

WATER AVAILABILITY AND USE IN THE
PROPOSED EL MALPAIS NATIONAL MONUMENT
AND GRANTS CONSERVATION AREA

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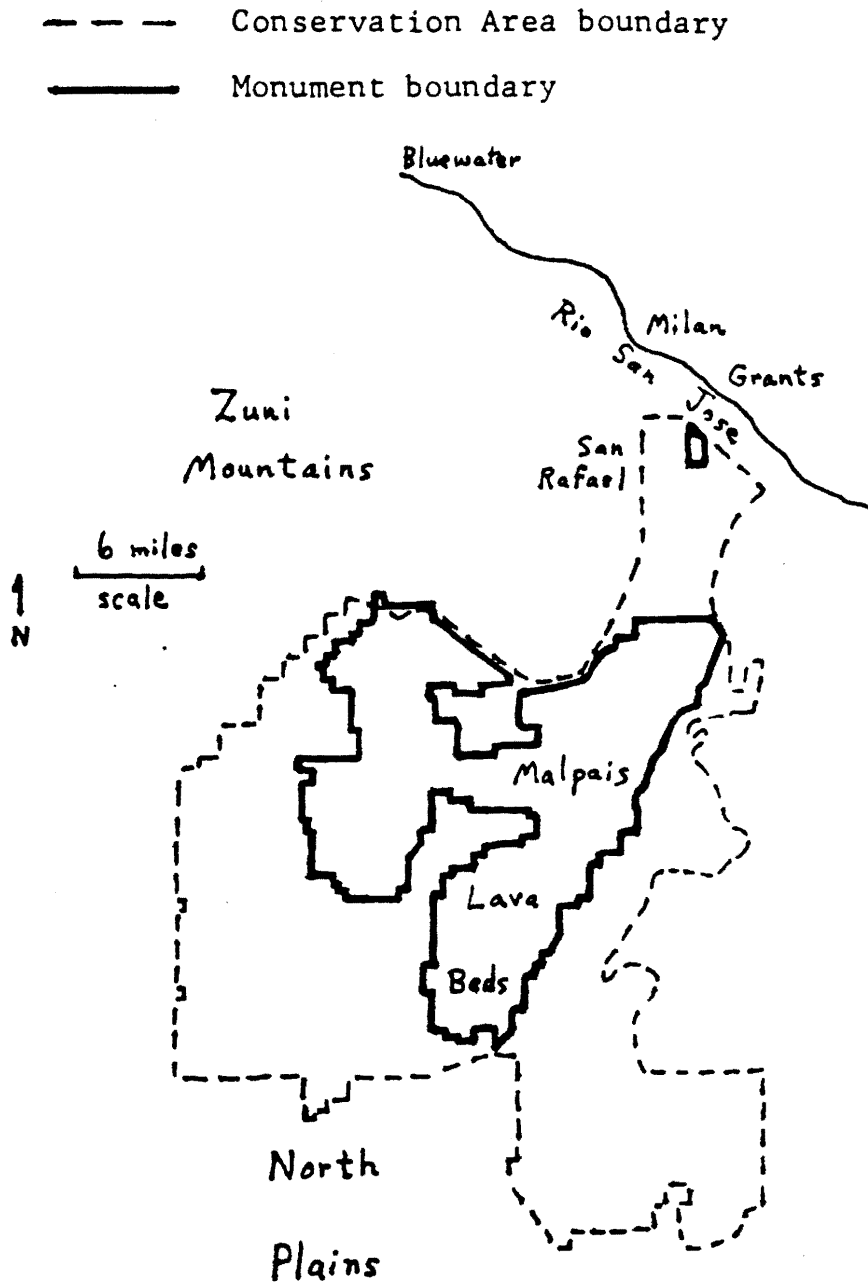
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I. INTRODUCTION

The El Malpais National Monument and surrounding Grants Conservation Area have been proposed for national designation. As part of a survey of existing resources and uses, this report assesses the surface and groundwater resources and summarizes water rights information for the area.

South and west of Grants, the proposed El Malpais National Monument comprises an area of 126,194 acres, surrounded by a proposed Grants Conservation Area about twice as large (Figure 1). With the exception of a small section in the northwest, the area lies on the east side of the Continental Divide, mostly in a closed basin known physiographically as the North Plains and the Malpais Lava Beds. Bounded on the north by the Rio San Jose valley and the Zuni Mountains, the broad lava beds extend southwesterly from Grants. A small section of the southeast part of the larger conservation area lies in the Rio San Jose drainage, as well as a small section of the northeast part. The northern portion of the study area is within the Bluewater Groundwater Basin with the southern portion within the Rio Grande Groundwater Basin.

Figure 1. Location Map: Proposed El Malpais National Monument and Grants Conservation Area



II. OBJECTIVES

The objectives of this survey are the following: 1) to qualitatively assess the surface and groundwater resources of the proposed El Malpais National Monument and Grants Conservation Area; and 2) to summarize water rights information for both areas.

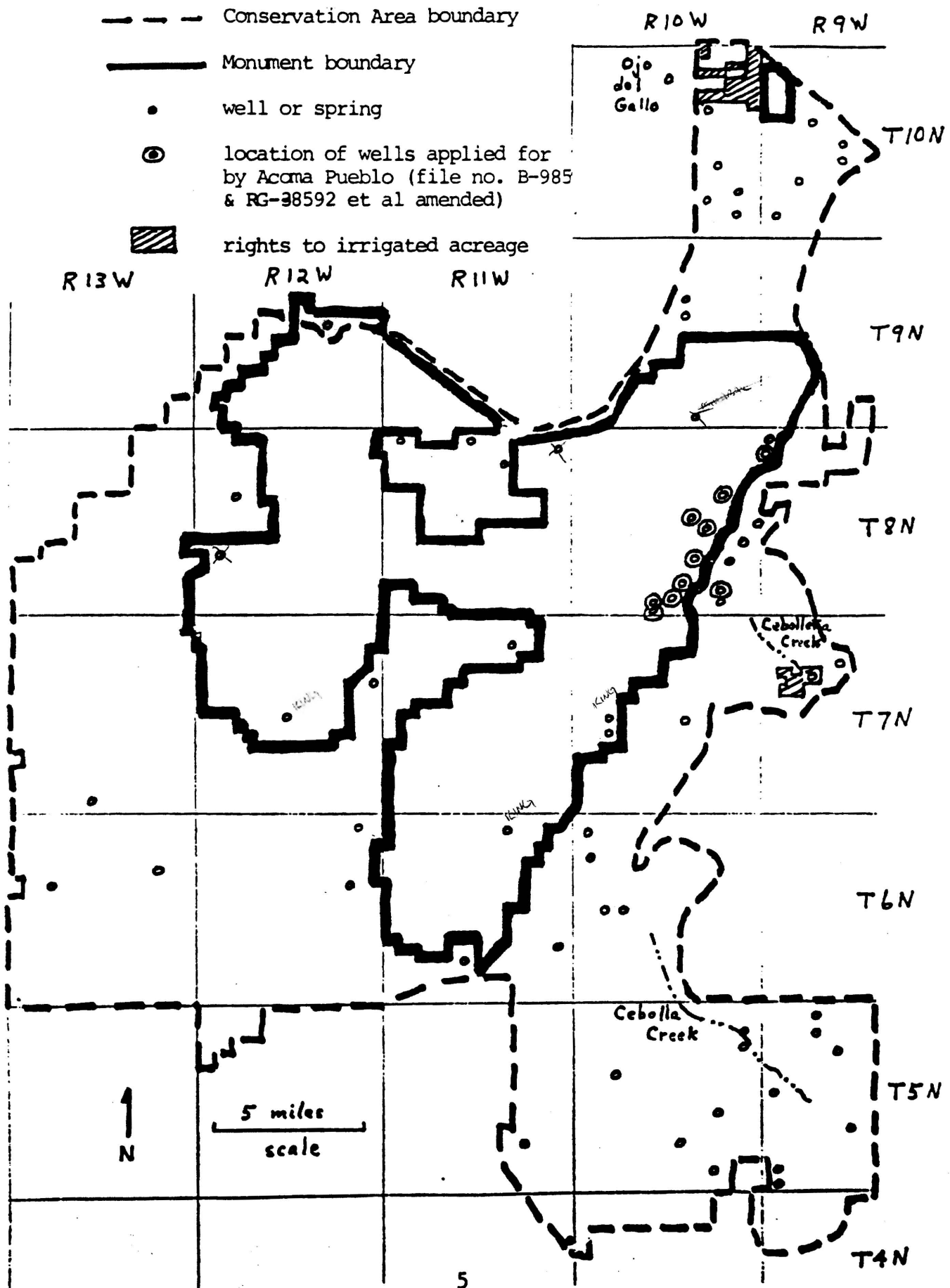
III. SURFACE WATER RESOURCES

Hydrologically, most of the area is a closed basin, with no outflow of surface water. With the exception of a few short stream reaches near springs, all stream channels are ephemeral, with flow ^(LASTING ONLY ONE DAY) resulting from short-duration storms.

The largest ephemeral stream is Cebolla Creek, in the eastern part of the conservation area (Figure 2). The creek has carved a significant channel through the sandstone of the "Rimrock" area, and then is covered by lava near the boundary with the monument. A smaller stream, Cebolleta Creek, is perennial for less than a mile from its spring source near Cebolleta Mesa, and then becomes ephemeral and loses surface expression in the lava of the Malpais. Cebolleta Spring is the source of water for rights to irrigate 280 acres in the conservation area.

The Ojo del Gallo, a spring near San Rafael and outside of the monument and conservation areas, is the source of water for rights to irrigate about 1,600 acres within the conservation area (Figure 2). Three small springs in the southeast part of the conservation area supply stock needs.

Figure 2. Wells, Springs and Water Rights for Irrigated Acreage in the Proposed El Malpais National Monument and Grants Conservation Area



IV. GROUNDWATER RESOURCES

A review of available information indicates that limited geohydrologic data exist for the proposed conservation area. Most wells are for domestic and stock use, capable of providing only relatively small quantities of ground water. Because of these data limitations, the extent to which ground water may be available is uncertain.

Several possible sources of groundwater supply exist, including alluvium and basalt flows used for shallow wells in the northeastern part of the conservation area. Gordon (1961) indicates that the lower portion of the alluvium is the most permeable and that several shallow wells have been drilled through the basalt to the lower alluvium to achieve adequate groundwater supplies. While the basalt appears to be sufficiently fractured to act as an aquifer, it was dry where penetrated by several wells. The maximum thickness of basalt is reported by Gordon to be 197 feet in the northern part of the conservation area. The alluvium and basalt aquifer typically yields adequate supplies for domestic and stock use. A review of State Engineer Office files indicates that some wells may not be able to obtain ground water from the alluvium and basalt in all areas covered by the lava beds.

Consolidated sedimentary rocks beneath the alluvium and basalt are known to yield limited amounts of ground water for stock and domestic use. The principal aquifer in the northern half

of the conservation area is the San Andres-Glorieta aquifer, composed of limestone and sandstone of Permian age (Cooper and West, 1967). Several wells were drilled to depths up to 500 feet in the San Andres-Glorieta. While the San Andres-Glorieta is a major aquifer north of the conservation area, yielding quantities of water from 500 to more than 2,000 gallons per minute (gpm) in the Grants-Bluewater area, yields are probably much lower in the conservation area. The San Andres may be present in the southern half of the conservation area, but at increasingly greater depths and with lesser yields as distances from the northern boundary increase.

The Chinle Formation, consisting of sandstones, siltstones and mudstones of Triassic age, may yield limited quantities of ground water in the northwest part of the conservation area. One well was drilled to 500 feet in the Chinle for domestic and stock use.

Limited quantities of ground water may be available from portions of the Zuni Sandstone of Jurassic age and the Dakota Sandstone of Cretaceous age. Several domestic and stock wells in the eastern and southern part of the area obtain water from the Dakota and Zuni Sandstones at depths up to 500 feet.

The Gallup Sandstone and Crevasse Canyon Formation of Cretaceous age yield water for domestic and stock use in the southeast corner of the conservation area, where wells are up to 190 feet deep.

V. WATER RIGHTS

A survey of water rights on file in the State Engineer Office was conducted for surface and ground water*. Groundwater information is from water rights files for wells drilled after the extension of the Bluewater and Rio Grande Groundwater Basins on May 14, 1976, and from U.S. Geological Survey records of wells and springs in Cibola County for wells drilled prior to this time. Because the pre-basin wells were inventoried by field surveys, the information may not be complete. Surface water information is from files on water rights to irrigated acreage within the boundaries.

Available information indicates that there are at least 58 wells and springs and 10 pending water right applications within the conservation area (Table 1 and Figure 2). Of the the 68 wells, springs and pending applications, 18 are located within the boundary of the monument. While the majority of the wells are shallow ones for stock and domestic use, 10 of the 68 are proposed by the applications filed in 1984 by the Acoma Pueblo for ground water from the San Andres-Glorieta aquifer**. The water would be used by the pueblo for irrigation, stock, domestic and industrial purposes.

*Surface water information was supplied by Kent Breese and groundwater information by Charles Wohlenberg, both of the Water Rights Division of the State Engineer Office.

**The Pueblo has applied to withdraw 20,000 acre-feet from 30 wells, 10 of which are located within the conservation area. Distribution of pumpage among the 30 wells is not specified.

The applications have been protested and consideration of the applications awaits the completion of a groundwater study by the U.S. Geological Survey. Nine of the 10 Acoma applications are located within the boundary of the proposed monument.

Surface water from Ojo del Gallo, a spring located outside the monument and conservation area boundary, has rights associated with it for irrigation use within the conservation area (Table 2 and Figure 2). Water from the spring was used to irrigate 1,593 acres in the northern part of the conservation area. None of this acreage is within the monument boundary.

Surface water from Cebolleta Spring in the eastern part of the conservation area has rights associated with it for the irrigation of 280 acres within the conservation area (Table 2 and Figure 2). Water from the spring is also used for several stock ponds which have a water right. None of these water rights is for use inside the monument boundary.

VI. SUMMARY AND CONCLUSIONS

Information on available water resources within the proposed boundary of the El Malpais National Monument and the Grants Conservation Area is not extensive. Domestic and stock wells of small capacity extract water from several sandstone formations as well as the San Andres-Glorieta aquifer. Without more information on the San Andres-Glorieta and other aquifers, it is conjectural whether moderate to large amounts of ground water would be feasibly recoverable from the area. There are 68 wells, springs and pending water right applications in the proposed Grants Conservation area, of which 18 are located within the El Malpais National Monument boundary. Most are for stock and domestic use, except for 10 pending applications by the Acoma Pueblo for irrigation, stock, domestic and industrial use. There are surface water rights to irrigate 1,873 acres within the conservation area, none of which are located within the monument boundary.

VIII. REFERENCES

- Cooper, J. B. and S. W. West, 1967. Principal aquifers and uses of water between Laguna Pueblo and Gallup, Valencia and McKinley counties, New Mexico. N.M. Geol. Soc. Guidebook, 18th Field Conf., p. 145-149.
- Gordon, E. D., 1961. Geology and groundwater resources of the Grants-Bluewater area, Valencia County, New Mexico. N.M. State Engineer Office Tech. Rpt. 20, 109 p.

TABLE 1

Wells and Springs Located Within the Proposed Boundary
of the El Malpais National Monument and Grants
Conservation Area

Symbols: d, domestic; s, stock; i, irrigation; u, unused;
n, industrial; pb, well drilled prior to basin
declaration in 1976

Location	Owner	Water Right File Number	Use
8.12.17.22	Lowery	B0426	
10.09.17.11	Gottlieb	B0105	
10.10.11.3	Valencia Co.	B0790	d
10.10.26.331	Plains Electric	B0937	
10.10.36.444	Garcia	B0755	d
6.11.28	Raney	RG33042	d,s
6.13.13	Moleras	RG45246	d,s
7.13.34	USDI, BLM	RG36848	d,s
8.10.25	Meringer	RG38355	d,s
*8.11.01.323	Sena	B01101	d,s
*9.12.14.31	Vance	B01094	d,s
*8.9.07.310	Acoma	B985**	i,s,d,n
*8.10.13.110	Acoma	B985**	i,s,d,n
*8.10.14.330	Acoma, BLM	B985**	i,s,d,n
*8.10.23.220	Acoma	B985**	i,s,d,n
*8.10.23.430	Acoma, BLM	B985**	i,s,d,n
*8.10.26.230	Acoma	B985**	i,s,d,n
*8.10.26.310	Acoma, BLM	B985**	i,s,d,n
*8.10.34.340	Acoma	B985**	i,s,d,n
*8.10.34.410	Acoma	B985**	i,s,d,n
8.10.35.110	Acoma, BLM	B985**	i,s,d,n
4.11.12.432	King	pb	d,s
5.09.03.133	Major	pb	u
5.09.10.131	Major	pb	s
5.09.14.221	Major	pb	u
5.09.19.433	Major	pb	u
5.09.25.412	Major	pb	s
5.09.31.323a	Major	pb	u
5.09.31.323	Major	pb	?
5.10.12.113	King	pb	s (spring)
5.10.12.141	King	pb	s (spring)
5.10.17.412	King	pb	s
5.10.23.422	King	pb	s
5.10.27.233	King	pb	s
5.10.34.223	King	pb	s
5.11.26.323	King	pb	s
6.10.06.121	King	pb	s

Location	Owner	Water Right File Number	Use
6.10.07.232	King	pb	s
6.10.20.114	King	pb	s
6.10.20.411	King	pb	s
*6.11.02.412	King	pb	s
6.12.01.311	King	pb	s
6.12.13.421	King	pb	s
6.13.17.112	Moleras	pb	?
7.09.09.334	King	pb	(spring)
*7.10.20.414a	King	pb	s
*7.10.20.414b	King	pb	s
7.10.22.112	King	pb	s
7.11.02.311	King	pb	s
7.12.13.244	King	pb	s
*7.12.21.433	King	pb	s
8.09.07.311	Acoma	pd	s
8.10.24.221	Acoma	pb	s
8.10.24.311	Acoma	pb	s
8.10.26.412	Acoma	pb	s
8.10.35.141	King	pb	s
8.11.04.414	Arrosa	pb	s
8.11.06.233	Bright	pb	s
8.11.10.111	Porter	pb	d
*8.12.19.334	Major	pb	s,d
9.10.10.414	Mirabal	pb	s,d
*9.10.35.110	Mirabal	pb	s
10.09.21.222	Gottlieb	pb	s
10.09.21.444	Gottlieb	pb	s
10.09.29.132	Gottlieb	pb	s
10.09.31.324	Gottlieb	pb	s
10.10.23.132	?	pb	u
10.10.25.331	Mirabal	pb	i

*Locations within the monument boundary

**Acoma Pueblo filed application number "B985 and RG38592 et al amended" on November 9, 1984 to appropriate 20,000 acre-feet of ground water per year from the San Andres-Glorieta aquifer; application has been protested and the consideration of the application awaits completion of a groundwater study by the U.S. Geological Survey.

TABLE 2

Rights to Irrigated Acreage and Stock Ponds Supplied
With Surface Water Sources Within the Proposed
Grants Conservation Area

(none within the boundary of the El Malpais National Monument)

<u>Location</u>	<u>Owner</u>	<u>Water Rights File No.</u>	<u>Water Source</u>	<u>Acres</u>
10.10.1,2	Mirabal	03007	Ojo del Gallo*	290
10.10.14	Klute	03128	Ojo del Gallo*	40
10.10.11	Mirabal	03009	Ojo del Gallo*	110
10.10.26	Mirabal	03952	Ojo del Gallo*	320
10.10.11	La Vega Estates	03058	Ojo del Gallo*	162.8
10,10.1,12	Mirabal	03008	Ojo del Gallo*	670
7.9.8	Garcia	0433	Cebolleta Spring	280
7.9.6,7,8	Bibo	01429	Cebolleta Spring	Stock ponds

*The Ojo del Gallo, a spring located outside the boundary of both the conservation area and the monument, has water rights associated with it for the irrigation of about 1,593 acres within the conservation area.