

(303) 236-5593  
FAX (303) 236-3200  
awilson@usgs.gov

August 17, 2001

Ms. Charlene Rainville  
National Grassland Exchange Coordinator  
U.S. Forest Service - Rocky Mountain Region  
2250 East Richards Street  
Douglas, WY 82633-8922

Dear Ms. Rainville:

This is in response to your June 8, 2001 request for information on locatable mineral resources in a land exchange proposal in which Alvin Zietlow and Dennis Zelpner have offered certain non-Federal lands within the Nebraska National Forest in exchange for Federal lands within the Nebraska National Forest.

In accordance with the working agreement under Public Law 86-509, we are providing you with a report on the locatable mineral resources on the lands in the Spring Draw Land Exchange described in "Exhibits A and B" included with your request. (I have changed the description on Exhibit A from Sec. 22, SW1/4NW1/4 to SW1/4SW1/4 to match the location shown on the map.) These lands comprise 1754.62 acres, more or less, in Pennington County, South Dakota.

Sincerely yours,

Anna B. Wilson, Geologist  
Mineral Resources Program, Central Region

Copies:       W.D. Day  
                  E.A. duBray

LOCATABLE MINERAL REPORT FOR THE  
SPRING DRAW (Zietlow/Zelpher) LAND EXCHANGE OFFER,  
BUFFALO GAP NATIONAL GRASSLAND,  
NEBRASKA NATIONAL FOREST,  
PENNINGTON COUNTY, SOUTH DAKOTA

By  
Anna B. Wilson  
U.S. Geological Survey

August 17, 2001

*The following report is based on information contained in USGS mineral resource and commodity files, mineral information databases (MRDS and MAS), and on reports and maps available in the USGS library. These data are occasionally augmented with unpublished documents, personal communications, and professional experiences. No field studies or on-site visits were performed in preparing this report. Emphasis is primarily on locatable mineral resources. Leasable and salable resources are covered only if they appear in the above documents. Mineral resource assessments are subjective: the opinions expressed herein are entirely those of the author.*

For the legal location description of lands considered for exchange, refer to Exhibits A and B in Attachment A. Approximate locations of parcels are shown on Attachment B. Rock units are described in Attachment C and a geologic map is included as Attachment D.

## **NON-FEDERAL**

### **#1. T. 3 S., R. 12 E., Secs. 22, 27, 28 (160 acres)**

Scenic SW 1:24,000; 1:100,000; and 1:250,000 quadrangles

This T-shaped parcel in Indian Creek is mapped as Cretaceous Pierre Shale (King and Raymond, 1971). Larger scale mapping of the Scenic and Sheep Mountain Table quadrangles to the east (Raymond and King, 1974) shows Quaternary Older Alluvium (Qoa) in the valley bottoms. It is likely that Qoa is present along Indian Creek and therefore throughout much of this parcel overlying the Pierre Shale.

### **#2. T. 3 S., R. 12 E., Sec. 36 (320 acres)**

Heutmacher Table 1:24,000; 1:100,000; and 1:250,000 quadrangles

Heavily dissected topography of this rectangular parcel is underlain by Cretaceous Pierre Shale topped by Oligocene Chadron Formation (the lower part of the White River Group) (King and Raymond, 1971). Immediately adjacent to this parcel, the Chadron Fm. is capped with Qoa and some Qa (Raymond and King, 1974), but the map stops just east of the parcel. Metatyuyamunite (?), a calcium uranyl vanadate, occurs adjacent to the parcel in the northeast corner of the section (Moore and Levish, 1955).

### **#3. T. 3 S., R. 13 E., Sec. 30 (157.96 acres)**

Scenic 1:24,000; 1:100,000; and 1:250,000 quadrangles

This square-shaped parcel is entirely within Oligocene Brule Formation (the upper part of the White River Group) (King and Raymond, 1971). Geologically this parcel is similar to the Federal Sec. 18 parcel, below. The parcel may be entirely covered with Quaternary Eolian Sand (Raymond and King, 1974).

### **#4. T. 3 S., R. 13 E., Sec. 33 (240 acres)**

Sheep Mountain Table 1:24,000; 1:100,000; and 1:250,000 quadrangles

This rectangular parcel is mapped as mostly Chadron Formation on the lower elevations in the northern part and overlain by Brule Formation in the higher southern part (King and Raymond, 1971). The parcel may be capped with Quaternary Older Alluvium (Qoa) (Raymond and King, 1974).

## **FEDERAL**

**#5. T. 3 S., R. 13 E., Sec. 5 & 6** (718.74 acres)  
Scenic 1:24,000; 1:100,000; and 1:250,000 quadrangles

The parcel spans Spring Draw from Hart Table on the west to Kube Table on the east, exposing the entire local stratigraphic section: black shale and interior zone of Pierre Shale, Chadron, and Brule Formations (Attachment C) (King and Raymond, 1971; Raymond and King, 1974). Quaternary alluvium (Qoa) is present in Spring Draw and eolian sand (Qe) caps both Hart and Kube Tables (Raymond and King, 1974).

**#6. T. 3 S., R. 13 E., Sec. 18** (157.92 acres)  
Scenic 1:24,000; 1:100,000; and 1:250,000 quadrangles

This square-shaped parcel is entirely within Oligocene Brule Formation (the upper part of the White River Group) (King and Raymond, 1971). Geologically this parcel is similar to the non-Federal Sec. 30 parcel, above. The parcel may be entirely covered with Quaternary Eolian Sand (Raymond and King, 1974).

## **RESOURCE ASSESSMENT**

Uranium occurrences are common in the region, however no productive mines are known to occur in the vicinity (McFaul and others, 2000). In sec. 31, about 1 mi from the parcels in sections 36, 30, and 33, uranium minerals are “abundant along the axis of a channel sandstone” near the top of the Chadron Fm. (Moore and Levish, 1955, p. 4). Most of the uranium occurs as uranocircite, a barium uranyl phosphate. “Metatyuyamunite(?), a calcium uranyl vanadate” occurs adjacent to the Sec. 36. parcel in the top inch of a 2 ft-thick bed of freshwater limestone at the top of the Chadron Fm. Spring-water samples may contain high concentrations of uranium and should be tested before considered for use as a water supply. Eolian sand is generally too fine grained to be of commercial use. No other mineral resources are known in the area. The closest is an occurrence of molybdenum and uranium in T. 4 S., R. 12 E., sec. 3 (McFaul and others, 2000; A.B. Wilson, USGS, unpublished data). Mineral resource potential on all the parcels is low.

## REFERENCES:

- King, R.U., and Raymond, W.H., 1971, Geologic map of the Scenic area, Pennington, Shannon, and Custer Counties, South Dakota: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-662, scale 1:31,680.
- McFaul, E.J., Mason, G.T., Jr., Ferguson, W.B., and Lipin, B.R., 2000, U.S. Geological Survey Mineral Databases--MRDS and MAS/MILS: U.S. Geological Survey Digital Data Series DDS-52.
- Moore, G.W., and Levish, Murray, 1955, Uranium-bearing sandstone in the White River Badlands, Pennington County, South Dakota: U.S. Geological Survey Circular 359, 7 p.
- Raymond, W.H., and King, R.U., 1974, Geologic map of the Scenic and parts of the Brennan Flat and Sheep Mountain Table quadrangles, Pennington and Shannon Counties, South Dakota: U.S. Geological Survey Miscellaneous Field Studies Map MF-603, scale 1:24,000.

## LIST OF ATTACHMENTS:

- A. Exhibits A and B (provided by U.S. Forest Service)
- B. Approximate locations of parcels (provided by U.S. Forest Service)
- C. Description of Rock units (from Raymond and King, 1974)
- D. Geologic map of a portion of the Scenic area (from King and Raymond, 1971)