U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Locatable Mineral Reports for Colorado, South Dakota, and Wyoming provided to the U.S. Forest Service in Fiscal Year 1999

by

Anna B. Wilson

Open File Report OF 99-501

1999

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FIGURES OR ATTACHMENTS

COLORADO

INTRODUCTION

The U.S. Geological Survey is required by Congress (under Public Law 86-509) to provide Locatable Mineral Reports to the U.S. Forest Service whenever National Forest System lands are sold or exchanged. This volume is a compilation of the reports already provided to the Forest Service by the author in fiscal year 1999. Altogether, the reports describe the geology and resource potential of about 127 properties covering considerably more than 11,927 acres in 8 National Forests.

Locatable Mineral Reports provide complete and reliable information even though the sizes of land parcels and degree of difficulty in producing the reports varies. Each report was researched and written using library resources, professional experience, and interviews with other geoscientists as appropriate--no field work was conducted. The reports were not formally reviewed, but appropriate scientists were asked to give informal feedback before they were submitted to the Forest Service. Copies of the reports reside in U.S. Geological Survey Mineral Resource Program and U.S. Forest Service files.

Most recent land exchanges are proposed for mutual convenience to gather both Federal and private lands into manageable blocks. Some are proposals by Towns, Counties, and States to enhance the "common good". Others are motivated by ranchers to improve their grazing lands and efficiency of their operations. Many recent land exchange offers are directed toward acquisition of public lands in high-value recreation areas (such as ski areas). The potential for litigation, controversy, and politics is much higher when land exchanges involve "high-value real estate" than when exchanges involve common grazing lands. Hence, locatable mineral reports must be reliable enough to withstand scrutiny of litigants vying for "high-stakes" real estate.

Twelve reports are included in this volume. They are grouped by State, then alphabetically by Forest. Each report starts with a cover letter and title page. Geologic descriptions of the properties, their mineral potential, and references comprise the main body of each report. Legal descriptions (either verbatim or paraphrased from descriptions supplied by the Forest Service) of the property locations are given either before the main body of the report or as attachments designated Exhibits A and B; figures follow. The figures, normally photocopies of cited references, are provided only for the convenience of the Forest Service minerals examiner--they have not been redrafted.

COLORADO

United States Department of the Interior
GEOLOGICAL SURVEY
BOX 25046 M.S. 905
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO:

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

June 23, 1999

Mr. M. M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your April 14, 1999 request for information on locatable mineral resources in the Shepard and Associates Land Exchange Offer, in which certain non-Federal lands within Pike National Forest have been offered in exchange for Federal lands also within Pike National Forest.

In accordance with the working agreement under Public Law 86-509, I am providing you with a report on the locatable mineral resources on the lands described in Exhibits "A" and "B", included with your request. These lands comprise 550 acres, more or less, in Park and Teller Counties, Colorado.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE SHEPARD AND ASSOCIATES LAND EXCHANGE OFFER, PIKE NATIONAL FOREST, PARK AND TELLER COUNTIES, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

June 23, 1999

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 are occasionally augmented with unpublished documents and personal 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.

Locations of properties are described in Exhibits A and B (Attachment 1), as supplied by the US Forest Service.

NON-FEDERAL LANDS

Round Hill parcel
(Fairplay West 1:24,000 quadrangle)

The Round Hill parcel is about 7-8 mi south-southwest of Fairplay and immediately south of Breakneck Pass. Tweto (1974; Tweto and others, 1978) mapped the area as gray and red sandstone, grit, conglomerate, black shale, and locally abundant gypsum of the Pennsylvanian Minturn and Belden Formations (see Attachment 2). Pleistocene (Pinedale and Bull Lake) outwash and terrace gravels and pre-Bull Lake glacial drift cover much of the western part of the parcel.

The parcel is not known to be in an area of productive mineral deposits (Tweto, 1974). The glacial deposits should be examined for sand and gravel potential.

FEDERAL LANDS

Woodland Park parcel
(1:24,000 quadrangle)

The Woodland Park parcel is less than 2 mi northwest of Woodland Park. It is mapped (see Attachment 3) as Proterozoic Y Pikes Peak Granite (Ypp) in the Pikes Peak batholith (Bryant and others, 1981). The eastern part of the parcel may include Holocene and Pleistocene colluvium and Pleistocene fan alluvium. The parcel may be in the Ute Pass fault zone on the west flank of the Manitou Park half graben (Bryant and others, 1981, section B).

No mines or prospects occur in the vicinity (MRDS, 1999), but Pikes Peak Granite is known to host ore deposits elsewhere in the region.

REFERENCES:

Bryant, Bruce, McGrew, L.W., and Wobus, R.A., 1981, Geologic map of the Denver 1° X 2^{0} quadrangle, north-central Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-1163, scale 1:250,000.

Tweto, Ogden, 1974, Reconnaissance geologic map of the Fairplay West, Mount Sherman, South Peak, and Jones Hill 7 1/2-minute quadrangles, Park, Lake, and Chaffee Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-555, scale 1:62,500.

Tweto, Ogden, Moench, R.H., and Reed, J.C., Jr., 1978, Geologic map of the Leadville 1° X 2° quadrangle, northwestern Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-999, scale 1:250,000.

OTHER SOURCES OF INFORMATION:

Davis, M.W., and Streufert, R.K., 1990, Gold occurrences of Colorado: Colorado Geological Survey Resource Series 28, 101 p., 2 plates.

U.S. Geological Survey, 1999a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1999b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

LIST OF ATTACHMENTS:

1. Exhibits A and B, descriptions of lands to be considered for exchange (provided by the USFS)

2. Geologic map of the area near Round Hill (Tweto, 1974, scale 1:62,500)

3. Geologic map of the area near Woodland Park (Byrant and others, 1981, scale 1:250,000).

EXHIBIT A

Property Shepard and Associates, LLC, will consider exchanging:

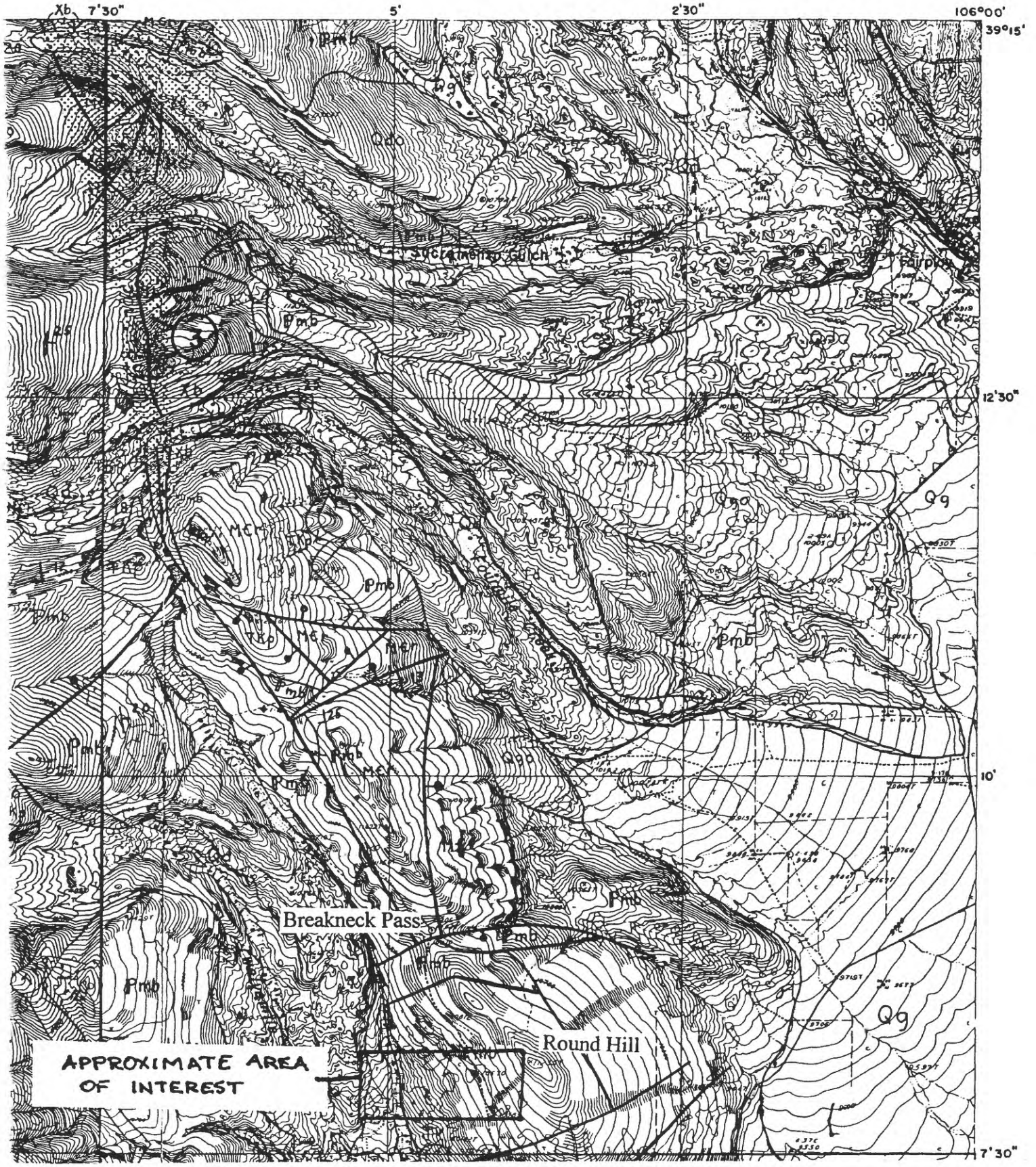
Township 10 South, Range 78 West of the 6th P.M.
Section 35: S1/2
Section 36: W1/2SW1/4
Park County, Colorado
Consisting of approximately 400 acres

EXHIBIT B

Property that the United States Forest will consider exchanging:

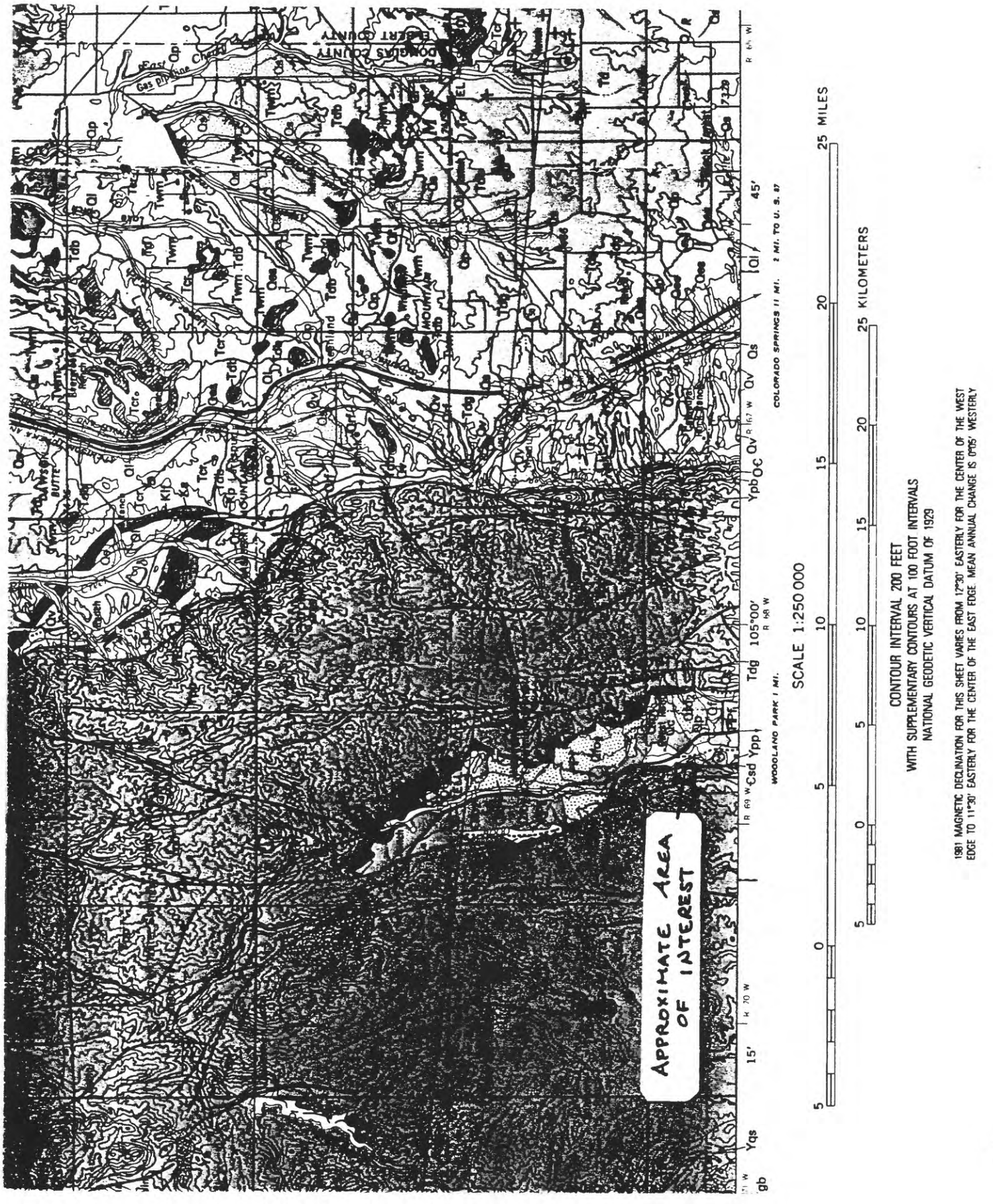
Township 12 South, Range 69 West of the 6th P.M.
Section 10: E1/2NE1/4
Section 11: E1/2E1/2NW1/4NW1/4, W1/2NW1/4NW1/4, SW1/4NW1/4
Teller County, Colorado
Consisting of approximately 150 acres

ATTACHMENT 1. Exhibits A and B, descriptions of lands to be considered for exchange (provided by the USFS)



ATTACHMENT 2: Geologic map of the area near Round Hill (Tweto, 1974, scale 1:62,500)

ATTACHMENT 3. Geologic map of the area near Woodland Park (Byrant and others, 1981, scale 1:250,000).



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November 23, 1998

Mr. M. M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your October 26, 1998 (received October 28, 1998) request for information on locatable mineral resources in the land exchange proposal in which the City of Fort Collins has offered certain non-Federal lands within Roosevelt National Forest in exchange for Federal lands also within Roosevelt 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 described in Exhibits "A" and "B", included with your request. These lands comprise 710 acres, more or less, in Larimer County, Colorado.

Sincerely yours,

Anna B. Wilson, Geologist
Mineral Resource Surveys, Central Region

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE CITY OF FORT COLLINS LAND EXCHANGE OFFER, ROOSEVELT NATIONAL FOREST, LARIMER COUNTY, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

November 23, 1998

EXHIBIT A: Property that the City of Fort Collins will consider exchanging:

6th Principal Meridian, Larimer County, Colorado

		acres
T. 8N., R. 72W.		
PARCEL A:	sec. 5 SW 1/4, SE 1/4	40
PARCEL B:	sec 19, E1/2 SW 1/4; NE 1/4 SW 1/4; NW 1/4 SE 1/4	160
T. 8N., R. 73W.		
PARCEL C:	sec. 15, S 1/2 NE 1/4; NW 1/4 SE 1/4; NE 1/4 SW 1/4	160
PARCEL D:	sec. 26, SW 1/4 NW 1/4; NW 1/4 SW 1/4	
	sec. 27, SE 1/4 NE 1/4; NE 1/4 SE 1/4	160

Total non-federal property considered for exchange: ±520

EXHIBIT B: Property that the Forest Service will consider exchanging:

6th Principal Meridian, Larimer County, Colorado

T. 7N.., R. 76W.	acres
Secs. 24, 25,26: Joe Wright Reservoir	190.0

Total federal property considered for exchange ±190.0

Total acreage considered for exchange **±710**

APPROXIMATE LOCATIONS OF PARCELS A-D SHOWN ON ATTACHMENT A

APPROXIMATE LOCATION OF JOE WRIGHT RESERVOIR SHOWN ON ATTACHMENT B

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 are occasionally augmented with unpublished documents and personal 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.

NON-FEDERAL LANDS

Parcel A

(Big Narrows 1:24,000 quadrangle; Cache la Poudre Wilderness)

Parcel A is located along the west bank of the Cache la Poudre River on the edge of the Cache la Poudre Wilderness. The tract is located about a mile south of the Poudre River Shear Zone on the north limb of the South Fork Antiform (Abbott, 1976, Attachment C). The rocks are Early Proterozoic migmatitic biotite schist intruded by Early and Middle Proterozoic pegmatite (map units Xms and YXp). Quaternary alluvium (map unit Qal) drapes the schist along the river. A mostly concealed Precambrian-age fault may cut the southeast corner of the parcel.

Most of the pegmatite is probably related to the Middle Proterozoic Silver Plume Granite but some may be related to the Early Proterozoic Boulder Creek granodiorite. Beryl occurs in some pegmatite bodies in the area (USGS, 1998a, b; Pearson and others, 1981).

Uranium mineralization is associated with some of the pegmatites and shear zones, but there is no indication of concentrations large enough to constitute an ore deposit (USGS, 1998a, b; Pearson and others, 1981). Scheelite-bearing calc-silicate gneiss (Xcg) has been prospected for tungsten (Abbott, 1976) about three miles to the southeast, but no gneiss is mapped in Parcel A. Oxidized and weakly mineralized zones in calc-silicate gneiss and amphibolite lenses at the intersection of the Skin Gulch and Poudre River shear zones, about 4-5 mi to the east, have been prospected for sulfide minerals (Abbott, 1976) but no production has been reported. Mineral resource potential for all other metals is low.

Parcels A-D are all at the southeastern extent of the Tertiary activity at the Manhattan mining district. This small district produced a small amount of gold . Between 1932 and 1941, 16 tons of ore from small veins yielded 27 oz of gold and 9 oz of silver (Vanderwilt, 1947, p. 139). No production from the district was reported from 1941-1960 (Del Rio, 1960, p. 188-192). The Tertiary igneous rocks are thin dikes and small bodies of rhyolite. One is present about a mile north of Parcel A (Abbott, 1976), others are present several miles to the west in Dad Gulch (Shaver and others, 1988; T. Klein, U.S. Geological Survey, written communication, November 1998).

Parcel B
(Rustic 1:24,000 quadrangle)

Parcel B is mapped as interlayered Early Proterozoic migmatitic biotite schist (Xms), quartzofeldspathic mica schist (Xqs), and quartzofeldspathic gneiss (Xfg) which were metamorphosed about 1,710 Ma (Shaver and others, 1988, Attachment D). These are intruded by Early and Middle Proterozoic pegmatite (YXp) and Middle Proterozoic equigranular phase of the Silver Plume granite (Yse) dated at about 1,390 +/-30 Ma. A small amount of Quaternary alluvium (Qal) is present in the east central area.

A prospect is shown on the topographic and geologic maps in the northwest part of the parcel in the migmatitic schist (Xms). According to Pearson and others (1981), this prospect consists of two shafts, one 33 ft (10 m) deep, the other caved to 6 ft (2 m). The MRDS database lists this site as a probable silver vein (USGS, 1998a). Samples from the collars contained only traces of metals.

A few miles to the east there are several mines and prospects in gold- and silver-bearing veins, uranium-bearing veins, and beryl-bearing pegmatites (Attachment E). No other productive mines or prospects are in the vicinity (U.S. Geological Survey, 1998 a, b).

There is low mineral potential for precious metal veins, uranium in veins, and for pegmatite deposits. Potential for all other metallic mineral resources is low.

Parcel C
(Rustic 1:24,000 quadrangle)

Parcel C is mapped as interlayered migmatitic biotite schist (Xms), amphibolite gneiss (Xam), anthophyllite-cordierite gneiss (Xacg), granitic gneiss (Xgg), and calc-silicate gneiss (Xcg) which were metamorphosed about 1,710 Ma (Shaver and others, 1988, Attachment D). These are intruded by Early and Middle Proterozoic pegmatite (YXp) and Middle Proterozoic equigranular Silver Plume granite (Yse). There may be small Middle Proterozoic dikes (Yd) at the extreme eastern edge of the parcel. Quaternary alluvium (Qal) fills the stream valley and forms the road bed for Brown Road in Bennett Creek.

Of the four parcels considered for exchange, Parcel C is closest to the Manhattan mining district (U.S. Geological Survey, 1998 a, b; see Attachment E), but the absence of mapped Tertiary intrusions on the parcel indicate low potential for precious-metal deposits. There is low mineral potential for uranium in veins and for pegmatite deposits. Potential for all other metallic mineral resources is low.

Parcel D
(Rustic 1:24,000 quadrangle; Comanche Peak Wilderness)

Parcel D is mapped as quartzofeldspathic schist (Xqs) with minor inclusions of amphibolite gneiss (Xam) metamorphosed, together, at about 1,710 Ma (Shaver and others, 1988, Attachment D). These are intruded by Early and Middle Proterozoic pegmatite (YXp) and Middle Proterozoic equigranular Silver Plume granite (Yse). Quaternary alluvium (Qal) fills Jacks Gulch and a northeast-trending lineament that may contain an inferred fault.

No productive mines or prospects are in the immediate vicinity (U.S. Geological Survey, 1998 a, b; Pearson and others, 1981). There is low mineral potential for precious metal veins, uranium in veins, and for pegmatite deposits. Potential for all other metallic mineral resources is low.

SUMMARY OF PARCELS A-D

A map showing the locations the Parcels and of mines and prospects in the USGS databases (U.S. Geological Survey, 1998 a, b) is included as Attachment E. Locations in the MRDS database plot as pluses, locations from the MILS database as squares. Many are superimposed on one another. It isn't known if the locations in one database were "borrowed" from the other. Locations reported in the two databases are notoriously inaccurate and none of the locations has been verified for this report. Only the MRDS locations are labeled on this Attachment. The Attachment illustrates that Parcels A-D lie between two distinct mining clusters. Mineral resource potential for all the Parcels is low.

FEDERAL LANDS
Joe Wright Reservoir
(Clark Peak and Chambers Lake 1:24,000 quadrangles; between Neota and Rawah Wilderness)

The entire tract is under the reservoir (Attachment B). The reservoir has no resource potential for locatable minerals.

REFERENCES CITED:

Abbott, J.T., 1976, Geologic map of the Big Narrows quadrangle, Larimer County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-1323, scale 1:24,000.

Del Rio, S.M., 1960, Mineral Resources of Colorado–First Sequel: State of Colorado Mineral Resources Board, 764 p.

Pearson, R.C., Braddock, W.A., Flanigan, V.J., and Patten, L.L., 1981, Mineral resources of the Comanche-Big South, Neota-Flat Top and Never Summer Wilderness Study Areas, North-Central Colorado: U.S. Geological Survey Open-File Report OF 81-578, 73 p.

Shaver, K.C., Nesse, W.D., and Braddock, W.A., 1988, Geologic map of the Rustic quadrangle, Larimer County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-1619, scale 1:24,000.

U.S. Geological Survey, 1998a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1998b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

Vanderwilt, J.W., 1947, Mineral Resources of Colorado: State of Colorado Mineral Resources Board

OTHER SOURCES OF INFORMATION:

Hanley, J.B., Heinrich, E.W., and Page, L.R., 1950, Pegmatite investigations in Colorado, Wyoming, and Utah 1942-1944: U.S. Geological Survey Professional Paper 227, 125 p.

Lovering, T.S., and Goddard, E.N., 1950, Geology and ore deposits of the Front Range, Colorado: U.S. Geological Survey Professional Paper 223, 319 p.

Meeves, H.C., Harrer, C.M., Salsbury, M.H., Konselman, A.S., and Shannon, S.S., Jr., 1966, Reconnaissance of beryllium-bearing pegmatite deposits in six western states: U.S. Bureau of Mines Information Circular IC-8298, 34 p.

Pearson, R.C., McCallum, Griswold, M.L., and Patten, L.L., 1982, Mineral resources of the Rawah Wilderness, Larimer County, Colorado: U.S. Geological Survey Open-File Report OF 82-376, 27 p.

ATTACHMENTS:

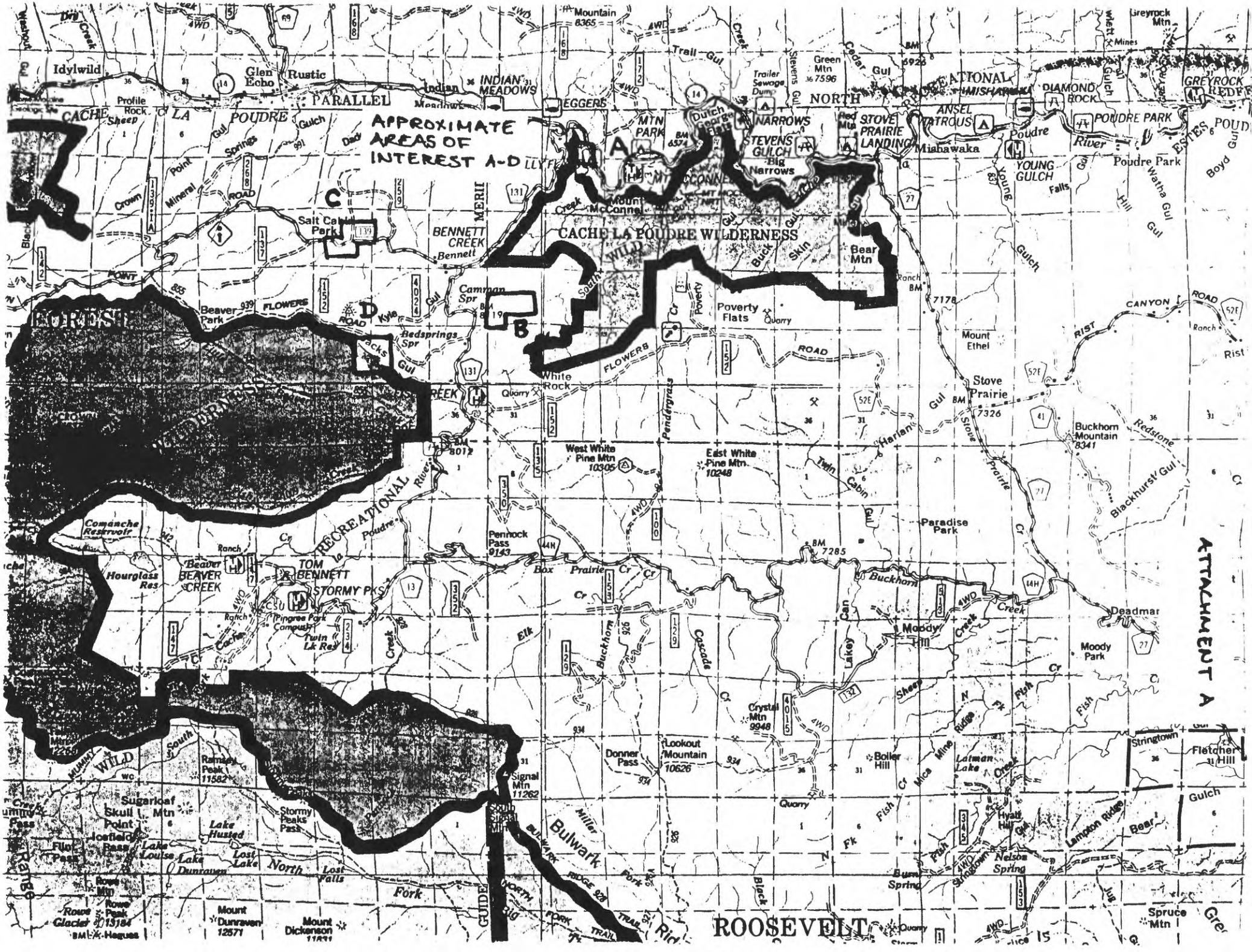
A. Map showing locations of land exchange Parcels A-D.

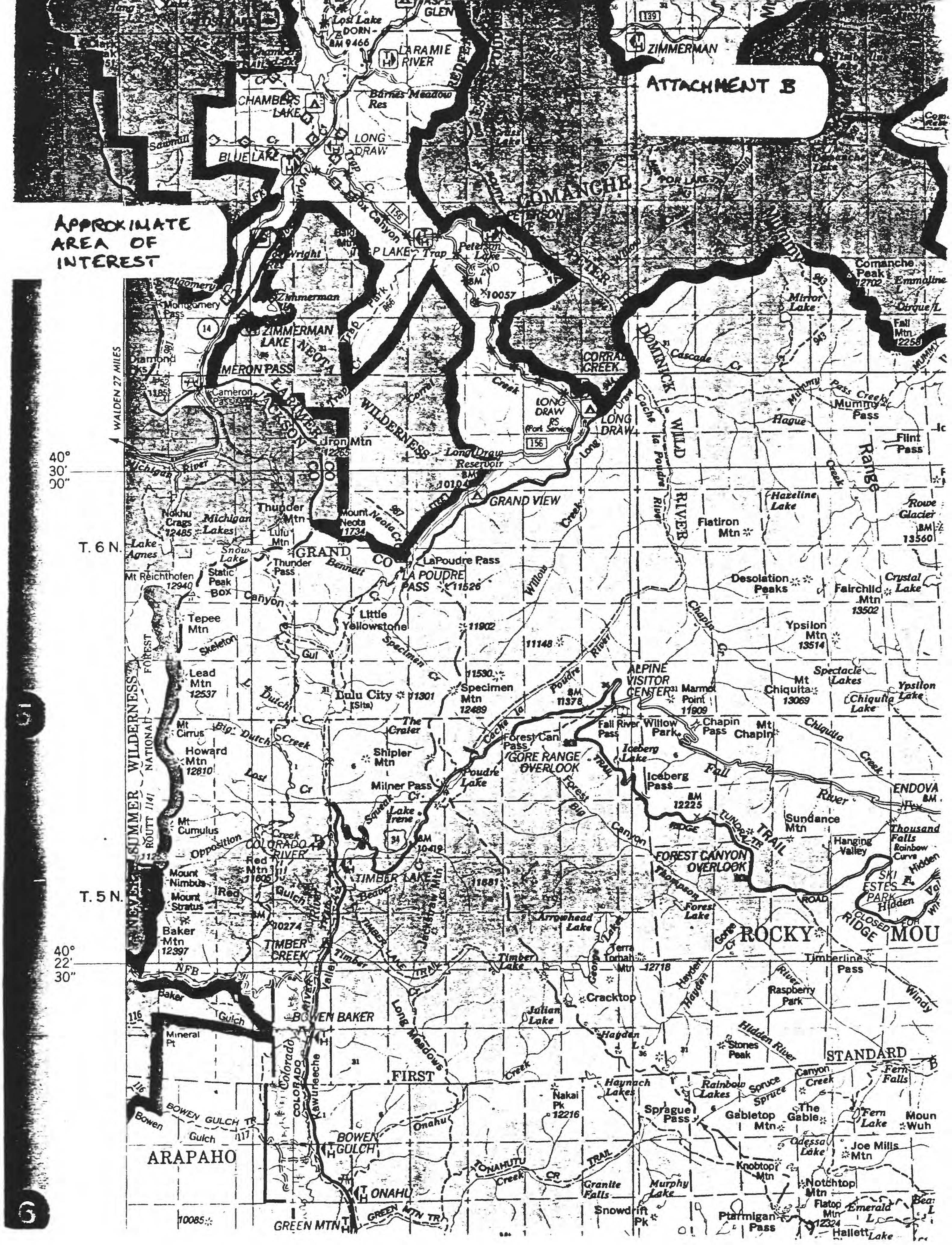
B. Map showing location of Joe Wright Reservoir.

C. Geologic map of part of the Rustic quadrangle (Shaver and others, 1988) in the vicinity of Parcel A.

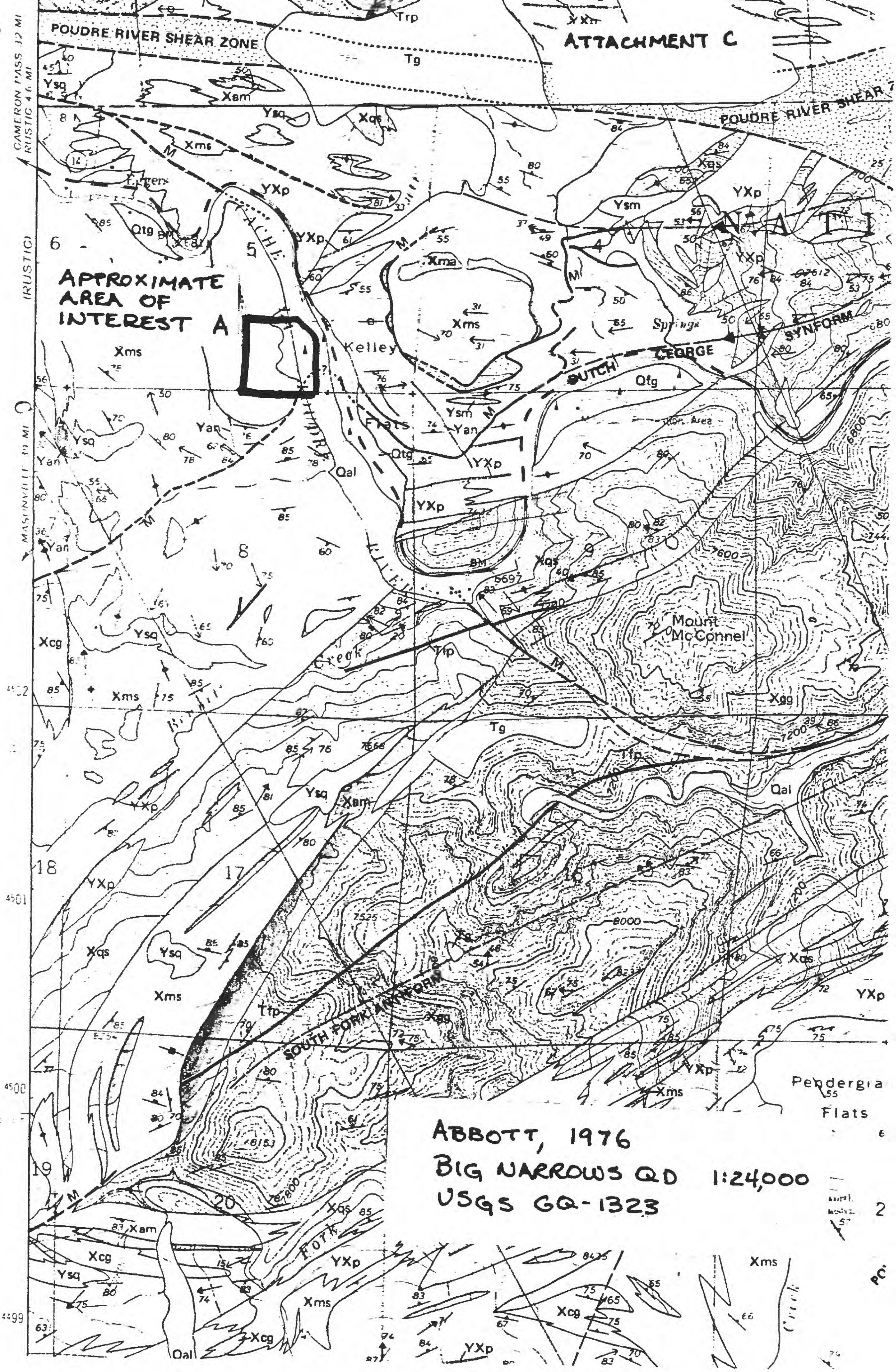
D. Geologic map of part of the Big Narrows quadrangle (Abbott, 1976) in the vicinity of Parcels B-D.

E. Approximate location of mines and prospects and location of Parcels A-D. Mine and prospect locations from USGS (1998a, b).

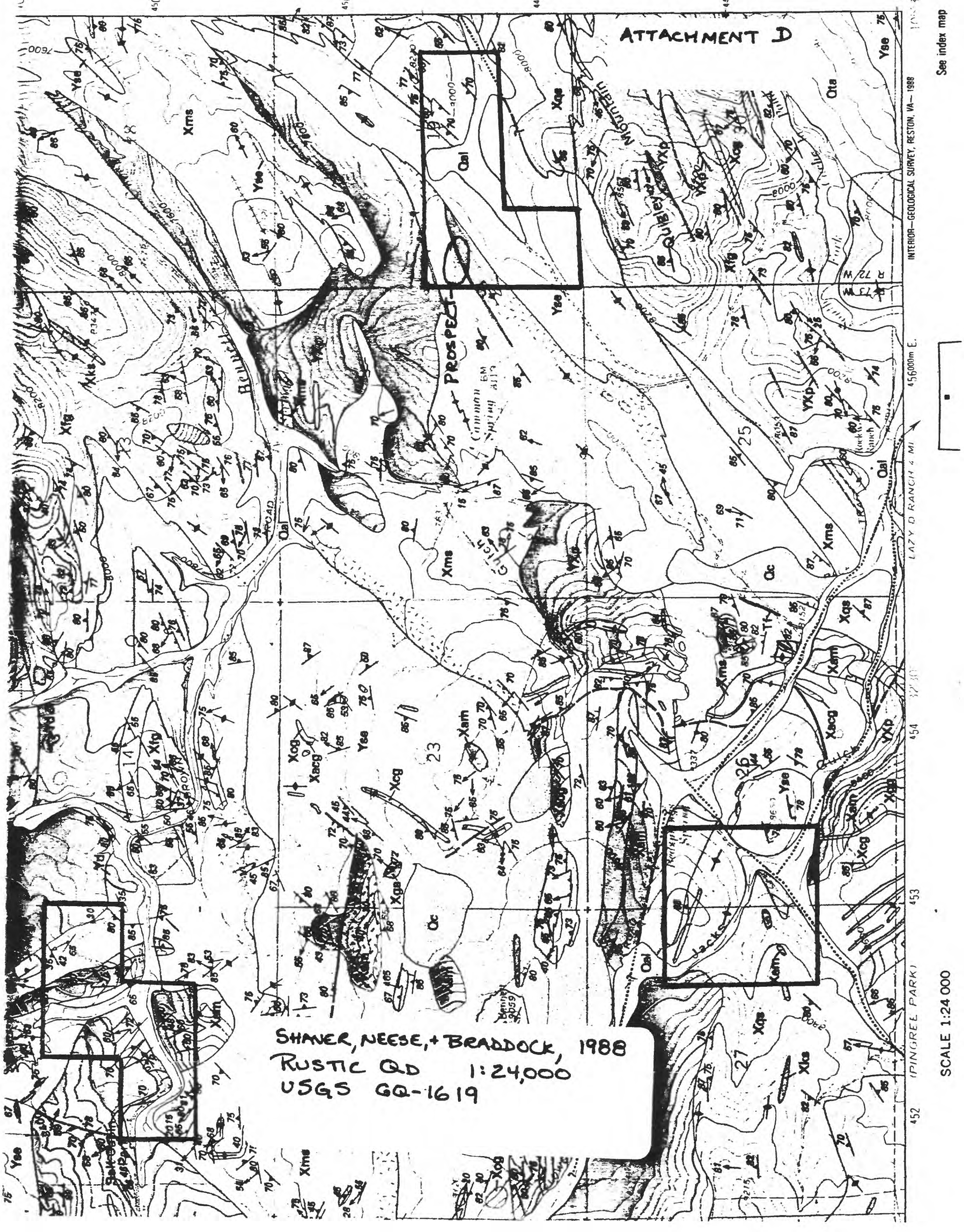

APPROXIMATE AREAS OF INTEREST A-D
A
B
C
D
CACHE LA POUDRE WILDERNESS
ROOSEVELT
NORTH PARALLEL
CACHE LA POUDRE
RECREATIONAL
NATIONAL
FOREST
ATTACHMENT A



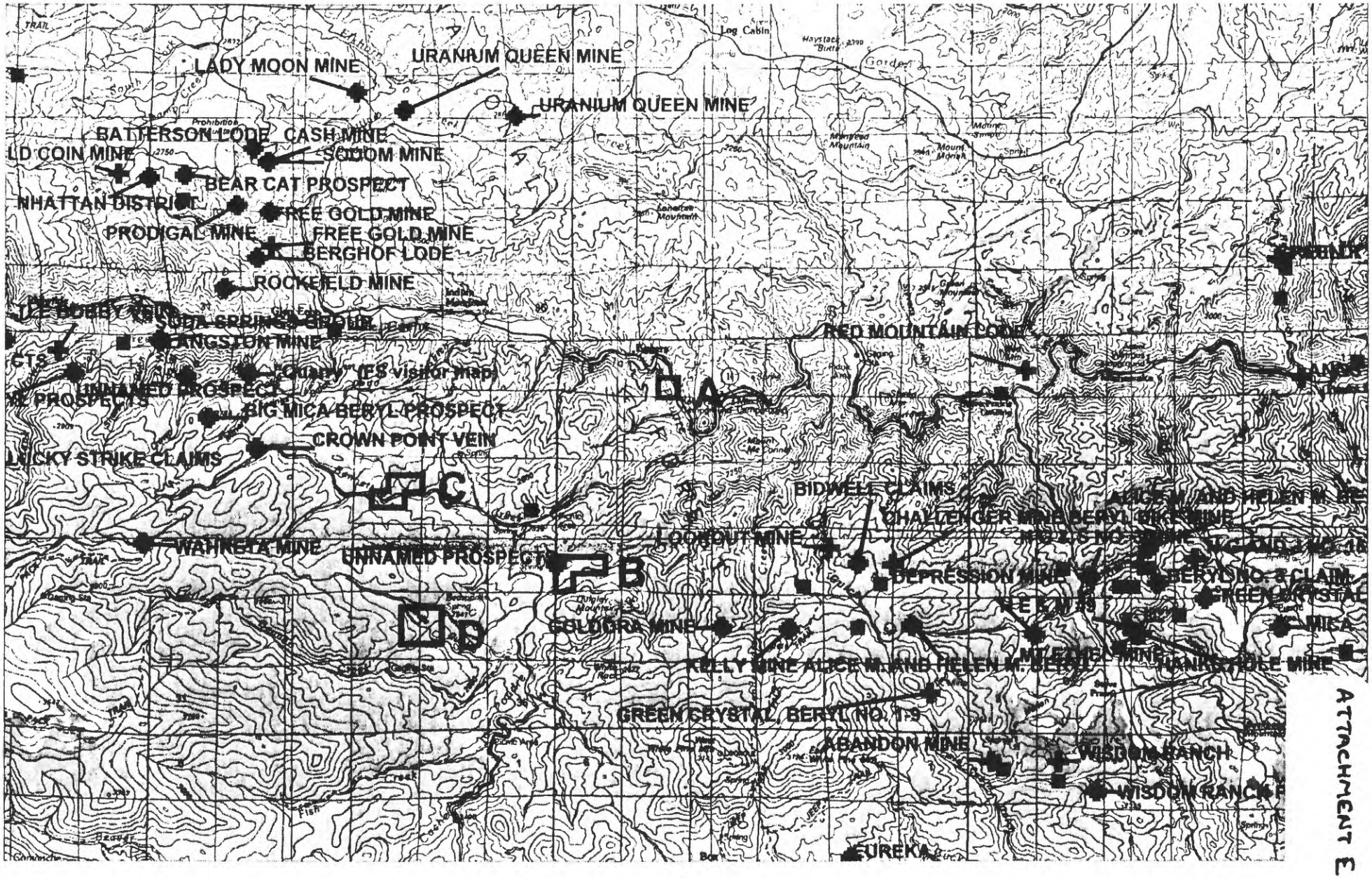
ATTACHMENT B
APPROXIMATE AREA OF INTEREST
Lost Lake
LARAMIE RIVER
ZIMMERMAN
CHAMBERS LAKE
Barnes Meadow Res
LONG DRAW
BLUE LAKE
COMANCHE
Box Canyon
Peterson Lake
Zimmerman
ZIMMERMAN LAKE
NEOTA
CAMERON PASS
Cameron Pass
WALDEN 27 MILES
Diamond Pks
Montgomery Pass
Comanche Peak 12702
Mirror Lake
Fall Mtn 12258
Emmaline L
Cirque L
CORRAL CREEK
Cascade Cr
Mummy Pass
Mummy Pass Creek
Hague
Flint Pass
Range
NEOTA WILDERNESS
LONG DRAW RS (Fort Service)
LONG DRAW
Long Draw Reservoir
Iron Mtn 12265
Michigan River
40° 30' 00"
GRAND VIEW
Nokhu Crags 12485
Michigan Lakes
Thunder Mtn
Lulu Mtn
Mount Neota 11734
Hazeline Lake
Rowe Glacier
13560
Flatiron Mtn
T. 6 N.
Lake Agnes
Snow Lake
Thunder Pass
GRAND
Bennett
LaPoudre Pass
LA POUDRE PASS 11526
Mt Reichthofen 12940
Static Peak
Box Canyon
Desolation Peaks
Fairchild Mtn 13502
Crystal Lake
Tepee Mtn
Little Yellowstone
11902
Ypsilon Mtn 13514
11148
Skeleton
Specimen Cr
Lead Mtn 12537
11530
ALPINE VISITOR CENTER
Marmot Point 11909
Spectacle Lakes
Mt Chiquita 13069
Ypsilon Lake
Chiquita Lake
Lulu City (Site)
11301
Specimen Mtn 12489
BM 11378
Dutch Cr
The Crater
Fall River Pass
Willow Park
Chapin Pass
Mt Chapin
Mt Cirrus
Big Dutch Creek
Forest Can Pass
Howard Mtn 12810
Shipler Mtn
GORE RANGE OVERLOOK
Iceberg Lake
Chiquita Creek
Iceberg Pass
BM 12225
Fall River
ENDOVA
Lost Cr
Milner Pass
Poudre Lake
Lake Irene
Sundance Mtn
Thousand Falls
Rainbow Curve
Hanging Valley
Mt Cumulus
Opposition Creek
COLORADO RIVER
BM 10419
TUNDRA TR
TRAIL RIDGE
FOREST CANYON OVERLOOK
Big Thompson
Forest Canyon
Red Mtn 11605
Mount Nimbus
Mount Stratus
TIMBER LAKE
Jackstraw Mtn
11881
SKI ESTES PARK
Hidden Valley
T. 5 N.
Red Gulch
BM 10274
Arrowhead Lake
Forest Lake
ROCKY MOU
ROAD CLOSED
Baker Mtn 12397
TIMBER CREEK
Timber Cr
TIMBER LAKE TRAIL
Terra Tomah Mtn 12718
Timberline Pass
40° 22' 30"
Timber Lake
Windy
NFB
Baker Gulch
Cracktop
Hayden Gorge
Raspberry Park
BOWEN BAKER
Julian Lake
Long Meadows
Mineral Pt
Colorado
Kawuneeche
Hayden L
Stones Peak
Hidden River
STANDARD
FIRST
Creek
Haynach Lakes
Rainbow Lakes
Spruce Canyon
Fern Falls
Nakai Pk 12216
Sprague Pass
Gabletop Mtn
The Gable
Fern Lake
Mount Wuh
BOWEN GULCH TR
Bowen Gulch
ARAPAHO
BOWEN GULCH
Onahu
Odessa Lake
Joe Mills Mtn
TONAHUTU CR TRAIL
Knobtop Mtn
Notchtop Mtn
Granite Falls
Murphy Lake
ONAHU
Snowdrift Pk
Ptarmigan Pass
Flatop Mtn 12324
Emerald L
Hallett
10085
GREEN MTN
GREEN MTN TR
NEVER SUMMER WILDERNESS
ROUTT NATIONAL FOREST


ATTACHMENT C
POUDRE RIVER SHEAR ZONE
POUDRE RIVER SHEAR
APPROXIMATE AREA OF INTEREST A
Kelley
Flats
DUTCH GEORGE
SYNFORM
Mount McConnel
SOUTH FORK ANTIFORM
Pendergra
Flats
ABBOTT, 1976
BIG NARROWS QD 1:24,000
USGS GQ-1323
CAMERON PASS 32 MI
RUSTIC 4.6 MI
(RUSTIC)
MASONVILLE 39 MI

ATTACHMENT D



SHANER, NEESE, + BRADDOCK, 1988
RUSTIC QD 1:24,000
USGS GQ-1619



ATTACHMENT E

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 905
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

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September 15, 1999

Mr. M.M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your September 9, 1999 (received September 14) request for information on locatable mineral resources on Federal lands, within the Roosevelt National Forest, which The Eldora Group has applied to acquire under the Small Tracts Act.

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 described in "Exhibit A", included with your request. These lands comprise 16.92 acres, more or less, in Boulder County, Colorado.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE ELDORA LAND ACQUISITION, ROOSEVELT NATIONAL FOREST, BOULDER COUNTY, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

September 15, 1999

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, and their location shown on a geologic map, please refer to Attachment A.

Federal
Nederland 1:24,000 quadrangle

Two parcels north of Eldora are in areas mapped as Precambrian hornblende gneiss (Gable, 1969). Quaternary glacial gravels or valley till may cover the lower slope of the eastern parcel (Gable, 1969). Although there has been some historic exploratory mining on the south flank of Eldorado Mountain, there have not been any productive mines. Mineral potential for precious metals in polymetallic veins is low.

The third parcel, south of Eldora, is mapped as Precambrian hornblende gneiss and microcline gneiss (Gable, 1969). It is directly over some of the workings of the Enterprise mine, the most productive mine in the Eldora district (Lovering and Goddard, 1950). The 400 ft Enterprise shaft is located south of the parcel, and both the Mogul and Swarthmore tunnels, on or adjacent to the north edge of the parcel, intercept the vein at depth. In 1896 and 1897, the mine produced 1,800 tons of ore, said to have averaged $10.80 per ton, mainly in gold, with some silver (Lovering and Goddard, 1950, p. 197). At $20.67/oz, this works out to about 1/2 oz gold per ton. Other reports claim the ore averaged 1 to 2 oz/ton of gold.

Most of the ore occurs in east-west trending veins made up of 1-3 ft wide, sheeted zones containing several narrow seams of ore. Most of the ore material is gold telluride minerals such as sylvanite and petzite, which occur as small specks in "horn" quartz or in greenish roscoelite and, rarely, as crystals. Fine-grained molybdenite intergrown with barite is common. Roscoelite was especially abundant in the ore from Mogul tunnel and the Enterprise mine . Pyrite is sparse. Mineral resource potential for similar gold-silver vein deposits on this parcel is high (Lovering and Goddard, 1950, p. 197).

REFERENCES:

Gable, D.J., 1969, Geologic map of the Nederland quadrangle, Boulder and Gilpin Counties, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-833, scale 1:24,000.

Lovering, T.S., and Goddard, E.N., 1950, Geology and ore deposits of the Front Range, Colorado: U.S. Geological Survey Professional Paper 223, 319 p.

LIST OF ATTACHMENTS:

A. Exhibit A (supplied by U.S. Forest Service) and geology of part of the Nederland quadrangle (from Gable, 1969), showing approximate location of parcels.

EXHIBIT A

Lands to be conveyed by the United States:

T. 1 S., R. 73 W.

sec. 20, Lots 66, 87, and 88;
sec. 21, Lots 82, 84, and 112.

Containing 16.92 acres, more or less.

Attachment A. Exhibit A (supplied by U.S. Forest Service) and Geology of part of the Nederland quadrangle(from Gable, 1969), showing approximate location of parcels.

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 905
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

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

November 4, 1998

Mr. M. M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your October 26, 1998 (received October 28, 1998) request for information on locatable mineral resources in the Maitland land exchange proposal in which the Walter McC. Maitland Trust and Ruth V. Maitland have offered certain non-Federal lands within Roosevelt National Forest in exchange for Federal lands also within Roosevelt 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 described in Exhibits "A" and "B", included with your request. These lands comprise 355 acres, more or less, in Larimer County, Colorado.

Sincerely yours,

Anna B. Wilson, Geologist
Mineral Resource Surveys, Central Region

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE MAITLAND LAND EXCHANGE OFFER, ROOSEVELT NATIONAL FOREST, LARMIMER COUNTY, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

November 4, 1998

EXHIBIT A: Property that the Walter McC. Maitland Trust and Ruth V. Maitland will consider exchanging:

6th Principal Meridian, Larimer County, Colorado

		acres
T. 6N., R. 72W.		
Sec. 9:	E 1/2 SE 1/4	80
Sec 10:	SW 1/4 SW 1/4	40
Sec. 15:	NW 1/4 NW 1/4	40
T. 8N., R. 71W.		
Sec. 32:	Trailhead area in portion of NW 1/4 NE 1/4 SW 1/4	± 3
Sec. 32:	Trail ROW (right of way) in SW 1/4 SW 1/4 NW 1/4 (20' x 600')	± 0.275
Total non-federal property considered for exchange:		±163.275

EXHIBIT B: Property that the Forest Service will consider exchanging:

6th Principal Meridian, Larimer County, Colorado

		acres
T. 6N., R. 72W.		
Sec. 36:	NE 1/4 NW 1/4	36.98
Sec. 36:	N 1/2 NE 1/4	74.45
T. 6N., R. 71W.		acres
Sec. 31:	SW 1/4 NE 1/4	40
Sec. 31:	SE 1/4 NW 1/4	40
Total federal property considered for exchange		±191.43
Total acreage considered for exchange		**±355**

APPROXIMATE LOCATIONS OF PARCELS SHOWN ON ATTACHMENT A

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 are occasionally augmented with unpublished documents and personal 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.

NON-FEDERAL LANDS
T. 6N., R. 72W.
(Glen Haven 1:24,000 quadrangle)

The non-federal lands are in the headwaters of Miller Fork, north of the Big Thompson River and Bulwark Ridge. The parcel is underlain by Early Proterozoic metasedimentary knotted mica schist (Bucknam and Braddock, 1989, Attachment B, map unit Xks). The schist is relatively high grade and contains microcline and sillimanite. Locally, it may be intruded by small bodies of Middle and Early Proterozoic pegmatite (map unit YXp).

This tract is in the vicinity of the Crystal Mountain pegmatite district, about three miles to the northeast (U.S. Geological Survey 1998a,b; Hanley and others, 1950; Thurston, 1955; Meeves and others, 1966). The tract should be examined for beryllium-bearing pegmatite bodies. If none is found, mineral resource potential for all commodities and deposit types is low.

Trailhead access and Right of Way
(Glen Haven 1:24,000 quadrangle)

The trailhead area is mapped as Early Proterozoic trondhjemite of Thompson Canyon overlain with Quaternary colluvium at the edge of a mass of Middle and Early Proterozoic pegmatite (Bucknam and Braddock, 1989, Attachment C, map units Xtc, Qc, and YXp, respectively).

The Crystal Mountain Pegmatite district is about 3 miles to the north, and the Hyatt pegmatite mine is about 2 miles to the northeast (U.S. Geological Survey 1998a,b; Hanley and others, 1950; Thurston, 1955; Meeves and others, 1966). The site should be examined for beryllium-bearing pegmatites. If none is found, mineral resource potential for all commodities and deposit types is low.

FEDERAL LANDS
T. 6 N., R. 72 W.
(Glen Haven 1:24,000 quadrangle)

The Federal lands are primarily underlain by Middle and Early Proterozoic pegmatite in fault contact with metasedimentary knotted mica schist (Bucknam and Braddock, 1989, Attachment C, map units YXp and Xks). Small bodies of Middle Proterozoic biotite-muscovite-alkali feldspar granite that grades into pegmatite (map unit Yag) are present in the two parcels. The metamorphic rocks contain muscovite and sillimanite. The metamorphic grade is slightly lower than at the non-Federal lands in Miller Fork. Both Federal parcels are cut by a WNW-trending fault that is brecciated along the segment that passes through section 36. The granite (Yag) has been dated at 1,361 +/-30 Ma, and regional metamorphism has been dated at 1,713 +/- 30 Ma (Bucknam and Braddock, 1989).

Although two pegmatites are mapped in this area (map units YXp and Yag), it is not possible to distinguish them based on field observations. At least some of the pegmatite in unit YXp may be equivalent to pegmatite included in Yag. There is also some speculation that the pegmatite on Crosier Mountain, only 1 to 2 miles to the south and mapped within the same continuous pegmatite unit as the Federal lands, may be older than the beryllium-bearing pegmatites.

The Crystal Mountain Pegmatite district is about 3 miles to the north, and the Hyatt pegmatite mine is about 2 to 3 miles to the northeast (U.S. Geological Survey 1998a,b; Hanley and others, 1950; Thurston, 1955; Meeves and others, 1966). The site should be examined for beryllium-bearing pegmatites. If none is found, mineral resource potential for all commodities and deposit types is low.

REFERENCES CITED:

Bucknam, R.C., and Braddock, W.A., 1989, Geologic map of the Glen Haven quadrangle, Larimer County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-1626, scale 1:24,000.

Hanley, J.B., Heinrich, E.W., and Page, L.R., 1950, Pegmatite investigations in Colorado, Wyoming, and Utah, 1942-1944: U.S. Geological Survey Professional Paper 227, 125 p.

Meeves, H.C., Harrer, C.M., Salsbury, M.H., Konselman, A.S., and Shannon, S.S., Jr., 1966, Reconnaissance of beryllium-bearing pegmatite deposits in six western states: U.S. Bureau of Mines Information Circular IC-8298, 34 p.

Thurston W.R., 1955, Pegmatites of the Crystal Mountain district, Larimer County, Colorado: U.S. Geological Survey Bulletin 1011, 185 p.

U.S. Geological Survey, 1998a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1998b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

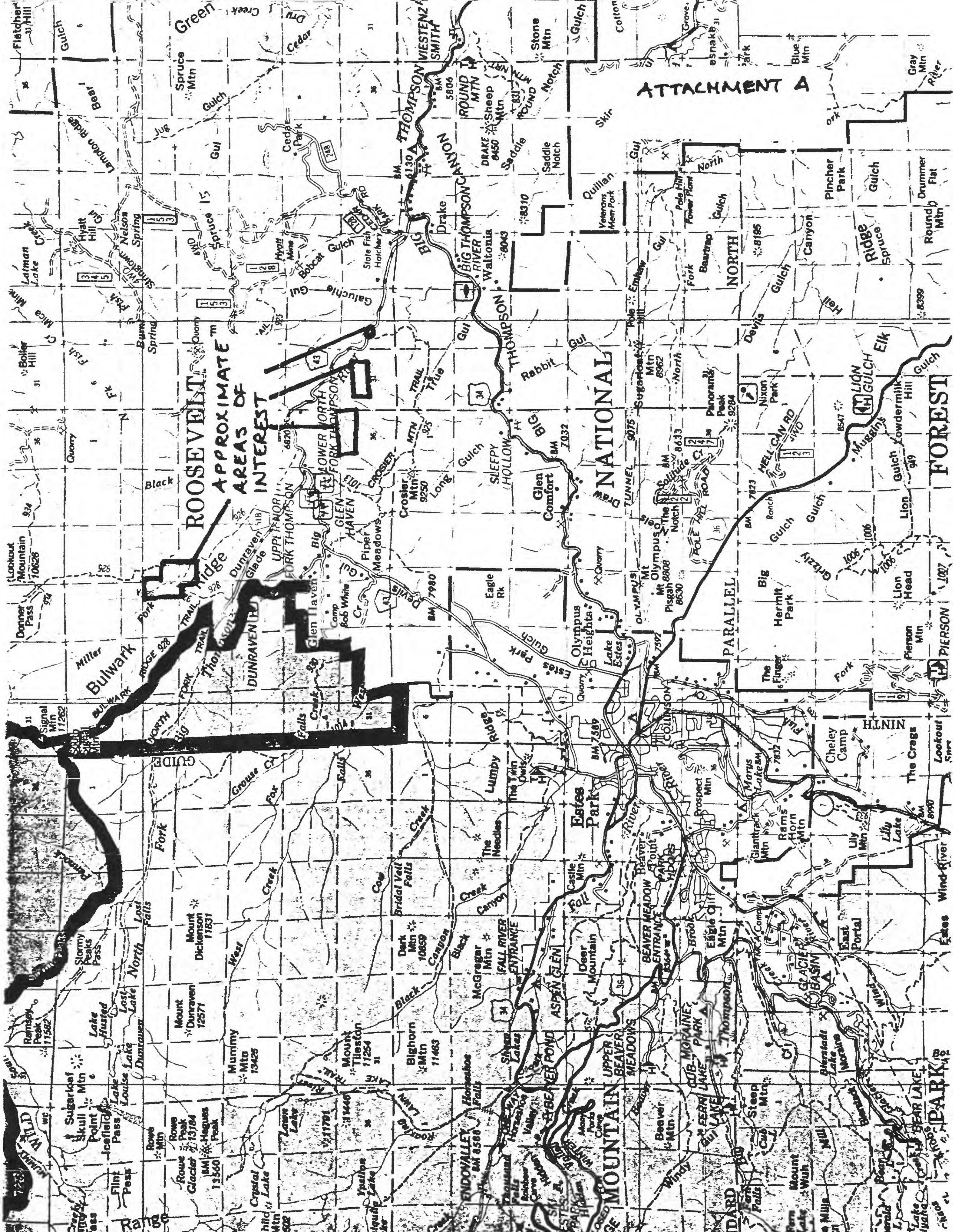
LIST OF ATTACHMENTS:

A. Map showing locations of land exchange parcels.

B. Geologic map of area of Non-Federal lands considered for exchange (Bucknam and Braddock, 1989).

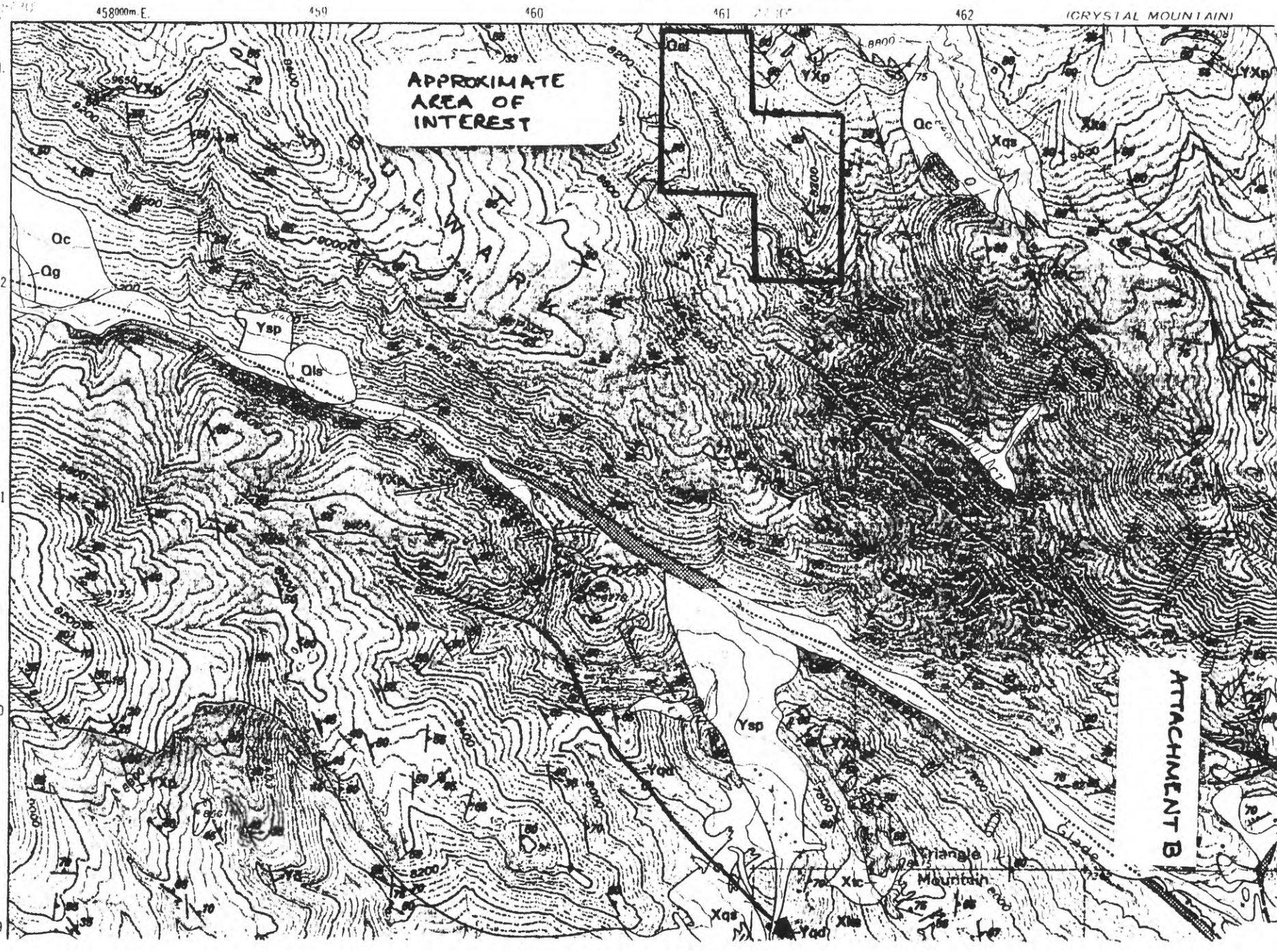
C. Geologic map of trailhead area and Federal lands considered for exchange (Bucknam and Braddock, 1989).

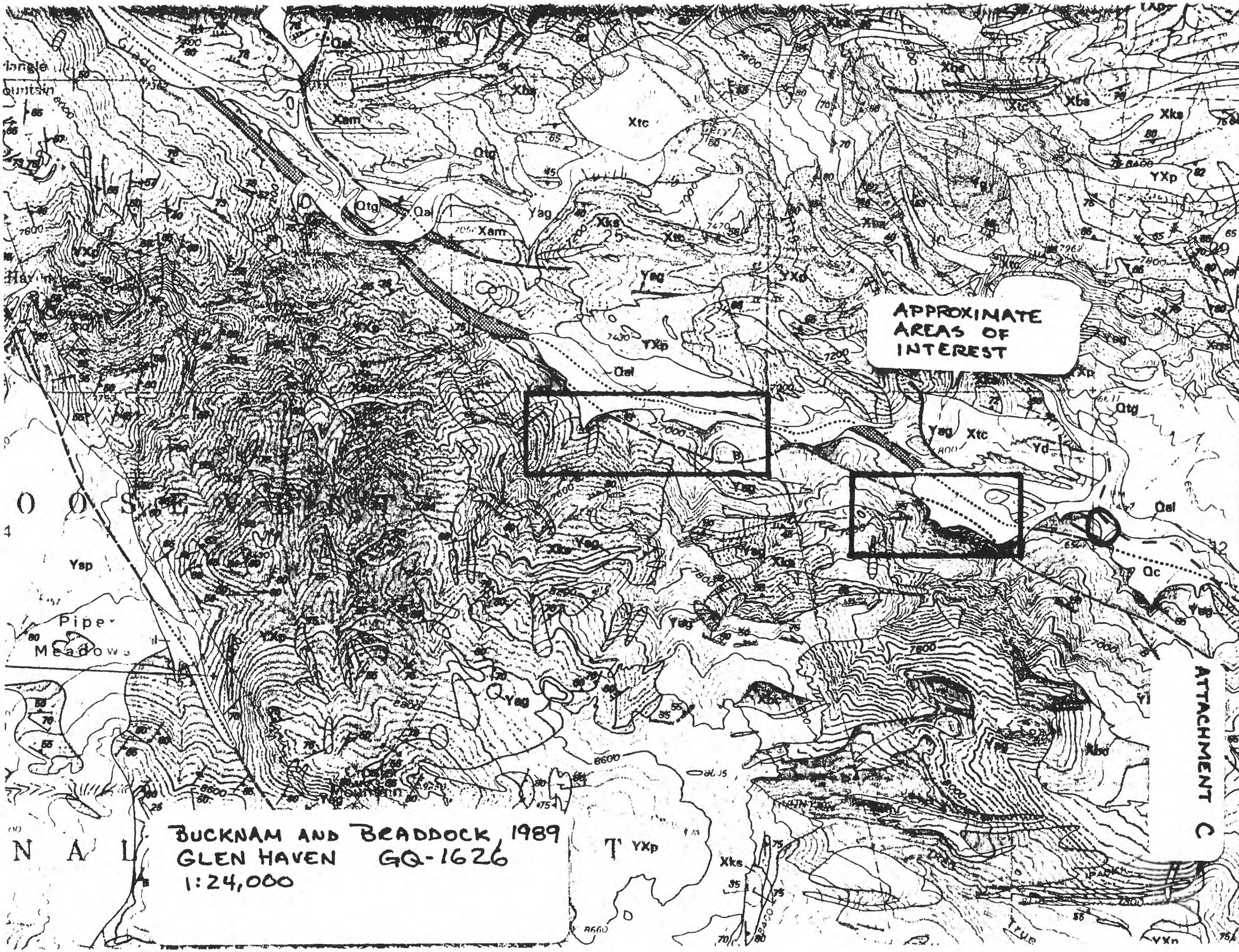
ATTACHMENT A



DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

BUCKNAM AND BRADDOCK, 1989
USGS GQ-1626
GLEN HAVEN, CO 1:24,000




ATTACHMENT C
APPROXIMATE AREAS OF INTEREST
BUCKNAM AND BRADDOCK, 1989
GLEN HAVEN GQ-1626
1:24,000
Pipe Meadows
(DRAKE)

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
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IN REPLY REFER TO:

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May 27, 1999

Mr. M. M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your February 4, 1999 request for information on locatable mineral resources in the Lake County, State of Colorado Land Exchange Offer, in which certain non-Federal lands within San Isabel National Forest have been offered in exchange for Federal lands within San Isabel and White River National Forests.

In accordance with the working agreement under Public Law 86-509, I am providing you with a report on the locatable mineral resources on the lands described in Exhibits "A" and "B", included with your request. These lands comprise approximately 2048.19 acres in Lake and Eagle Counties, Colorado.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE LAKE COUNTY LAND EXCHANGE OFFER, SAN ISABEL AND WHITE RIVER NATIONAL FORESTS, LAKE AND EAGLE COUNTIES, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

May 27, 1999

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 are occasionally augmented with unpublished documents and personal 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.

Locations of properties are described in Exhibits A and B (Attachments 1 and 2), as supplied by the US Forest Service.

NON-FEDERAL LANDS

Coin (MS 15507)
(Homestake Reservoir 1:24,000 quadrangle; Holy Cross 15-minute quadrangle)

The Coin claim is about 10 mi. northwest of Leadville on the east side of the Continental Divide at the head of the South Fork of West Tennessee Creek, about 1/2 mi. north of West Tennessee Lakes.

Tweto (1974; Tweto and others, 1978; see attachment 3) mapped the area near the Coin claim as Proterozoic X hornblende and calc-silicate gneiss (hc) and biotite gneiss and schist (bg) cut by numerous NE-trending high-angle faults.

Several adits and shafts are in the area. Taylor and others (1984) assigned this area moderate potential for vein deposits of Ag, Au (Pb, Cu, Zn, U)

Alice (MS 4011)
(Homestake Reservoir 1:24,000 quadrangle; Holy Cross 15-minute quadrangle)

The Alice claim is about 9 mi. northwest of Leadville and about 2 mi. north of the west end of Turquoise Lake, between St. Kevin Lake and Galena Mountain.

Tweto (1974; Tweto and others, 1978; see attachment 3) mapped the area near the Alice claim as Proterozoic X biotite gneiss and schist (bg) and migmatite (mi) and Proterozoic Y St. Kevin Granite. The claim is at a structurally complex intersection of north- and north-northwest-trending high-angle faults. Several adits and shafts are shown in the same map units in the near vicinity.

Taylor and others, 1984, assigned this area high potential for porphyry stockwork deposits of Mo and Cu on the basis of radial and concentric patterns of faults and dikes and presence of alteration minerals indicating past activity of hydrothermal solutions. Although no stock crops out, drilling by industry has located at least one possible porphyry-type mass. This area was also assigned high potential for major vein systems containing base and precious metals.

Kobe parcel
(Leadville South 1:24,000 quadrangle; Mt. Elbert 1:62,500 quadrangle)

The Kobe parcel is approximately 8 mi. south-southwest of Leadville and 1 1/2 mi. north of Twin Lakes Reservoir on the west side of the Arkansas River valley.

The area was mapped by Tweto and Reed (1973) as Holocene and Pleistocene landslide deposits (Ql); Pleistocene (Pinedale and Bull Lake) glacial drift (Qd) and outwash and terrace gravels (Qg); Pleistocene (pre-Bull Lake) glacial drift (Qdo); and Pliocene and Miocene Dry Union Formation silt, sand, and gravel (Tdu) (see attachment 4) .

Possible potential for placer gold deposits and for sand and gravel. The gravels should be analyzed for heavy metal content due to drainage and potential contamination from mining activities near Leadville.

FEDERAL LANDS

Turquoise Lake parcel
(Leadville South 1:24,000 quadrangle; Mt. Elbert 1:62,500 quadrangle)

The Turquoise Lake parcel is about 3 mi west of Leadville. within 1/2 mi of the southernmost part of Turquoise Lake.

The area was mapped by Tweto and Reed (1973) as Pleistocene (Bull Lake and Pinedale) outwash, terrace gravels, and glacial drift (see Attachment 4). There may be potential for placer deposits and for sand and gravel resources. The gravels should be analyzed for heavy metal content due to drainage and potential contamination from mining activities near Leadville.

Tennessee Pass
(Leadville North 1:24,000 quadrangle; Holy Cross 15-minute quadrangle)
(The northeastern corner of this parcel is in White River National Forest)

The Tennessee Pass parcel is on Tennessee Pass on the south side of, and partly including, Ski Cooper. The property also extends a short distance north of the divide into Eagle County and White River National Forest.

Tweto (1956, 1974; Taylor and others, 1984) showed the geology in this area as Paleozoic strata overlying Proterozoic biotite schists and gneisses of the Idaho Springs formation (see Attachment 5). The Paleozoic rocks include Upper Cambrian Sawatch Quartzite and Peerless Formation; Lower Ordovician Manitou Dolomite; Middle Ordovician Harding Sandstone; Upper Devonian Chaffee Formation (Parting Quartzite member overlain by Dyer Dolomite); Lower Mississippian Leadville Dolomite including the basal Gilman Sandstone Member overlain by the Dolomite member; and finally Middle Pennsylvanian Belden and Minturn Formations. The voluminous and widespread Upper Cretaceous Pando Porphyry forms sills at or near the base of the Pennsylvanian rocks. Paleocene or Upper Cretaceous Sacramento Porphyry forms thick domed sills and smaller connecting bodies. Early Paleocene Lincoln Porphyry is widespread throughout the Tennessee Pass area. It forms a large irregular sheet and also occurs in numerous

smaller sills and dikes. Paleocene(?) Eagle River Porphyry forms prominent sills in basal beds of Minturn Formation. Oligocene rhyolite porphyry intruded along NE-trending faults that roughly parallel US Hwy. 24 on the NW edge of the parcel. Pleistocene glacial drift covers most of the central part of the parcel.

The Paleozoic rocks are riddled with prospects and mine workings in the Tennessee Pass mining district. Tweto (1956) described the area as showing widespread evidence of weak mineralization. The area was intensely explored due to its proximity to Leadville, Kokomo, and Climax and because of close similarities to those districts. He concluded that the likelihood of undiscovered near-surface deposits of importance was low, but they remained economically viable because of the relation to nearby productive districts and the possibility of an ore deposit hidden deep beneath porphyry bodies or the Pennsylvanian clastic rocks.

Taylor and others (1984) assigned much of the western part of the parcel moderate potential for vein deposits of Au, Ag, (Pb, Zn, Cu) and the eastern part high potential for both vein deposits of Au, Ag, (Pb, Zn, Cu) and polymetallic replacement deposits of Ag, Au, Zn, Cu.

Toth and others (1993) assigned this area moderate potential (E1) for small stratabound deposits of Ag, Zn, Pb, (Cu); high potential (D4) for large replacement deposits containing Ag, Au, Cu, Pb, Zn; moderate potential (F10) for small vein deposits of Ag, Au, Cu, Pb, Zn; and moderate potential (M5) for bedded, medium sized deposits of high-calcium limestone.

REFERENCES:

Taylor, R.B., Stoneman, R.J., and Marsh, S.P., 1984, An assessment of the mineral resource potential of the San Isabel National Forest, south-central Colorado, *with a section on* Salable minerals by J.S. Dersch: U.S. Geological Survey Bulletin 1638, 42 p., scale 1:250,000.

Toth, M.I., Wilson, A.B., Cookro, T.M., Bankey, Viki, Lee, G.K., and Case, J.E., 1993, Mineral resource potential and geology of the White River National Forest and the Dillon Ranger District of the Arapaho National Forest, Colorado, *with a section on* Salable commodities by J.S. Dersch: U.S. Geological Survey Bulletin 2035, 117 p., scale 1:250,000.

Tweto, Ogden, 1956, Geology of the Tennessee Pass area, Eagle and Lake Counties, Colorado: U.S. Geological Survey Mineral Investigations Field Studies Map MF-34, scale 1:14,400.

Tweto, Ogden, 1974 (1984), Geologic map and sections of the Holy Cross [15-minute] quadrangle, Eagle, Lake, Pitkin, and Summit Counties, Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-830, scale 1:24,000.

Tweto, Ogden, Moench, R.H., and Reed, J.C., Jr., 1978, Geologic map of the Leadville 1° X 2° quadrangle, northwestern Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-999, scale 1:250,000.

Tweto, Ogden, and Reed, J.C., Jr., 1973, Reconnaissance geologic map of the Mount Elbert 15-minute quadrangle, Lake, Chaffee, and Pitkin Counties, Colorado: U.S. Geological Survey Open-File Report 73-287 (temp. no. 1777), scale 1:62,500.

OTHER SOURCES OF INFORMATION:

Davis, M.W., and Streufert, R.K., 1990, Gold occurrences of Colorado: Colorado Geological Survey Resource Series 28, 101 p., 2 plates.

U.S. Geological Survey, 1999a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1999b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

LIST OF ATTACHMENTS:

1. Exhibit A: Property that Lake County will consider exchanging (provided by USFS)

2. Exhibit B. Property that the Forest Service will consider exchanging (provided by USFS)

3. Geologic map of the area surrounding the Coin and Alice claims (Tweto, 1974, scale 1:24,000).

4. Geologic map of the area near the Kobe and Turquoise Lake parcels (Tweto and Reed, 1973, scale 1:62,500)

5. Geologic map of the Tennessee Pass area (Tweto, 1974, scale 1:24,000)

EXHIBIT A

Property that Lake County will consider exchanging:

6th Principal Meridian, Colorado

		Acres
T. 8 S. R. 81 W. (see map A1)		
MS 15507 COIN (located in sec. 15)		8.42
MS 4011 ALICE (located in sec. 34)		10.33
T. 10 S., R. 80 W. (see map A2)		
sec. 33, S1/2SW1/4, S1/2SE1/4		160.00
T. 11 S., R. 80 W. (see map A2)		
sec. 4, Lots 2, 3, 4, SW1/4NE1/4, S1/2,NW1/4 NE1/4SW1/4, W1/2SW1/4		345.66
sec. 5, Lots 1, 2 S1/2NE1/4, SW1/4NW1/4, N1/2SW1/4, N1/2SW1/4SW1/4, N1/2SE1/4SW1/4, N1/2SE1/4		386.23
sec. 6, Lots 9, 10, 11 (Except Glacier Placer) N1/2SW1/4,SE1/4, N1/2SE1/4SE1/4		104.55
	Total	1,015.19

ATTACHMENT 1. Exhibit A: Property that Lake County will consider exchanging (provided by USFS)

EXHIBIT B

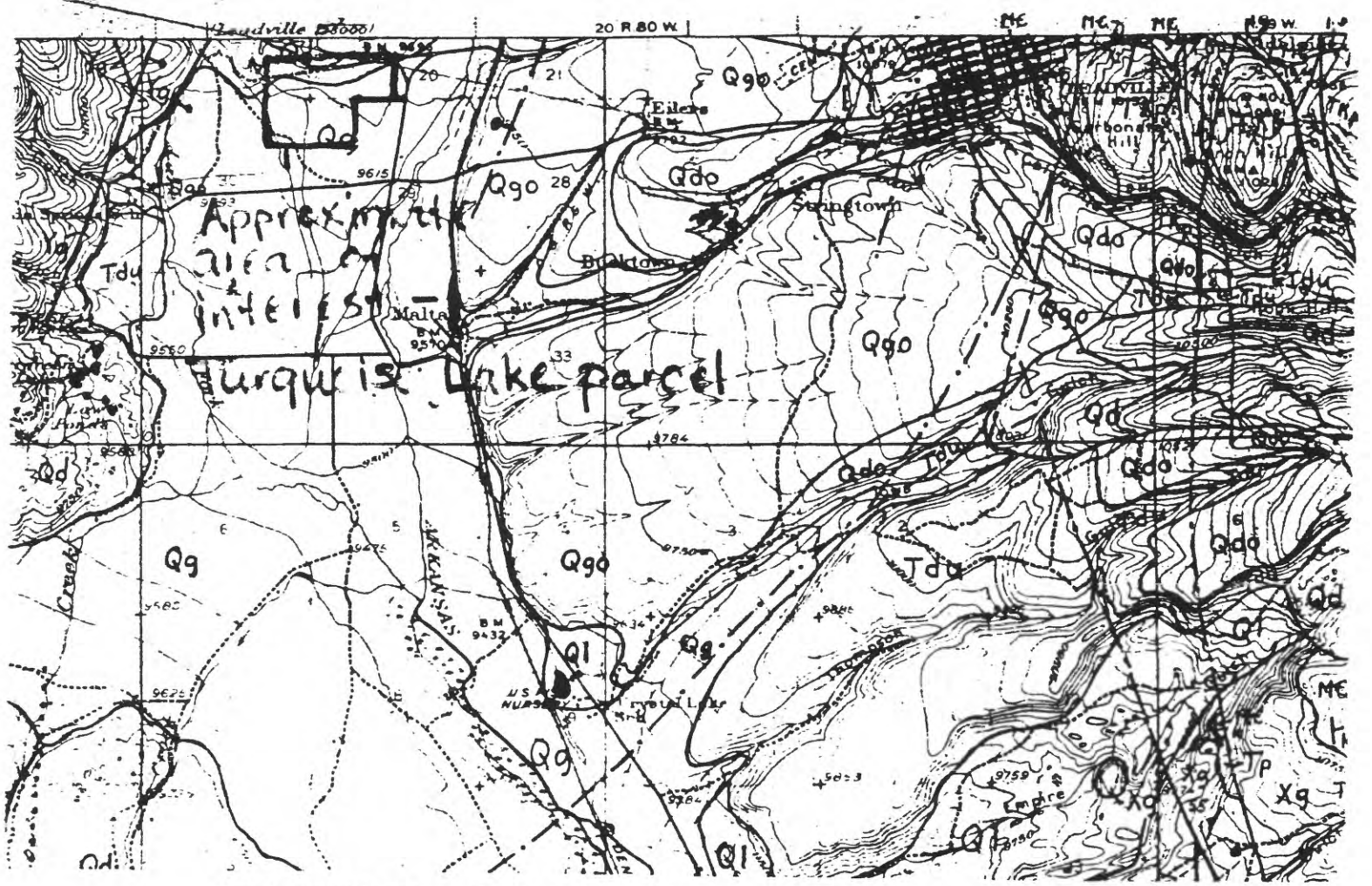
Property that the FOREST SERVICE will consider exchanging:

6th Principal Meridian, Colorado

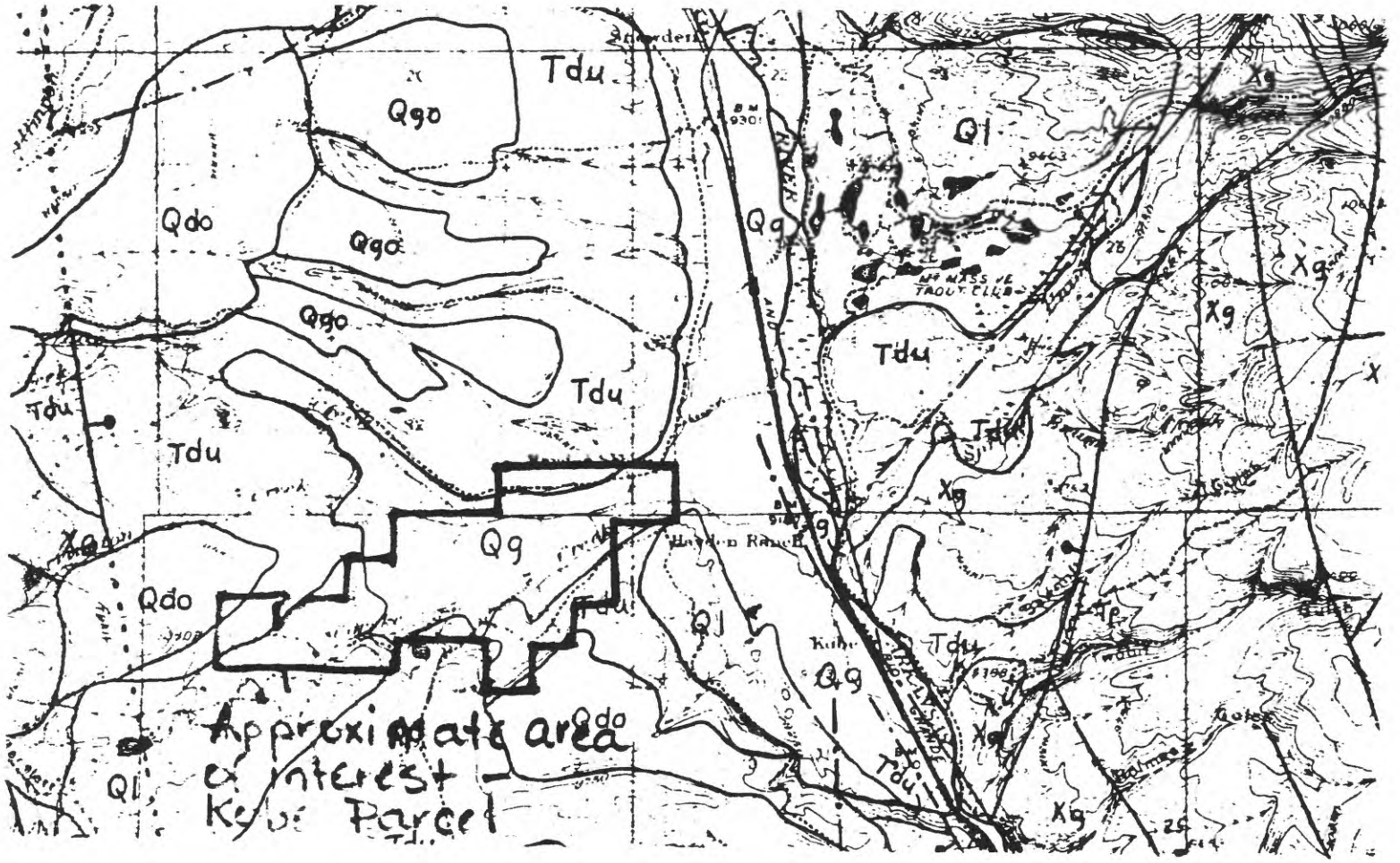
				Acres
T. 9 S., R. 80 W. (see map B1)				
sec.	19	SE1/4SE1/4		40.00
sec.	20	S1/2SW1/4		80.00
sec.	29	NW1/4NW1/4		40.00
sec.	30	NE1/4NE1/4		40.00
T. 8 S., R. 80 W. (see map B2)				
sec.	10	SE1/4SE1/4	EAST OF HWY 24	20.00
sec.	11	S1/2SW1/4	SOUTH OF HWY 24	15.00
sec.	14	W1/2NE1/4		80.00
sec.	14	NW1/4		160.00
sec.	14	SW1/4		160.00
sec.	14	W1/2SE1/4		80.00
sec.	15	NE1/4NE1/4	SE OF HWY 24	36.00
sec.	15	NW1/4NW1/4	SE OF HWY 24	2.00
sec.	15	SW1/4NE1/4		40.00
sec.	15	E1/2SE1/4		80.00
sec.	22	NE1/4NE1/4		40.00
sec.	23	NW1/4NE1/4		40.00
sec.	23	N1/2NW1/4		80.00
			Total	1,033.00

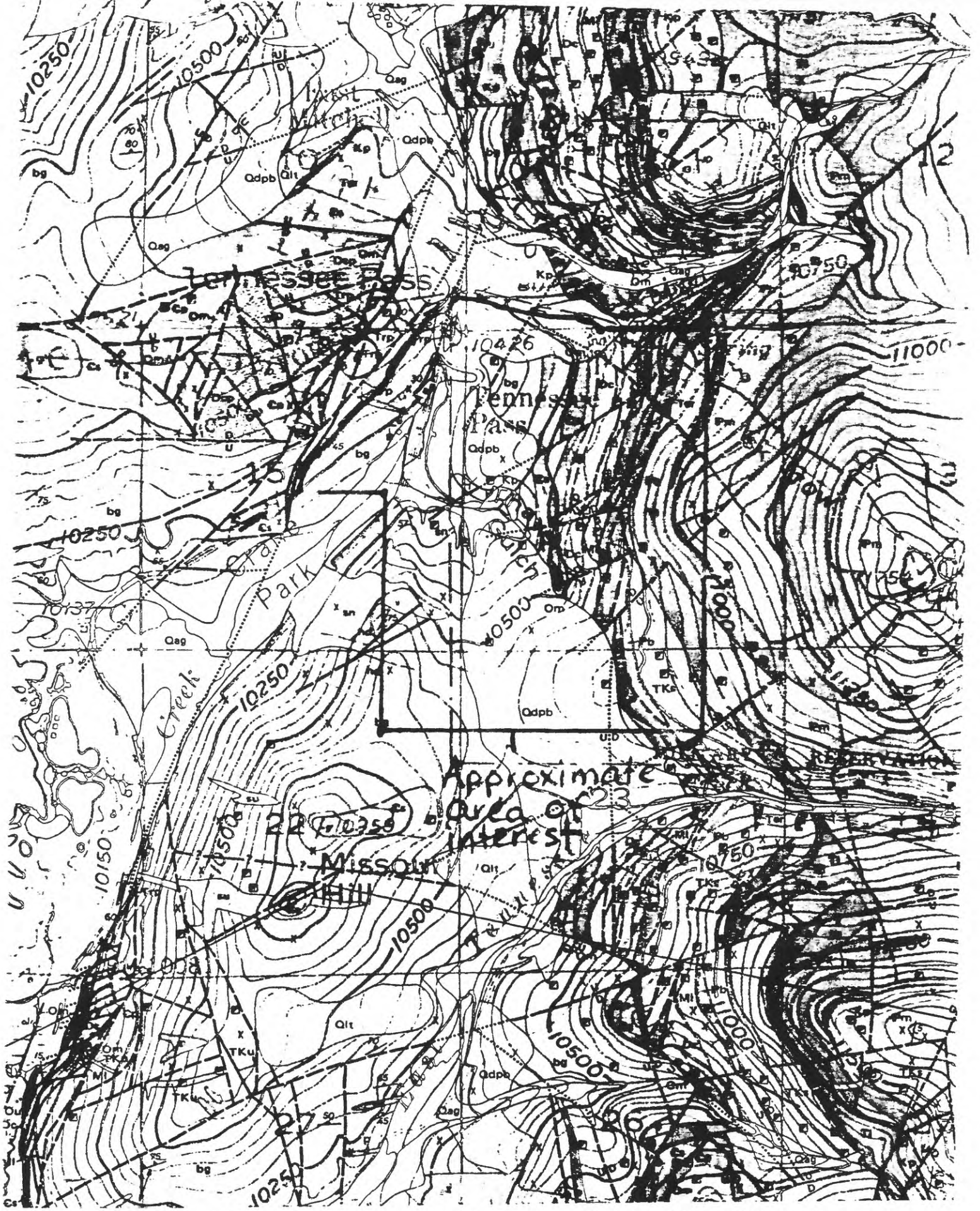
ATTACHMENT 2. Exhibit B. Property that the Forest Service will consider exchanging (provided by USFS)

ATTACHMENT 3: Geologic map of the area surrounding the Coin and Alice claims (Tweto, 1974, scale 1:24,000)



ATTACHMENT 4. Geologic map of the area near Kobe and Turquoise Lake (Tweto and Reed, 1973, scale 1:62,500)





ATTACHMENT 5. Geologic map of the Tennessee Pass area (Tweto, 1974, scale 1:24,000)

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
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Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

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September 22, 1999

Mr. M.M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your September 17, 1999 (received September 20) request for information on locatable mineral resources in a land exchange proposal in which Lindner Ranches has offered certain non-Federal lands within the San Juan National Forest in exchange for Federal lands also within the San Juan 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 described in "Exhibits A and B", included with your request. These lands comprise 262 acres, more or less, in Dolores and Mineral Counties, Colorado.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR LINDNER RANCH LAND EXCHANGE, SAN JUAN NATIONAL FOREST, DOLORES AND MINERAL COUNTIES, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

September 23, 1999

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.

Non-Federal
Hermosa Peak 1:24,000 quadrangle

The Lindner parcel is due north of Harts Peak, in and north of Silver Creek, about one mile east of the Blaine Tunnel to the Rico-Argentine Mine, in Rico (McKnight, 1974). The parcel appears to be entirely within Permian Cutler Formation. Quaternary talus and slope wash may cover the lowest slopes.

A mine adit shown on the topographic map is not in the MRDS database (USGS, 1999a). The MAS/MILS database indicates that the Copper Claims (MILS # 80330060) may be on or near this parcel (USGS, 1999b). Other than location, the only information contained in the database is that copper is the primary commodity, and owners (company) are E.L. Ericson and Edward Baer.

The tract is at the far eastern margin of overlapping areas assigned favorable for polymetallic replacement and skarn deposits (at depths greater than 3,000 ft), stockwork molybdenum deposits, and porphyry copper-molybdenum deposits (C2, Aa6, and B4, respectively of Van Loenen and Gibbons, 1997). Because the potential carbonate or other soluble host rocks are buried at least 3,000 ft, the likelihood of hydrothermal polymetallic replacement and skarn deposits of Ag, Pb, Zn, and Cu sulfide minerals within 1 km of the surface is low. Descriptions of the porphyry copper-molybdenum deposits (which may also contain gold and silver), magmatic-hydrothermal mineralization in quartz stockwork veinlets and disseminated potassic-altered porphyritic stock and adjacent wallrocks center on the Calico Peak and Horse Creek areas west of the main highway through Rico. There are no indications of such deposits near the Lindner parcel. Stockwork molybdenum deposits (which may also contain tin, tungsten, and bismuth) are found in, or closely associated with, small high-silica porphyry intrusive complexes that have multiple intrusive stages. At Rico, the molybdenum deposit is more than 3,900 ft deep. From the Lindner parcel, the depth would be even greater. From a site-specific viewpoint, mineral resource potential of the Lindner parcel is low.

The Lindner parcel is in an area assigned favorable for conventional accumulations of oil and gas in permeable deltaic sandstones of equivalents of the Hermosa Group along the flank of the Paradox Basin (Van Loenen and Gibbons, 1997).

Federal
Pagosa Peak 1:24,000 quadrangle

Geology is Lewis and Mesaverde shales overlain by Quaternary landslides and glacial drift (Steven and others, 1974).

The only commodity shown as favorable by Van Loenen and Gibbons (1997) is sand and gravel. Mineral resource potential of this parcel for all other commodities is low.

REFERENCES:

McKnight, E.T., 1974, Geology and ore deposits of the Rico district, Colorado: U.S. Geological Survey Professional Paper 723, 100 p.

Pratt, W.P., 1976, Preliminary geologic map of the Hermosa Peak quadrangle, Dolores, San Juan, La Plata, and Montezuma Counties, Colorado: U.S. Geological Survey Open-File Report 76-314, scale 1:24,000.

Steven, T.A., Lipman, P.W., Hail, W.J., Jr., Barker, Fred, and Luedke, R.G, 1974, Geologic map of the Durango quadrangle, southwestern Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-764, scale 1:250,000.

U.S. Geological Survey, 1999a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1999b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

Van Loenen, R.E., and Gibbons, A.B., eds., 1997, Mineral resource potential and geology of the San Juan National Forest, Colorado: U.S. Geological Survey Bulletin 2127, 140 p.

LIST OF ATTACHMENTS:

A. Exhibits A and B (supplied by U.S. Forest Service)

Attachment A. Exhibits A and B (supplied by U.S. Forest Service)

EXHIBIT A

Property that the Robert D. Lindner Ranches will consider exchanging:

New Mexico Principal Meridian, Dolores County, Colorado

T. 40 N., R. 10 W.

sec. 20, SW1/4SE1/4;
sec. 29, N1/2NE1/4, NE1/4NW1/4.

Containing 160 acres, more or less.

EXHIBIT B

Property that the U.S. Forest Service will consider exchanging:

New Mexico Principal Meridian, Mineral County, Colorado

T. 37 N., R. 2 W.

sec. 5, Portion of Lot 8 and portion of the SW1/4;
sec. 6, Portion of Lots 22 and 27 and portion of SE1/4;
sec. 7, Portion of Lot 13 and portion of the N1/2.

Containing 102 acres, more or less.

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 905
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

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

May 12, 1999

Mr. M. M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your December 16, 1998 request for information on locatable mineral resources in the Dillon District Land Exchange Joint Venture , acting by and through its managing agent, Western Land Group, Inc., in which certain non-Federal lands within White River National Forest have been offered in exchange for Federal lands also within White River National Forest.

In accordance with the working agreement under Public Law 86-509, I am providing you with a report on the locatable mineral resources on the lands described in Exhibits "A" and "B", included with your request. These lands comprise 5118 acres, more or less, in Summit County, Colorado.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE DILLON DISTRICT LAND EXCHANGE JOINT VENTURE, WHITE RIVER NATIONAL FOREST, SUMMIT COUNTY, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

May 12, 1999

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 are occasionally augmented with unpublished documents and personal 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.

EXHIBIT A: Offered Non-Federal Lands

6th Principal Meridian, Summit County, Colorado

		acres
1.	Summit County Tax Default Lands See attachment A for list of County owned mining claims and properties for exchange to USFS	±1840.57
2.	Copper Mountain Wheeler Flats (see Exhibit 8)–RECUSAL T. 6S., R. 78W. portion of secs. 19 and 30	±26.3
3.	Parkville, portions not previously conveyed (see Exhibit 10) T. 6&7S., R. 76&77W. All or portions of MS #84, Fuller and Greenleaf Placer Mining Claims; all or portions of MS #85, Fuller and Greenleaf Placer Mining Claims; portion of MS #3909, Miller Placer, and, all or portions of MS #12048, Excelsior Placer	±557.73
4.	Schick Wetlands (see Exhibit 5) T. 5S., R. 76W. Portions of Sec. 19	±5.3
5.	Montezuma Claims (see Exhibit 6) T. 5S., R. 76W. Little Joe Lode (MS 1947), Wellman Lode (MS 1955), Montezuma Lode (MS 1591), Wyoming Lode (MS 1378), Harrison Lode (MS 1308)	±18.5
6.	Swan Gulch (B&B Mines) (see Exhibit 11) T. 6S., T. 77 W. All or portions of Eureka (MS 3203), Highland Mary (MS 3201), Royal Tiger (MS 3200), I.X.L. (MS 3178B), Swallow (MS 3177), British Boy (MS 3071), O.J. Lewis (MS 3047), Teddy (MS 19717), Silver Eel (MS 3232), Mammoth (MS 5926), Cashier (MS 5926), Mineral Chief (MS 3051), and Williams, Primrose, Brown, and I.X.L. Placers, and Brown Mill Site	±483.572
7.	Swan River Placer (McCleneghan) (see Exhibit 11) T. 6S., R. 77W. Portion of Swan River Placer, Sec. 25	±12.04

8. Breckenridge Sanitation District (Town of Breckenridge) (see Exhibit 11)
T. 6S., R. 77W.
Part of the Swan River Placer (USMS 7083) as amended, including portions of secs. 24 and 25. ±36.201

9. Other non-federal land as necessary to equalize values.

Total non-federal property considered for exchange: ±2980.213

EXHIBIT B: Property that the Forest Service will consider exchanging:

6th Principal Meridian, Summit County, Colorado

		acres
A.	Davis Spring (Summit Trust) (Exhibit 1)	
	T. 2S., R. 79W.	
	Sec. 33: NW 1/4 NE 1/4, NE1/4 NW 1/4	±80
B.	Black Creek (Summit Trust) (Exhibit 1)	
	T. 3S., R. 79W.	
	Sec. 5, Lot 2, SW 1/4 NW 1/4	±80
C.	Pass Creek Ranch (Exhibit 2)	
	T. 3S., R. 78W.	
	Sec. 8, Lots 7 and 19	±3.98
	Sec. 9, NW 1/4 SE 1/4	±40
D.	Eagle's Nest (IntraWest) (Exhibit 3)-RECUSAL	
	T. 4S., R. 78W.	
	Sec. 26, Portion of Lot 16 and Lot 17 to the east	±14.15
E.	Heit Ranch (Seminole Landholdings) (Exhibit 3)	
	T. 5S., R. 77W.	
	Sec. 6, SE 1/4 SW 1/4 NW 1/4	±10
F.	Snake River Inlet (Exhibit 4)	
	T. 5S., R. 77W.	
	Sec. 21, Lot 18	±19.59
G.	Homestead Lodge Easement (Exhibit 5A and 5)	
	T. 5S., R. 76W.	
	Sec. 19, 60 ft. wide access and utility easement in SW 1/4	N/A

H. Montezuma Townsite (Euler) (Exhibit 6)

T. 5S., R. 76W.

Portion of Sec. 26 and 35, to be determined	±10

I. County Commons (Exhibit 7) ±19.59

T. 5S., R. 78W.

Sec. 35, portion of SE 1/4 SE 1/4
Sec. 36, portion of S 1/2

J. Gold Hill (Exhibit 7)

T. 6S., R. 77W.

Sec. 6, Lot 8, portion of Lot 7	±70

K. Tenmile Creek (Copper Mountain Resorts) (Exhibit 8)–RECUSAL

T. 6S., R. 78W.

Portions of Secs. 29 and 32	±2.32

T. 6S., R. 79W.

Portion of Sec. 25	±104

L. Peak 7 Parcel (Exhibit 9)

T. 6S., R. 78W.

Sec. 24, Lot 9	±31.40
Sec. 25, Lot 10	±14.65

M. Claimjumper (Exhibit 9)

T. 6S., R. 77W.

Sec. 30, Lots 30, 45	±9.28
Sec. 31, Lot 27	±7.23

T. 6S., R. 78W.

Sec. 25, Lot 17	±1.12
Sec. 25, Lot 18	±14.18
Sec. 25, Lot 8	±1.67
Sec. 36, Lot 10	±2.49

N. French Gulch/Gibson Hill (Exhibit 9)

T. 6S., R. 77W.

Sec. 31, Lot 23	±21.04
Sec. 31, Lot 31	±6.86
Sec. 32, portion of NW 1/4	±7.1

O. Bonanza Elbow (Simonian) (Exhibit 9)

T. 6S., R. 77W.

Sec. 31, Lot 34	±0.36
Sec. 31, Lot 35	±0.52

P. Cucumber Gulch (Vail Resorts Development) (Exhibit 9)

T. 6S., R. 78W.

Sec. 36, portions of lots 23, 33, and 34	±18

Q. East Moonstone (Exhibit 9)

T. 6S., R. 77W.

Sec. 32, Lot 10	±21.32

T. 7S., R. 77W.

Sec. 5, Lot 51	±30.91
Sec. 6, Lot 35	±8.45

R. Little Mountain (Exhibit 9)

T. 7S., R. 77W.

Sec. 5, Lot62	±.45
Sec. 5, Lot 68	±8.04
Sec. 6, Lot 29	±0.41
Sec. 6, Lot 30	±10.20
Sec. 6, Lot 31	±0.11
Sec. 6, Lot 32	±12.33

Total federal property considered for exchange (not including Schick easement) ±2,137.69

Total acreage considered for exchange (not including Schick easement) **±5,117.903**

NON-FEDERAL LANDS

1. Summit County Tax Default Lands

(Gray's Peak, Montezuma, Keystone, Boreas Pass, Frisco, Breckenridge, Vail Pass, Willow Lakes, and Copper Mountain 1:24,000 quadrangles. Numbers 1-63 that follow in this section on Tax Default Lands are keyed to map and list of claim blocks supplied by the U.S. Forest Service; see Attachment A)

1-9. (Gray's Peak quadrangle): Claims in the northern part of Horseshoe Basin, on the south flank of Mount Edwards, between Argentine Pass and Falls Gulch. Peru Creek Mining district. The claims are north of Queen of the West and Paymaster mines (Wilson and LaRock, 1992) and a high angle east-west trending fault (Neuerburg and others, 1977).

The area is mapped as Idaho Springs Formation overlain locally by glacial till (Lovering, 1935). There are small, local intrusions of pegmatite and Eocene quartz monzonite (Lovering, 1935). Neuerburg and others (1977) indicate that these are Silver Plume Granite on Mount Edwards and quartz latite biporphyry farther east.

There are no named mines in this claim group (Wilson and LaRock, 1992; Lovering, 1935). Patton (1909) places the silver Ledge, Baalbec, Tenth Legion, Rip van Winkle, Little Chief, Little Chief Extension, Lone Star, and Lone Star Extension in this vicinity.

10. (Montezuma quadrangle): Claim near the intersection of Ruby and Chihuahua Gulches.

The area is mapped as glacial till overlying quartz monzonite of the Montezuma stock (Lovering, 1935).

There are no named or productive mines in the immediate vicinity (Wilson and LaRock, 1992).

11, 13, 16-19. (Montezuma and Keystone quadrangles) Tracts 11 and 13 are on the south side of Cooper Mountain. Tract 16 is on the southwest flank of Santa Fe Peak in the vicinity of the Waukeegan and Santa Fe mines (Wilson and LaRock, 1992). Tract 17 is northwest of the intersection of Chihuahua Gulch and Peru Creek near the Maid of Orleans (Patton, 1909). Tract 18 is west of Thurman Gulch. Tract 19 is on Tip Top Peak in the vicinity of the Tip Top and Rose mines (Wilson and LaRock, 1992).

The area underlying all of these tracts is mapped as quartz monzonite of the Montezuma stock (Lovering, 1935). Tract 18 may be covered with older glacial drift and valley train deposits. Locally, veins are mapped parallel to some of the claims.

Tracts 11 and 13 are in the immediate vicinity of the Buda, Pittsburg Tunnel, and Rothschild mines (Wilson and LaRock, 1992). The Buda mine had a 25 ft. shaft and an adit "said to be about 300 ft. long". A small amount of lead, silver, and gold was produced from 1886-1889. Pyrite, sphalerite, galena, some silver, and gold were in a 3-6 in. wide quartz vein (Lovering, 1935, p. 74). The Rothschild (Minerou) tunnel was driven 4,600 ft under Cooper Mountain to explore the veins at depth and to provide a means of transportation. Production records are scanty. At a minimum, between 1873 and 1923, the Rothschild produced 2900-5400 short tons of ore including 14.8 oz. gold, 18,109 oz. silver, 77,259 lbs. lead, 7,156 lbs. copper, and 47,000 lbs. zinc. Galena, tetrahedrite, chalcopyrite, and some ruby silver were in a 3 to 36 in. wide quartz vein. Patton (1909) indicates that the following mines are in the vicinity of these tracts: Bertha, Fifth of July, Grey Eagle, Little Chief, Chicago, Buda, Sylvia, Howard, Rudolph, Gold Bug, Rotschild (sic.), and Rotschild (sic.) No. 2.

The Waukeegan vein was developed by 3 adits . It produced a small amount of lead ore in 1885 and 1889 (Lovering, 1935, p. 112-113). The Maid of Orleans was worked from a shaft–its total production was probably about 50 tons of silver ore worth about $60/ton (Lovering, 1935, p. 112-113).

12. (Montezuma quadrangle) Immediately south of Shoe Basin Mine on north side of Peru Creek.

Mapped as Idaho Springs Formation, possibly following northeast-trending veins (Lovering, 1935). "Little is known of the history of ths Shoe Basin vein; it is said to have been worked in the [18] seventies through a shaft 300 ft. deep, but the mine is not mentioned by any of the reports of that time" (Lovering, 1935, p. 95). Ore on the dump of the Shoe Basin tunnel came from a vein more than 10 inches wide and included silicified sulfide-bearing gneiss, and fissure filling containing quartz, barite, dolomite, galena, pyrite, sphalerite, and tetrahedrite (Lovering, 1935, p. 96).

14-15. (Montezuma quadrangle) On Silver and Revenue Mountains.

Mapped as Idaho Springs Formation overlain locally by glacial till (Lovering, 1935). Local intrusions of pegmatite and Eocene quartz monzonite (Lovering, 1935).

Both tracts are in the vicinity of the Delaware, Revenue, and Silver Spoon mines (Wilson and LaRock, 1992). The Delaware probably produced more than 1,000 tons of ore from a several-foot wide quartz vein containing 6 to 36 inches of galena, tetrahedrite, and chalcopyrite and assayed 25 to 600 oz of silver per ton (Lovering, 1935, p. 78). The Revenue vein is about 6 inches wide with tetrahedrite, galena, chalcopyrite, and gold.

20. (Keystone quadrangle) On the south flank of Bear Mountain, north of Saints John Creek and west of Saints John.

Mapped as Swandyke hornblende gneiss. Locally intruded by Silver Plume Granite and small veins (Lovering, 1935).

No mines or prospects are located in the immediate vicinity of this tract (Wilson and LaRock, 1992).

35. (Montezuma quadrangle) In Deer Creek, not near any known mines (Wilson and LaRock, 1992).

Mapped as Quaternary glacial till overlying Swandyke hornblende gneiss (Lovering, 1935).

36. (Montezuma quadrangle) On the east flank of Teller Mountain, across the Snake River to the base of the west flank of Geneva Peak.

Mapped as Swandyke hornblende gneiss and Idaho Springs Formation. Locally intruded by Silver Plume Granite and small veins (Lovering, 1935) Extension to the east crosses Quaternary till and bog iron ore in the Snake River valley.

In the vicinity of the Montaque mine on Teller Mountain. No other information on this mine is available other than its location shown on the plate which accompanies Patton (1909).

Toth and others (1993) assigned the area that includes tracts 1-20, 35, and 36 high mineral resource potential for medium-sized deposits of base and precious metal in veins (F14). Commodities expected would be silver, gold, copper, lead, and zinc.

21-22. (Willow Lakes quadrangle) Tract 21 is on the headwall above Willow Lakes. Tract 22 is on the south flank of Red Peak. Both are within the Eagle's Nest Wilderness Area.

Both tracts are patented claims which are mapped following faults in Precambrian granitic rocks (Tweto and others, 1970). Tract 21 appears to coincide with the Treasure Vault claim, at which Tweto and others (1970) saw no sign of past mining activity. Tract 22, may be either the Defiance or Highline Chief claim. Handpicked samples from this area yielded at most 0.01 oz gold per ton, and 0.48 oz silver per ton (Tweto and others, 1970, p. C113).

Toth and others (1993) assigned this area high mineral resource potential for small deposits of base and precious metal in veins (F12). Commodities expected would be silver, gold, copper, lead, and zinc.

23-31. (Frisco and Vail Pass quadrangles) Tracts 23-31 are southwest of Frisco, east of Interstate 70, at the north end of the Tenmile Range.

The parcels are mapped entirely as biotite gneiss and migmatite on the east side of the Mosquito fault (Tweto and others, 1978).

These tracts are within the area that Toth and others (1993) assigned high mineral for small deposits of base and precious metals (silver, gold, copper, lead, and zinc) in veins (F12) and moderate potential for small deposits of tungsten in veins (H1). There is unknown potential for small stratabound sulfide deposits (potentially hosting copper, lead, zinc, gold, and silver) (L6) near the southernmost tracts in this group.

32-34. (Frisco, Keystone, and Boreas Pass quadrangles) Tract 32 is at the northeast junction of Swan River and Horseshoe Gulch. Tract 33 is on Brewery Hill. Tract 34 is on the west flank of the summit on the east side of Gold Run Gulch.

Tract 32 is mapped as quartz monzonite porphyry, possibly overlain by Quaternary alluvium and dredge tailings in the lower elevations (Ransome, 1911). Brewery Hill is mapped as Cretaceous Pierre Shale Tertiary intruded by northwest-trending quartz monzonite stingers (Ransome, 1911). Tract 34 is mapped entirely within quartz monzonite porphyry (Ransome, 1911).

Two unnamed shafts are shown on Ransome's map (1911) on, or adjacent to, tract 34. No other workings are immediately adjacent to these tracts.

All three tracts are within the area that Toth and others (1993) assigned high mineral resource potential for small replacement deposits (D6) and for large deposits of base and precious metals in veins (F13). Commodities expected would be silver, gold, copper, lead, and zinc.

37. (Keystone quadrangle) Tract 37 is on the hillside above the Tony mine.

The geology is mapped as Swandyke Hornblende gneiss and granite gneiss with local, small pegmatite bodies (Lovering, 1935).

This claim is very close to the boundary between high mineral resource potential for small replacement deposits (D6) and moderate potential for small deposits of base and precious metals in veins (F12) (Toth and others, 1993). Commodities expected would be silver, gold, copper, lead, and zinc.

38-39. (Boreas Pass quadrangle) Both claims are in the vicinity of Glacier Peak. No named mines are in the immediate vicinity (Wilson and LaRock, 1992).

Mapped as Swandyke gneiss (amphibolite and felsic gneiss) on the east side of the Elkhorn thrust fault (Bryant and others, 1981).

Toth and others (1993) assigned this area moderate potential for small deposits of base and precious metals in veins (F12). Commodities expected would be silver, gold, copper, lead, and zinc.

40-42. (Boreas Pass quadrangle) Claims at the head of Little French Gulch on the north end of Mt. Guyot. No named mines are in the immediate vicinity (Wilson and LaRock, 1992).

Mapped as Cretaceous Pierre Shale (Ransome, 1911), possibly intruded by Tertiary quartz monzonite and located on the west side of the Elkhorn thrust fault (Bryant and others, 1981).

43-46. (Boreas Pass quadrangle) Claims on the north end of Bald Mountain between Weber and Illinois Gulches. In the vicinity of the Corporal, Carbonate, Tommy, Gold Edge, and Gold Bell mines (Wilson and LaRock, 1992).

Mapped as monzonite porphyry (Ransome, 1911).

Tracts 40-46 are within the area that Toth and others (1993) assigned high mineral resource potential for small replacement deposits (D6). Commodities expected would be silver, gold, copper, lead, and zinc.

47. (Boreas Pass quadrangle) Tract is on the west flank of Bald Mountain near the Twin Sisters mine.

Mapped as monzonite porphyry overlying Pennsylvanian, Permian, and Jurassic strata, primarily sandy redbeds (Singewald, 1951).

Toth and others (1993) assigned this area high mineral resource potential for small replacement deposits (D6). Commodities expected would be silver, gold, copper, lead, and zinc. However, Singewald's (1951) description of the Twin Sisters mine suggests that it is a small polymetallic vein that carried galena and minor pyrite, sphalerite, and specular hematite. The liklihood that the area could host other small, polymetallic veins containing galena is high.

48-50. (Boreas Pass quadrangle) Near Dyersville, about 1 mi. west and northwest of Boreas Pass in the vicinity of the Warriors Mark mine.

Mapped as undifferentiated east-dipping, Pennsylvanian and Permian strata, intruded by a "white porphyry" sill and cut by northeast-trending veins and faults (Singewald, 1951).

The Warrior's Mark probably produced "several hundred thousand dollars" worth of silver ore between its discovery in the late 1870's and 1941 (Singewald, 1951). The productive ore zone is about one-thousand feet below the base of the Jurassic Entrada(?) Sandstone in several thin limestone beds and the sill of white porphyry. Three types of ore were described: 1) small seams of chalcocite with secondary copper minerals and high silver values as small seams in red sandstone, 2) silver-lead ore in quartz-calcite gangue, and 3) silver-bearing clay gouge (Singewald, 1951, p. 62).

Toth and others (1993) did not assign this area any mineral resource potential. However, the liklihood that the area could host small, polymetallic replacement deposits containing galena is high.

51-52. (Breckenridge quadrangle) Tract 51 is an unnamed vein on the south fork of Crystal Creek. Tract 52 may be the Glen-Mohawk (Singewald, 1951) or Lillie G (Wilson and LaRock, 1992) mine, near Mohawk Lake in Spruce Creek.

Both properties are mapped as veins in Precambrian Idaho Springs Formation (Singewald, 1951).

The veins are "on the outskirts of the productive area" (Singewald, 1951). Neither property is described in detail. Glen-Mohawk was apparently a silver mine: sphalerite, galena, pyrite, and chalcopyrite in a gangue of iron carbonate and barite were reported on the dumps (Singewald, 1951).

53-54. (Breckenridge and Copper Mountain quadrangles) Claims at the head of Monte Cristo Creek on the south flanks of Fletcher Mountain and Quandary Peak. Includes the area around the Maximus, Denver City and Little Annie, and Golden Beaver mines (Singewald, 1951; Wilson and LaRock, 1992).

Mapped as Precambrian Idaho Springs Formation with local veins (Singewald, 1951).

The Maximus may have been a silver prospect. Only pyrite was identified on the dump. Denver City and Little Annie was also a silver prospect-sphalerite and galena were identified. The Golden Beaver had shows of pyrite, specular hematite, sphalerite, galena, and chalcopyrite, but the primary commodities are not unidentified (Singewald, 1951).

Tracts 51-54 are within an area that Toth and others (1993) assigned high potential for small deposits of base and precious metals (silver, gold, copper, lead, and zinc) in veins (F11) and moderate resource potential for small deposits of tungsten in veins (H2).

55. (Breckenridge quadrangle) Northwest of the junction of Monte Cristo Creek with Blue River.

Mapped as Quaternary moraine overlying Pennsylvanian and Permian sedimentary strata (Singewald, 1951).

Toth and others (1993) assigned this area high potential for medium size gold placer deposits (K7).

56-60. (Breckenridge quadrangle) Claims in Monte Cristo Creek and by Crystal Lake.

Mapped as Precambrian Idaho Springs Formation with local veins (Singewald, 1951).

Prospects in this area may contain pyrite, galena, chalcopyrite, sphalerite, and molybdenum (Singewald, 1951, pl. 2). They were probably prospected for gold.

Toth and others (1993) assigned this area high potential for small deposits of base and precious metals (silver, gold, copper, lead, and zinc) in veins (F11) and moderate resource potential for small deposits of tungsten in veins (H2).

61-63. (Copper Mountain quadrangle) Claims at the head of Monte Cristo Creek near Point C.

Mapped as biotitic gneisses and related rocks (Tweto, 1974). The claims are very close to the Climax molybdenum deposit on the west side of the ridge.

These claims are at the very fringe of areas that Toth and others (1993) assigned high potential for small deposits of base and precious metals (silver, gold, copper, lead, and zinc) in veins (F11) and moderate resource potential for small deposits of tungsten in veins (H2).

2. Copper Mountain Wheeler Flats-RECUSAL
(Vail Pass 1:24,000 quadrangle)

Toth and others (1993) rated this area as having moderate potential for Au, Ag, Cu, Pb, and Zn in small veins.

3. Parkville
(Boreas Pass and Keystone 1:24,000 quadrangles)

This tract is on the east flank of Farncomb, Humbug, and Brewery Hills in the Swan River drainage. It is mapped (Bryant and others, 1981) as Upper Cretaceous Pierre Shale intruded to the west by Oligocene and Eocene porphyritic quartz monzonite. Immediately to the east, the edge of the Williams Range thrust fault, places Early Proterozoic biotite, felsic, and hornblende gneisses above the shale. Pleistocene glacial drift and outwash gravels fill the Swan River drainage.

Toth and others (1993) rated this area as having high potential for large polymetallic vein deposits (F13) and for small polymetallic replacement deposit (D6). Commodities expected would be silver, gold, copper, lead, and zinc.

4. Schick Wetlands (Easement)
(Keystone 1:24,000 quadrangle)

Schick Wetlands are at the base of the Keystone ski area, south of Peru Creek, in an area mapped as alluvium probably overlying Silver Plume Granite and Idaho Springs Formation, and immediately west of the Oligocene Montezuma quartz monzonite stock (Lovering, 1935; Bryant and others, 1981).

5. Montezuma Claims
(Montezuma 1:24,000 quadrangle)

These claims, on the north flank of Glacier Mountain, overlooking Montezuma, are mapped as alluvium and glacial till probably overlying Swandyke hornblende gneiss and possibly Oligocene quartz monzonite of the Montezuma stock at the northernmost tip of the claim block (Lovering, 1935; Bryant and others, 1981).

Parcels 4 and 5 are within an area that Toth and others (1993) assigned high mineral resource potential for medium-sized deposits of base and precious metal in veins (F14). Commodities expected would be silver, gold, copper, lead, and zinc.

6. Swan Gulch
(Keystone 1:24,000 quadrangle)

The Swan Gulch tract is mostly on the north flank of Brewery Hill and east of Brown Gulch. Mapped as Cretaceous Pierre Shale intruded with Eocene and Oligocene porphyritic quartz monzonite, with Pleistocene outwash gravels in the Swan River valley (Lovering, 1935; Bryant and others, 1981).

Toth and others (1993) assigned this area high mineral potential for large deposits of base and precious metals in veins (F13). Metal veins occur along faults in Tertiary intrusives and in the Dakota Sandstone, but some veins are also found in the shale units. Expected commodities are silver, gold, copper, lead, and zinc (Toth and others, 1993). There is high potential for metals in small replacement deposits (D6). Although vein deposits are the dominant type of deposits within these districts, some subsidiary replacement deposits formed where veins intersected favorable rocks. Favorable characteristics include the presence of favorable host rocks and plutonic bodies, extensive faults, known metals, and proximity to a known mining district. Expected commodities are silver, gold, copper, lead, and zinc (Toth and others, 1993).

7. Swan River Placer
and
8. Breckenridge Sanitation District
(Keystone and Boreas Pass 1:24,000 quadrangles)

These tracts are immediately adjacent to Tract 3, due east of Brewery Hill, in the Swan River drainage. It is mapped (Bryant and others, 1981; Lovering, 1935) as Pleistocene glacial drift overlying Early Proterozoic biotite gneiss on the flank of the Williams Range thrust fault.

Toth and others (1993) rated this area as having high potential for large polymetallic vein deposits (F13) and for small polymetallic replacement deposits (D6). Commodities expected would be silver, gold, copper, lead, and zinc.

FEDERAL LANDS

A. Davis Spring
(Squaw Creek 1:24,000 quadrangle)

Mapped as Glacial drift (Tweto and others, 1978). Mapped as middle glacial drift representing two stades of probable Bull Lake age (Tweto and others, 1970).

B. Black Creek
(Mount Powell 1:24,000 quadrangle)

Mapped as upper glacial drift representing five latest stades, two Neoglacial and three of Pinedale age (Tweto and others, 1970; 1978).

C. Pass Creek Ranch
(Squaw Creek 1:24,000 quadrangle)

Entire tract, 3 parcels, is mapped as Cretaceous Pierre Shale (Tweto and others, 1978).

D. Eagle's Nest-RECUSAL
(Dillon 1:24,000 quadrangle)

Mapped entirely within younger landslide deposits (Kellogg, 1997).

Mapped immediately north (about 1000 ft.) of the lower of the Hammer Fluorspar Deposit (Tweto and others, 1970). According to Tweto and others (1970):

> The deposits consist largely of fragmental fluorspar dispersed in the preglacial colluvium, which here is involved in a landslide that formed before glaciers of the

middle group advanced over it. The colluvium contains abundant chloritized rock and vein quartz derived from the area along the Frontal fault between North and South Willow Creeks, as well as various unaltered Precambrian rocks. A large pit at the lower deposit and trenches at the upper deposit show that some fluorspar encrusts the boulders of these varied rocks, and hence that it was introduced after they had been incorporated in the colluvium, and not before. As fluorspar is a fragile substance that would break off the boulders if they moved far, and as it is localized mainly in two distinct areas, the mineralization is inferred to have occurred approximately at the sites of the two deposits. Renewed movements of the landslide, which continue to the present at the toe of the slide, then diffused some of the fluorspar through the colluvial material in localized areas downslope from these sites. As the colluvium, which has been shown by drilling to be about 100 feet thick, was at the surface at the time of mineralization, the fluorspar can be classed as a hot-spring deposit. The hot springs probably rose along some of the faults in the sedimentary rocks subsidiary to the Frontal fault. One such fault, near the upper end of the upper deposit, evidently contains a large vein of quartz which was leached to a vuggy, porous state by the corrosive fluorine-bearing solutions. This quartz is geochemically barren, but quartz from a similar source incorporated in the colluvium at the lower fluorspar deposit contains a little gold an silver. The fluorspar deposits are of marginal quality in terms of the combination of size and grade in light of ordinary market value of fluorspar.

E. Heit Ranch
(Dillon 1:24,000 quadrangle)

Heit Ranch is on the hinge of an anticline in Cretaceous Dakota Group covered with Quaternary colluvium and loess, undivided, and by younger landslide deposits (Kellogg, 1997).

Toth and others (1993) did not assign any mineral resource potential to the area containing Parcels A-E.

F. Snake River Inlet
(Frisco 1:24,000 quadrangle)

The part of the parcel southwest of the highway is underlain by Upper Cretaceous Benton Shale which is overlain by Niobrara Formation (Karl Kellogg, USGS, unpublished data, 1999), and, northeast of the highway, lower shale member of the Pierre Shale may be present. A NE-striking ribbon of Holocene and upper Pleistocene alluvium and colluvium covers a large part of the parcel (Karl Kellogg, USGS, unpublished data, 1999).

This parcel is at the periphery of an area (F12) that Toth and others (1993) assigned moderate mineral resource potential for small polymetallic veins.

G. Homestead Lodge Easement
(Keystone 1:24,000 quadrangle)

Homestead Lodge is adjacent to the Schick Wetlands at the base of the Keystone ski area, south of Peru Creek, in an area mapped as alluvium probably overlying Silver Plume Granite and Idaho Springs Formation, and immediately west of the Oligocene Montezuma quartz monzonite stock (Lovering, 1935; Bryant and others, 1981).

H. Montezuma Townsite
(Montezuma 1:24,000 quadrangle)

Montezuma townsite is mapped as alluvium and glacial till probably overlying Swandyke hornblende gneiss and possibly Tertiary quartz monzonite of the Montezuma stock (Lovering, 1935).

Toth and others (1993) assigned the area containing Parcels G and H high mineral resource potential for medium-sized deposits of base and precious metal in veins (F14). Commodities expected would be silver, gold, copper, lead, and zinc.

I. County Commons
(Frisco 1:24,000 quadrangle)

Almost entirely within upper Pleistocene Pinedale till and Middle Pleistocene Bull Lake till overlying Early Proterozoic granite gneiss of the approximately 1.7 Ga Routt Plutonic Suite (Karl Kellogg, USGS, unpublished data, 1999).

This tract is at the periphery of an area (F12) that Toth and others (1993) assigned moderate mineral resource potential for small polymetallic veins. It is also just outside a small area (H1) assigned moderate potential for small deposits of tungsten (± gold) in veins. On a site-specific basis, the likelihood of mineral deposits on this particular tract is low.

J. Gold Hill
(Frisco 1:24,000 quadrangle)

The Gold Hill area is mapped as Eocene quartz monzonite porphyry overlain by Holocene and upper Pleistocene terrace gravel (Karl Kellogg, USGS, unpublished data, 1999).

Toth and others (1993) assigned this area high mineral resource potential for medium sized placer gold (± silver) deposits.

K. Tenmile Creek-RECUSAL
(Vail Pass and Copper Mountain 1:24,000 quadrangles)

Toth and others (1993) assigned this area moderate mineral resource potential for small polymetallic vein deposits (F12). Expected commodities might be gold, silver, copper, lead, and zinc.

L. Peak 7 Parcel
(Frisco 1:24,000 quadrangle)

Granite gneiss of the approximately 1.7 Ga Routt Plutonic Suite overlain by Middle or Lower Pleistocene Gravel of Gold Run (Karl Kellogg, USGS, unpublished mapping, 1999).

Toth and others (1993) assigned this area, or areas immediately adjacent, high mineral resource potential for small polymetallic replacement deposits (D6), moderate potential for small contact copper and gold skarns (C4), high potential for medium gold (± silver) placer deposits (K7), and high potential for large polymetallic vein deposits (F13). Commodities expected would be silver, gold, copper, lead, and zinc.

M. Claimjumper
(Breckenridge 1:24,000 quadrangle)

(Ransome, 1911) maps the north end of Shock Hill as Cretaceous Dakota Sandstone overlain with shale. Monzonite porphyry is exposed on the northeast side of the hill. Singewald (1951) shows considerably more geologic detail. The hill is bisected nearly along its axis but a NE-trending high angle fault that is dropped down on the southeast side. On the southeast side, the nose of the hill is Jurassic Morrison Formation overlain by Cretaceous Dakota sandstone (quartzite) and Benton shale which is intruded by Tertiary monzonite porphyry. Northwest of the fault the section begins with undifferentiated Pennsylvanian and Permian sedimentary rocks on the nose of the hill, overlain in succession by Jurassic Entrada sandstone, Jurassic Morrison Formation, and Cretaceous Dakota sandstone (quartzite).

Four mines are shown in the immediate vicinity: Iron Mask, Deep Shaft, Groundhog, and Brooks-Snider. According to Ransome (1911, p. 18), the Iron Mask shipped "high-grade silver-lead ore" from "1888 and continued with few interruptions for about 10 years." He classified the ores as blanket deposits, described by the miners as "contacts" (Ransome, 1911, p. 161). The ore was "said to have occurred above and below a sheet of porphyry" and "in some places the carbonate ore was accompanied by much free sulphur" (Ransome, 1911, p. 161). As of 1909, signs of any mining were scarce.

N. French Gulch/Gibson Hill
(Breckenridge 1:24,000 quadrangle)

Lovering (1934) mapped this area Maroon Formation, overlain by Jurassic Morrison Formation, Cretaceous Dakota sandstone (quartzite), and Benton shale intruded by monzonite porphyry and quartz monzonite porphyry. A series of en echelon northeast-trending faults cut all of the different rock units. A number of small, unnamed mines, including the New York (Wilson and LaRock, 1992), occur on or near the tract.

O. Bonanza Elbow
(Breckenridge 1:24,000 quadrangle)

Probably entirely within area mapped as Quaternary terrace gravels (Ransome, 1911).

P. Cucumber Gulch
(Breckenridge 1:24,000 quadrangle)

Appears to be in an area on the north side of Cucumber Gulch underlain by Cretaceous Dakota sandstone (quartzite) almost entirely covered with Quaternary terrace gravels (Ransome, 1911).

Q. East Moonstone
(Breckenridge 1:24,000 quadrangle)

Area on the north side of Barney Hill (formerly Nigger Hill on older maps) is mostly Cretaceous Dakota sandstone (quartzite) (Lovering, 1934). Locally overlain by Pleistocene terrace gravels and possibly intruded by monzonite porphyry (Ransome, 1911).

R. Little Mountain
(Breckenridge 1:24,000 quadrangle)

Geology in this area is complexly faulted Jurassic Morrison Formation, Cretaceous Dakota quartzite, Benton Shale, and Niobrara Formation (Lovering, 1934). These rocks are intruded by Tertiary monzonite porphyry.

Germania tunnel accesses Little Mountain, Puzzle and Ouray mines are in the immediate vicinity (Wilson and LaRock, 1992). see p. 161

Toth and others (1993) assigned the area containing Parcels M-R, or areas immediately adjacent, high mineral resource potential for small polymetallic replacement deposits (D6), moderate potential for small contact copper and gold skarns (C4), and high potential for medium gold (± silver) placer deposits (K7). Commodities expected would be silver, gold, copper, lead, and zinc.

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Wilson, A.B., and LaRock, E.J., 1992, Map showing mineralized areas and principal lode mines in southern Summit County, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-2163, scale 1:50,000.

OTHER SOURCES OF INFORMATION:

Davis, M.W., and Streufert, R.K., 1990, Gold occurrences of Colorado: Colorado Geological Survey Resource Series 28, 101 p., 2 plates.

U.S. Geological Survey, 1999a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1999b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

LIST OF ATTACHMENTS (provided by the USFS):

1. List of Summit County Tax Default Lands (for Parcel 1, claims 1-63)
2. Exhibit 1. Location map of Parcels A and B
3. Exhibit 2. Location map of Parcel C
4. Exhibit 3. Location map of Parcels D and E
5. Exhibit 4. Location map of Parcel F
6. Exhibit 5. Location map of Parcel G and Parcel 4
7. Exhibit 6. Location map of Parcel H and Parcel 5
8. Exhibit 7. Location map of Parcels I and J
9. Exhibit 8. Location map of Parcel K and Parcel 2
10. Exhibit 9. Location map of Parcels L, M, N, O, P, Q, and R
11. Exhibit 10. Location map of Parcel 3
12. Exhibit 11. Location map of Parcels 6, 7, and 8

Dillon Ranger District 1999 Land Exchange
(list compiled July 6, 1998)

No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
1	2091-0840-00-001	4008287	8 - 5 - 75	Schwitzerland	17416	46286	3/19/1908	24.930
			8 - 5 - 75	Progress	17416			
			8,9 - 5 - 75	Pacific	17416			
			8,9 - 5 - 75	Atlantic	17416			
			8,9 - 5 - 75	Silent Friend	17416			
2	2091-0910-00-001	4008454	9 - 5 - 75	Arva	7267	22547	2/17/1893	4.000
3	2091-0910-00-003	4008457	9 - 5 - 75	Pride of the West	6767	21073	5/11/1892	5.10?
4	2091-0910-00-004	4008452	9 - 5 - 75	Mountain Top	6629	19722	2/23/1892	4.650
5	2091-0920-00-005	4008453	9 - 5 - 75	Monarch	6630	19723	2/23/1892	9.77?
			9 - 5 - 75	Excelsior	6630			
6	2091-0930-00-012	4008451	9 - 5 - 75	Aladdin	1753	11514	2/7/1887	4.740
7	2091-0940-00-018	4009125	9 - 5 - 75	Queen City	9660	26667	3/28/1896	8.048
				Little Chief Extension	1514	15249	10/12/1889	
				Lone Star Extension	1515	15250	10/12/1889	
				Queen of the West	1516	15251	10/12/1889	
8	2091-0940-00-025	4008455	9 - 5 - 75	Cashier	6627	19720	2/23/1892	5.160
9	2091-0940-00-026	4008460	9 - 5 - 75	Yankee	16263	39168	6/30/1904	2.490
10	2091-1830-00-017	4008440	18 - 5 - 75	Bullion	1905	10906	9/8/1886	5.100
11	2091-1840-00-007	4009147	18 - 5 - 75	Isabel	19162	272855	6/6/1912	96.819
			18 - 5 - 75	Isabel No. 5	19162			
			18 - 5 - 75	ASF	19172	341522	6/17/1913	
			18 - 5 - 75	WTL	19172			
			17 - 5 - 75	Madison	19172			
			18,19 - 5 - 75	Pittsburg	19172			
			18 - 5 - 75	Princess	19172			
			18,19 - 5 - 75	Schuykill	19172			
			18,19 - 5 - 75	Rochester Queen	19172			
			18,19 - 5 - 75	Sharon	19172			
			17,18 - 5 - 75	WLT	19172			
			18,19 - 5 - 75	Allegheny	19172			
			17,18 - 5 - 75	CBS	19172			
			18 - 5 - 75	Isabel No. 2	19162			
			18 - 5 - 75	Isabel No. 4	19162			
			18 - 5 - 75	Philadelphia	19172			
			18 - 5 - 75	ESR	19172			
			17,18 - 5 - 75	Lincoln	19172			
			17,18 - 5 - 75	Jackson	19172			
			17,18 - 5 - 75	Washington	19172			
			17,18 - 5 - 75	Oil City	19172			
			17,18 - 5 - 75	Henderson	1086A	12639	11/18/1887	
			17,18 - 5 - 75	Isabel No. 1	19162			
			18,19 - 5 - 75	Decatur	19172			
12	2091-2010-00-014	4008179	17,20 - 5 - 75	Mattie Monroe	12358	30413	1/18/1899	4.120
13	2091-2020-00-009	4008186	17,20 - 5 - 75	Wall Street	1430	7118	1/31/1883	4.330

Dillon Ranger District 1999 Land Exchange
(list compiled July 6, 1998)

No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
14	2091-2920-00-003	4009157	29 - 5 - 75	Rich Ore	2105	20373	4/9/1892	48.620
			29 - 5 - 75	Black Crow	20426	1053812	3/8/1932	
			29 - 5 - 75	Lucky Dutchman	20426			
			29 - 5 - 75	Lucky	20426			
15	2091-2930-00-016	4008173	29 - 5 -75	Rush No. 2	19788	654923	11-29-1918	41.250
				Cady No. 2	19788			
				Palmer No. 2	19788			
				Baldridge No. 1	19788			
16	2091-3130-00-005	4009160	31 - 5 - 75 & 36 - 5 - 76	Monte Rosa	2365	19525	2/6/1892	12.420
			31 - 5 - 75	Salisbury	4912	17330	3/4/1891	
			31 - 5 - 75	Santa Fe	4912	17330	3/4/1891	
			31,36 - 5 - 75	Santa Cruz	4912	17330	3/4/1891	
			31,36 - 5 - 75	Bryan	16676	40761	4/3/1905	
			31 - 5 - 75	Russell	17359	44566	3/5/1908	
17	2093-1330-00-003	4008188	13,24 - 5 - 76	Grand Union	1986	11873	4/19/1887	5.160
18	2093-1510-00-004	4008439	14,15 - 5 - 76	Fairmont	1909	10124	8/14/1885	5.160
19	2093-2530-00-006	4008198	25 - 5 - 76	undivided 1/2 interest				12.845
				Elsie	18759			
				Corona	18759			
				Lillian	18759			
20	2093-3330-00-010	4008171	33 - 5 - 76	Silver Point	5730	18291	7/8/1891	5.167
21	2097-0720-00-002	4009445	7 - 5 - 78	Bromide	1963	24674	8/1/1894	8.170
22	2099-0110-00-001	4008213	1 - 5 - 79	undivided 3/4 interest				5.160
				Treasure Vault	1916	11449	1/25/1887	
05 (23)	2209-0420-00-001 (Byron)	6502223	4 - 6 - 78	Royal Queen of Shebas	18072			292.064
			4 - 6 - 78	RQ of S No. 2	18072			
			4 - 6 - 78	RQ of S No.5	18072			
			4 - 6 - 78	RQ of S No. 6	18072			
			4 - 6 - 78	RQ of S No. 7	18072			
			4 - 6 - 78	RQ of S No. 8	18072			
			4 - 6 - 78	RQ of S No. 9	18072			
			4 - 6 - 78	RQ of S No. 10	18072			
			4 - 6 - 78	RQ of S No. 11	18072			
			4,9 - 6 - 78	Sunnyside	18072			
			4,9 - 6 - 78	Sunnyside No. 2	18072			
			4,9 - 6 - 78	Sunnyside No. 3	18072			
			4,9 - 6 - 78	Sunnyside No. 4	18072			
			9 - 6 - 78	Gold King	18072			
			9 - 6 - 78	Gold King No. 2	18072			
			9 - 6 - 78	Gold King No. 3	18072			
			9 - 6 - 78	Gold King No. 4	18072			
			9 - 6 - 78	Camp Bird	18072			
			9 - 6 - 78	Camp Bird No. 2	18072			
			9 - 6 - 78	Camp Bird No. 3	18072			
			9 - 6 - 78	Camp Bird No. 4	18072			

Dillon Ranger District 1999 Land Exchange
(list compiled July 6, 1998)

No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
			4 - 6 - 78	Golden Centrum	18844			
			9 - 6 - 78	Camp Bird No. 5	19061			
			9 - 6 - 78	Camp Bird No. 6	19061			
			9 - 6 - 78	Camp Bird No. 7	19061			
			9 - 6 - 78	Camp Bird No. 8	19061			
			9 - 6 - 78	Camp Bird No. 9	19061			
			9 - 6 - 78	Gold King No. 5	19061			
			9 - 6 - 78	Gold King No. 6	19061			
			9 - 6 - 78	Gold King No. 7	19061			
			9 - 6 - 78	Gold King No. 8	19061			
			9 - 6 - 78	Gold King No. 9	19061			
			4,9 - 6 - 78	Sunnyside No. 5	19061			
			4,9 - 6 - 78	Sunnyside No. 6	19061			
			4,9 - 6 - 78	Sunnyside No. 7	19061			
			4,9 - 6 - 78	Sunnyside No. 8	19061			
			4,9 - 6 - 78	Sunnyside No. 9	19061			
			4 - 6 - 78 & 34 - 5 - 78	Beloit	19064			
			4 - 6 - 78 & 34 - 5 - 78	Beloit No. 1	19064			
			4 - 6 - 78 & 34 - 5 - 78	Beloit No. 2	19064			
			4 - 6 - 78 & 34 - 5 - 78	Delavan	19064			
			4 - 6 - 78	Delavan Extension	19064			
			4 - 6 - 78	Madison	19064			
			4 - 6 - 78	Tram	19064			
			33 - 5 - 78	Protection	19064			
			4 - 6 - 78	Royal King Solomon	17781A			
			4 - 6 - 78	RKS No. 1	17781A			
			4 - 6 - 78	RKS No. 2	17781A			
			4 - 6 - 78 & 34 - 5 - 78	Royal Frank	17781A			
			4 - 6 - 78 & 34 - 5 - 78	Royal Frank No. 2	17781A			
			4 - 6 - 78	Royal Queen of Sheba	17781A			
			4 - 6 - 78	RQ of S No. 2	17781A			
			4 - 6 - 78	RQ of S No. 3	17781A			
			4 - 6 - 78	RQ of S No. 4	17781A			
			4 - 6 - 78	RQ of S No. 5	17781A			
			4 - 6 - 78	RQ of S No. 6	17781A			
			4 - 6 - 78	RQ of S No. 7	17781A			
			4 - 6 - 78	RQ of S No. 8	17781A			
			4 - 6 - 78	RQ of S No. 9	17781A			
			4 - 6 - 78 & 33 - 5 -78	King Solomon Mill Site	17781B			
05	(24) 2209-0420-00-004 (weigel)	3009310	4 - 6 - 78	Star of the West	19334A			30.950
			4 - 6 - 78	Young Giant	19334A			
			4 - 6 - 78	Copper Queen	19334A			
			4 - 6 - 78	Decimal	19334A			
			4,5 - 6 - 78	Florence	19334A			
			4 - 6 - 78	Grace	19334A			
			4 - 6 - 78	Mary Verna	19334A			
05	(25) 2209-0810-00-001 (weigel)	3009311	8 - 6 - 78	South Dakota	19334A			92.880

Summit County Government Offered Lands
Dillon Ranger District 1999 Land Exchange
(list compiled July 6, 1998)

No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
			8 - 6 - 78	Tennessee	19334A			
			8 - 6 - 78	Washington	19334A			
			8 - 6 - 78	West Virginia	19334A			
			8,9 - 6 - 78	Alaska	19334A			
			8,9 - 6 - 78	Arizona	19334A			
			8 - 6 - 78	Arkansas	19334A			
			8 - 6 - 78	Connecticut	19334A			
			8 - 6 - 78	Delaware	19334A			
			8 - 6 - 78	Iowa	19334A			
			8 - 6 - 78	Kentucky	19334A			
			8 - 6 - 78	Massachusetts	19334A			
			8 - 6 - 78	Missouri	19334A			
			8 - 6 - 78	Michigan	19334A			
			8 - 6 - 78	New York	19334A			
			8 - 6 - 78	Nevada	19334A			
			8 - 6 - 78	Ohio	19334A			
			8,9 - 6 - 78	Oregon	19334A			
26	2209-0820-00-002	4008172	8 - 6 - 78	Monroe	7714	24765	9/8/1894	4.828
27	no PPI #	3001837	9 - 6 - 78	Cliff	19062			13.403
				Cliff No. 1	19062			
				Cliff No. 2	19062			
28	2209-0920-00-001	4008230	9 - 6 - 78	Greenland	19334A	516061	2/28/1916	517.740
			9 - 6 - 78	Iceland	19334A			
			9 - 6 - 78	Badger	19334A			
			9 - 6 - 78	Sucker	19334A			
			4 - 6 - 78	Dollie Thompson	19334A			
			4 - 6 - 78	Troublesome	19334A			
			4 - 6 - 78	Tid-A-Wid	19334A			
			4 - 6 - 78	Marguerite	19334A			
			9 - 6 - 78	Tar Heels	19334A			
			9 - 6 - 78	Hawkeye	19334A			
			9 - 6 - 78	Keystone	19334A			
			9 - 6 - 78	Sonora	19334A			
			9 - 6 - 78	Alberta	19334A			
			9 - 6 - 78	Assiniboia	19334A			
			9 - 6 - 78	Nova Scotia	19334A			
			9 - 6 - 78	Mississippi Coon	19334A			
			9 - 6 - 78	Quebec	19334A			
			9 - 6 - 78	Manitoba	19334A			
			9 - 6 - 78	Columbia	19334A			
			9 - 6 - 78	Indiana	19334A			
			9 - 6 - 78	Oklahoma	19334A			
			9 - 6 - 78	California	19334A			
			9 - 6 - 78	Cohuila	19334A			
			8,9 - 6 - 78	North Dakota	19334A			
			4,8,9 - 6 - 78	Nebraska	19334A			
			4,8,9 - 6 - 78	Pennsylvania	19334A			
			4,8,9 - 6 - 78	New Jersey	19334A			
			4,5,8,9 - 6 - 78	Utah	19334A			
			5,9 - 6 - 78	Idaho	19334A			
			5,9 - 6 - 78	Wisconsin	19334A			
			5,9 - 6 - 78	Maine	19334A			
			5,9 - 6 - 78	Maryland	19334A			

Summit County Government Offered Lands
Dillon Ranger District 1999 Land Exchange
(list compiled July 6, 1998)

No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
			5,9 - 6 - 78	Colorado	19334A			
			9 - 6 - 78	Chihuahua	19334A			
			5,9 - 6 - 78	Illinois	19334A			
			5,9 - 6 - 78	Louisiana	19334A			
			5,9 - 6 - 78	Mississippi	19334A			
			5,9 - 6 - 78	Texas	19334A			
			5 - 6 - 78	Tifton No. 3	19334A			
			5 - 6 - 78	Tifton No. 4	19334A			
			5 - 6 - 78	Tifton No. 5	19334A			
			4,5 - 6 - 78	Tifton No. 6	19334A			
			4,5 - 6 - 78	Tifton No. 7	19334A			
			4,5 - 6 - 78	Tifton No. 8	19334A			
			4,5 - 6 - 78	Tifton No. 9	19334A			
			4,5 - 6 - 78	Tifton No. 10	19334A			
			4,5 - 6 - 78	Tifton No. 11	19334A			
			4 - 6 - 78	Tifton No. 12	19334A			
			4 - 6 - 78	Tifton No. 13	19334A			
			4 - 6 - 78	Tifton No. 14	19334A			
			4 - 6 - 78	Tifton No. 15	19334A			
			4,9 - 6 - 78	Tifton No. 16	19334A			
			4,9 - 6 - 78	Tifton No. 17	19334A			
			4,9 - 6 - 78	Tifton No. 18	19334A			
			4,9 - 6 - 78	Tifton No. 19	19334A			
			4,9 - 6 - 78	Tifton No. 20	19334A			
			4,9 - 6 - 78	Tifton No. 21	19334A			
			4,9 - 6 - 78	Tifton No. 22	19334A			
			4,9 - 6 - 78	Tifton No. 23	19334A			
			4,9 - 6 - 78	Tifton No. 24	19334A			
			4,9 - 6 - 78	Tifton No. 25	19334A			
			4,9 - 6 - 78	Tifton No. 26	19334A			
			4,9 - 6 - 78	Tifton No. 27	19334A			
			4,9 - 6 - 78	Tifton No. 28	19334A			
			4,9 - 6 - 78	Tifton No. 29	19334A			
			4,9 - 6 - 78	Tifton No. 30	19334A			
			9 - 6 - 78	Tifton No. 31	19334A			
			4 - 6 - 78	Tifton No. 32	19334A			
			4 - 6 - 78	Tifton No. 33	19334A			
			4 - 6 - 78	Tifton No. 34	19334A			
			4 - 6 - 78	Tifton No. 35	19334A			
			4 - 6 - 78	Tifton No. 36	19334A			
			4 - 6 - 78	Tifton No. 37	19334A			
			4 - 6 - 78	Tifton No. 38	19334A			
			4 - 6 - 78	Tifton No. 39	19334A			
			4 - 6 - 78	Tifton No. 40	19334A			
			4 - 6 - 78	Tifton No. 41	19334A			
			4 - 6 - 78	Tifton No. 42	19334A			
			4 - 6 - 78	Tifton No. 43	19334A			
			4 - 6 - 78	Tifton No. 44	19334A			
			4 - 6 - 78	Tifton No. 45	19334A			
			4 - 6 - 78	Tifton No. 46	19334A			
			4 - 6 - 78	Tifton No. 47	19334A			
			4 - 6 - 78	Tifton No. 48	19334A			
			4 - 6 - 78	Tifton No. 49	19334A			
			4 - 6 - 78	Tifton No. 50	19334A			
			4,5 - 6 - 78	Tifton No. 51	19334A			
			4,5 - 6 - 78	Tifton No. 52	19334A			

Summit County Government Offered Lands
Dillon Ranger District 1999 Land Exchange
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No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
			4,5 - 6 - 78	Tifton No. 53	19334A			
			4,5 - 6 - 78	Tifton No. 54	19334A			
			4,5 - 6 - 78	Tifton No. 55	19334A			
			4 - 6 - 78	Tifton No. 56	19334A			
			4 - 6 - 78	Tifton No. 57	19334A			
			4 - 6 - 78	Tifton No. 58	19334A			
			4 - 6 - 78	Tifton No. 59	19334A			
			4 - 6 - 78	Tifton No. 60	19334A			
			4 - 6 - 78	Tifton No. 61	19334A			
			4,5 - 6 - 78	Oroconda	19334A			
			9 - 6 - 78	Labrador	19334A			
			9 - 6 - 78	Ontario	19334A			
			9 - 6 - 78	Wolverine	19334A			
			9 - 6 - 78	Nutmeg	19334A			
			9 - 6 - 78	Hatchie	19334A			
29	no PPI #	4008170	9 - 6 - 78	Eureka	9971	28994	2/1/1898	5.170
30	2209-0930-00-004	4008210	9 - 6 - 78	Emma J	6708	22545	2/17/1893	5.160
31	no PPI #	4008119	17 - 6 - 78	Frank No. 1 Millsite	18009B	25473	2/10/1908	1.062
05 (32)	2211-1610-00-001	2806001	9,16 - 6 - 77	HES 235 Tract A & portion of Tract B				39.190
33	2211-2620-00-001	4008581	26 - 6 - 77	Treasury	8647	24618	7/17/1894	5.160
34	2211-2810-00-003	4008207	28 - 6 - 77	Cleopatra No. 2	8529	28557	8/28/1897	5.165
35	2213-1020-00-003	4008274	10 - 6 - 76	Sampson Mill Site	677B	6320	8-15-1882	5.000
36	2213-1110-00-001	4008190	11,12 - 6 - 76	Montague	16498A	41119	11/20/1905	46.380
			11,12 - 6 - 76	Montague #1	16498A			
			11,12 - 6 - 76	Montague #2	16498A			
			11,12 - 6 - 76	Montague #3	16498A			
			11,12 - 6 - 76	Montague #4	16498A			
			12 - 6 - 78	Montague #5	16498A			
			12 - 6 - 78	Montague #6	16498A			
			11,12 - 6 - 76	Weasel	16498A			
			1,12 - 6 - 76	Montague Mill Site	16498B	41119	11/20/1905	
37	2213-2030-00-002	4008176	20 - 6 - 76	Black Bess	10033	27201	6/23/1896	15.490
			20 - 6 - 76	Keystone State	10033			
			20 - 6 - 76	Brother John	10033			
38	2213-2840-00-004	4008165	28,33 - 6 - 76	Uncle Sam	12286	29777	8/18/1898	4.395
39	2213-3320-00-020	4008277	33 - 6 - 76	Mary B	14760	?	?	4.106
40	2369-0630-00-004	4008217	6 - 7 - 76 & 1 - 7 - 77	Wahpeton No. 3	19202A	587056	6/6/1917	96.320
			6,7 - 7 - 77	Wahpeton No. 14	19202A			
			6,7 - 7 - 77	Wahpeton No. 15	19202A			
			6,7 - 7 - 77	Wahpeton No. 16	19202A			
			6,7 - 7 - 77	Wahpeton No. 11A	19202A			
			6 - 7 - 76 &	Stray Four Hundred	19202A			

Summit County Government Offered Lands
Dillon Ranger District 1999 Land Exchange
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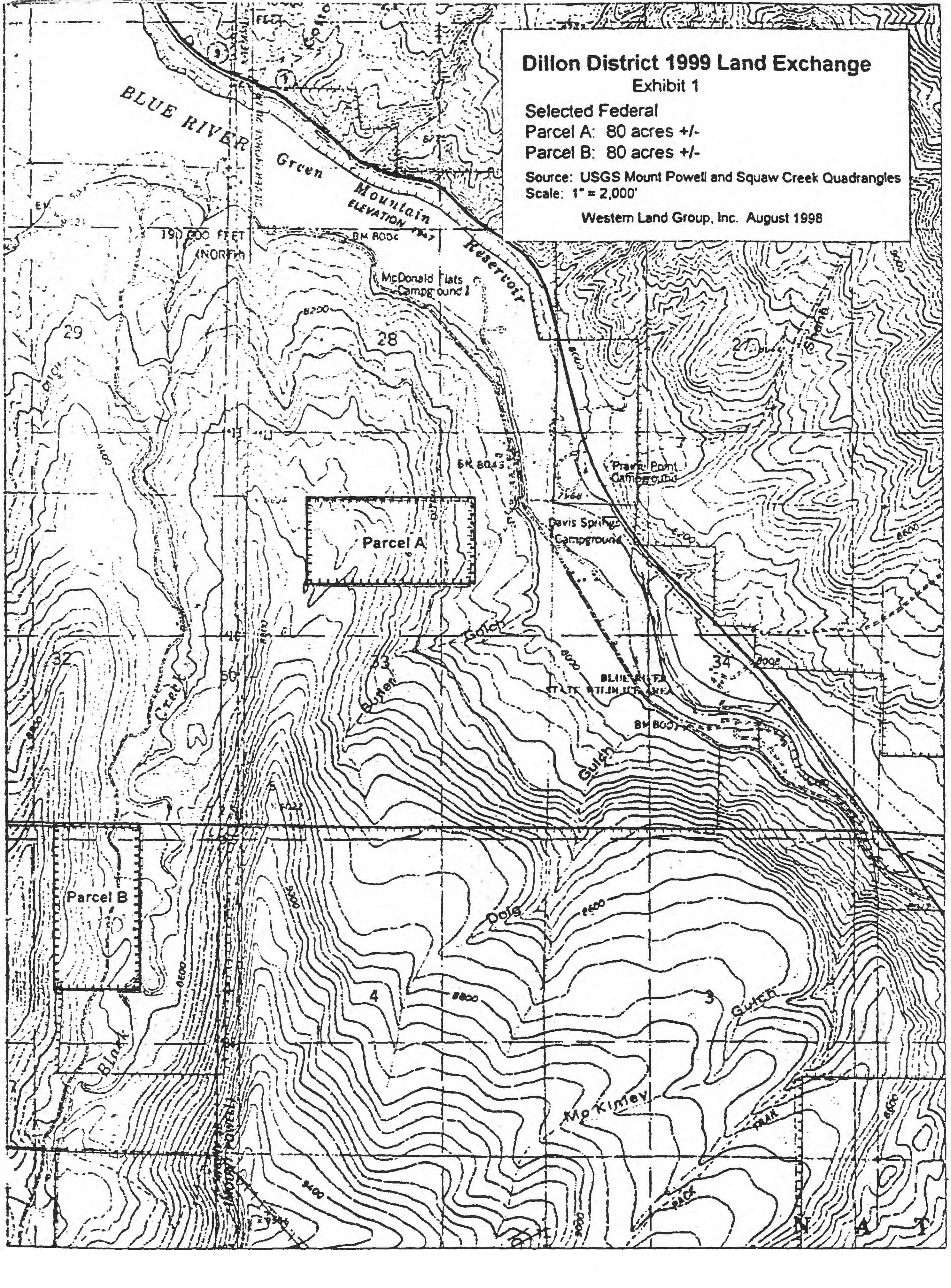
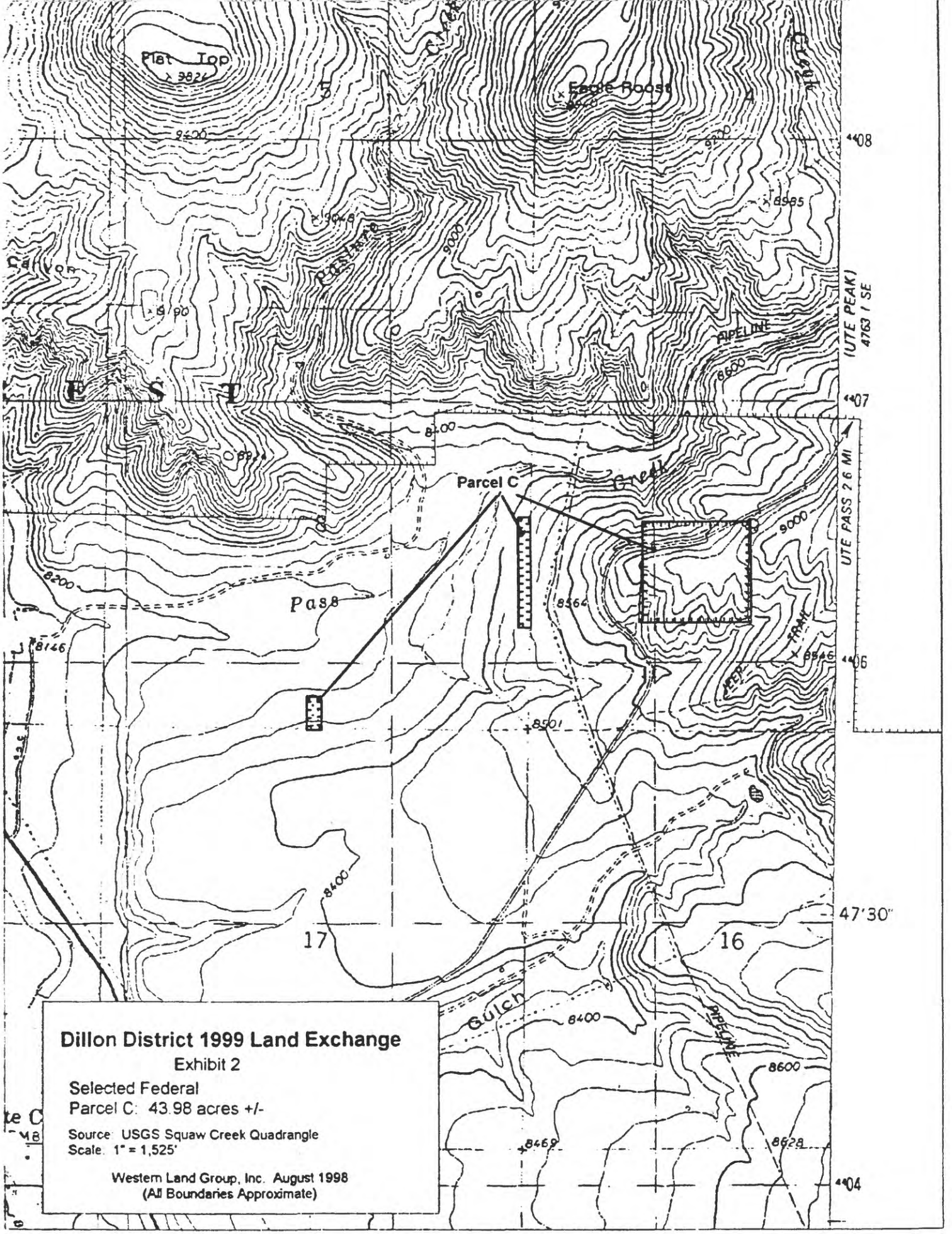
No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
			1 - 7 - 77					
			6 - 7 - 77	Maid of Erin No. 2	19202A			
			6,7 - 7 - 77	Reno	19202A			
			6,7 - 7 - 77	Edmona	19202A			
			6,7 - 7 - 77	Robert Lee	19202A			
			6,7 - 7 - 77	Louisiana	19202A			
			6 - 7 - 77	Wahpeton No. 6	19202A			
			6,7 - 7 - 77	Silver Gate	19202A			
			6 - 7 - 77	Wahpeton No. 7	19202A			
			6 - 7 - 77	Wahpeton No. 8	19202A			
			6 - 7 - 77	Wahpeton No. 9	19202A			
			6,7 - 7 - 77	Wahpeton No. 10	19202A			
			6,7 - 7 - 77	Wahpeton No. 11	19202A			
			6,7 - 7 - 77	Wahpeton No. 12	19202A			
			6,7 - 7 - 77	Wahpeton No. 13	19202A			
			6 - 7 - 77 & 1,12 - 7 - 77	Puzzler	19202A			
OS (41)	2371-0130-00-010	no Sch #	1 -7 - 77	Me Too	6699			5.160
OS (42)	2371-0140-00-011	6502649	1,12 - 7 -77	Minnie B	6589			5.160
OS (43)	2371-0330-00-008	2809205	3 - 7 - 77	Gold Bell	16137	?	8/5/1905	43.196
			3 - 7 - 77	Gold Bell No. 2	16137			
			3 - 7 - 77	Black Prince	16137			
			3 - 7 - 77	Black Prince No. 2	16137			
			3 - 7 - 77	Little Chief	16137			
			3 - 7 - 77	Little Chief No. 2	16137			
			3 - 7 - 77	Indian Girl	16137			
			3 - 7 - 77	Silver Cup	16137			
			3 - 7 - 77	Silver Cup No. 2	16137			
44	2371-0340-00-009	4008167	3 - 7 - 77	Denver	12378	?	?	5.022
45	2371-1340-00-010	4008193	3 - 7 - 77	Wisconsin	15408	38215	4/11/1904	5.165
46	2371-1020-00-018	4008166	3,10 - 7 - 77	Pony Express	12367	30060	11-16-1898	8.400
			3,10 - 7 - 77	Harry S	12367			
OS (47)	2371-1510-00-008	2809516	15 - 7 - 77	Evening Star	3871			5.160
48	2371-2240-00-005	4008191	22 - 7 - 77	Sunny Side	9580	26602	3/13/1896	5.160
OS (49)	2371-2720-00-003	2803977	27 - 7 - 77	Casandra No. 1	2143	?	?	62.050
			22,27 - 7 - 77	Snowdrift	2152			
			27 - 7 - 77	Warriors Mark	2138			
			27 - 7 - 77	Warriors Mark No. 2	2139			
			27 - 7 - 77	Queen Name No. 1	2140			
			27 - 7 - 77	Queen Name No. 2	2141			
			22,27 - 7 - 77	Aetna	2142			
			22,27 - 7 - 77	Snowdrift Placer	2331			
			27 - 7 - 77	Casandra No. 2	2144			
			27 - 7 - 77	Casandra No. 3	2145			
			27 - 7 - 77	Casandra No. 4	2146			
			27 - 7 - 77	Casandra No. 5	2147			

Summit County Government Offered Lands
Dillon Ranger District 1999 Land Exchange
(list compiled July 6, 1998)

No.	PPI #	Schedule #	Location	Mining Claim Name	USMS #	Patent #	Patent Date	Size
50	2371-2730-00-005	4008199	27 -7 - 77	Silver Belt No. 1	4087	14409	11/3/1888	5.070
05 (51)	2373-2220-00-002	2809469	22 - 7 - 78	Eliza Ann	3888			5.160
52	2373-2240-00-003	4008296	22 - 7 - 78	Continental	5297	17991	6/5/1891	5.160
53	2373-3220-00-002	4008168	32 - 7 - 78	Matchless	2103	7233	2/28/1883	15.270
			32 - 7 - 78	Peerless	2104	7188	2/15/1883	
			32 - 7 - 78	Smuggler	3003	10453	4/9/1886	
54	2373-3330-00-001	4008218	33 - 7 - 78	May	19400	357015	9/25/1913	62.750
			32,33 - 7 - 78	Crown Point No. 4	19400			
			33 - 7 - 78	Crown Point No. 5	19400			
			33 - 7 - 78 & 4 - 8 - 78	Grandview	15418	?	2/1904	
			33 - 7 - 78 & 4 - 8 - 78	Marguerite	19400			
			33 - 7 - 78 & 4 - 8 - 78	Copper & Silver	19400			
			33 - 7 - 78 & 4 - 8 - 78	Gold Coin	19400			
			4 - 8 - 78	Copper & Silver Ext S	19400			
			33,34 - 7 - 78	Copper & Silver Ext NE	19400			
			33 - 7 - 78	Crown Point No. 1	19400			
			33 - 7 - 78	Crown Point No. 2	19400			
			33 - 7 - 78 & 4 - 8 - 78	Crown Point No. 3	19400			
			33 - 7 - 78	Crown Point	19400			
55	2483-0110-00-002	4008180	1 - 8 - 78	Derby	15511	39355	7/21/1904	4.670
56	2483-0220-00-002	4008200	2 - 8 - 78	Dickson	6265	?	?	3.650
57	2483-0230-00-012	4008285	2 - 8 - 78	Witch Hazel	9899	27417	9/23/1896	5.160
58	2483-0230-00-014	4008693	2,11 - 8 - 78	Grey Eagle	17678	43845	3/9/1908	5.170
59	2483-0230-00-016	4008694	2,11 - 8 - 78	Webster	20446	1111572	6/9/1941	20.660
60	2483-0340-00-010	4008194	3 - 8 - 78	Jo Dandy	14801	35783	8/1/1902	0.090
61	2483-0540-00-007	4008181	5 - 8 - 78	Peoples Party	16737	40005	11/19/1904	8.349
62	2483-0540-00-009	4008204	5 - 8 - 78	Geneva	13697	33887	5/18/1901	3.970
			5 - 8 - 78	North Star	13697			
63	no PPI #	4008174	6 - 8 - 78	Miller	2913	10520	5/7/1886	5.170
				TOTAL				180[illegible].457


Dillon District 1999 Land Exchange
Exhibit 1
Selected Federal
Parcel A: 80 acres +/-
Parcel B: 80 acres +/-
Source: USGS Mount Powell and Squaw Creek Quadrangles
Scale: 1" = 2,000'
Western Land Group, Inc. August 1998
BLUE RIVER
Green Mountain Reservoir
ELEVATION
190 000 FEET (NORTH)
McDonald Flats Campground
Prairie Point Campground
Davis Springs Campground
Parcel A
Parcel B
Gulch
Gulch
Gulch
Dols
McKinney
BLUE RIVER STATE WILDLIFE AREA
29
28
27
32
33
34
4
3
8200
8600
8800
9000
9400



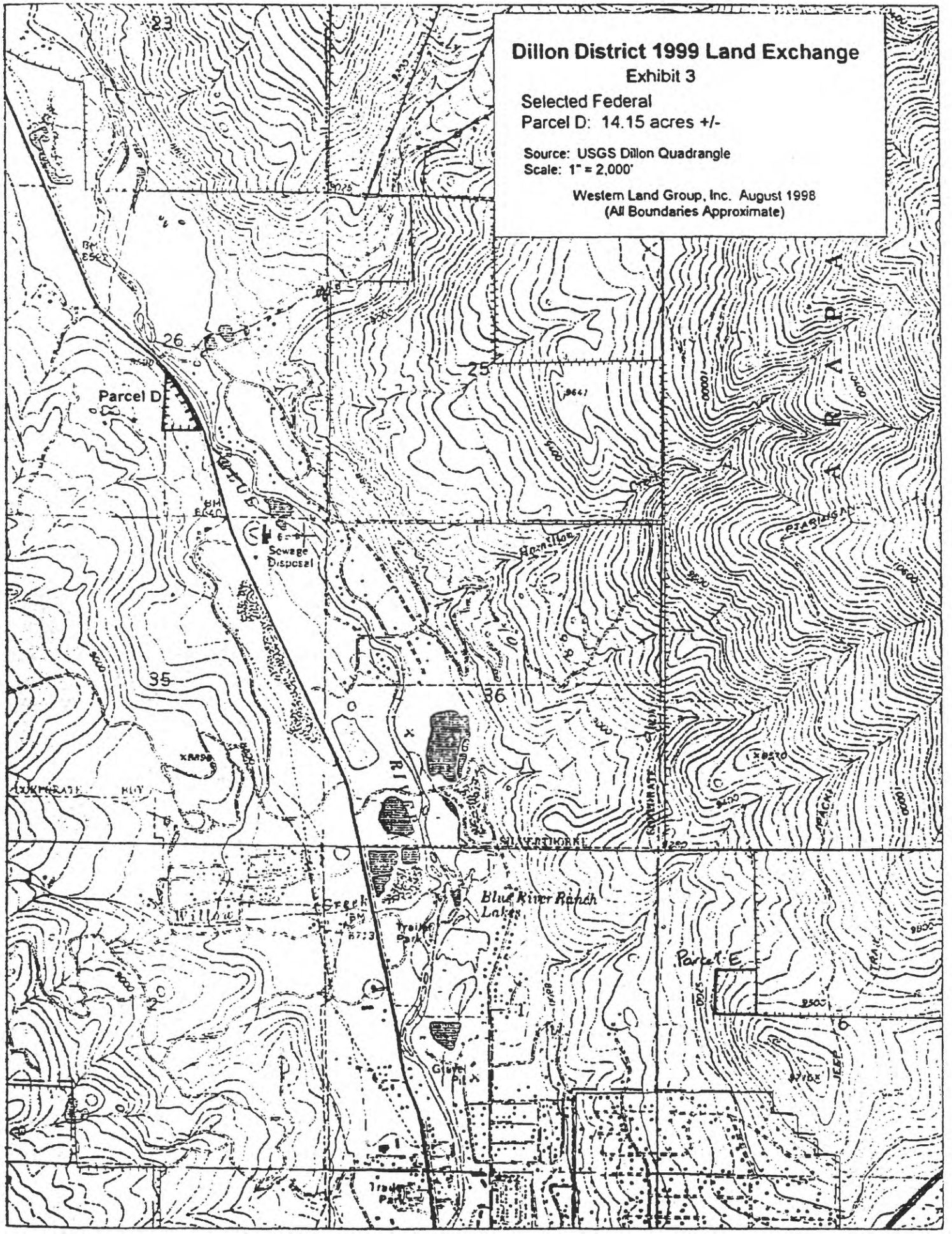
Dillon District 1999 Land Exchange

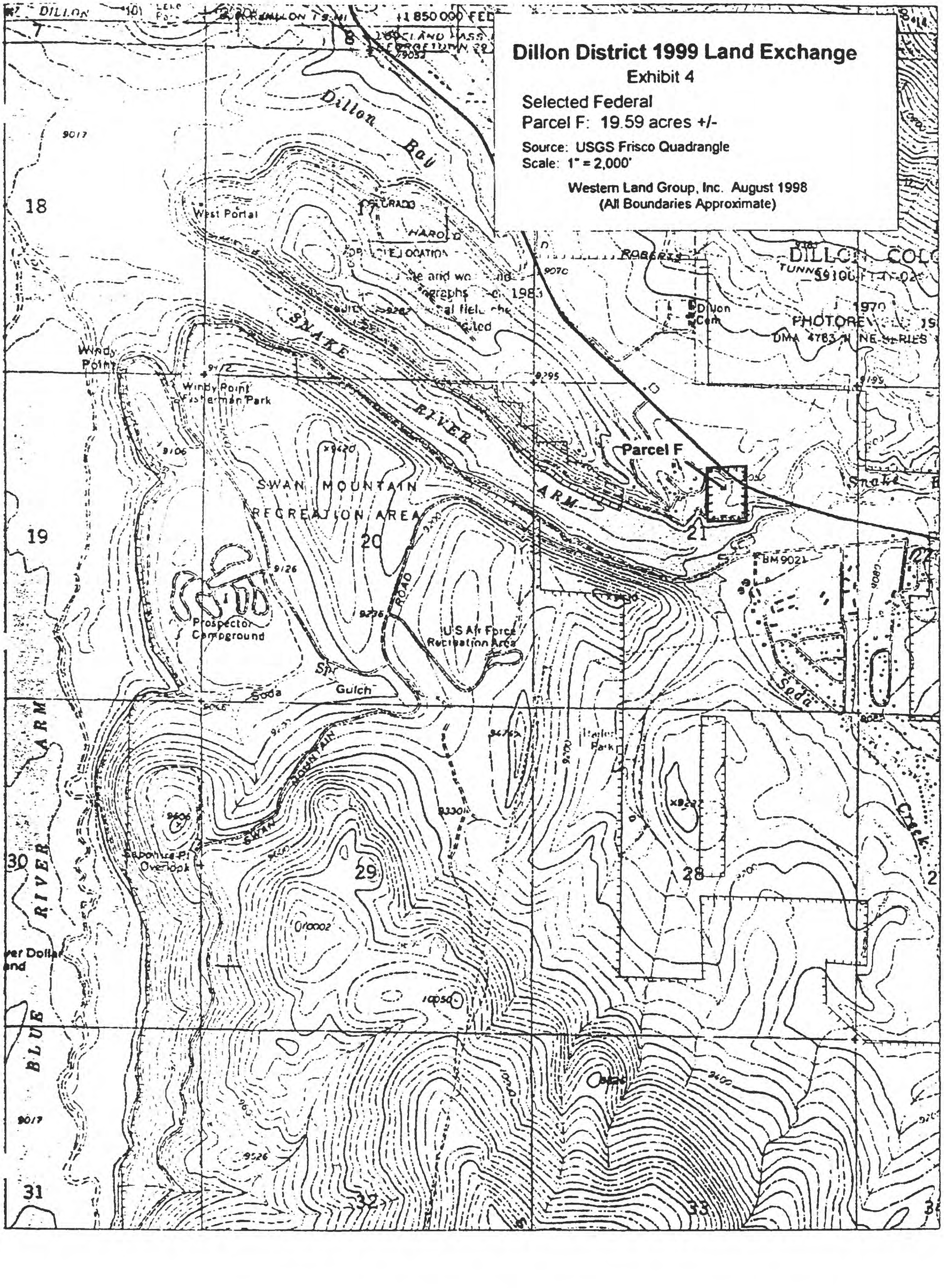
Exhibit 2

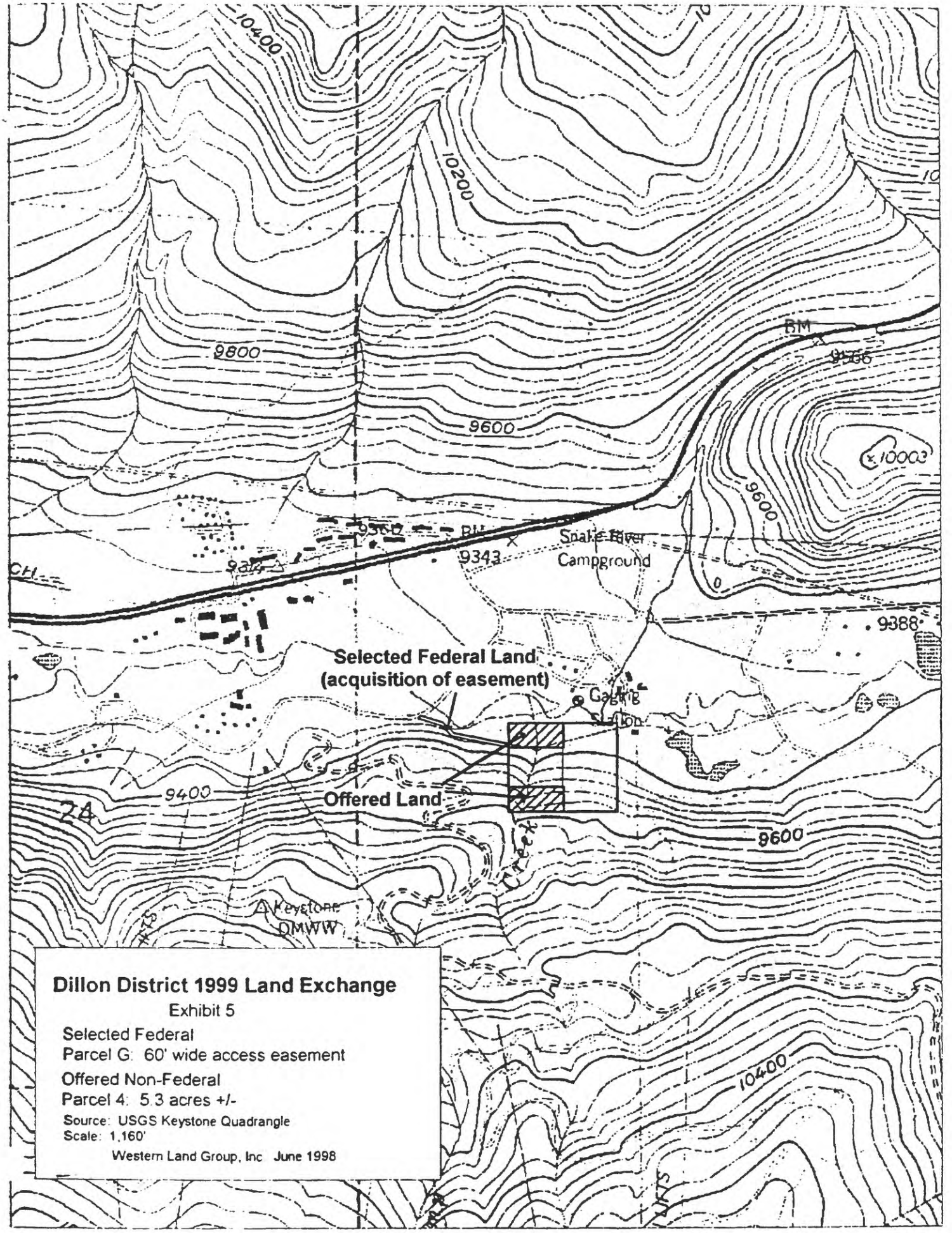
Selected Federal
Parcel C: 43.98 acres +/-

Source: USGS Squaw Creek Quadrangle
Scale: 1" = 1,525'

Western Land Group, Inc. August 1998
(All Boundaries Approximate)


Dillon District 1999 Land Exchange
Exhibit 3
Selected Federal
Parcel D: 14.15 acres +/-
Source: USGS Dillon Quadrangle
Scale: 1" = 2,000'
Western Land Group, Inc. August 1998
(All Boundaries Approximate)
Parcel D
Parcel E
Sewage Disposal
Blue River Ranch Lakes
23
26
25
35
36


Dillon District 1999 Land Exchange
Exhibit 4
Selected Federal
Parcel F: 19.59 acres +/-
Source: USGS Frisco Quadrangle
Scale: 1" = 2,000'
Western Land Group, Inc. August 1998
(All Boundaries Approximate)
Parcel F
Dillon Bay
SNAKE RIVER ARM
SWAN MOUNTAIN RECREATION AREA
West Portal
Windy Point
Windy Point Fisherman Park
Prospector Campground
U S Air Force Recreation Area
Soda Gulch
ROAD
BLUE RIVER ARM
Dillon Cem
BM 9021
Creek
18
19
20
21
28
29
30
31
32
33



Dillon District 1999 Land Exchange

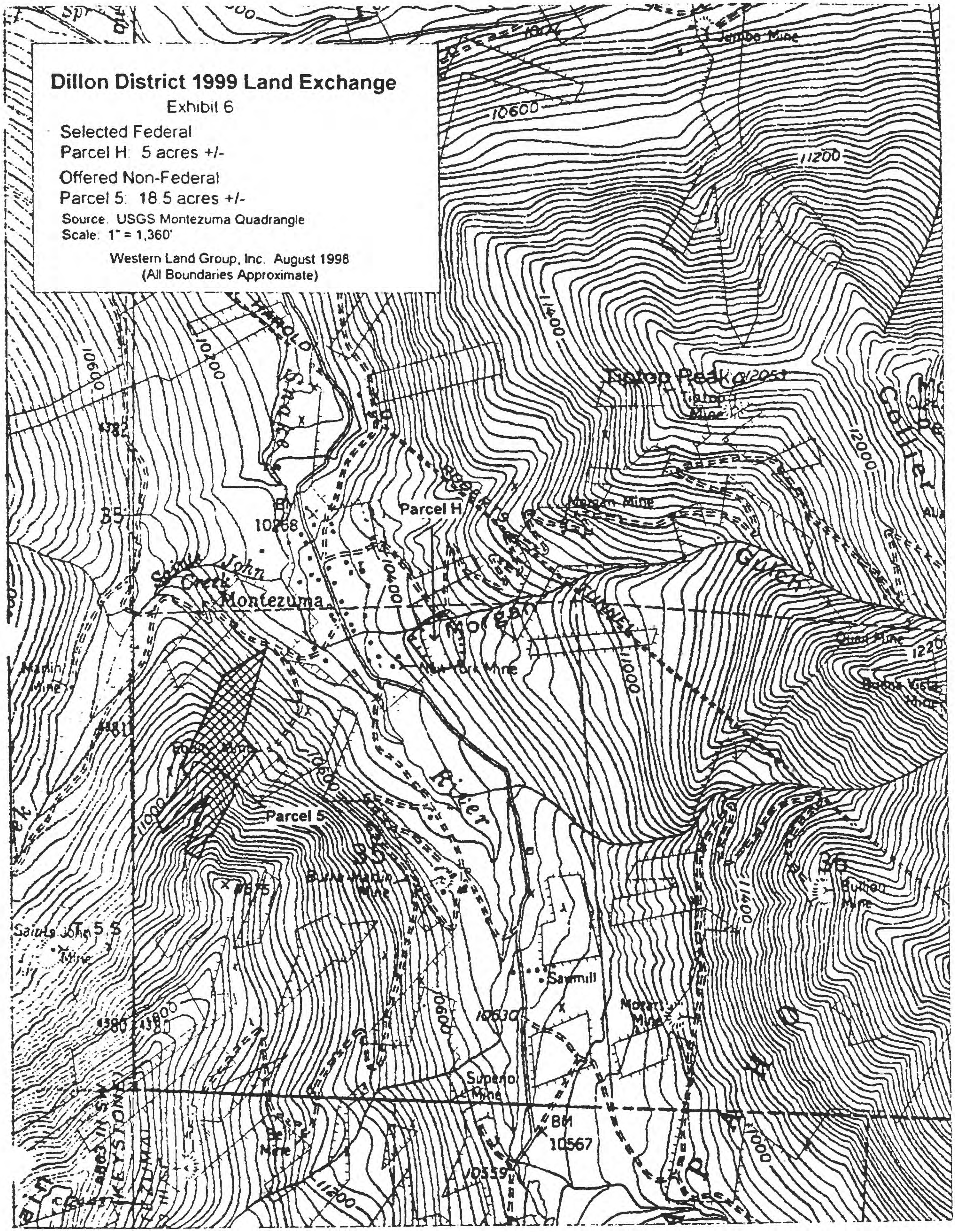
Exhibit 5

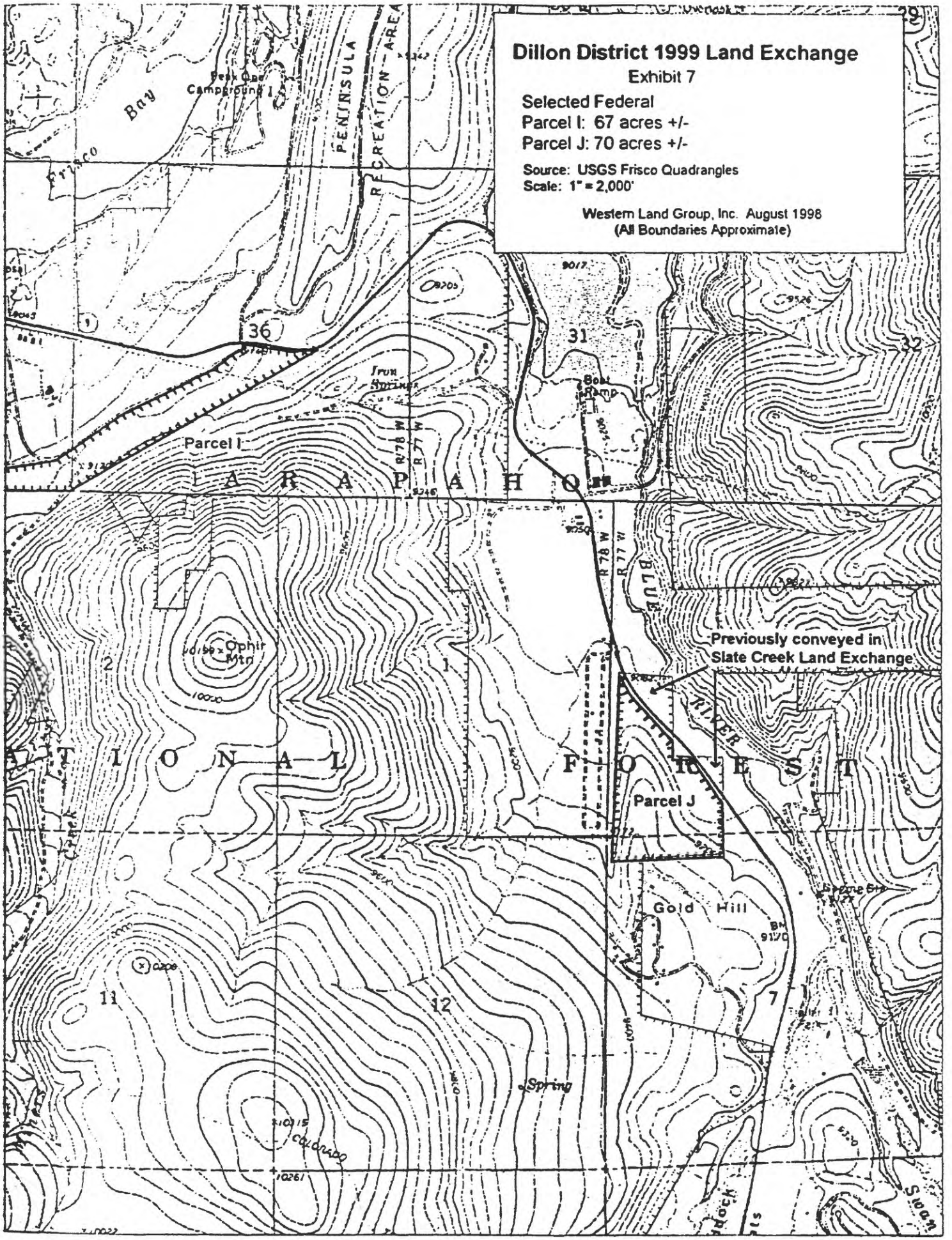
Selected Federal
Parcel G: 60' wide access easement

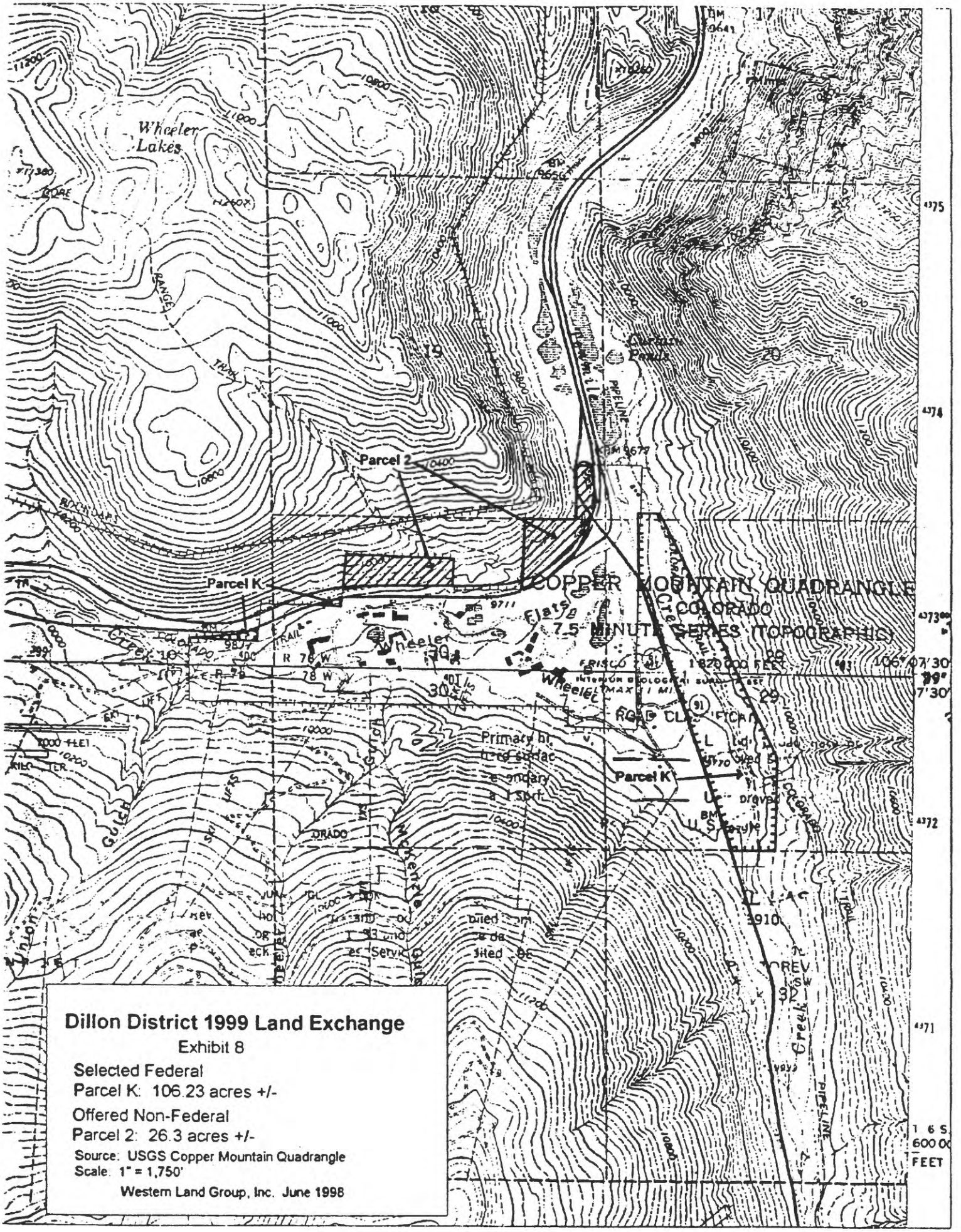
Offered Non-Federal
Parcel 4: 5.3 acres +/-

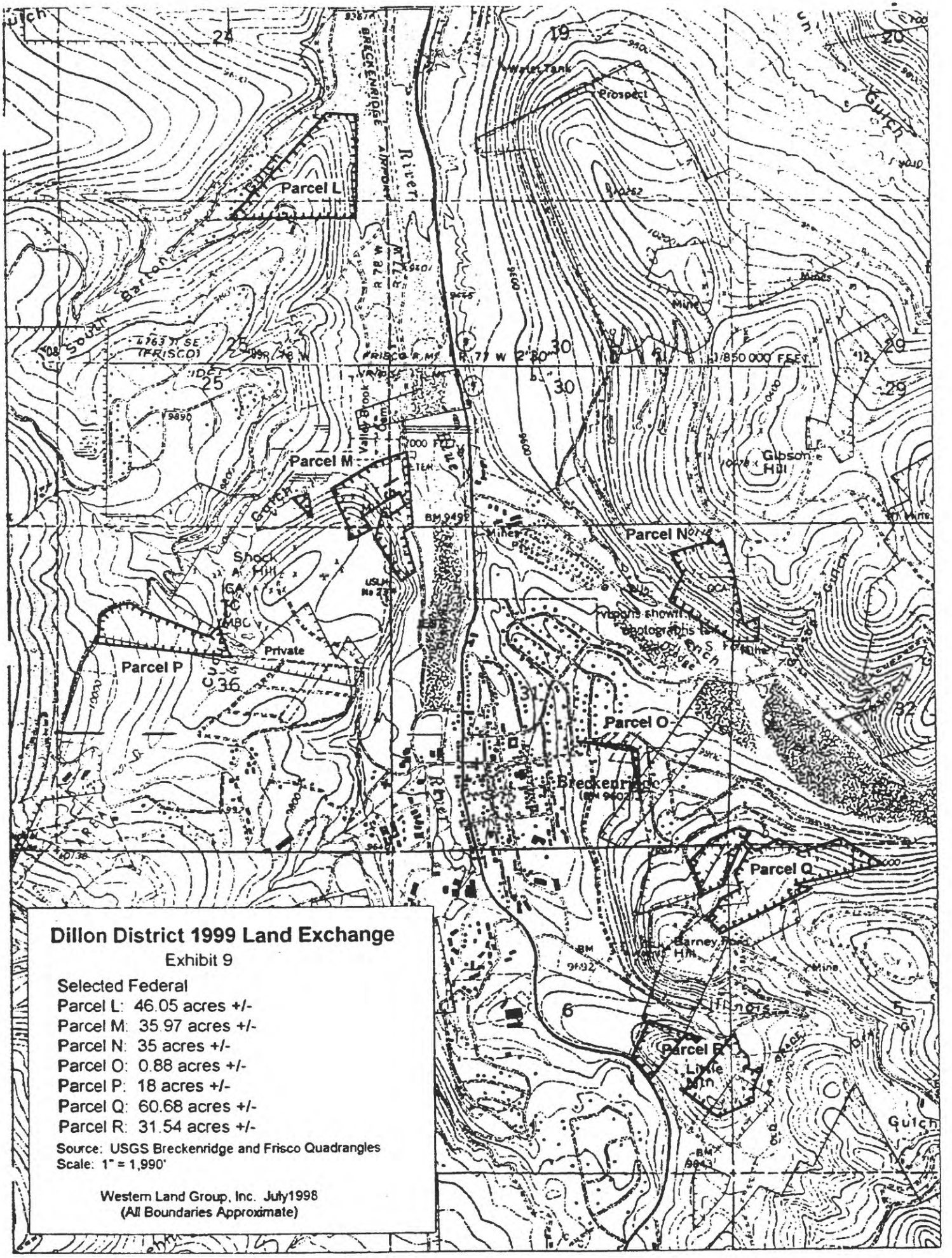
Source: USGS Keystone Quadrangle
Scale: 1,160'

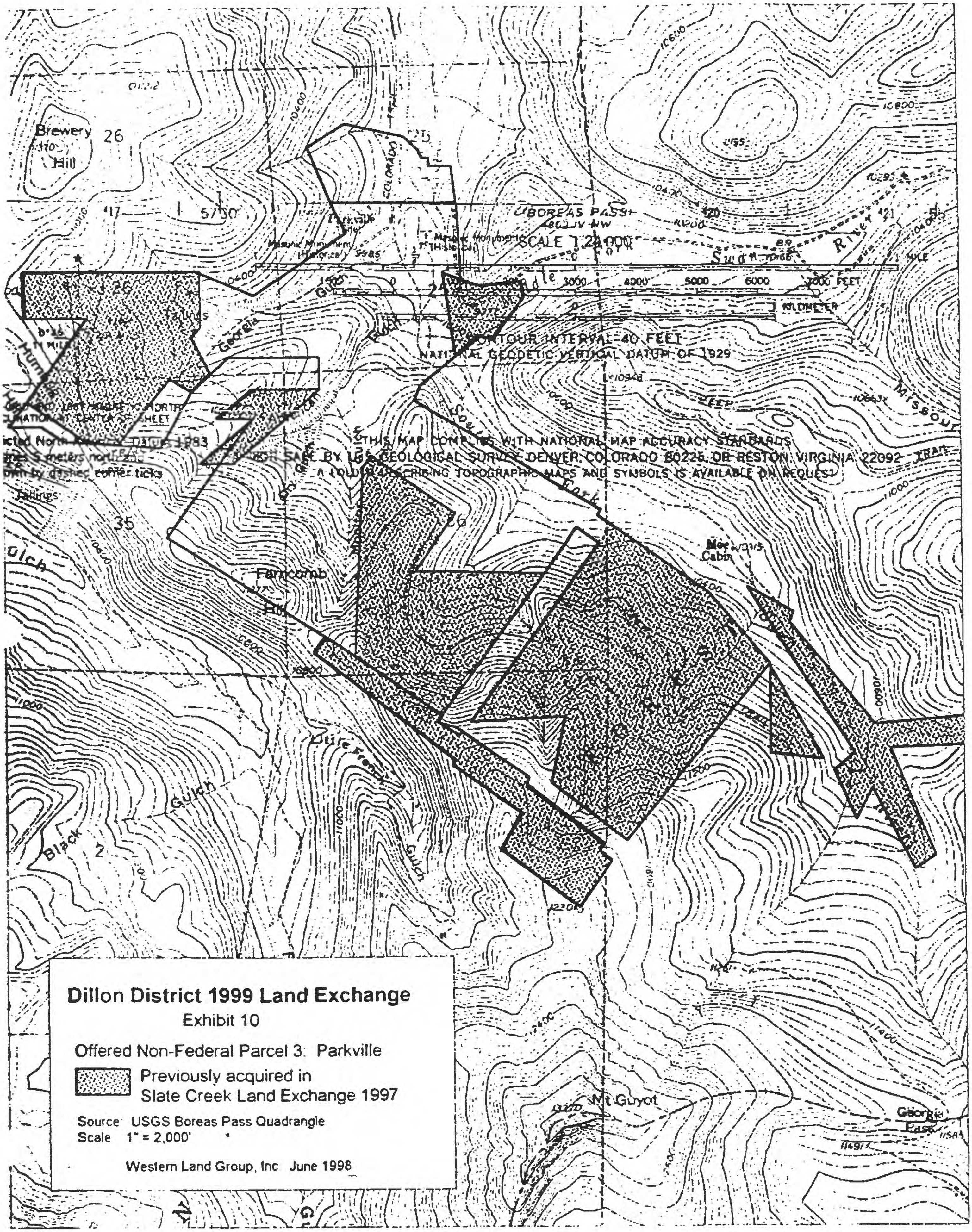
Western Land Group, Inc June 1998

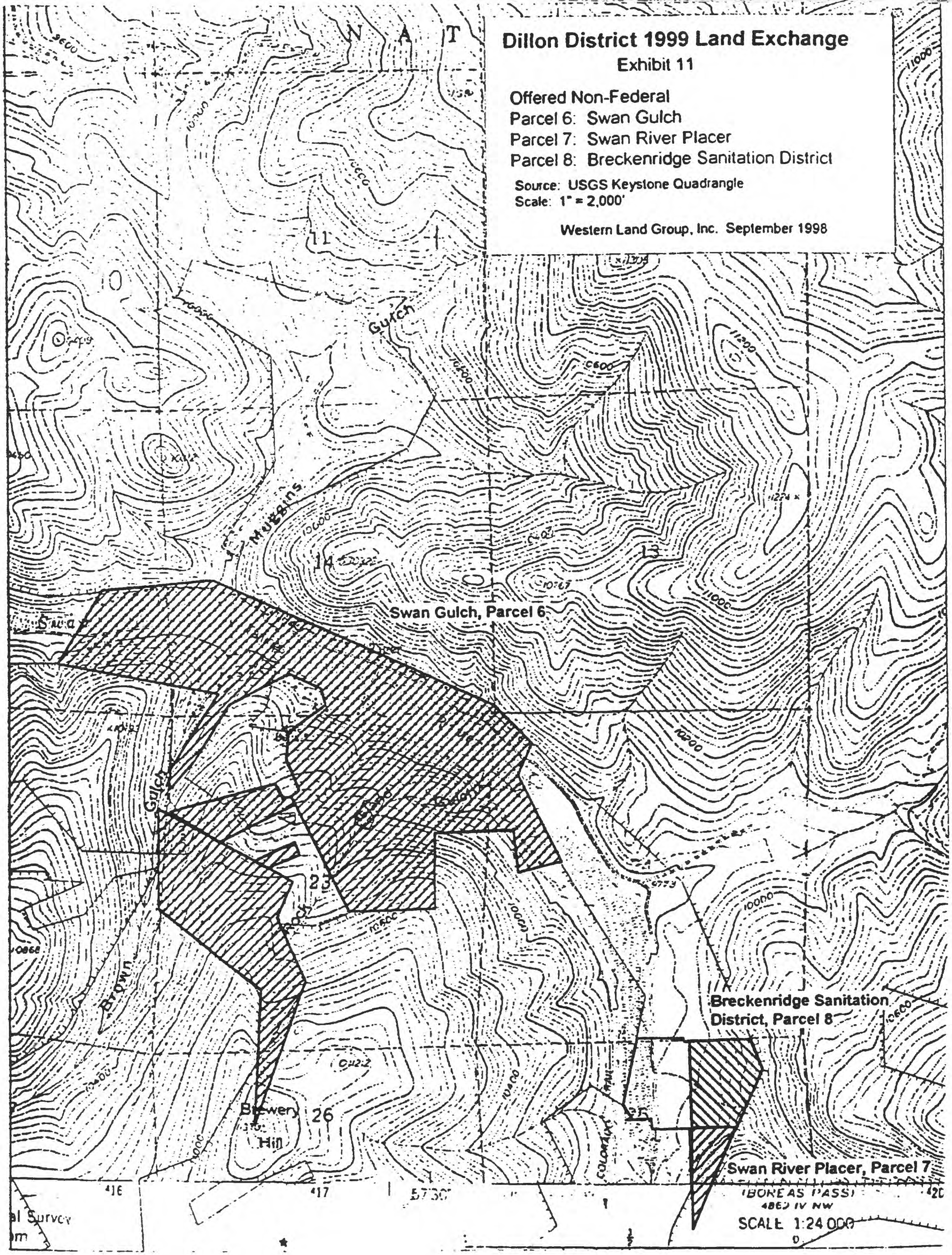

Dillon District 1999 Land Exchange
Exhibit 6
Selected Federal
Parcel H: 5 acres +/-
Offered Non-Federal
Parcel 5: 18.5 acres +/-
Source. USGS Montezuma Quadrangle
Scale: 1" = 1,360'
Western Land Group, Inc. August 1998
(All Boundaries Approximate)
Jumbo Mine
10600
11200
11400
10200
Tiptop Peak
Parcel H
Morgan Mine
BM
10268
Montezuma
Morgan
New York Mine
Gulch
Quail Mine
Parcel 5
River
Sawmill
Superior Mine
BM
10567
10530
10559
11200
Bullion Mine
12000
11000


Dillon District 1999 Land Exchange
Exhibit 7
Selected Federal
Parcel I: 67 acres +/-
Parcel J: 70 acres +/-
Source: USGS Frisco Quadrangles
Scale: 1" = 2,000'
Western Land Group, Inc. August 1998
(All Boundaries Approximate)
Bay
Peak One Campground
PENINSULA RECREATION AREA
Frisco
36
31
32
Iron Springs
Boat Ramp
Parcel I
ARAPAHO
R78W
R77W
BLUE
Previously conveyed in Slate Creek Land Exchange
Ophir Mtn
2
1
RIVER
NATIONAL FOREST
Parcel J
Gold Hill
11
12
7
Spring
Colorado
Slate Creek


Wheeler Lakes
Parcel 2
Parcel K
COPPER MOUNTAIN QUADRANGLE
COLORADO
7.5 MINUTE SERIES (TOPOGRAPHIC)
Parcel K
Dillon District 1999 Land Exchange
Exhibit 8
Selected Federal
Parcel K: 106.23 acres +/-
Offered Non-Federal
Parcel 2: 26.3 acres +/-
Source: USGS Copper Mountain Quadrangle
Scale: 1" = 1,750'
Western Land Group, Inc. June 1998


Parcel L
Parcel M
Parcel N
Parcel O
Parcel P
Parcel Q
Parcel R
Dillon District 1999 Land Exchange
Exhibit 9
Selected Federal
Parcel L: 46.05 acres +/-
Parcel M: 35.97 acres +/-
Parcel N: 35 acres +/-
Parcel O: 0.88 acres +/-
Parcel P: 18 acres +/-
Parcel Q: 60.68 acres +/-
Parcel R: 31.54 acres +/-
Source: USGS Breckenridge and Frisco Quadrangles
Scale: 1" = 1,990'
Western Land Group, Inc. July1998
(All Boundaries Approximate)


Dillon District 1999 Land Exchange
Exhibit 10
Offered Non-Federal Parcel 3: Parkville
Previously acquired in
Slate Creek Land Exchange 1997
Source USGS Boreas Pass Quadrangle
Scale 1" = 2,000'
Western Land Group, Inc June 1998
Brewery
Hill
Farncomb
Hill
Mt Guyot
Georgia
Pass
Black
Gulch
CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
KILOMETER
FEET


Dillon District 1999 Land Exchange
Exhibit 11
Offered Non-Federal
Parcel 6: Swan Gulch
Parcel 7: Swan River Placer
Parcel 8: Breckenridge Sanitation District
Source: USGS Keystone Quadrangle
Scale: 1" = 2,000'
Western Land Group, Inc. September 1998
Swan Gulch, Parcel 6
Breckenridge Sanitation District, Parcel 8
Swan River Placer, Parcel 7
Gulch
Brewery Hill
SCALE 1:24 000

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 905
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

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

June 30, 1999

Mr. M. M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This report is in response to your June 17, 1999 request for information on locatable mineral resources in the D. Stone Davis Land Exchange, in which D. Stone Davis has offered certain non-Federal lands within White River National Forest in exchange for Federal lands also within White River National Forest.

In accordance with the working agreement under Public Law 86-509, I am providing you with a report on the locatable mineral resources on the lands described in Exhibits A and B, included with your request. These lands comprise an unspecified number of acres in Pitkin County, Colorado.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE D. STONE DAVIS LAND EXCHANGE, WHITE RIVER NATIONAL FOREST, PITKIN COUNTY, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

June 30, 1999

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 are occasionally augmented with unpublished documents and personal 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.

Locations of properties are described in **EXHIBITS A and B**, as supplied by the U.S. Forest Service (See Attachment 1)

NON-FEDERAL LANDS:

Daisy and Picayune Lodes
(Aspen and Hayden Peak 1:24,000; Leadville 1:100,000; Leadville 1:250,000)

The Daisy and Picayune Lodes are located east of the Little Annie mine and south of the Midnite Shaft. The geologic map shows a 72.2 ± 2.2 m.y. white quartz porphyry and a 67.4 ± 2.2 to 70.0 ± 2.3 m.y. aplite (Bryant, 1971, 1970) in fault contact with Ordovician Manitou Dolomite (Attachment 2). At least one shaft and several prospect pits are located on these lode claims. Bryant (1972) indicates that these claims are south of the productive part of the Richmond Hill district.

This area was assigned high mineral resource potential for Ag, Au, Cu, Pb, and Zn in large replacement deposits and in large veins (D4 and F5, respectively, of Toth and others, 1993). Additionally, in this area, the Paleozoic sedimentary rocks, including the Manitou Dolomite, were assigned high potential for small veins of Ag, Pb, and Zn (E1 of Toth and others, 1993). The same area was assigned moderate potential (M4 of Toth and others, 1993) for medium-sized, bedded sedimentary deposits of high-calcium limestone; however, at 1:24,000 scale (Bryant, 1971) it does not appear that limestone is present. Thus the potential for this type of deposit is low.

Case Lode
(Independence Pass 1:24,000; Leadville 1:100,000; Leadville 1:250,000)

Case Lode is in an area mapped as Early Proterozoic metasedimentary gneiss and is locally covered by Holocene surficial deposits (Fridrich and others, 1998, see Attachment 3; Luddington and Yeoman, 1980).

Toth and others (1993) assigned this area high potential (F6) for medium-sized veins of Ag, Au, Cu, and Pb.

Forest City Lode
(Aspen 1:24,000; Leadville 1:100,000; Leadville 1:250,000)

Forest City Lode is mapped within a wedge of uplifted Paleozoic sedimentary rocks including Ordovician Manitou Dolomite and Upper Devonian Chaffee Formation's Parting and Dyer Dolomite Members (Bryant, 1971, see Attachment 4).

No mine workings are mapped on the claim, which is south of the productive part of the Lenado mining district (Bryant, 1972).

This area was assigned high mineral resource potential for Ag, Au, Cu, Pb, and Zn in large replacement deposits and in large veins (D4 and F5, respectively, of Toth and others, 1993).

Prep Plant
(Placita 1:24,000; Carbondale 1:100,000; Leadville 1:250,000)

Mapped entirely within Upper Cretaceous Mancos Shale (Donnell, 1962) and locally covered with Holocene and Pleistocene landslide deposits (Tweto and others, 1978). Near the core of the Coal Basin Anticline (Toth and others, 1993).

Toth and others (1993) assigned no resource potential to this area. About two miles to the south and west of the parcel, in overlying Mesaverde Group rocks, there is high potential for coal and coalbed methane (P3 and Q3 of Toth and others, 1993).

FEDERAL LANDS:

Tract A, Castle Creek Four Subdivision
(Hayden Peak 1:24,000; Leadville 1:100,000; Leadville 1:250,000)

Tract A is in an area mapped primarily as Holocene alluvium and alluvial fan deposits and local landslide deposits, probably overlying Mississippian Leadville Limestone intruded by an approximately 70 m.y. old aplite (Bryant, 1970, see Attachment 5).

There are several small, unnamed prospect pits in the immediate vicinity, but none is mapped on the property. Toth and others (1993) assigned this area moderate mineral resource potential for large veins of Ag, Au, Cu, Pb, and Zn.

REFERENCES

Bryant, Bruce, 1970, Geologic map of the Hayden Peak quadrangle, Pitkin and Gunnison Counties, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-863, scale 1:24,000.

Bryant, Bruce, 1971, Geologic map of the Aspen quadrangle, Pitkin County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-933, scale 1:24,000.

Bryant, Bruce, 1972, Map showing mines, prospects, and areas of significant silver, lead, and zinc production in the Aspen quadrangle, Pitkin County, Colorado: U.S. Geological Survey Map I-785-D, scale 1:24,000.

Bryant, Bruce, 1979, Geology of the Aspen 15-minute quadrangle, Pitkin and Gunnison Counties, Colorado: U.S. Geological Survey Professional Paper 1073, 146 p.

Donnell, J.R., 1962, Geology and coal resources of the Carbondale area, Garfield, Pitkin, and Gunnison Counties, Colorado: U.S. Geological Survey Open-File Report 62-38 (temp no. 222), scale 1:126,720.

Fridrich, C.J.; DeWitt, Ed; Bryant, Bruce; Richard, Steve; and Smith, R.P., 1998, Geologic map of the Collegiate Peaks Wilderness Area and the Grizzly Peak Caldera, Sawatch Range, central Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-2565, scale 1:50,000, 29 p. pamphlet.

Luddington, Steve, and Yeoman, R.A., 1980, Geologic map of the Hunter-Fryingpan Wilderness area and the Porphyry Mountain wilderness study area, Pitkin County, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-1236A, scale 1:50,000.

Toth, M.I., Wilson, A.B., Cookro, T.M., Bankey, Viki, Lee, G.K., Case, J.E., Dersch, J.S., 1993, Mineral resource potential and geology of the White River National Forest and the Dillon Ranger District of the Arapaho National Forest, Colorado: U.S. Geological Survey Bulletin 2035, 117 p.

Tweto, Ogden, Moench, R.H., and Reed, J.C., Jr., 1978, Geologic map of the Leadville 1° X 2° quadrangle, northwestern Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-999, scale 1:250,000.

OTHER SOURCES OF INFORMATION:

U.S. Geological Survey, 1999a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1999b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

LIST OF ATTACHMENTS:

1. Exhibits A and B. Offered Lands (provided by the USFS)

2. Geologic map of part of the Aspen and Hayden Peak quadrangles (Bryant, 1970, 1971)

3. Geologic map of part of the Collegiate Peaks Wilderness area (Fridrich and others, 1998)

4. Geologic map of part of the Aspen quadrangle (Bryant, 1971)

5. Geologic map of part of the Hayden Peak quadrangle (Bryant, 1970)

EXHIBIT A

Property that the Non-Federal Party will consider exchanging:

Sixth Principal Meridian, Pitkin County, Colorado

Tract 1 - By Davis:

Picayune Lode, U.S. Mineral Survey No. 5743, in Sec. 6, T. 11 S., R. 84 W., as patented and described in United States Patent No. 25204 dated January 29, 1895, and recorded March 19, 1991, in Book 642 at Page 50.

Case Lode, U.S. Mineral Survey No. 3811, in Sec. 6, T. 11 S., R. 82 W., as patented and described in United States Patent No. 11398 dated February 25, 1887, and recorded _____, 19__, in Book ____ at Page _____.

Daisy Lode, U.S. Mineral Survey No. 4050, in Sec. 6, T. 11 S., R. 84 W., as patented and described in United States Patent No. 13084 dated May 3, 1888, and recorded June 21, 1888, in Book 39 at Page 13.

Tract 2 - By Davis:

Forest City Lode, U.S. Mineral Survey No. 6624, in Sec. 34, T. 9 S., R. 84 W., according to the United States Patent recorded in Book 175 at page 25, EXCEPTING therefrom any portion of the Forest City Lode lying within the Big Chief and Little Chief Lodes, also being U.S. Mineral Survey No. 6624, and within the Virginia Pet Lode, being U.S. Mineral Survey No. 4533.

Tract 3 - MIDCON Realty LLC, a Colorado limited liability company

T. 10 S., R. 89 W.

sec. 10: S1/2S1/2S1/2SW1/4, SE1/4SE1/4, S1/2S1/2SW1/4SE1/4 and E1/2SE1/4NE1/4SE1/4;

sec. 11: SW1/4NW1/4SW1/4 and SW1/4SW1/4 EXCEPT that parcel conveyed to the United States by deed recorded as Reception No. 409040, on October 1, 1997; AND EXCEPT the following parcel: BEGINNING at a point whence the southwest corner of said Section 11 bears South 64 degrees twenty-three minutes 21 seconds West, 758.24 feet; Thence North 60 degrees East 150 feet; Thence North 30 degrees West 150 feet; Thence South 60 degrees West 150 feet; Thence South 30 degrees East 150 feet to the point of BEGINNING.

sec. 14: NW1/4NE1/4NW1/4 and N1/2NW1/4NW1/4.

sec. 15: NE1/4NW1/4, N1/2NW1/4NW1/4, N1/2S1/2NW1/4NW1/4, N1/2NW1/4NE1/4, N1/2S1/2NW1/4NE1/4, N1/2NE1/4NE1/4 and N1/2SW1/4NE1/4NE1/4.

ATTACHMENT 1. Exhibits A and B. Offered Lands (provided by the USFS)

NOTE: If the final agreement on value indicates that the values of the Federal lands listed on Exhibit B is significantly higher than the value of Tract 1, above, Landowner will make up such deficiency by transferring the Forest City Lode, Tract 2, above. If the Forest Service and the Landowner cannot agree on an exchange value for the Forest City Lode, then the value for exchange purposes shall be determined by binding arbitration as provided in the Settlement Agreement. If the valuation is such that the total exchange values result in a greater value for the Landowner for Tract 1, above, and the Forest City Lode, Tract 2, above, than the Federal lands listed on Exhibit B, then the United States may make up any deficiency in value with cash.

EXHIBIT B

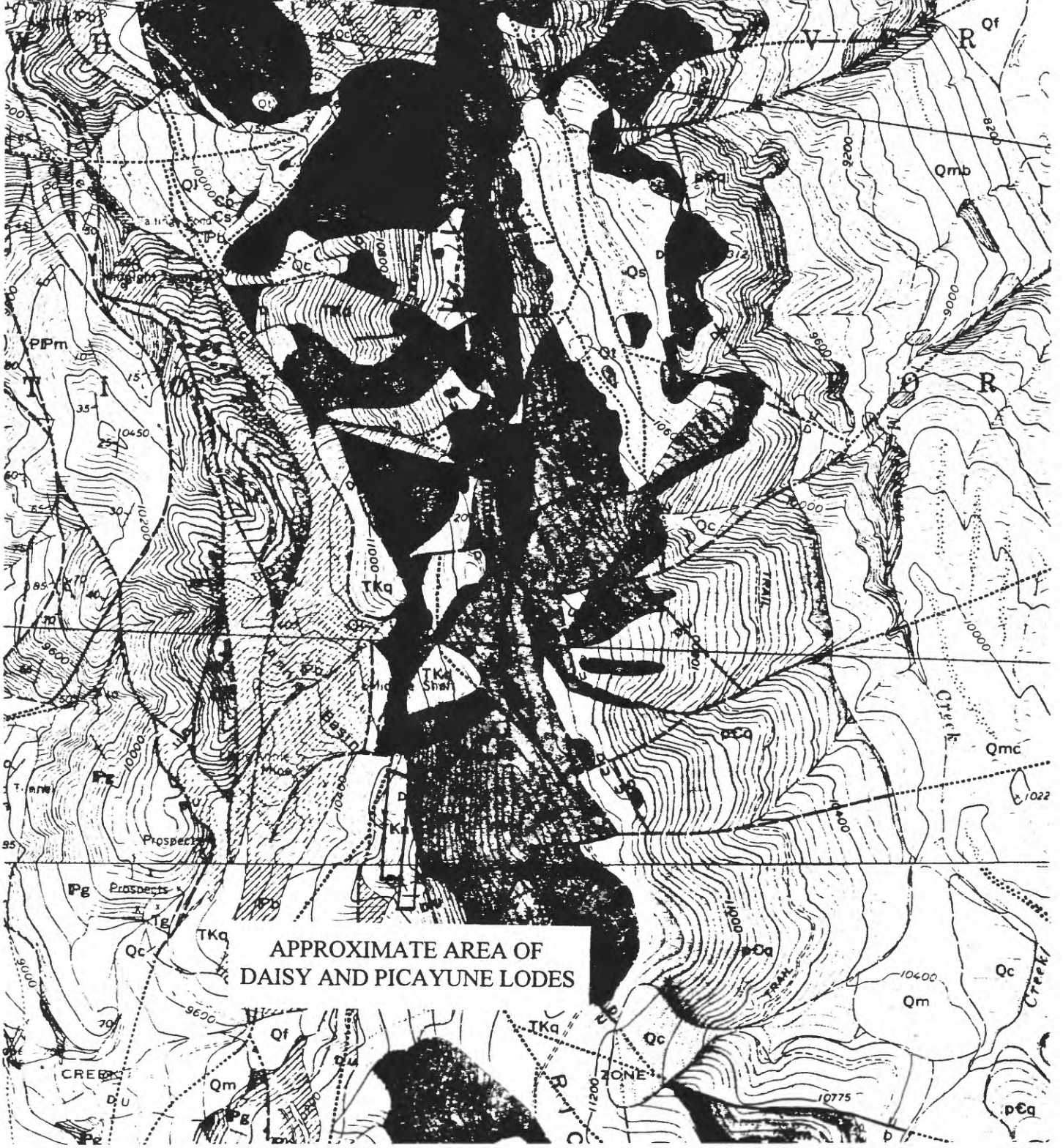
Property that the U.S. Forest Service will consider exchanging:

Sixth Principal Meridian, Pitkin County, Colorado

Tract A To Davis:

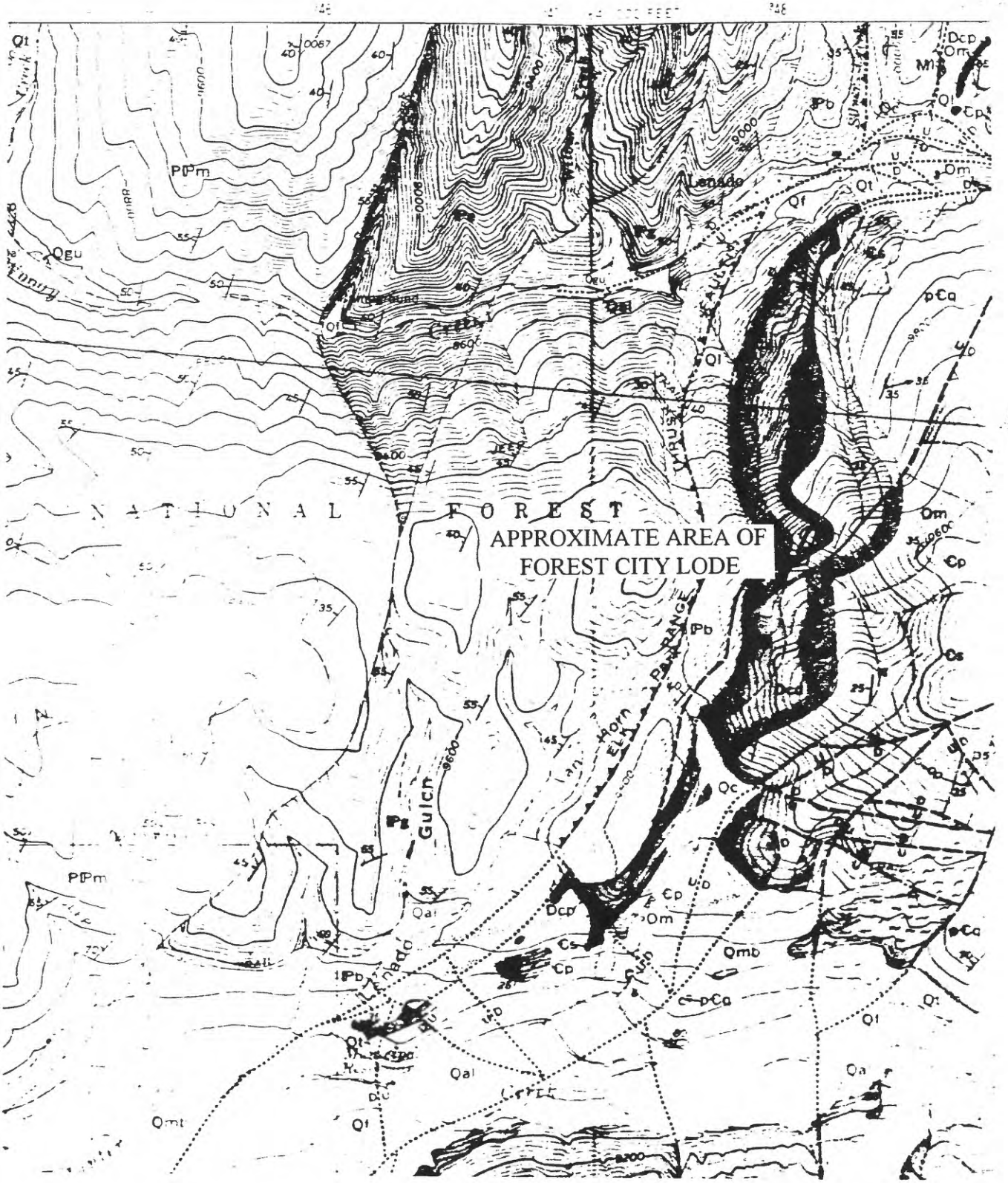
A 5 acre tract known as the Castle Creek Parcel, in Section 19, T. 11 S., R. 84 W., as shown on Map #1 attached hereto, and to be more particularly described by survey.

All Parties agree that the Federally owned tract listed above shall be appraised as a legally created parcel having growth management allocation or exemptions as provided by Pitkin County Code. The non-Federal party agrees that development of this tract, after completion of the land exchange, will be subject to Article 3 and Areas of Local and State Interest/Environmental Hazard 1041 review processes and building code regulations within the Pitkin County Code and that the uses and improvements allowed to occur on this property shall be consistent with the existing uses of surrounding neighborhoods. The size of any residential structure on Tract A shall not exceed 6000 square feet.

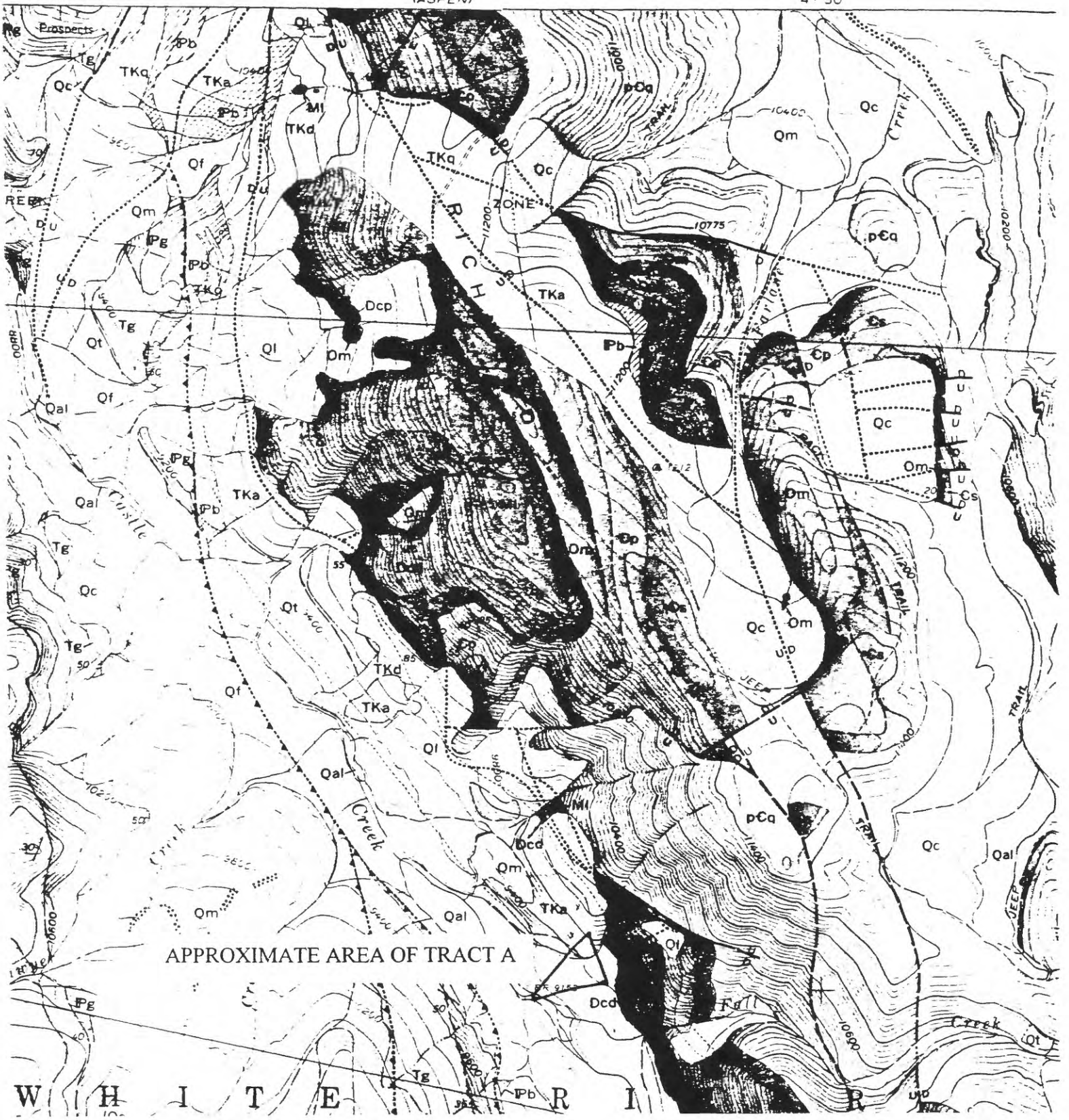


ATTACHMENT 2. Geologic map of part of the Aspen and Hayden Peak quadrangles (Bryant, 1970, 1971)

ATTACHMENT 3. Geologic map of part of the Collegiate Peaks Wilderness area (Fridrich and others, 1998)



ATTACHMENT 4. Geologic map of part of the Aspen quadrangle (Bryant, 1971)



ATTACHMENT 5. Geologic map of part of the Hayden Peak quadrangle (Bryant, 1970)

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 905
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:
(303) 236-5593
FAX (303) 236-3200
awilson@usgs.gov

June 28, 1999

Mr. M. M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your April 14, 1999 request for information on locatable mineral resources in the Sylvan Lake Land Exchange, in which the State of Colorado, acting by and through the State Board of Land Commissioners, has offered certain non-Federal lands within White River and Gunnison National Forests in exchange for Federal lands within White River National Forest.

In accordance with the working agreement under Public Law 86-509, I am providing you with a report on the locatable mineral resources on the lands described in Exhibits "A1, and B", included with your request. These lands comprise about 2480 acres in Summit, Eagle, Gunnison, and Saguache Counties, Colorado.

As per your request, the severed minerals described in Exhibit A2, in Pike, Arapaho, Routt, Rio Grande, and San Juan National Forests (in Park, Grand, Jackson, Conejos, LaPlata, and Mineral Counties), have not been evaluated.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE SYLVAN LAKE LAND EXCHANGE, WHITE RIVER AND GUNNISON NATIONAL FORESTS, SUMMIT AND EAGLE COUNTIES, COLORADO

By
Anna B. Wilson
U.S. Geological Survey

June 28, 1999

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 are occasionally augmented with unpublished documents and personal 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.

Locations of properties are described in **EXHIBITS A1, A2, and B**, as supplied by the U.S. Forest Service (See Attachments 1-3)

NON-FEDERAL LANDS (see Attachment 1)

Item #1 in White River National Forest
(Squaw Creek 1:24,000; Ute Peak 1:62,500; Vail 1:100,000; Leadville 1:250,000)

The parcel in Spring, Charlie, and Palmer Gulches is mapped entirely within gently northeast-dipping Upper Cretaceous Pierre Shale (Attachment 4) less than 1/2 mi west of the overriding plate of the Williams Range Thrust Fault (Tweto and Reed, 1973).

Toth and others (1993) did not assign any mineral resource potential to this area.

Item #2 in White River National Forest
(Minturn 1:24,000; Minturn 1:62,500; Vail 1:100,000; Leadville 1:250,000)

Tweto and Lovering (1977) mapped this section along the Eagle River west of Dowd's Junction as northward-dipping Middle Pennsylvanian Minturn Formation (Attachment 5). Minturn Formation is composed of grit, conglomerate, sandstone, and shale. A grit marker bed and several carbonate layers are exposed north of the river. All of these rocks are locally covered by Holocene and Pleistocene landslide and thick colluvial deposits and, along the river, by alluvium.

Toth and others (1993) did not assign any mineral resource potential to this area. Directly west of the parcel, at a scale of 1:250,000, Toth and others (1993) assigned an area moderate potential for small bedded sedimentary gypsum deposits associated with the Pennsylvanian Eagle Valley evaporite. Mapping at 1:48,000 scale (Tweto and Lovering, 1977) does not show any evaporite on the parcel.

Item #3 in Gunnison National Forest
(Pahlone Peak and Chester 1:24,000; Saguache 1:100,000; Montrose 1:250,000)

Mapped (Attachment 6) primarily as Quaternary landslide (Ql) covering Oligocene pre-ash flow andesitic vent-facies lavas and breccias (Tpl) (Day and Green, 1999, USGS unpublished data; Tweto and others, 1976)

The parcel is about 1.5 mi southwest of known deposits of vein uranium in the Marshall Pass mineralized area (Wilson and Spanski, 1999, USGS unpublished data; U.S. Geological Survey, 1999a, b). It is possible that vein uranium could occur on the parcel. Mineral resource potential for all other commodities on this parcel is low.

Item #4 in Gunnison National Forest
(Parlin 1:24,000; Gunnison 1:100,000; Montrose 1:250,000)

The parcel is directly north of the Quartz Creek Pegmatite mineralized area (Wilson and Spanski, 1999, USGS unpublished data). It is mapped (Day and Green, 1999, USGS unpublished data; Tweto and others, 1976) as Xg with minor Xm in the northeast corner and minor Xfh in the southeast corner (Attachment 6).

Mineral resource potential is low for most commodities. It is possible that small base and precious metal veins similar to those in the same mapped units to the northeast could be present. No rocks hosting pegmatites are mapped on the parcel.

FEDERAL LANDS (See Attachment 2)

Items #1 and #2
(Crooked Creek Pass 1:24,000; Leadville 1:100,000; Leadville 1:250,000)

Parcel north of Sylvan Lake is in Lower Triassic and Permian State Bridge Formation TrPs (Tweto and others, 1978) at the southern margin of a fault-bounded local depositional basin in the Pennsylvanian Eagle Valley Evaporite (Attachment 7). Directly south of the fault, the parcels composing item #2 are in an area underlain by Pennsylvanian and Permian Maroon Formation and covered with Pleistocene glacial drift of Bull Lake age.

Toth and others (1993) did not assign any mineral resource potential to this area.

REFERENCES

Toth, M.I., Wilson, A.B., Cookro, T.M., Bankey, Viki, Lee, G.K., Case, J.E., Dersch, J.S., 1993, Mineral resource potential and geology of the White River National Forest and the Dillon Ranger District of the Arapaho National Forest, Colorado: U.S. Geological Survey Bulletin 2035, 117 p.

Tweto, Ogden, Steven, T.A., Hail, W.J., Jr., and Moench, R.H., 1976, Preliminary geologic map of the Montrose 1° x 2° quadrangle, southwestern Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-761, scale 1:250,000.

Tweto, Ogden, and Lovering, T.S., 1977, Geology of the Minturn 15-minute quadrangle, Eagle and Summit Counties, Colorado: U.S. Geological Professional Paper, scale 1:48,000.

Tweto, Ogden, and Reed, J.C., Jr., 1973, Reconnaissance geologic map of the Ute Peak 15-minute quadrangle, Grand and Summit Counties, Colorado: U.S. Geological Open-File Report 73-288 (temp no. 1779), scale 1:62,500.

Tweto, Ogden, Moench, R.H., and Reed, J.C., Jr., 1978, Geologic map of the Leadville 1° X 2° quadrangle, northwestern Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-999, scale 1:250,000.

OTHER SOURCES OF INFORMATION:

U.S. Geological Survey, 1999a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1999b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

LIST OF ATTACHMENTS:

1. Exhibit A1. Offered State Lands (provided by the USFS)

2. Exhibit A2. Offered State Mineral Estate (provided by the USFS)

3. Exhibit B. Selected Federal Lands (provided by the USFS)

4. Geologic map of part of the Ute Peak 15-minute quadrangle (Tweto and Reed, 1973)

5. Geologic map of part of the Minturn 15-minute quadrangle (Tweto and Lovering, 1977)

6. Geologic map of part of the Montrose 1°X2° quadrangle (Tweto and others, 1976; Day and Green, USGS unpub. data, 1999; Wilson and Spanski, USGS unpub. data, 1999; Wilson and Crane, USGS unpub. data, 1999)

7. Geologic map of part of the Leadville 1°X2° quadrangle (Tweto and others, 1978)

SYLVAN LAKE LAND EXCHANGE

EXHIBIT A1

(Offered State Lands)

(See exhibit A2 for offered state mineral estates)

Item #1:

Township 2 South, Range 79 West, 6th P.M., White River National Forest, Summit County, Colorado

Section 36; S1/2

Item #2:

Township 5 South, Range 81 West, 6th P.M., White River National Forest, Eagle County, Colorado

Section 16; All, except that portion lying between the South Boundary of Interstate Highway 70 and the center line of the Eagle River.

Item #3:

Township 48 North, Range 5 East, New Mex. P.M., Gunnison National Forest, Saguache County, CO

Tract 64

Item #4:

Township 50 North, Range 3 East, New Mex. P.M., Gunnison National Forest, Gunnison County, CO

Tract 38

(end).

ATTACHMENT 1. Exhibit A1. Offered State Lands (provided by the USFS)

SYLVAN LAKE LAND EXCHANGE

EXHIBIT A2

(Offered State Mineral Estate)

(See exhibit A1 for offered state lands)

Item #1:

Township 6 South, Range 73 West, 6th P.M., Pike National Forest, Park County, Colorado

Section 5;	SW1/4
Section 8;	All
Section 9;	S1/2
Section 17;	All
Section 18;	All
Section 19;	All
Section 20;	All
Section 30;	N1/2

Item #2:

Township 7 South, Range 73 West, 6th P.M., Pike National Forest, Park County, Colorado

Section 19:	Lot 3, Lot 4, E1/2SW1/4, SE1/4
Section 30:	NE1/4

Item #3:

Township 7 South, Range 74 West, 6th P.M., Pike National Forest, Park County, Colorado

Section 7;	SE1/4
Section 8;	SW1/4
Section 14;	S1/2
Section 15;	All
Section 17;	N1/2
Section 18;	Lot 1, Lot 2, E1/2NW1/4, NE1/4
Section 22:	N1/2
Section 23:	All
Section 24:	NW1/4, S1/2.

(cont. pg. 2)

ATTACHMENT 2. Exhibit A2. Offered State Mineral Estate (provided by the USFS)

Item #4:

Township 2 North, Range 75 West, 6th P.M., Arapaho National Forest, Grand County, Colorado

Section 36; All

Item #5:

Township 9 North, Range 82 West, 6th P.M., Routt National Forest, Jackson County, Colorado

Section 16; S1/2S1/2

Item #6:

Township 34 North, Range 4 East, New Mex. P.M., Rio Grande National Forest, Conejos County, CO

Section 36; NE1/4 and N1/2NW1/4

Item #7:

Township 35 North, Range 4 1/2 East, New Mex. P.M., Rio Grande Nat'l Forest, Conejos County, CO

Tract 38; All

Item #8:

Township 37 North, Range 6 West, New Mex. P.M., San Juan Nat'l Forest, LaPlata County, CO

Section 16; All

Item #9:

Township 39 North, Range 2 West, New Mex. P.M., Rio Grande National Forest, Mineral County, CO

Section 16; NE1/4 and E1/2W1/2

(end)

SYLVAN LAKE LAND EXCHANGE

EXHIBIT B

(Selected Federal Lands)

Item #1:

Township 6 South, Range 83 West, 6th P.M.

Section 31; S1/2SE1/4

Section 32; SW1/4SW1/4

Item #2"

Township 7 South, Range 83 West, 6th P.M.

Section 5; W1/2SW1/4NW1/4, W1/2W1/2SW1/4

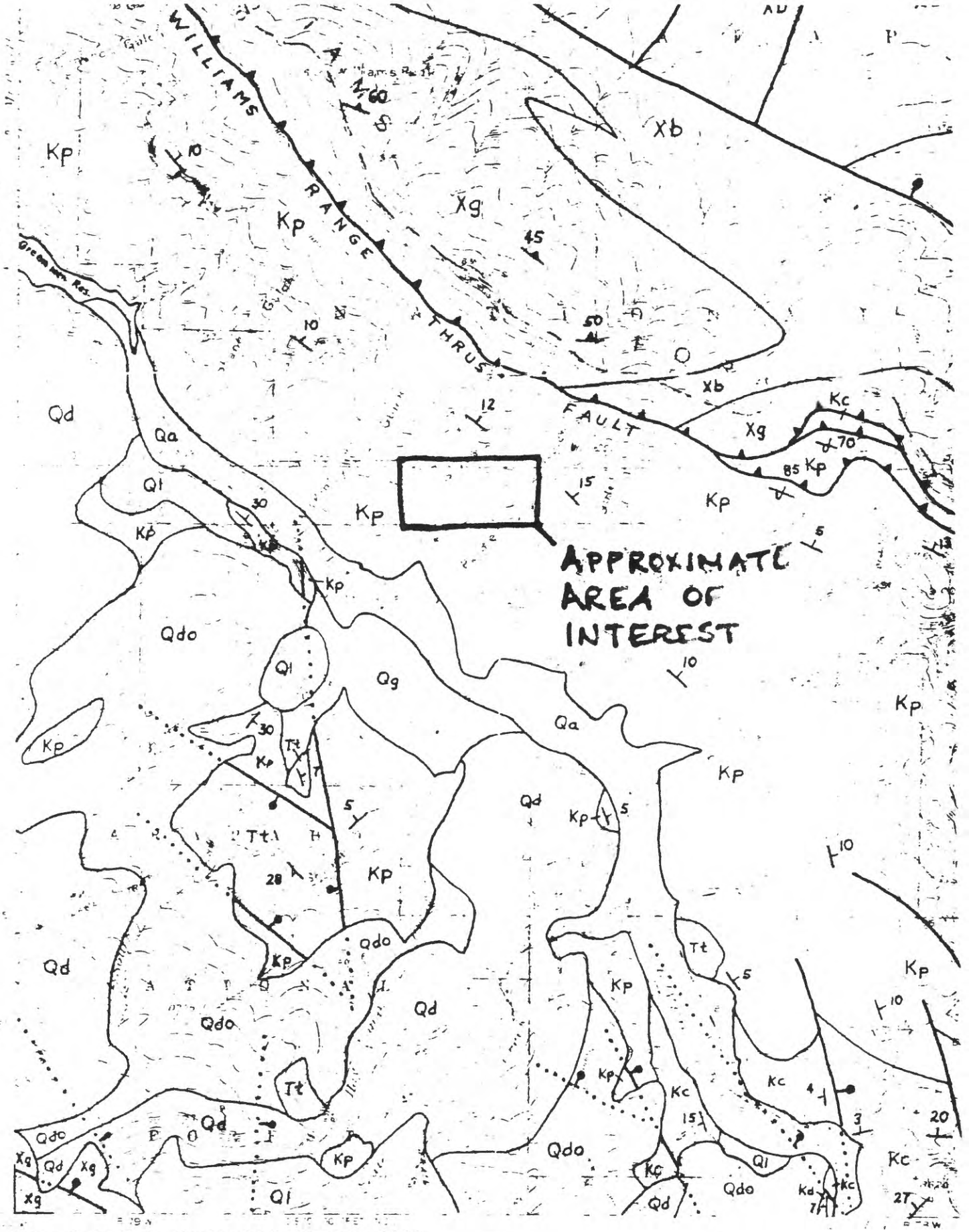
Section 6: E1/2E1/2SE1/4, E1/2SW1/4NE1/4

TOTAL ACREAGE IS 240 ACRES, MORE OR LESS; ALL IN THE WHITE RIVER NATIONAL FOREST, EAGLE COUNTY, COLORADO.

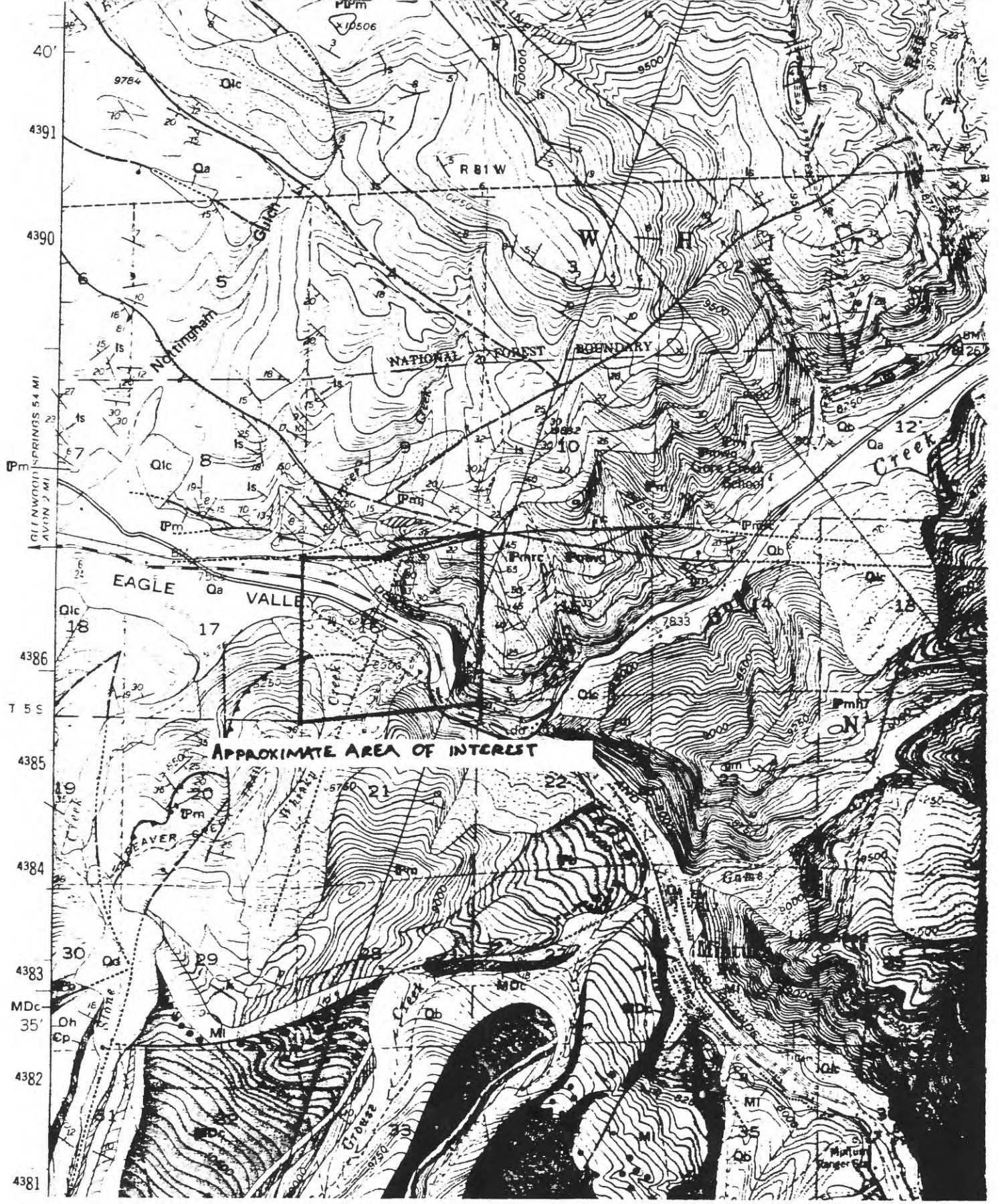
(end)

ATTACHMENT 3. Exhibit B. Selected Federal Lands (provided by the USFS)

ATTACHMENT 4. Geologic map of part of the Ute Peak 15-minute quadrangle (Tweto and Reed, 1973) showing approximate area of Item #1.



Base from U.S. Geological Survey, 1933



ATTACHMENT 5. Geologic map of part of the Minturn 15-minute quadrangle (Tweto and Lovering, 1977) showing approximate area of Item #2.

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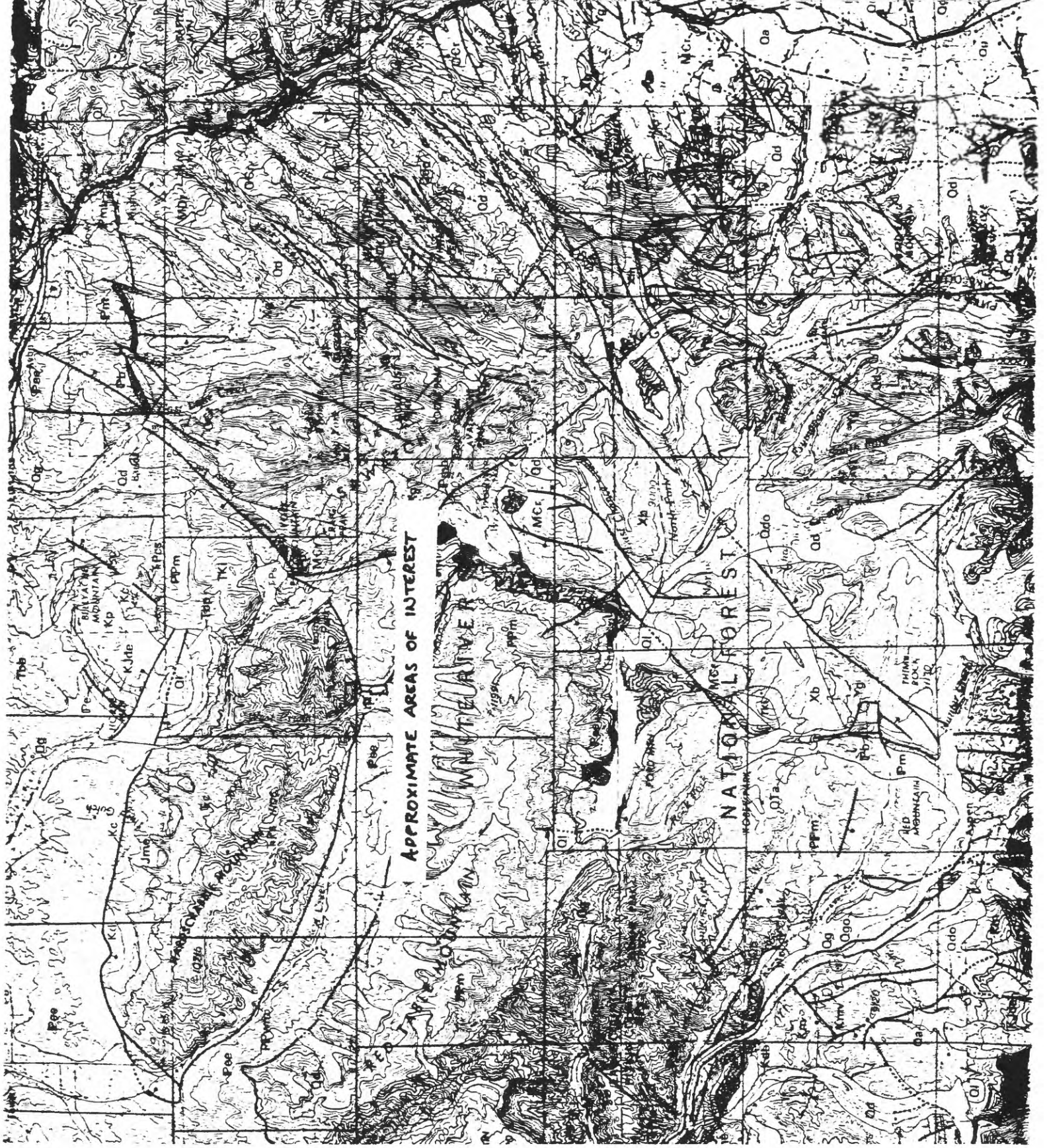
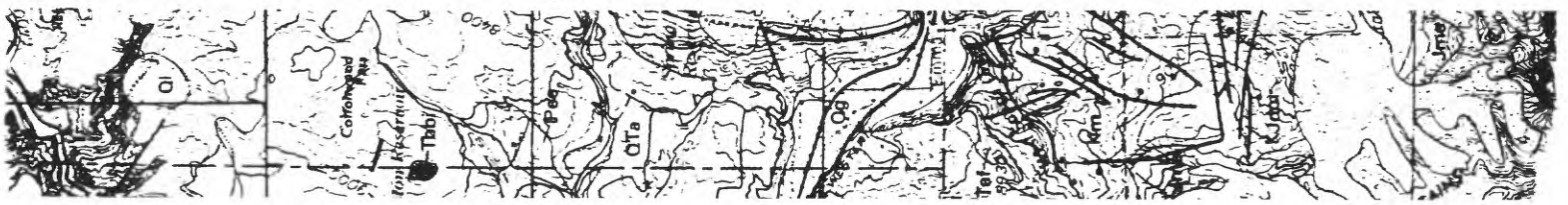
ATTACHMENT 6. Geologic map of part of the Montrose 1°X2° quadrangle (Tweto and others, 1976; Day and Green, USGS unpub. data, 1999; Wilson and Spanski, USGS unpub. data, 1999; Wilson and Crane, USGS unpub. data, 1999) showing approximate areas of Items #3 and #4.



ATTACHMENT 7. Geologic map of part of the Leadville 1°X2° quadrangle (Tweto and others, 1978) showing approximate areas of Federal Items #1 and #2.



SOUTH DAKOTA

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 905
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

(303) 236-5593
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awilson@usgs.gov

May 13, 1999

Mr. M.M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your January 27, 1999 request for information on locatable mineral resources in a land exchange proposal in which Richard, Jody, Thomas, and Darlene McKee have offered certain non-Federal lands within the Black Hills National Forest in exchange for Federal lands also within the Black Hills 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 described in "Exhibits A and B", included with your request. These lands comprise 250.1 acres, more or less, in Pennington and Lawrence Counties, South Dakota.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE McKEE LAND EXCHANGE OFFER, BLACK HILLS NATIONAL FOREST, PENNINGTON AND LAWRENCE COUNTIES, SOUTH DAKOTA

By
Anna B. Wilson
U.S. Geological Survey

May 13, 1999

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, please refer to Attachment A, as supplied by the U.S. Forest Service. The Parcels are also shown on a map as Attachment B.

Non-Federal: McKee Parcel (see Attachment C)
Deerfield 1:24,000 quadrangle

The McKee parcel is mapped as Early Proterozoic metamorphosed shale and described as medium- to dark-gray phyllite, slate, and mica schist (DeWitt and others, 1989).

Lessering Draw nearly bisects the McKee parcel. Bog iron deposits may occur on or adjacent to the property (DeWitt and others, 1988b). "These deposits are colluvial concentrations of iron-rich material found in steam bottoms and along canyon walls that are formed in the present-day surface weathering environment. Cool, moist conditions and locally reducing environments concentrate the iron and minor manganese" (DeWitt and others, 1988b).

McKee parcel is also in the immediate vicinity of two types of Proterozoic deposits (DeWitt and others, 1988b). 1). Syngenetic stratiform deposits of gold, silver, and arsenic in carbonate-, silicate-, and sulfide-facies iron formation formed in a submarine environment about 1.8 to 2.2 Ga. 2). Discordant veins and shear zones, formed in a metamorphic and tectonic environment about 1.6-1.9 Ga., contain gold, silver, lead, and minor amounts of zinc, copper, and arsenic. The parcel is included in three overlapping mineralized areas (Wilson and DeWitt, 1995).

At 1:100,000 scale, DeWitt and others (1986, p. 62-63, fig. 16) assigned the lands in Lessering Draw to an area of moderate potential (P1 of DeWitt and others, 1986) for small to medium-sized colluvial deposits containing iron (±gold) The parcel is immediately northeast of a tract (C7 of DeWitt and others, 1986) assigned high potential for medium-sized syngenetic stratiform deposits of gold (±silver, ±arsenic) and it is within a half- mile of another tract (D7 of DeWitt and others, 1986) assigned moderate potential for small vein deposits of gold and silver (±arsenic, ±zinc).

Federal Property
Nemo 1:24,000 quadrangle

Parcel 1# (see Attachment D)

The entire parcel appears is mapped as undivided Cambrian to Ordovician sedimentary rocks (DeWitt and others, 1989). The undivided rock units include the 1) Upper Cambrian and Lower Ordovician Deadwood Formation, comprising a locally developed basal conglomerate overlain by brown to light-gray glauconitic sandstone, shale, and

limestone, 2) Middle Ordovician Winnipeg Formation , Middle Ordovician, a gray and light-green shale and siltstone, and 3) light gray to tan Upper Ordovician Whitewood Dolomite (DeWitt and others, 1989).

No mines or prospects are known to occur on the parcel, but it is near known mineralized areas (DeWitt and others, 1988a; Wilson and DeWitt, 1995). Known deposit types in the area include 1) Archean and Proterozoic taconitic iron-formations, stratiform metasedimentary deposits of iron and silica that were formed in a submarine environment about 2.2-2.5 Ga, 2) Proterozoic quartz pebble conglomerates containing uranium, thorium, and minor amounts of gold and chromium that were formed in a shallow-water fluvial environment about 2/2 Ga, and 3) Proterozoic veins and shear zones, discordant deposits of gold, silver, lead, and minor amounts of zinc, copper, and arsenic, formed in a metamorphic and tectonic environment about 1.6-1.9 Ga (DeWitt and others, 1988a).

At 1:100,000 scale, DeWitt and others (1986, p. 58-59, fig. 15) includes this parcel in an area assigned of moderate potential (L5 of DeWitt and others, 1986) for medium-sized paleo-beach deposits containing hydrafrac sand. The tract is immediately adjacent to an area (A1 of DeWitt and others, 1986) assigned high potential for large stratiform sedimentary deposits of iron (±titanium), however, the Early Proterozoic iron-formation required for this deposit type is not mapped on Parcel 1.

Parcel #2 (see Attachment E)

The entire parcel is mapped as Early Proterozoic Reausaw Slate (Bayley, 1972). This unit contains a variety of slaty or schistose rocks: fissile gray garnet schist and black graphitic slate. The northern part of the unit contains grunerite- or cummingtonite-bearing, magnetic cherty ferruginous schist (Bayley, 1972).

No mines or prospects are known to occur on the parcel (DeWitt and others, 1988a). The parcel is not included in any mineralized areas (Wilson and DeWitt, 1995). The nearest known deposit, the Calabogie (DeWitt and others, 1988a), is a base- and precious-metal vein deposit. It is south of a mapped fault in metagraywacke of the Roubaix Formation (Bayley, 1972) so there is no reason to expect similar host rocks on Parcel #2.

At 1:100,000 scale, DeWitt and others (1986, p. 58-59, fig. 15) includes this parcel in an area of unknown potential (K3 of DeWitt and others, 1986) for large stratabound deposits of gold, silver, vanadium and copper. The Parcel is at the edge of an area (C9 of DeWitt and others, 1986) assigned moderate potential for small syngenetic stratiform deposits of gold (±silver, copper, arsenic) (DeWitt and others, 1986, p. 58-59).

REFERENCES:

Bayley, R.W., 1972, Preliminary geologic map of the Nemo district, Black Hills, South Dakota: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-712, scale 1:24,000.

DeWitt, Ed, Buscher, D.P., Wilson, A.B., and Johnson, T.M., 1988a, Map of mines, prospects, and patented mining claims, and classification of mineral deposits in the Nemo 7 ½-minute quadrangle and the western one-third of the Piedmont 7 ½-minute quadrangle, Black Hills, South Dakota: U.S. Geological Survey Open-File Report 87-261-D, scale 1:24,000.

DeWitt, Ed, Buscher, D.P., Wilson, A.B., and Johnson, T.M., 1988b, Map of mines, prospects, and patented mining claims, and classification of mineral deposits in the Deerfield 7 ½-minute quadrangle, Black Hills, South Dakota: U.S. Geological Survey Open-File Report 87-261-E, scale 1:24,000.

DeWitt, Ed, Redden, J.A. Redden, Buscher, David, and Wilson, A.B., 1989, Geologic map of the Black Hills area, South Dakota and Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-1910, scale 1:250,000.

DeWitt, Ed; Redden, J.A., Wilson, A.B., and Buscher, David, 1986, Mineral resource potential and geology of the Black Hills National Forest, South Dakota and Wyoming, *with a section on* salable commodities, by J.S. Dersch: U.S. Geological Survey Bulletin 1580, 135 p, 4 pls. (scale 1:250,000) in pocket.

Wilson, A.B., and DeWitt, Ed, 1995, Maps showing metallic mineral districts and mines in the Black Hills, South Dakota and Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-2445, scale 1:100,000.

LIST OF ATTACHMENTS: (as supplied by USFS)

A. Exhibits A & B–Location information

B. McKee Land Exchange Location map

C. Location of McKee Parcel

D. Location of Parcel #1

E. Location of Federal Parcel #2

EXHIBIT A

Property that Richard M., Jody L., Thomas A., and Darlene F. McKee will consider exchanging:

Black Hills Meridian.
Pennington County
South Dakota

The East Half of the Southeast Quarter of Section 19	80 acres
The West half of the South West Quarter of Section 20	80 acres
in Township 2 North of Range 3 East.	
	Total approx. **160.61 acres**

EXHIBIT B

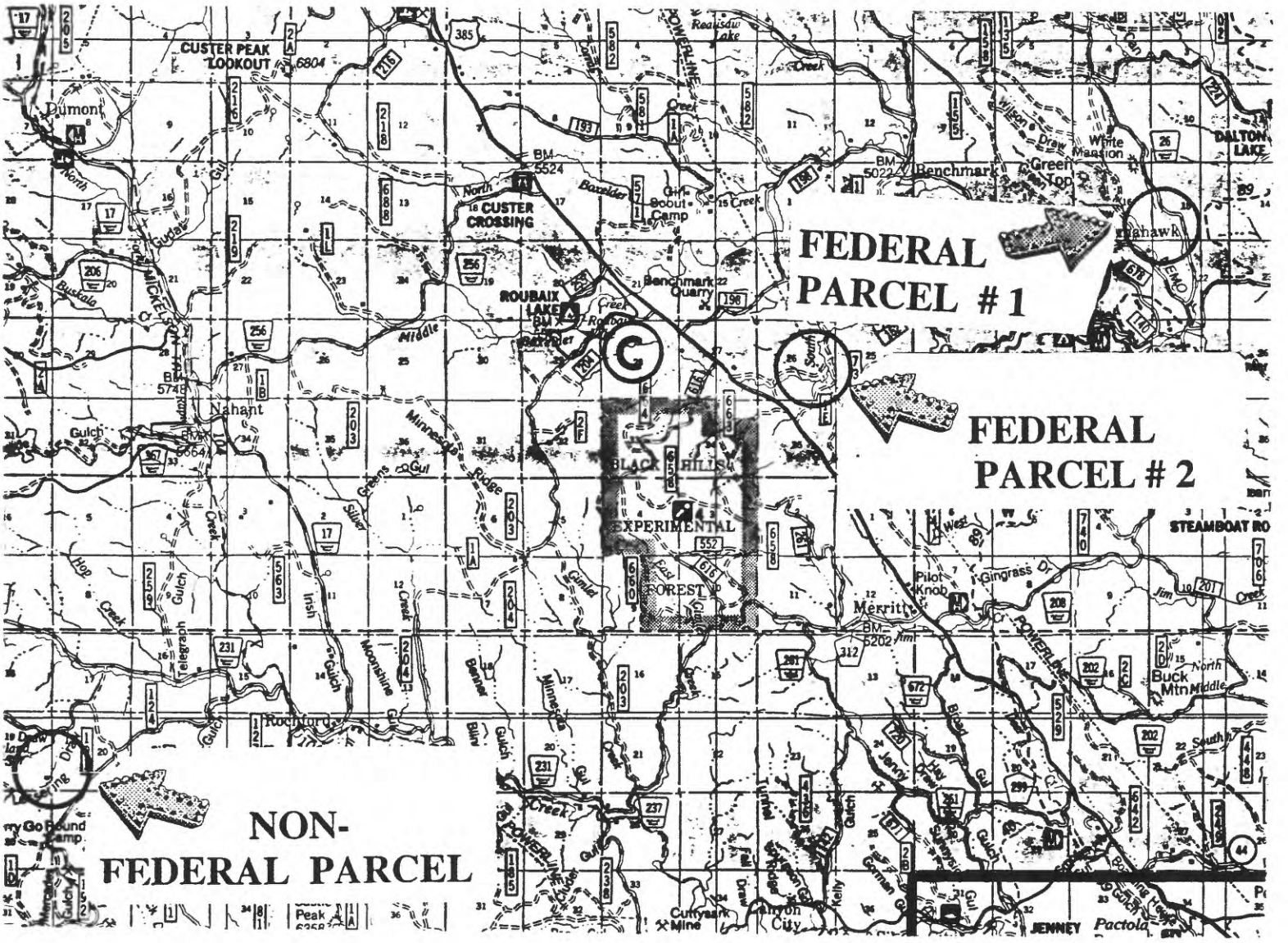
Property that the FOREST SERVICE will consider exchanging:

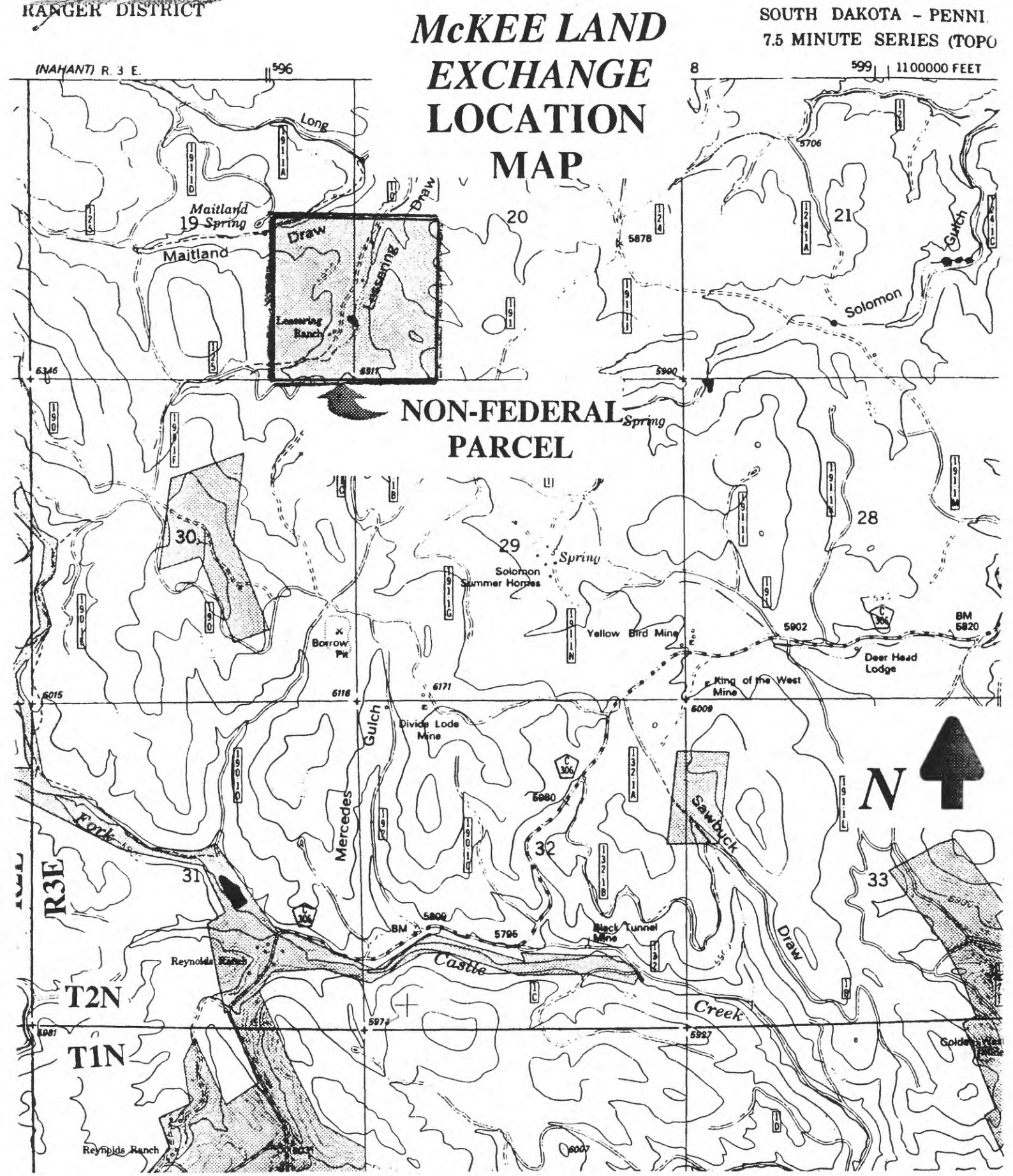
Black Hills Meridian
Lawrence County
South Dakota

A portion of the ~~West~~ East half of Section 26	
in Township 3 North of Range 4 East	41.88 acres
Govt Lot 4 of the Southwest Quarter of Section 15	12.92 acres
Govt Lot 5 of the Southwest Quarter of Section 15	28.66 acres
A portion of the Southeast Quarter of Section 16	5.87 acres
Govt Lot 4 of the Northwest Quarter of Section 22	0.16 acres
in Township 3 North of Range 5 East	
	Total approx **89.49 acres**

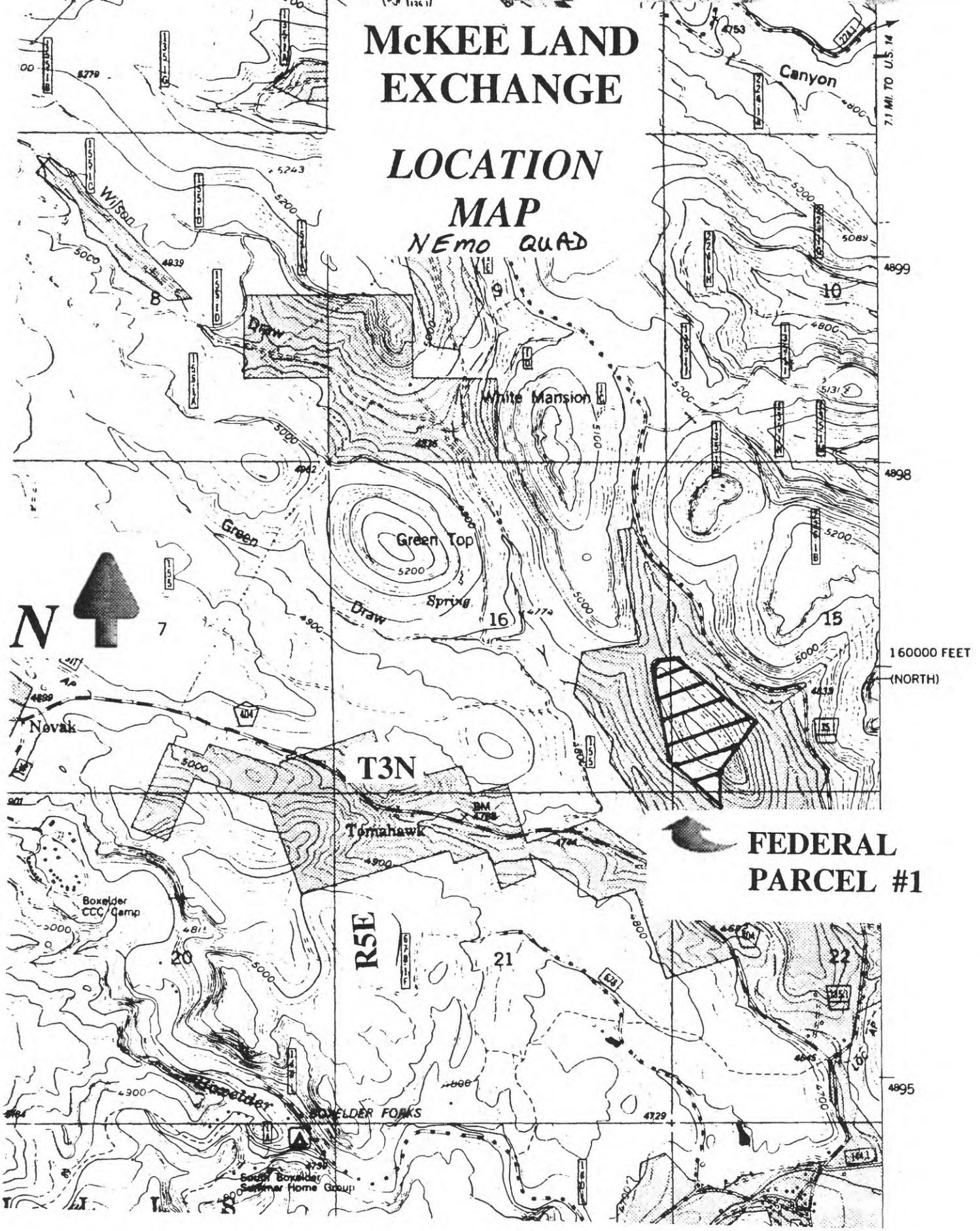
Attachment A. Exhibits A & B–Location Information

Attachment B. McKee Land Exchange Location Map

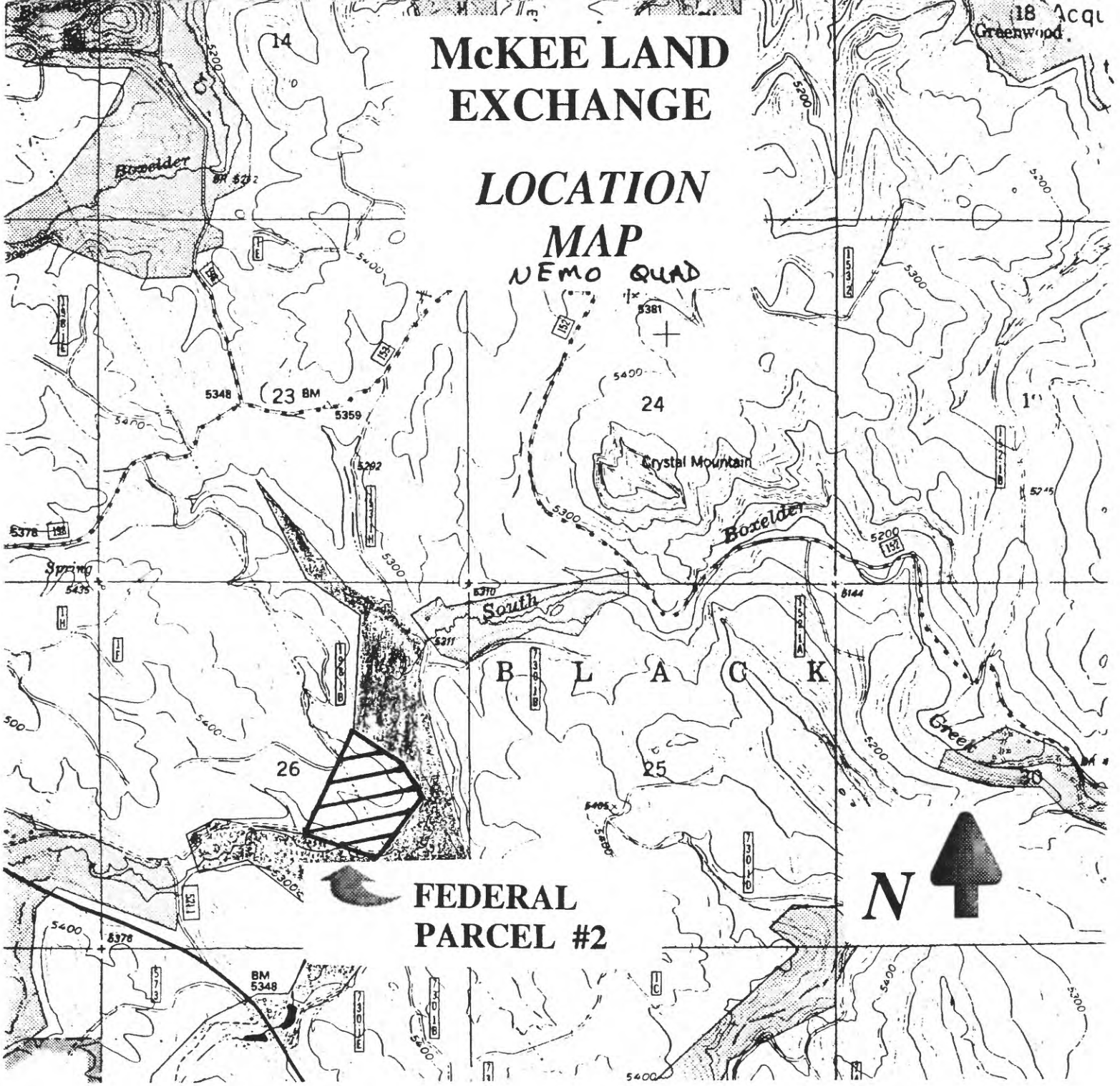




Attachment C. Location of McKee Parcel



Attachment D. Location of Parcel #1



Attachment E. Location of Federal Parcel #2

United States Department of the Interior

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Denver, Colorado 80225

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August 18, 1999

Mr. M.M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your August 5, 1999 request for information on locatable mineral resources in a land exchange proposal in which Dennis and Penny Knuckles have offered certain non-Federal lands within the Black Hills National Forest in exchange for Federal lands also within the Black Hills 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 described in "Exhibits A and B", included with your request. These lands comprise 19.37 acres, more or less, in Pennington and Custer Counties, South Dakota.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE KNUCKLES LAND EXCHANGE OFFER, BLACK HILLS NATIONAL FOREST, PENNINGTON AND CUSTER COUNTIES, SOUTH DAKOTA

By
Anna B. Wilson
U.S. Geological Survey

August 18, 1999

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, please refer to Attachment A (which includes Exhibits A and B, as supplied by the U.S. Forest Service). The Parcels are also shown on maps as Attachments B and C.

Non-Federal: Knuckles Parcel (see Attachments A and B)
Hill City 1:24,000 quadrangle

A geologic map of the Hill City quadrangle (Ratte and Wayland, 1969) shows the area surrounding the Knuckles parcel, about 3 mi. southeast of Hill City, as a synform in the Bugtown Formation. The Bugtown is described as quartz-mica, staurolite, and sillimanite schists interlayered with thick-bedded quartz schist and metagraywacke. Locally, small heterogeneous beds of coarse-grained amphibole and pyroxene-bearing calc-silicate rocks, black and white banded quartzite, and graphitic quartz schist are present. The metamorphic rocks were intruded by pegmatite phases of the Harney Peak Granite. The Dewey pegmatite is zoned and dips approximately 45 degrees to the northwest.

The Knuckles parcel coincides with the Dewey Lode, a Proterozoic mica-bearing pegmatite (Ratte and Wayland, 1969; DeWitt and others, 1988a). Other small pegmatite deposits may occur in the vicinity. Wilson and DeWitt (1995) included this parcel in the Harney Peak mineralized area, an area with potential for the occurrence of feldspar and mica in pegmatites. At a scale of 1:250,000 it is not clear if this parcel is within the area assigned moderate or high potential for Proterozoic pegmatite deposits (DeWitt and others, 1986). Based on proximity to known deposits and detailed (1:24,000 scale) geologic mapping, the potential for finding small pegmatite bodies in the vicinity of the parcel is high. There is no known potential for any other commodities.

Federal Property (See attachments A and C)
Custer 1:24,000 quadrangle

A geologic map of the Black Hills (DeWitt and others, 1989) shows the area surrounding the federal parcel, about 2 mi. northeast of Custer, as Early Proterozoic metagraywacke. Minor prospects or diggings are in the vicinity of the parcel (DeWitt and others, 1988b). The nearest known deposits are small pegmatites related to the Harney Peak Granite. Wilson and DeWitt (1995) placed this parcel just outside the Harney Peak mineralized area, an area with potential for the occurrence of feldspar and mica in pegmatites.

At a scale of 1:250,000, DeWitt and others (1986) assigned the area in the vicinity of the Federal parcel high potential for small to medium sized pegmatite deposits. Based on proximity to known deposits, the potential for finding small pegmatite bodies in the vicinity of the parcel is moderate. There is no known potential for any other commodities.

REFERENCES:

DeWitt, Ed, Buscher, D.P., Wilson, A.B., and Johnson, T.M., 1988a, Map of mines, prospects, and patented mining claims, and classification of mineral deposits in the Hill City 7 ½-minute quadrangle, Black Hills, South Dakota: U.S. Geological Survey Miscellaneous Field Studies Map MF-1978-J, scale 1:24,000.

DeWitt, Ed, Buscher, D.P., Wilson, A.B., and Johnson, T.M., 1988b, Map of mines, prospects, and patented mining claims, and classification of mineral deposits in the Custer 7 ½-minute quadrangle, Black Hills, South Dakota: U.S. Geological Survey Miscellaneous Field Studies Map MF-1978-M, scale 1:24,000.

DeWitt, Ed, Redden, J.A. Redden, Buscher, David, and Wilson, A.B., 1989, Geologic map of the Black Hills area, South Dakota and Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-1910, scale 1:250,000.

DeWitt, Ed, Redden, J.A., Wilson, A.B., and Buscher, David, 1986, Mineral resource potential and geology of the Black Hills National Forest, South Dakota and Wyoming, *with a section on* salable commodities, by J.S. Dersch: U.S. Geological Survey Bulletin 1580, 135 p, 4 pls. (scale 1:250,000) in pocket.

Ratte, J.C., and Wayland, R.G., 1969, Geology of the Hill City quadrangle, Pennington County, South Dakota–A preliminary report: U.S. Geological Survey Bulletin 1271-B, 14 p., scale 1:24,000.

Wilson, A.B., and DeWitt, Ed, 1995, Maps showing metallic mineral districts and mines in the Black Hills, South Dakota and Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-2445, scale 1:100,000.

LIST OF ATTACHMENTS:

A. Exhibits A & B–Location information as supplied by U.S. Forest Service.

B. Geology of the Hill City 1:24,000 quadrangle in the vicinity of the Knuckles parcel (from Ratte and Wayland, 1969).

C. Location of Knuckles and Federal parcels in relation to mineralized areas (from Wilson and DeWitt, 1995).

EXHIBIT A

Property that Dennis and Penny Knuckles will consider exchanging:

Black Hills Principal Meridian, Pennington County, South Dakota

T. 2S., R. 5E.	Acres
a portion of secs. 8 and 17 known as **MS 1699**	10.3 m/l

EXHIBIT B

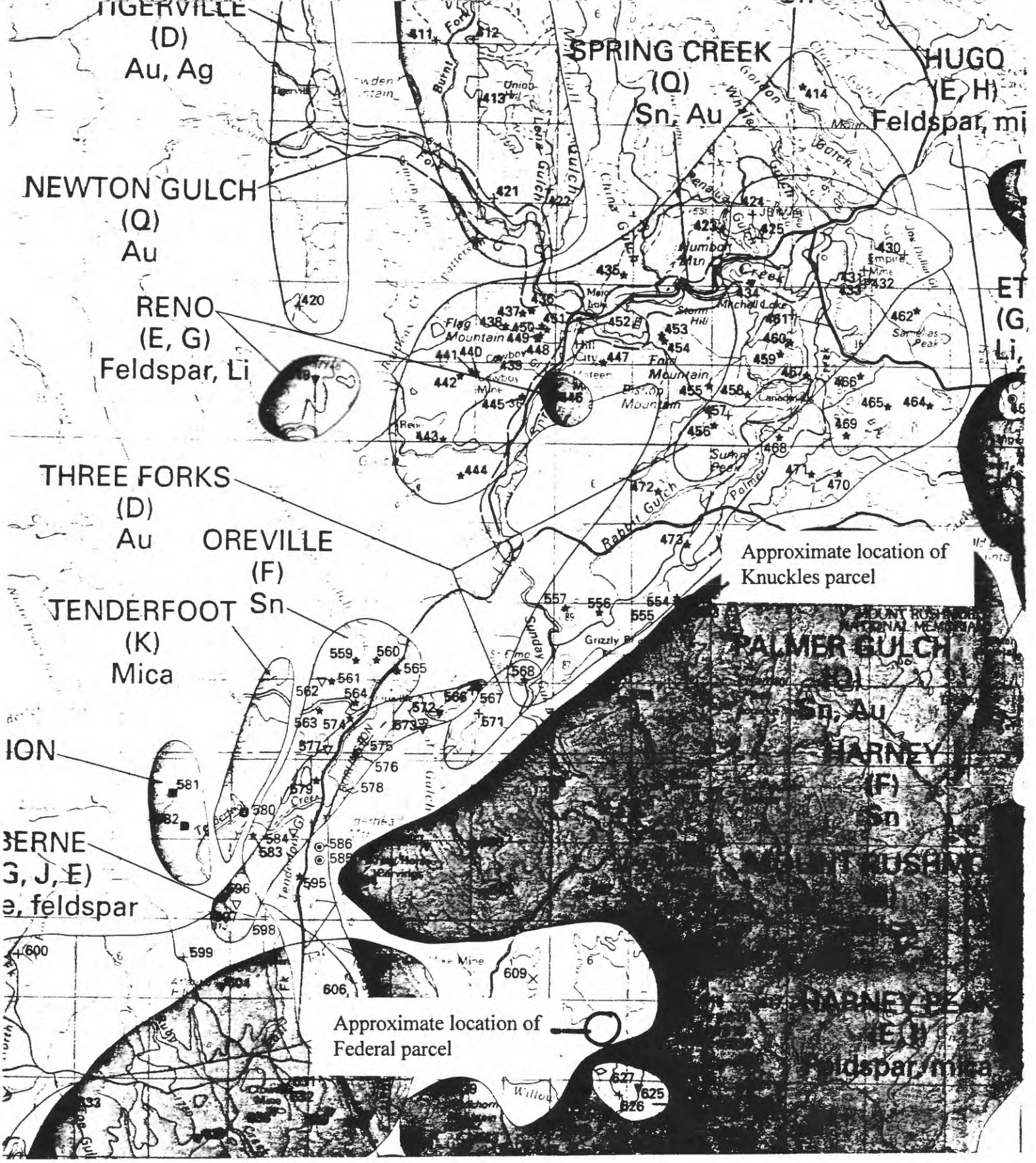
Property that the FOREST SERVICE will consider exchanging:

Black Hills Principal Meridian, Custer County, South Dakota

T. 3S., R. 5E.	Acres
sec. 7, a portion of the SW4NE4 and the NW4SE4	9.07

Attachment A. Exhibits A & B–Location information as supplied by U.S. Forest Service.

Attachment B. Geology of the Hill City 1:24,000 quadrangle in the vicinity of the Knuckles parcel (from Ratte and Wayland, 1969).



Attachment C. Location of Knuckles and Federal parcels in relation to mineralized areas (from Wilson and DeWitt, 1995).

WYOMING

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 905
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Denver, Colorado 80225

IN REPLY REFER TO:

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September 23, 1999

Mr. M.M. Underwood, Jr.
Director of Physical Resources
U.S. Forest Service - Rocky Mountain Region
P.O. Box 25127
Lakewood, CO 80225-0127

Dear Mr. Underwood:

This is in response to your September 16, 1999 (received September 20) request for information on locatable mineral resources in a land exchange proposal in which the James Darrel Dunrud Revocable Trust has offered certain non-Federal lands within the Shoshone National Forest in exchange for Federal lands also within the Shoshone 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 described in "Exhibits A and B", included with your request. These lands comprise 117.89 acres, more or less, in Park County, Wyoming.

Sincerely yours,

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

Copies: G.S. Plumlee
E.A. duBray

LOCATABLE MINERAL REPORT FOR THE DUNRUD LAND EXCHANGE OFFER, SHOSHONE NATIONAL FOREST, PARK COUNTY, WYOMING

By
Anna B. Wilson
U.S. Geological Survey

September 23, 1999

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.

Non-Federal
Dunrud Peak 1:24,000 quadrangle

The non-federal parcel is two contiguous patented mining claims along Bear Creek. Each claim is marked by a prospect on the topographic map. Quaternary alluvium conceals a northeast-trending fault subparallel to the creek. The rest of the area is underlain by the lower member of the Wiggins Formation (Upper Eocene and Lower Oligocene(?)), composed of vent facies, gray and purple andesite flows and breccias (Wilson, 1982).

The parcel is a few miles southwest of the Kirwin district (Hausel, 1997). Wilson (1964) recognized at least two different types of vein mineralization in the Kirwin area: 1) pyrite-chalcopyrite-molybdenite-quartz veins in an altered and silicified zone and 2) galena-sphalerite-tetrahedrite (commonly silver-bearing) with minor pyrite-chalcopyrite in carbonate-quartz gangue. Wilson (1964) also recognized the signs of a buried copper-molybdenum porphyry and suggested the area be explored further. Significant disseminated copper-molybdenum resources related to buried intrusions in an area extending from Kirwin to Galena Basin (about 2 mi. farther northeast) were studied by at least two mineral exploration companies in the 1960's to1970's (Terry Klein, U.S. Geological Survey, personal communication, 8/19/97; Ketner and others, 1966)).

Mineral resource potential for polymetallic veins containing silver, lead, and zinc (± silver, ± gold) and for porphyry copper-molybdenum deposits is high in the Kirwin area. The parcel however, is outside the area targeted for exploration. Because this area was not of interest to exploration companies, proprietary data probably showed no indication of mineralization. No mines, prospects, or occurrences outside of the main Kirwin area are in the MRDS (1999a) or MAS/MILS (1999b) databases. Mineral resource potential of the parcel is moderate to low.

Federal
Dick Creek Lakes 1:24,000 quadrangle

The Federal lands appear to be at Double D Ranch, shown as private on land status and topographic maps (U.S. Geological Survey, 1991). Bunkhouses, lodges, and other buildings are situated on the parcel. The western part of the parcel is in andesitic volcaniclastic rocks of the alluvial facies of the lower member of the Wiggins Formation (Upper Eocene and Lower Oligocene(?)). The northern edge of the parcel is covered with Quaternary landslide deposits. The remainder of the parcel is covered with Quaternary unconsolidated deposits of silt, sand, gravel, and cobbles, including alluvial fans, talus,

morainal debris, small landslides, and slumps (Wilson, 1982). A nearly 14 mi long east-west-trending fault is less than a mile south of the parcel.

Although the tract is on trend with the Kirwin district and the host rocks are similar, there is no known mineralization. The absence of alteration or mineralized veins suggests that the metal-bearing fluids similar to those that formed deposits in the Kirwin district have not affected the host rocks in this area. No mines, claims, or prospects are in the immediate vicinity of the parcel; the parcel is 4 mi northeast of Galena Basin, the northern end of the mineralized area. Mineral resource potential is low.

REFERENCES:

Hausel, W.D., 1997, Copper, lead, zinc, molybdenum, and associated deposits of Wyoming: Wyoming State Geological Survey Bulletin 70, 229 p.

Ketner, K.B., Keefer, W.R., Fisher, F.S., Smith, D.L., and Raabe, R.G., 1966, Mineral resources of the Stratified Primitive area, Wyoming: U.S. Geological Survey Bulletin 1230-E, 56 p.

U.S. Geological Survey, 1991, Dick Creek Lakes quadrangle, Park County, Wyoming: U.S. Geological Survey topographic map, scale 1:24,000.

U.S. Geological Survey, 1999a, Mineral Resource Data System [MRDS: active computer file; data available from U.S. Geological Survey, Mineral Resources Program, Building 20, Denver Federal Center, Denver CO 80225].

U.S. Geological Survey, 1999b, Minerals Availability System [MAS: active computer file; data available from U.S. Geological Survey, Minerals Information Team (formerly U.S. Bureau of Mines), Building 20, Denver Federal Center, Denver CO 80225].

Wilson, W.H., 1964, The Kirwin mineralized area, Park County, Wyoming: Geological Survey of Wyoming Preliminary Report No. 2, 12 p., scale approximately 1:31,680.

Wilson, W.H., 1982, Geologic map of the Dick Creek Lakes, Dunrud Peak, Francs Peak, Noon Point and Twin Peaks quadrangles, Fremont, Hot Springs, and Park Counties, Wyoming: Geological Survey of Wyoming Map Series 10, scale 1:50,000.

LIST OF ATTACHMENTS:

A. Exhibits A and B (provided by the U.S. Forest Service)

B. Geologic map of the Kirwin area showing approximate locations of Federal and Non-Federal land exchange parcels (from Wilson, 1982).

EXHIBIT A

Property that the Non-Federal Party will consider exchanging:

6th Principal Meridian, Park County, Wyoming

T. 45N., R. 104 W., 6th PM

Mineral Survey No. 434, location in sections 15, 16, 21, 22

Total nonfederal acres 57.891 Acres

EXHIBIT B

Property that the U.S. Forest Service will consider exchanging:

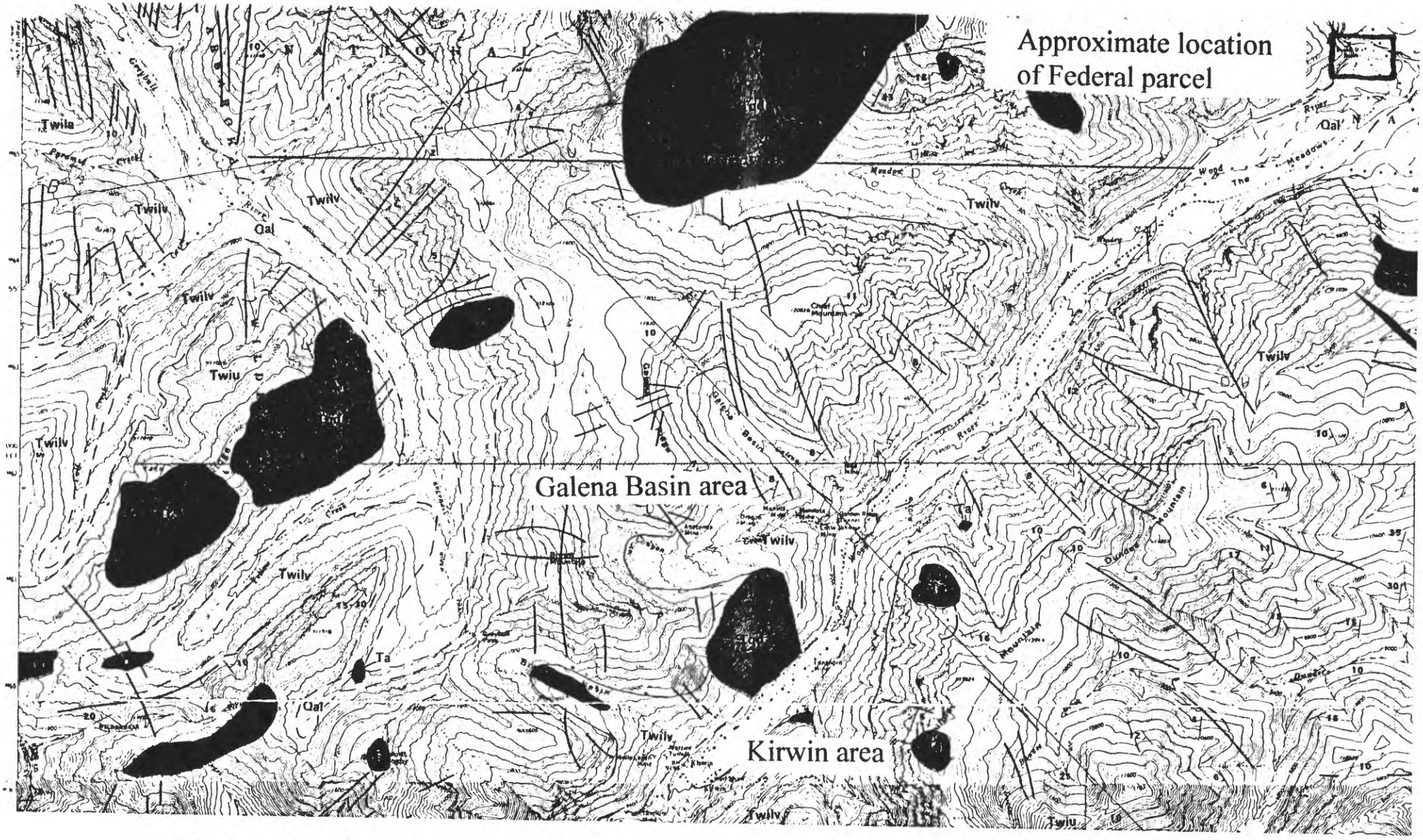
6th Principal Meridian, Park County, Wyoming

Federal Lands:

T. 46 N., R.103 W., 6th PM

Sec. 21:	NW1/4SE1/4	40Acres
	W1/2NE1/4SE1/4	20 Acres
Total federal acres:		60 Acres

Attachment A. Exhibits A and B (provided by U.S. Forest Service)



Attachment B. Geologic map of the Kirwin area showing approximate locations of Federal and Non-Federal land exchange parcels (from Wilson, 1982).

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