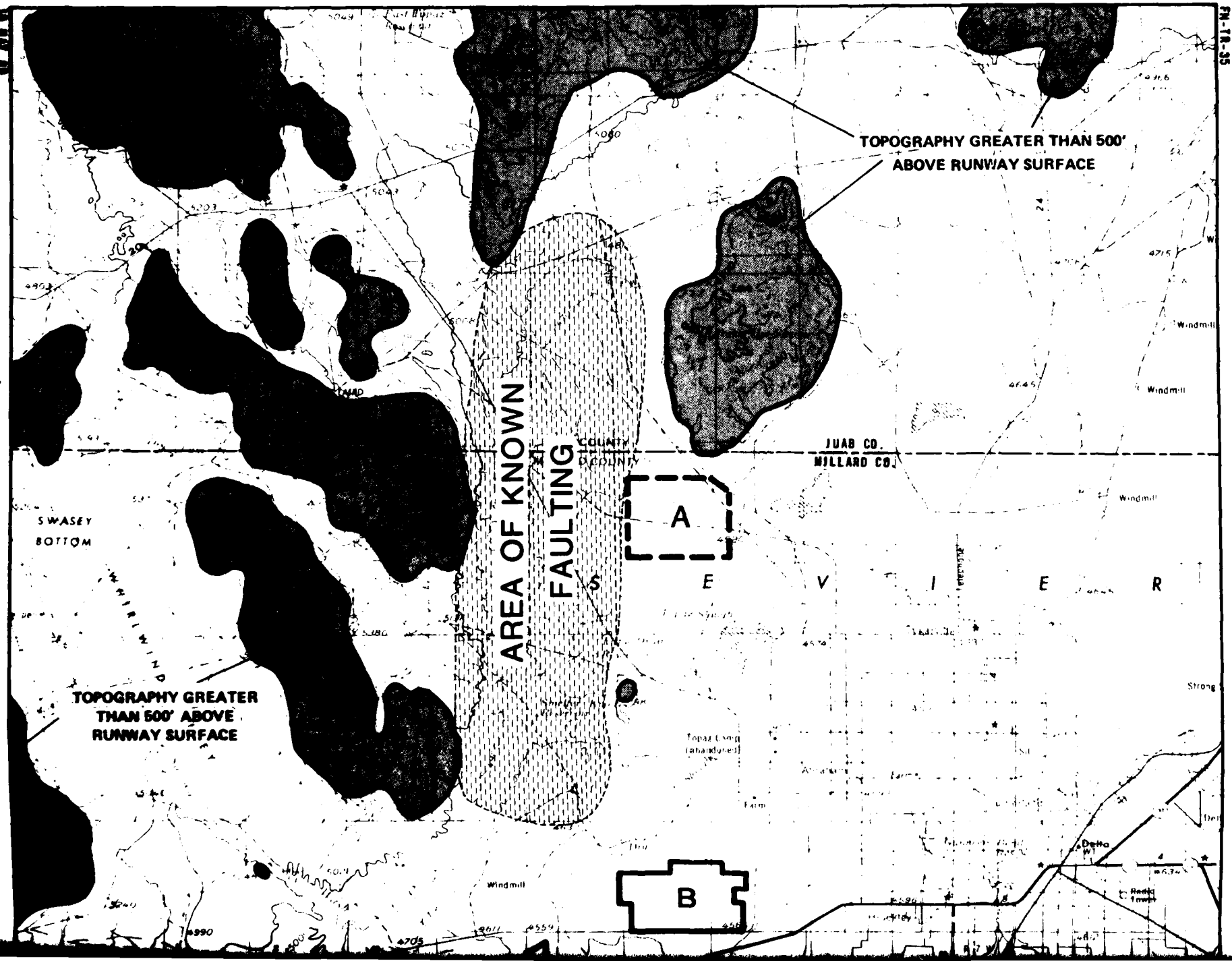
7.0 OPERATIONAL BASE LAYOUT OPTIONS

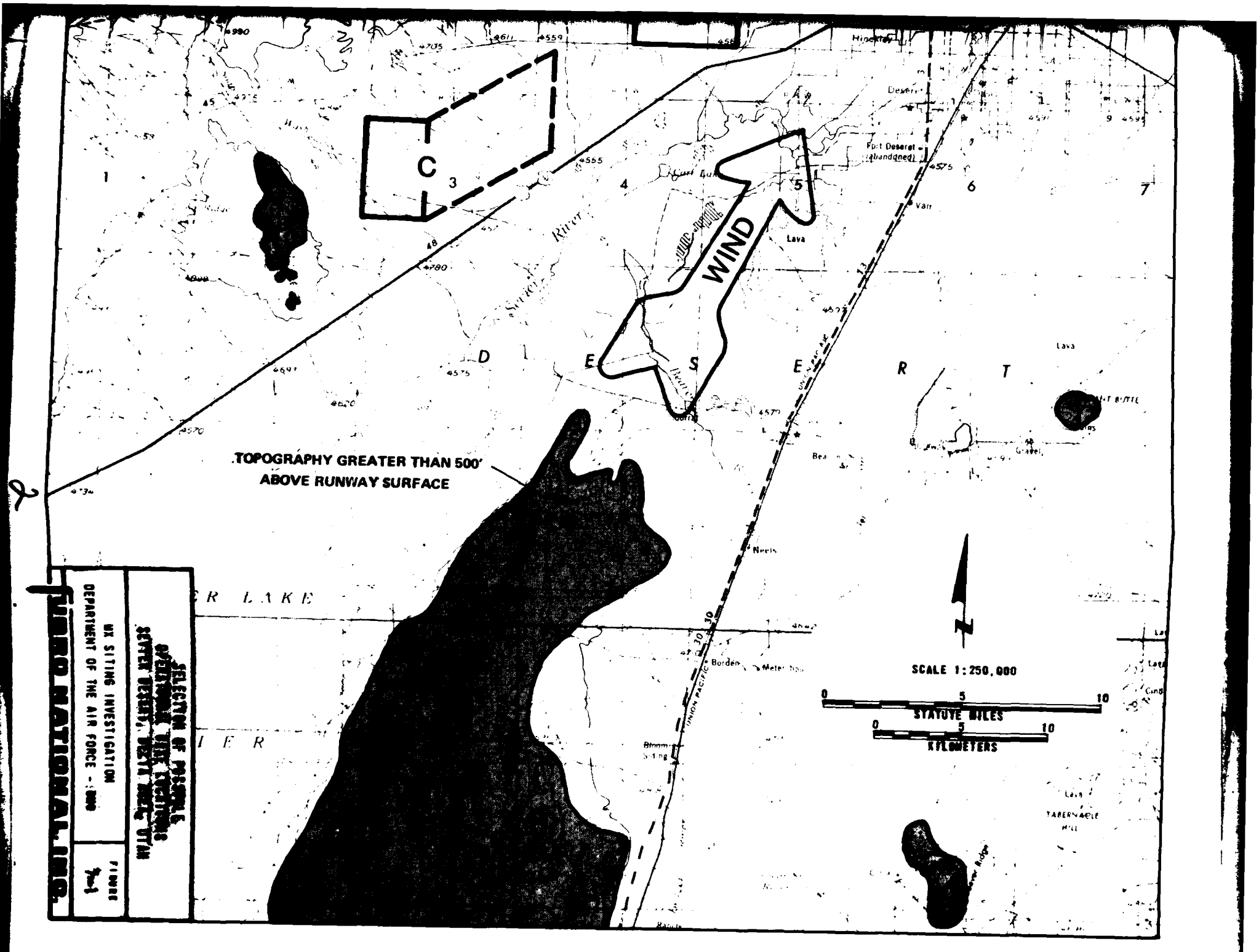
7.1 FACTORS GOVERNING THE OPERATIONAL BASE SITE SELECTION

Several possible operational base configurations have been developed in the Delta area. These configurations are based on the data presented in the previous sections of this report. The OB location is controlled by 1) the unobstructed approach and departure airspace needed for the airfield, and 2) the availability of a 5500-acre parcel (preferably on BLM land).

There is no area 17 miles by 20.9 miles of wholly unobstructed air space in the study area. However, there are large areas in the northeastern and southeastern portions of the study area where the approach/departure criteria are met. Within these areas the prevailing wind is assumed to trend N30°E for 95 percent of the time. This orientation is based on a crosswind equal to or less than 10 knots (Captain D. Grimm, 1980, personal communication).

Within the area of acceptable approach and departure space, there are three areas of contiguous BLM land. One area (area A on Figure 7-1) is in the northeastern corner of the study area, south of Brush Wellman Road and northwest of the Topaz Waterfowl Management Area. The second area (labeled B) is south of the first and north of U.S. Highway 6 and 50. A third area (C) is five miles southwest of the second area. This third area is north of U.S. Highway 6 and 50 and extends southwest to Long Ridge.


TOPOGRAPHY GREATER THAN 500' ABOVE RUNWAY SURFACE
AREA OF KNOWN FAULTING
JUAB CO.
MILLARD CO.
A
B
SWASEY BOTTOM
TOPOGRAPHY GREATER THAN 500' ABOVE RUNWAY SURFACE
Windmill
Windmill
Windmill
Windmill
Topaz Camp (abandoned)
Delta
Strong
FN-16-35


C
3
WIND
TOPOGRAPHY GREATER THAN 500'
ABOVE RUNWAY SURFACE
SCALE 1:250,000
0 5 10
STATUTE MILES
0 5 10
KILOMETERS
SELECTION OF POSSIBLE
OPERATIONAL MPS LOCATIONS
SEVIER DESERT, DESTA ROAD, UTAH
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 1980
FIGURE
3-1

The northeastern area (A), although it appears to have sufficient BLM land, does not have an acceptable approach/departure corridor alignment for the prevailing wind directions. The best possible alignment is closer to N45°E rather than the preferred N30°E. Upon more detailed examination, topographic obstructions could occur within 10,000 feet of the southern end of the runway location. This area is also 8 miles due west of the proposed IPP site. A plume from the plant's two 650 foot stacks could reduce visibility for aircraft attempting to use the OB airfield. Water purchases and base development could also be in direct conflict with this coal-fired power project. The depth to ground-water from the surface could be 10 to 20 feet within this area.

The second area (B), to the south, has sufficient BLM land for the OB. The regional unobstructed air space, although not totally unobstructed, is the most open of the sites studied to date. Thus, the approach/departure corridor is very compatible with the present criteria. The depth to ground-water could be less than 10 feet based on regional data and limited well data.

The third area (C), to the southwest, can be divided into two sections. The eastern half is due south of the existing fault system previously mentioned (see Section 5.0). Until further studies determine the southerly extent of these faults, avoidance of this area is suggested. The western half of area C has adequate BLM land. The regional air space, although not totally

unobstructed, is the second best of the sites that have been studied. The depth to ground-water is at least 50 feet or greater.

Overall, the western portion of area C appears be one of the best for an operational base and will represent Option 1 in the subsequent discussions. Area B, with its relatively shallow depth to ground water, is the site which will be used for options 2 and 3. Area A will not be discussed further for reasons already stated. Other areas, outside the study area which have been suggested (i.e., Lynndyl) were screened and determined to be unacceptable based on air space and geotechnical (i.e., sand dunes) criteria.

7.2 OPERATIONAL BASE LAYOUT

7.2.1 Option 1

Operational base layout Option 1 is shown in Figure 7-2 and Drawing 7-1. In this configuration the DAA is 1 mile north of the OB (Table 7-1). The maintenance MAB is the minimum desirable distance (2965 feet) north of the DAA, and 5 miles east of the production MAB. The production MAB is 4 miles from the Designated Deployment Area (DDA) and has easy access to Whirlwind Valley and other valleys to the west, as well as Sevier Desert and areas to the north. This is due to Option 1 being located in an area suitable for the DDA. This location could contain three to five clusters depending upon the choice of shelter spacing. The Security Alert Facility (SAF) and the Cluster

OPTION[1]	RAILROAD		HIGHWAY		DESIGN	
	From Union Pacific to OB[2]/ Alternative	From OB to DAA	From Hinckley to OB[4]	From OB to DAA	From DAA	
					to Maintenance MAB	to Production MAB
1	18.5[3]	2.5	20	1	.56[5]	4
2	9	2.5	6	2.5	9	.56
3	31/9	14.5	6	15	.56	5.5

NOTES:

(1) See Text and Figures 7-1, 7-2 AND 7-3.
(2) See Figure 3-1 for Abbreviations.
(3) Distances given are in Statute Miles.
(4) Distance from Hinckley to Delta is 6 miles.
(5) .56 Mile Represents the 2965-Foot Stand off Distance in Miles.

DESIGNATED TRANSPORTATION NETWORK				DTN/HIGHWAY		Straight Line From Maintenance MAB to Production MAB
From DAA		From Maintenance MAB to OBTS	From Production MAB to DDA	From OBTS to DAA	From OBTS to OB	From OB to DDA	
nce	to Production MAB						
4		1.12	3	1.68	3.5	4	5
.56		2	8	11	13.5	10.5	8.44
5.5		1.12	1	1.68	16.68	10.5	6

DISTANCES BETWEEN OPERATIONAL BASE COMPONENTS
SEVIER DESERT, DELTA AREA, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

TABLE 7-1

UGRO NATIONAL, INC.

Maintenance Facility (CMF) have been placed 1 mile east of the maintenance MAB.

The Operational Base Test Site (OBTS) for this layout is located northeast of the CMF. This location was selected because it is relatively isolated. Also, the OBTS would probably be the activity center least impacted by the nearness of potentially active faults. An area south of the OB and U.S. Highway 6 and 50 was also evaluated as an OBTS site. This area is not isolated and is crossed by two powerlines which make an OBTS layout difficult.

The layout configuration for Option 1, as presented, minimizes the distances between the OB, DAA, maintenance MAB, and the OBTS while only locating a portion of the OBTS within the airfield approach/departure corridor. All activity centers are on BLM land.

7.2.2 Option 2

Option 2 (Figure 7-3) uses the OB location nearest to Hinckley and Delta (area B of Figure 7-1). This is the area of potential shallow ground water; i.e., water 10 feet from the ground surface. The DAA is 2.5 miles southwest of this OB layout along U.S. Highway 6 and 50. The production MAB is situated the minimum distance (2965 feet) southwest of the DAA (Table 7-1). The DAA and production MAB are sited on private property. From this location, the DTN has easy access to portions of the DDA to the north, west, and southwest. The maintenance MAB, as well as the CMF, SAF, and OBTS were situated so as to avoid potentially

active faults and power lines, and to minimize loss of suitable area from the DDA. The distance between the maintenance MAB and the DAA is 9 miles.

This option minimizes the railroad construction distance, although to do so, the alignment for the rail must traverse private property. All activities in this option are outside of the approach/departure corridor.

7.2.3 Option 3

Option 3 (Figure 7-4) is based on the same location for the OB and OBTS as Option 2. The difference in this option is that the DAA and MAB's have been moved to BLM land near the OBTS and are no longer on private property. The DAA is 15 miles from the OB and is the minimum desirable distance (2965 feet) from the maintenance MAB (Table 7-1). The production MAB is 5.5 miles further southwest along U.S. Highway 6 and 50 from the DAA. This location offers the same relatively easy access to the DDA as Option 1. All activity centers are outside the approach/departure corridor.

7.3 TRANSPORTATION CONSIDERATIONS

With the possible operational base locations selected, the problems of providing ground transportation to the site need to be considered. U.S. Highway 6 and 50 is adjacent to each of the three OB options and can be accessed by short roads from the OB. Additionally, the Union Pacific Railroad traverses the length of the valley through Delta, which is 9 miles due east of the study

area. The Union Pacific Railroad is built with 130 lb/yd rail, which should handle moderate to heavy freight loads.

Four rail alignment alternatives have been considered for connecting the three OB configurations to the Union Pacific Railroad. The alignment used in the OB configuration for Option 1 is a southern east-west route (18.5 miles long) from near Clear Lake to the OB site north of U.S. Highway 6 and 50. Another 2.5 miles of rail would be needed to the DAA. Although this route is totally within BLM land, it must cross the Beaver and Sevier Rivers and several agricultural irrigation canals.

The route used in the OB configuration for Option 2 (Figure 7-3) is only 9 miles long, extending from just south of Deseret to the OB site and a mile more to the DAA. This route traverses 5 miles of private property, the Sevier River and several roads and irrigation canals.

OB configurations for Option 3 (Figure 7-4) can be approached by two different rail alignments. The shorter route connects the OB with the Union Pacific by way of the Option 2 route through private property. From the OB, the rail would be extended another 14.5 miles southwest along U.S. Highway 6 and 50 to the DAA. This extension must cross state and private property for 3 miles. The total length of rail would be 23.5 miles with 8 miles in state and private property. The alternative is to use essentially the same route to the DAA as was used for Option 1, and to extend the rail on additional 14.5 miles northeast

along U.S. Highway 6 and 50 to the OB. This latter route would total 33 miles with only 3 miles in state and private property.

Generally, none of the four routes discussed above should present any extreme construction difficulties.

7.4 AIRSPACE CONSIDERATIONS

The airfield locations shown on Figures 7-2 to 7-4 and Drawing 7-1 have been selected based on the airspace criteria presented in Section 3.2 and on the possible OB locations discussed above. All topography within the unobstructed approach and departure airspace for each of these airfields is within the criteria as given.

The topography at right angles to the airfields does not wholly meet the criteria for regional unobstructed airspace. However, in a comparison of the Delta area to the three previous OB site location studies, the airspace is relatively unobstructed. Within the areas that should be unobstructed, there are Long Ridge, Red Knolls, and Smelter Knolls. The extent to which each of these ranges deviates from the regional unobstructed airspace criteria is presented in Table 7-2.

Airspace usage in the study area seems to be somewhat controlled. The majority of the study area is within the Sevier "B" Military Operations Area (MOA). The MOA is not restricted airspace, but requires prior coordination with the appropriate range control, for civilian and other users. Military aircraft use the airspace from 100 feet above ground level to but not

MOUNTAIN RANGE	LONG RIDGE	RED KNOLLS	SMELTER KNOLLS
AIRFIELD OPTION (1)	1	1	2 AND 3
MAXIMUM ELEVATIONS WITHIN REGIONAL UNOBSTRUCTED AIRSPACE	5229 TO 5329 FEET	5224	5102
HEIGHT OF RANGE IN EXCESS OF UNOBSTRUCTED AIRSPACE CRITERIA	139 FEET	34 FEET	37 FEET
CLOSEST PEAK TO RUNWAY HEIGHT IN EXCESS OF UNOBSTRUCTED AIRSPACE CRITERIA AND PROXIMITY TO RUNWAY	139 FEET / 3 MILES	34 FEET / 8 MILES	37 FEET / 7,5 MILES

NOTE : (1) RUNWAY ELEVATIONS ARE AS FOLLOWS :

OPTION 1	4690 FEET
OPTION 2 AND 3	4565 FEET

MOUNTAIN RANGES IMPACTING ON REGIONAL UNOBSTRUCTED AIRSPACE SEVIER DESERT, DELTA AREA, UTAH

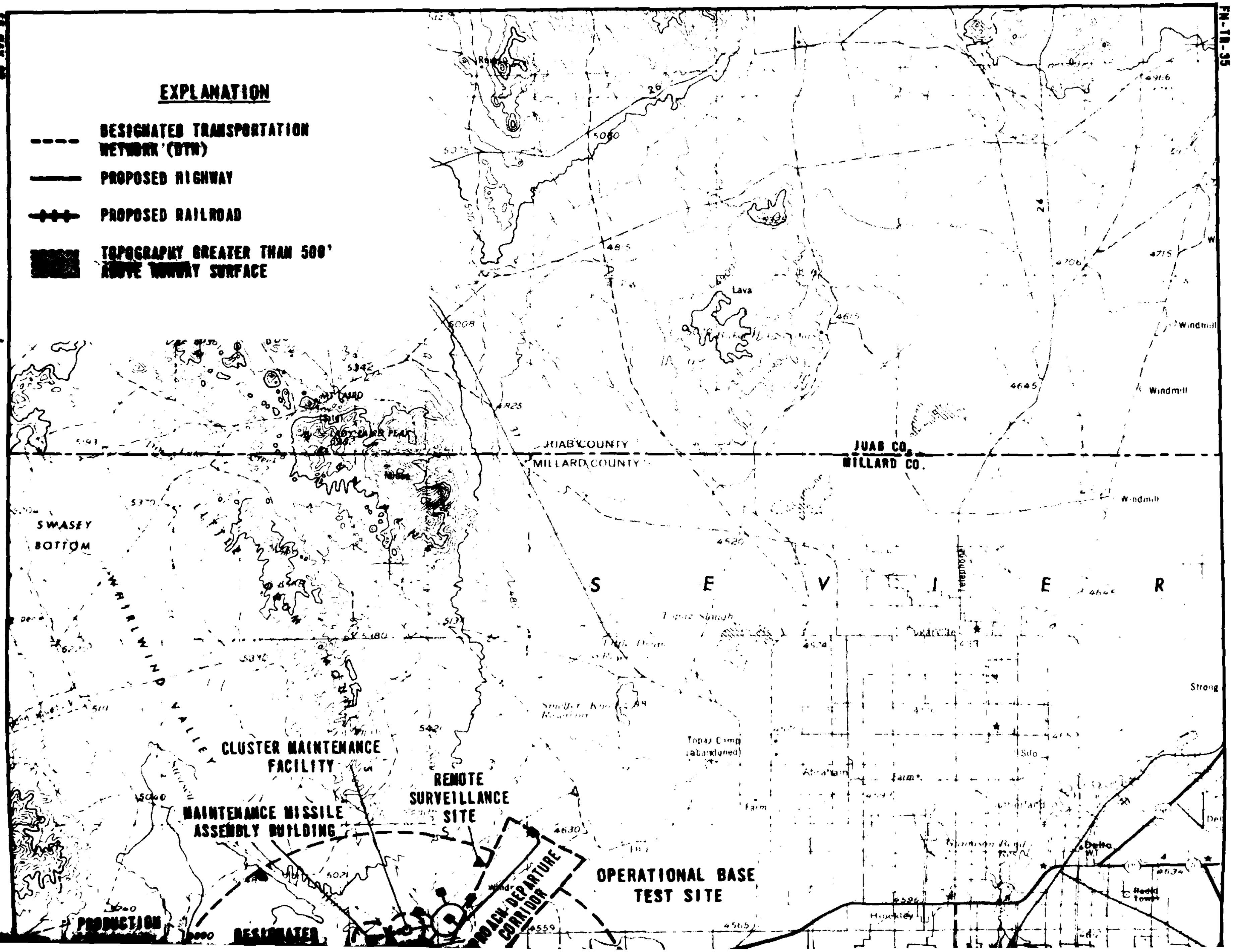
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

TABLE 7-2

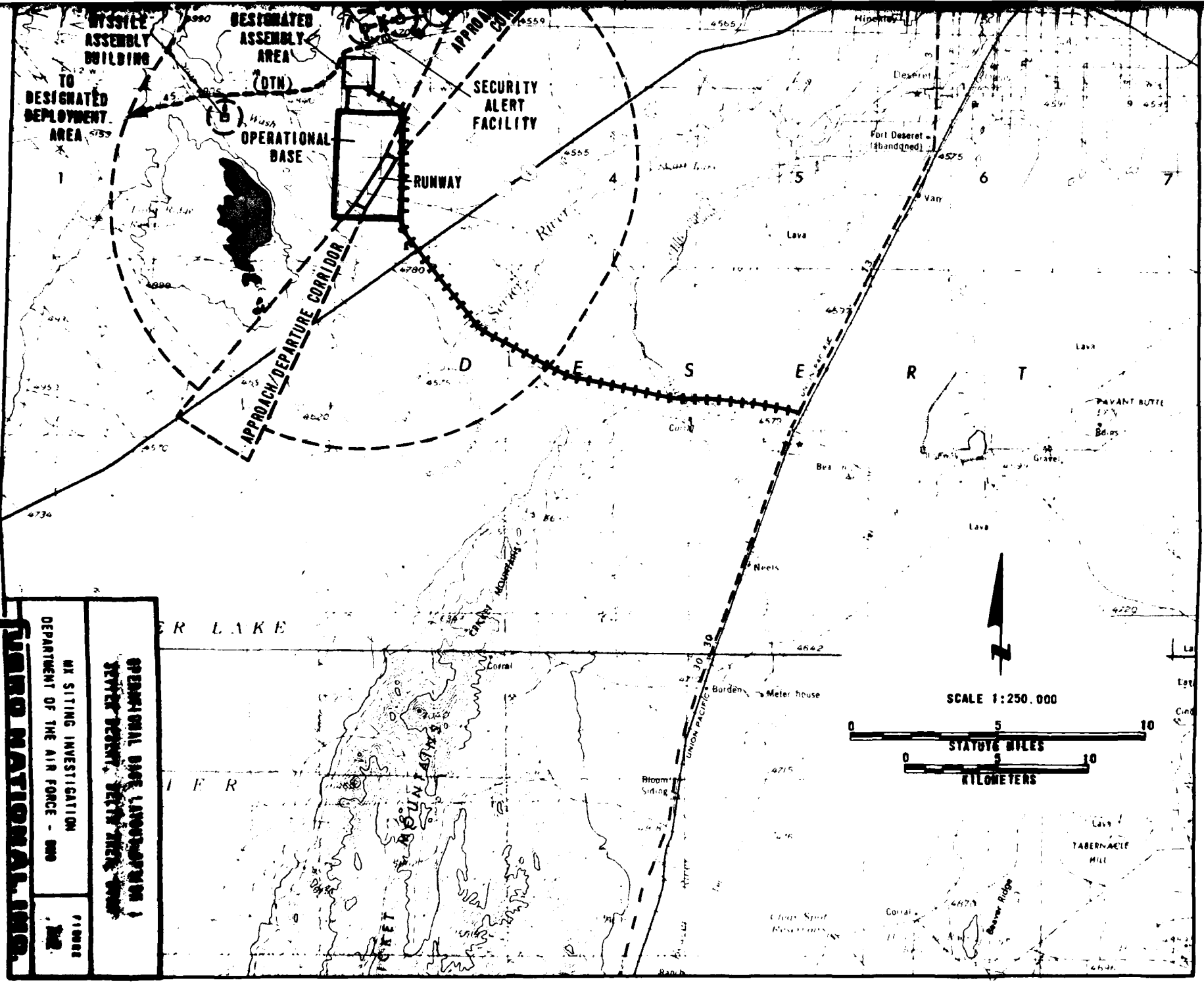
FUGRO NATIONAL, INC.

including 9500 feet, from 0500 to 2000 hours, Monday through Friday. This MOA is east of Sevier "A" MOA and 16 miles at the nearest point from the restricted airspace used by the Dugway Proving Ground and the Utah Test and Training Range. The Delta municipal airport is outside of the study area and should not pose a problem.

FN-TR-35



30 MAY 80

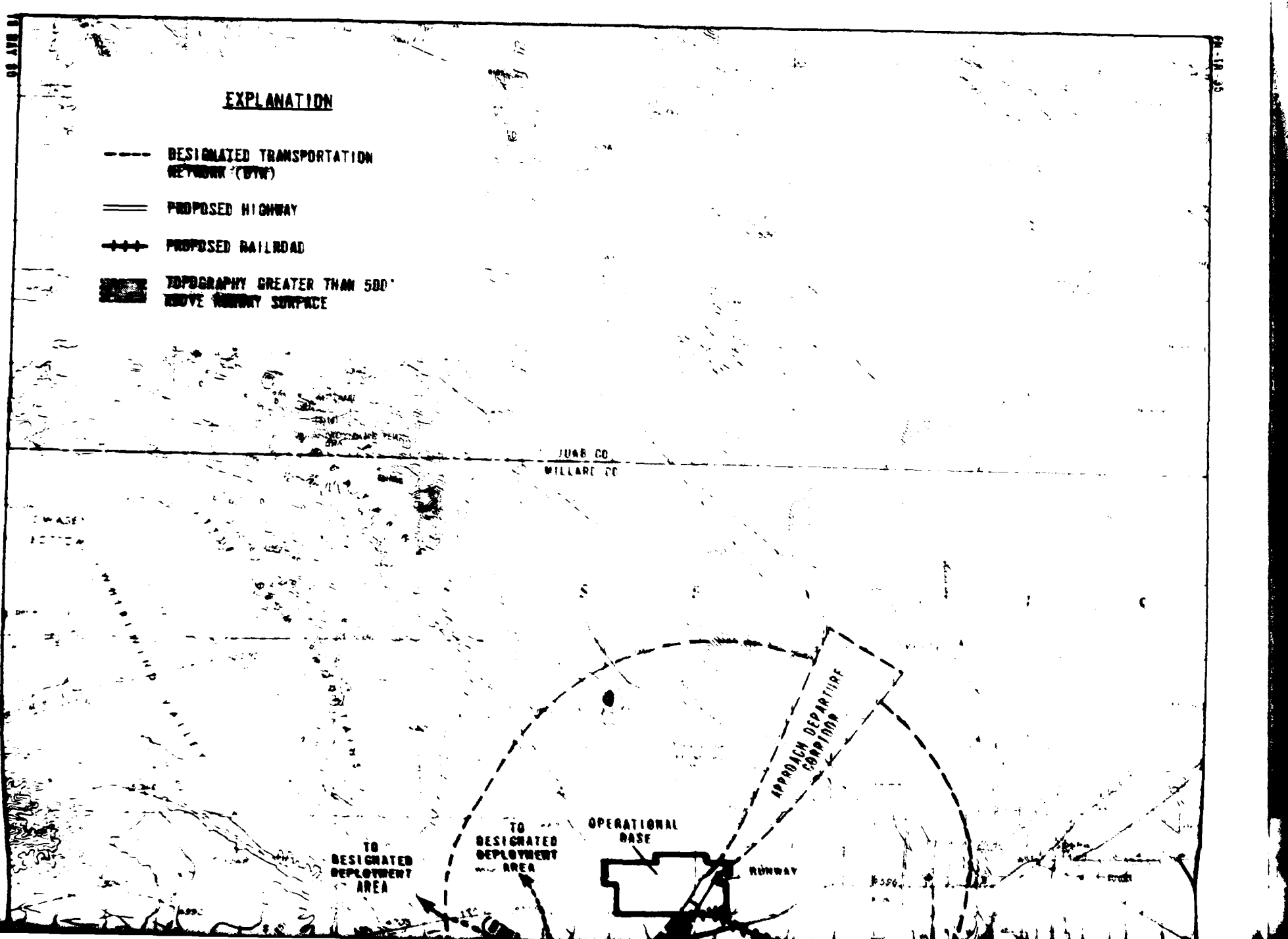


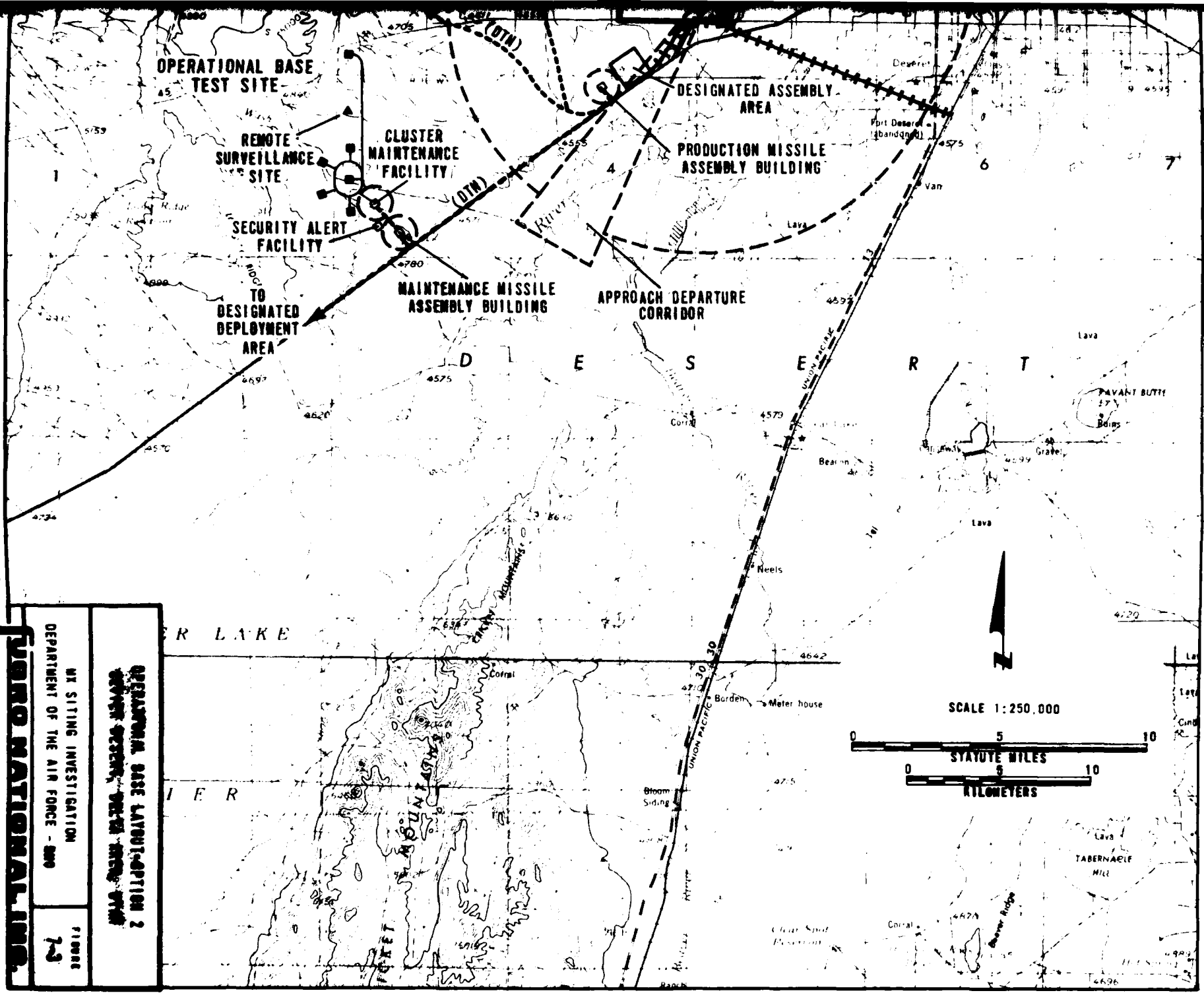
OPERATIONAL BASE LAYOUT OPTION I
SEVIER DESERT, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DOD

FIGURE

FIGURE NATIONAL INC.

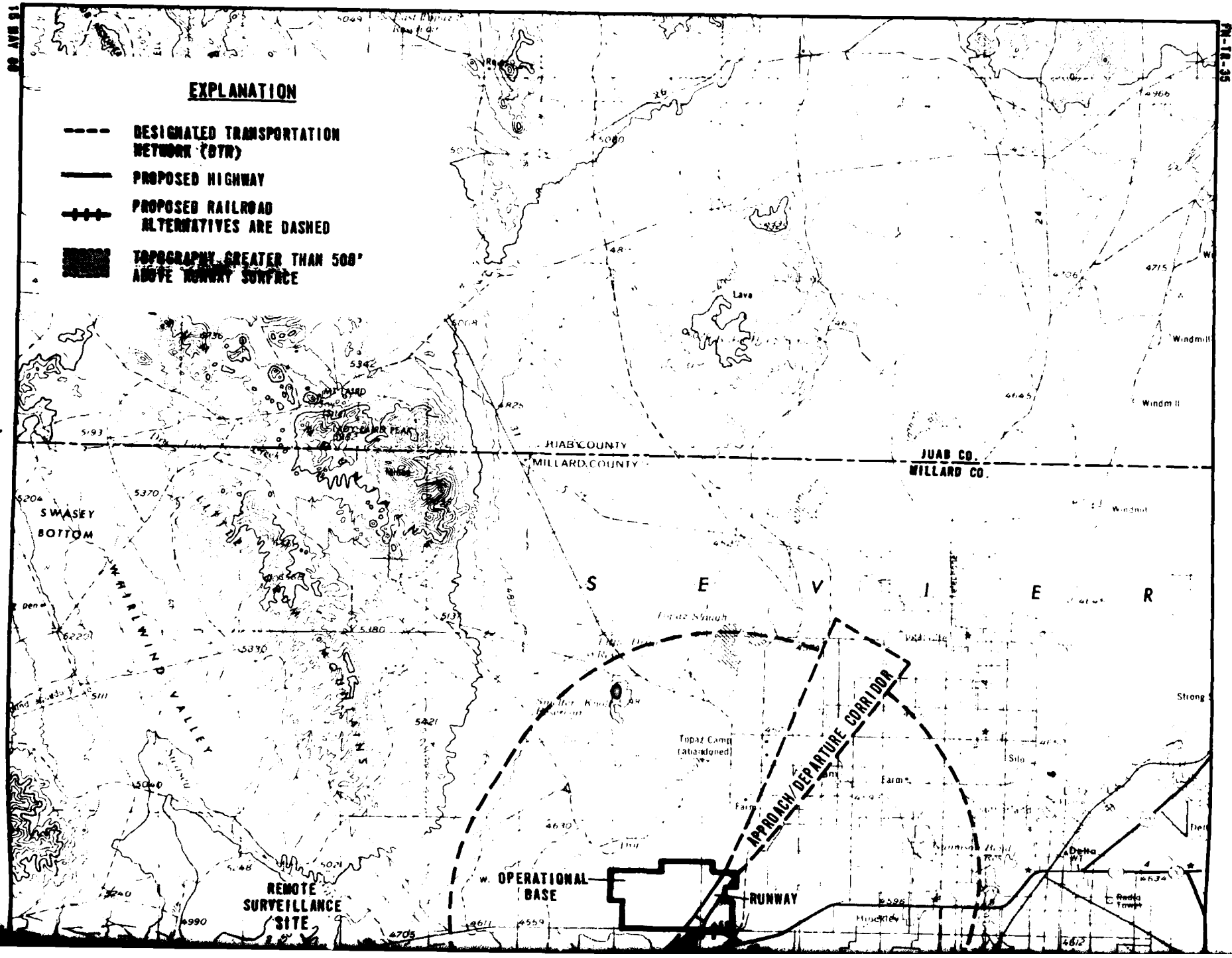

EXPLANATION
DESIGNATED TRANSPORTATION NETWORK (DTN)
PROPOSED HIGHWAY
PROPOSED RAILROAD
TOPOGRAPHY GREATER THAN 500' ABOVE RUNWAY SURFACE
TULARE CO
KINGS CO
TO DESIGNATED DEPLOYMENT AREA
TO DESIGNATED DEPLOYMENT AREA
OPERATIONAL BASE
RUNWAY
APPROACH DEPARTURE CORRIDOR

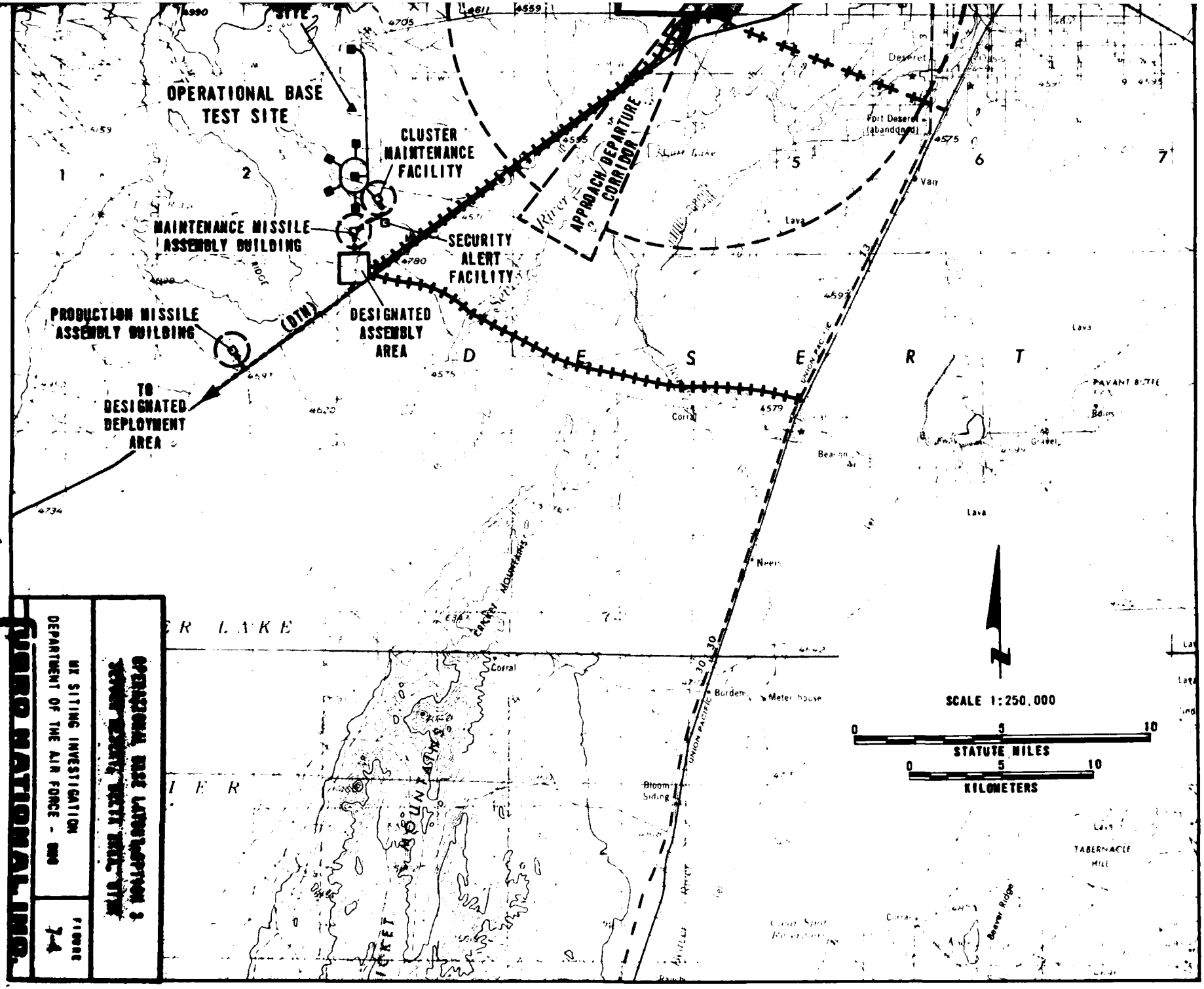


OPERATIONAL BASE LAYOUT-OPTION 2

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE 7-3


EXPLANATION
DESIGNATED TRANSPORTATION NETWORK (DTN)
PROPOSED HIGHWAY
PROPOSED RAILROAD
ALTERNATIVES ARE DASHED
TOPOGRAPHY GREATER THAN 500' ABOVE RUNWAY SURFACE
JUAB COUNTY
MILLARD COUNTY
JUAB CO.
MILLARD CO.
SEVIER
SWASEY BOTTOM
WARNING LAKE VALLEY
APPROACH/DEPARTURE CORRIDOR
W. OPERATIONAL BASE
RUNWAY
REMOTE SURVEILLANCE SITE
Topaz Camp (abandoned)
Windmill
Windmill
Lava
Strong
Silo
Farm
Farm
Delta
Radio Tower
Hinckley



MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE 7-4

OPERATIONAL BASE LAUNCH OPTION 2
SEVIER DESERT TEST SITE, UTAH

FOR INFORMATION

8.0 CONCLUSIONS

Based on the preceding discussions, it is possible to reach the following preliminary conclusions regarding the suitability of the Delta Area for an Operational Base Site:

- In general, the Delta area has sufficient area for the layout of the OB and its components. However, the useable area is limited by land use, geotechnical, and airfield considerations to locations southwest of Delta. Only two sites are entirely on BLM land.

- There are some areas of adverse terrain and flooding potential within the study area, but these can possibly be avoided or mitigated. Additionally, there are potentially active faults in the northern and central portions of the study area. Further consideration will have to be given in all base layout options, especially Option 2, in regard to these faults. It is expected that potential problems associated with faults can be mitigated by proper placement of critical structures and by using appropriate seismic design.

- Ground water in the Sevier Desert, and especially in the Delta area, is of suitable quality for use during OB construction and operation. The quantity of existing ground water needs further evaluation, but it appears that the area is being overused and that purchase from existing users may be the only source of OB water supply.

- It is not possible to site an OB that fully complies with the guidelines for regional unobstructed airspace. The area of obstructed airspace is minimal in Option 1 and covers a small area south and west of the southern approach/departure corridor. Options 2 and 3 each have a single small obstruction northwest of the runway.

- The OB layout and the location of the OB proper are flexible; three possible configurations have been presented here. Final configurations can only be developed after all trade-offs have been considered.

- The Delta area offers good access to the DDA, either by a constructed DTN through Whirlwind Valley and Sevier Desert or by existing highways into the other valleys of the DDA. Transportation, especially railroad, and local community impacts should be considered before final site selection is made.

- Option 1 is located in a portion of the study area that appears to be suitable for inclusion in the DDA. The location of an OB in this area could cause the loss of about three to five cluster sites within the total DDA.

Should Sevier Desert be selected for the OB, it is recommended that ground-water observation wells be drilled to obtain better information about ground-water conditions. This information should be available before final site selection is made to avoid construction where the ground water is near the surface.

METRIC CONVERSION FACTORS

Because of the large number of distance figures presented in this report, it was thought that presentation of metric equivalents within the text would result in cumbersome reading. Therefore, the metric conversions are presented below for convenience.

1 foot = 0.3048 meters
1 mile = 1.6093 kilometers
1 acre = 0.4047 hectares
1 $mile^2$ = 259 hectares or 2.59 km^2
1 acre foot = 1233 $meters^3$

LIST OF ABBREVIATIONS

AFM	Air Force Manual
ASL	Above Sea Level
BLM	Bureau of Land Management
BMO	Ballistics Missile Office
CMF	Cluster Maintenance Facility
DAA	Designated Assembly Area
DDA	Designated Deployment Area
DTN	Designated Transportation Network
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
IPP	Intermountain Power Project
MAB	Missile Assembly Building
MOA	Military Operation Area
OB	Operational Base
OBTS	Operational Base Test Site
RSS	Remote Surveillance Site
SAF	Security Alert Facility

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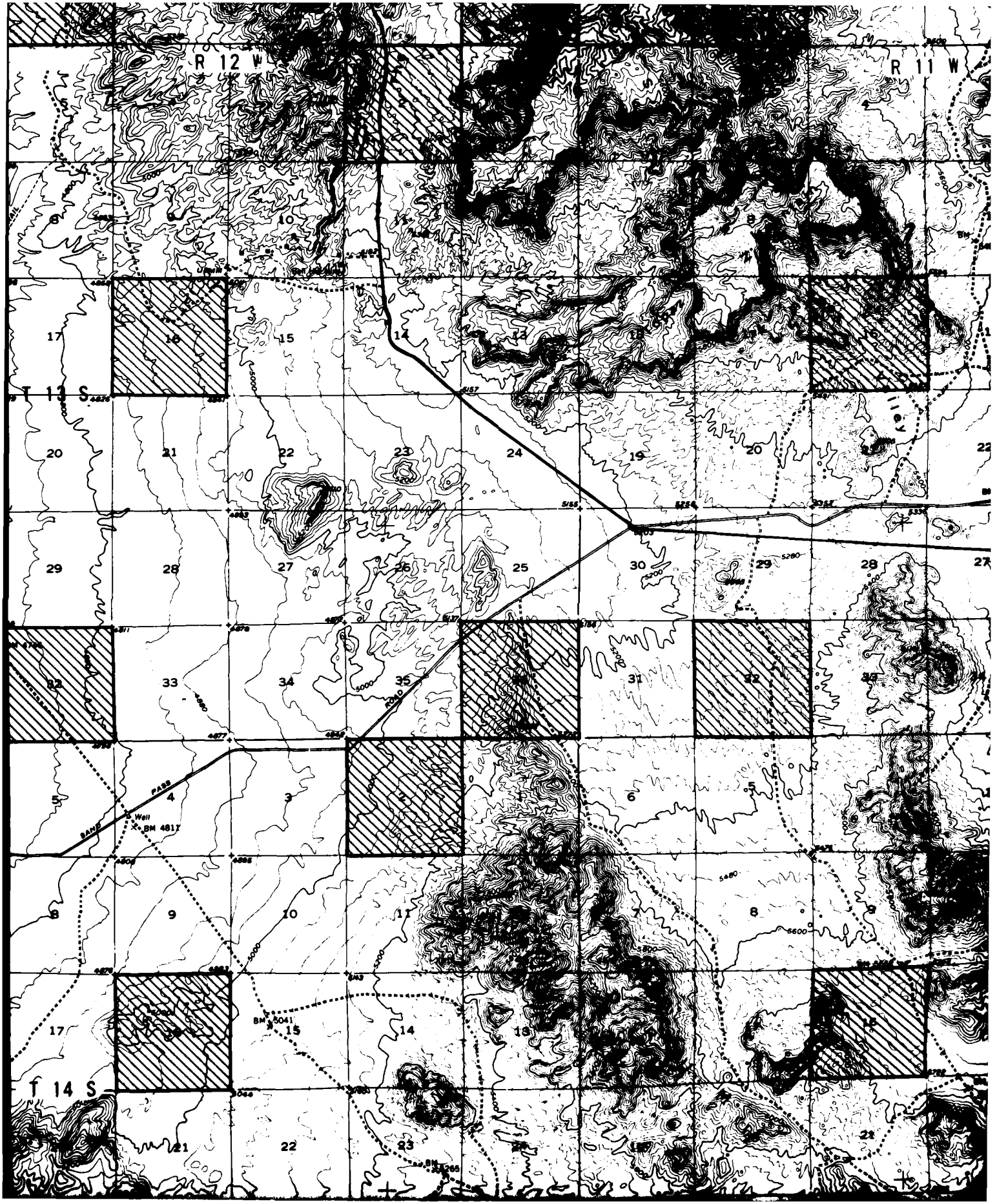
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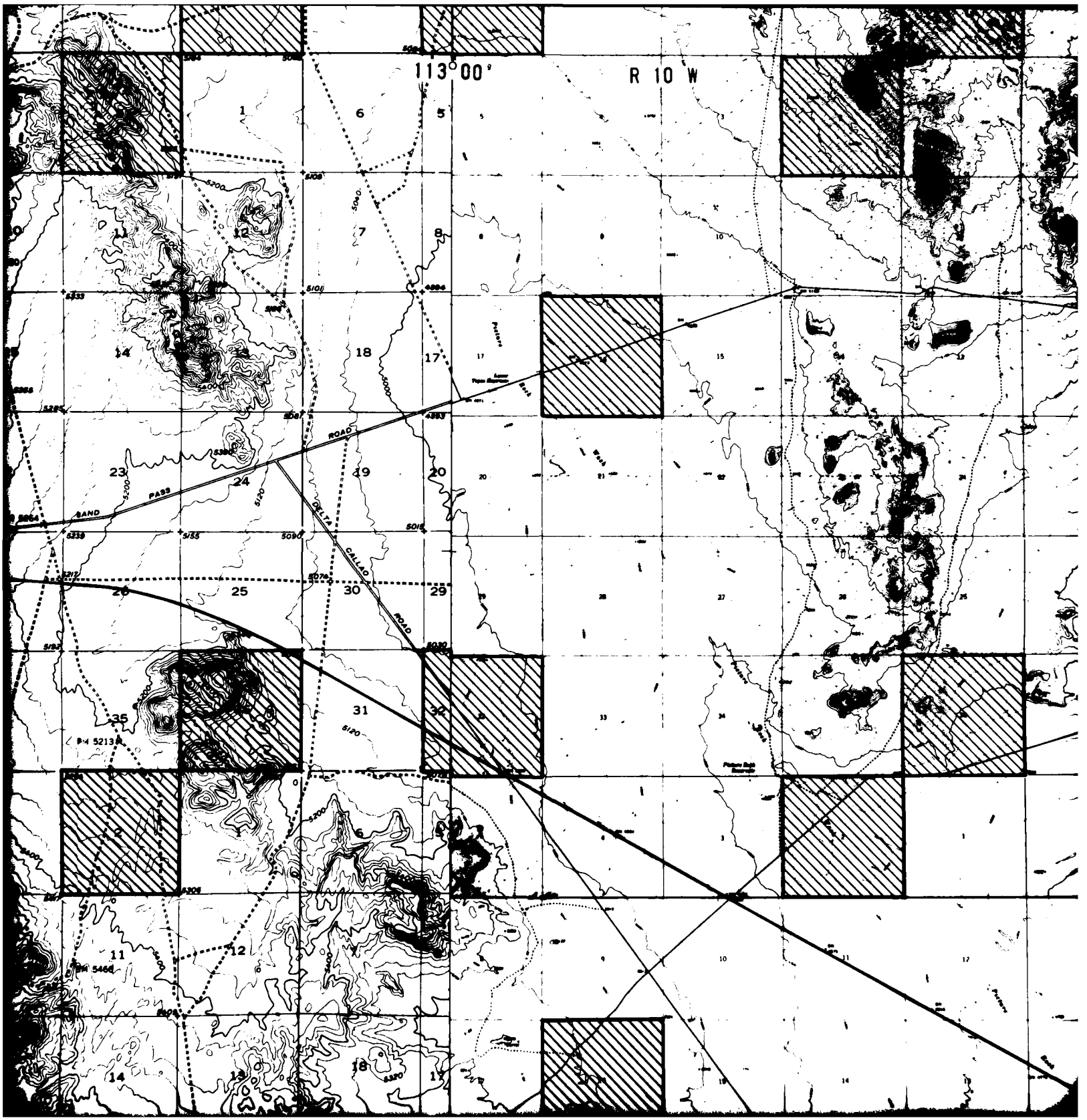
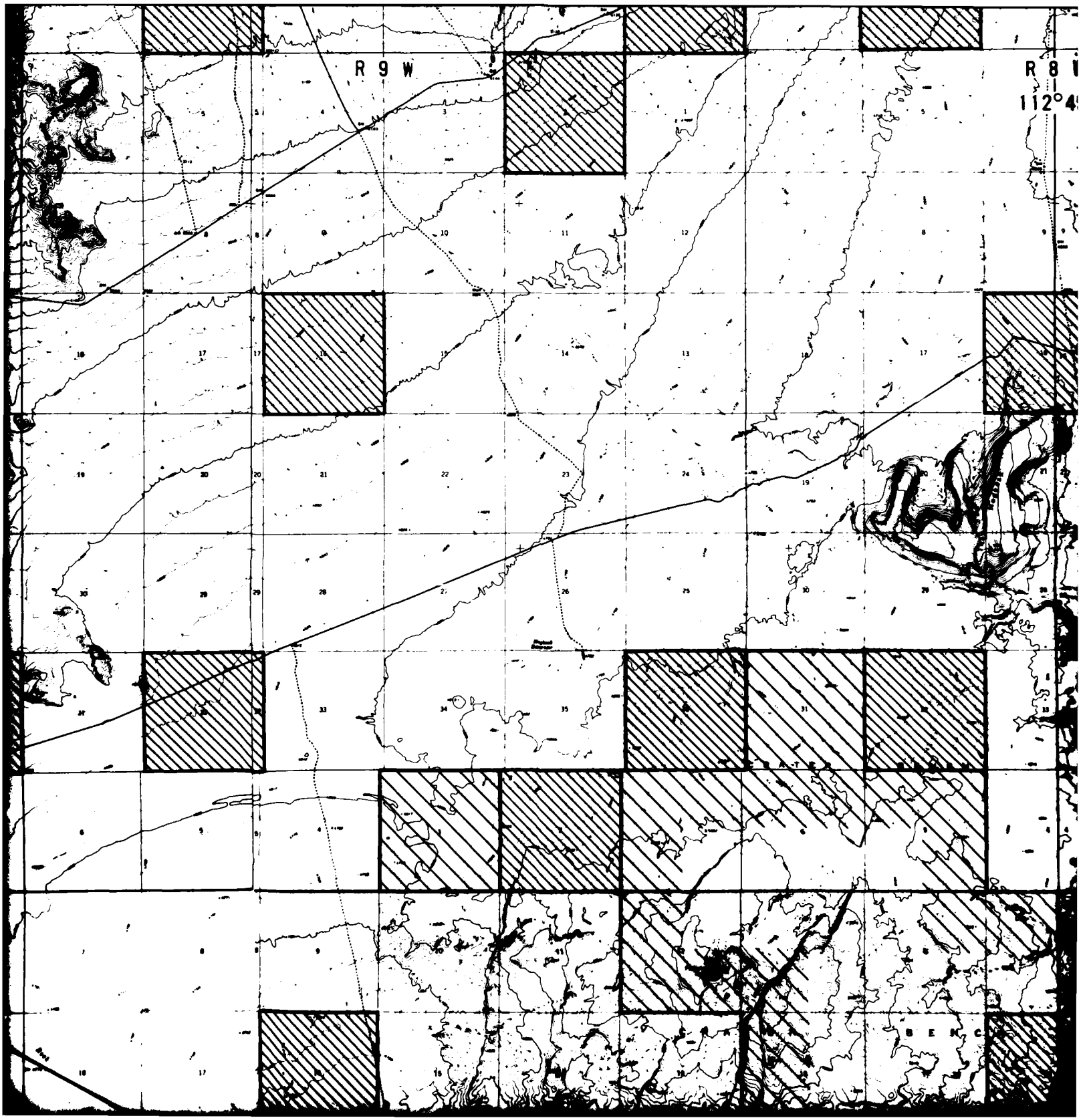
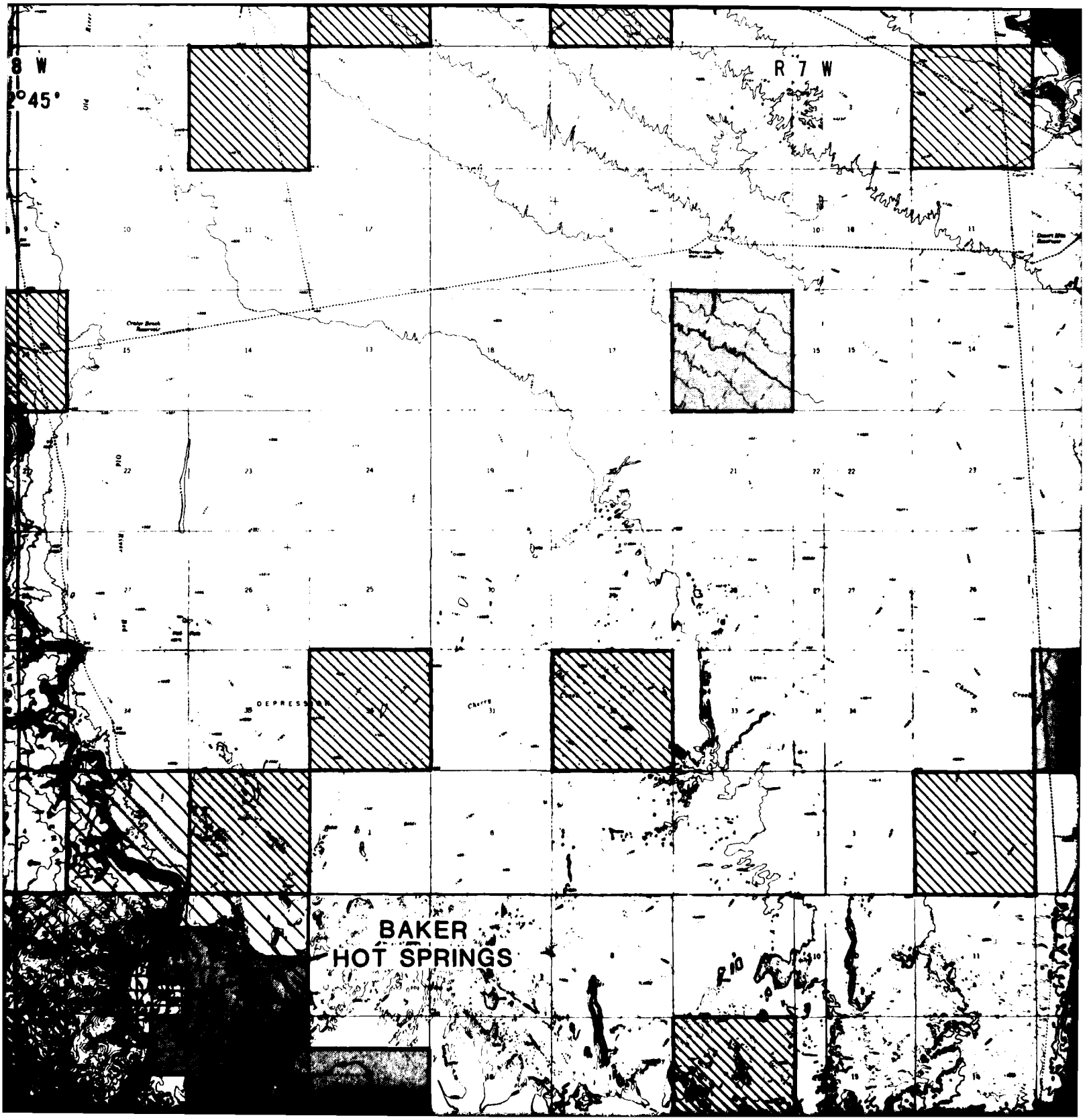
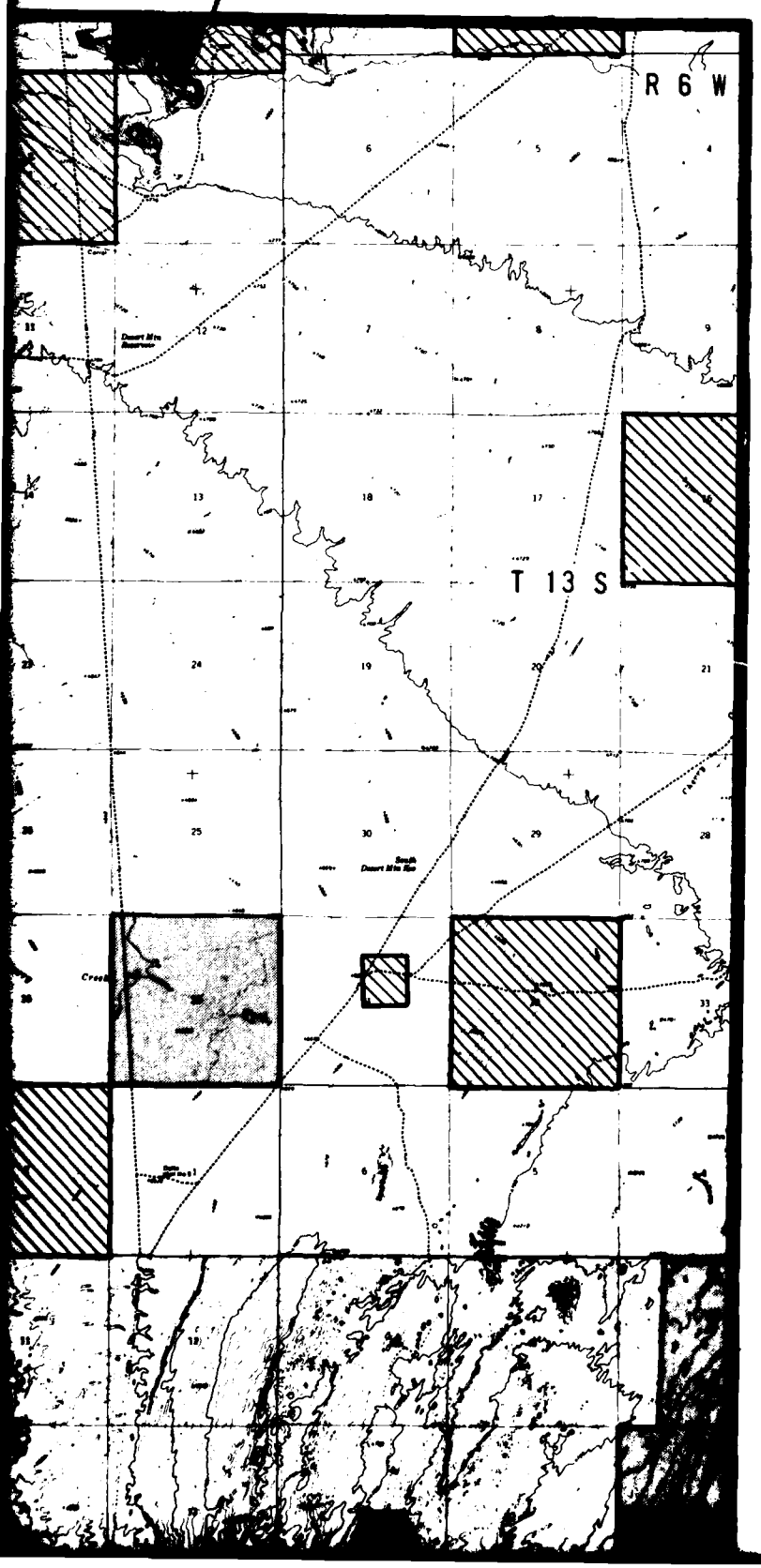
R 11 W
T 13 S
T 14 S
PASS
BAND
Well
BM 4817
BM 5041

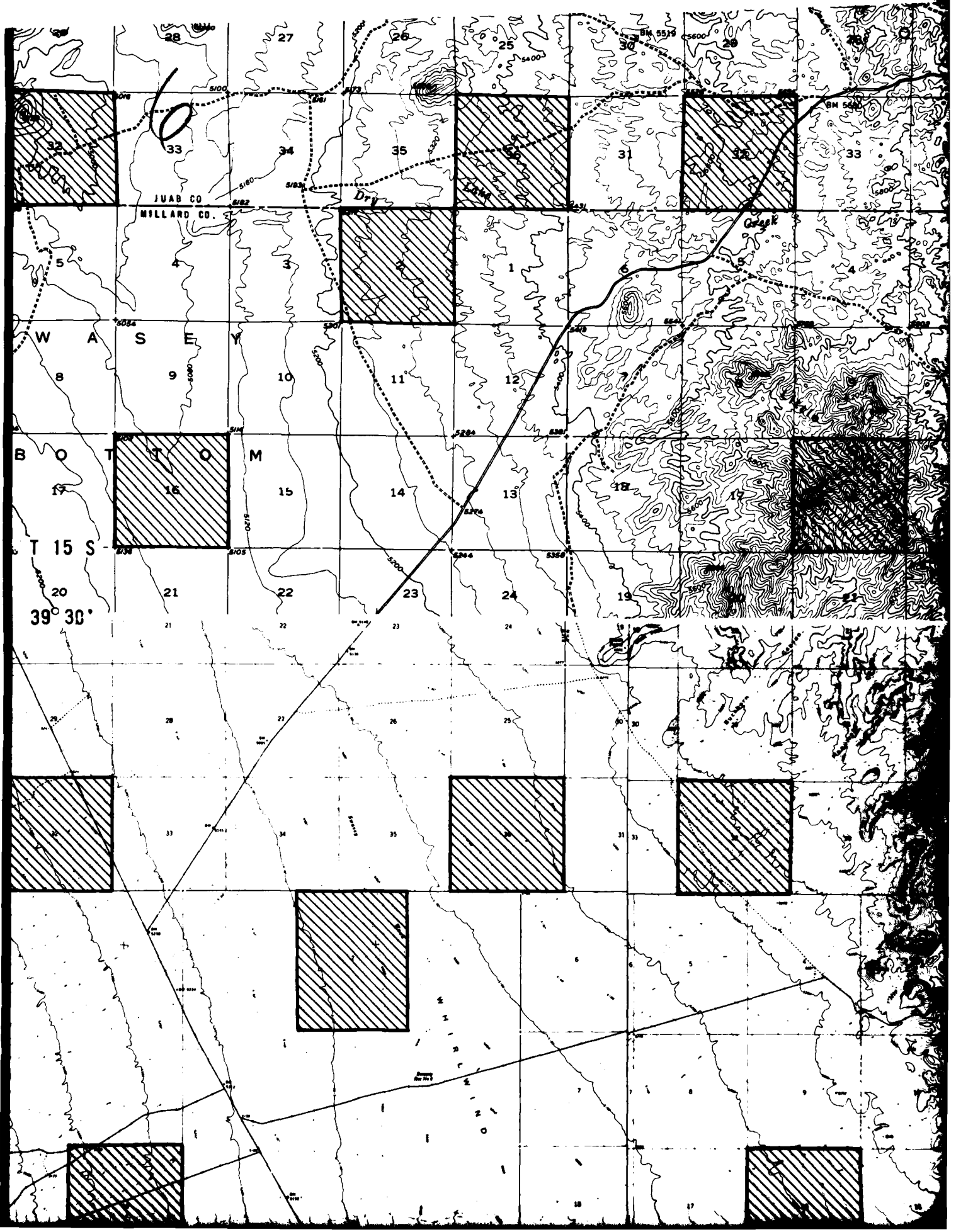

113°00'
R 10 W
ROAD
PASS
SAND
DELTA
CALLAO
ROAD
BM 5213
BM 5468


R 9 W
R 8
112°4


8 W
45°
R 7 W
BAKER
HOT SPRINGS
R 10

5

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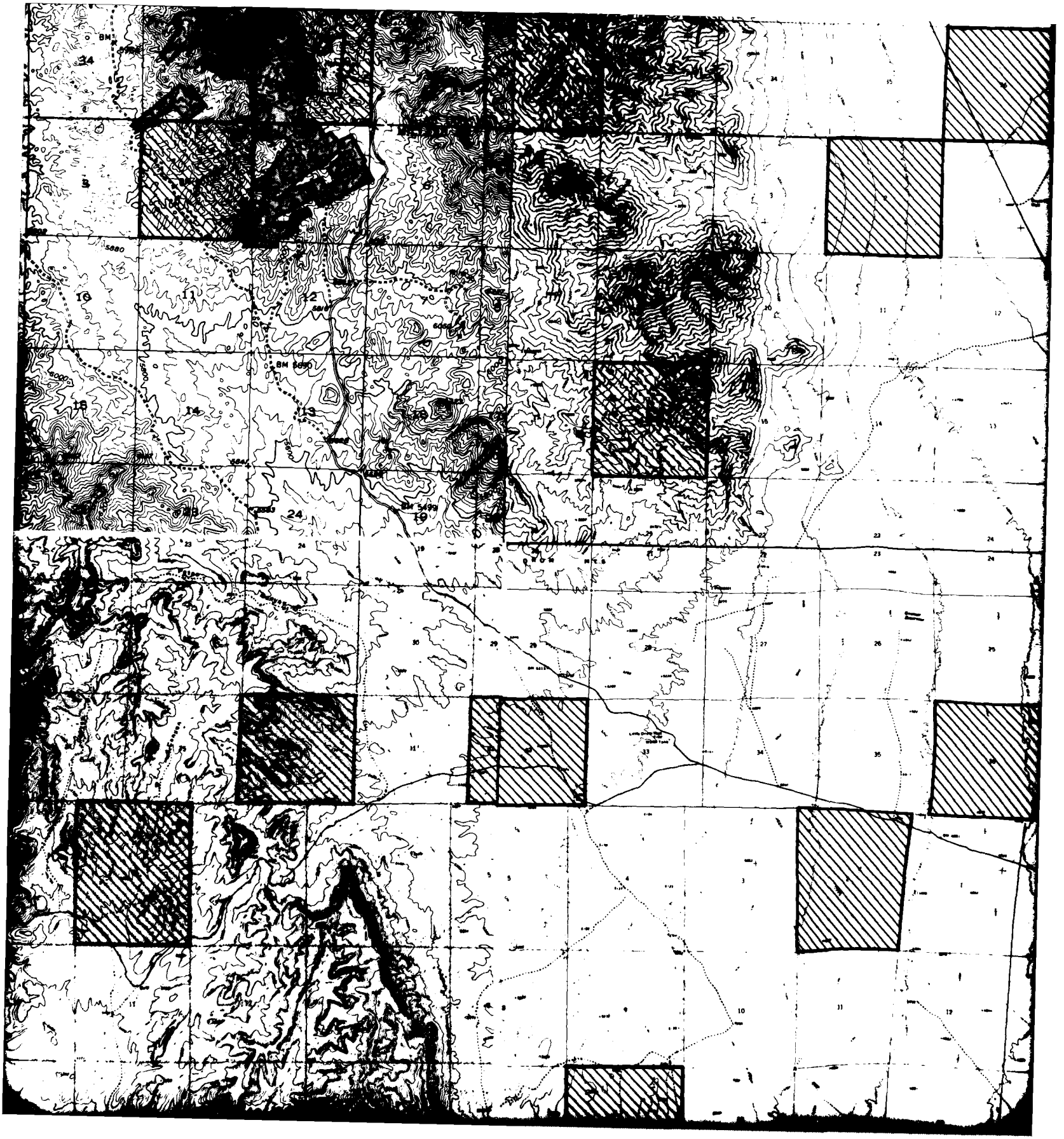
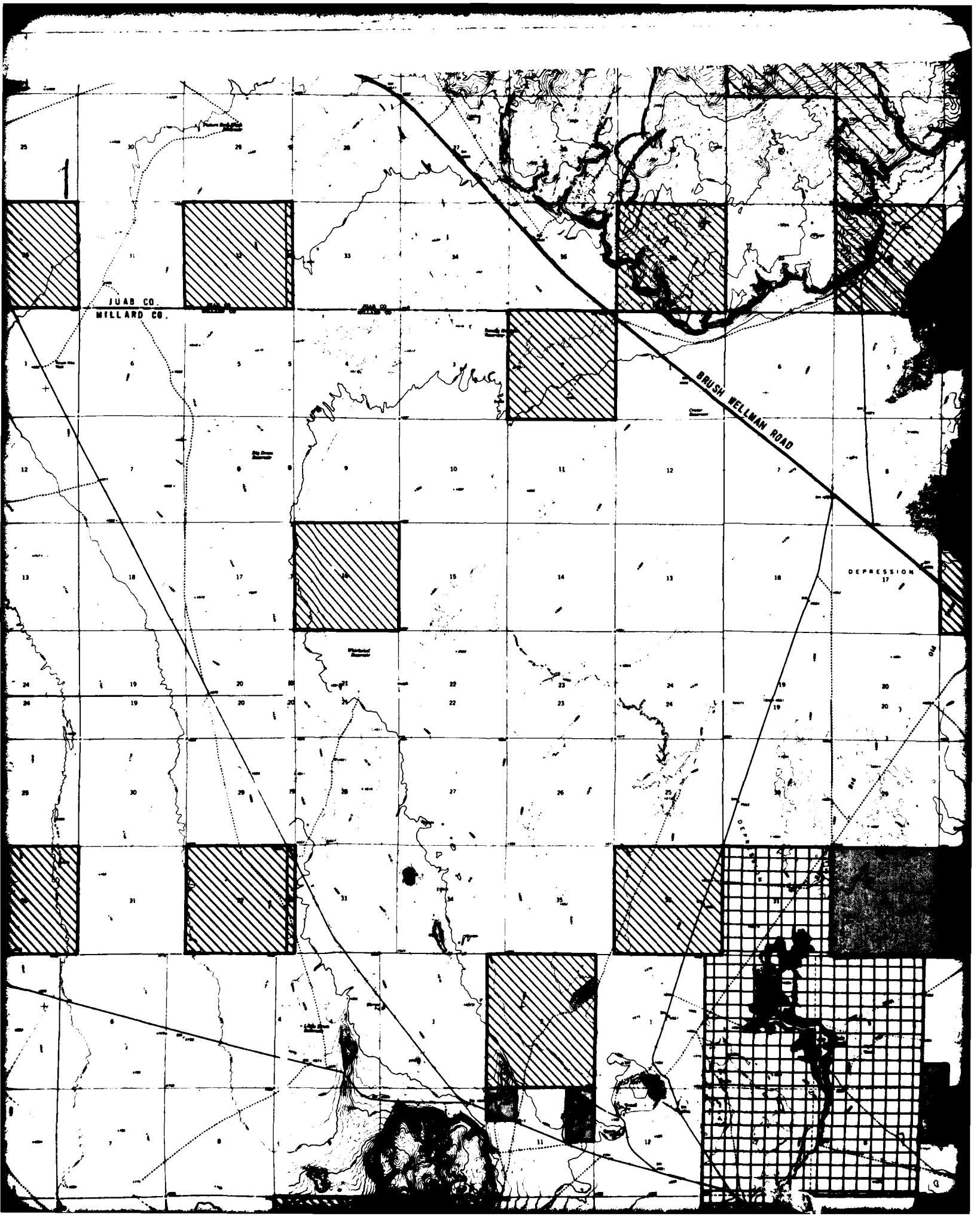
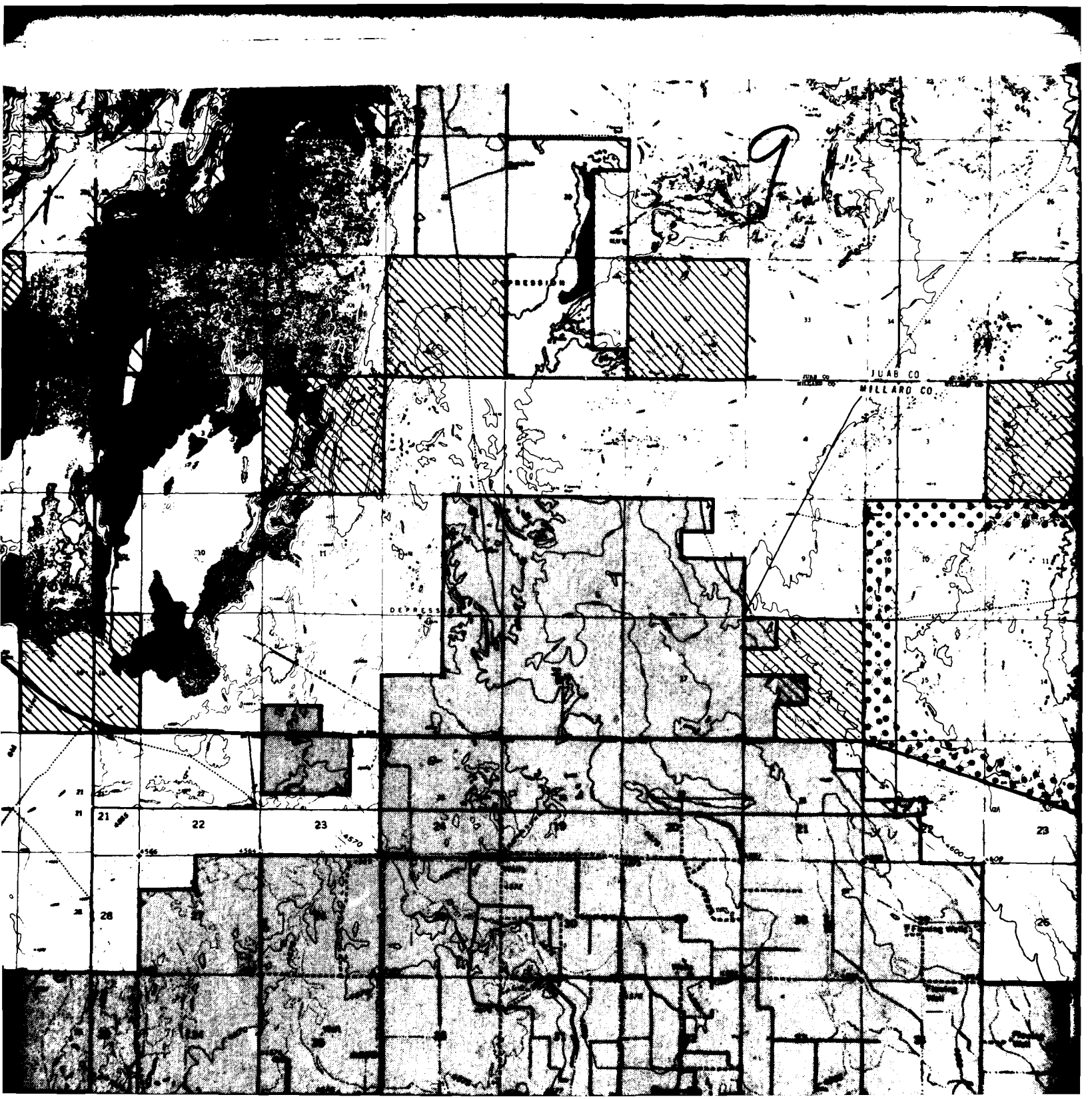
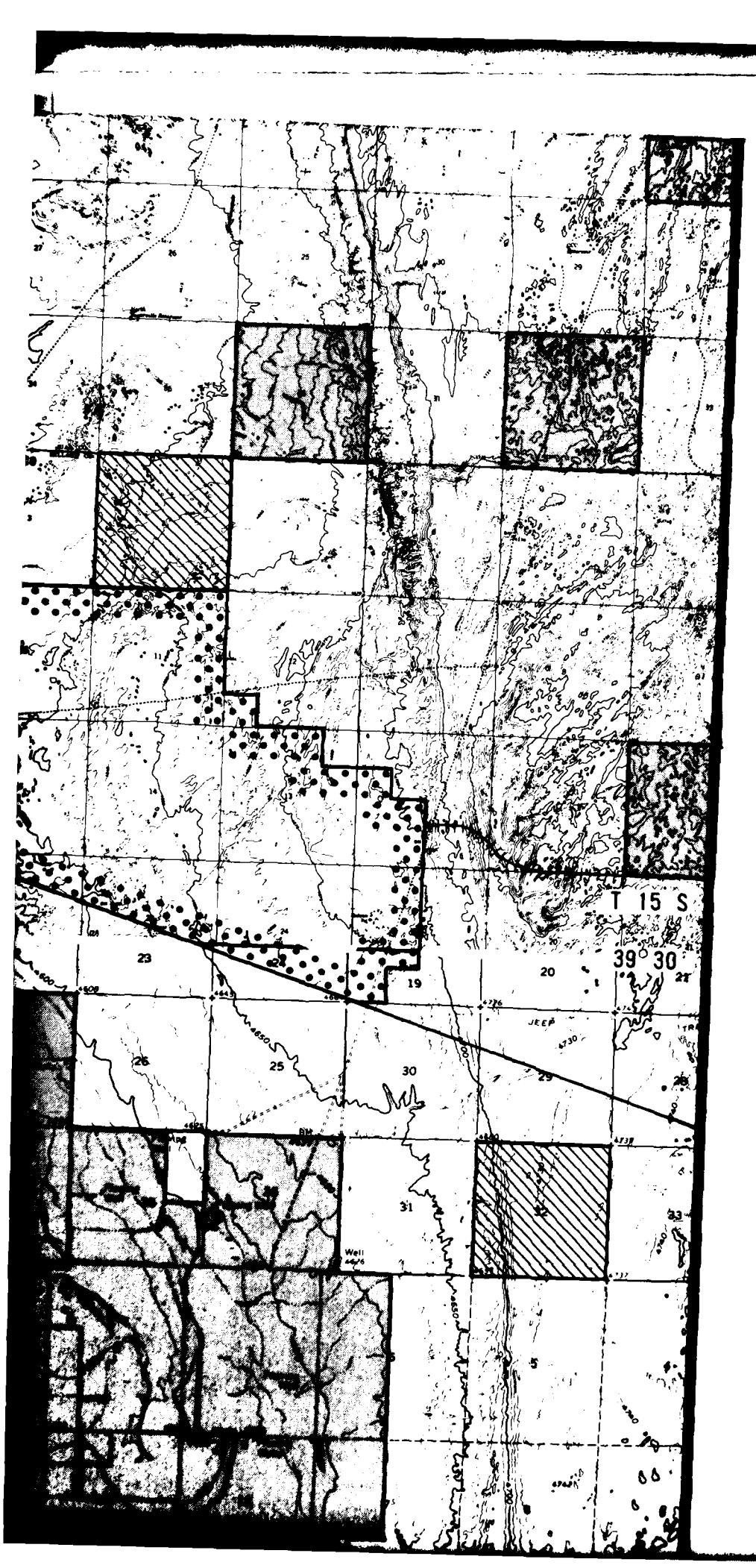
MILLARD CO.
Dry
Lake
Creek
W A S E Y
B O T T O M
T 15 S
39° 30'
BM 5519
BM 5680




JUAB CO.
MILLARD CO.
BRUSH WELLMAN ROAD
DEPRESSION


JUAB CO
MILLARD CO
21
22
23
26



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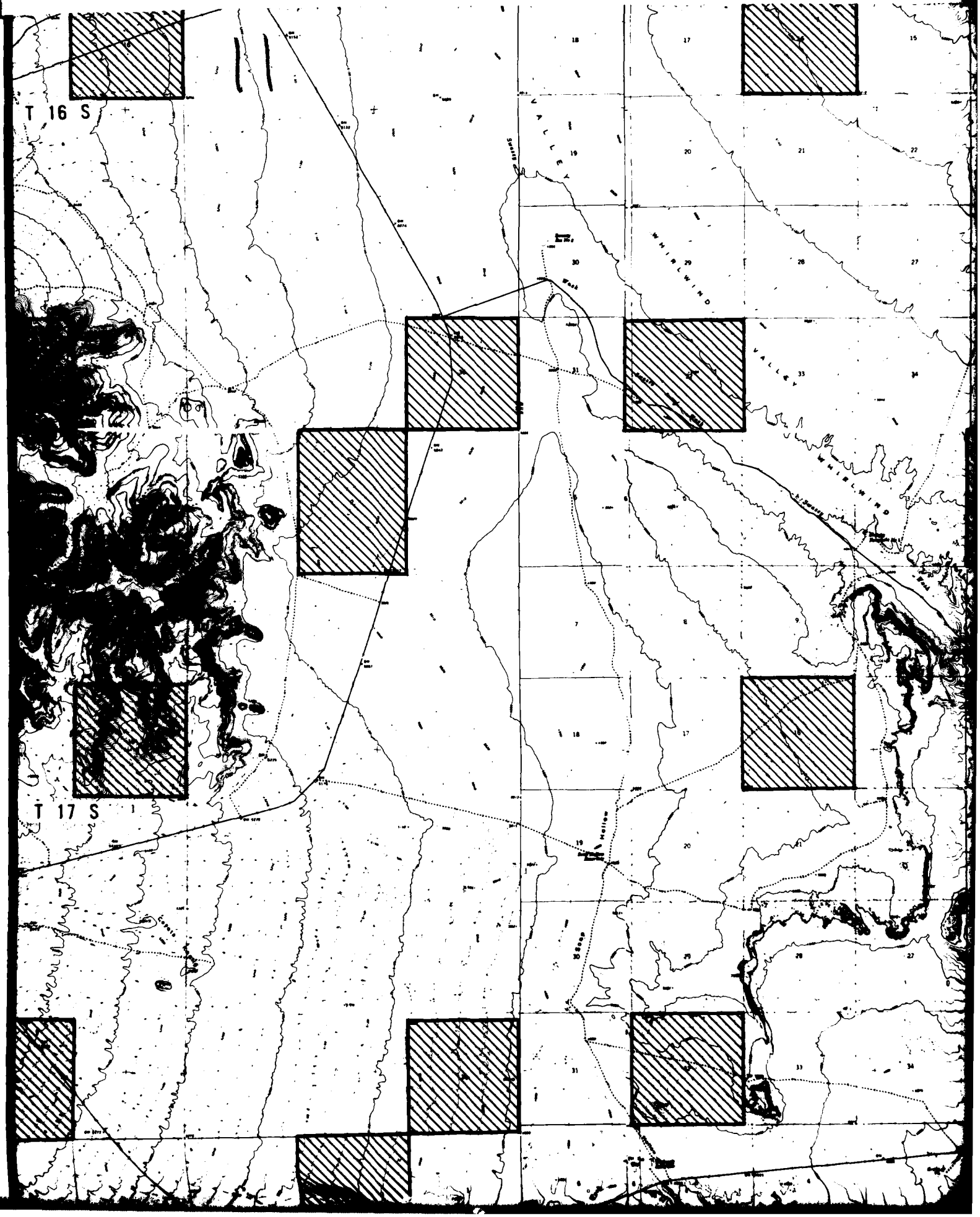
T 16 S
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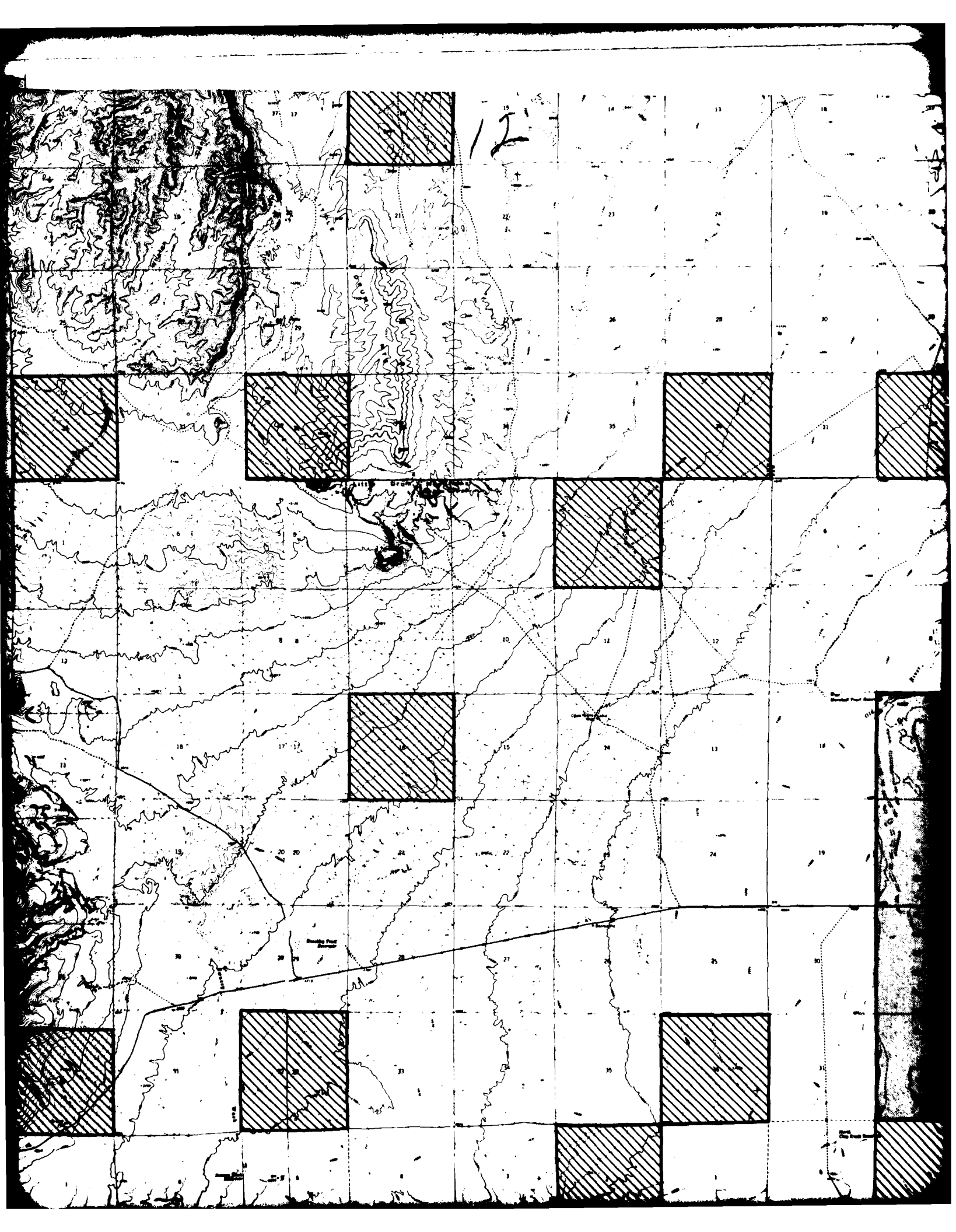
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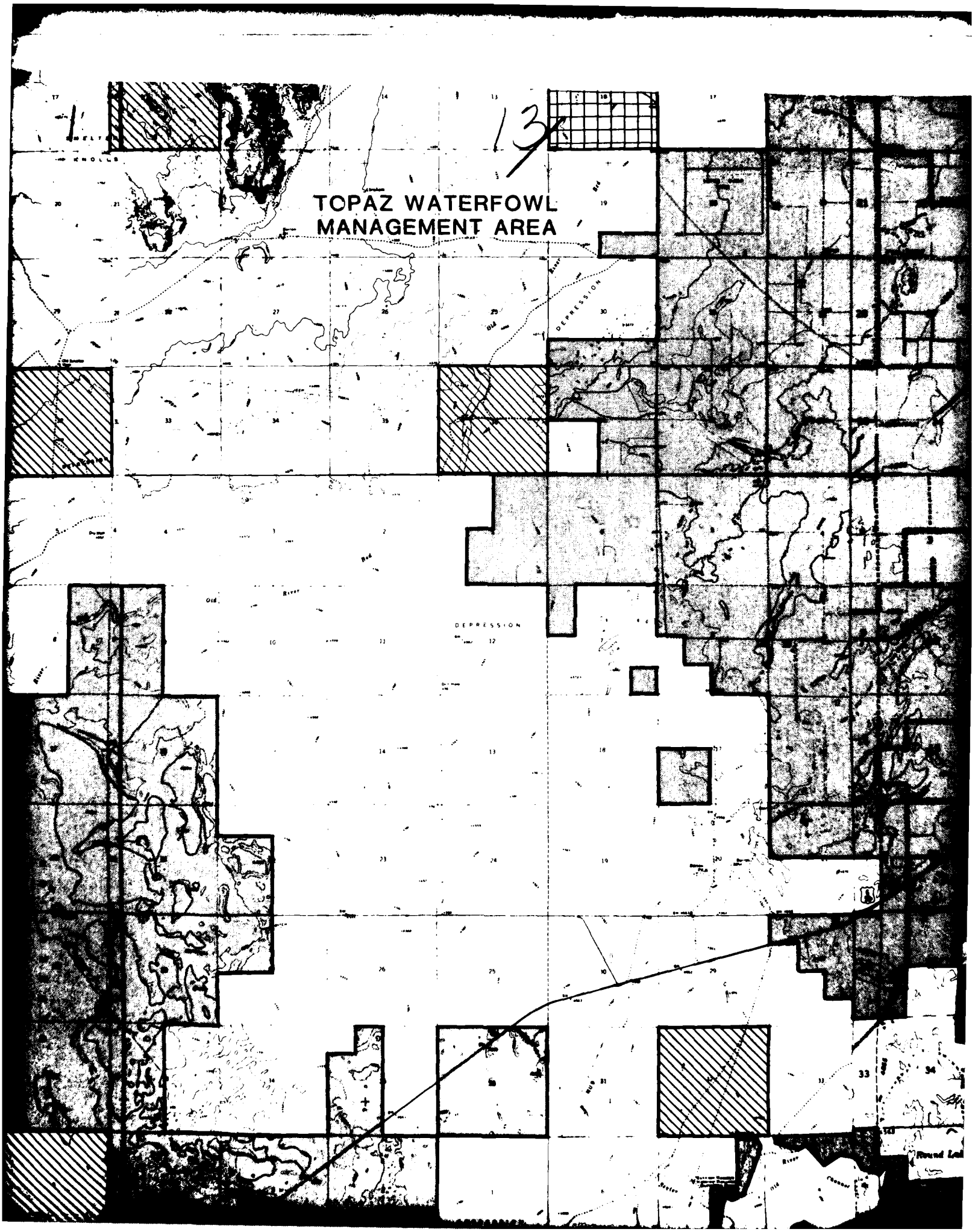
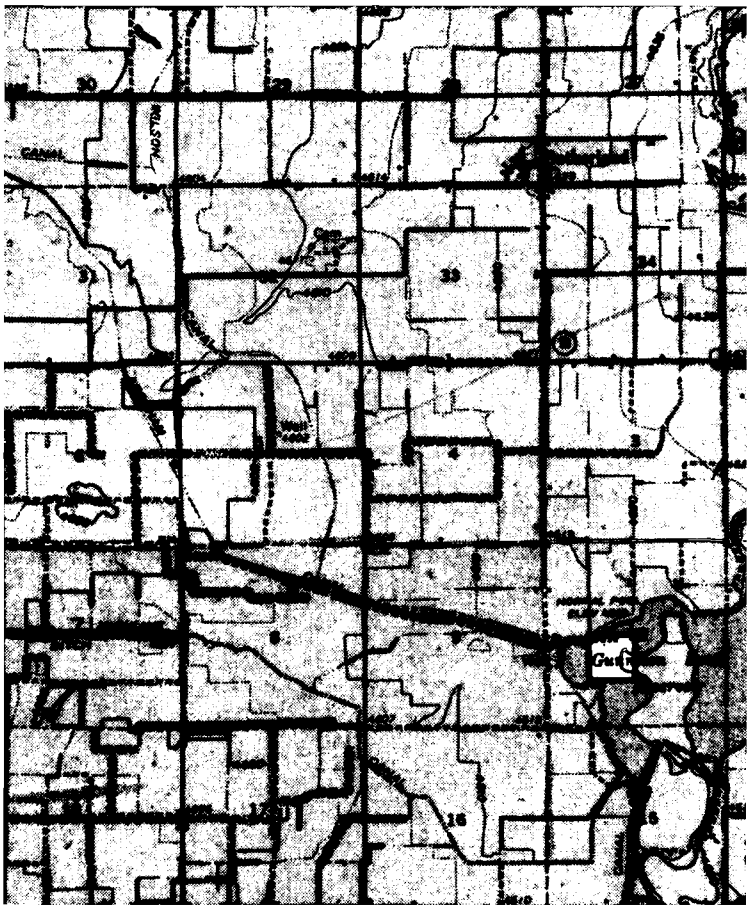
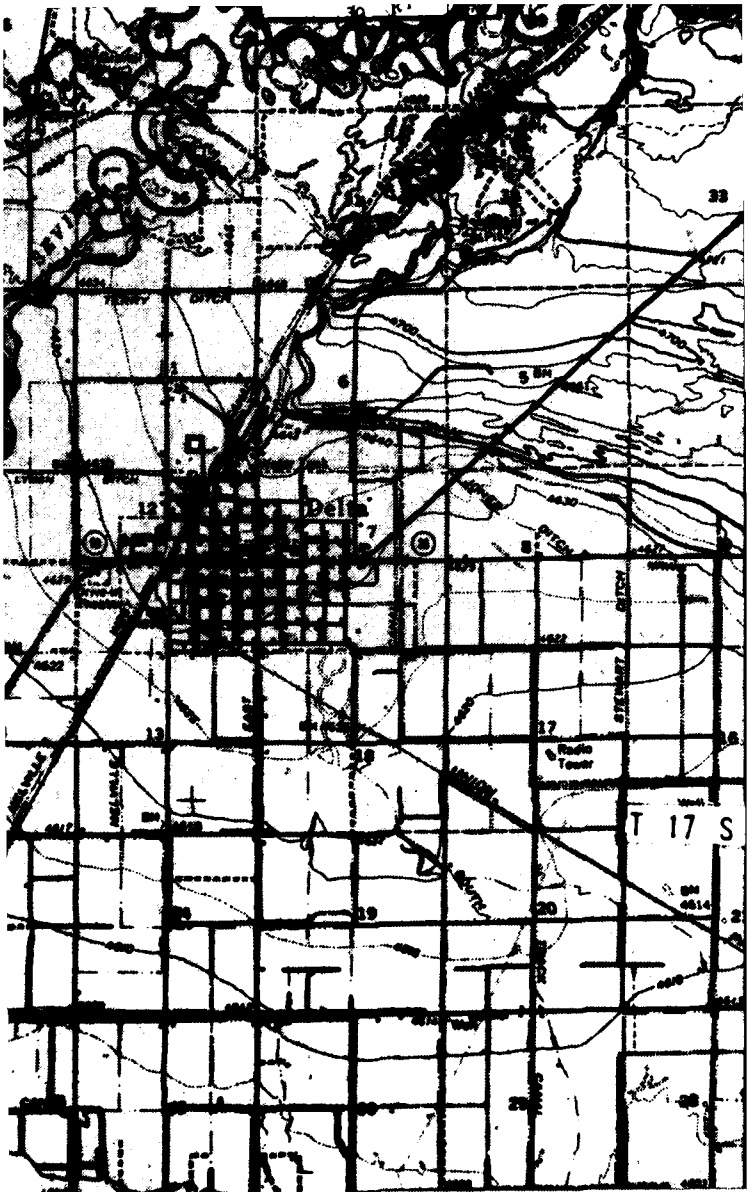
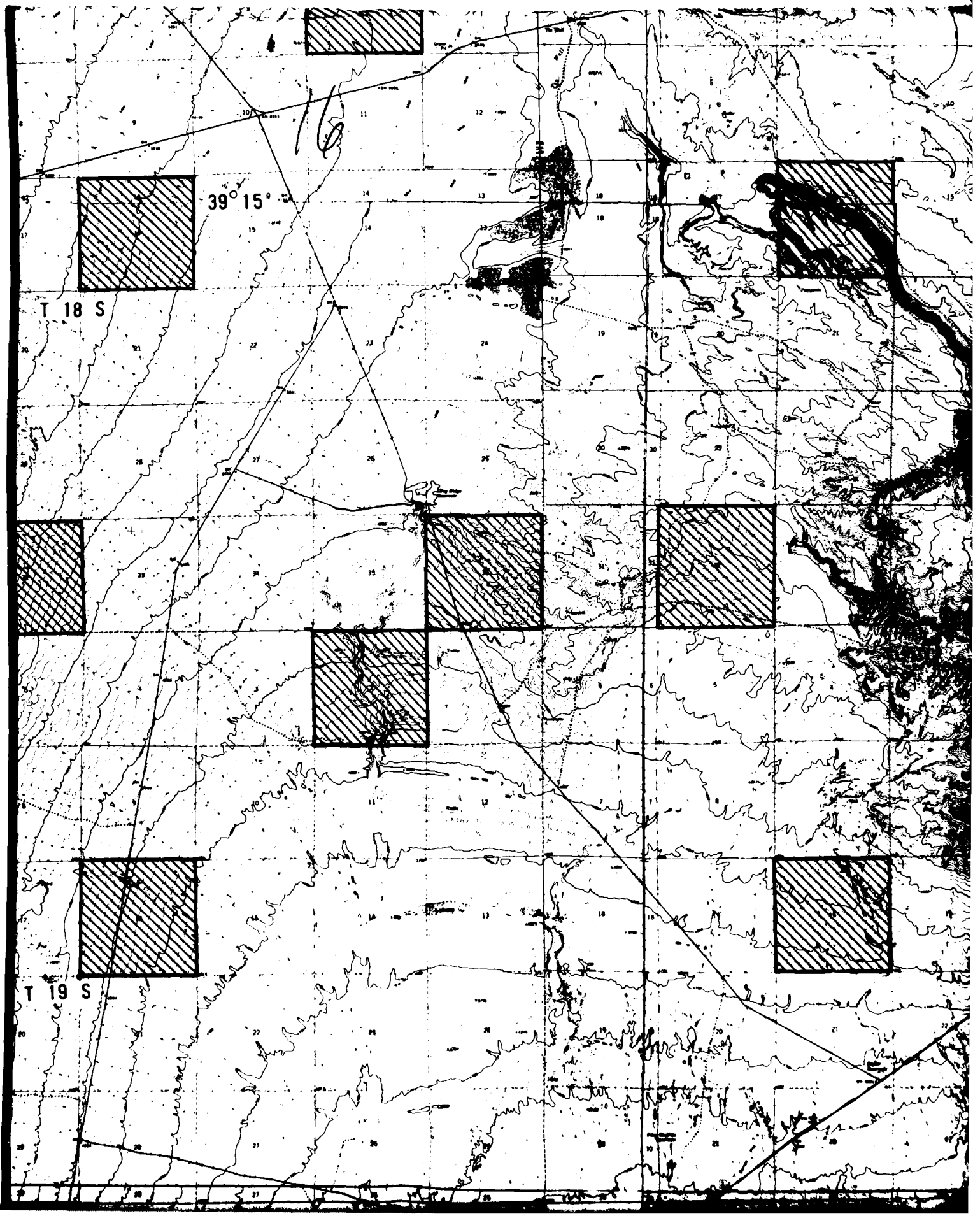
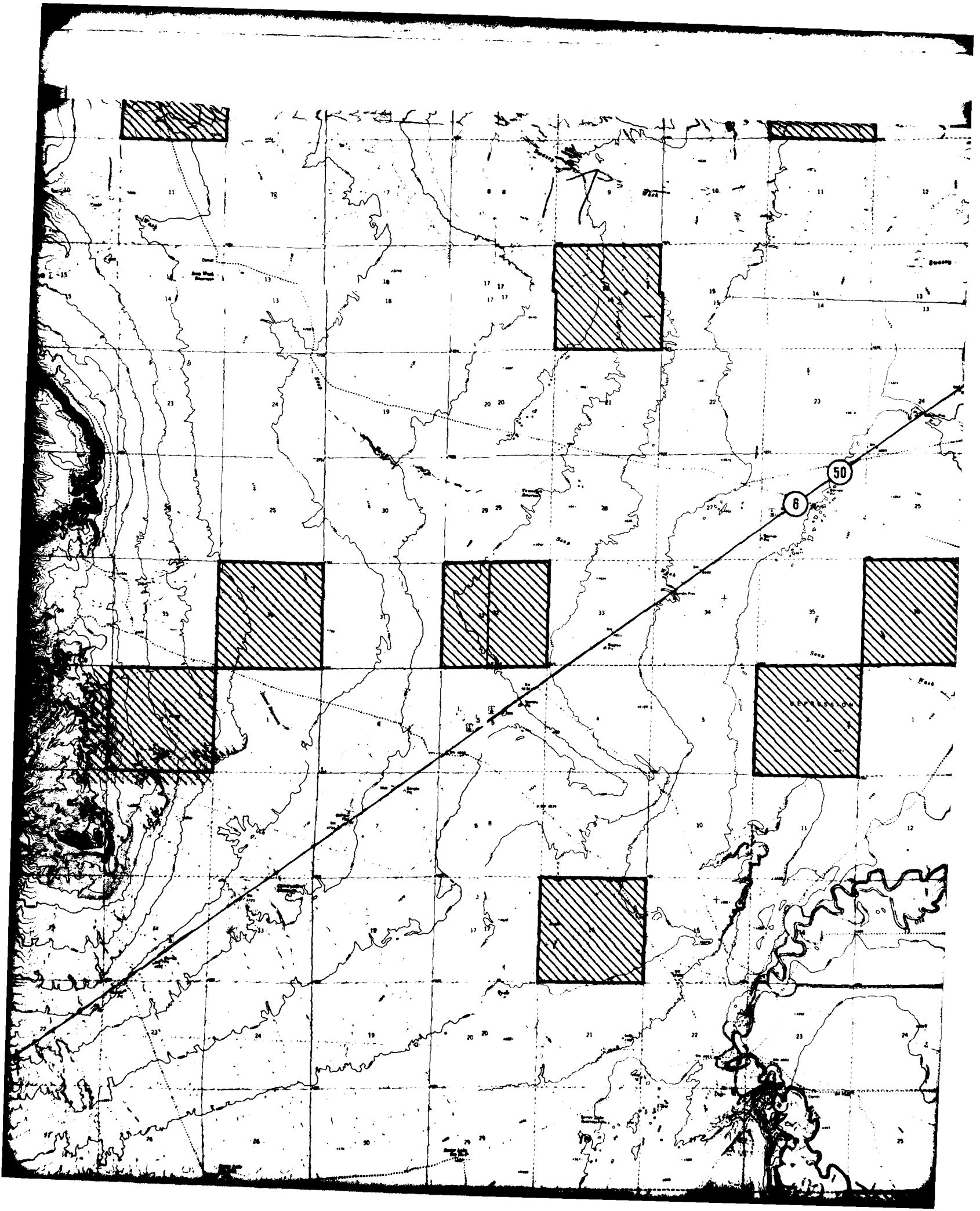
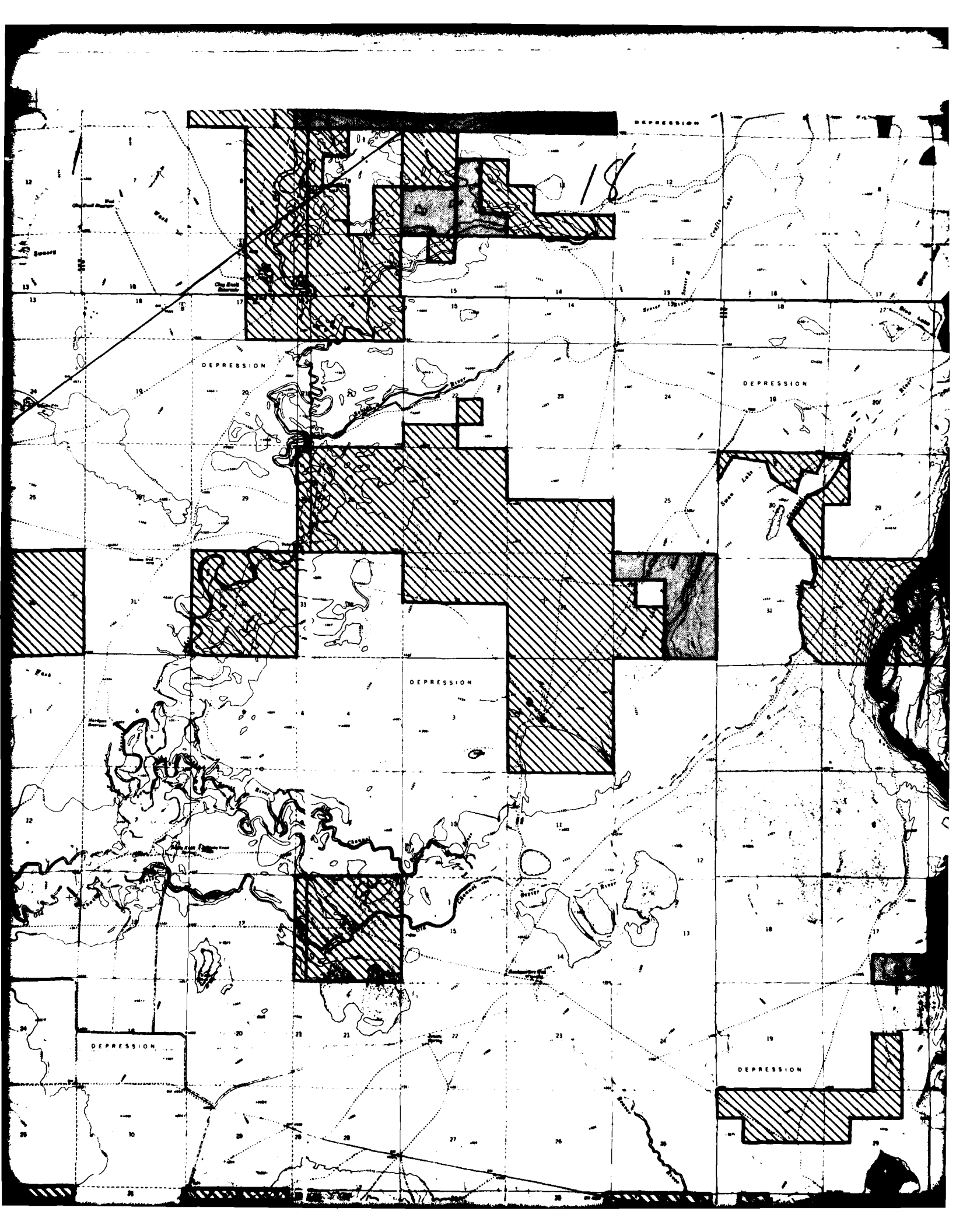

TOPAZ WATERFOWL
MANAGEMENT AREA
DEPRESSION
DEPRESSION

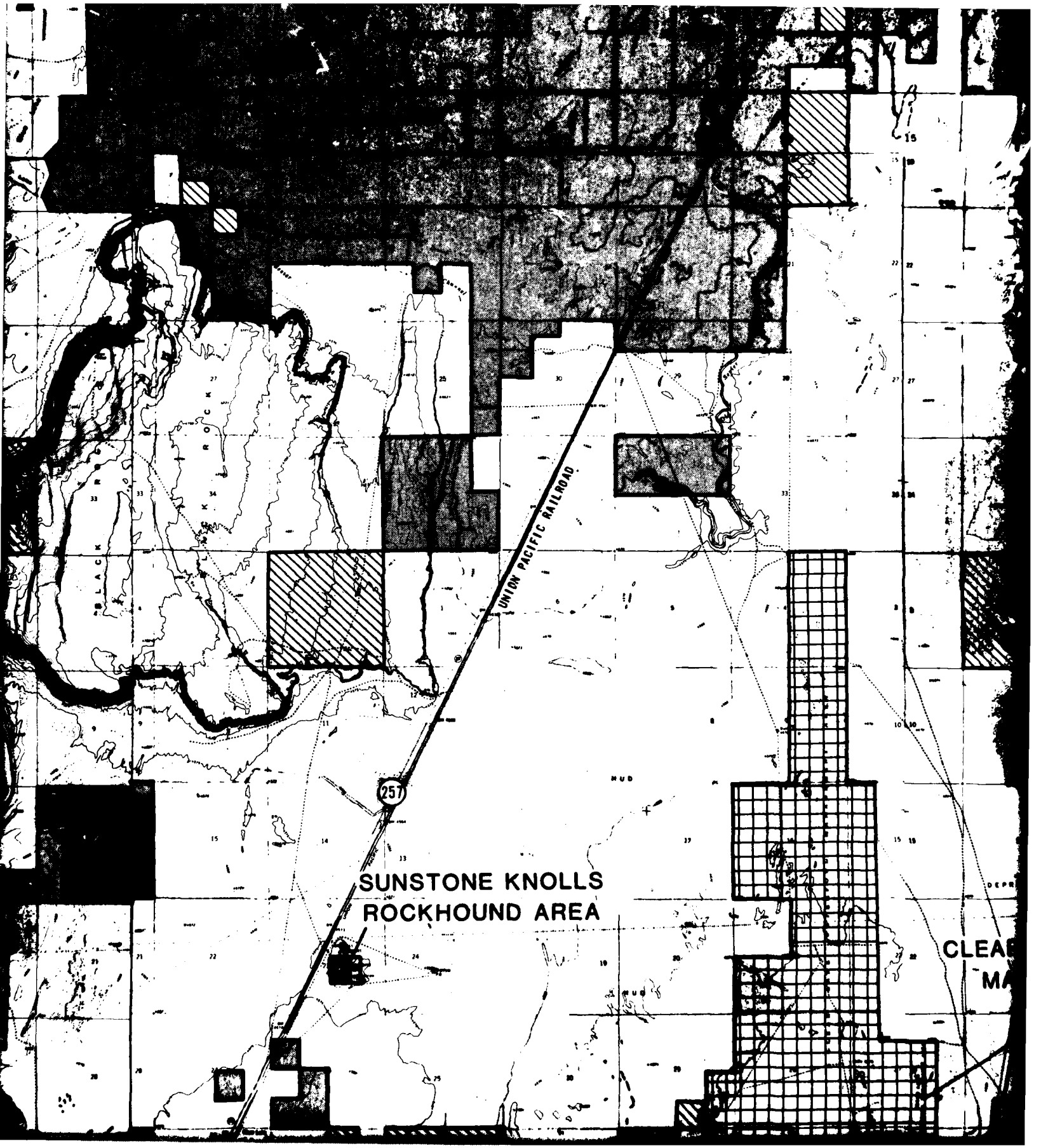

NELSON
CANAL

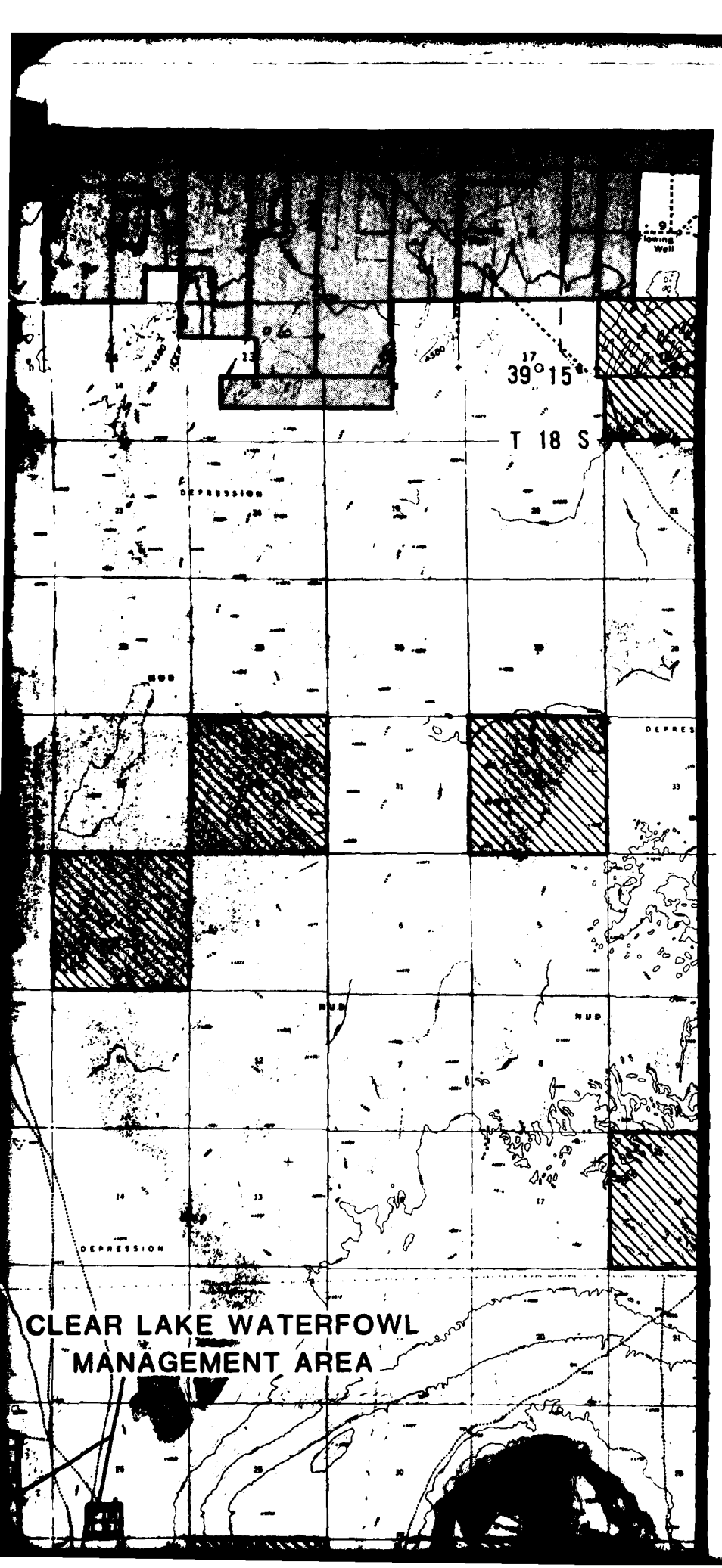

Delta
T 17 S


39° 15'
T 18 S
T 19 S

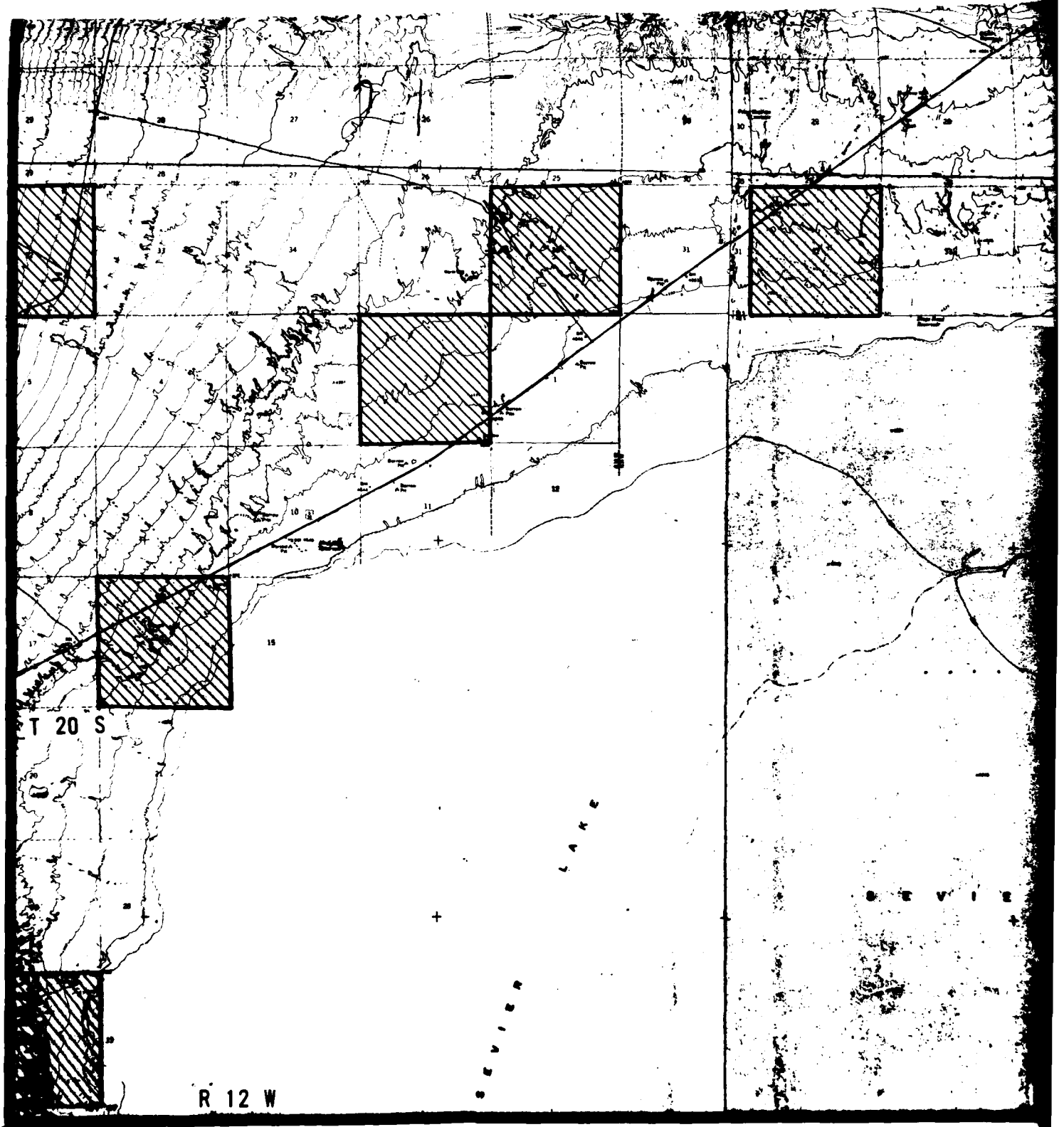

50
6


DEPRESSION
DEPRESSION
DEPRESSION
DEPRESSION
DEPRESSION
DEPRESSION

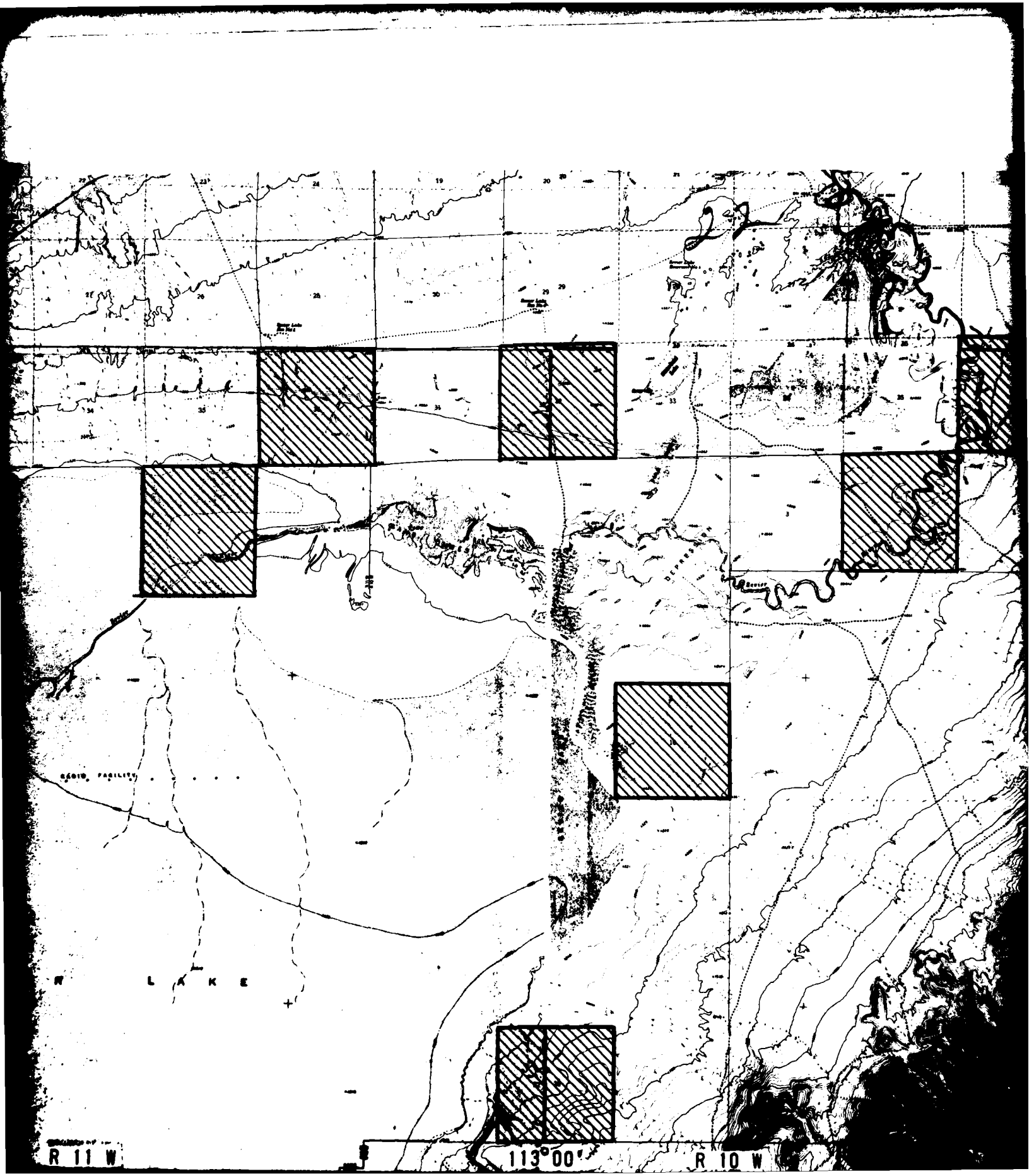

UNION PACIFIC RAILROAD
257
SUNSTONE KNOLLS
ROCKHOUND AREA

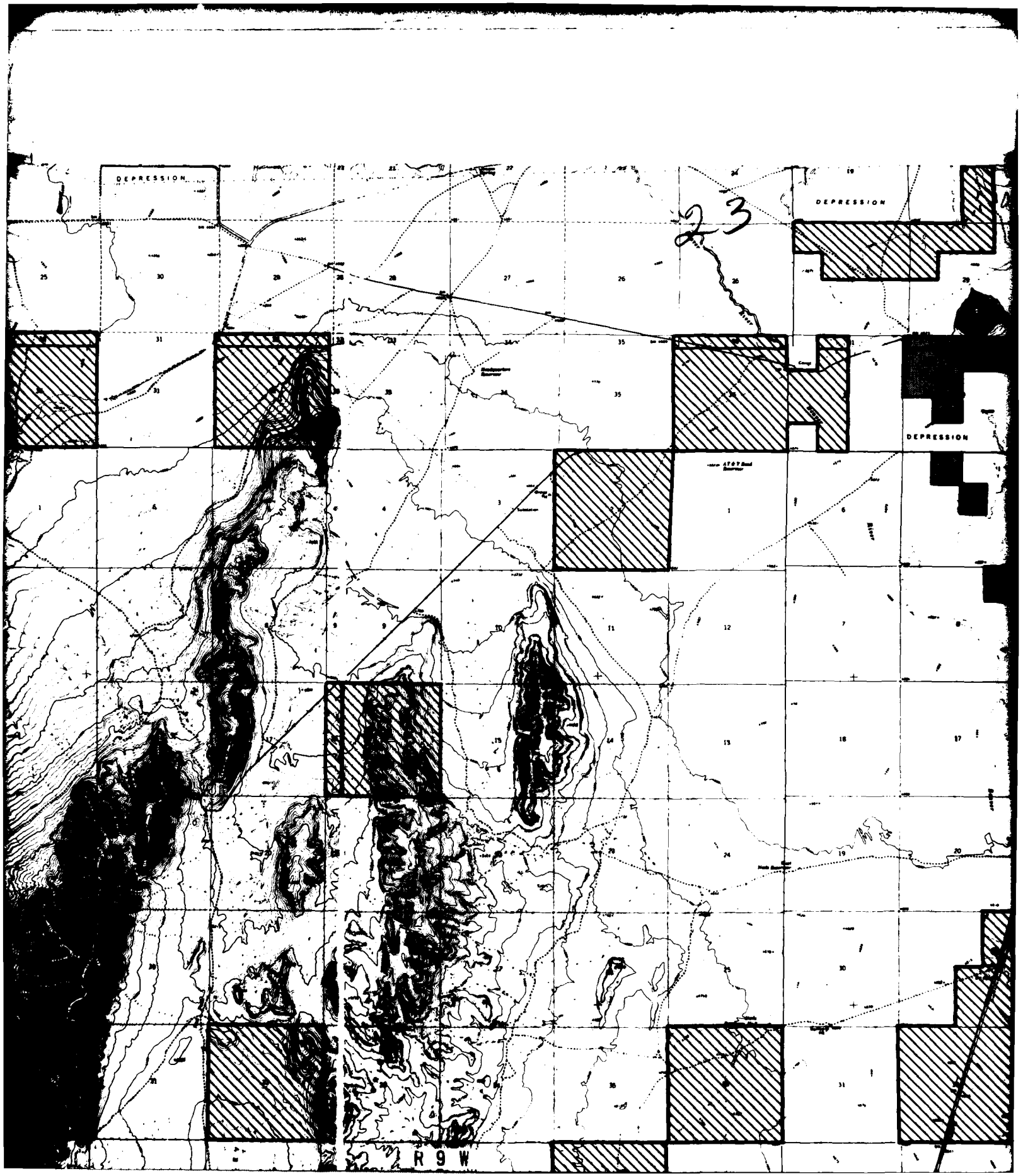

39°15
T 18 S
DEPRESSION
MUD
CLEAR LAKE WATERFOWL
MANAGEMENT AREA

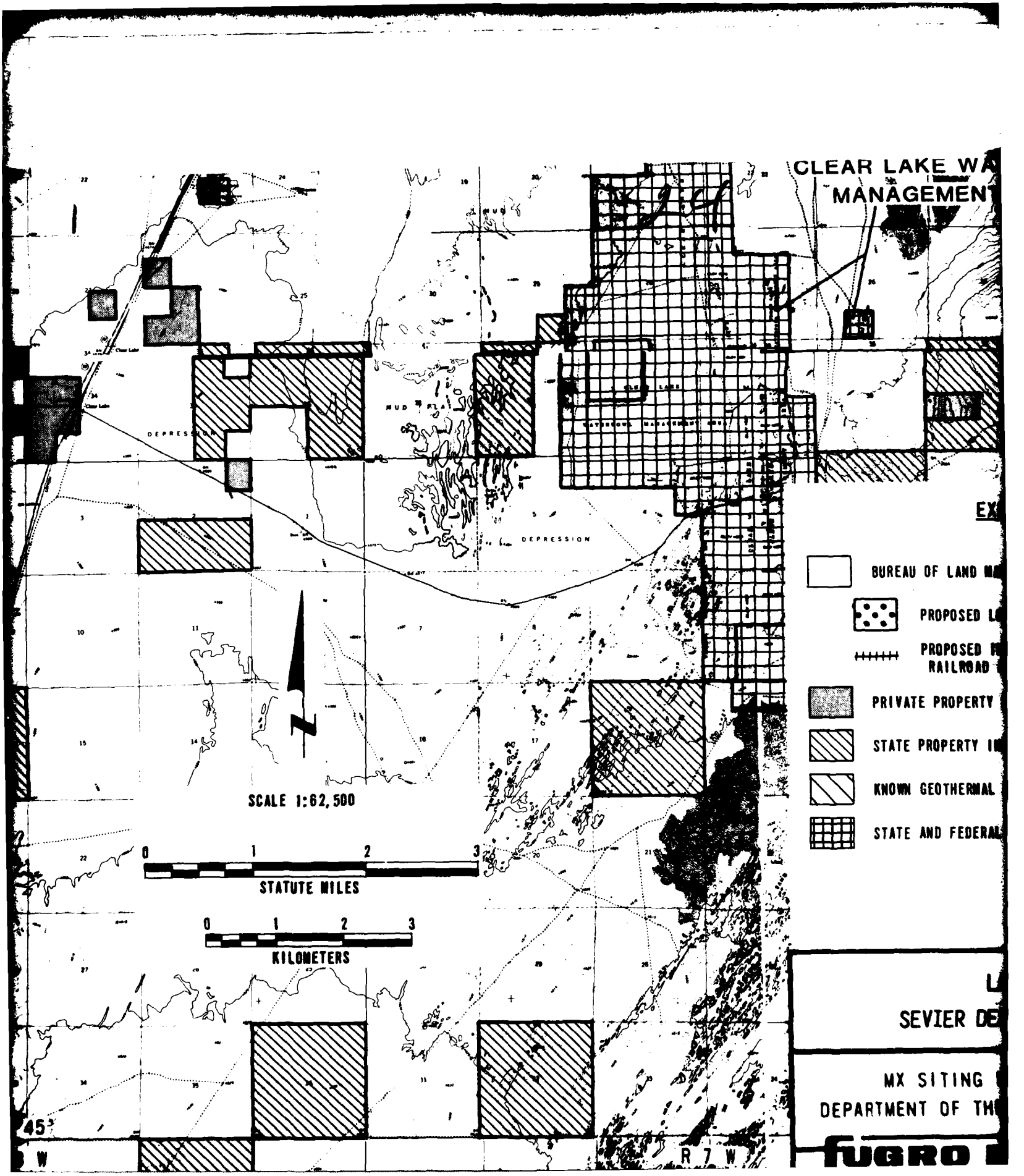
20

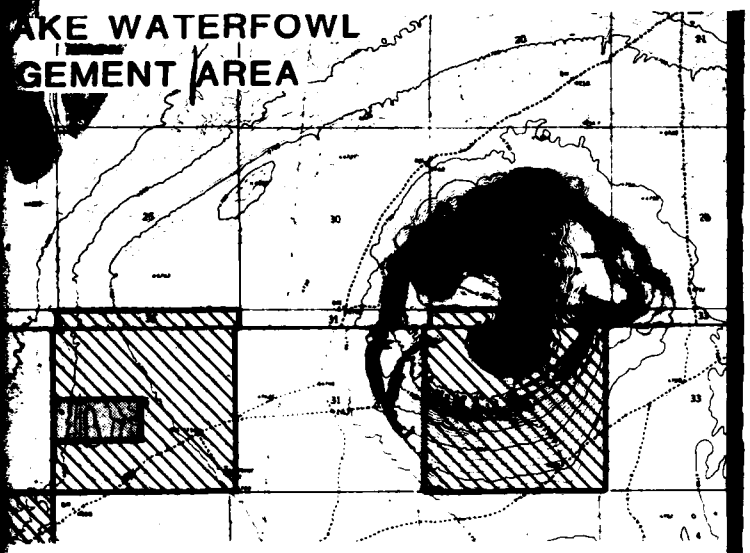


15 MAY 80


R 11 W
113°00'
R 10 W
L A K E


DEPRESSION
DEPRESSION
DEPRESSION
23
R 9 W


CLEAR LAKE WA
MANAGEMENT
DEPRESSION
DEPRESSION
BUREAU OF LAND M
PROPOSED L
PROPOSED
RAILROAD
PRIVATE PROPERTY
STATE PROPERTY I
KNOWN GEOTHERMAL
STATE AND FEDERA
SCALE 1:62,500
0 1 2 3
STATUTE MILES
0 1 2 3
KILOMETERS
SEVIER DE
MX SITING
DEPARTMENT OF TH
45
R 7 W
fugro



25

EXPLANATION

AU OF LAND MANAGEMENT (BLM) LAND

PROPOSED LOCATION OF INTERMOUNTAIN POWER PROJECT

PROPOSED INTERMOUNTAIN POWER PROJECT
RAILROAD ALIGNMENT

ATE PROPERTY INCLUDING MINING PATENTS

E PROPERTY INCLUDING MATERIAL SITES

GEOTHERMAL RESOURCE AREA

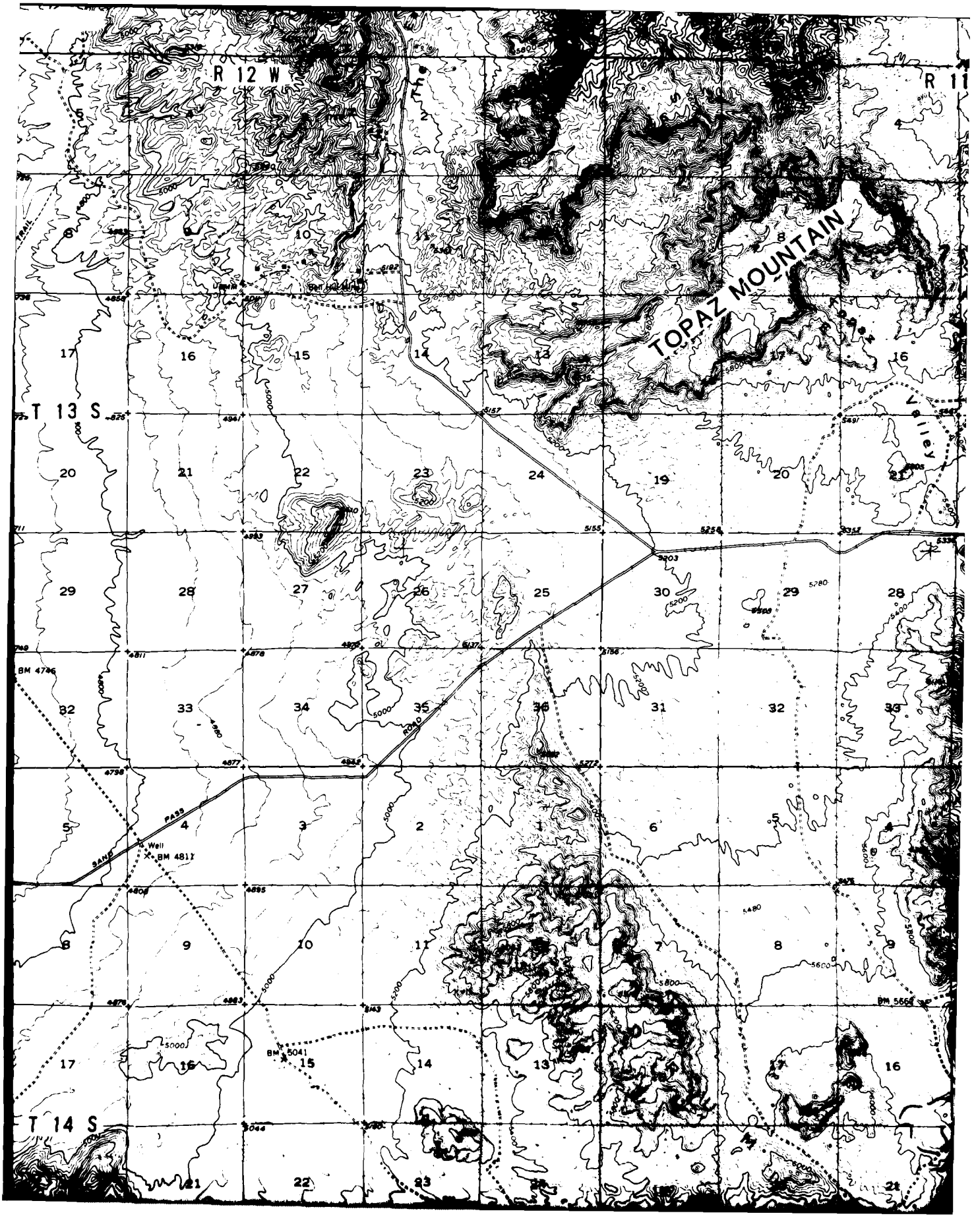
E AND FEDERAL DESIGNATED SENSITIVE AREAS

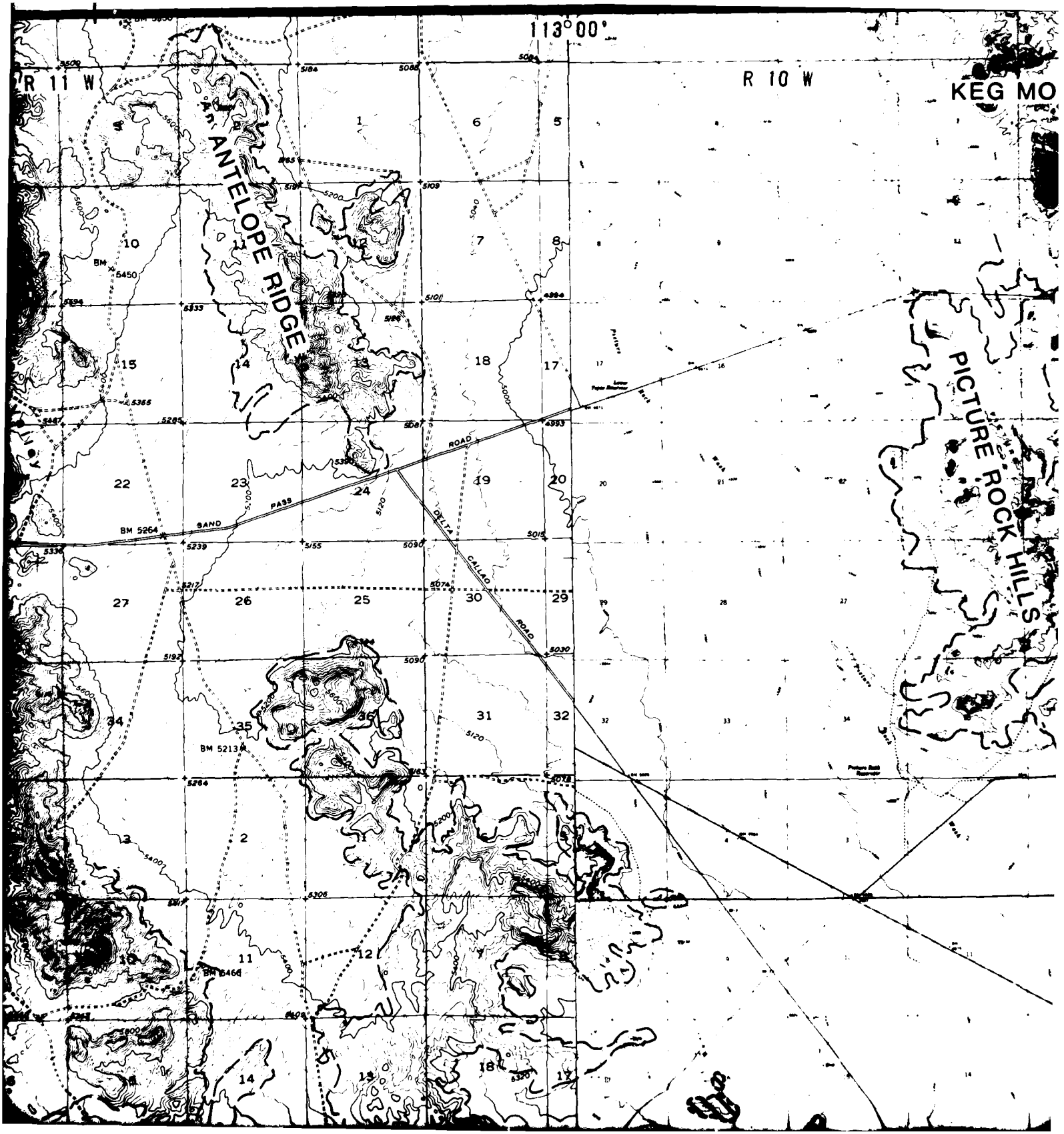
LAND STATUS MAP
EVIER DESERT, DELTA AREA, UTAH

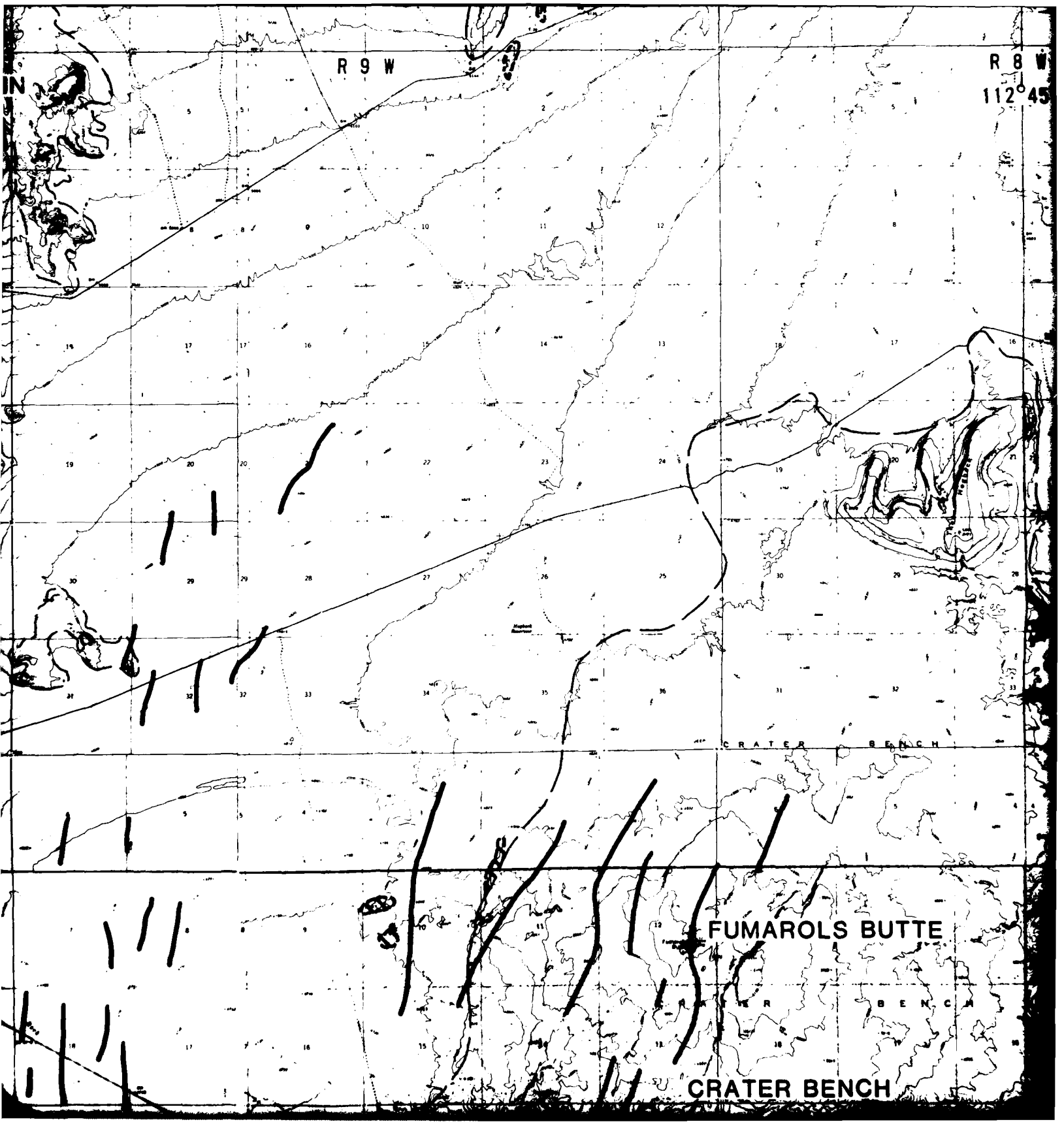
SITING INVESTIGATION
T OF THE AIR FORCE - BMO

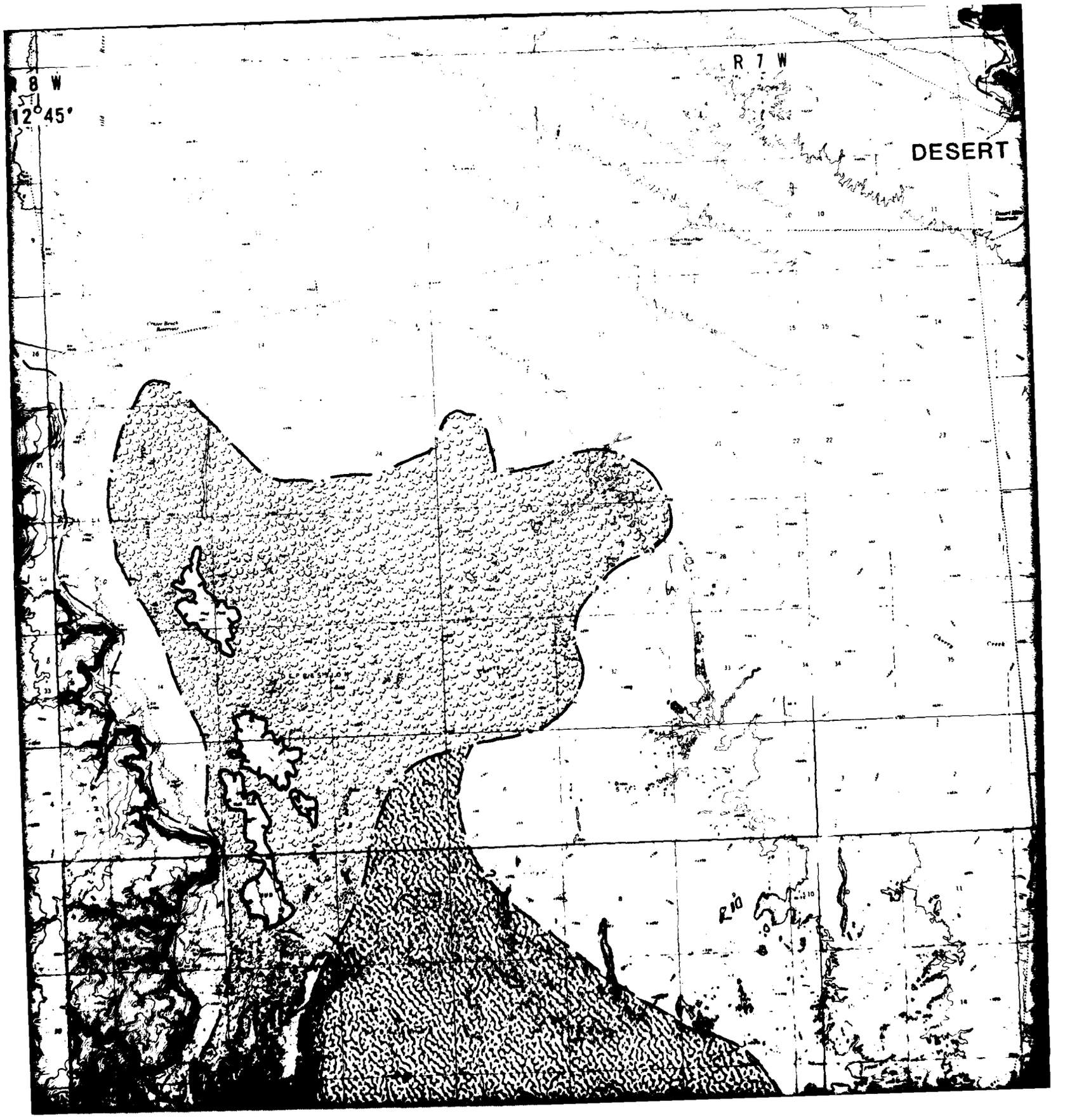
DRAWING
4-1

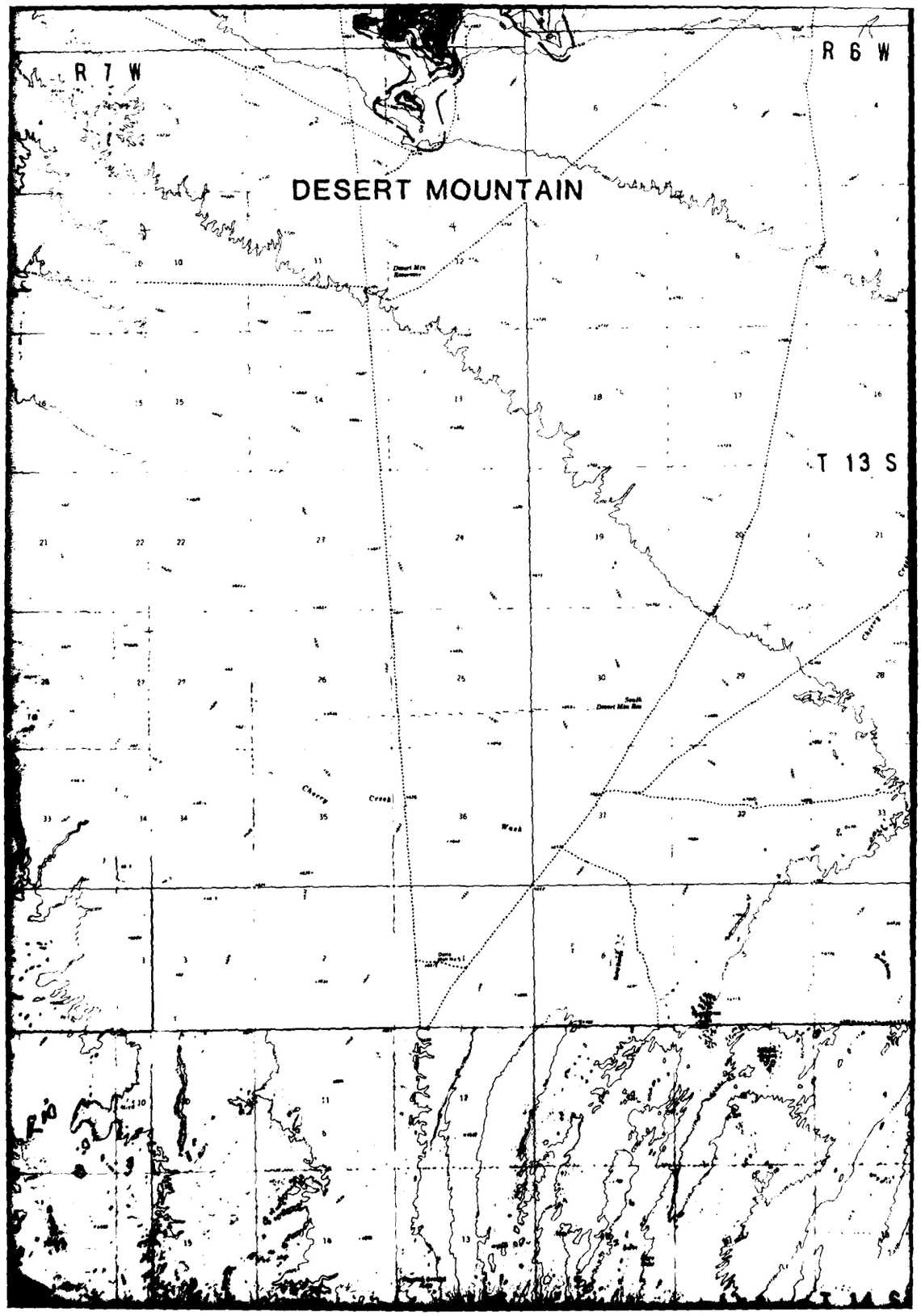
RO NATIONAL, INC.

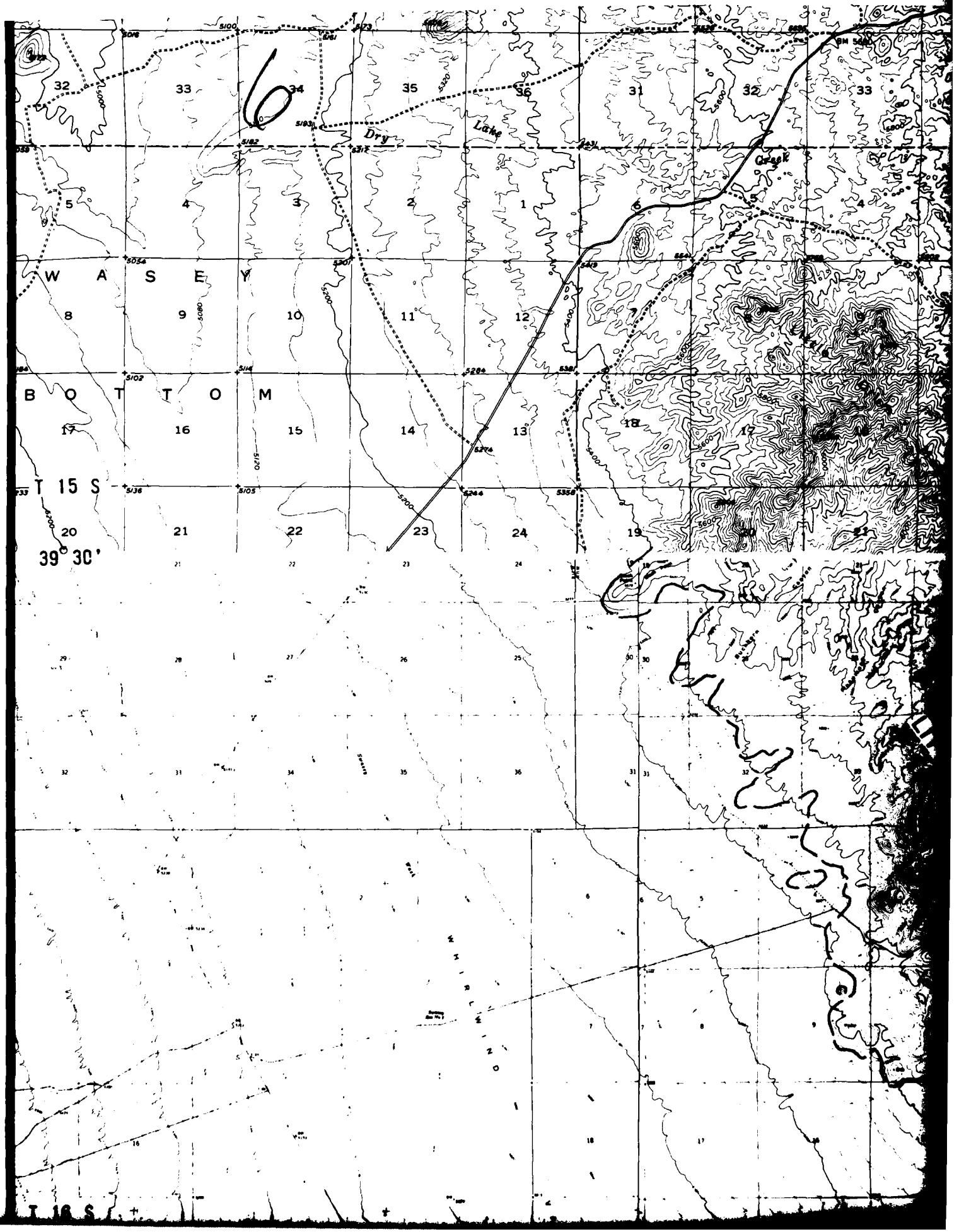

R 12 W
R 11
T 13 S
T 14 S
TOPAZ MOUNTAIN
Valley
SAND PASS ROAD
BM 4736
BM 4811
Well
BM 5041
BM 5666


113° 00'
R 11 W
R 10 W
KEG MO
ANTELOPE RIDGE
PICTURE ROCK HILLS
ROAD
PASS
SAND
DELTA
CALLAO
ROAD
BM 5450
BM 5264
BM 5213
BM 5466

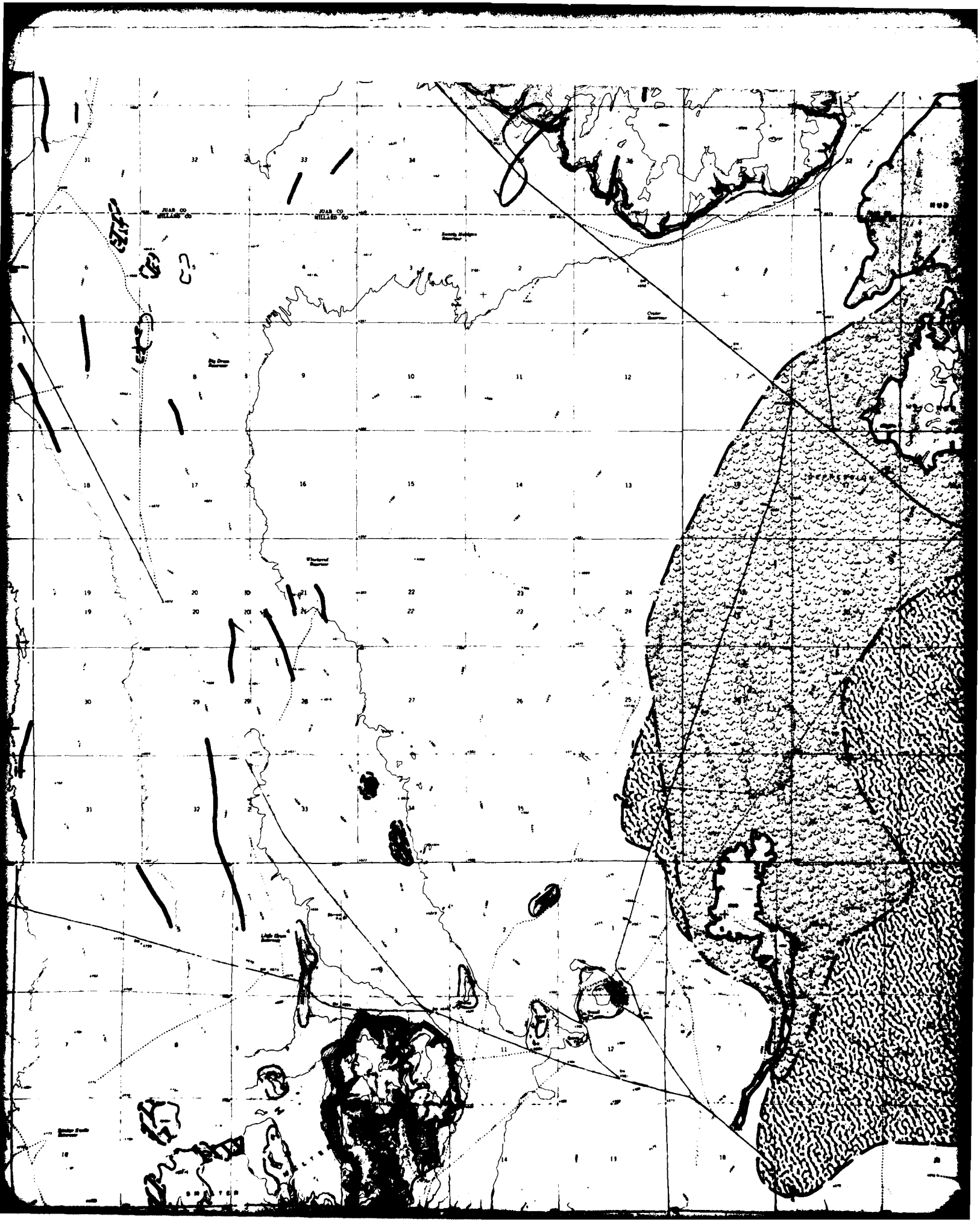

R 9 W
R 8 W
112°45
CRATER BENCH
FUMAROLS BUTTE
CRATER BENCH

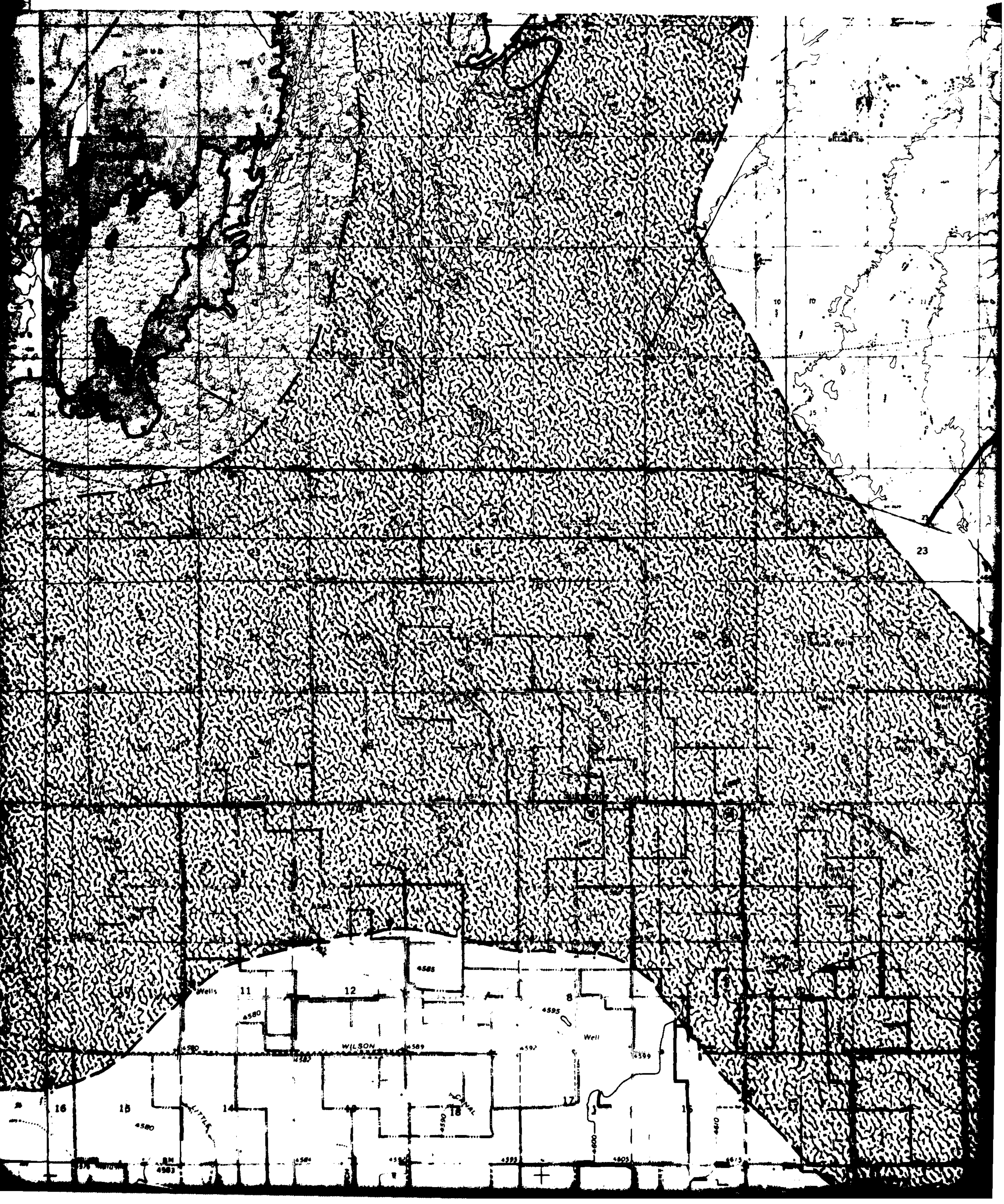

8 W
12°45'
R 7 W
DESERT
R10

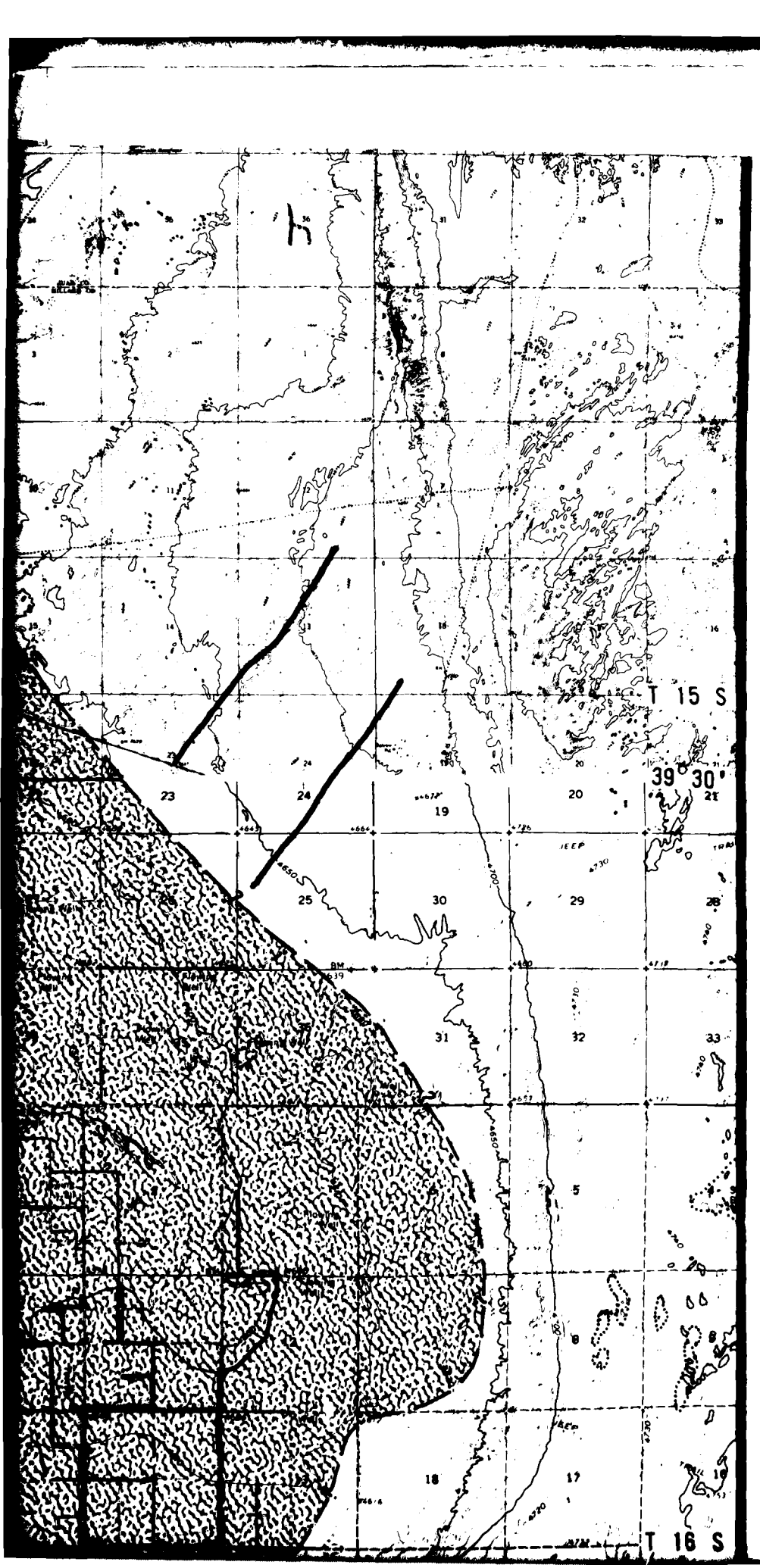

R 7 W
R 6 W
DESERT MOUNTAIN
T 13 S

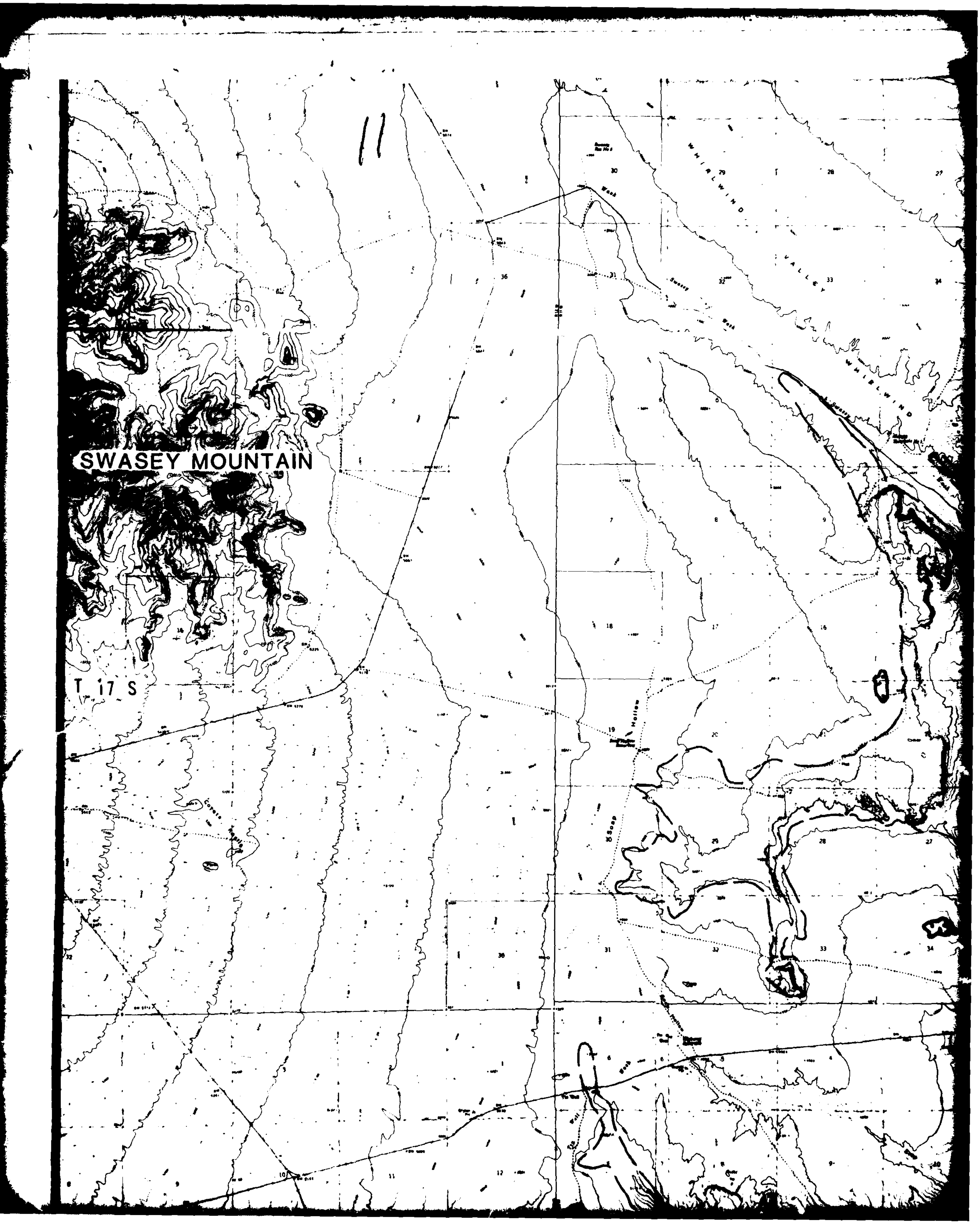

6
Dry
Lake
Creek
WASEY
BOTTOM
T 15 S
39° 30'
T 16 S

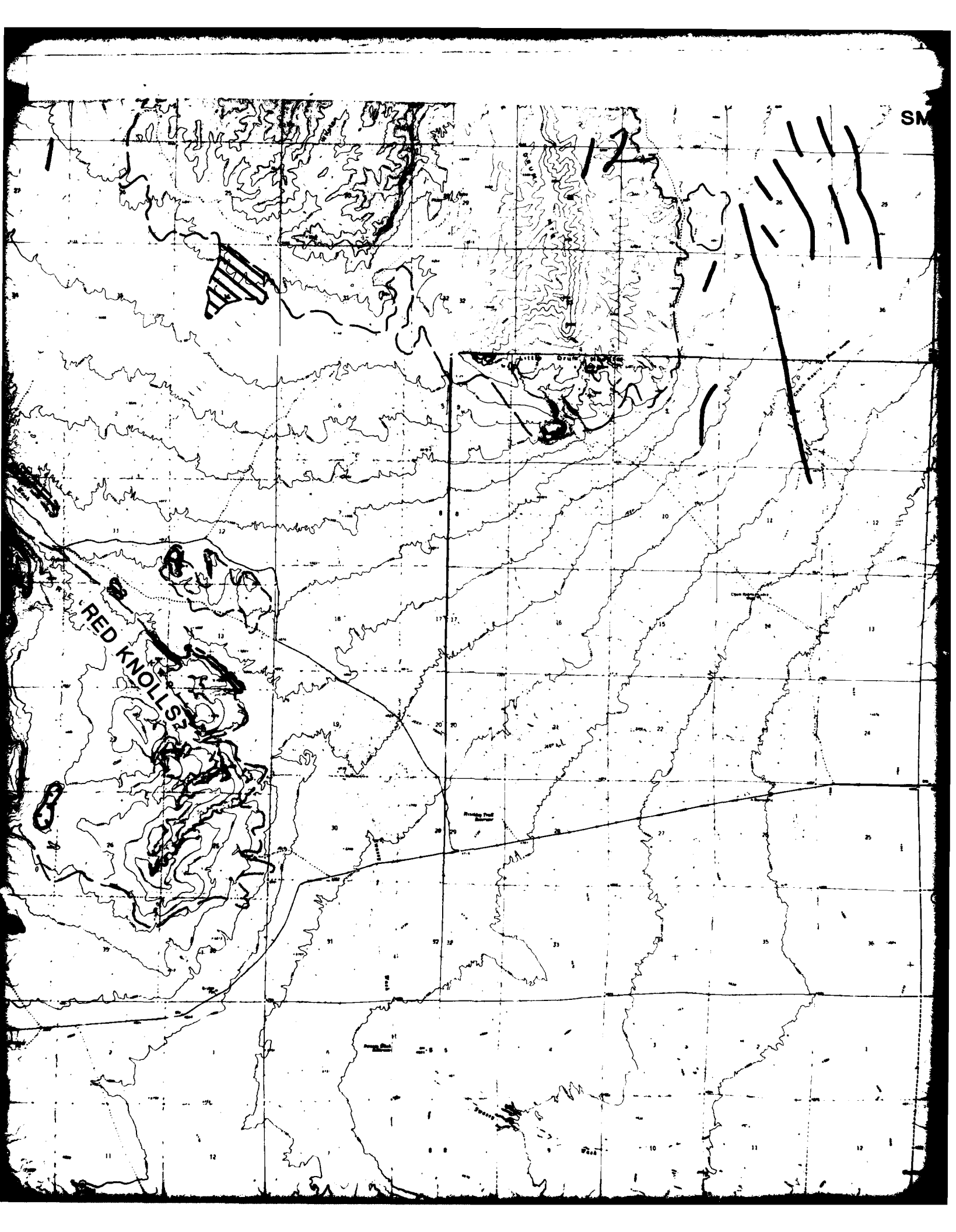

DRUM MOUNTAINS
E DRUM MOUNTAINS
BM 5499
BM 5650

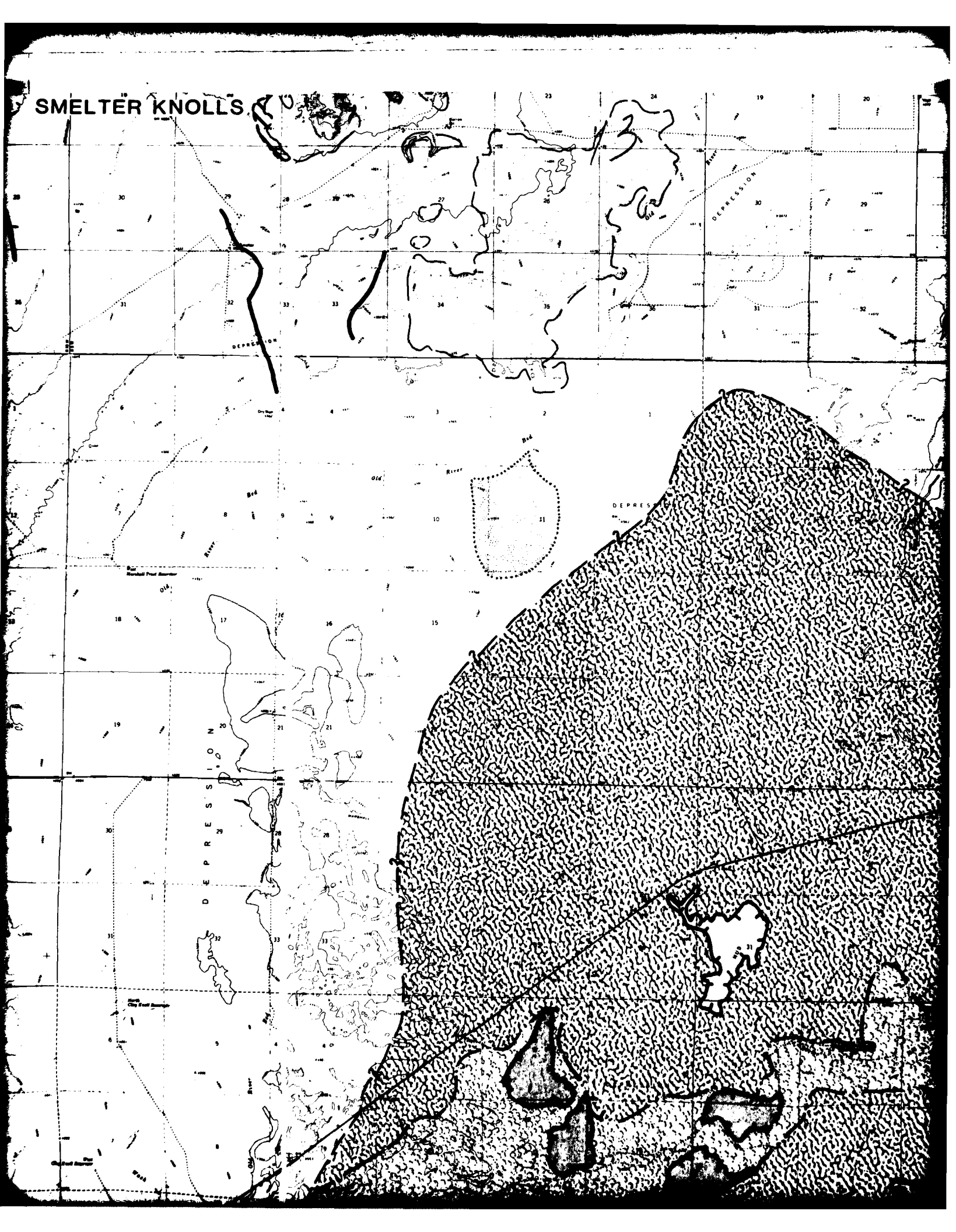


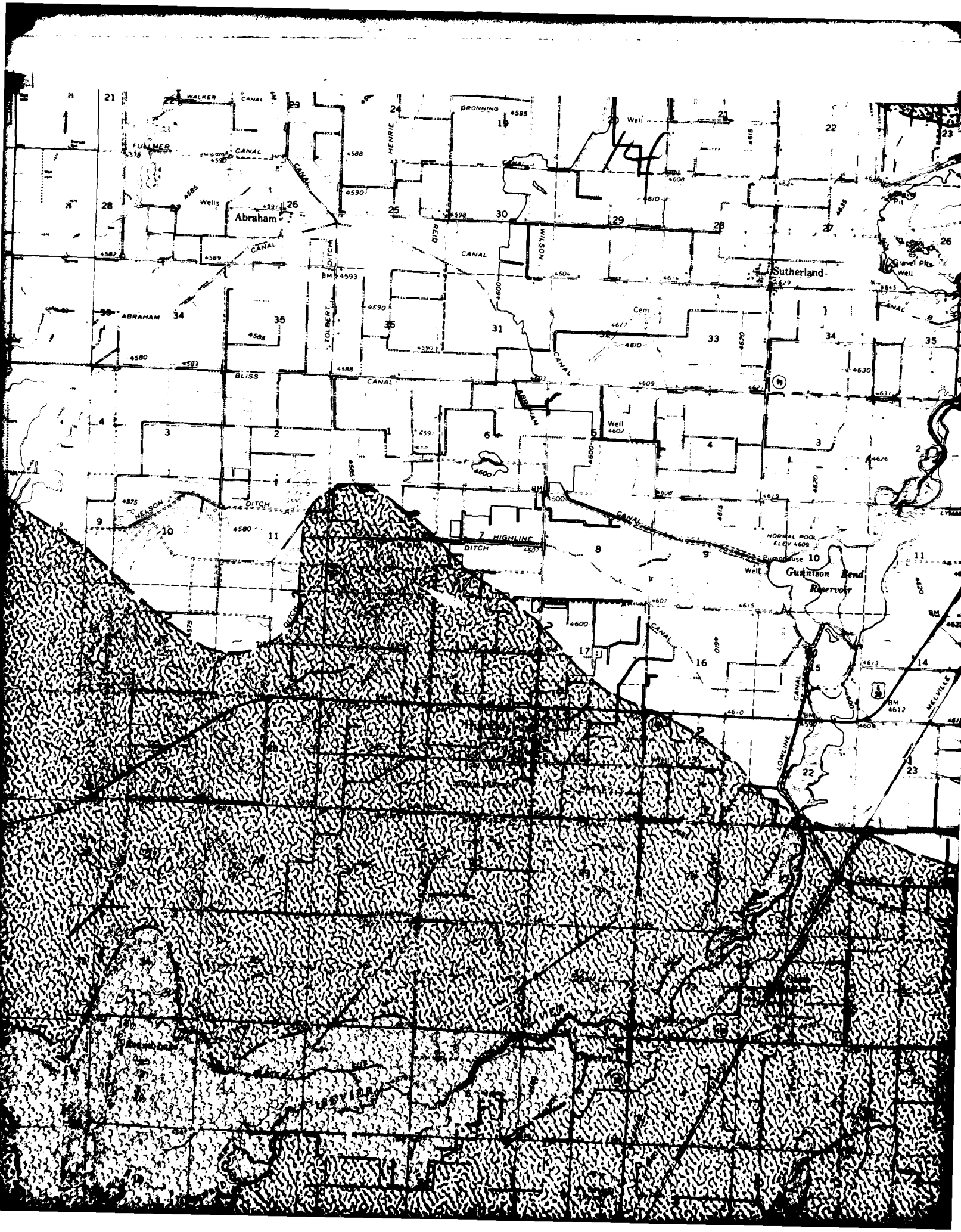

23
Wells
11
12
8
4585
4580
4595
Well
WILSON
4589
4597
4599
16
15
14
17
18
4580
4590
4600
4610
4605

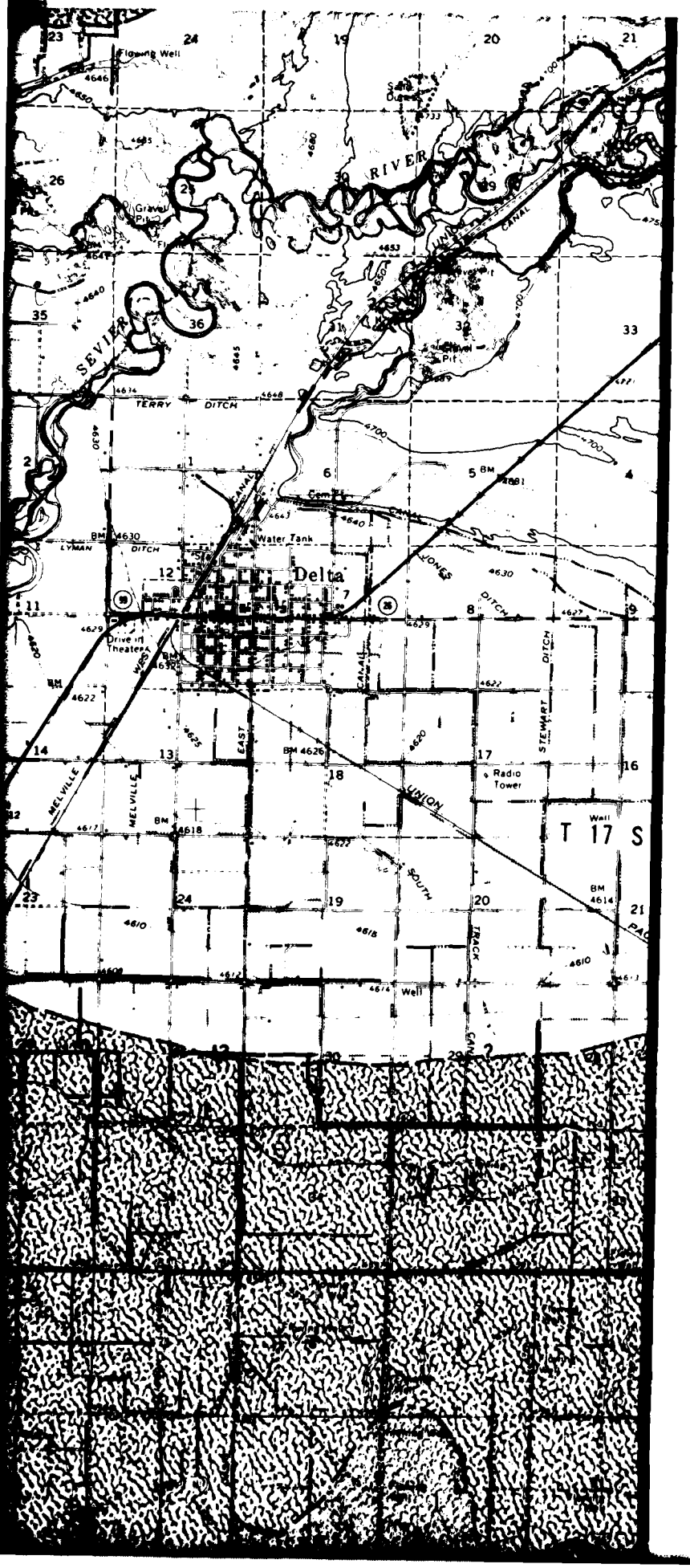

T 15 S
39° 30'
T 16 S


11
SWASEY MOUNTAIN
T 17 S
WHIRLWIND
VALLEY
WHIRLWIND

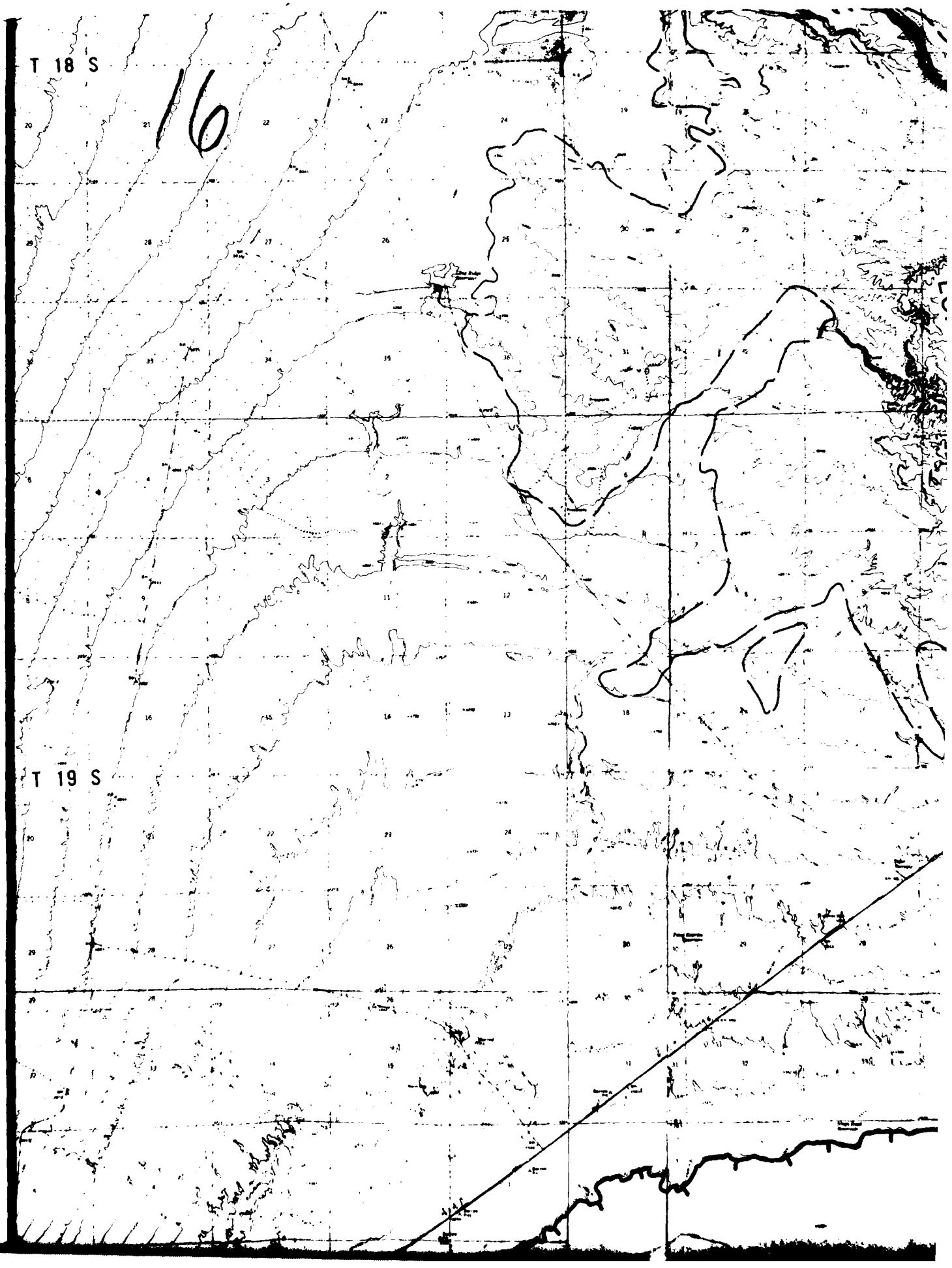

SM
RED KNOLLS


SMELTER KNOLLS
DEPRESSION
DEPRESSION
DEPRESSION
DEPRESSION


WALKER CANAL
FULLMER CANAL
HENRIE CANAL
GRONNING
Abraham
Wells
REID CANAL
WILSON CANAL
TOLBERT DITCH
BM 4593
Sutherland
Gravel Pits
Well
Cem
ABRAHAM
BLISS CANAL
ABRAHAM CANAL
Well 4602
NELSON DITCH
HIGHLINE DITCH
NORMAL POOL ELEV 4609
Pumphouse
Well
Gunnison Bend Reservoir
CANAL
BM 4612
MELVILLE
LOWLINE CANAL

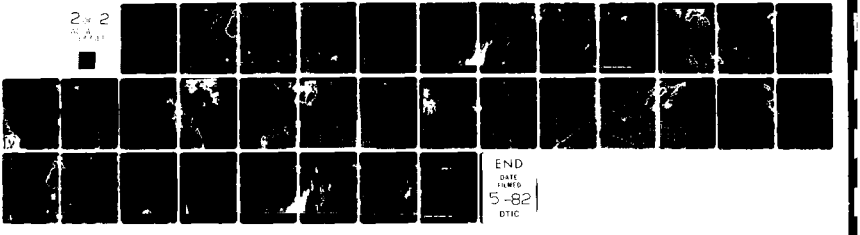

Flowing Well
RIVER
Gravel Pit
SEVIER
TERRY DITCH
Water Tank
Delta
LYMAN DITCH
LYONES DITCH
Drive in Theater
WEST CANAL
EAST
MELVILLE
MELVILLE
STEWART DITCH
Radio Tower
UNION PAC
SOUTH TRACK
Well
T 17 S
BM 4630
BM 4626
BM 4618
BM 4614
BM 4622

15

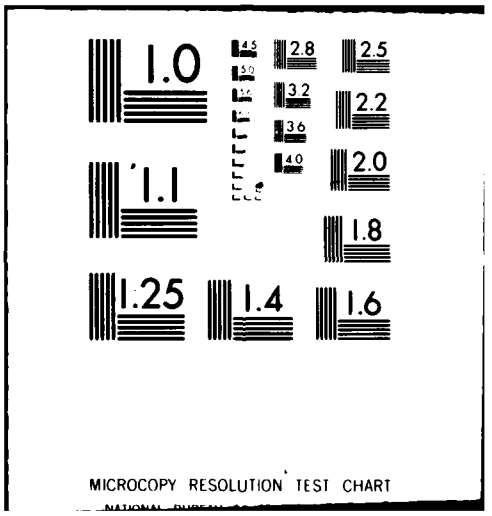

T 18 S
16
T 19 S

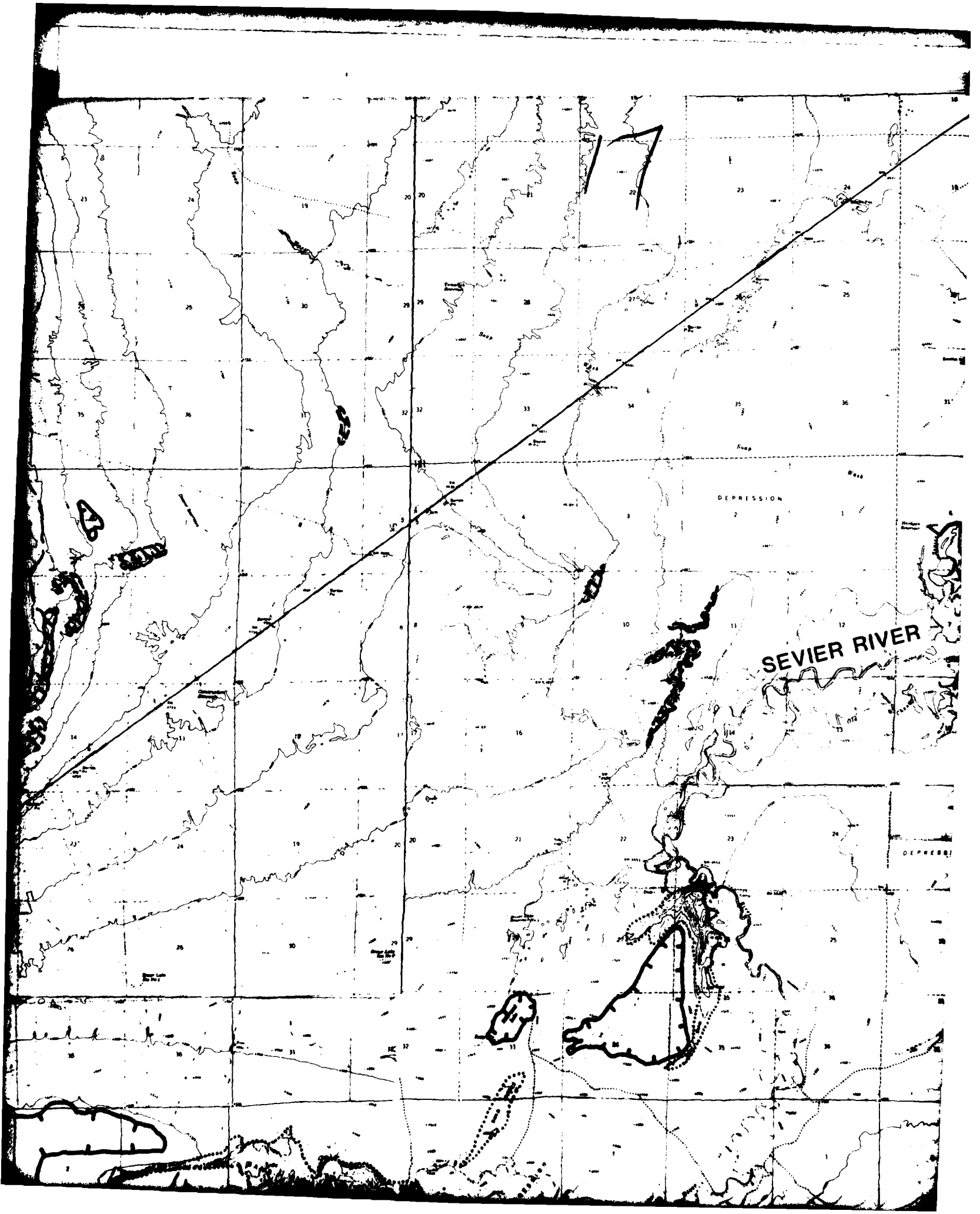
AD-A113 345 FUGRO NATIONAL INC LONG BEACH CA F/G 13/2
PROPOSED OPERATIONAL BASE SITE, SEVIER DESERT, DELTA AREA, UTAH--ETC(U)
MAY 80 F04704-80-C-0006
UNCLASSIFIED FN-TR-35-4 NL

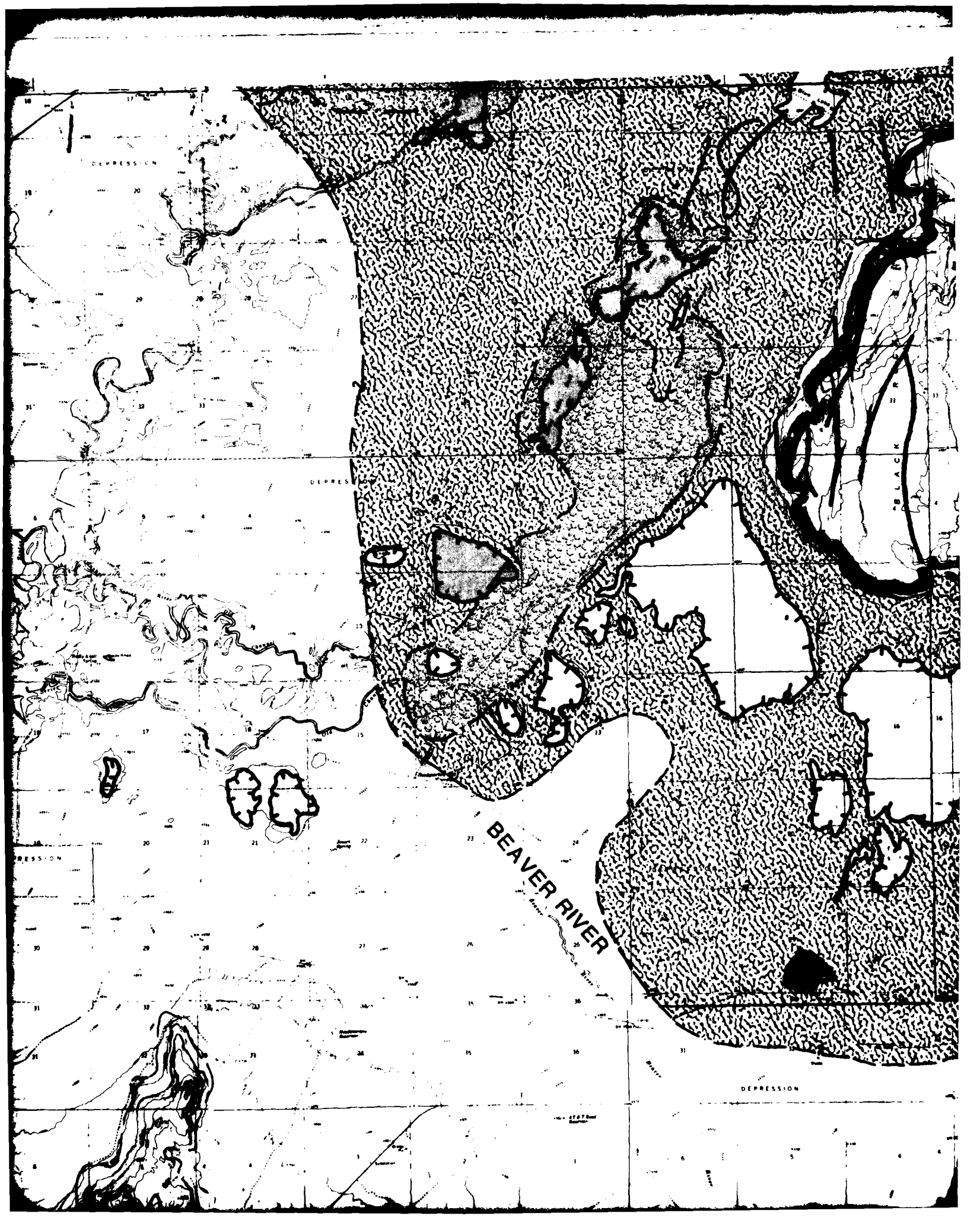
2 x 2

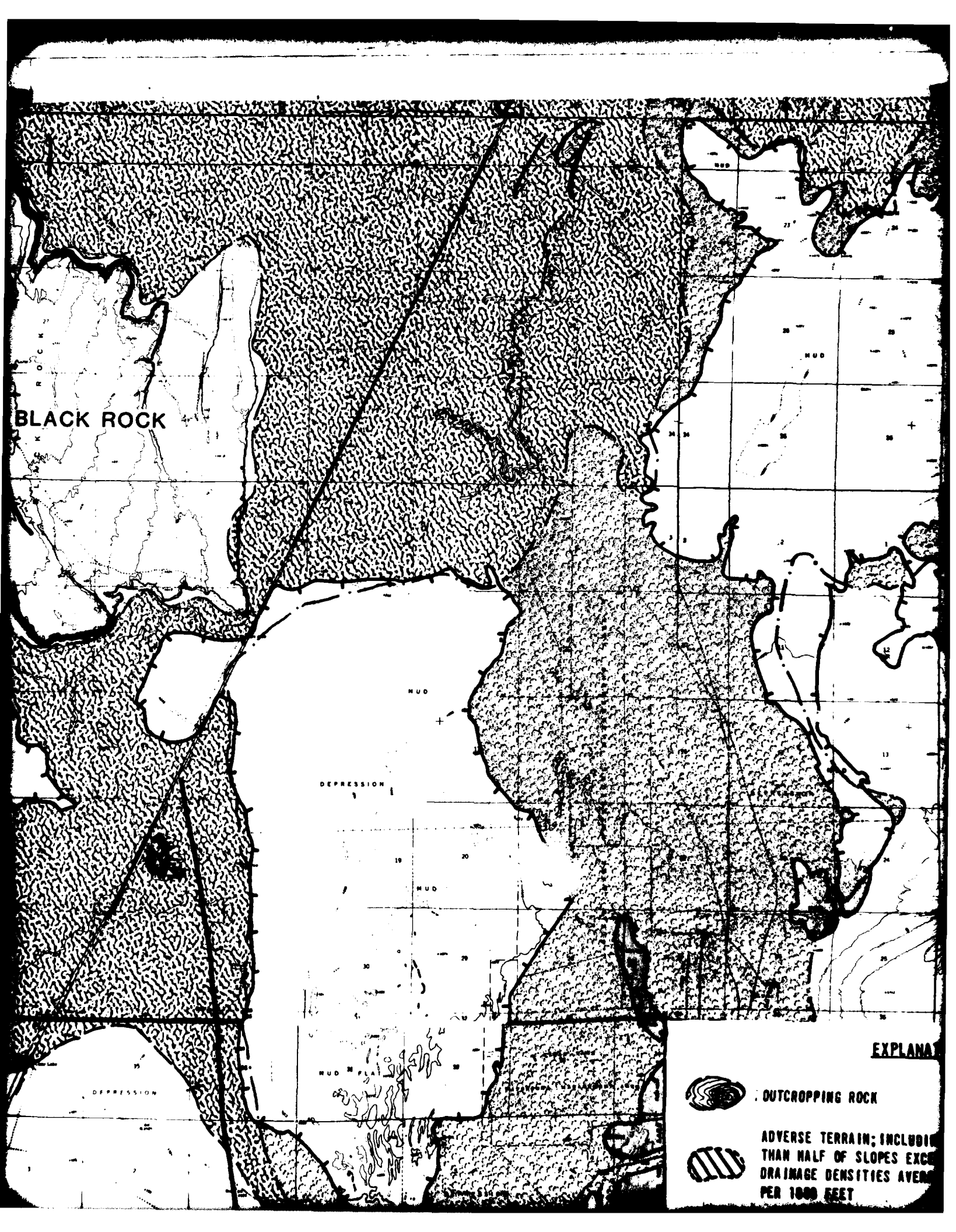


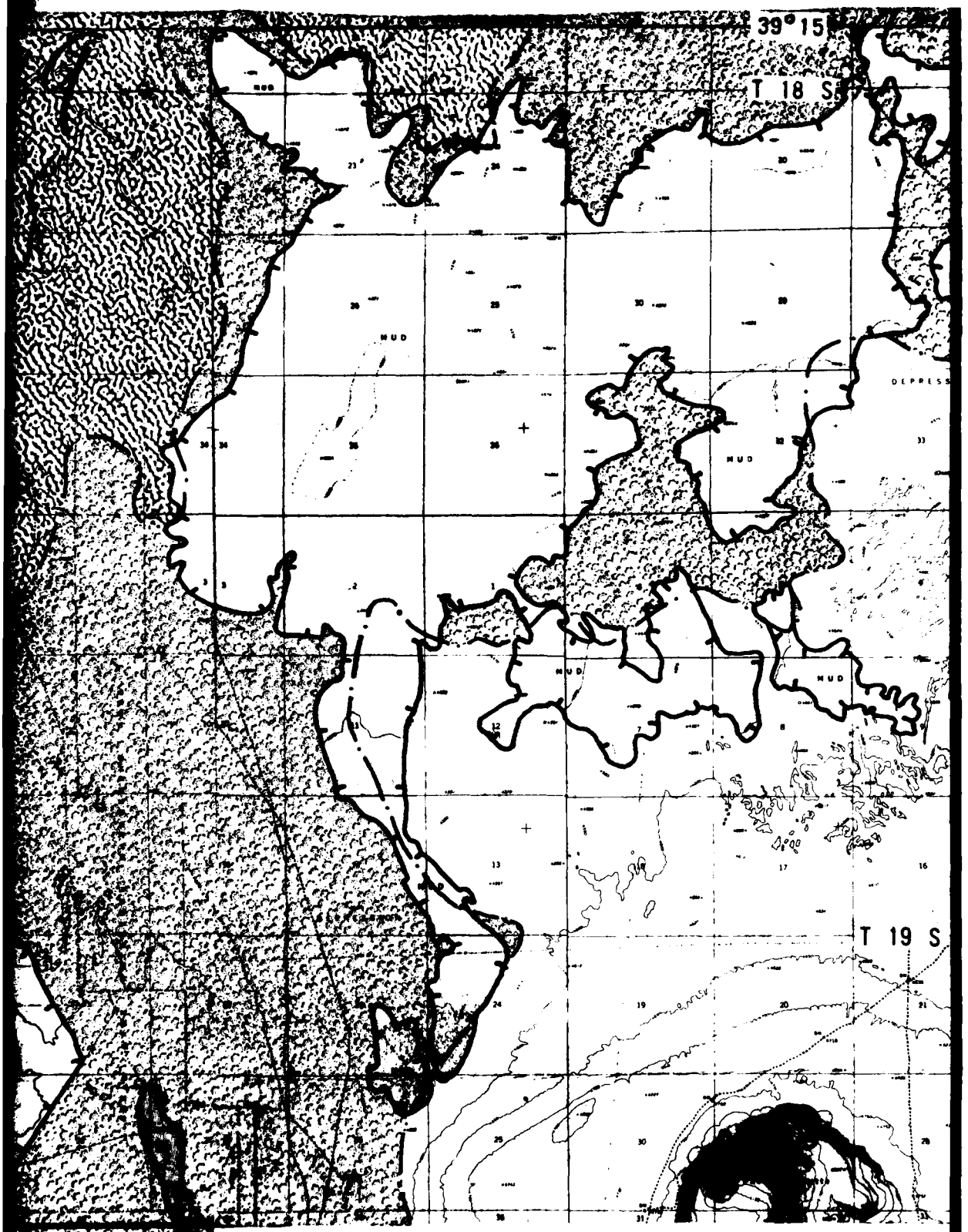
END
DATE FILMED
5-82
DTIC


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
MICROCOPY RESOLUTION TEST CHART


DEPRESSION
SEVIER RIVER


BEAVER RIVER
DEPRESSION
DEPRESSION
DEPRESSION

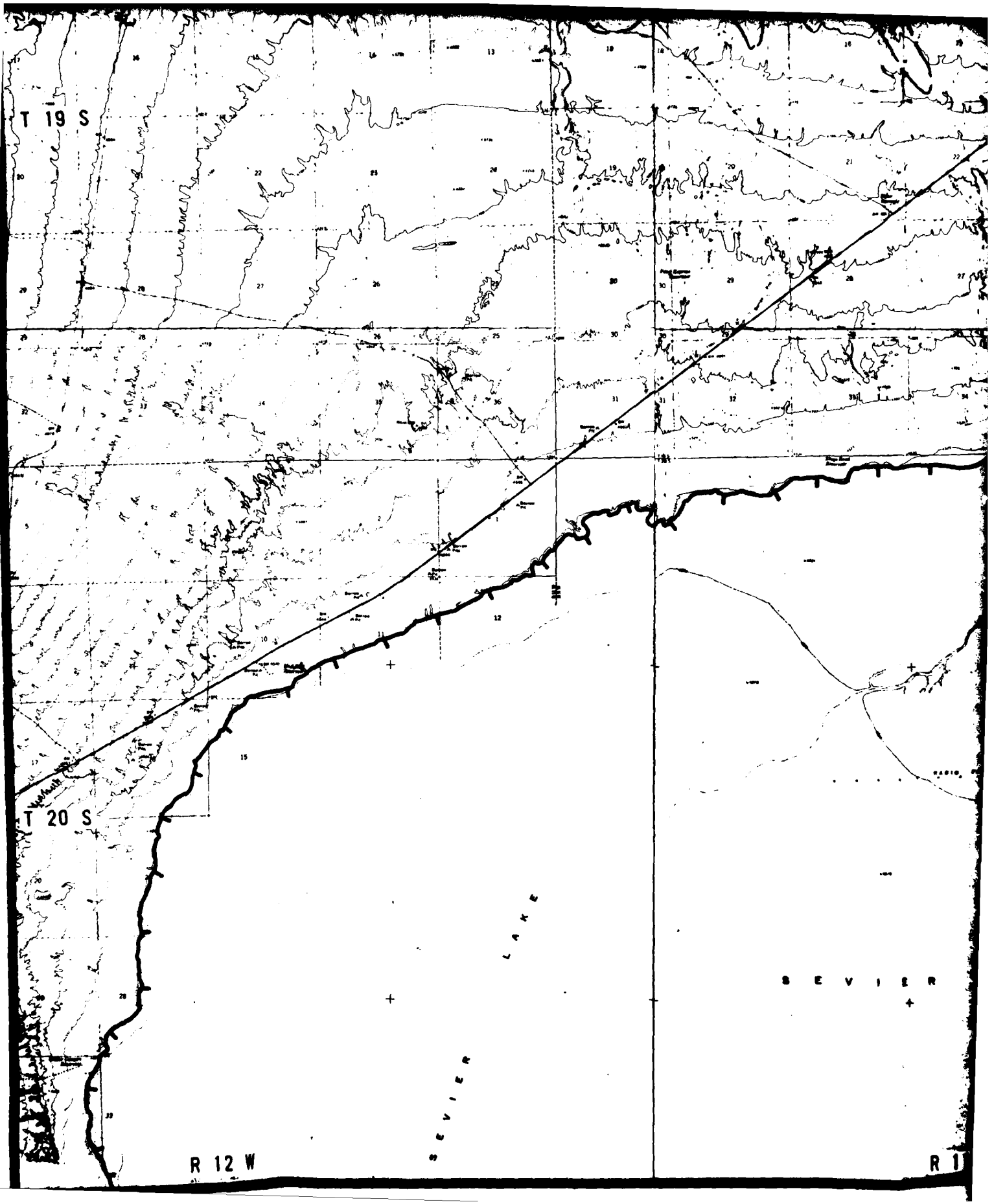

BLACK ROCK
MUD
DEPRESSION
MUD
MUD FLAT
DEPRESSION
EXPLANA
. OUTCROPPING ROCK
ADVERSE TERRAIN; INCLUDI
THAN HALF OF SLOPES EXC
DRAINAGE DENSITIES AVER
PER 1000 FEET

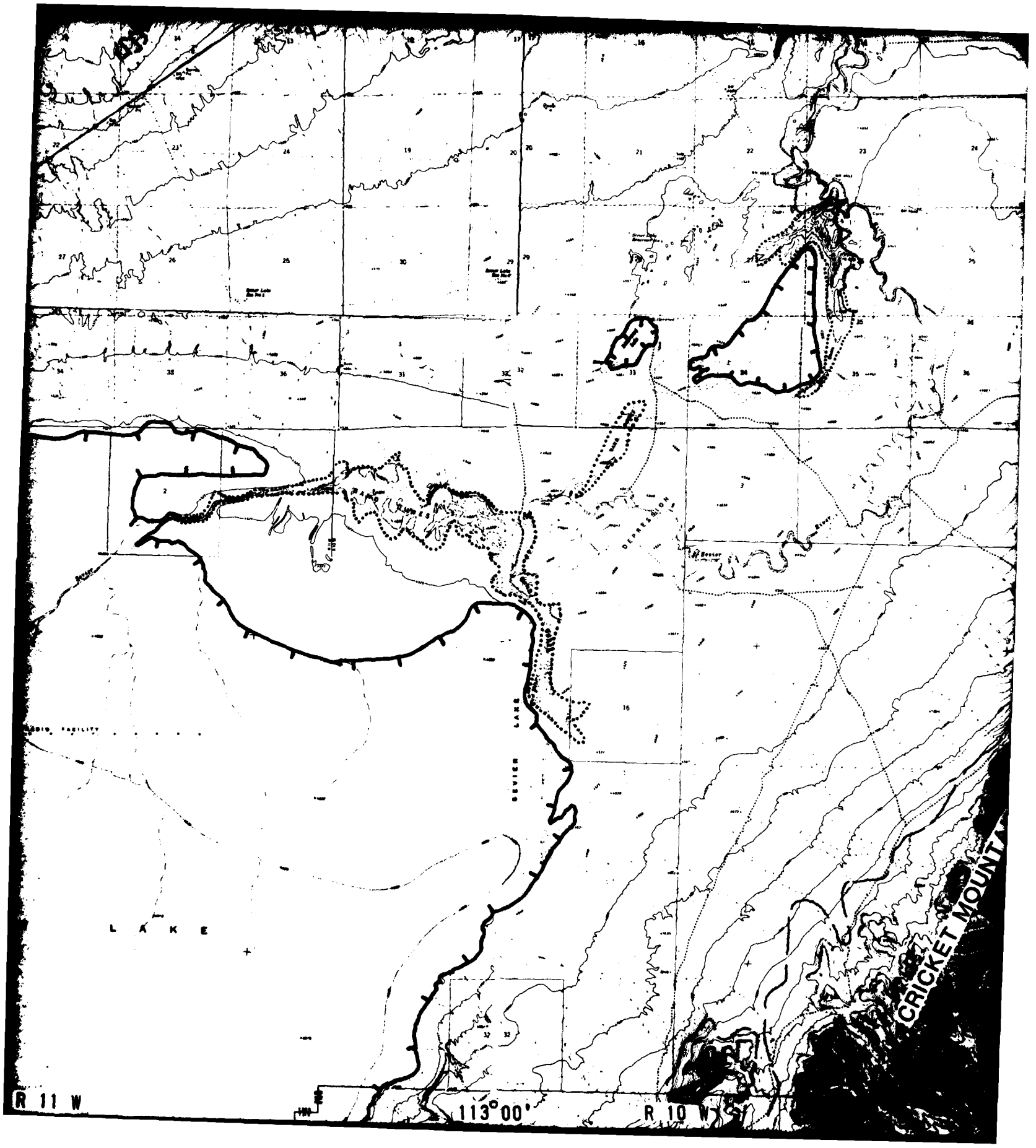


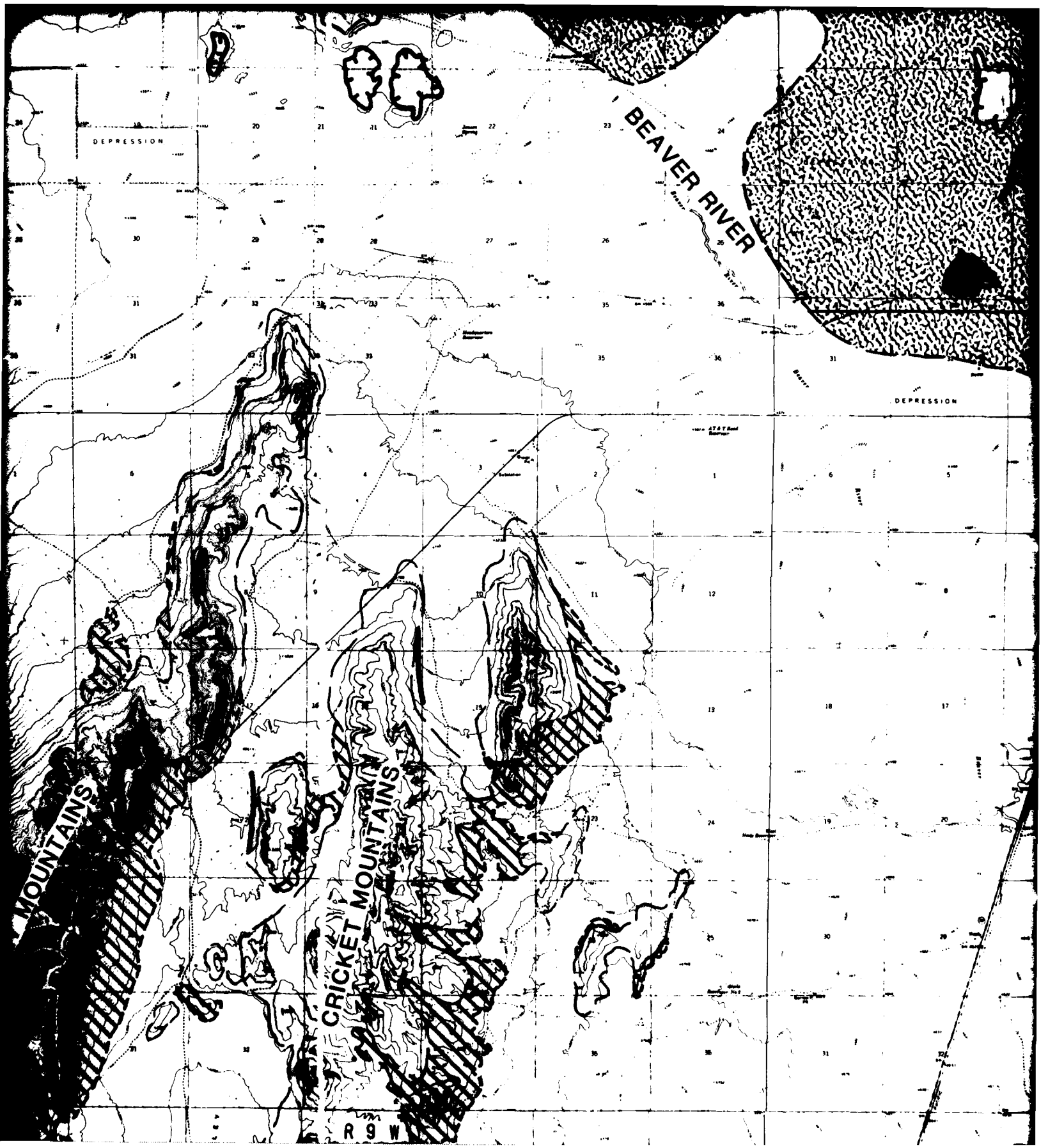
EXPLANATION

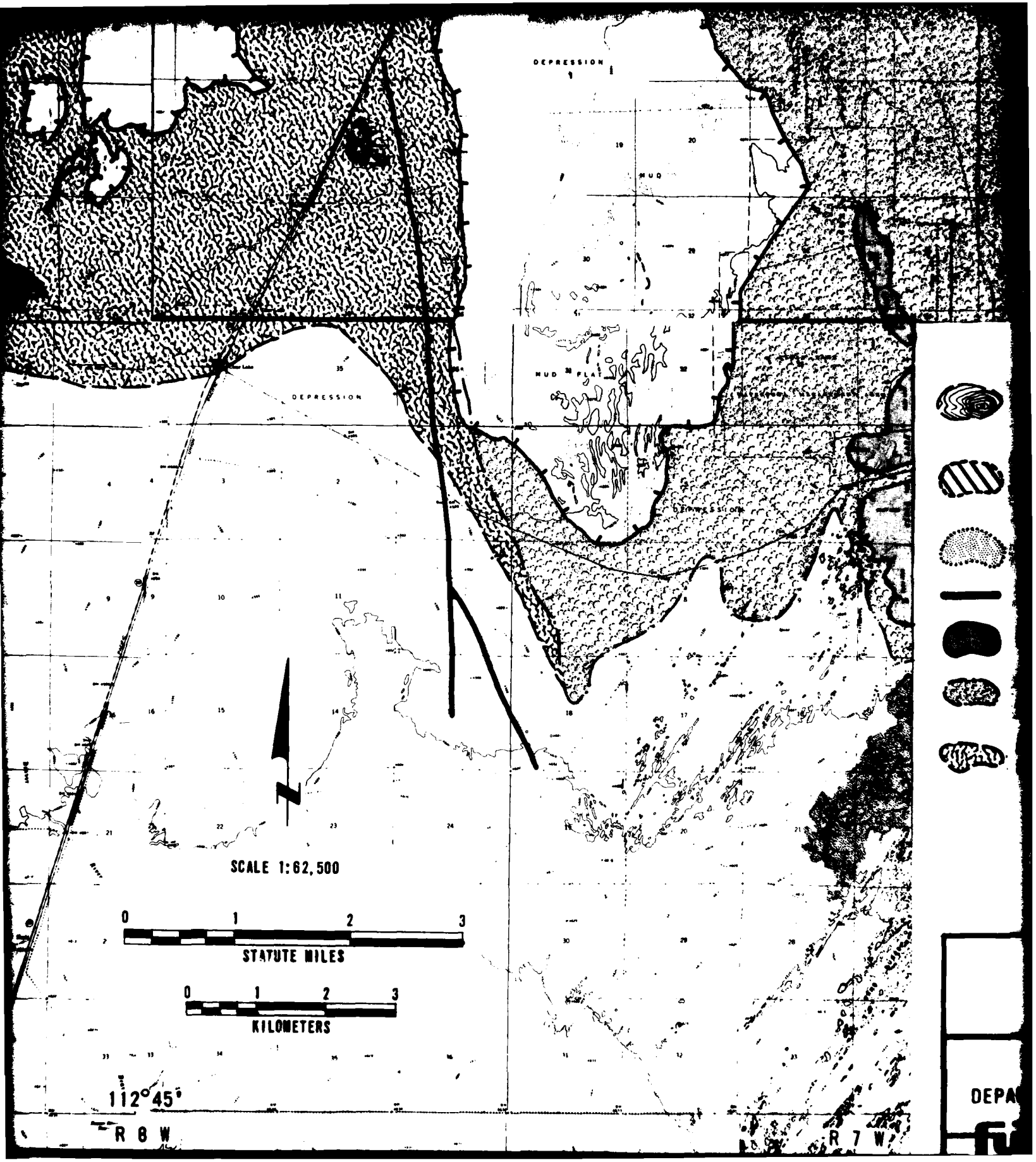
: OUTCROPPING ROCK

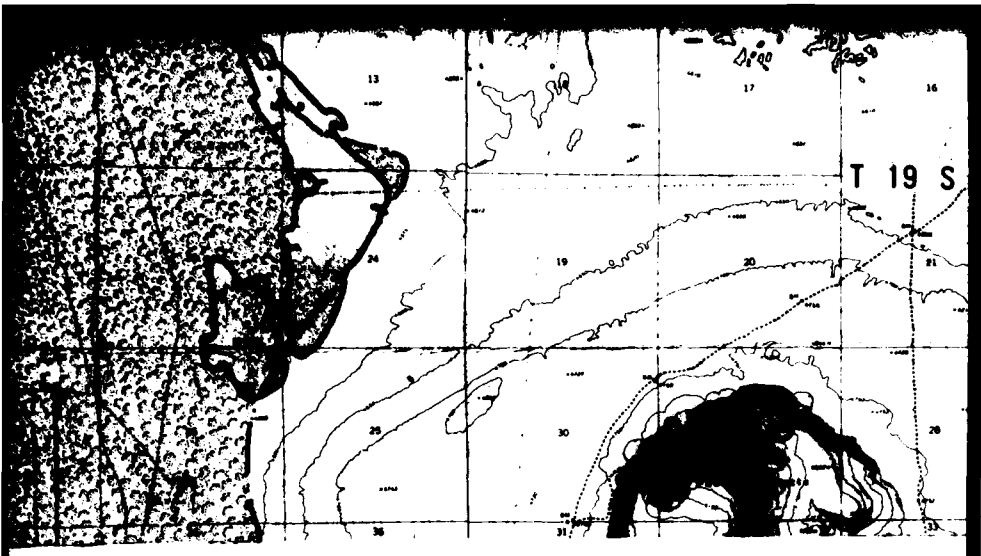
ADVERSE TERRAIN; INCLUDING SLOPES EXCEEDING 10% GRADE OR MORE THAN HALF OF SLOPES EXCEEDING 10% GRADE, AND AREAS HAVING DRAINAGE DENSITIES AVERAGING AT LEAST TWO 10 FOOT DRAINAGES PER 1000 FEET


T 19 S
T 20 S
R 12 W
SEVIER LAKE
SEVIER


R 11 W
113°00'
R 10 W
LAKE
DEVILS LAKE
DEPRESSION
CRICKET MOUNTA


BEAVER RIVER
DEPRESSION
DEPRESSION
MOUNTAINS
CRICKET MOUNTAINS
R 9 W


DEPRESSION
MUD
MUD FLAT
DEPRESSION
SCALE 1:62,500
0 1 2 3
STATUTE MILES
0 1 2 3
KILOMETERS
112°45'
R 8 W
R 7 W



EXPLANATION

OUTCROPPING ROCK

ADVERSE TERRAIN; INCLUDING SLOPES EXCEEDING 10% GRADE OR MORE THAN HALF OF SLOPES EXCEEDING 10% GRADE, AND AREAS HAVING DRAINAGE DENSITIES AVERAGING AT LEAST TWO 10 FOOT DRAINAGES PER 1000 FEET

DUNES AND SHEET SANDS

LATE QUATERNARY AND HOLOCENE FAULTS

MUD FLAT OR SEASONAL POND

DEPTH TO WATER GENERALLY LESS THAN 10 FEET, INTERPRETED FROM OCCURRENCE OF SALTGRASS, PICKLEWEED, AND GREASEWOOD

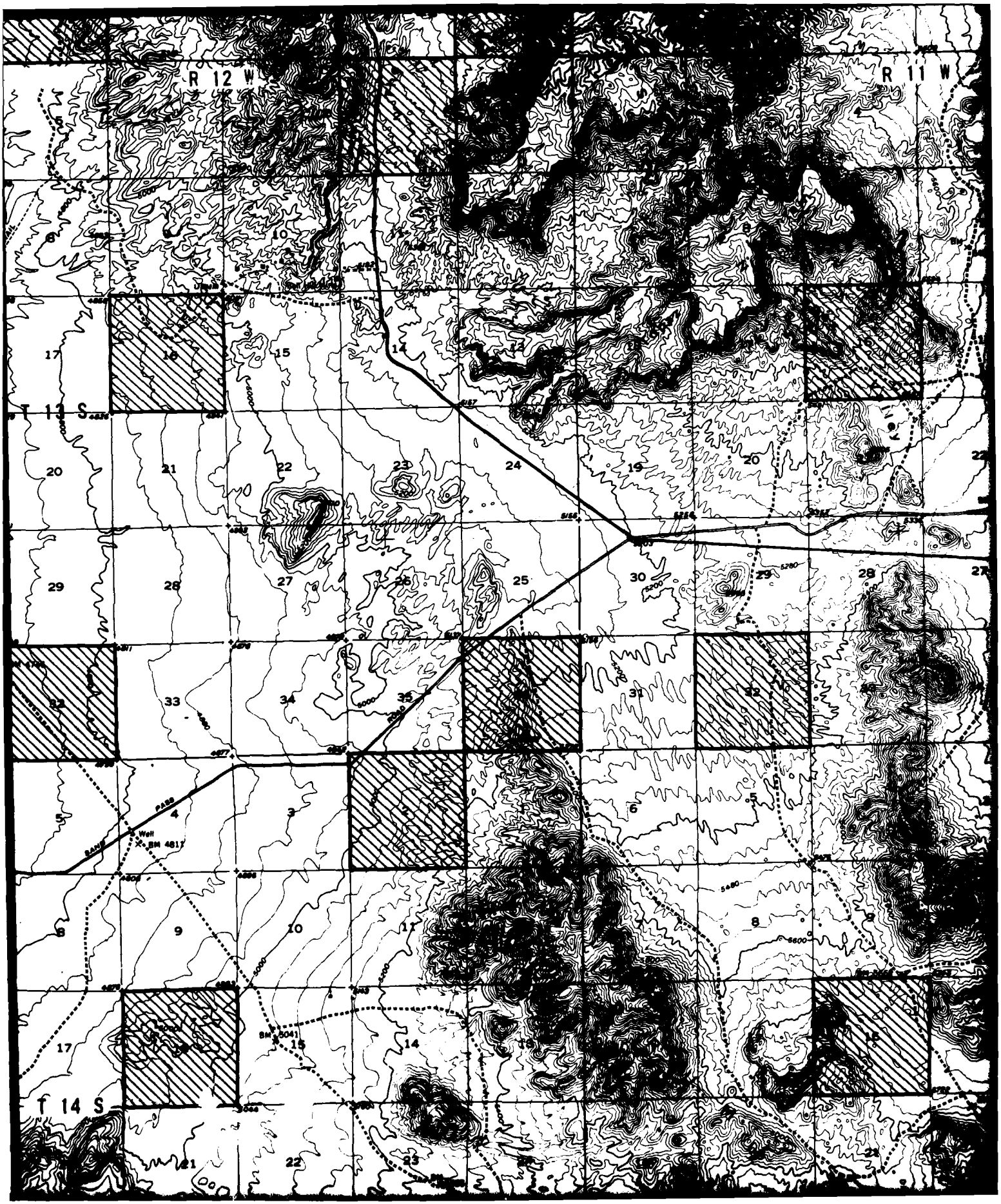
DEPTH TO WATER GENERALLY LESS THAN 10 FEET, INTERPRETED FROM WELL DATA, QUERIED WHERE UNCERTAIN

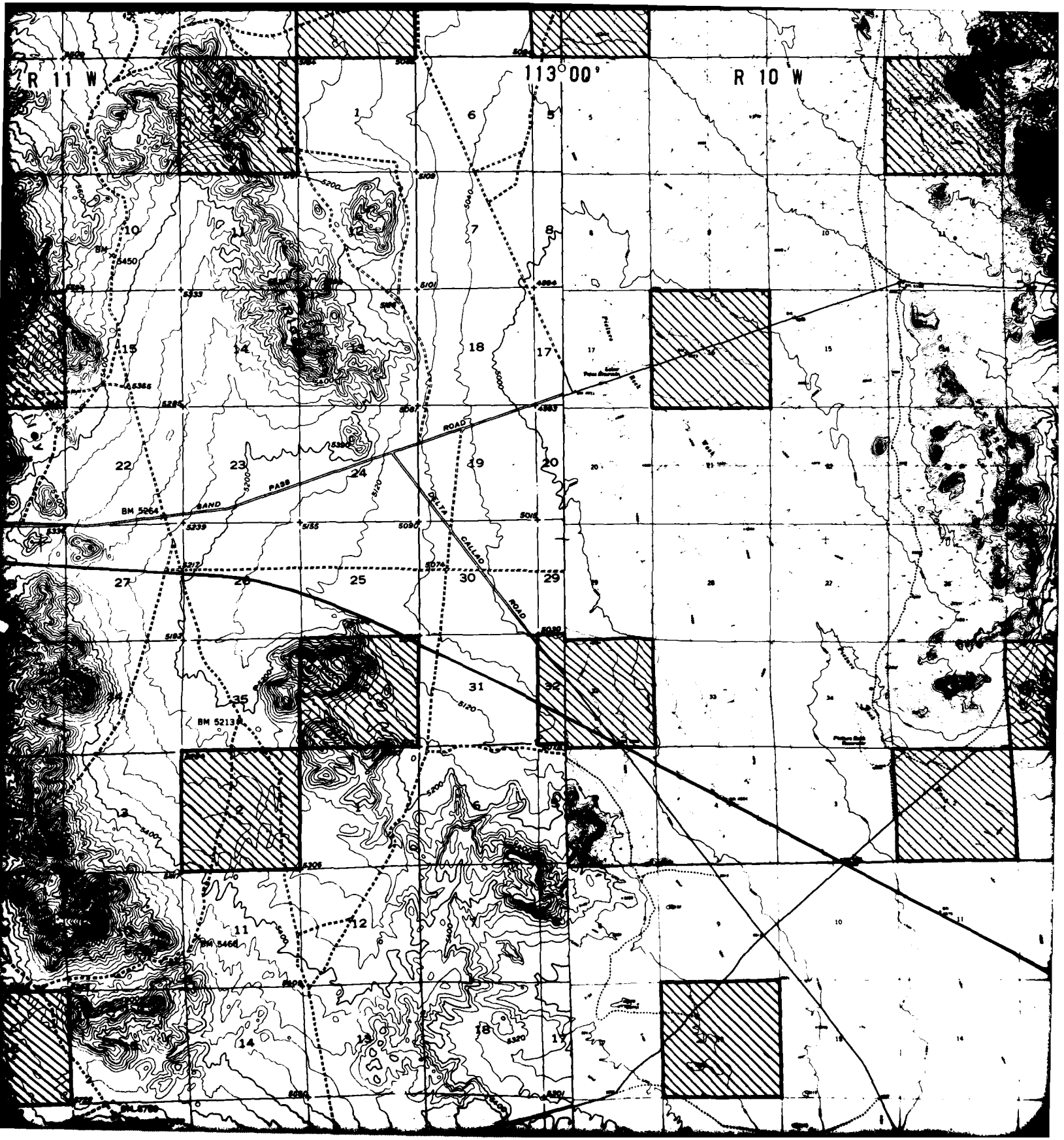
GEOTECHNICAL CONDITIONS
SEVIER DESERT, DELTA AREA, UTAH

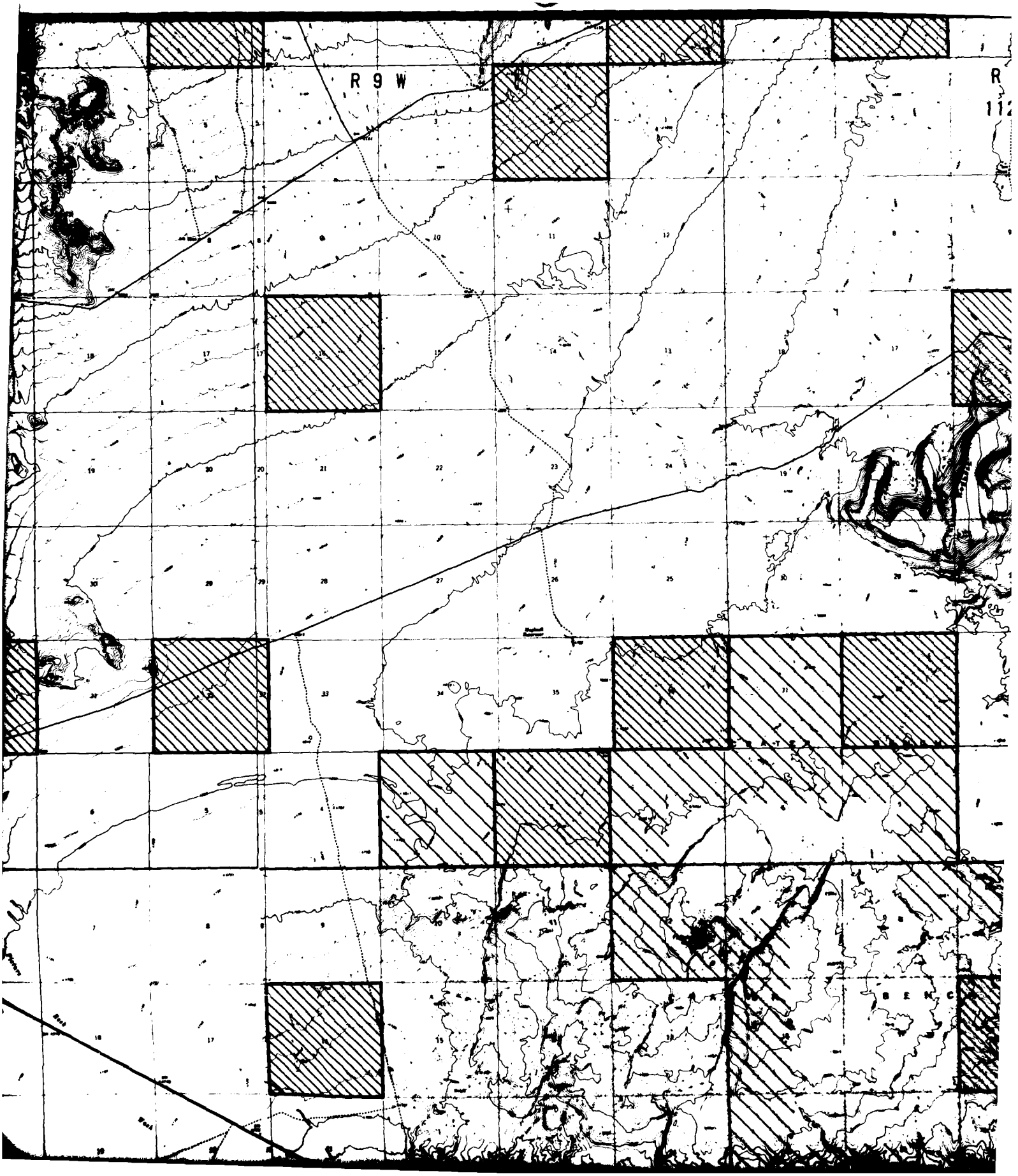
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

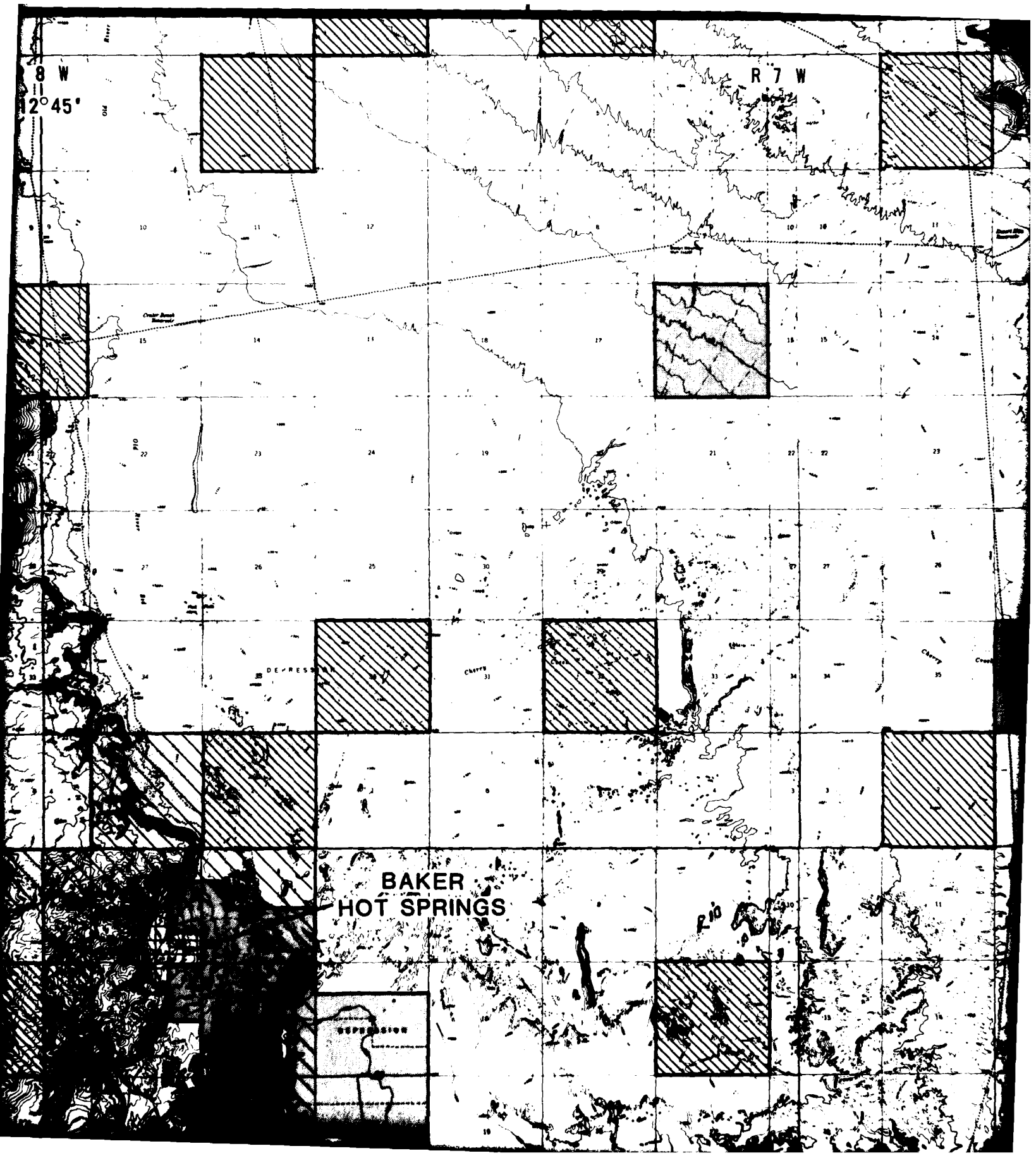
DRAWING
5-1

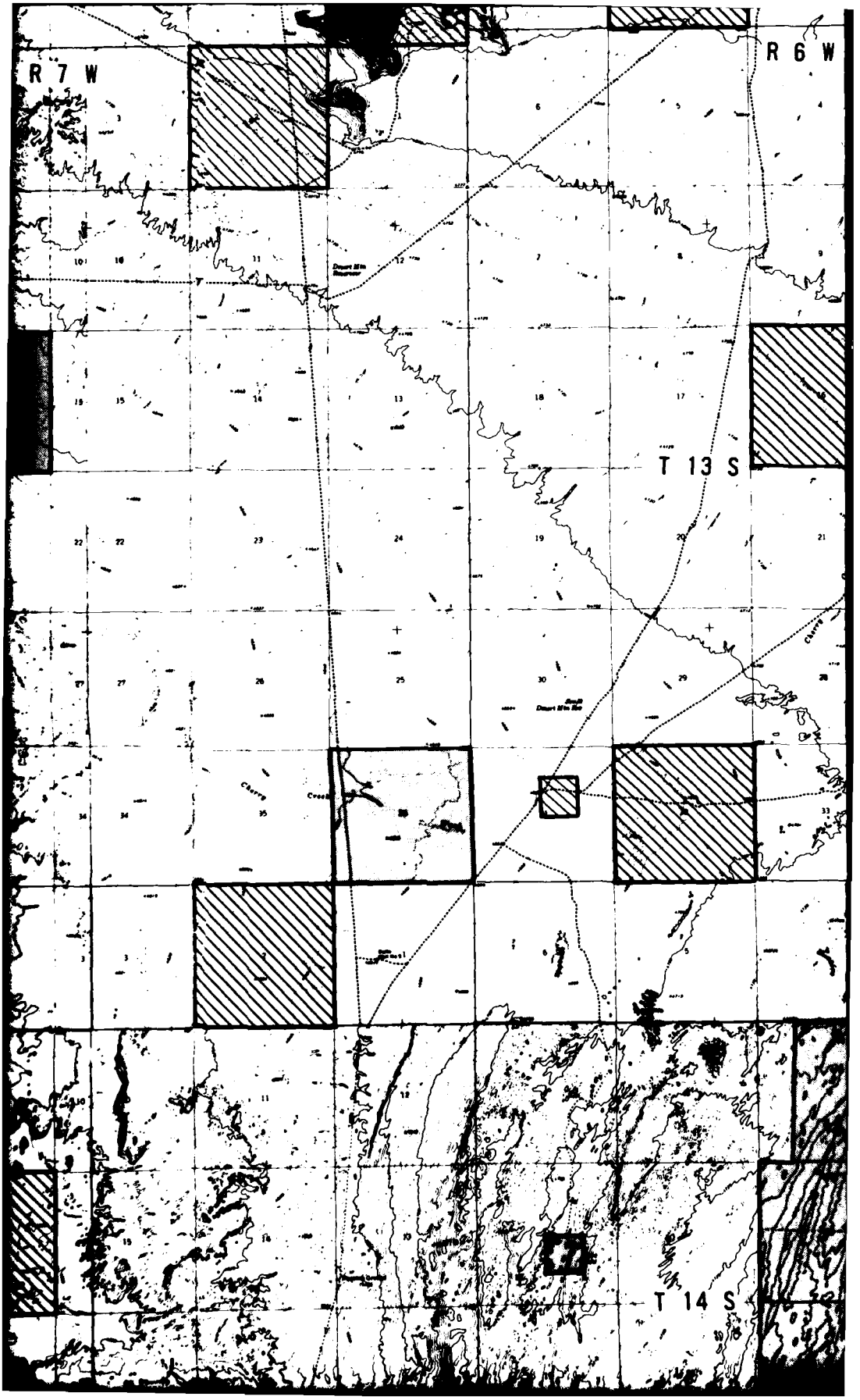
FUGRO NATIONAL, INC.

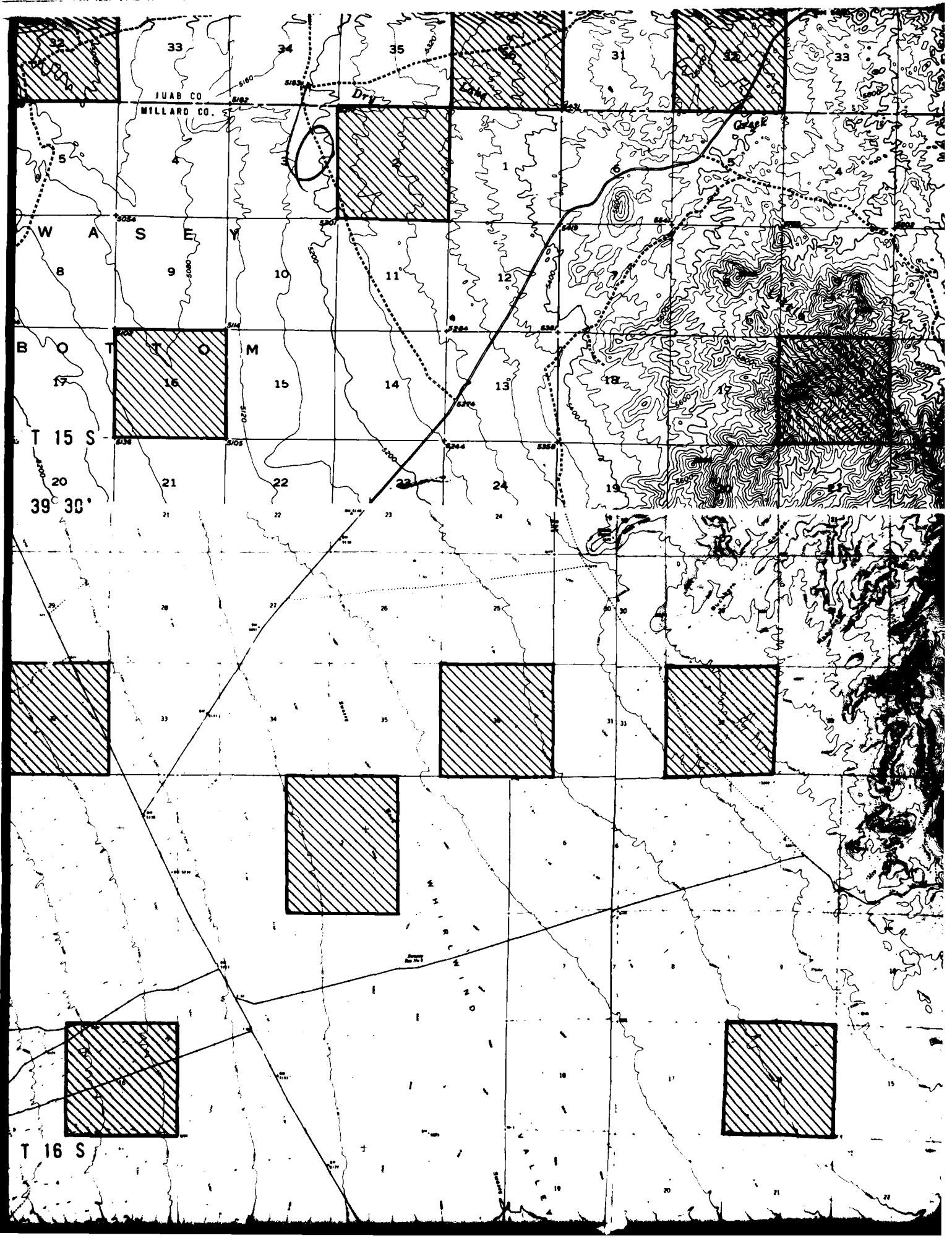

R 12 W
R 11 W
T 13 S
T 14 S
Well
BM 4817
BM 5041

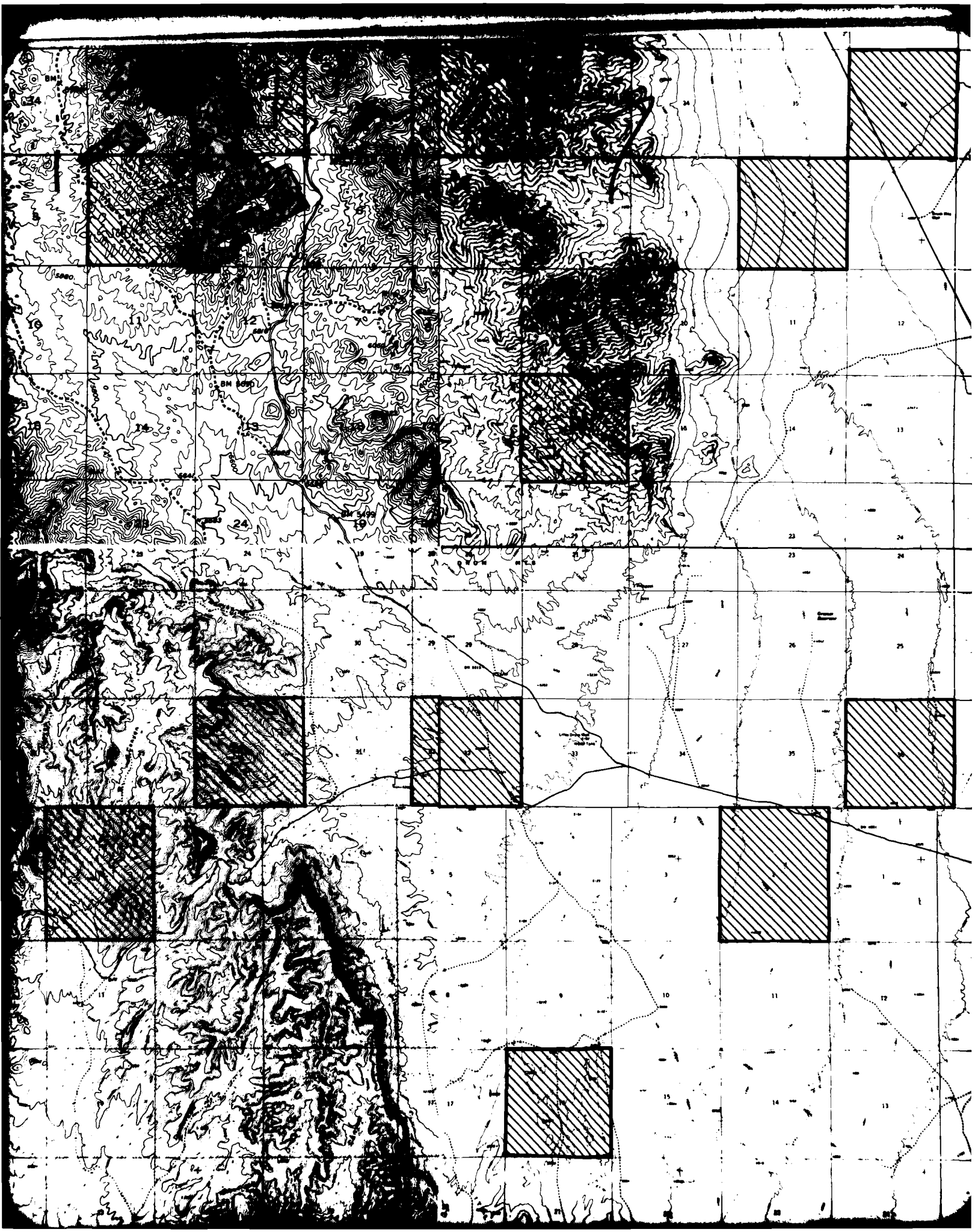

R 11 W
113° 00'
R 10 W
BM 5450
BM 5264
BM 5213
BM 5468
SAND PASS
DELTA CALLAO ROAD
ROAD

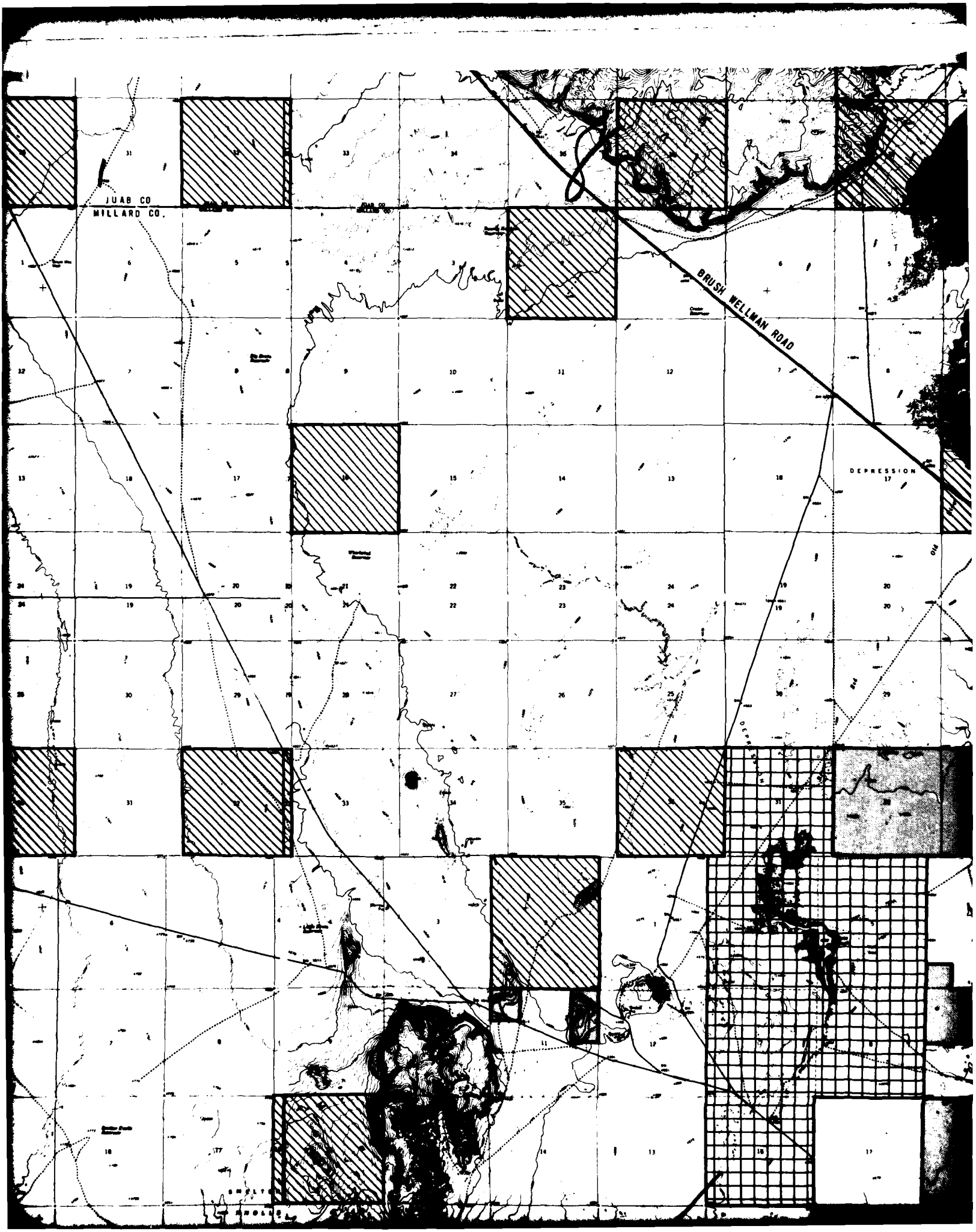

R 9 W
R
11
CLUB
BENC

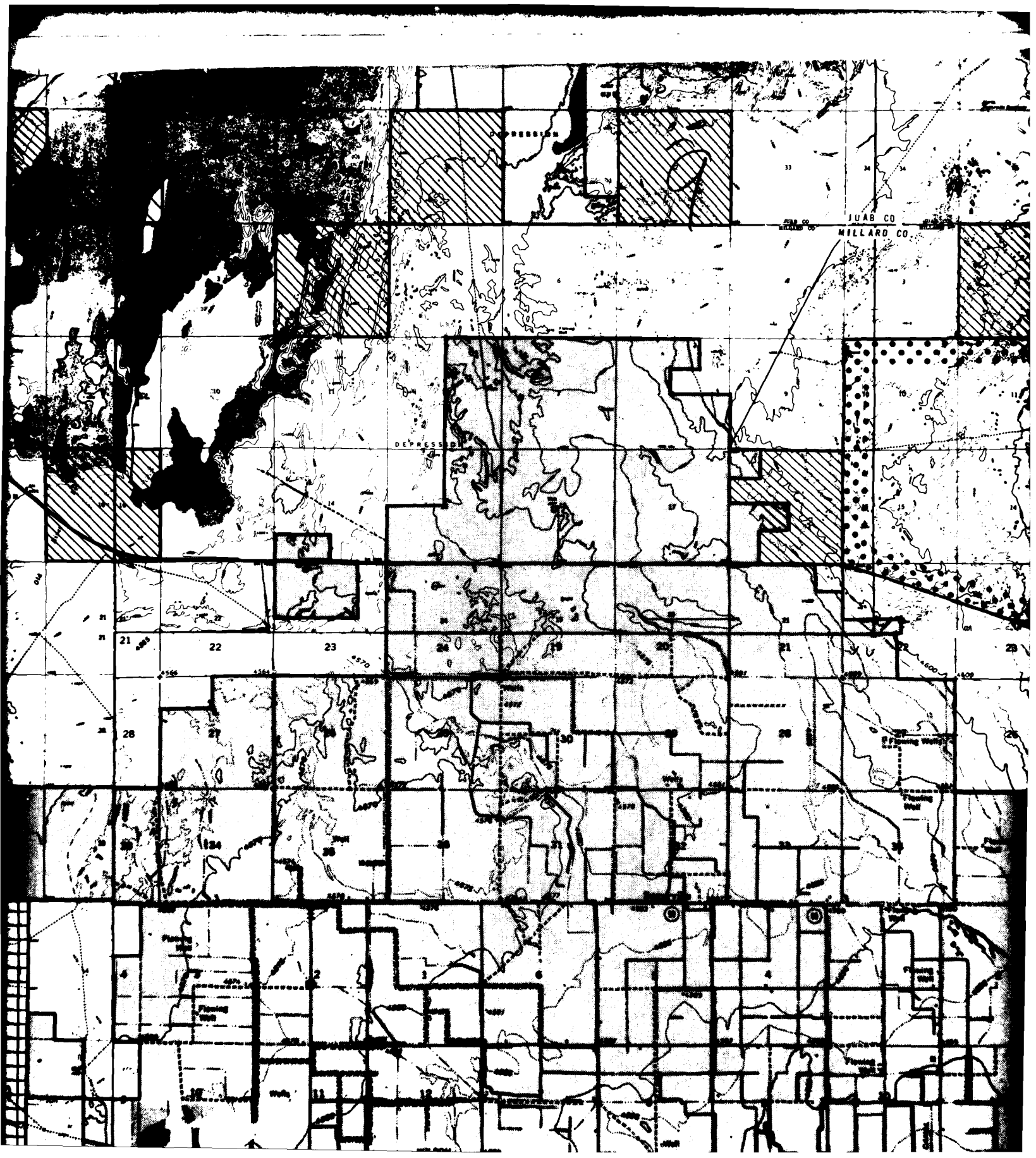

8 W
12°45'
R 7 W
BAKER
HOT SPRINGS

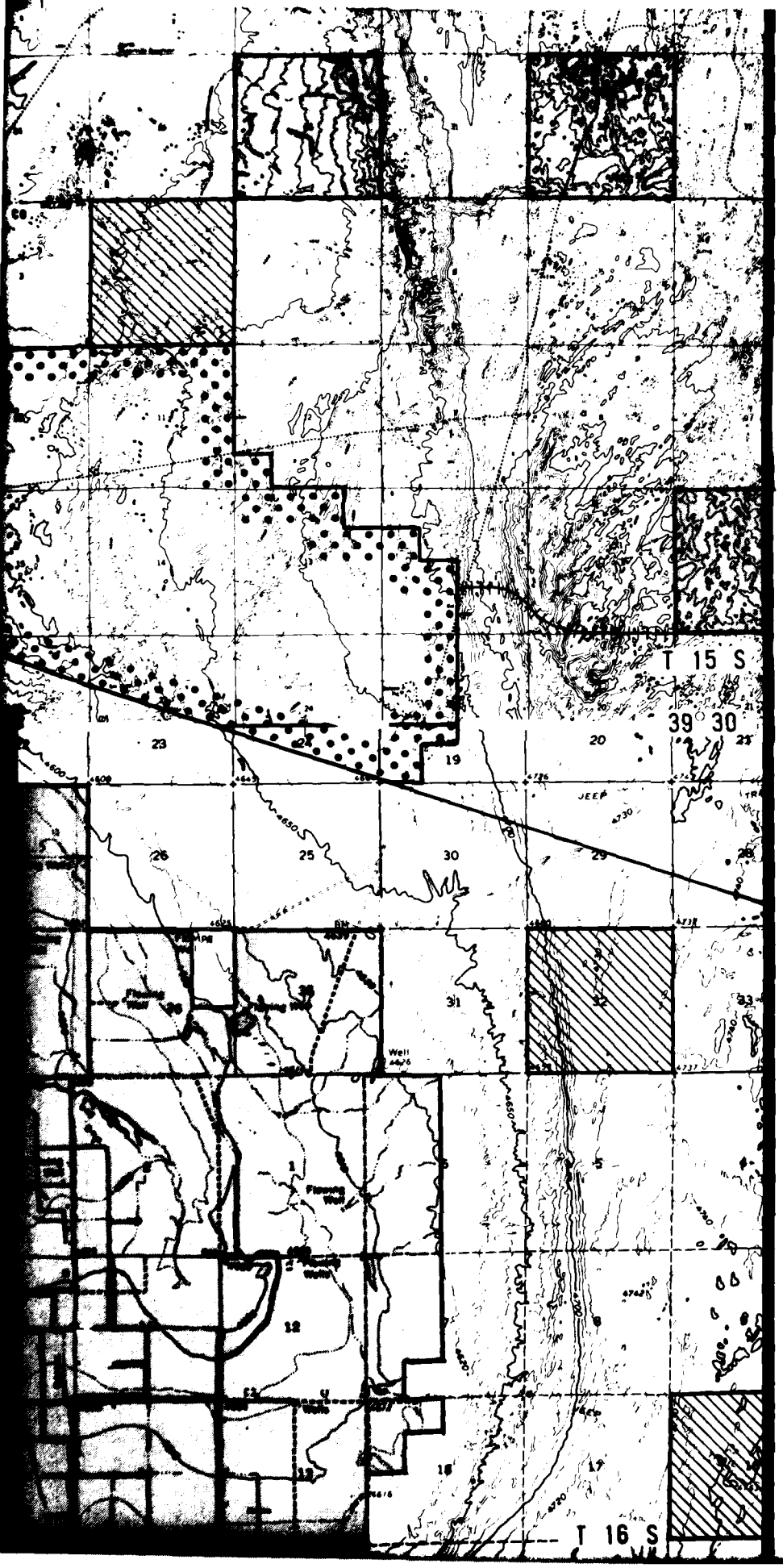

R 7 W
R 6 W
T 13 S
T 14 S


JUAB CO.
MILLARD CO.
Dry Lake
Creek
W A S E Y
B O T T O M
T 15 S
T 16 S
39° 30'

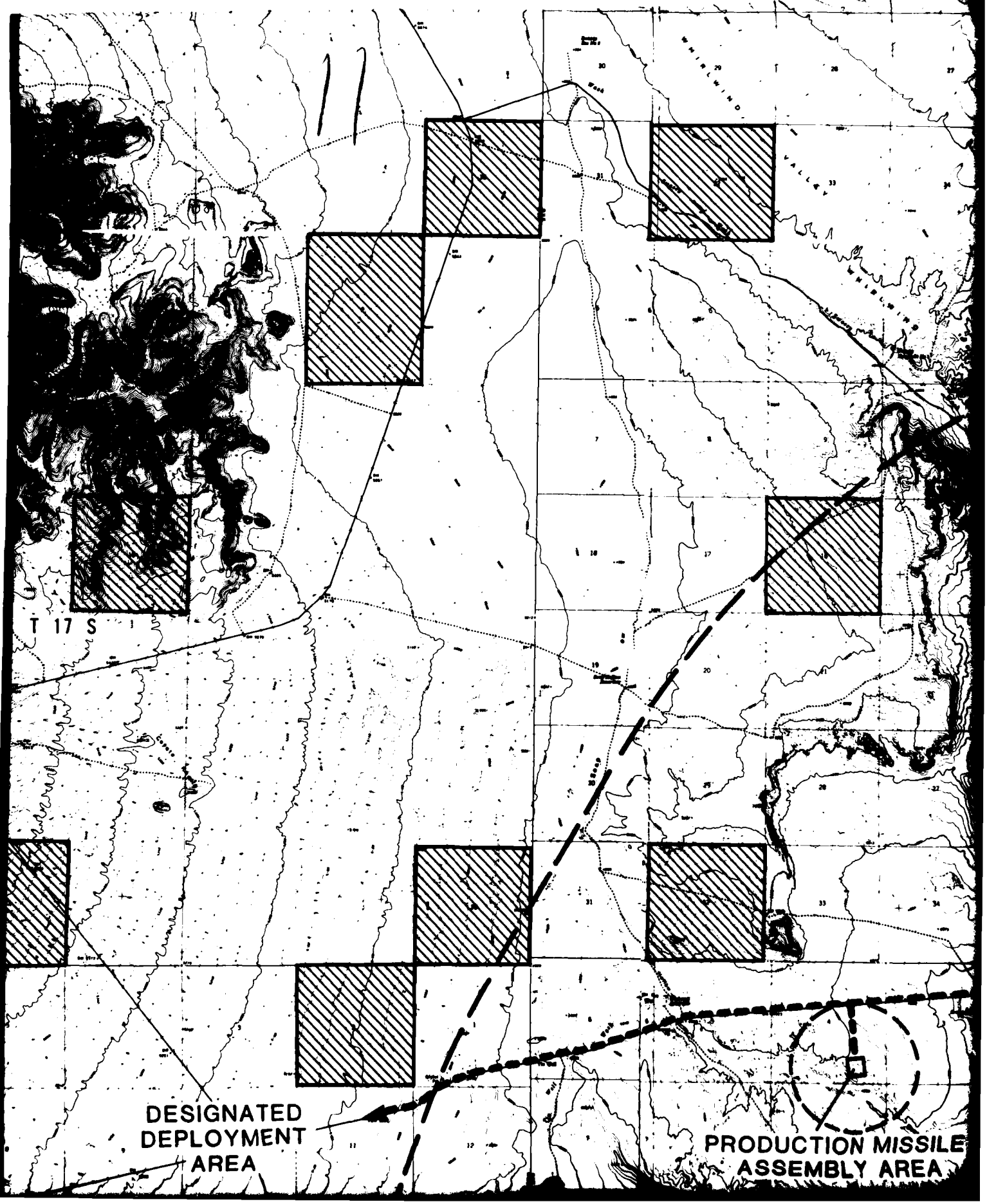


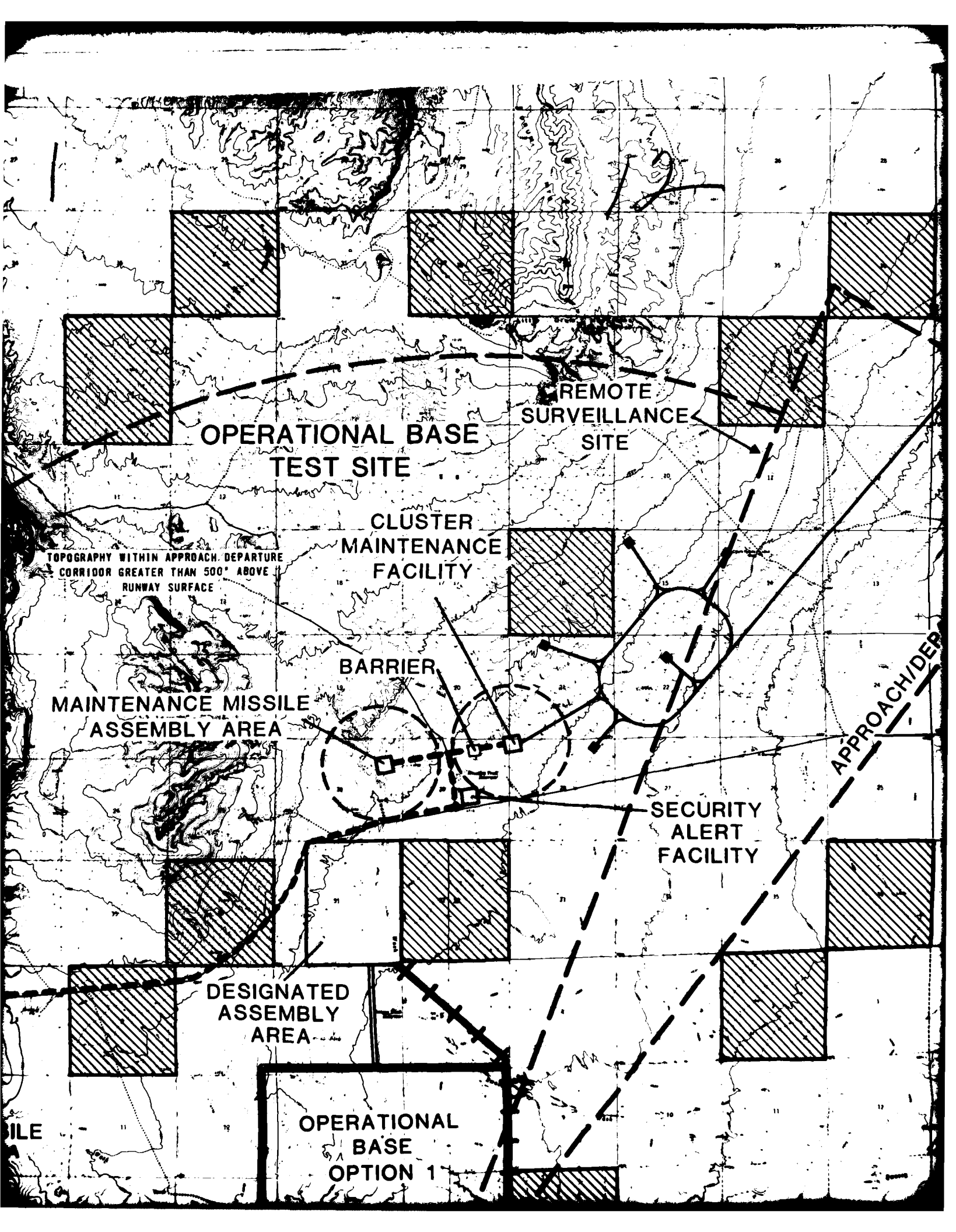

JUAB CO
MILLARD CO.
BRUSH WELLMAN ROAD
DEPRESSION
17

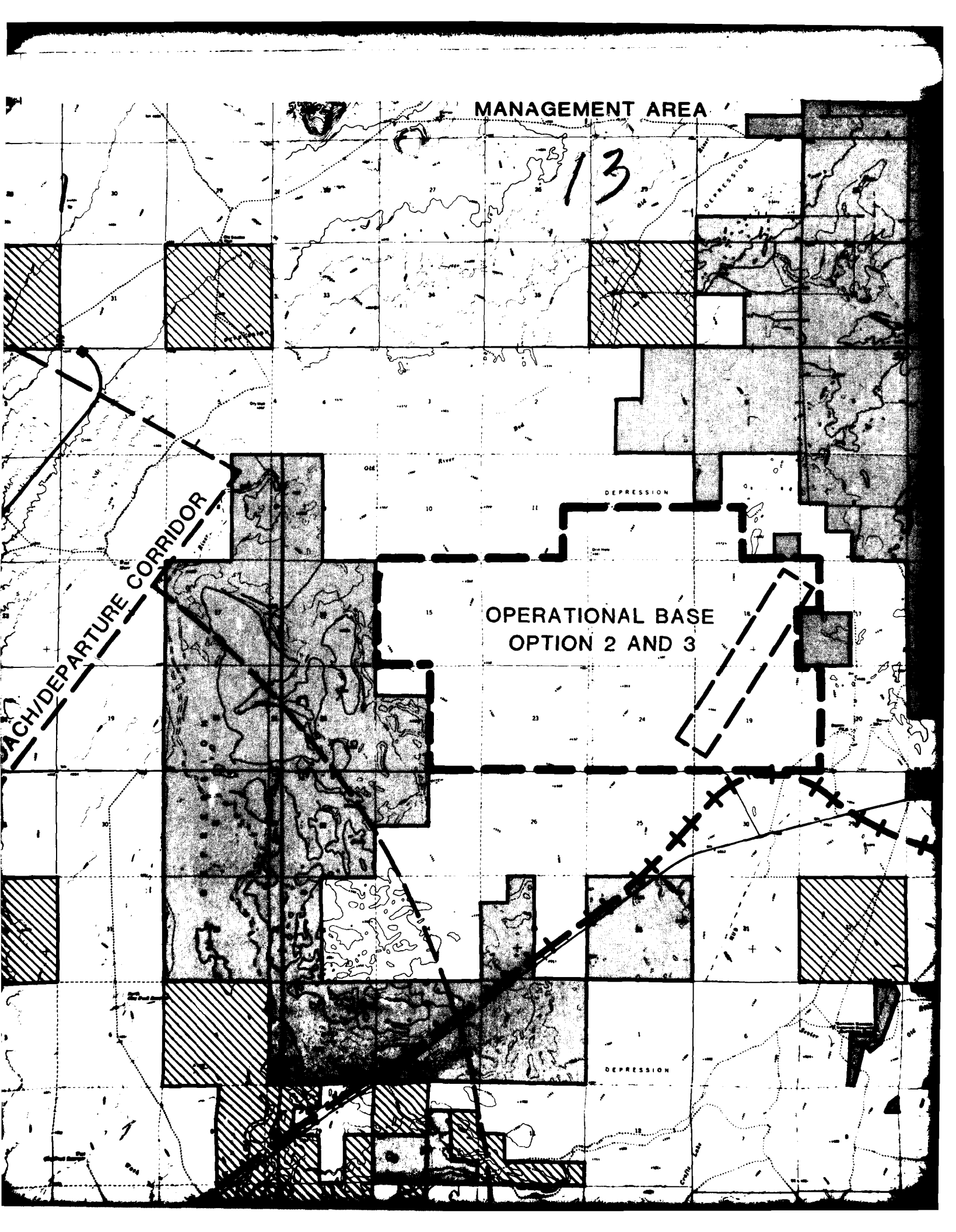

JUAB CO
MILLARD CO
DEPRESSION
21
22
23
28

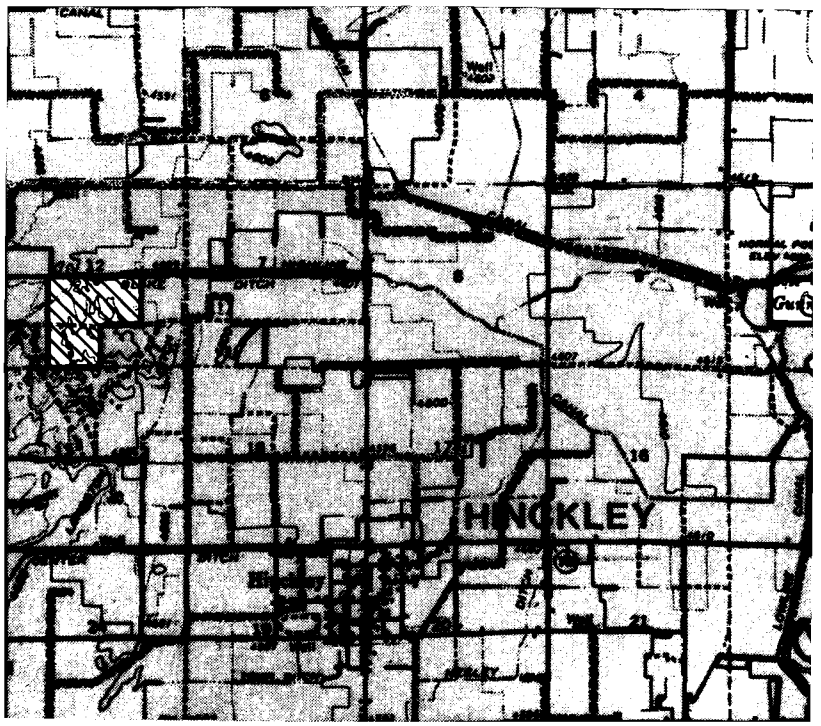


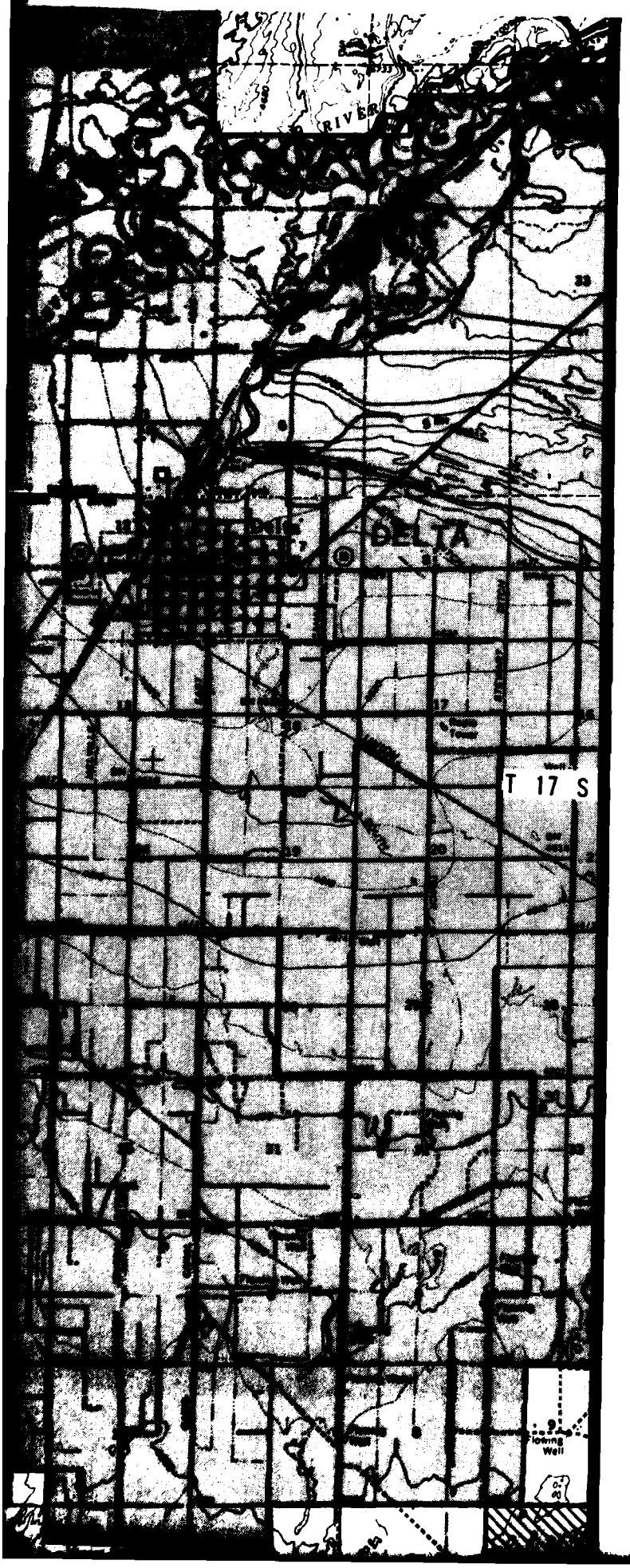
10


T 17 S
DESIGNATED
DEPLOYMENT
AREA
PRODUCTION MISSILE
ASSEMBLY AREA

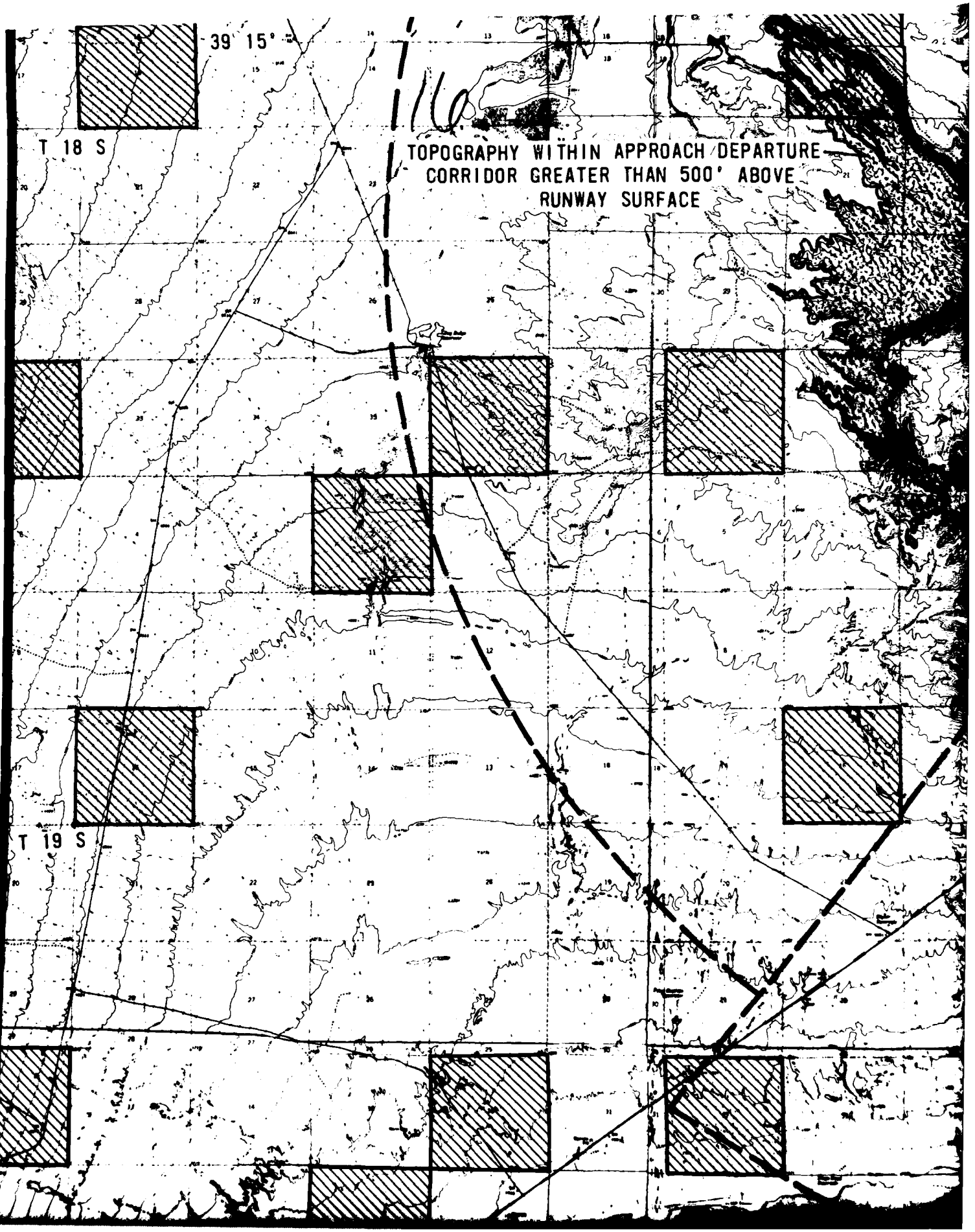

REMOTE SURVEILLANCE SITE
OPERATIONAL BASE TEST SITE
CLUSTER MAINTENANCE FACILITY
TOPOGRAPHY WITHIN APPROACH DEPARTURE CORRIDOR GREATER THAN 500' ABOVE RUNWAY SURFACE
BARRIER
MAINTENANCE MISSILE ASSEMBLY AREA
APPROACH/DEP
SECURITY ALERT FACILITY
DESIGNATED ASSEMBLY AREA
OPERATIONAL BASE OPTION 1

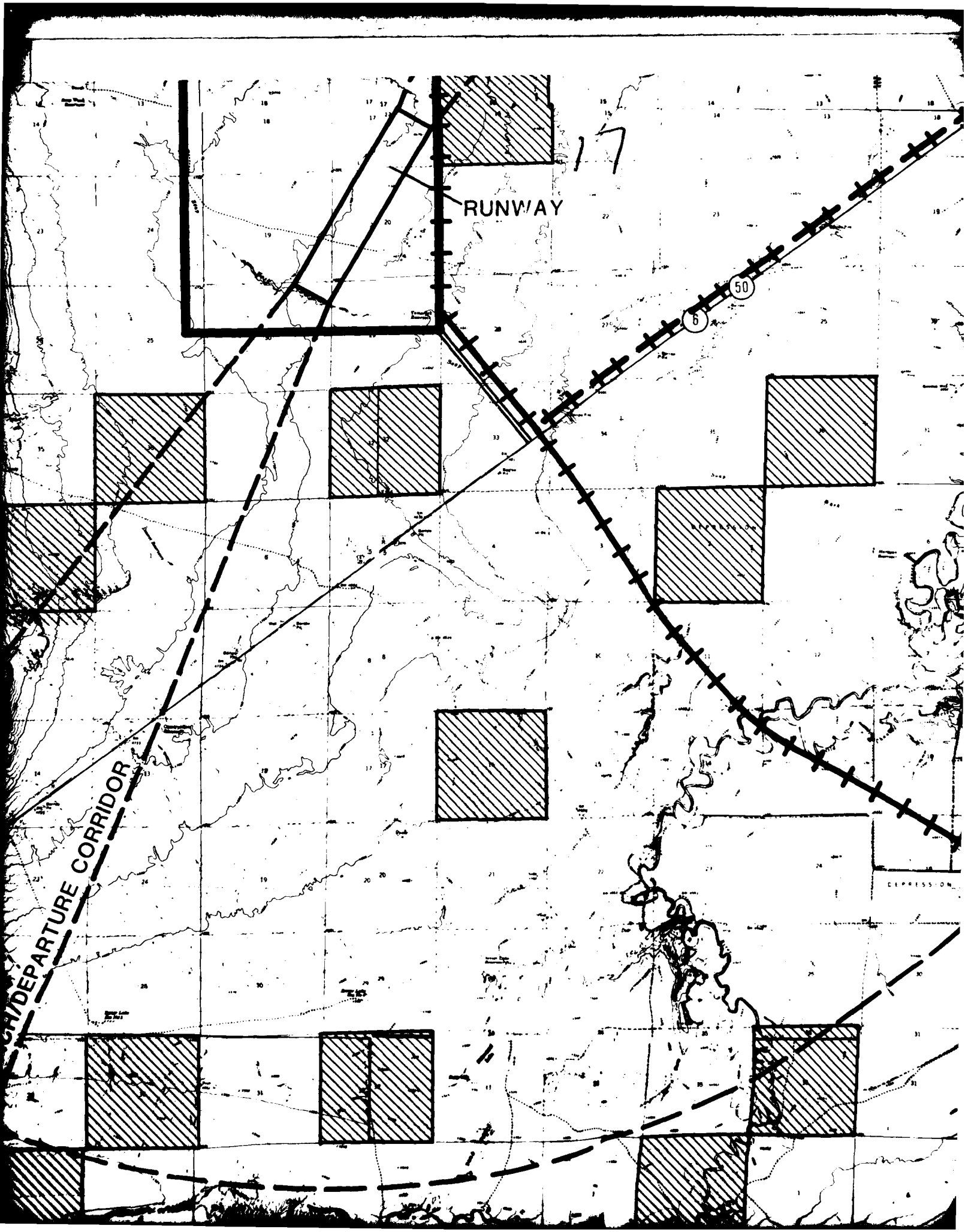

MANAGEMENT AREA
13
DEPRESSION
DEPRESSION
DEPRESSION
OLE RIVER
ACH/DEPARTURE CORRIDOR
OPERATIONAL BASE
OPTION 2 AND 3

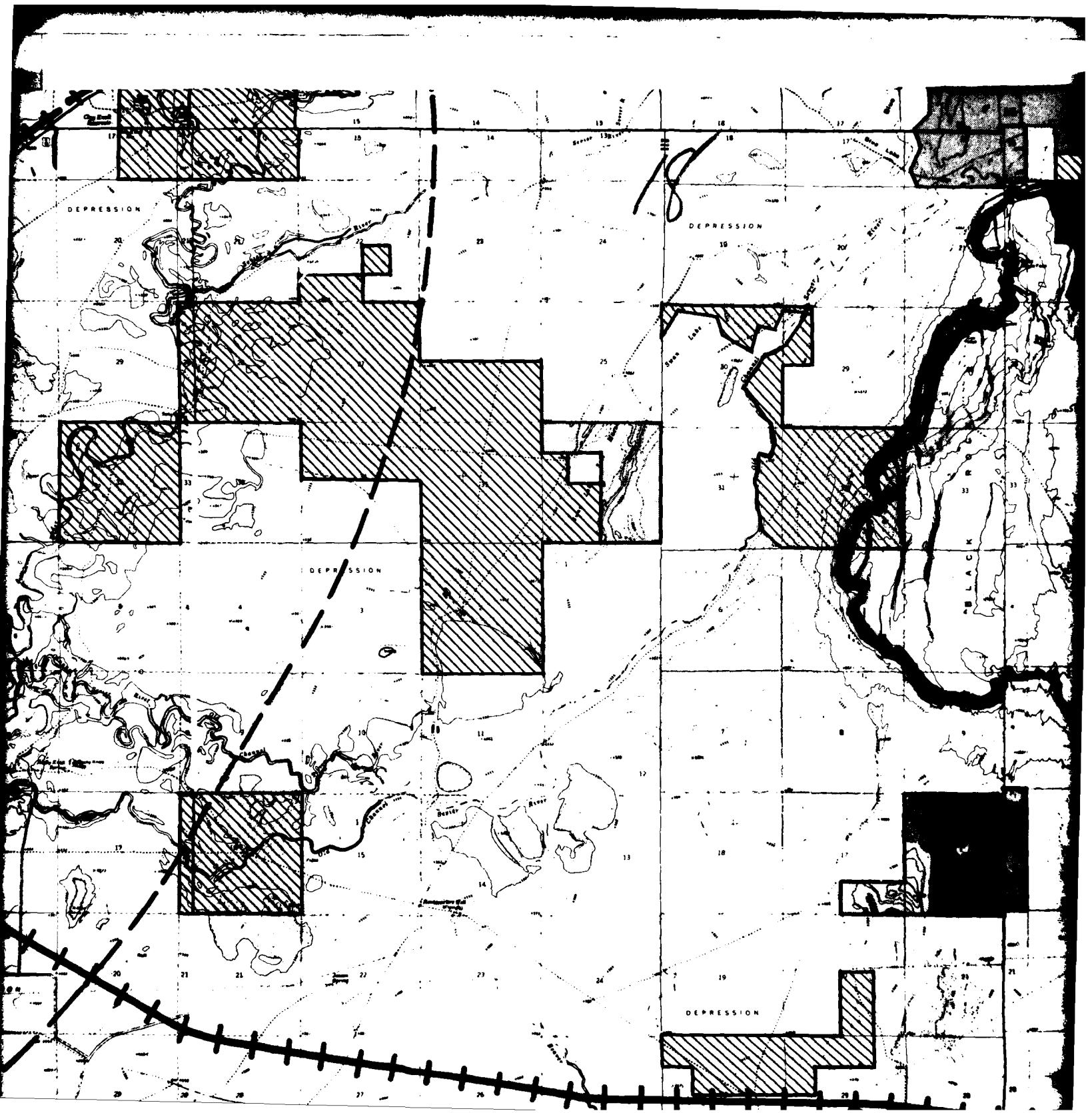

CANAL
HINCKLEY

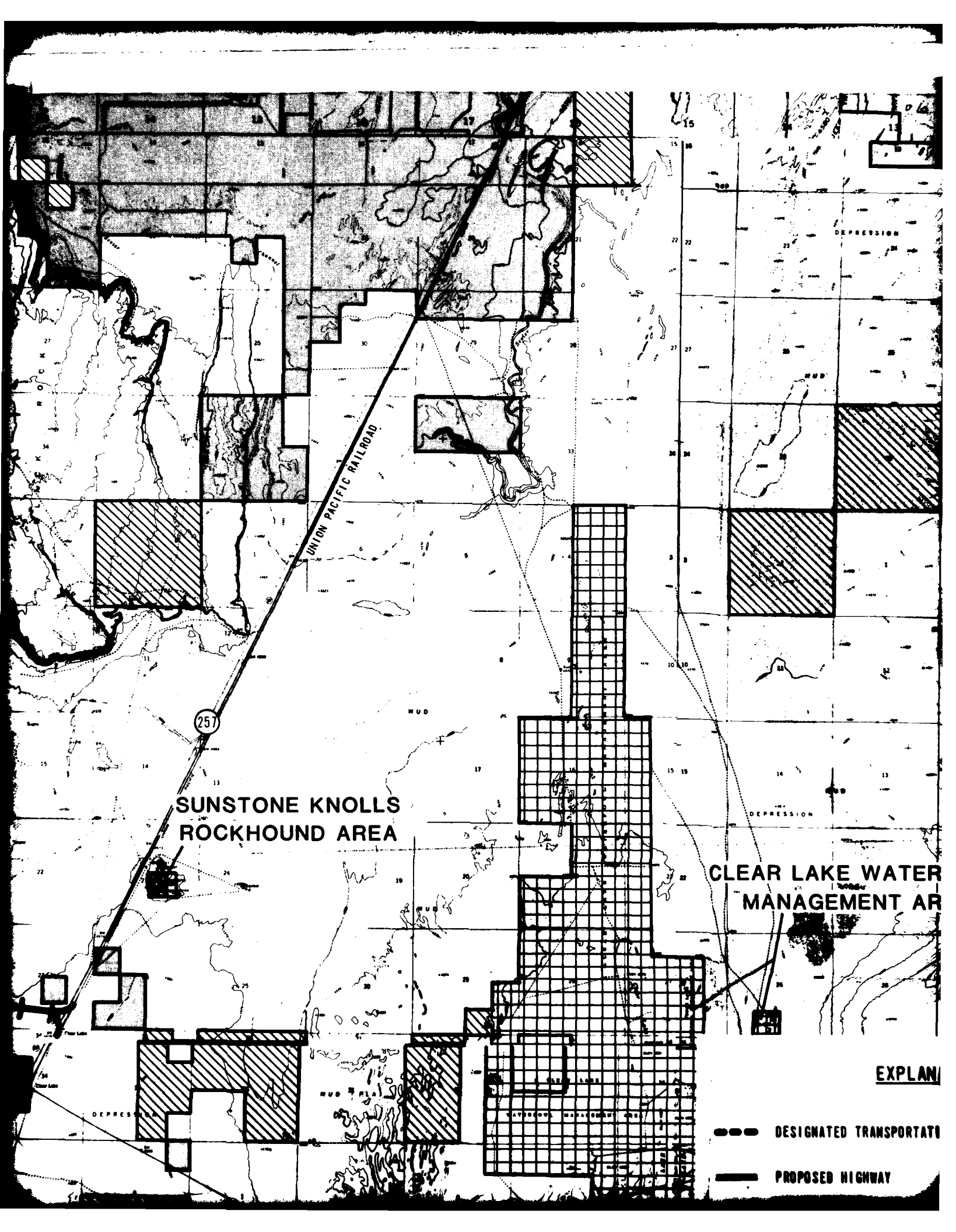


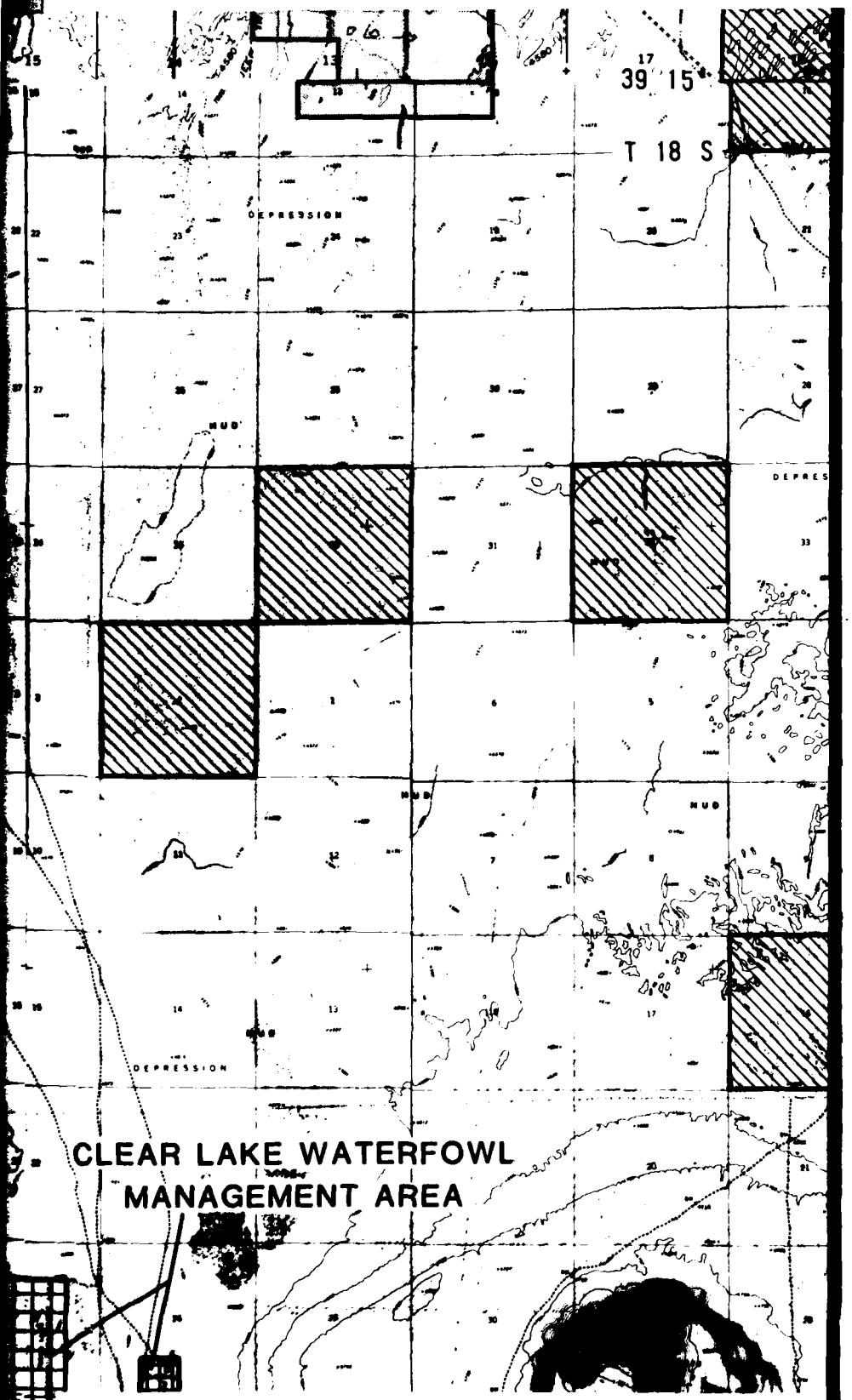
15


39° 15'
T 18 S
T 19 S
TOPOGRAPHY WITHIN APPROACH/DEPARTURE
CORRIDOR GREATER THAN 500' ABOVE
RUNWAY SURFACE


RUNWAY
17
50
6
DEPRESSION
CH/DEPARTURE CORRIDOR


DEPRESSION
DEPRESSION
DEPRESSION
DEPRESSION
BLACK


UNION PACIFIC RAILROAD
257
SUNSTONE KNOLLS
ROCKHOUND AREA
CLEAR LAKE WATER
MANAGEMENT AR
EXPLAN
DESIGNATED TRANSPORTATI
PROPOSED HIGHWAY



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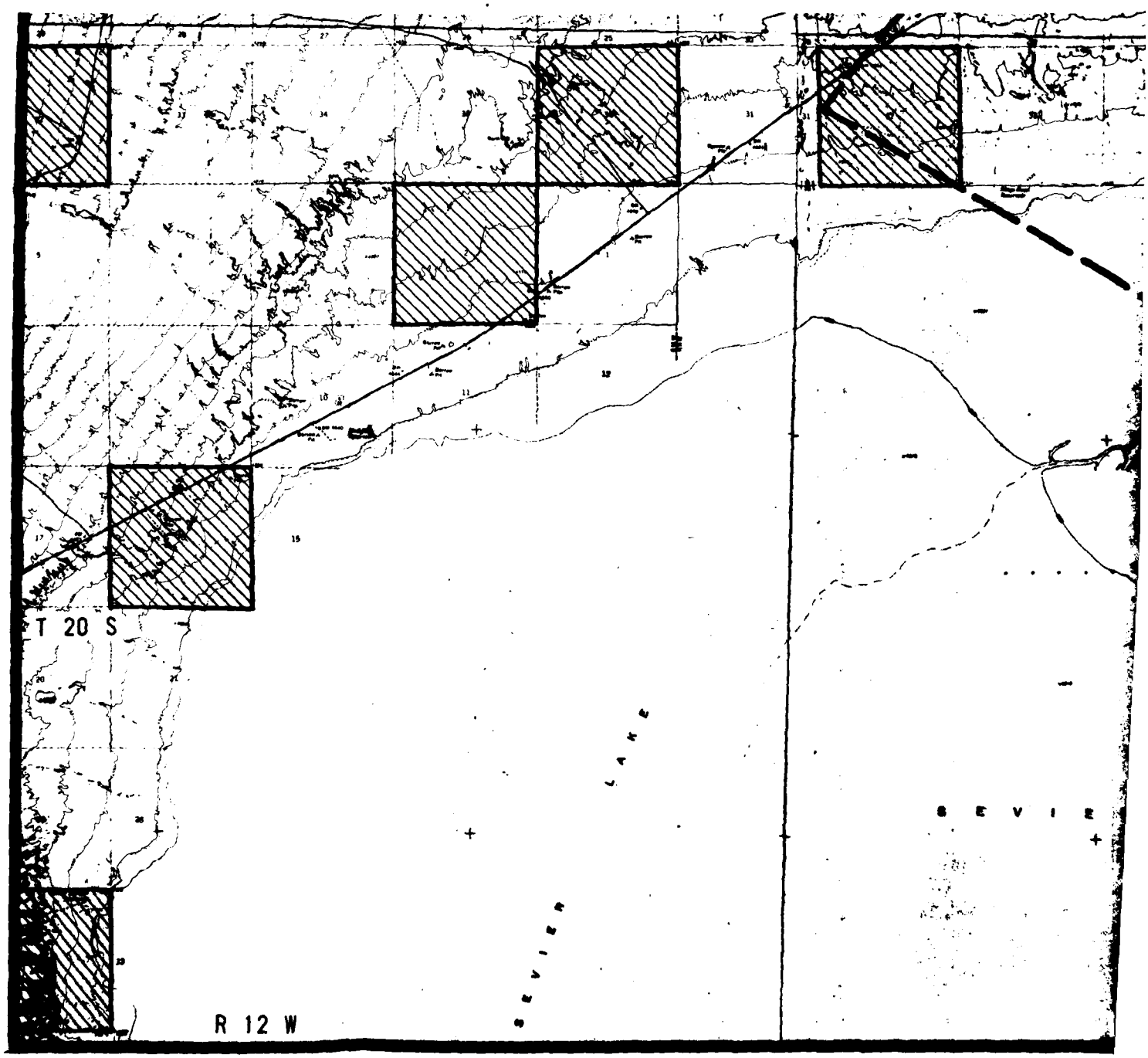
EXPLANATION

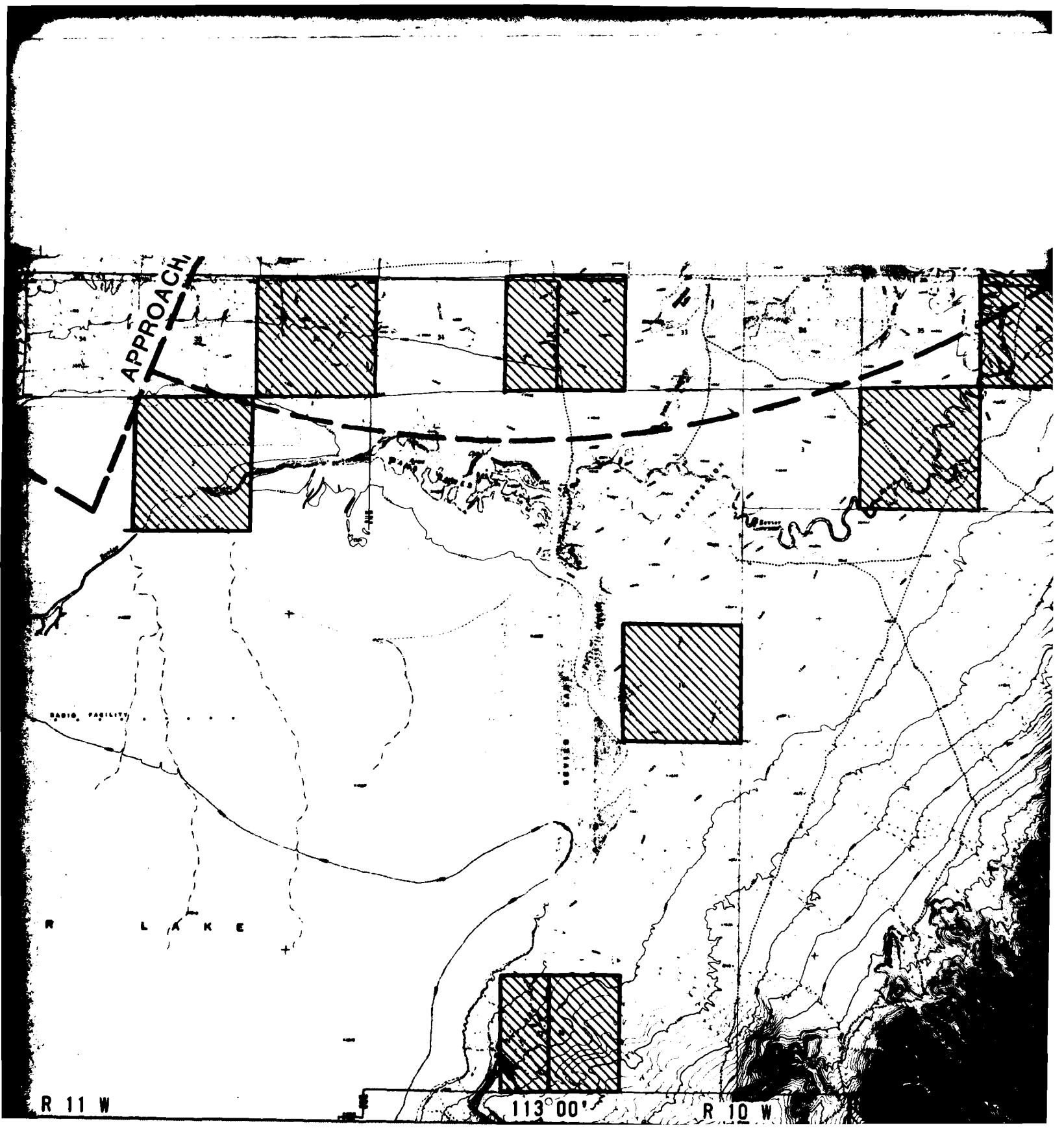
DESIGNATED TRANSPORTATION NETWORK (DTN)

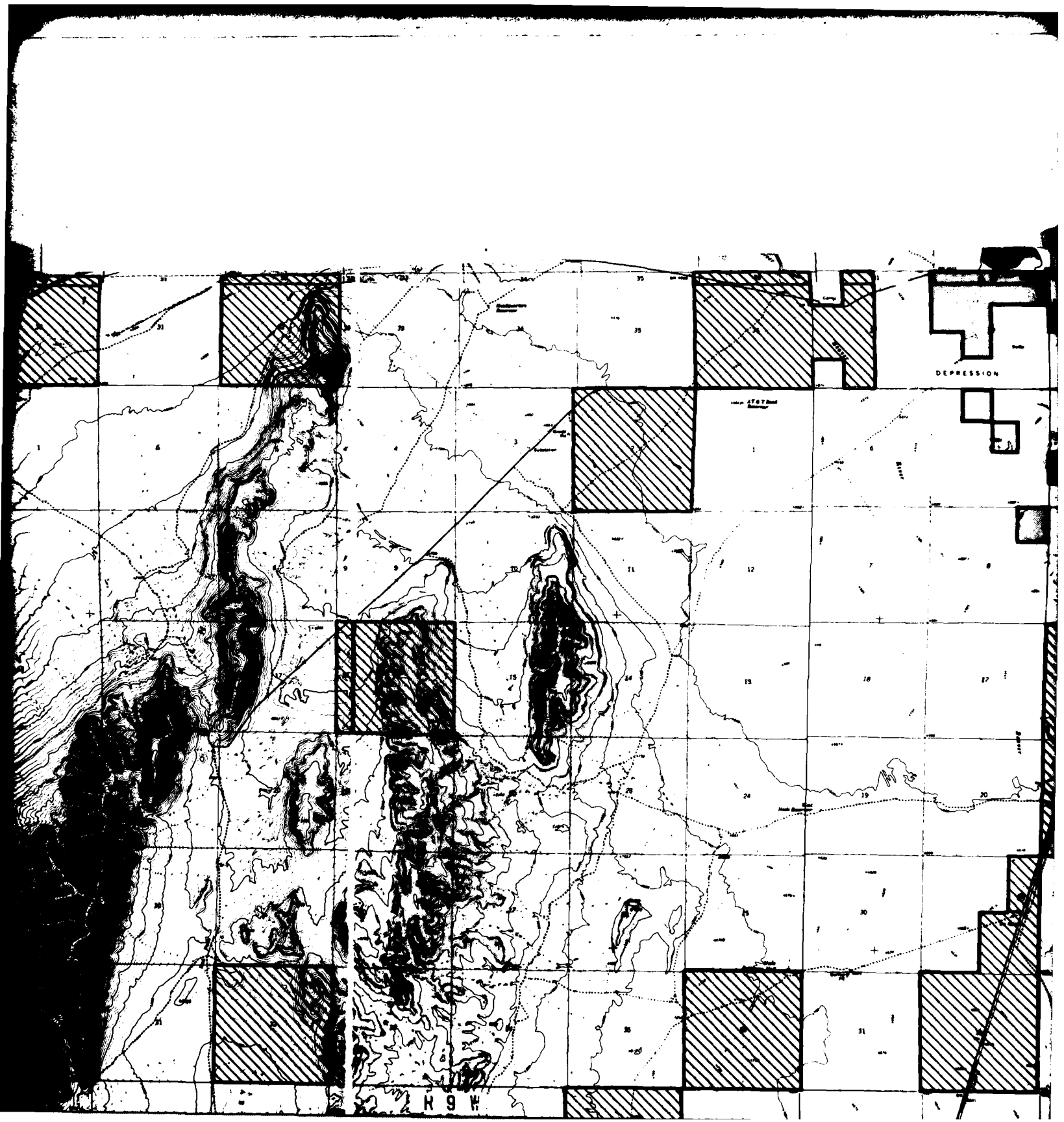
PROPOSED HIGHWAY

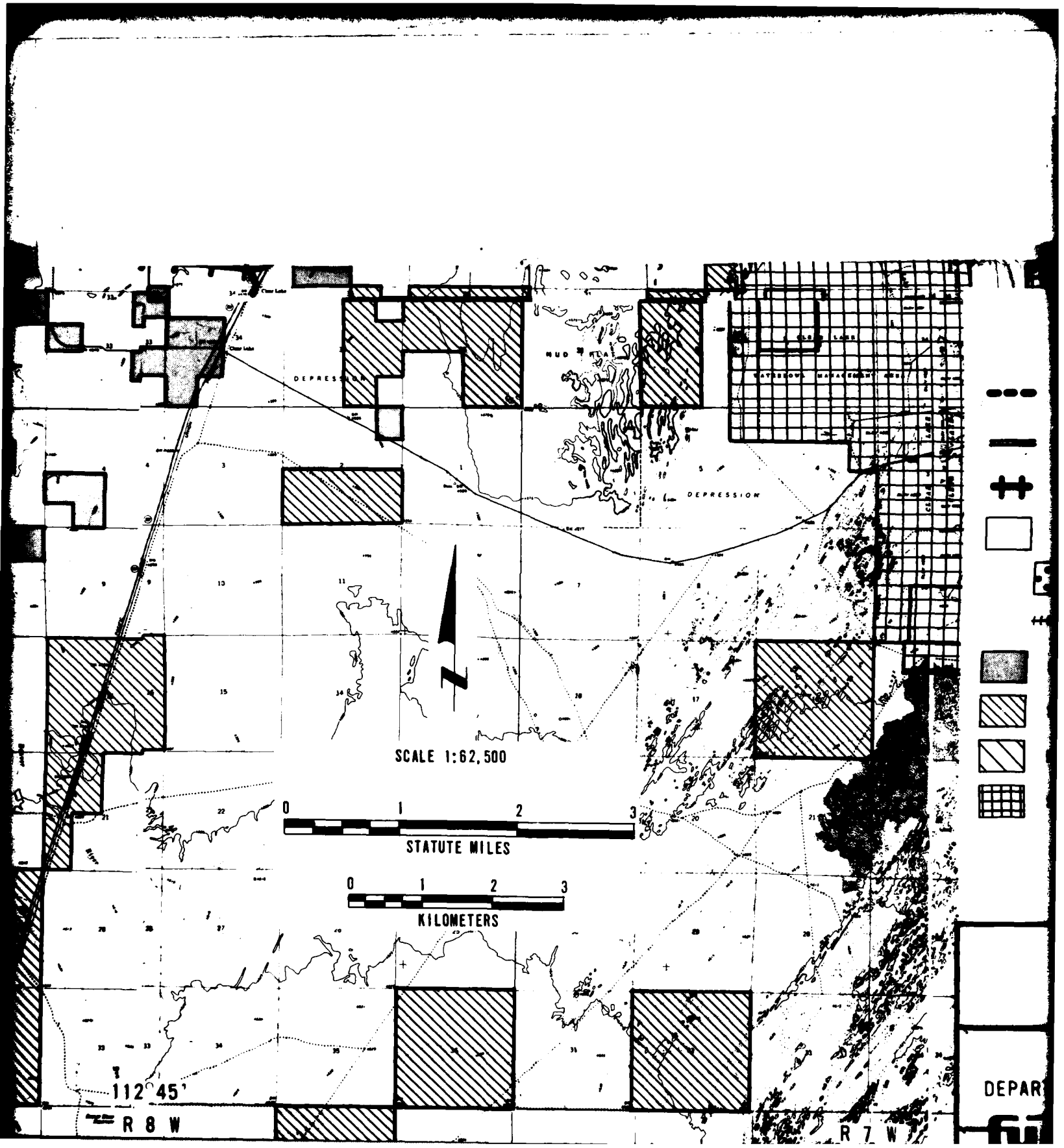


15 MAY 80

21


APPROACH
RADIO FACILITY
R L A K E
R 11 W
113° 00'
R 10 W


DEPRESSION
R 9 W


SCALE 1:62,500
0 1 2 3
STATUTE MILES
0 1 2 3
KILOMETERS
112°45'
R 8 W
R 7 W
DEPRESSION
DEPRESSION

EXPLANATION

- DESIGNATED TRANSPORTATION NETWORK (DTN)
- PROPOSED HIGHWAY
- PROPOSED RAILROAD
  ALTERNATIVES ARE DASHED
- BUREAU OF LAND MANAGEMENT (BLM) LAND
- PROPOSED LOCATION OF INTERMOUNTAIN POWER PROJECT
- PROPOSED INTERMOUNTAIN POWER PROJECT
  RAILROAD ALIGNMENT
- PRIVATE PROPERTY INCLUDING MINING PATENTS
- STATE PROPERTY INCLUDING MATERIAL SITES
- KNOWN GEOTHERMAL RESOURCE AREA
- STATE AND FEDERAL DESIGNATED SENSITIVE AREAS

OPERATIONAL BASE LAYOUT OPTION 1
SEVIER DESERT, DELTA AREA, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE · BMO

DRAWING
7-1

FUGRO NATIONAL, INC.

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