

APPENDIX 6—KANAB FIELD OFFICE: COAL UNSUITABILITY REPORT

INTRODUCTION

Bureau of Land Management (BLM) regulations regarding coal management on public lands are found in Title 43 of the Code of Federal Regulations (CFR), Part 3400. During land use planning, BLM is required to review federal lands and assess whether there are areas unsuitable for all coal mining or for certain stipulated methods of coal mining. This report addresses the 20 criteria of coal unsuitability as defined in 43 CFR 3461.5 and applies these criteria to the known recoverable coal resource areas (KRCRA) for the Alton, Kaiparowits, and Kolob coal fields. Unsuitability decisions were based on these criteria and applied to federally owned coal estates within the Kanab Field Office (KFO) Planning Area (KPA). Currently there are no active coal leases within the KPA, but one lease application is currently being processed/analyzed in the Alton Amphitheater.

GEOLOGIC SETTING

KPA coals are located within Late Cretaceous sedimentary strata of the Dakota and Straight Cliffs formations. The Alton and Kolob coal fields are in the Dakota Formation and the Kaiparowits coal field is in the John Henry Member of the Straight Cliffs Formation. The depositional environment for both the Dakota and Straight Cliffs coals was a coastal plain setting along the Western Interior Seaway. The Dakota coals were deposited approximately 95 million years ago during the onset (transgression) of the Western Interior Seaway. Kaiparowits coals were deposited approximately 85 million years ago as the Western Interior Seaway regressed from the area. Rivers originating along the Sevier Mountain belt and Mogollon highlands provided a steady supply of sediment for burial of the rich coastal mires.

LANDS CONSIDERED

The recoverable coal resources within the KPA cross a number of surface ownership boundaries, including BLM, U.S. Forest Service (USFS), National Park Service (NPS), State of Utah, and private lands, and are located within Kane and Garfield counties. This report considers suitability for approximately 246,879 acres of federally owned coal within the KRCRA (Map 1).

COAL RESOURCES

The *Kanab Field Office Mineral Potential Report* (BLM/Utah Geological Survey 2006) identifies an in-ground coal resource for the KPA of approximately 10 billion tons. Approximately 200 million tons have been identified as surface minable in the Alton coal field. Generally, Dakota Formation coals range from a subbituminous B rank in the Alton coal field to subbituminous A rank in the Kolob coal field. The sulfur content varies, but averages about 1.2 percent. The ash content generally ranges between 10 percent and 15 percent. Heat content for Dakota Formation coals varies from about 7,500 to 9,500 BTU/lb. In the Kaiparowits field, the coal rank decreases from high-volatile C bituminous to subbituminous from south to north in the KPA. The ash and sulfur levels of the Straight Cliffs coals average about 10 percent and 0.7 percent, respectively. The heat content of Kaiparowits coal ranges from about 7,420 to 10,300 BTU/lb (BLM/UGS 2006).

Table A6-1 through Table A6-3 identify the coal resources based on the depth of cover and the mapped quadrangle. Shallower depths of cover, which have the potential for surface mining, are presented in Table A6-1.

Table A6-1. Alton Coal Field

Quadrangle	Depth of Cover				TOTAL
	0–200 ft	200–1000 ft	1000–2000 ft	2000–3000 ft	
Alton	95.3	212.1	114.3	98.9	520.6
Bald Knoll	52.7	152.9	48.8	42.3	296.7
Orderville NE-SE	38.3	96.9	0.0	0.0	135.2
Skutumpah Creek	16.9	183.4	107.4	17.8	325.5
TOTAL	203.2	645.3	270.5	159.0	1,278.0
PERCENT	15.9%	50.5%	21.2%	12.4%	100.0%

Identified coal resource for the Alton coal field within the KPA by depth of cover and quadrangle (in millions of tons; from BLM/UGS 2006)

Table A6-2. Kolob Coal Field

Quadrangle	Depth of Cover			TOTAL
	0–1000 ft	1000–2000 ft	2000–3000 ft	
Orderville Canyon NE	62.4	305.6	193.2	561.2
Orderville Canyon SE	258.7	143.0	0.0	401.7
Orderville SW	132.2	257.0	8.4	397.6
TOTAL	453.3	705.6	201.6	1,360.5
PERCENT	33.3%	51.9%	14.8%	100.0%

Identified coal resource for the Kolob coal field within the KPA by depth of cover and quadrangle (in millions of tons; from BLM/UGS 2006)

Table A6-3. Kaiparowits Coal Field

Township/ Range	Depth of Cover					TOTAL
	Minable			Deep		
	0–1000 ft	1000–2000 ft	2000–3000 ft	3000–6000 ft	> 6000 ft	
33S, 2W	0.0	0.0	0.0	0.0	0.0	0.0
33S, 1W	0.0	0.0	0.0	0.0	0.0	0.0
33S, 1E	0.0	94.9	655.4	1,046.6	0.0	1,796.9
33S, 2E	10.5	48.8	93.3	7.3	0.0	159.9
34S, 2W	7.5	121.2	113.1	74.4	0.0	316.2
34S, 1W	0.0	0.0	45.3	49.9	0.0	95.2
34S, 1E	33.2	589.7	284.5	278.9	0.0	1,186.3
34S, 2E	1.4	45.0	0.0	0.0	0.0	46.4

Township/ Range	Depth of Cover					TOTAL
	Minable			Deep		
	0–1000 ft	1000–2000 ft	2000–3000 ft	3000–6000 ft	> 6000 ft	
35S, 2W	111.3	150.2	165.6	249.0	0.0	676.1
35S, 1W	0.0	0.0	0.0	405.7	54.4	460.1
35S, 1E	20.0	190.5	188.9	356.4	6.9	762.7
36S, 2W (N½)	65.5	42.6	7.9	0.1	0.0	116.1
36S, 1W (N½)	9.7	22.5	101.8	151.8	7.4	293.2
36S, 1E	104.2	217.8	189.5	948.8	0.0	1,460.3
TOTAL	363.3	1,523.2	1,845.3	3,568.9	68.7	7,369.4
PERCENT	4.9%	20.7%	25.0%	48.4%	0.9%	100.0%

Identified coal resource for the Kaiparowits Plateau coal field within the KPA by depth of cover and township (in millions of tons; from BLM/UGS 2006)

EVALUATION OF THE COAL UNSUITABILITY CRITERIA

This report assesses KPA coal resources for suitability based on the 20 criteria outlined in 43 CFR 3461.5. Underground mining of coal deposits is exempt from the criteria, where there would be no surface coal mining operations as stated at 3461.1.1(a). Surface mining operations include surface operations and surface impacts incident to an underground mine as stated in 43 CFR 3400.0-5(mm). In addition, where underground mining would include surface operations and surface impacts on federal lands to which a criterion applies, the lands shall be assessed as unsuitable unless an exception or exemption applies (43 CFR 3461.1(b)). Each criterion is subject to exceptions and/or exemptions as prescribed in the regulations.

Criterion Number 1

All Federal lands included in the following land systems or categories shall be considered unsuitable: National Park System; National Wildlife Refuge System; National System of Trails; National Wilderness Preservation System; National Wild and Scenic Rivers System; National Recreation Areas; lands acquired with money derived from the Land and Water Conservation Fund; National Forests; and Federal lands in incorporated cities, towns, and villages.

- *Exceptions. (i) A lease may be issued within the boundaries of any National Forest if the Secretary finds no significant recreational, timber, economic or other values which may be incompatible with the lease; and (A) surface operations and impacts are incident to an underground coal mine, or (B) where the Secretary of Agriculture determines, with respect to lands which do not have significant forest cover within those National Forests west of the 100th Meridian, that surface mining may be in compliance with the Multiple-Use Sustained-Yield Act of 1960, the Federal Coal Leasing Amendments Act of 1976 and the Surface Mining Control and Reclamation Act of 1977. (ii) A lease may be issued within the Custer National Forest with the consent of the Department of Agriculture as long as no surface coal mining operations are permitted.*

- *Exemptions.* The application of this criterion to lands within the listed land systems and categories is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977.

A number of land systems specified in Criterion 1 are applicable under the unsuitability criteria.

National Forests

All National Forest lands are considered unsuitable for surface coal mining operations. An exception to this criterion would allow surface operations based on the specific criteria outlined above. The Dixie National Forest prepared a Coal Unsuitability Study in 1983, and found that only 10 acres met the conditions of the exception. The study was based on areas identified as high- and moderate-potential coal lands that did not have significant forest cover. The Dixie National Forest Coal Unsuitability Study results are carried forward in this report. Therefore, approximately 93,425 acres of National Forest lands within the KRCRA are determined to be unsuitable for surface coal mining and for surface impacts incident to underground mining. There are an additional 1,587 acres of Bankhead-Jones lands under USFS administration in the KRCRA for surface coal mining and surface impacts incident to underground mining.

National Recreation Areas

There are about 2,120 acres of federal coal in the Kaiparowits coal field that underlie the Glen Canyon National Recreation Area. This federal coal is unsuitable for further consideration for leasing because it is within the National Park System.

National Wild and Scenic Rivers System

There are about 230 acres of lands that are eligible for inclusion in the National Wild and Scenic Rivers System. If these lands obtain such status, they will be determined to be unsuitable.

Incorporated Cities, Towns, and Villages

Approximately 3,000 acres of federal coal in the Alton and Kolob coal fields within the KRCRA underlie the towns of Alton, Orderville, and Glendale. Because of possible damage to private property caused by subsidence and surface mining, these areas are determined to be unsuitable and will not be further considered for future leasing. The breakdown of the number of acres within each town is as follows:

Alton	101 acres
Glendale	1,742 acres
Orderville	1,162 acres

Exemptions for valid existing rights do not apply.

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Summary: Criterion 1—Approximately 100,137 acres are determined to be unsuitable based on the conditions set forth in this criterion.

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Criterion Number 2

Federal lands that are within rights-of-way or easements or within surface leases for residential, commercial, industrial, or other public purposes, on federally owned surface shall be considered unsuitable.

- *Exceptions. A lease may be issued, and mining operations approved, in such areas if the surface management agency determines that: (i) All or certain types of coal development (e.g., underground mining) will not interfere with the purpose of the right-of-way or easement; or (ii) The right-of-way or easement was granted for mining purposes; or (iii) The right-of-way or easement was issued for a purpose for which it is not being used; (iv) The parties involved in the right-of-way or easement agree, in writing, to leasing; or (v) It is impractical to exclude such areas due to the location of coal and method of mining and such areas or uses can be protected through appropriate stipulations.*
- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

There are only 17 recorded rights-of-way (ROW), totaling approximately 30 acres of land, within the KRCRA. The exception (parts (i), (iv), and (v)) of this criterion offers protection for the ROWs and their improvements from the potential adverse effects of mining or associated surface facilities and, therefore, will not be considered unsuitable.

There are a large number of roads that will be evaluated in the future for Revised Statute (RS) 2477 standing. This could greatly affect the number of ROWs within the KRCRA. It is likely that the criterion exception would also apply in these cases.

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Summary: Criterion 2—No acres are determined to be unsuitable based on the conditions set forth in this criterion.

Criterion Number 3

The terms used in this criterion have the meaning set out in the Office of Surface Mining Reclamation and Enforcement regulations at Chapter VII of Title 30 of the Code of Federal Regulations. Federal lands affected by section 522(e) (4) and (5) of the Surface Mining Control and Reclamation Act of 1977 shall be considered unsuitable. This includes lands within 100 feet of the outside line of the right-of-way of a public road or within 100 feet of a cemetery, or within 300 feet of any public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling.

- *Exceptions. A lease may be issued for lands: (i) Used as mine access roads or haulage roads that join the right-of-way for a public road; (ii) For which the Office of Surface Mining Reclamation and Enforcement has issued a permit to have public roads relocated; (iii) If after public notice and opportunity for public hearing in the locality, a written finding is made by the authorized officer that the interests of the public and the landowners affected by mining within 100 feet of a public road will be protected; (iv) For which owners of occupied dwellings have given written permission to mine within 300 feet of their buildings.*
- *Exemptions. The application of this criterion is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977.*

Criterion 3 identifies approximately 3,200 acres of land within the KRCRA that have been found to be unsuitable. Data was not available to ascertain the location of all public buildings, community or institutional buildings, or occupied dwellings. Therefore, municipality boundaries were used to identify the areas of unsuitability. There are still a number of homes and summer cabins on private lands outside of these boundaries that are underlain by federal coal in the Alton and Kolob fields. A survey of the exact locations was not conducted. Because many of these structures are located in areas that would be mined primarily by underground methods, the underground exemption could possibly be applied. If the exemption could not be applied, mining would not be allowed within 300 feet of any such dwelling. A survey of existing dwellings would be made if leasing of federal coal is considered. The owners of the dwellings would be given the opportunity to give written permission for mining. If permission is not obtained, the area would then be designated unsuitable and the exact acreage calculated. Until that time, the area will be considered suitable.

The Alton Cemetery is underlain by surface minable coal. This area is unsuitable because surface mining is prohibited within 100 feet of a cemetery. This involves only about 1 acre.

As mentioned above in Criterion 2, the total acreage determined to be unsuitable could increase significantly based on administrative determinations regarding RS 2477 road assertions.

The exemptions for valid existing rights do not apply because there are presently no authorized coal leases within the KRCRA.

Summary: Criterion 3—Approximately 3,200 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining based on the conditions set forth in this criterion.

Criterion Number 4

Federal lands designated as wilderness study areas shall be considered unsuitable while under review by the Administration and the Congress for possible wilderness designation. For any Federal land which is to be leased or mined prior to completion of the wilderness inventory by the surface management agency, the environmental assessment or impact statement on the lease sale or mine plan shall consider whether the land possesses the characteristics of a wilderness study area. If the finding is affirmative, the land shall be considered unsuitable, unless issuance of noncompetitive coal leases and mining on leases is authorized under the Wilderness Act and the Federal Land Policy and Management Act of 1976.

- *Exemptions. The application of this criterion to lands for which the Bureau of Land Management is the surface management agency and lands in designated wilderness areas in National Forests is subject to valid existing rights.*

There is one Wilderness Study Area (WSA) that partially overlies the KRCRA. Therefore, approximately 45 acres within the Parunuweap Canyon WSA are considered unsuitable.

The exemptions for valid existing rights do not apply because there are presently no authorized coal leases within the KRCRA.

Summary: Criterion 4—Approximately 45 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining based on the conditions set forth in this criterion.

Criterion Number 5

Scenic Federal lands designated by visual resource management analysis as Class I (areas of outstanding scenic quality or high visual sensitivity) but not currently on the National Register of Natural Landmarks shall be considered unsuitable.

- *Exceptions. A lease may be issued if the surface management agency determines that surface coal mining operations will not significantly diminish or adversely affect the scenic quality of the designated area.*
- *Exemptions. This criterion does not apply to lands: to which the operator has made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977, or which include operations on which a permit has been issued.*

There are presently no Visual Resource Management (VRM) Class I lands within the KRCRA. This will change in the future with the new KFO Resource Management Plan (RMP) based on BLM policy set forth in the Washington Office Instruction Memorandum 2000-096, which directs BLM to assign VRM Class I designations to all WSA lands. Therefore, after authorization of the new RMP, 45 acres in the Parunuweap Canyon WSA that fall within the KRCRA (Criterion 4) will become unsuitable for surface mining.

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Summary: Criterion 5—No acres are determined to be unsuitable at this time.

Criterion Number 6

Federal lands under permit by the surface management agency, and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments shall be considered unsuitable for the duration of the study, demonstration or experiment, except where mining could be conducted in such a way as to enhance or not jeopardize the purposes of the study, as determined by the surface management agency, or where the principal scientific user or agency gives written concurrence to all or certain methods of mining.

- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

Southern Utah University in conjunction with the Utah Division of Wildlife Resources (UDWR) and the KFO BLM are studying Greater sage-grouse in the Alton area. The study incorporates approximately 5,800 acres within the Alton Amphitheater. The purpose of the study is to determine locations and suitability for sage-grouse brooding and winter habitats. This study is scheduled to be complete in 2008. The schedule would not conflict with future mining/leasing and, therefore, the project area is considered suitable under this criterion.

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Summary: Criterion 6—No acres are determined to be unsuitable.

Criterion Number 7

All publicly or privately owned places which are included in the National Register of Historic Places shall be considered unsuitable. This shall include any areas that the surface management agency determines, after consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer, are necessary to protect the inherent values of the property that made it eligible for listing in the National Register.

- *Exceptions. All or certain stipulated methods of coal mining may be allowed if, after consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer, they are approved by the surface management agency, and, where appropriate, the State or local agency with jurisdiction over the historic site.*
- *Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

This criterion applies to districts, sites, objects, and other items of historical, architectural, archaeological, or cultural significance in or eligible for inclusion in the National Register of Historic Places. Although no sites within the KRCRA have been included in the National Register, there are a large number of known and documented archaeological sites that have been determined eligible. The exception for stipulated coal mining methods that will not result in adverse impacts is applicable; however, mitigation may be required for eligible sites where adverse impacts cannot be avoided. The State Historic Preservation Officer has identified possible subsidence problems associated with underground mining. Stipulations would be necessary in any future leases to mitigate the adverse effects of subsidence.

Summary: Criterion 7—No acres are determined to be unsuitable at this time.

Criterion Number 8

Federal lands designated as natural areas or as National Natural Landmarks shall be considered unsuitable.

- *Exceptions. A lease may be issued and mining operation approved in an area or site if the surface management agency determines that: (i) The use of appropriate stipulated mining technology will result in no significant adverse impact to the area or site; or (ii) The mining of the coal resource under appropriate stipulations will enhance information recovery (e.g., paleontological sites).*
- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which includes operations on which a permit has been issued.*

There are no designated natural areas or National Natural Landmarks designated under 43 CFR 2070 within the KRCRA.

Summary: Criterion 8—No acres are determined to be unsuitable.

Criterion Number 9

Federally designated critical habitat for listed threatened or endangered plant and animal species, and habitat proposed to be designated as critical for listed threatened or endangered plant and animal species or species proposed for listing, and habitat for Federal threatened or endangered species which is determined by the Fish and Wildlife Service and the surface management agency to be of essential value and where the presence of threatened or endangered species has been scientifically documented, shall be considered unsuitable.

- *Exceptions. A lease may be issued and mining operations approved if, after consultation with the Fish and Wildlife Service, the Service determines that the proposed activity is not likely to jeopardize the continued existence of the listed species and/or its critical habitat.*
- *Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

There are approximately 33,630 acres of federally designated critical habitat for the Mexican spotted owl (MSO) within the boundaries of the KRCRA. In informal consultation with the U.S. Fish and Wildlife Service (USFWS), BLM mapped areas that contain only the primary constituent elements for MSO habitat, as defined by the *Mexican Spotted Owl Recovery Plan* (USFWS 2001, FR 8530, vol. 66 no. 22). These areas were identified using professional judgment and by buffering the 2000 Willey MSO habitat model by ½ mile. The areas identified include approximately 8,668 acres of habitat that would be considered unsuitable for surface coal mining or surface facilities. In the event of future leasing, BLM would inventory coal areas for threatened and endangered (T&E) plant and animal species in conjunction with a site-specific environmental impact statement (EIS) analysis. Critical habitat designations for T&E plant or animal species will likely change in the future, at which time the determination of suitability would be revised.

Past surveys include a general reconnaissance for T&E plants in the entire southern Utah coal area by Dr. Stanley Welch in 1977. Moderately intensive surveys were conducted by Dr. Kent Ostler in 1979 on about 56,500 acres on the Utah Power and Light Company preference right lease application area, the El Paso Coal Company leases, and the Resources Company leases. A moderately intensive survey on about 26,800 acres in the Alton coal field was conducted by Dr. Robert Foster in 1979. UDWR inventoried the coal areas of southern Utah for T&E animals in 1977 and 1978. The process included a literature search and field inventories. In 1979 and 1980, BLM conducted an essential habitat inventory for the Utah prairie dog, peregrine falcon, and bald eagle in southern Utah. Several bald eagle sightings were made on the Alton and Kolob coal fields, and one concentration area was located (Criterion 12). No peregrine falcons or Utah prairie dogs were identified closer than 10 miles from the KRCRA (Escalante and Zion Unit Resource Analyses; Johnson 1979; UDWR 1977; USFWS 1978, 44 FR 7096, December 10, 1979).

The exception in this criterion could allow for surface mining and surface facilities within these areas only after the USFWS determined that the proposed activity is not likely to jeopardize the continued existence of the MSO or other listed species in the future and/or their critical habitats.

The exemption for substantial legal and financial commitments and ongoing mining operations does not apply because there are no active leases or operations within the planning area.

Summary: Criterion 9—Approximately 8,668 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining. The exception in this criterion may be applicable subject to site-specific analysis and consultation with USFWS.

Criterion Number 10

Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a state pursuant to state law as endangered or threatened shall be considered unsuitable.

- *Exceptions. A lease may be issued and mining operations approved if, after consultation with the state, the surface management agency determines that the species will not be adversely affected by all or certain stipulated methods of coal mining.*
- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

The State of Utah does not maintain an official state T&E species list; therefore, no state-listed T&E plant or animal species or critical habitat exists for this criterion.

Summary: Criterion 10—No acres are determined to be unsuitable.

Criterion Number 11

A bald or golden eagle nest or site on Federal lands that is determined to be active and an appropriate buffer zone of land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

- *Exceptions. A lease may be issued if: (i) It can be conditioned in such a way, either in manner or period of operation, that eagles will not be disturbed during breeding season; or (ii) The surface management agency, with the concurrence of the Fish and Wildlife Service, determines that the golden eagle nest(s) will be moved. (iii) Buffer zones may be decreased if the surface management agency determines that the active eagle nests will not be adversely affected.*
- *Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

In 2003, UDWR identified an active bald eagle nest within the KPA adjacent to the KRCRA. When including a 1-mile buffer zone, a portion of the KRCRA is intersected. Nests are considered active for a period of 7 years after discovery of a nest in use. Exercising (iii) of the exception above, the buffer has been modified because the natural topography provides adequate protection for the nest site. Approximately 20 acres of land remain unsuitable after the readjustment. Leasing may be feasible within the area determined to be unsuitable if the condition of exceptions (i and ii) are met. The underground exemption could also be applied on possible future leasing. Future leases would stipulate that no surface facilities could be built within a 1-mile radius of an active nest site and that surface operations could be conducted only between September 1 and December 31 of each year (Utah Field Office *Guidelines for Raptor Protection From Human and Land Use Disturbances* [USFWS 1999]). Future inventories by

UDWR and BLM may identify additional eagle nests within the coal areas that would render the nest and buffer areas unsuitable.

The exemption for substantial legal and financial commitments and ongoing mining operations does not apply because there are no active leases or operations within the planning area.

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Summary: Criterion 11—Approximately 20 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining. The exception in this criterion may be applicable subject to site-specific analysis and consultation with USFWS.

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Criterion Number 12

Bald and golden eagle roost and concentration areas on Federal lands used during migration and wintering shall be considered unsuitable.

- *Exceptions.* A lease may be issued if the surface management agency determines that all or certain stipulated methods of coal mining can be conducted in such a way, and during such periods of time, to ensure that eagles shall not be adversely disturbed.
- *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

BLM and UDWR inventories have identified a bald eagle winter concentration area of approximately 1,160 acres on Table Bench along the North Fork of the Virgin River. The wintering area is used from about November 1 to March 15 each year. The rough surface topography and the deep coals have led to the determination that only underground methods would be used to mine this area. The exception and underground exemption could be applied to possible future leases and surface facilities to restrict activities that could adversely disturb the eagles during the winter concentration period. Future inventories by BLM and UDWR may identify other bald eagle concentration areas within the coal areas, which could affect suitability (BLM 1978 and 1979, Zion Unit Analysis; UDWR 1977; Johnson 1979).

The exemption for substantial legal and financial commitments and ongoing mining operations does not apply because there are no active leases or operations within the planning area.

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Summary: Criterion 12—Approximately 1,160 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining. The exception in this criterion may be applicable subject to site-specific analysis.

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Criterion Number 13

Federal lands containing a falcon (excluding kestrel) cliff nesting site with an active nest and a buffer zone of Federal land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

- *Exceptions.* A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining

will not adversely affect the falcon habitat during the periods when such habitat is used by the falcons.

- *Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

BLM and UDWR inventories conducted in the late 1970s and early 1980s identified several prairie falcon nesting sites within the KPA, two of which were located within the KRCRA (BLM 1978, 1979 Zion and Escalante Unit Resource Analyses; UDWR 1977, 1978; Hoffman 1978; Johnson 1979; BLM field inventories 1976, 1977, 1978, and 1980). No recent surveys have been conducted to verify this data. Because of the amount of time that has passed since the data was collected and the likelihood of a change of status, no lands are designated as unsuitable under this criterion. A more thorough analysis would be required at the time of coal leasing to adequately address this criterion. Future inventories by UDWR and BLM or site-specific lease analysis may identify new falcon nests within coal areas. At that time the lands would be designated unsuitable unless the exception could be applied.

Summary: Criterion 13—No acres are determined to be unsuitable.

Criterion Number 14

Federal lands which are high priority habitat for migratory bird species of high Federal interest on a regional or national basis, as determined jointly by the surface management agency and the Fish and Wildlife Service, shall be considered unsuitable.

- *Exceptions. A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining will not adversely affect the migratory bird habitat during the periods when such habitat is used by the species.*
- *Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

Several Bird Habitat Conservation Areas have been identified by the Intermountain West Joint Venture (IWJV) along the East Fork of the Virgin River, East Fork of the Sevier River (Parker Mountain), and Escalante River in and adjacent to the KRCRA. In consultation with USFWS, BLM determined that high-priority habitats for migratory birds exist along these corridors, defined as a ½-mile buffer zone from the outer edge of the bank. Approximately 11,900 acres of the KRCRA would be affected and considered unsuitable. Future leasing within these areas could occur if site-specific consultation with USFWS determined that such operations would not adversely affect the migratory bird habitat during the periods of use.

The underground exemption does not apply in this criterion because of the potential to affect hydrologic systems and riparian habitat.

The exemption for substantial legal and financial commitments and ongoing mining operations does not apply because there are no active leases or operations within the planning area.

Summary: Criterion 14—Approximately 11,900 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining. The exception in this criterion may be applicable subject to site-specific analysis and consultation with USFWS.

Criterion Number 15

Federal lands which the surface management agency and the state jointly agree are habitat for resident species of fish, wildlife and plants of high interest to the state and which are essential for maintaining these priority wildlife and plant species shall be considered unsuitable. Examples of such lands which serve a critical function for the species involved include: (i) Active dancing and strutting grounds for Greater sage-grouse, sharp-tailed grouse, and prairie chicken; (ii) Winter ranges crucial for deer, antelope, and elk; (iii) Migration corridor for elk; and (iv) Extremes of range for plant species.

- *Exceptions. A lease may be issued if, after consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected.*
- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

There are approximately 18,330 acres of crucial elk winter range; 12,780 acres of crucial mule deer winter range; 8,735 acres of Greater sage-grouse breeding, nesting, and brood-rearing habitat; and 12 acres classified as leks on federal coal lands within the KRCRA. The State of Utah and BLM agree that elk, mule deer, and sage-grouse habitats should remain suitable because site-specific analyses would occur before coal field leasing. Presently there is an EIS underway as part of a coal leasing application in the Alton Amphitheater. High-interest habitat issues will be addressed in this EIS.

Table A6-4. State Sensitive Species Habitat

State Sensitive Species Habitat (acres of habitat by ownership)	USFS	BLM	State Surface	Private Surface
Elk	17,015	1,235		80
Mule Deer	8,445	2,530	680	1,125
Sage-Grouse Breeding, Nesting, and Brood-Rearing	5,735	1,940		1,060
Sage-Grouse Lek		12		

Neither the BLM nor the State of Utah has high-interest plant species of concern within the KRCRA.

The first exception and underground exemption in this criterion would apply.

The exemption for substantial legal and financial commitments and ongoing mining operations does not apply because there are no active leases or operations within the planning area.

Summary: Criterion 15—No acres are determined to be unsuitable.

Criterion Number 16

Federal lands in riverine, coastal and special floodplains (100-year recurrence interval) on which the surface management agency determines that mining could not be undertaken without substantial threat of loss of life or property shall be considered unsuitable for all or certain stipulated methods of coal mining.

- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

Data for this criterion is not presently available to adequately delineate riverine and special floodplains. Limited 100-year flood hazard maps are available from the U.S. Department of Housing and Urban Development, but the data is not adequate to determine the threat assessment. A more thorough analysis will be required at the time of coal leasing to adequately address this criterion.

Summary: Criterion 16—No acres are determined to be unsuitable.

Criterion Number 17

Federal lands which have been committed by the surface management agency to use as municipal watersheds shall be considered unsuitable.

- *Exceptions. A lease may be issued where the surface management agency in consultation with the municipality (incorporated entity) or the responsible governmental unit determines, as a result of studies, that all or certain stipulated methods of coal mining will not adversely affect the watershed to any significant degree.*
- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

No lands within the KRCRA have been committed for use as municipal watersheds.

Summary: Criterion 17—No acres are determined to be unsuitable.

Criterion Number 18

Federal lands with National Resource Waters, as identified by states in their water quality management plans, and a buffer zone of Federal lands ¼ mile from the outer edge of the far banks of the water, shall be unsuitable.

- *Exceptions. The buffer zone may be eliminated or reduced in size where the surface management agency determines that it is not necessary to protect the National Resource Waters.*
- *Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.*

In the State of Utah, the designation “High Quality Waters” is the equivalent of National Resource Waters, and therefore waters with this designation receive additional regulatory protection.

Within the KPA, the State of Utah has designated Category 1 High Quality Waters in the following drainages:

1. North Fork of the Virgin River and tributaries, from the confluence with the East Fork of the Virgin River to its headwaters
2. East Fork of the Virgin River and tributaries, from the confluence with the North Fork of the Virgin River to its headwaters
3. East Fork of the Sevier River and tributaries, from the Kingston diversion to its headwaters
4. Kanab Creek and tributaries, from the irrigation diversion at the confluence with Reservoir Canyon to its headwaters (Utah Administrative Code R317-2-12).

Consistent with Criterion 18 and state rules, BLM has determined that protection of High Quality Waters can be achieved through the use of the unsuitability designation, best management practices (BMP), and the state permitting process. Buffers were established for springs and perennial and intermittent streams, as follows:

- Perennial streams: ¼ mile (1,320 feet; 402 meters) slope distance from the outer edge of the bank
- Intermittent streams: 330 feet (100 meters) slope distance from the outer edge of the bank
- Springs: 330 feet (100 meters) slope distance from the edge of the saturated area.

The locations of springs and perennial and intermittent stream reaches were determined based on interviews with employees of the BLM KFO and NPS (Sharrow, personal communication) as well as with a local landowner who has extensive knowledge of the area (Esplin, personal communication). Their input was used to edit the U.S. Geological Survey (USGS) digital line graphs dataset that covers the KPA. Stream segments that would be perennial or intermittent if it were not for irrigation diversions were classified according to their potential condition rather than their altered condition.

Approximately 13,760 acres are determined to be unsuitable because of proximity to National Resource Waters. It is likely that additional perennial/intermittent streams and springs are present that were not mapped. If such waterways are determined to exist after the publication of this report, they would be buffered and protected as described above.

The exemption for substantial legal and financial commitments and ongoing mining operations does not apply because there are no active leases or operations within the planning area.

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Summary: Criterion 18—Approximately 13,760 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining.

Criterion Number 19

Federal lands identified by the surface management agency, in consultation with the state in which they are located, as alluvial valley floors according to the definition in §3400.0—5(a) of this title, the standards in 30 CFR Part 822, the final alluvial valley floor guidelines of the Office of Surface Mining Reclamation and Enforcement when published, and approved state programs under the Surface Mining Control and Reclamation Act of 1977, where mining would interrupt, discontinue, or preclude farming, shall be considered unsuitable. Additionally, when mining Federal land outside an alluvial valley floor

would materially damage the quantity or quality of water in surface or underground water systems that would supply alluvial valley floors, the land shall be considered unsuitable.

- *Exemptions.* This criterion does not apply to surface coal mining operations which produced coal in commercial quantities in the year preceding August 3, 1977, or which had obtained a permit to conduct surface coal mining operations.

There is insufficient data at this time to determine either suitability or unsuitability of any area for coal development under this criterion. Identification of alluvial valley floors (AVF) is accomplished by the surface management agency in consultation with the state according to the definition in the Surface Mining Control and Reclamation Act of 1977 (SMCRA) (PL 95-87), the standards in 30 CFR 822, the Office of Surface Mining (OSM) AVF guidelines, and approved state programs under SMCRA.

The AVF guidelines provide a sequential procedure for identifying AVFs. The first phase is a reconnaissance investigation that identifies probable AVFs using available regional or generalized data. The second phase is more detailed, and involves test drilling and mapping of geologic, vegetation, and soils data, leading to a determination that an area meets the criteria outlined in the regulations (30 CFR 78 19(c)(2)). The third phase requires more detailed descriptions of the AVFs identified in phase two, and involves water monitoring for a sufficient period of time to be able to describe seasonal fluctuations.

In response to a petition to designate certain lands in the study area as unsuitable for surface coal mining, OSM completed the first phase of an AVF investigation in the Alton coal field area (OSM 1983). The following list represents areas identified as possible AVFs within the KRCRA, but additional analysis would be required before leasing:

1. Kanab Creek, upper and lower
2. Sink Valley Wash
3. Unnamed tributary north of Alton and west of Kanab Creek
4. Thompson Creek
5. Mill, Tenny, and Skutumpah Creeks
6. Lower Johnson Wash
7. Yellow Creek
8. Upper Paria drainage
9. East Fork of the Sevier River.

AVFs may exist within the decision area, but initial mapping of AVFs has occurred only within the Alton area and at a reconnaissance level. Approximately 3,850 acres were identified as possible AVFs using data obtained from an investigation conducted by Jack Schmidt (1980) and BLM geographic information system (GIS) data layers. No lands within the planning area are designated as unsuitable under this criterion. A more detailed investigation would be required at the time of lease analysis.

The exemption for ongoing mining operations does not apply because there are no active leases or operations within the planning area.

Summary: Criterion 19—No acres are determined to be unsuitable.

Criterion Number 20

Federal lands in a state to which is applicable a criterion (i) proposed by the state or Indian tribe located in the planning area, and (ii) adopted by rulemaking by the Secretary, shall be considered unsuitable.

- *Exceptions.* A lease may be issued when: (i) Such criterion is adopted by the Secretary less than 6 months prior to the publication of the draft comprehensive land use plan or land use analysis, plan, or supplement to a comprehensive land use plan, for the area in which such land is included, or (ii) After consultation with the state or affected Indian tribe, the surface management agency determines that all or certain stipulated methods of coal mining will not adversely affect the value which the criterion would protect.
- *Exemptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

Neither the State of Utah nor Indian tribes have proposed any criteria that would affect the coal lands under review, although in 1980 Secretary of Interior Andrus signed a decision designating certain areas in the viewshed of Bryce Canyon National Park unsuitable for surface coal mining and surface impacts incident to underground mining. Approximately 31,620 acres fall within the KRCRA, and these are determined to be unsuitable.

The exemption for substantial legal and financial commitments and ongoing mining operations does not apply because there are no active leases or operations within the planning area.

Summary: Criterion 20—Approximately 31,620 acres are determined to be unsuitable for surface coal mining and surface impacts incident to underground mining.

SUMMARY OF THE UNSUITABILITY EVALUATION

The coal resources with development potential within the KPA have been evaluated based on the 20 criteria of unsuitability. Based on the criteria, the coal resources that are considered unsuitable for leasing are shown on Map 2. These resources have been determined to be unsuitable for leasing based on Criteria 1, 3, 4, 9, 11, 12, 14, 15, 18, and 20. Based on the criteria, the coal resources that are considered suitable for further leasing consideration are shown on Map 3.

As a result of this analysis, there are approximately 113,642 acres within the KPA that are determined to be suitable and 133,237 acres that are determined to be unsuitable for surface coal mining operations. Within the KFO decision area, there are 113,629 acres that are determined to be suitable and 37,580 acres that are determined to be unsuitable based on the 20 criteria.

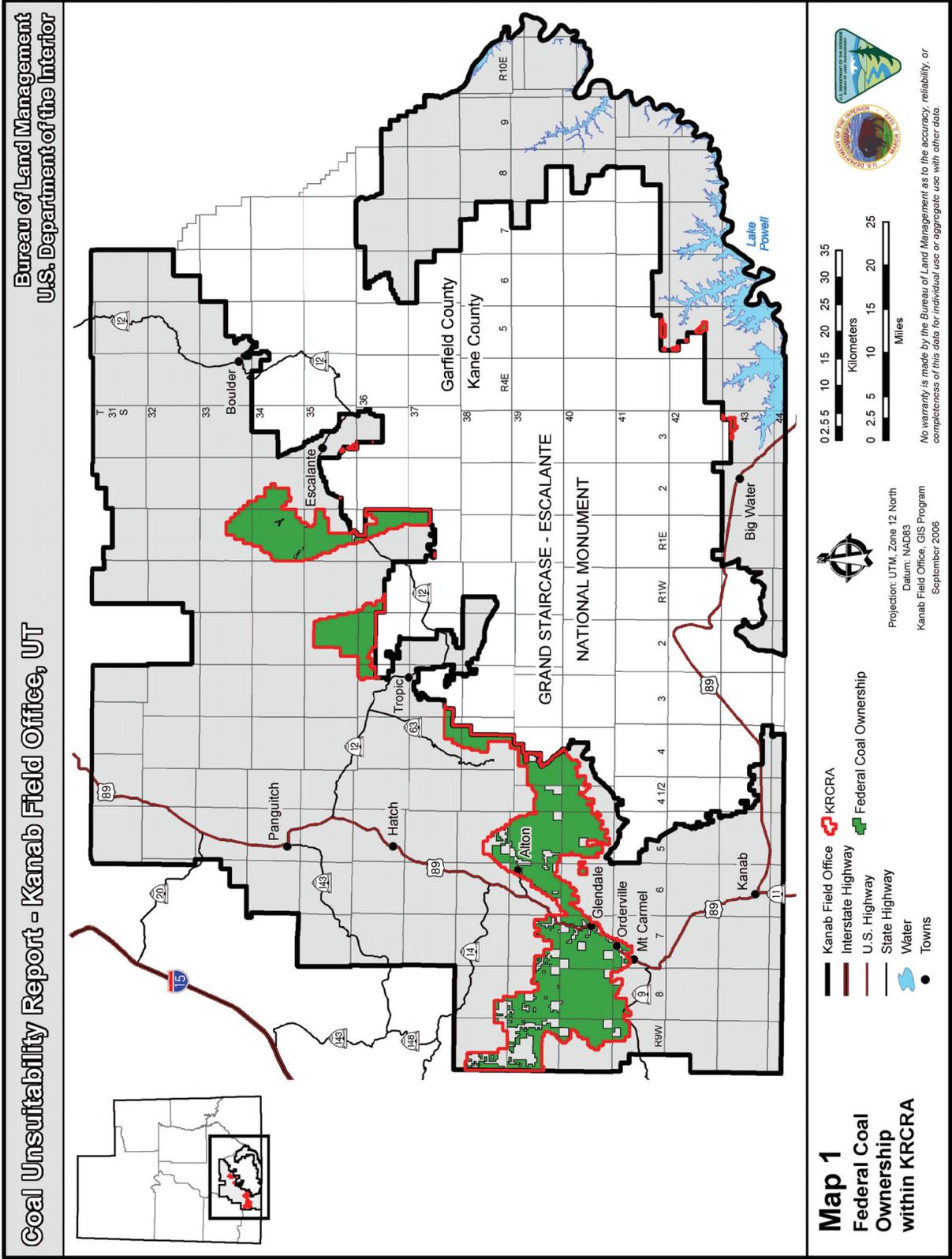
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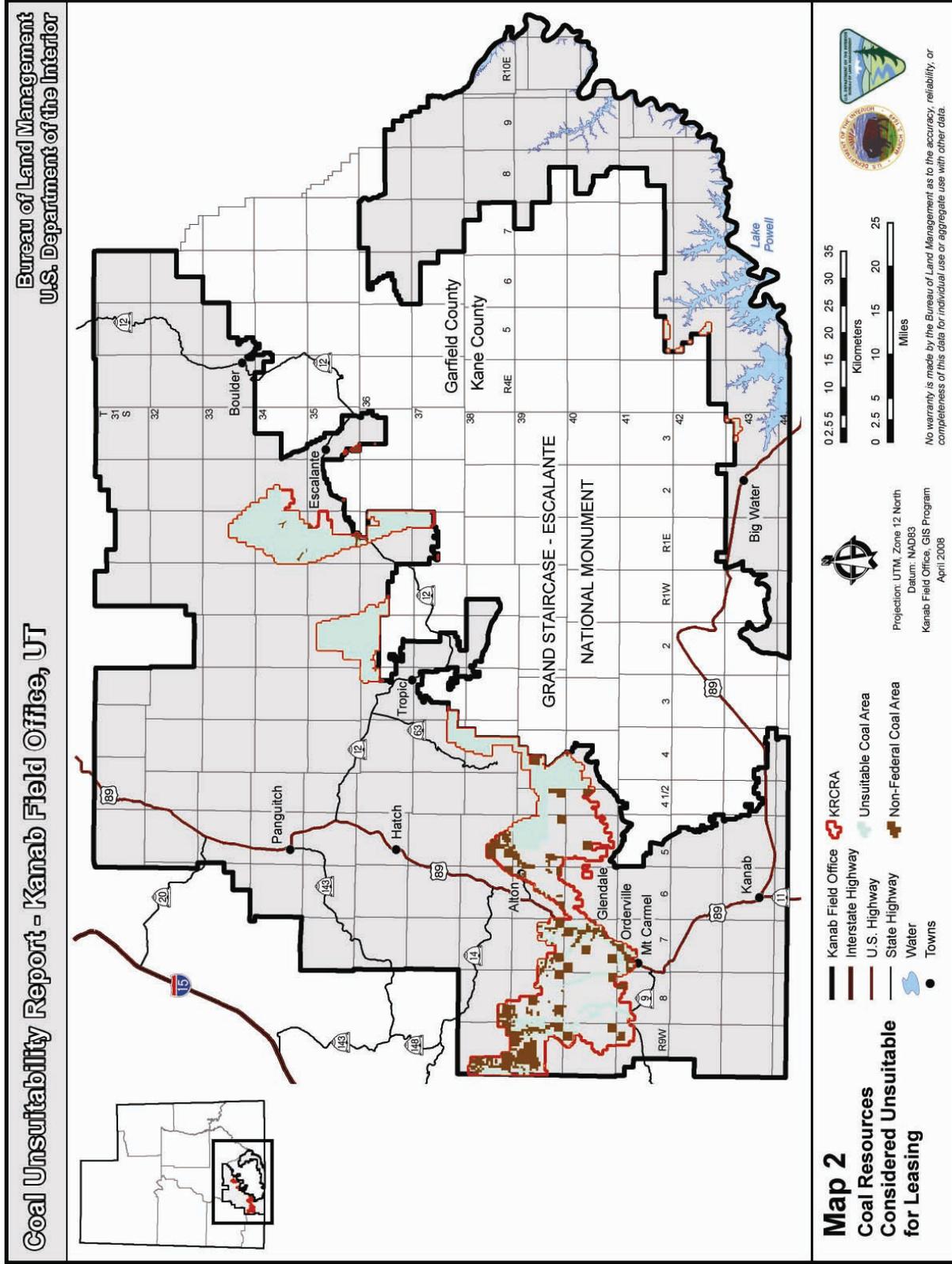
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MAP 1. FEDERAL COAL OWNERSHIP WITHIN KRCRA



MAP 2. COAL RESOURCES CONSIDERED UNSUITABLE FOR LEASING



MAP 3. COAL RESOURCES CONSIDERED SUITABLE FOR LEASING

