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APPENDIX C

**MINERAL AND ENERGY RESOURCE ASSESSMENT OF THE
McGREGOR RANGE, NEW MEXICO**

**McGregor Range Land Withdrawal
Legislative Environmental Impact Statement**

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**C.0 MINERAL AND ENERGY RESOURCE ASSESSMENT OF
THE McGREGOR RANGE, NEW MEXICO**

C.1 DEFINITIONS OF LEVEL OF RESOURCE POTENTIAL

NO (N) mineral resource potential is a category reserved for a specific type of resource in a well-defined area.

LOW (L) mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics define a geologic environment in which the existence of resources is unlikely. This broad category embraces areas with dispersed but insignificantly mineralized rock, as well as areas with few or no indications of having been mineralized.

MODERATE (M) mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics indicate a geologic environment favorable for resource occurrence, where interpretations of data indicate a reasonable likelihood of resource accumulation, and (or) where an application of mineral deposit models indicates favorable ground for the specified type(s) of deposits.

HIGH (H) mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics indicate a geologic environment favorable for resource occurrence, where interpretations of data indicate a high degree of likelihood for resource accumulation, where data support mineral deposit models indicating presence of resources, and where evidence indicates that mineral concentration has taken place. Assignment of high resource potential to an area requires some positive knowledge that mineral-forming processes have been active in at least part of the area.

UNKNOWN (U) mineral resource potential is assigned where information is inadequate to assign low, moderate, or high levels of resource potential.

C.2 DEFINITIONS OF LEVEL OF CERTAINTY

A Available information is not adequate for determination of the level of mineral resource potential.

B Available information suggests the level of mineral resource potential.

C Available information gives a good indication of the level of mineral potential.

D Available information clearly defines the level of mineral resource potential.

C.3 RELATIONSHIPS BETWEEN LEVELS OF RESOURCE POTENTIAL AND CERTAINTY

 <p><i>Increasing Level of Resource Potential</i></p>	U/A	H/B High Potential	H/C High Potential	H/D High Potential
	Unknown Potential	M/B Moderate Potential	M/C Moderate Potential	M/D Moderate Potential
		L/B Low Potential	L/C Low Potential	L/D Low Potential
		N/D No Potential		

Increasing Level of Certainty

**McGregor Range Land Withdrawal
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1 **Table C-1. Summary of Mineral and Energy Resource Potential on McGregor Range**

<i>Resource</i>	<i>Area</i>	<i>Potential</i>	<i>Certainty</i>	<i>Comments</i>
<i>Metallic Mineral Resources</i>				
Beryllium	Red Hills area	Low to moderate	B-C	Favorable alkaline host rocks
	Southern Otero Platform area	Low to moderate	C	Similar to topaz-rhyolites
	Martin-Hay Meadow Canyons area	Low	B	None
	Elsewhere on McGregor Range	None	D	None
Copper	Southern Jarilla Mountains area	Low to moderate	C	GPM deposits
	Red Hills area	Low to moderate	C	GPM deposits
	Martin-Hay Meadow Canyons area	Low to moderate	B-C	Sedimentary copper, GPM deposits
	Southern Otero Platform area	Low	C	Epithermal/mesothermal veins
	El Paso-Culp Canyons area	Low	B	Carbonate-hosted deposits
	Elsewhere on the McGregor Range	None	D	None
Gold	Southern Jarilla Mountains area	Low	C	GPM deposits
	Red Hills area	Low	C	Sedimentary copper, GPM deposits
	Martin-Hay Meadow Canyons area	Low to moderate	B	Epithermal/mesothermal veins
	Southern Otero Platform area	Low	C	Carbonate-hosted deposits
	El Paso-Culp Canyons area	Low	B	None
	Elsewhere on the McGregor Range	None	D	None
Iron	Entire McGregor Range	Low	C	Favorable host rocks
Lead-zinc	Southern Jarilla Mountains area	Moderate	C	GPM deposits
	Red Hills area	Low to moderate	C	GPM deposits
	Martin-Hay Meadow Canyons area	Low to moderate	B	Sedimentary copper, GPM deposits
	Southern Otero Platform area	Low	C	Epithermal/mesothermal veins
	El Paso-Culp Canyons area	Low	B-C	Carbonate-hosted deposits
	Elsewhere on the McGregor Range	None	D	None
Manganese	Central basin area	Low to moderate	B-C	Geochemical anomalies
	Elsewhere on the McGregor Range	Low	C	None
Molybdenum	Southern Jarilla Mountains area	Moderate	C	GPM deposits
	Red Hills area	Low	C	GPM deposits
	Martin-Hay Meadow Canyons area	Low to moderate	B	GPM deposits
	Southern Otero Platform area	Low	C	GPM deposits
	Elsewhere on the McGregor Range	None	D	None
	Niobium	Red Hills area	Low	C
	Elsewhere on the McGregor Range	None	D	None
PGE	Entire McGregor Range	None	C-D	Favorable host rocks
Silver	Southern Jarilla Mountains area	Moderate	C	GPM deposits
	Red Hills area	Low to moderate	C	GPM deposits
	Martin-Hay Meadow Canyons area	Low to moderate	B	Sedimentary copper, GPM deposits
	Southern Otero Platform area	Low	C	Epithermal/mesothermal veins
	El Paso-Culp Canyons area	Low	B	Carbonate-hosted deposits
	Elsewhere on the McGregor Range	None	D	None
Thorium and rare-earth elements	Red Hills area	Low	C	Favorable alkaline host rocks
	Elsewhere on the McGregor Range	None	D	None
Tin	Southern Otero Platform area	Low	C	Similar to topaz-rhyolites
	Elsewhere on McGregor Range	None	D	None
Other metallic resources ¹	Entire McGregor Range	None	D	None

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1 **Table C-1. Summary of Mineral and Energy Resource Potential on McGregor Range (Continued)**

<i>Resource</i>	<i>Area</i>	<i>Potential</i>	<i>Certainty</i>	<i>Comments</i>
<i>Industrial Mineral Resources</i>				
Barite and Fluorite	All	Low	B-C	None
Borate	All	Low	D	None
Building Stone	All	Low-Moderate	B-D	Dimension stone has dark color, and decorative stone lacks distinctive colors or textures
Clay	All	Low	C	No specialty clay minerals are present
Construction Aggregate	All	None-High	D	Refer to Figures ES-5 through ES-7
Garnet	Hueco and Jarilla Mountains	Low	C	Possible near Tertiary intrusions
	Elsewhere on the McGregor Range	None	D	None
Gypsum	All	None-High	B-C	Refer to Figure ES-8
Halite	All	Low	C	None
Limestone and Dolestone	All	None-High	D	Refer to Figure ES-9, potential for limestone is rated as none to high and dolestone is rated as low
	Red Hills area	Low	C	None
Nepheline Syenite	Elsewhere on the McGregor Range	None	D	None
Silica	All	Low	D	None
Sulfur	All	Low	D	None
<i>Energy Resources</i>				
Coal	All	None	D	No Cretaceous rocks
Geothermal	Near McGregor Base Camp	High	D	Refer to Figure ES-10
	Western portion of McGregor Range	Moderate	B	Refer to Figure ES-10
	Elsewhere on the McGregor Range	Low	B	Refer to Figure ES-10
Petroleum	Otero Platform and Huecco Uplift area	Low-Moderate	C	Refer to Figure ES-11
	Sacramento Uplift area	Low	C	Refer to Figure ES-11
	Tularosa Basin area	Moderate	C	Refer to Figure ES-11
	Hueco Mountains and Martin-Hay Meadows area	Low	C	Refer to Figure ES-12
	Elsewhere on the McGregor Range	None	D	None

2 ¹ Includes: bismuth, cadmium, cobalt, chromium, nickel, tantalum, vanadium, tungsten, and zirconium.

3 Source: U.S. Army 1998g.

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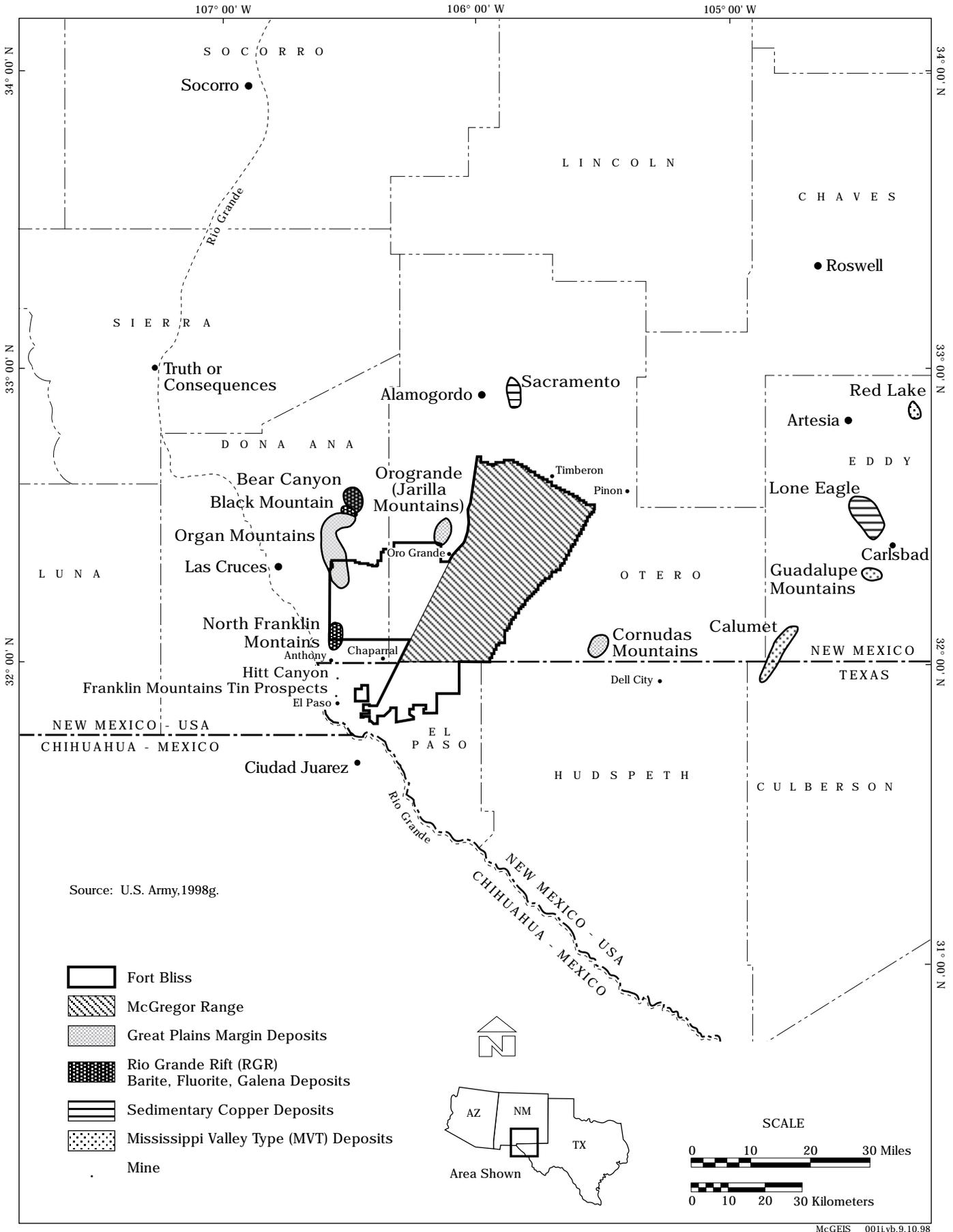


Figure C-1. Mining Districts Adjacent to the McGregor Range.

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1 **Table C.2. Summary Information on Mining Districts Adjacent to McGregor Range**

<i>District Name (Aliases)</i>	<i>Year of Discovery</i>	<i>Production Years</i>	<i>Historically Produced Commodities</i>	<i>Estimated Cumulative Value² (\$K)</i>	<i>Type of Mineral Deposit</i>
Bear Canyon (Stevens, San Augustin)	1883	Early 1900s	Copper, silver, lead, barite	< 5	RGR
Black Mountain (Kent, Organ, Gold Camp)	1883	1883-1990s	Copper, gold, silver, fluorite, lead	< 78	RGR
Calumet	1900s	1914-1927	Copper, silver	0	Sedimentary copper
Cornudas Mountains	1950s	1995	Nepheline syenite	0	GPM
Franklin Mountains Tin Deposits	1900s	1900s	Tin	< 5	Tin vein
Guadalupe Mountains (Two Ladies)	1930s	None	None	< 1	MVT
Hitt Canyon	Unknown	None	None	0	Copper, lead, zinc skarn or carbonate-hosted deposits, iron contact-metasomatic and skarn
Lone Eagle (Golden Eagle, Lucky Strike, Great Eagle, Annon)	1905	1905-1956	Copper	8	Sedimentary copper
Northern Franklin Mountains	1914	1925-1928	Lead, silver, gypsum, jarosite, galena	< 1	RGR deposits, sedimentary
Organ Mountains (Mineral Hill, Bishops Cap, Organ Gold Camp, Modac, South Canyon, Soledad Canyon, Texas Canyon)	1830s, perhaps as early as 1797	1849-1961	Copper, lead, gold, silver, barite, fluorite, uranium, vanadium, zinc, bismuth	4,000	Carbonate-hosted lead-zinc replacement, skarn, pegmatites, epithermal/mesothermal veins, porphyry-copper-molybdenum(?), copper breccia, RGR
Orogrande (Jarilla, Brice, Silver Hill)	1890	1890-1966	Copper, gold, lead, silver, iron, tungsten, turquoise	2,000	GPM, placer gold
Red Lake	Unknown	1900s	Copper, silver	< 1	MVT
Sacramento (High Rolls)	1900	1904-1962	Copper, lead, gold, silver, zinc	100	Sedimentary copper

2 ¹ Refer to Figure 35 for approximate locations.

3 ² Value of production in original dollars.

4 Source: U.S. Army, 1998g.

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