

1 Santa Fe National Forest
2 Geothermal Leasing EIS
3

4 **PROPOSED ACTION**
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6 The Forest Service (FS) is proposing to facilitate geothermal leasing on National Forest System
7 (NFS) lands that have geothermal potential for electrical power generation in the Santa Fe
8 National Forest (SFNF). This would be accomplished by the following four specific actions:

- 9 • Identify SFNF lands within the study area as being open or closed to leasing;
- 10 • Provide a comprehensive list of stipulations, best management practices (BMP), and
11 procedures to serve as consistent guidance for future geothermal leasing and
12 development;
- 13 • Incorporate the RFD scenario, resource allocations and stipulations, best management
14 practices, and procedures into the Forest Plan; and
- 15 • Make decisions regarding the geothermal lease applications on SFNF lands pending as of
16 October 1, 2014. These decisions will be made after the Forest Plan incorporates the
17 leasing classification and stipulations, best management practices, and procedures.
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19 **Identify Lands for Leasing**
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21 Under the proposed action, land within the project area administered by the FS would be
22 identified as being closed to geothermal leasing under either non-discretionary or discretionary
23 authorities, or open to geothermal leasing with possible moderate to major constraints. The
24 project area is approximately 194,910 acres, of which approximately 26,212 acres are privately
25 owned, approximately 48 acres are owned by state or other government entities, and
26 approximately 168,650 acres are NFS lands.
27

28 The FS has determined that certain lands within the project area are excluded from geothermal
29 leasing on the basis of existing laws, regulations (see 43 CFR 3201.11), and Executive Orders.
30 These non-discretionary closures include the following lands:

- 31 • Wilderness Areas (none in project area).
- 32 • Jemez National Recreation Area (approximately 28,850 acres)
- 33 • East Fork of the Jemez River Designated Wild River under the Wild and Scenic River
34 Act, including a corridor 0.25 miles from the high water mark on either side of the river
35 (approximately 1,162 acres within the Jemez NRA).
36

37 In addition to non-discretionary closures, the FS has the administrative authority to issue
38 discretionary closures to protect special resource values. The following areas are proposed Forest
39 Service discretionary closures for geothermal leasing:

- 40 • National Historic Trails (none in project area)
- 41 • Jemez Mountain National Scenic Byway (within Jemez NRA)
- 42 • Jemez Historic Site National Landmark (within the Jemez NRA)
- 43 • Monument Canyon Research Natural Area (approximately 640 acres within the Jemez
44 NRA)
- 45 • Administrative Site withdrawals:

- 1 ○ La Cueva (65 acres within JNRA)
- 2 ○ Sulphur Flat (226 acres within JNRA)
- 3 ○ Las Conchas (20 acres within JRNA)
- 4 ○ Seven Springs (7 acres)
- 5 ○ Encino (184 acres)
- 6 ○ Encino Point (120 acres)
- 7 ○ Cerro Pelado Lookout (160 acres)

8
9 About 29,321 acres of NFS lands would be closed (by law, regulations, or other authority) to
10 geothermal leasing within the project area. This represents about 17 percent of the NFS lands in
11 the project area.

12
13 Under the proposed action approximately 139,329 acres of the NFS lands within the project area
14 would be allocated as open to geothermal leasing subject to existing laws, regulations, formal
15 orders, and stipulations attached to the lease form, and the terms and conditions of the standard
16 lease form.

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19 **Lease Stipulations, Best Management Practices, and Procedures**

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21 *Lease Stipulations*

22 This section provides the list of constraints that would be applied as appropriate by the
23 authorized officer to new leases for lands that are available for geothermal leasing. Lease
24 stipulations are major or moderate constraints applied to a new geothermal lease. A lease
25 stipulation is a condition of lease issuance that provides a level of protection for other resource
26 values or land uses by restricting lease operations during certain times or at certain locations or
27 by mitigating unacceptable impacts, to an extent greater than standard lease terms or conditions.
28 A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions
29 of the standard lease form, and is attached to and made a part of the lease. Lease stipulations
30 further implement the FS and BLM’s regulatory authority to protect resources or resource values.

31

32 These stipulations were selected for inclusion based on a comprehensive review of land use
33 plans, program guidance, geothermal development activities, published data on geothermal
34 development impacts, industry standards, and best professional judgment. In addition, reports on
35 oil and gas leasing and development were consulted because of the similarity of most of the
36 activities and impacts, such as from exploration, drilling, and site development.

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40 *Applicability of Stipulations*

41 Stipulations provided in this EIS would serve as the minimal level of protection and would be
42 adopted into the Forest Plan upon signing of the ROD. It may be necessary to add, delete, or
43 modify lease stipulations in the Forest Plan as a result of pre-lease issuance parcel reviews,
44 statewide lease stipulation consistency reviews, plan amendments, changed circumstances on the
45 ground, or changed resource protection priorities. This is accomplished and documented either
46 through the plan maintenance process (for minor changes consistent with an approved plan) or

1 the plan amendment process (for changes resulting in modification of terms, conditions, or
2 decisions in an approved plan).

3
4 More than one stipulation may apply to a parcel of land. For example, a parcel may have a No
5 Surface Occupancy stipulation to protect a property designated on the National Register of
6 Historic Places, a Controlled Surface use Stipulation to protect a recreation area, and a Timing
7 Limitation for big game winter range.

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10 ***No Surface Occupancy Lease Stipulations***

11 No Surface Occupancy (NSO) stipulations are considered a major constraint as they do not allow
12 for surface development. For example, a lessee of a NSO area must develop any surface
13 infrastructure outside the NSO area and would need to use advanced technology, such as
14 directional drilling, to access the geothermal resource under the NSO area. An NSO is
15 appropriate when the standard terms and conditions, Controlled Surface Use (CSU) stipulations,
16 Timing Limitations, and BMPs for permit approval are determined to be insufficient to achieve
17 the resource protection objectives.

18
19 No Surface Occupancy stipulations would apply to:

- 20 • Designated or proposed critical habitat for listed species under the Endangered Species
21 Act of 1973 (as amended) if it would adversely modify the habitat. For listed or proposed
22 species without designated habitat, NSO would be implemented to the extent necessary to
23 avoid jeopardy.
- 24 • Areas with important cultural and archaeological resources, such as:
 - 25 ○ traditional cultural properties and Native American sacred sites, as identified
26 through consultation.
 - 27 ○ properties listed on or eligible for the National Register of Historic Places,
28 including National Landmarks and National Register Districts and Sites; and
29 additional lands outside the designated boundaries to the extent necessary to
30 protect values where the setting and integrity is critical to their designation or
31 eligibility.
 - 32 ○ Areas that qualify for cultural resource protection based on Forest Plan criteria.
- 33 • Water bodies, riparian areas, wetlands, playas, and 100-year floodplains and a 500 foot
34 wide protection zone around them. Also included are ephemeral channels and acequias.
- 35 • Developed recreational facilities, special-use permit recreation sites, and areas with
36 significant recreational use with which geothermal development is deemed incompatible.
 - 37 ○ Jemez Falls (within JNRA)
 - 38 ○ East Jemez (within JNRA)
 - 39 ○ Horseshoe Springs (within JNRA)
 - 40 ○ Las Conchas (within JNRA)
 - 41 ○ Jemez Canyon (within JNRA)
 - 42 ○ Redondo (within JNRA)
 - 43 ○ San Antonio Creek (within JNRA)
 - 44 ○ Banco Bonito (within JNRA)
 - 45 ○ Battleship Rock (within JNRA)
 - 46 ○ La Cueva (within JNRA)

- 1 ○ Laughing Water (within JNRA)
- 2 ○ Sulphur Flat Summer Home Area (within JNRA)
- 3 ○ San Antonio Creek (outside the JNRA)
- 4 ○ Seven Springs (outside the JNRA)
- 5 ○ Paliza (outside the JNRA)
- 6 ● Water Sources including points of surface water diversions, developed springs, and wells
- 7 which are recognized by the New Mexico Office of the State Engineer and a one-mile
- 8 protection zone around them.
- 9 ● East Fork of the Jemez River Designated National Scenic and Recreational Rivers under
- 10 the Wild and Scenic River Act including a corridor of 0.25 miles from the high water
- 11 mark on either side of the bank .
- 12 ● Segments of rivers determined to be potentially eligible for Wild and Scenic Rivers
- 13 (WSR) status by virtue of a WSR inventory, including a corridor of 0.25 miles from the
- 14 high water mark on either side of the bank (none in study area).
- 15 ● Natural geothermal features such as hot springs or other surface expressions of
- 16 geothermal activity and a one-mile protection zone around them.
- 17 ● NFS lands with a Scenery Management System integrity level of Very High.
- 18 ● Slopes in excess of 40 percent.
- 19 ● Soils with severe erosion potential.
- 20 ● Inventoried Roadless Areas.

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27 *Controlled Surface Use Lease Stipulations*

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In areas where an NSO stipulation is deemed overly restrictive, but where standard lease terms and permit-level decisions are deemed insufficient to protect the resources, the FS would apply controlled surface use (CSU) stipulations or timing limitation (TL) stipulations to leases.

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A CSU allows the FS to require any future activity or development be modified or relocated from the proposed location if necessary to achieve resource protection. The project applicant will be required to submit a plan to meet the resource management objectives through special design, construction, operation, mitigation, or reclamation measures, and/or relocation. Unless the plan is approved, no surface occupancy would be allowed on the lease.

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The following CSUs would be applied by the authorizing officer as appropriate for the specific area and site conditions.

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- ***Protection of viewsheds with a Scenery Management System classification of High.*** This stipulation would be applied to NFS lands with a Scenery Management System integrity level of High.
- ***Protection of important dispersed recreational areas.*** This stipulation would be applied to minimize the potential for adverse impacts to recreational values, both motorized and non-motorized, and the natural settings associated with the recreational activity.

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2 ***Timing Limitations***
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4 In general, timing limitations are used to protect resources that are sensitive to disturbance
5 during certain periods. Such stipulations are generally applicable to specific areas, seasons, and
6 resources. They are commonly applied to wildlife activities and habitat, such as winter range for
7 deer and elk, nesting habitat for raptors and migratory birds, and wildlife breeding areas. Timing
8 limitations would be applied by the authorizing officer as appropriate for the specific lease areas.
9 The SFNF will coordinate with the U.S. Fish and Wildlife Service and New Mexico Department
10 of Game and Fish to establish the periods and extent of area for timing limitations.
11

- 12 • Mexican Spotted Owl designated protected activity centers (PACs) – drilling and
13 construction activities prohibited between March 1 and August 31.
- 14 • Northern Goshawk designated post-fledging areas – drilling and construction
15 activities prohibited between March 1 and September 30.
- 16 • Peregrine Falcon eyrie nesting areas – drilling and construction activities
17 prohibited between March 1 and August 15.
- 18 • Deer and Elk Winter Range – drilling and construction activities prohibited
19 between December 15 and March 15.
- 20 • Deer Fawning/Elk Calving Areas – drilling and construction activities prohibited
21 between June 1 and July 31.
- 22 • Migratory Bird Nesting Areas – clearing of vegetation prohibited between March
23 1 and August 15.
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27 ***Lease Stipulation Exceptions, Waivers, and Modifications***
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29 To ensure leasing decisions remain appropriate in light of continually changing circumstances
30 and new information, the FS and BLM develop and apply lease stipulation exception, waiver,
31 and modification criteria. An exception, waiver, or modification may not be approved unless, (1)
32 the authorized officer determines that the factors leading to the stipulation’s inclusion in the lease
33 have changed sufficiently to make the protection provided by the stipulation no longer justified;
34 or (2) the proposed operations would not cause unacceptable impacts. (43 CFR 3101.1-4)
35

- 36 • An **exception** is a one-time exemption for a particular site within the leasehold;
37 exceptions are determined on a case-by-case basis; the stipulation continues to apply to
38 all other sites within the leasehold. An exception is a limited type of waiver.
- 39 • A **waiver** is a permanent exemption from a lease stipulation. The stipulation no longer
40 applies anywhere within the leasehold.
- 41 • A **modification** is a change to the provisions of a lease stipulation, either temporarily or
42 for the term of the lease. Depending on the specific modification, the stipulation may or
43 may not apply to all sites within the leasehold to which the restrictive criteria are applied.
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1 The SFNF must analyze and document how the exception, waiver, or modification is in
2 conformance with the Forest Plan and identify the plan decision (including goals, objectives, or
3 desired outcomes) supported by the proposed exception, waiver, or modification. If existing
4 NEPA analysis does not support the exception, waiver, or modification, the FS must conduct the
5 appropriate environmental review and NEPA analysis. If the proposed exception, waiver or
6 modification is not in conformance with the Forest Plan or that document does not disclose the
7 conditions under which such proposed change would be allowed, the FS must either amend the
8 plan or deny the request for exception, waiver, or modification.

9
10 The authorized officer will require the operator to submit a written request for an exception,
11 waiver, or modification and information demonstrating that (1) the factors leading to the
12 inclusion of the stipulation in the lease have changed sufficiently to make the protection provided
13 by the lease stipulation no longer justified or (2) that the proposed operation would not cause
14 unacceptable impacts. Requests from the operator should contain, at a minimum, a plan
15 including related on-site or off-site mitigation efforts, to adequately protect affected resources;
16 data collection and monitoring efforts; and timeframes for initiation and completion of the
17 proposed project.

18
19 During the review process, coordination with other state or Federal agencies will be undertaken,
20 as appropriate, and documented. For example, it may be appropriate to coordinate the review of
21 wildlife exceptions, waivers, and modifications with New Mexico Department of Game and Fish
22 staff; review and recommendations will be documented along with any necessary mitigation and
23 provided to the authorized officer for approval or disapproval. The applicant will then be
24 provided with a written notification of the decision.

25
26 Public notification (30-day public review), if required, should include identification of the
27 modified lease terms and a description of the affected lands or a map. When public notification
28 is required, the following procedures may apply:

- 29 • Approval of an exception, waiver, or modification at the same time the ground-disturbing
30 activity is approved: A notice describing the modified lease terms, when required, may be
31 posted for 30 days in the SFNF offices; posted on the SFNF website; posted in a local
32 paper as a legal notice or incorporated into a newspaper article; or the notice may be
33 included as part of the NEPA document's public review, if the NEPA document is
34 offered for review.
- 35 • Approval of an exception, waiver, or modification after the ground-disturbing activity is
36 approved: Public notice, if required, may take the form of a 30-day posting on the SFNF
37 website, a legal notice or article in the newspaper, or a notice and associated public
38 review conducted as part of the public review of a NEPA document.

41 ***Best Management Practices***

42 The Forest Service's first priority is to mitigate impacts on-site during the exploration, drilling,
43 utilization, or reclamation and abandonment of geothermal resources. The FS will require
44 project-specific mitigation measures, referred to as Best Management Practices to be used during
45 any surface disturbing activity. When the FS determines that impacts cannot be mitigated to an

1 acceptable level onsite, it may be necessary to deny the permit, ask the applicant to modify the
2 proposal, or mitigate remaining impacts off-site.

3
4 Best Management Practices may be incorporated into the permit application by the lessee or may
5 be included in the approved use authorization by the BLM as conditions of approval. Conditions
6 of approval are not lease stipulations, but they are site-specific and enforceable requirements to
7 minimize, mitigate, or prevent impacts to resource values from an intended operation. Conditions
8 of approval can limit or amend the specific actions proposed by the operator.

9
10 ***Monitoring***

11 Mitigation measures, including lease stipulations and conditions of approval, as well as the
12 general operation of geothermal developments, will be monitored by the lessee and the
13 appropriate Federal agency to ensure their continued effectiveness through all phases of
14 development. Using adaptive management strategies, where mitigation measures are determined
15 to be ineffective at meeting the desired resource conditions, the BLM and FS will take steps to
16 determine the cause and require the operator to take corrective action. This information will also
17 be used to inform future geothermal leasing and development.

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19
20 **Santa Fe National Forest Plan**

21 The determination of whether to amend the 1988 Santa Fe National Forest Plan (Forest Plan) or
22 incorporate the changes directly into the revised Forest Plan will be made during the preparation
23 of the Record of Decision. The determination will be guided by where the Forest is in the Forest
24 Plan Revision (FPR) process. If the EIS is completed prior the final stages of the FPR, then the
25 current (1988) Forest Plan will require an amendment; and the results of the EIS will be
26 incorporated into the revised Forest Plan. If the FPR is in the final stages, the results of the EIS
27 will be incorporated into the revised Forest Plan and no amendment of the 1988 Forest Plan will
28 be necessary.

29
30 The rationale for amending the 1988 Forest Plan includes the following:

- 31 • The Forest Plan does not address geothermal leasing.
- 32 • The Forest Plan does not allocate areas as being open or closed to geothermal leasing.
- 33 • The Forest Plan does not assess the reasonably foreseeable development scenario for
34 geothermal development.
- 35 • The Forest Plan does not have adequate or appropriate stipulations or best management
36 practices to apply to geothermal leases to protect sensitive resources.

37
38
39 **Pending Lease Applications**

40 Based on a 2012 review of the status of pending leases, the BLM and FS have identified nine
41 lease applications that may require site-specific analysis following completion of this EIS to
42 inform decisions to be made on whether to issue the lease or deny the application.

43
44 After the necessary analysis of the lease areas is completed, the FS will provide consent
45 determinations for the lease applications with appropriate determinations of which lands are not

1 leasable and stipulations for the lands which are leasable to the BLM. The BLM will then follow
2 their process to issue the leases.

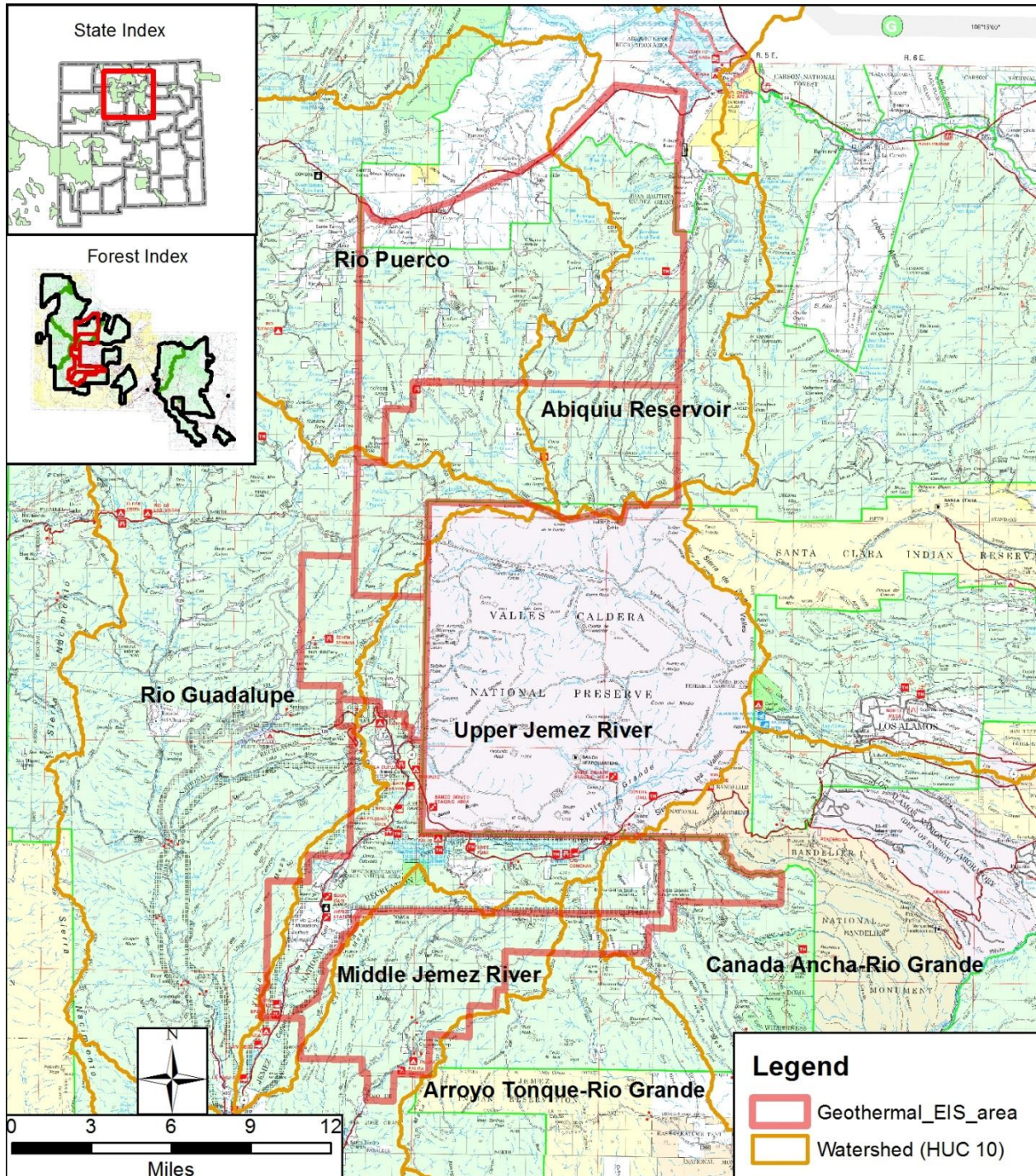
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4 Separate decisions could be issued for each of the nine leases, and lease boundaries may be
5 adjusted in the decision to avoid unacceptable impacts to sensitive resources.

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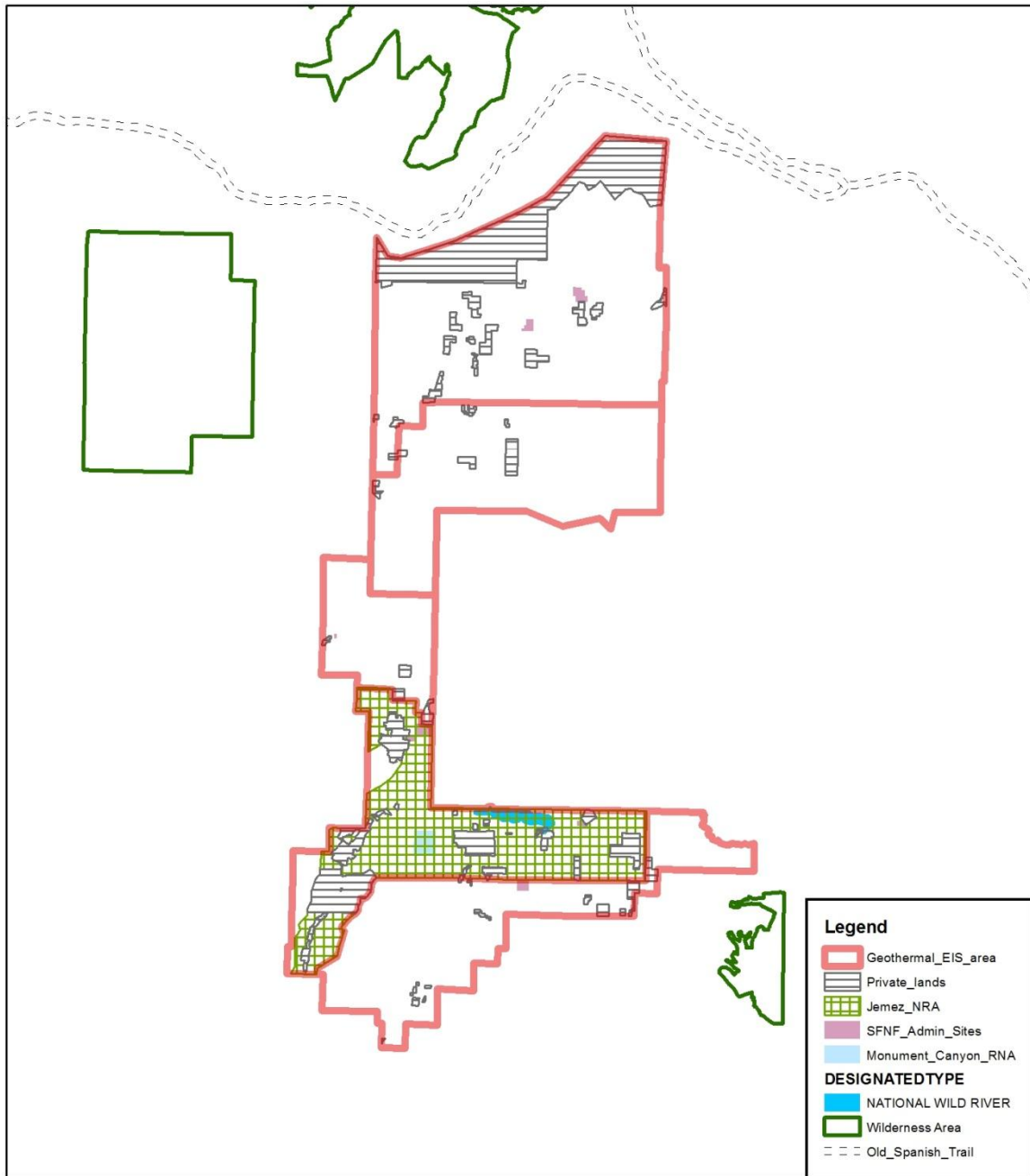
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Geothermal Leasing EIS Project Area



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Geothermal Leasing EIS No Leasing



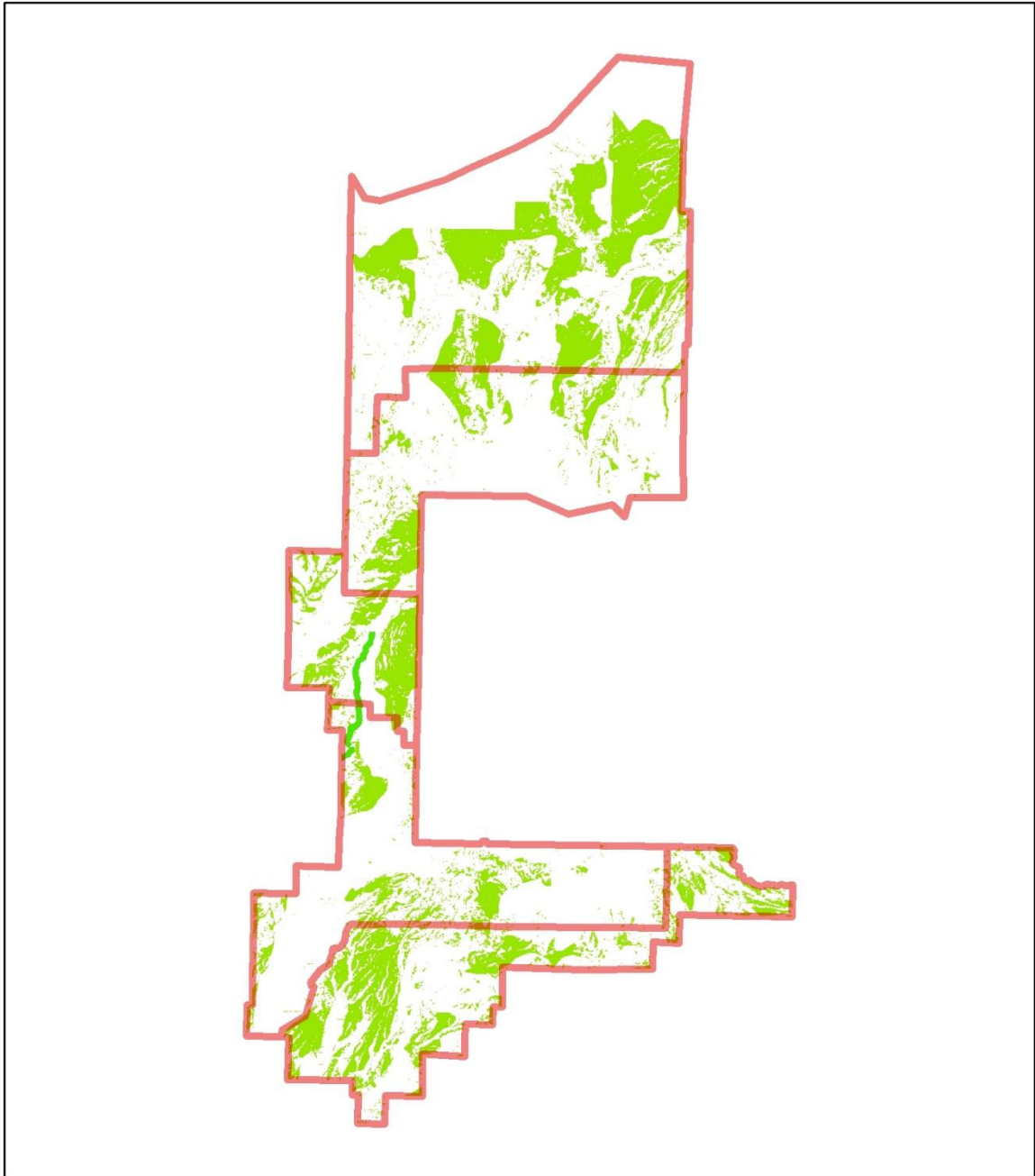
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**Geothermal Leasing EIS
No Surface Occupancy**



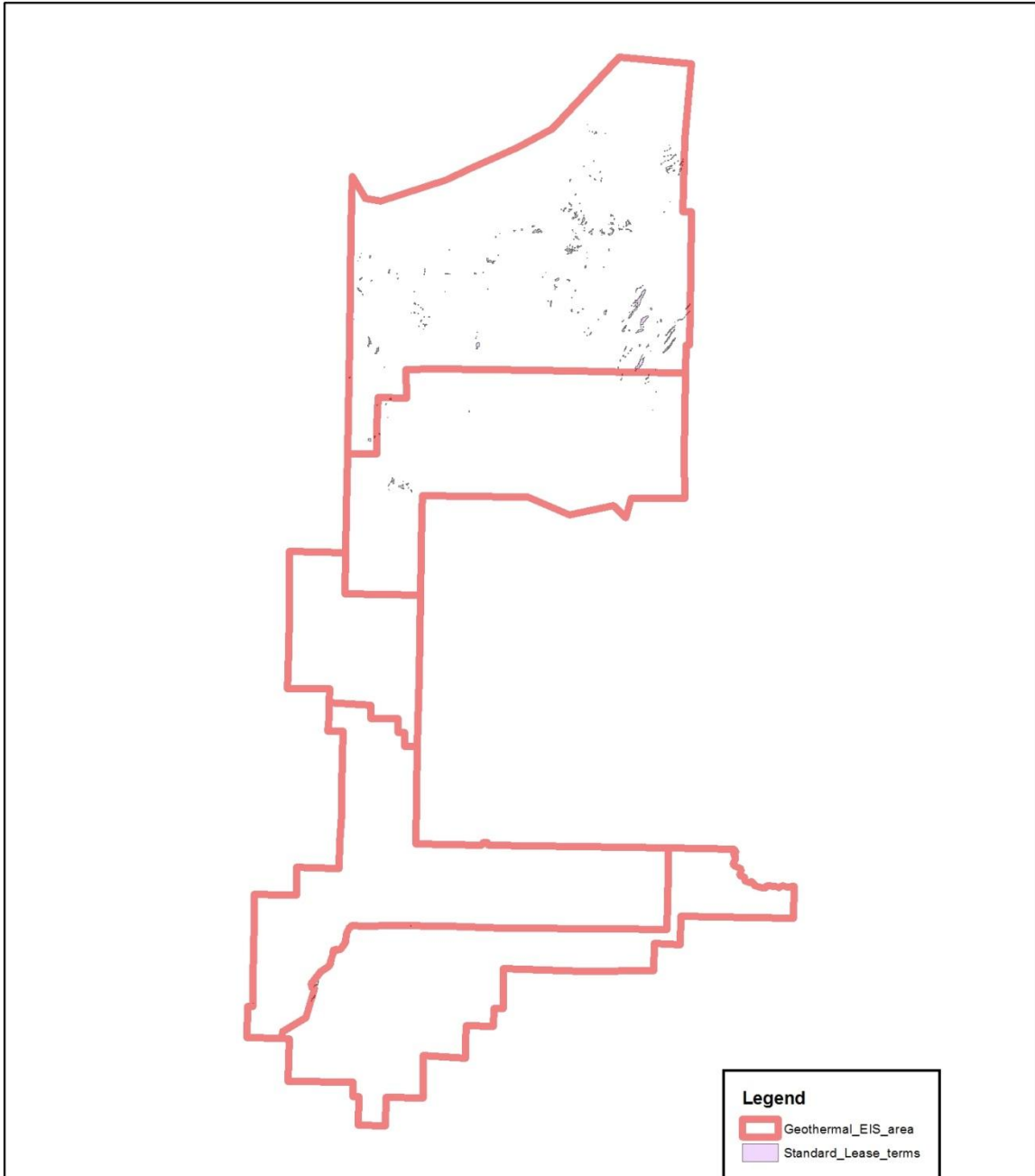
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**Geothermal Leasing EIS
Controlled Surface Use**



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Geothermal Leasing EIS Standard Lease Terms



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1 **Resource: Designated or proposed critical habitat for listed species under the Endangered**
2 **Species Act of 1973 (as amended)**

3
4 Stipulation: No Surface Occupancy

5
6 Location: Designated or proposed critical habitat for listed species under the Endangered Species
7 Act of 1973 (as amended). This includes:

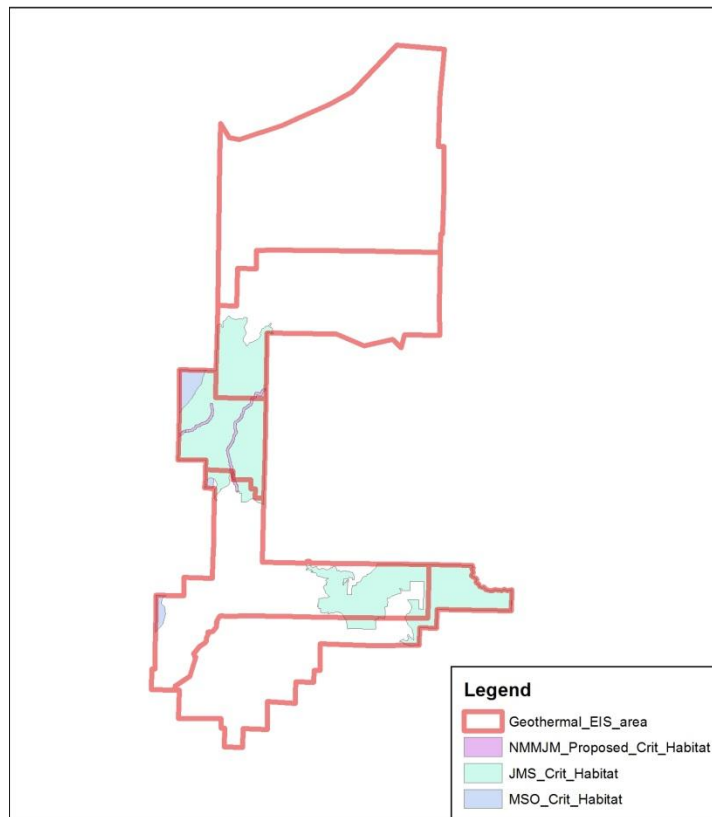
- 8 • New Mexico Meadow Jumping Mouse,
- 9 • Mexican Spotted Owl, and
- 10 • Jemez Mountain Salamander.

11
12 For listed or proposed species without designated habitat, NSO will be implemented to
13 the extent necessary to avoid jeopardy.

14
15 Purpose: To avoid surface disturbance activities that would result in loss of critical habitat within
16 these distinct localized areas.

17
18 Exception: An exception, modification, or waiver may be granted if a site-specific surface use
19 plan of operations demonstrates that adverse impacts to habitat can be completely
20 avoided, and clearance is obtained from the forest biologist and U.S. Fish and Wildlife
21 Service.

Geothermal Leasing EIS
No Surface Occupancy
Designated Critical Habitat T/E Species



22

1 **Resource: Areas with Important Cultural Resources**

2 Stipulation: No Surface Occupancy

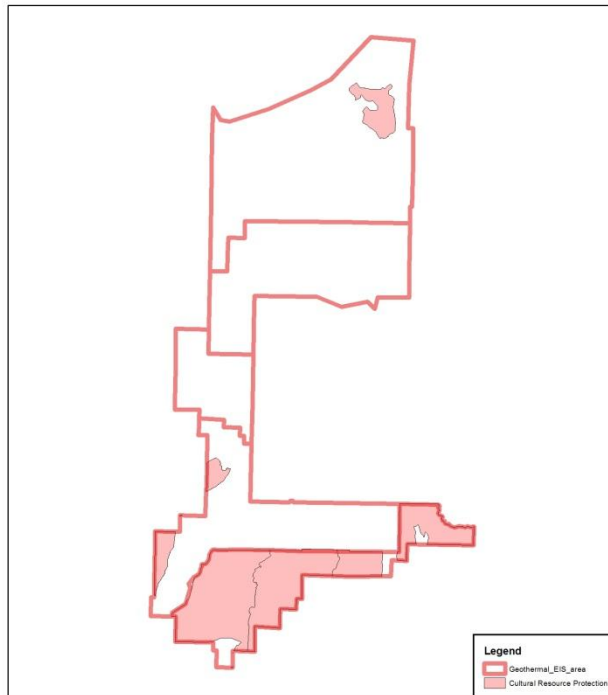
3 Location:

- 4 • Traditional cultural properties and Native American sacred sites, as identified through
5 consultation.
- 6 • Properties listed on or eligible for the National Register of Historic Places, including
7 National Landmarks and National Register Districts and Sites; and additional lands
8 outside the designated boundaries to the extent necessary to protect values where the
9 setting and integrity is critical to their designation or eligibility.
- 10 • Areas that qualify for cultural resource protection based on Forest Plan criteria (Planning
11 Areas J, K, and L).

12 Purpose: To avoid surface disturbance activities that would result in irreversible loss of cultural
13 resources within these areas where cultural resource avoidance or data recovery are not
14 viable options.

15 Exception: An exception, modification, or waiver may be granted if a site-specific surface use
16 plan of operations demonstrates that adverse impacts to the cultural resources can be
17 completely avoided, and clearance is recommended the Forest Archeologist and State
18 Historic Preservation Officer and approved by the Forest Supervisor. A public notice and
19 comment period is required prior to waiver, exception, or modification of this stipulation.

Geothermal Leasing EIS
No Surface Occupancy
Cultural Resource Protection Areas



1 **Resource: Water bodies, riparian areas, wetlands, playas, 100-year floodplains, and a 500**
2 **foot wide protection zone around them; and ephemeral channels and acequias.**

3
4 Stipulation: No Surface Occupancy

5
6 Location: There are many water features within the project boundary (predominantly ephemeral
7 channels).

- 8 • Water bodies, rivers/streams (perennial and intermittent), wetlands, springs, and
9 playas (mapped in the USGS National Hydrography Dataset (NHD)) are protected by a
10 500 ft. buffer.
- 11 • Riparian areas (marked by water loving vegetation generally found surrounding
12 water features) are protected by a 500 ft. buffer. They are approximately mapped within
13 the terrestrial ecosystem survey and vegetation data sets (includes Terrestrial Ecosystem
14 Units 3-8, 10, 11, 13, 31, 33, 34, 38, 234, 320, and 334), but they may also need site
15 specific field delineation.
- 16 • The 100-year floodplain (surrounding some features) needs to be delineated
17 through field geomorphology surveys and stream gage data.

18
19 These features are protected by a 500 foot wide protection zone measured horizontally
20 from the outer edge of each feature.

21
22 Ephemeral channels (primarily 1st and 2nd order) are mostly dry. These channels flow for
23 relatively brief periods during snowmelt or after rainfall. Ephemeral channels are not
24 included in the NHD and will need to be field delineated on site. They shall be protected
25 by a protection zone of a minimum of 15 feet measured horizontally from the outer edge
26 of each feature.

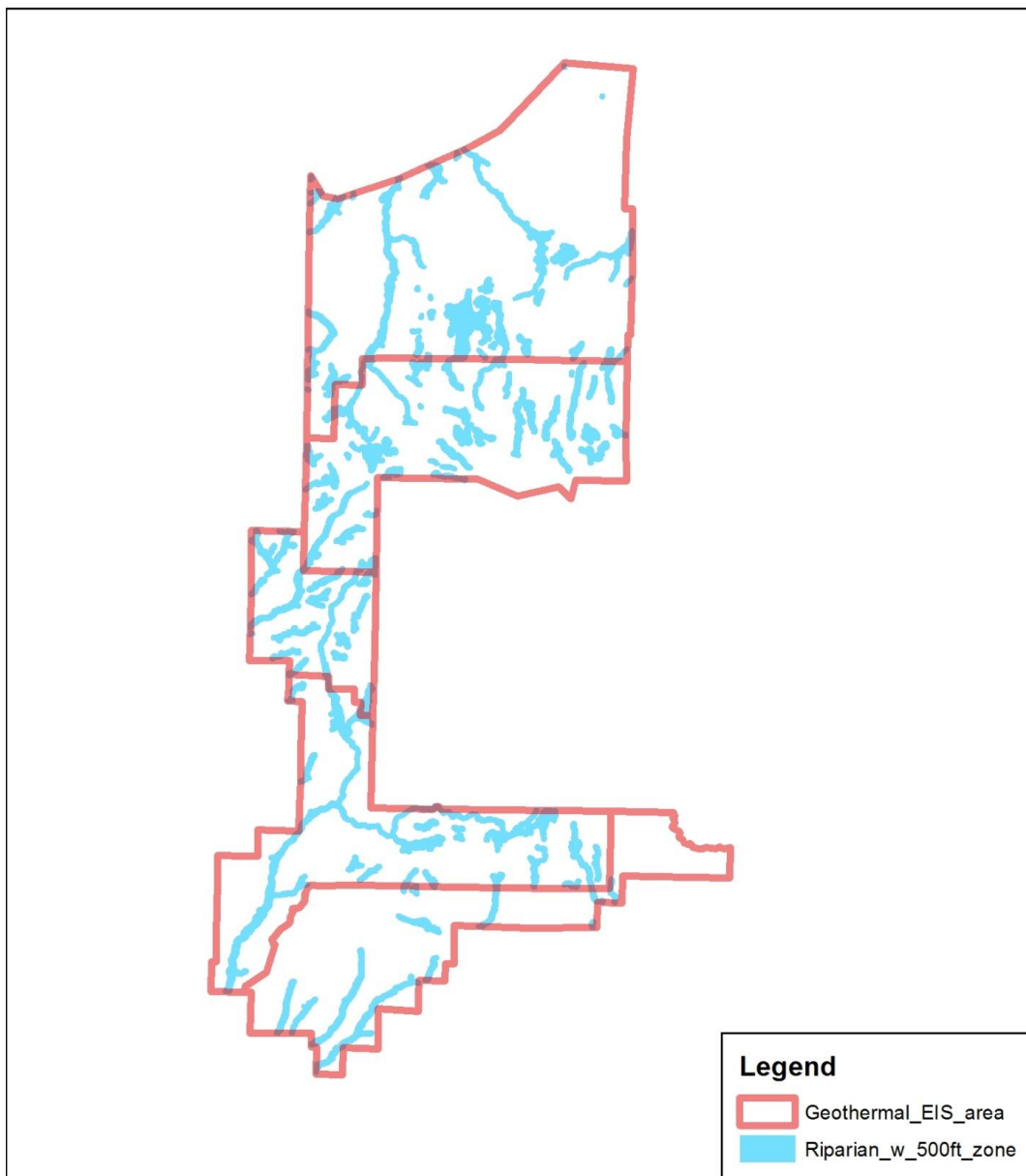
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28 Acequias are man-made ditches to bring irrigation water from the highlands to privately
29 owned agricultural lands. The flow in an acequia is controlled by the owners, within the
30 constraints of the water rights recognized by the New Mexico Office of the State
31 Engineer (OSE). Acequias are not included in the NHD and will need to be field
32 delineated on site. Acequias with OSE recognized water rights shall be protected by a
33 protection zone of a minimum of 15 feet measured horizontally from the outer edge of
34 the ditch.

35
36 Purpose: To avoid adverse impacts to riparian and wetland resources, prevent development in
37 floodplains, and remain consistent with law (Clean Water Act), regulation, and policy
38 (National BMPs).

1 Exception: An exception or modification may be granted if surveys show that the area of a
2 proposed activity is not a water course, wetland, spring, riparian, or floodplain, and
3 impacts to a water feature are not likely to occur.

4 Roads and power lines may cross these areas if the operator can demonstrate there are no
5 practicable alternatives and that adverse effects can be minimized. Detailed plans for
6 mitigations to adverse effects will be required with the application for exception or
7 modification.

**Geothermal Leasing EIS
No Surface Occupancy
Water Bodies, Riparian, Wetlands, Playas, and Floodplains**



8

1 **Resource: Developed recreational facilities, special-use permit recreation sites, and areas**
2 **with significant recreational use**

3 Stipulation: No Surface Occupancy

4

5 Location:

- 6 • Jemez Falls (within JNRA)
- 7 • East Jemez (within JNRA)
- 8 • Horseshoe Springs (within JNRA)
- 9 • Las Conchas (within JNRA)
- 10 • Jemez Canyon (within JNRA)
- 11 • Redondo (within JNRA)
- 12 • San Antonio Creek (within JNRA)
- 13 • Banco Bonito (within JNRA)
- 14 • Battleship Rock (within JNRA)
- 15 • La Cueva (within JNRA)
- 16 • Laughing Water (within JNRA)
- 17 • Sulphur Flat Summer Home Area (within JNRA)
- 18 • San Antonio Creek (outside the JNRA)
- 19 • Seven Springs (outside the JNRA)
- 20 • Paliza (outside the JNRA)

21

22 Purpose: To avoid incompatible development which would impact developed recreation facilities
23 and sites.

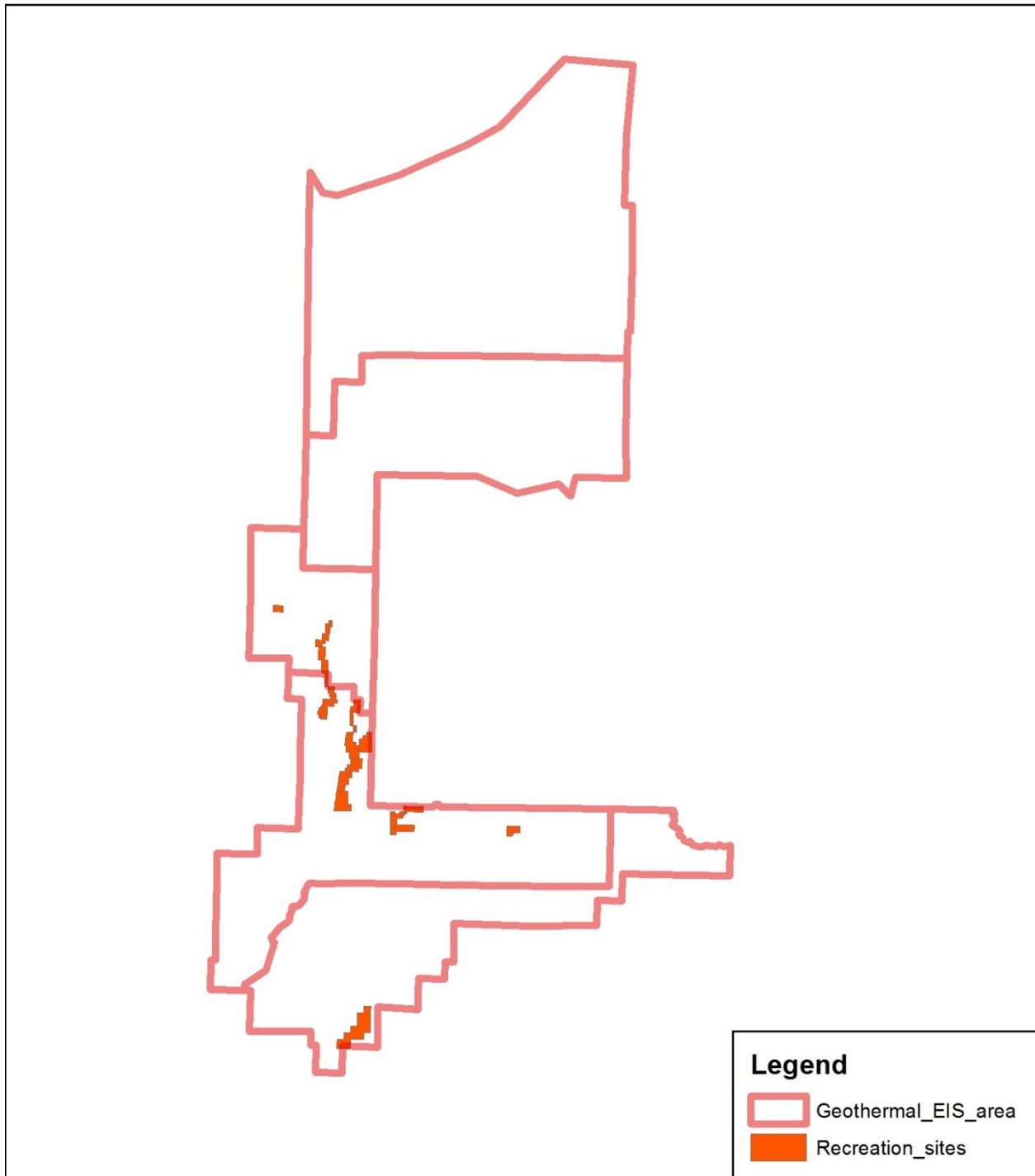
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25 Exception: An exception, modification, or waiver may be granted if a site-specific surface use
26 plan of operations demonstrates that adverse impacts to the facilities or sites can be
27 completely avoided.

28

29

**Geothermal Leasing EIS
No Surface Occupancy
Recreation Areas**



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1 **Resource: Water Sources and a one-mile protection zone around them**

2
3 Stipulation: No Surface Occupancy

4
5 Location: Water sources are defined as those points of surface water diversion (including
6 infiltration galleries) and developed springs (including stock /wildlife tanks) for which
7 established water rights are recognized by the New Mexico Office of the State Engineer
8 (OSE), in addition to all wells permitted by the NM OSE. The water may be used for
9 human, domestic animal and/or wildlife.

10 Within the project area boundary there are

- 11 • 6 known drinking water sources (Arroyo del Agua MDWCA, Coyote MDWCA,
12 Youngsville MDWCA, Jemez Springs Domestic Water Coop Association, Ponderosa
13 MDWCA (1), and Ponderosa MDWCA (2).
- 14 • 379 known wells. The wells range in depth from 545 to 10 feet, although many
15 well depths are not listed.
- 16 • 48 known springs; it is not known how many of these have been developed.

17
18 A 1 mile (radius) no surface occupancy protection zone will surround each water source.

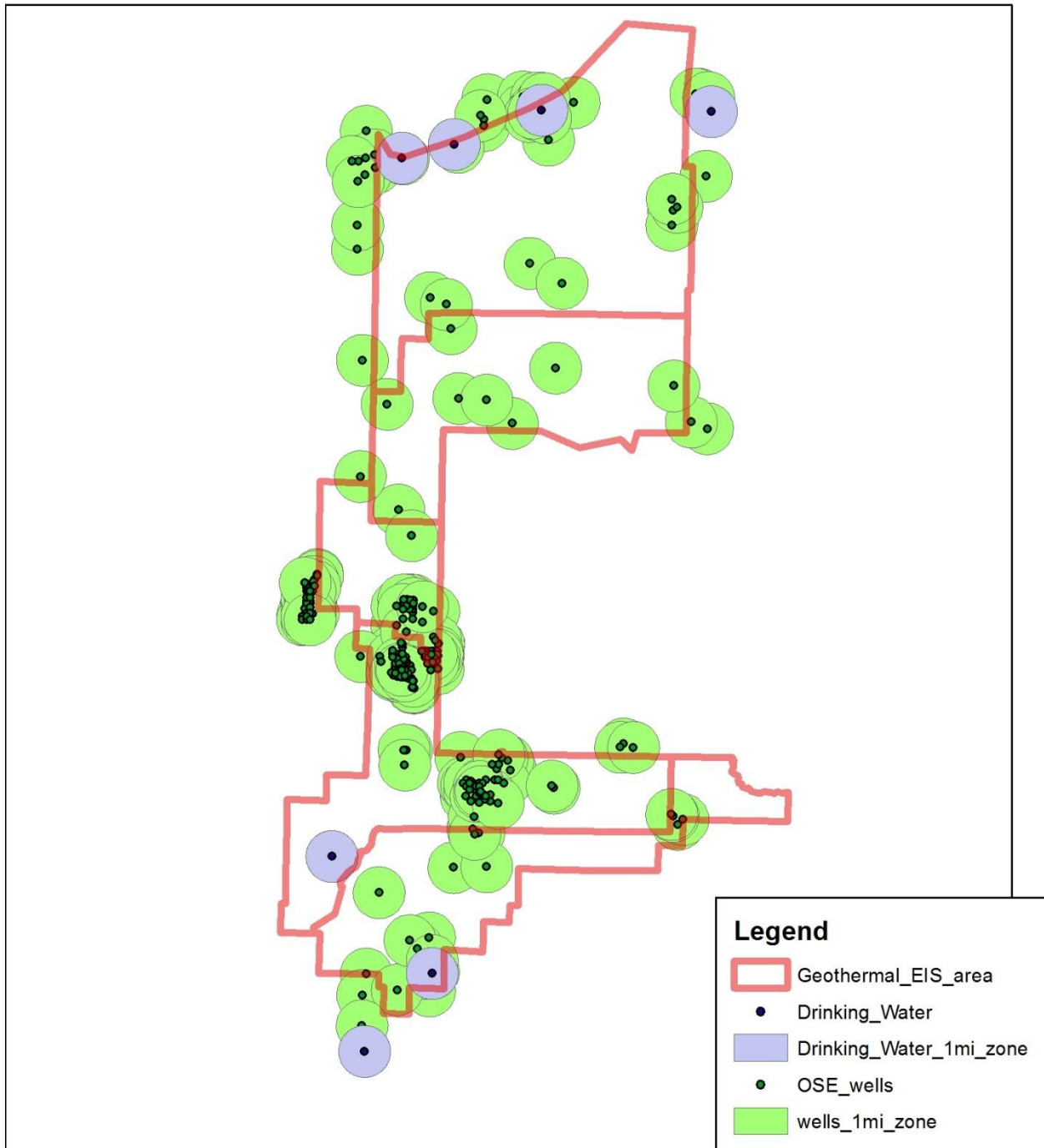
19 Purpose: To protect the water quality and quantity of water sources. Protecting water sources
20 will help the Forest Service comply with Forest Service management direction (e.g., the
21 Santa Fe National Forest Plan (1987) and FSM 2500), law (e.g., the Clean Water Act
22 (1972) and the Safe Drinking Water Act (1974)), and regulation (e.g., NM state water
23 quality standards, NM state water rights and permits).

24 Exception: An exception or modification may be granted if hydrology (surface and subsurface)
25 studies and mitigation plans submitted by the operator show there is no reasonable risk
26 (as determined by the NM Oil Conservation Division (OCD) and/or the NM Environment
27 Department (NMED)) to the quality or quantity at a water source. OCD has regulatory
28 jurisdiction only over hydro geothermal projects whose purpose is heat extraction; other
29 purposes would be regulated by the NMED.

30 Roads and power lines may cross water source buffers if the operator can demonstrate
31 that there are no practicable alternatives and that adverse effects can be minimized.

32
33 A public notice and comment period is required prior to exception or modification of this
34 stipulation.

Geothermal Leasing EIS No Surface Occupancy Water Sources



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2

1 **Resource: Designated National Scenic and Recreational Rivers under the Wild and Scenic**
2 **River Act, including a corridor of 0.25 miles from the high water mark on either side of the**
3 **bank.**

4
5 Stipulation: No Surface Occupancy

6
7 Location: Designated scenic and recreational rivers are characterized by reaches free of
8 impoundments which are accessible in places by road. Their shorelines or watersheds are
9 largely primitive and undeveloped. Designated recreational rivers and streams are
10 characterized by segments already accessible by road, with possibly some development
11 along its shoreline, and some impoundment or diversion in the past.

12 The East Fork of the Jemez, located in Sandoval County, is approximately five miles
13 northeast of Jemez Springs in portions of:

14 Township 18 North, Range 3 East, sections 1, 2, 3, 4, 5, and 10

15 Township 18 North, Range 4 East, sections 3, 4, 5, 6, 8, and 9

16 Township 19 North, Range 3 east, section 32

17
18 Segments of the East Fork of the Jemez River are designated protected (under the WSR
19 act) for recreation and scenic beauty. The recreational segment is characterized by low
20 stream gradients and easy access. The East Fork of the Jemez River from the Valles
21 Caldera Preserve boundary to the second highway crossing of New Mexico State
22 Highway 4 is designated Recreational (2 miles). The scenic segment is characterized by
23 steeper gradients, including Jemez Falls itself, and a narrow canyon with limited access.
24 The Scenic segment extends from the confluence with San Antonio Creek upstream for
25 five miles.

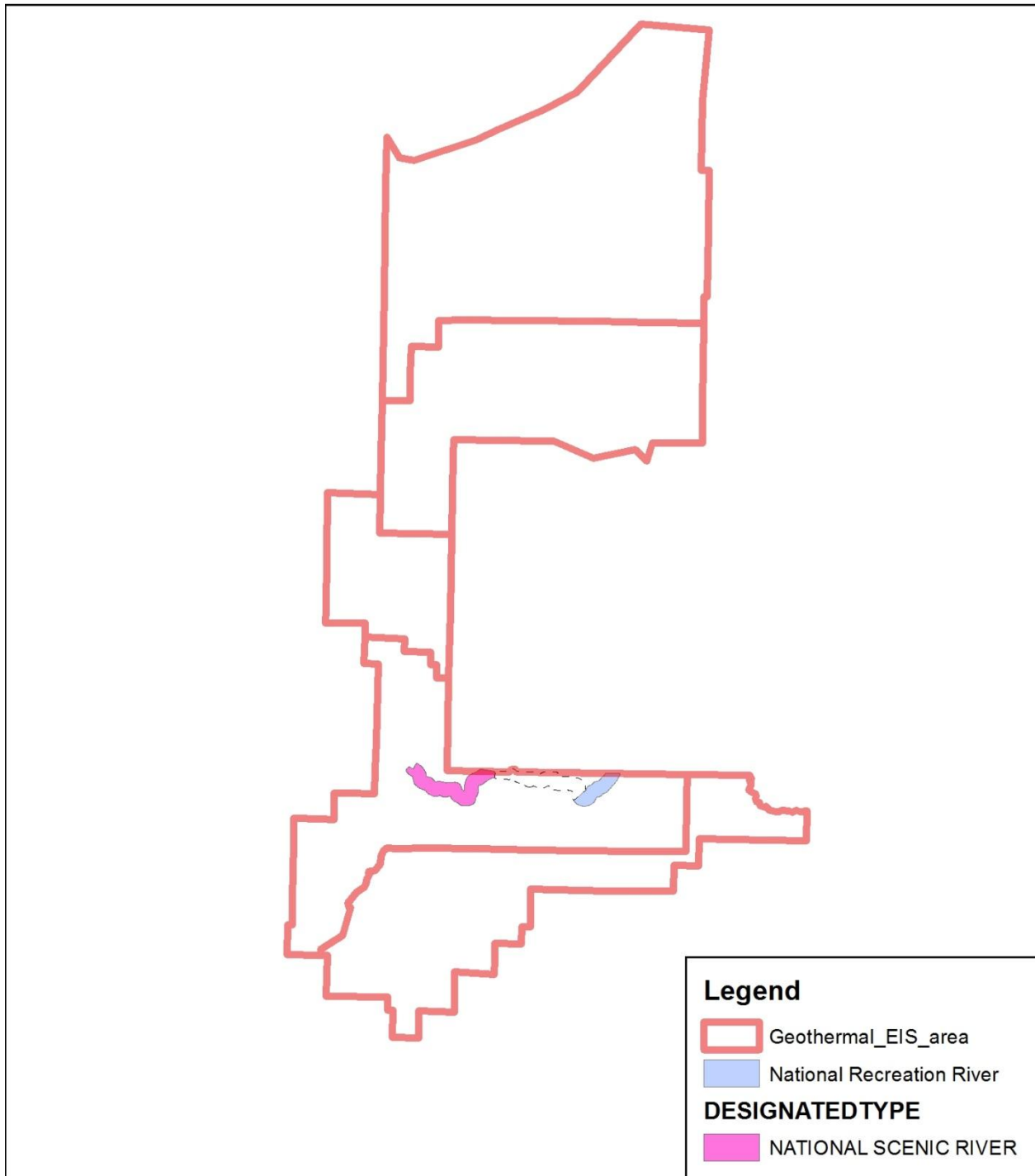
26 The Wild and Scenic portion of this river is 11 miles long with a corridor averaging 320
27 acres per mile.

28
29 Purpose: To avoid incompatible development which would impact the qualities for which these
30 rivers and streams were designated.

31 Exception: No Exceptions.

32

**Geothermal Leasing EIS
No Surface Occupancy
National Scenic and Recreation Rivers**



1

2

1 **Resource: Potentially Eligible Wild and Scenic River segments**

2

3 Stipulation: No Surface Occupancy

4 Location: Segments of rivers determined to be potentially eligible for Wild and Scenic River
5 (WSR) status by virtue of a WSR inventory. The stipulation also includes a corridor of
6 0.25 miles from the high water mark on either side of the stream/river bank.

7 Purpose: To comply with the Wild and Scenic Rivers Act (1968) by avoiding incompatible
8 development which would jeopardize designation for those rivers and streams potentially
9 eligible for inclusion into the WSR system.

10 Exception: No Exceptions.

11

12

None at this time

13

No Map

14

1 **Resource: Natural geothermal features and a one mile protection zone around them**

2

3 Stipulation: No Surface Occupancy

4

5 Location: Thermal features are defined broadly as places on the earth's surface with natural
6 discharges of elevated temperature groundwater. Within the project area boundary there
7 are 5 known hot springs:

8

• Spence Hot Springs

9

• McCauley Warm Springs

10

• Jemez Hot Springs

11

• Soda Dam

12

• San Antonio Hot Springs

13

• Sulphur Springs

14 San Antonio hot springs however is the only hot spring outside of the Jemez National Recreation
15 Area.

16 A one mile (radius) protection zone would surround any thermal feature (known or currently
17 unknown), within which the area would be closed to all surface occupancy.

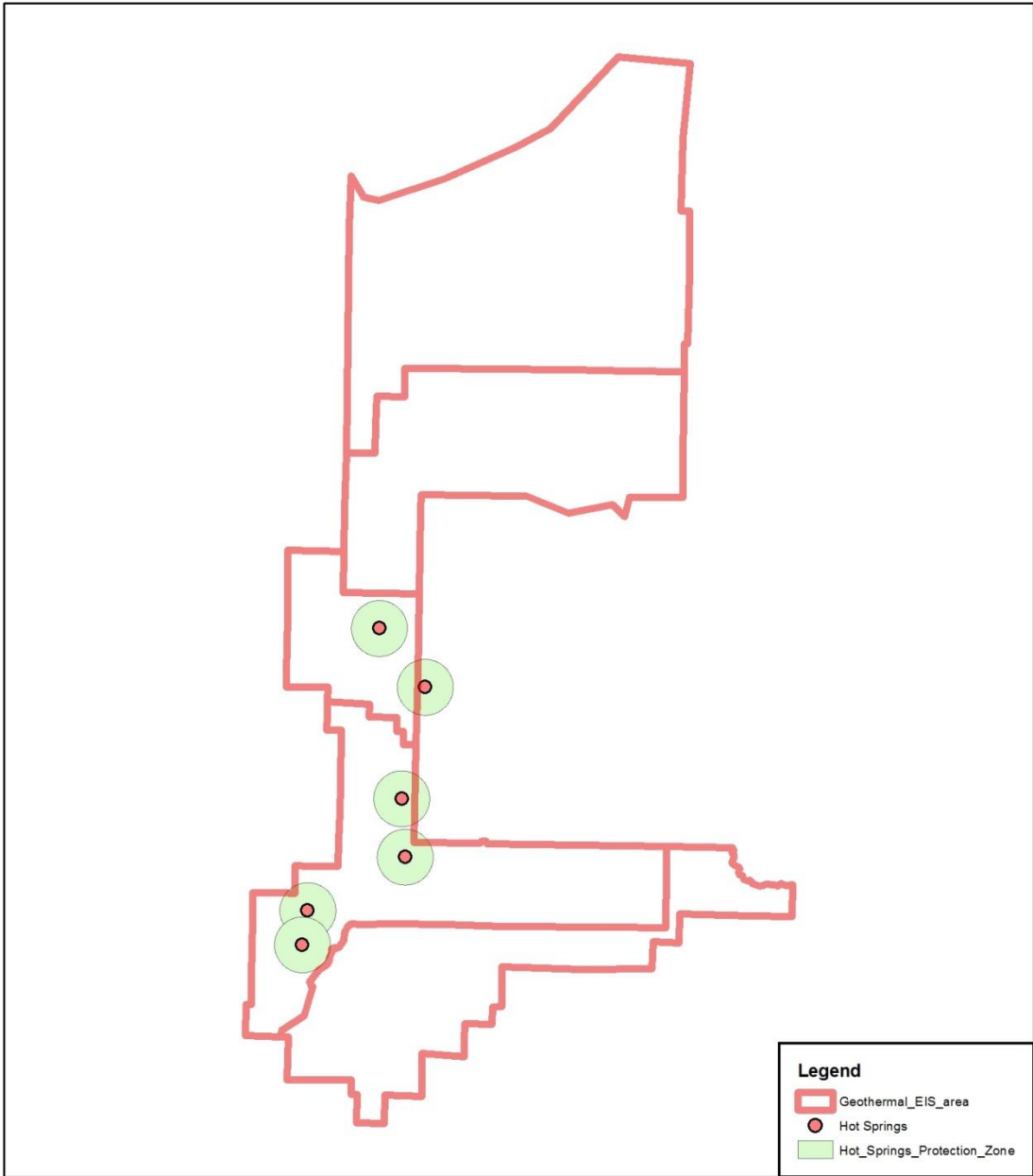
18 Purpose: To protect the water quality, water quantity, unique ecosystems and cultural values
19 these features hold.

20 Exception: Roads and power lines may cross these areas if the operator can demonstrate there
21 are no practicable alternatives and that adverse effects can be minimized. Detailed plans
22 for mitigations to adverse effects will be required with the application for exception or
23 modification.

24

25

**Geothermal Leasing EIS
No Surface Occupancy
Natural Geothermal Features**



1

2

1 **Resource: NFS lands with a Scenery Management System integrity level of Very High**

2

3 Stipulation: No Surface Occupancy

4

5 Location: lands classified as Category 1 in SMS inventory

6

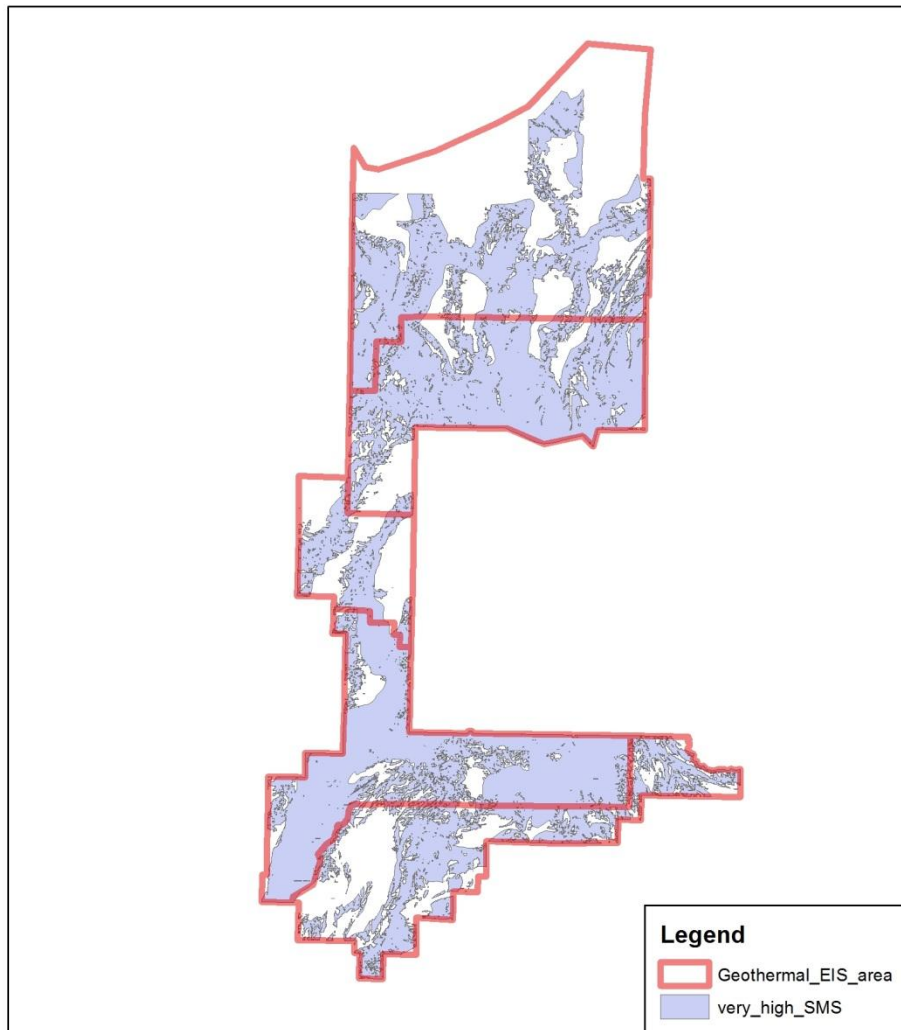
7 Purpose: to protect important viewsheds.

8

9 Exception: An exception, modification or waiver may be granted if a site-specific surface use
10 plan of operations demonstrates that adverse impacts to the viewshed will not occur.

11

**Geothermal Leasing EIS
No Surface Occupancy
Scenery Management System class very high**



12

1 **Resource: Slopes in excess of 40 percent**

2 Stipulation: No Surface Occupancy

3 Location: Slopes equal to or in excess of 40 percent grade. These scattered areas range in size
4 from 3 to over 2,000 acres each; they are mapped from a 10 m digital elevation model.
5 These areas are extremely susceptible to erosion and mass wasting.

6 Purpose: To preclude surface-disturbing activities on steep slopes because these areas tend to
7 have high erosion and mass wasting hazard. Additionally, water quality is more likely to
8 be impaired where steep slopes have been developed. Without this protection there would
9 be a high risk of impairing long-term soil productivity and watershed conditions.
10 Additionally, these precautions must be taken to remain consistent with USFS policy.

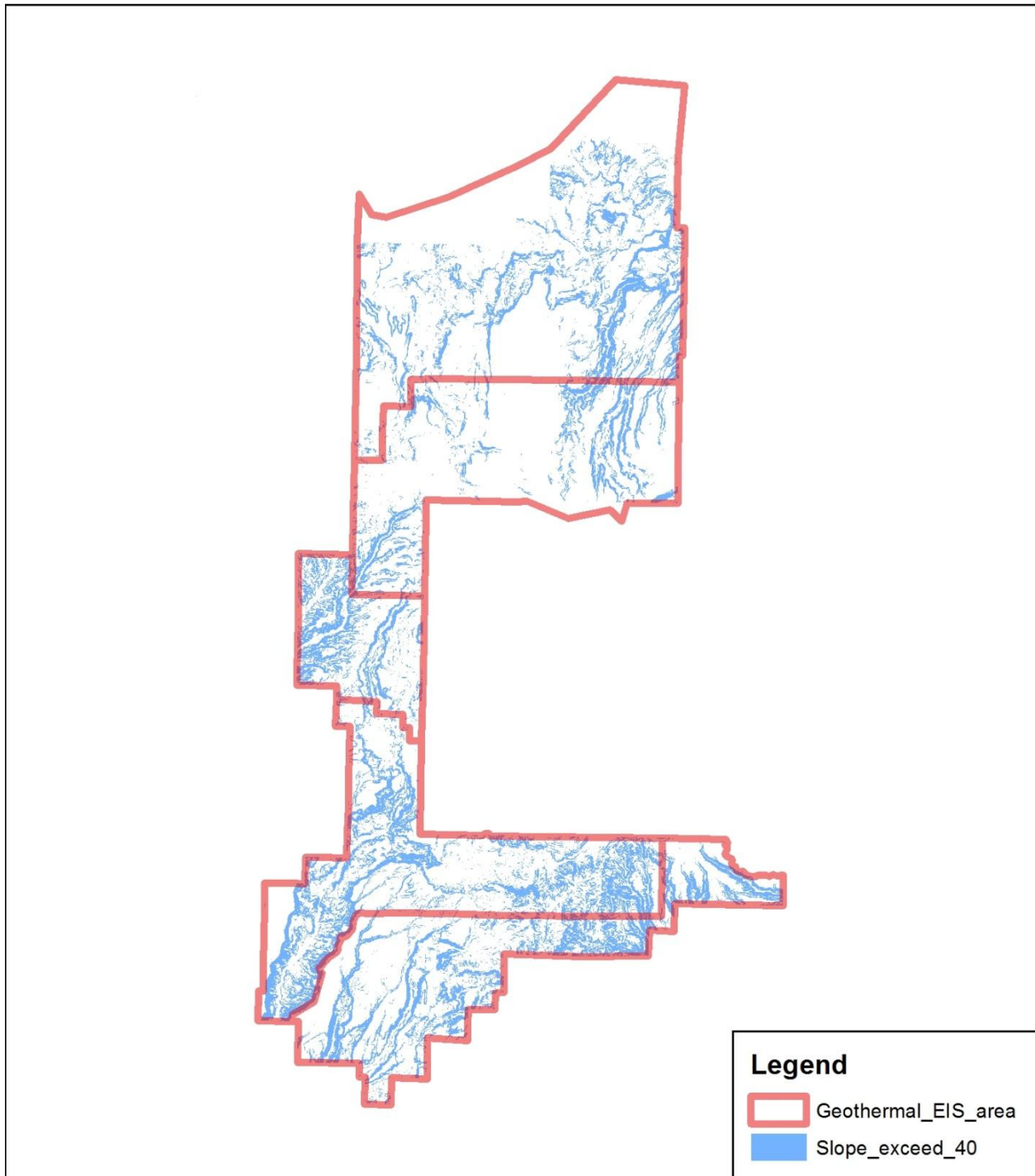
11 Exception: An exception or modification may be granted if onsite inspection shows that unstable
12 or steep slopes do not exist on the specific site, or if the operator can demonstrate in a
13 plan of operations that adverse effects can be minimized and activities safely conducted
14 without loss of long-term site productivity.

15 Power lines and roads may cross or descend slopes equal to or exceeding 40% gradient.
16 Where this occurs, any vegetation or ground disturbance must have a minimal impact on
17 the hydrologic network. This can be achieved through proper implementation of Best
18 Management Practices and designing for sufficient and appropriate water control. Plans
19 describing these mitigations in detail would need to be included in the application for
20 exception or modification.

21 A public notice and comment period is required prior to exception or modification of this
22 stipulation.

23

**Geothermal Leasing EIS
No Surface Occupancy
Steep slopes**



1
2

1 **Resource: Soils with Severe Erosion Potential**

2 Stipulation: No Surface Occupancy

3 Location: All soils with severe erosion potential as defined by the USFS Terrestrial Ecological
4 Unit (TEU) GIS layers.

5 Purpose: To preclude surface-disturbing activities on severely erosive soils because these areas
6 are likely to erode. Without this protection there would be a high risk of impairing long-
7 term soil productivity and watershed conditions. Additionally, these precautions must be
8 taken to remain consistent with USFS policy.

9 Exception: An exception or modification may be granted if onsite inspection shows that soils
10 with severe erosion potential do not exist on the specific site, or if the operator can
11 demonstrate in a plan of operations that adverse effects can be minimized and activities
12 safely conducted without loss of long-term site productivity.

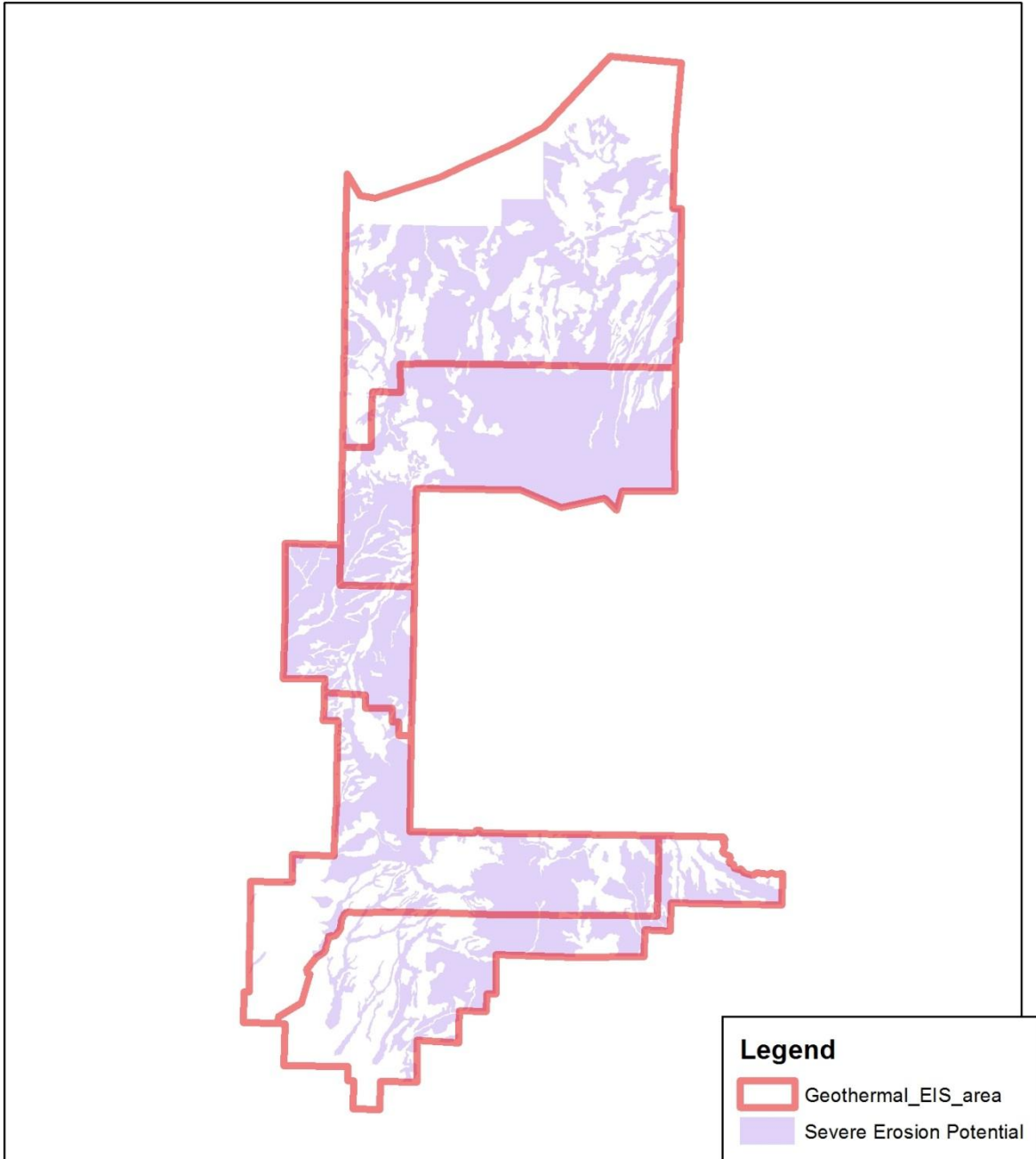
13 Power lines and roads may cross areas with severely erosive soils. Where this occurs, any
14 vegetation or ground disturbance must incorporate Best Management Practices (BMPs) to
15 minimize erosion potential. Plans describing these mitigations in detail will need to be
16 included in the application for exception or modification.

17 A public notice and comment period is required prior to exception or modification of this
18 stipulation.

19

20

**Geothermal Leasing EIS
No Surface Occupancy
Soils with Severe Erosion Potential**



1

2

1 **Resource: Inventoried Roadless Areas**

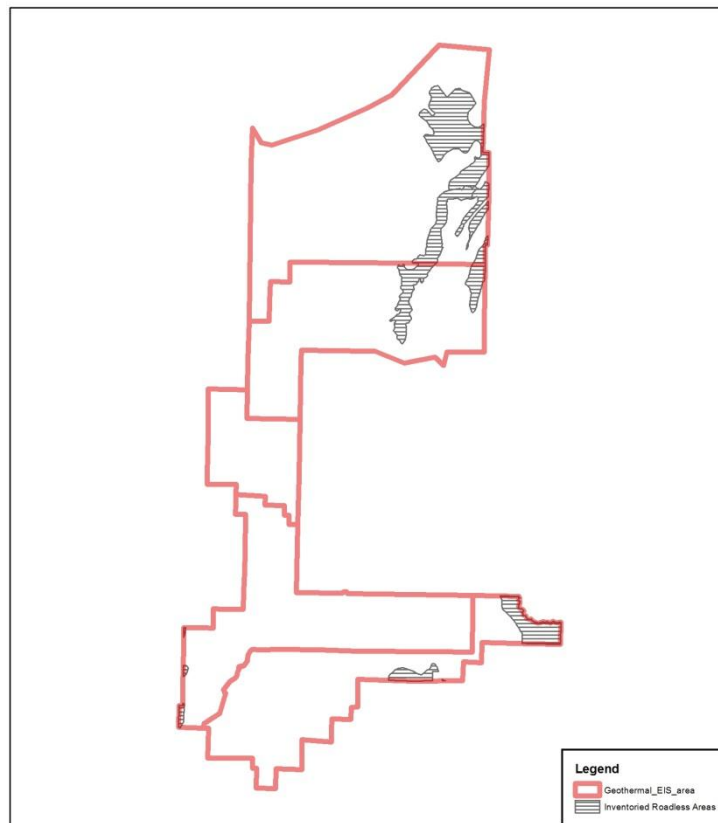
2 Stipulation: No Surface Occupancy

3 Location: Management Area L in Santa Fe NF Forest Plan:

4
5 Purpose: To keep surface disturbance activities outside the inventoried roadless area, this
6 stipulation is needed to protect and maintain the roadless, semi-primitive, and non-
7 motorized character within these special areas, which include such elements as natural
8 integrity, natural appearance, opportunity for quiet and solitude, manageability of
9 boundaries, and special features (ecological, geological, scenic, cultural features).

10
11 Exception: An exception, modification, or waiver may be granted if the Forest Plan designation
12 changes so that the area is no longer classified as semi-primitive non-motorized, or if the
13 operator can demonstrate in a surface use plan of operations that the activity can be
14 conducted with minimal impacts on the semi-primitive, non-motorized characteristics
15 within a site-specific locale. A public notice and comment period is required prior to
16 waiver, exception, or modification of this stipulation.

Geothermal Leasing EIS
No Surface Occupancy
Inventoried Roadless Areas



1 **Resource: Protection of viewsheds with a Scenery Management System classification of**
2 **High.**

3
4 Stipulation: Controlled Surface Use: locate and design surface disturbance activities to be
5 consistent with the visual quality objective of “retention” (or the scenic integrity of
6 “high”), or to reclaim disturbed areas to meet the visual quality objective within 1 to 3
7 years from project startup. Generally, this can be met by following best management
8 practices for minimizing impacts to visual quality, along with visual quality guidelines in
9 the Forest Plan and Forest Service Scenery Management System Handbook (Agriculture
10 Handbook 701).

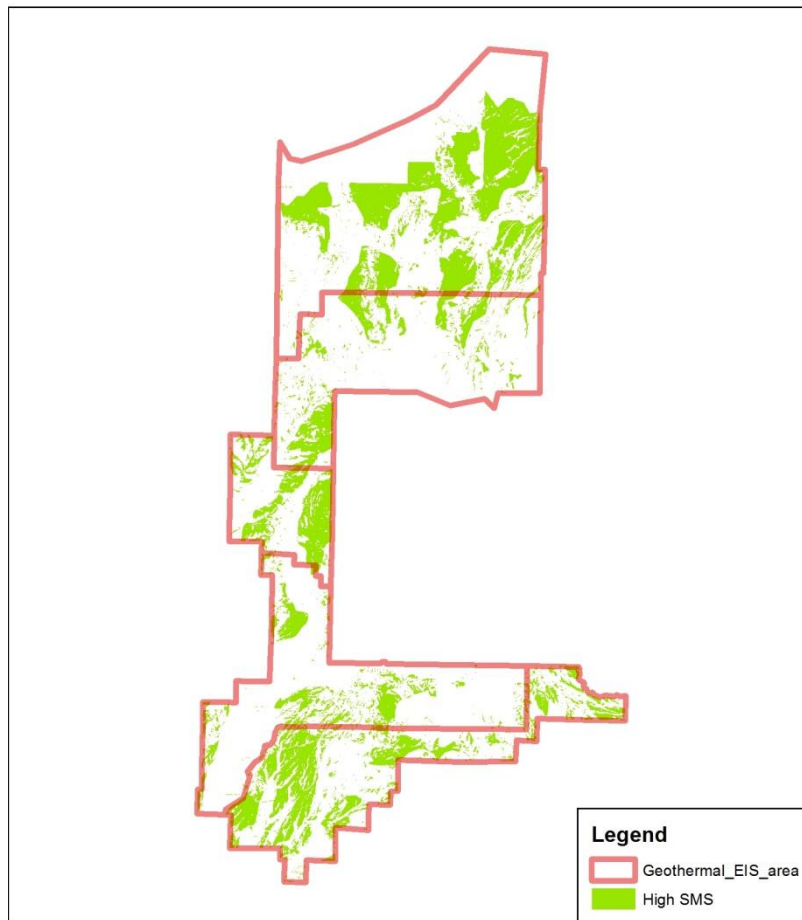
11
12 Location: NFS lands with a Scenery Management System integrity level of High.

13 Purpose: Needed to protect the long-term scenic values in areas of high scenic integrity
14 consistent with Agency directives and the Forest Plan.

15 Exception: An exception, modification or waiver may be granted if the area is reclassified to a
16 lower visual quality or scenic integrity objective.

17

**Geothermal Leasing EIS
Controlled Surface Use
High SMS**



1 **Resource: Protection of important dispersed recreational areas**

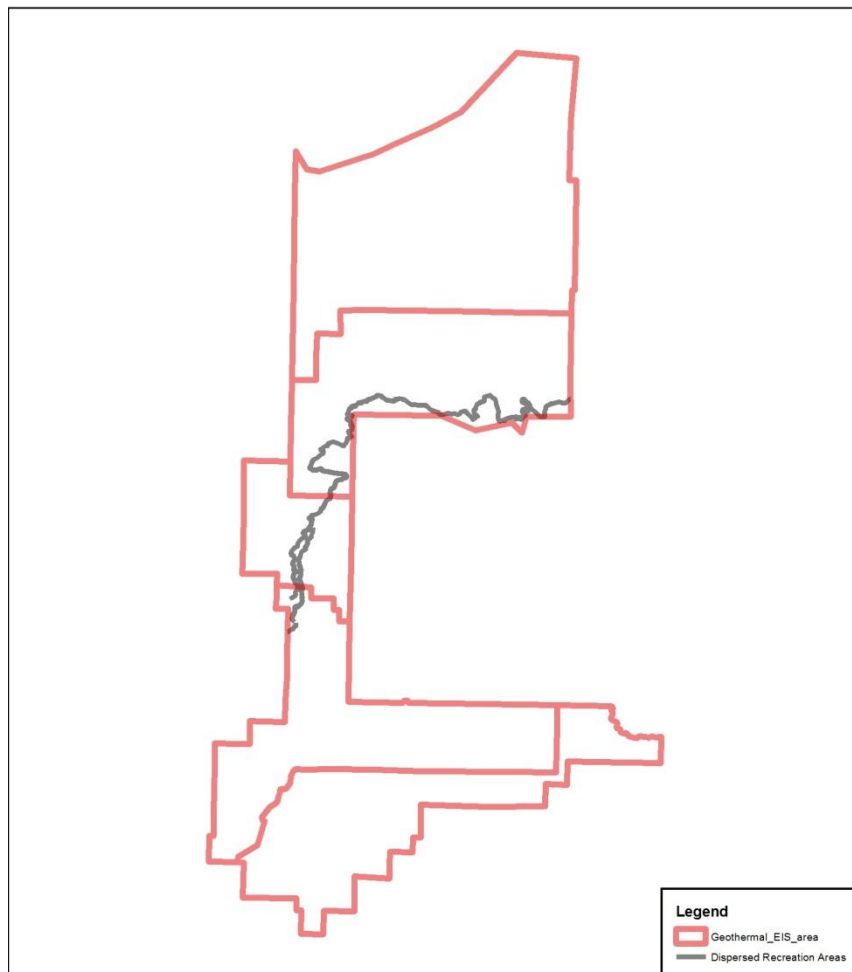
2
3 Stipulation: Controlled Surface Use: locate and design surface disturbance activities to be
4 compatible with dispersed recreational use, and to reclaim disturbed areas to be
5 substantially unnoticeable to dispersed recreational users within 1 to 3 years of project
6 startup. Generally, this can be met by following best management practices.

7
8 Location: along Forest Road 376 and FR 144

9
10 Purpose: to minimize the potential for adverse impacts to recreational values, both motorized and
11 non-motorized, and the natural settings associated with the recreational activity.

12
13 Exception: An exception, modification, or waiver may be granted if the operator can demonstrate
14 there are no practicable alternatives and that adverse effects can be minimized. Detailed
15 plans for mitigations to adverse effects will be required with the application for exception
16 or modification.

**Geothermal Leasing EIS
Controlled Surface Occupancy
Dispersed Recreation Areas**



17

1 **Resource: Mexican Spotted Owl designated Protected Activity Centers (PAC)**

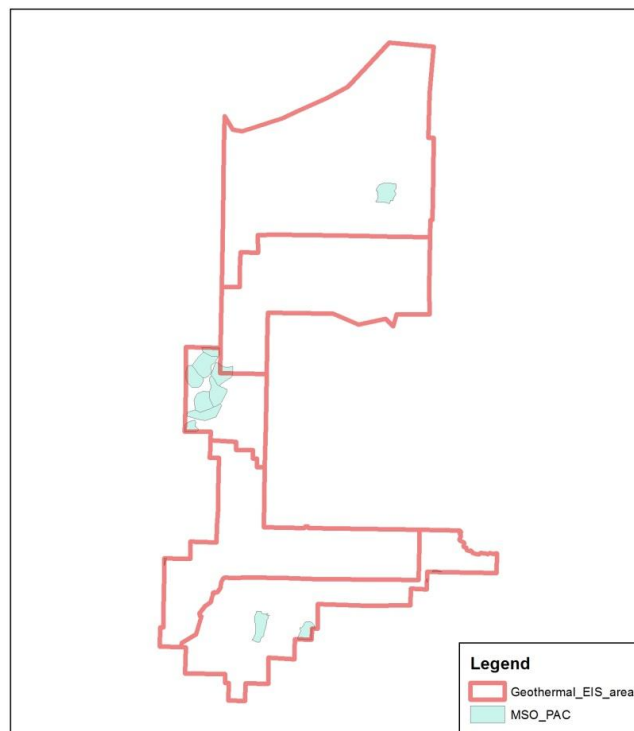
2
3 Stipulation: Timing limitation on drilling operations and construction activities from March 1 to
4 August 31.

5
6 Location: Would apply wherever there is a designated PAC.

7
8 Purpose: To protect and limit disturbance from drilling and construction activities within
9 Mexican spotted owl PACs (nesting/fledging areas) to minimize risks to reproductive and
10 post-fledging success of Mexican spotted owls during the critical nesting/breeding period
11 defined in the recovery plan for this federally listed threatened species as well as the
12 Forest Plan (Appendix D, pg. 2). This stipulation would not apply to daily operations and
13 maintenance of producing wells.

14
15 Exception: An exception, modification, or waiver to the timing limitation may be granted if site-
16 specific surface use plan of operations demonstrates that adverse effects to threatened and
17 endangered species can be avoided, effects are documented in a biological assessment,
18 and concurrence from the U.S. Fish and Wildlife Service is obtained. A public notice and
19 comment period is required prior to waiver, exception, or modification of this stipulation
20

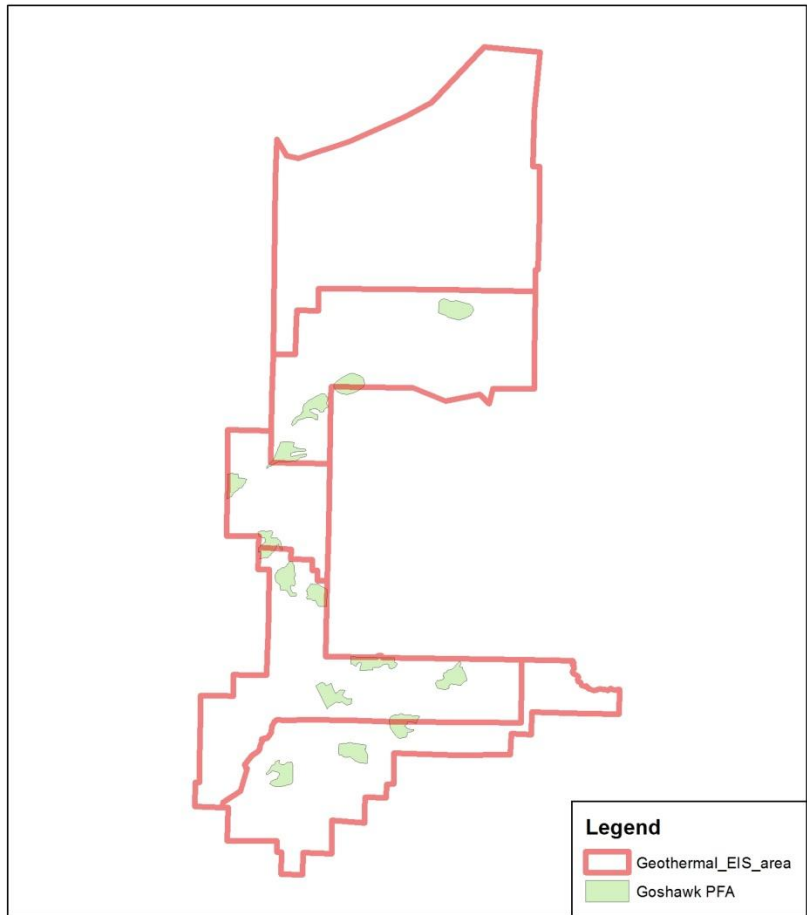
Geothermal Leasing EIS
Timing Limitation
Mexican Spotted Owl PAC



21

- 1 **Resource: Northern Goshawk designated Post-fledging areas (PFAs)**
2 Stipulation: Timing limitation on drilling operations and construction activities from March 1 to
3 September 30.
4 Location: Would apply wherever there is a designated PFA.
5 Purpose: To protect and limit disturbance from drilling and construction within northern
6 goshawk nesting PFAs to minimize risks to reproductive and post-fledging success of
7 northern goshawks during the critical nesting/breeding period defined in interagency
8 goshawk guidelines and the Forest Plan (Appendix D, pp. 6, 10). Would not apply to
9 daily operation and maintenance of producing wells.
10
11 Exception: An exception, modification, or waiver to the timing limitation may be granted if
12 goshawk surveys show that the area is not used for nesting.
13

**Geothermal Leasing EIS
Timing Limitation
Goshawk Post Fledging Area**



14

1 **Resource: Peregrine Falcon eyrie nesting areas**

2 Stipulation: Timing limitation on drilling operations and construction activities from March 1 to
3 August 15.

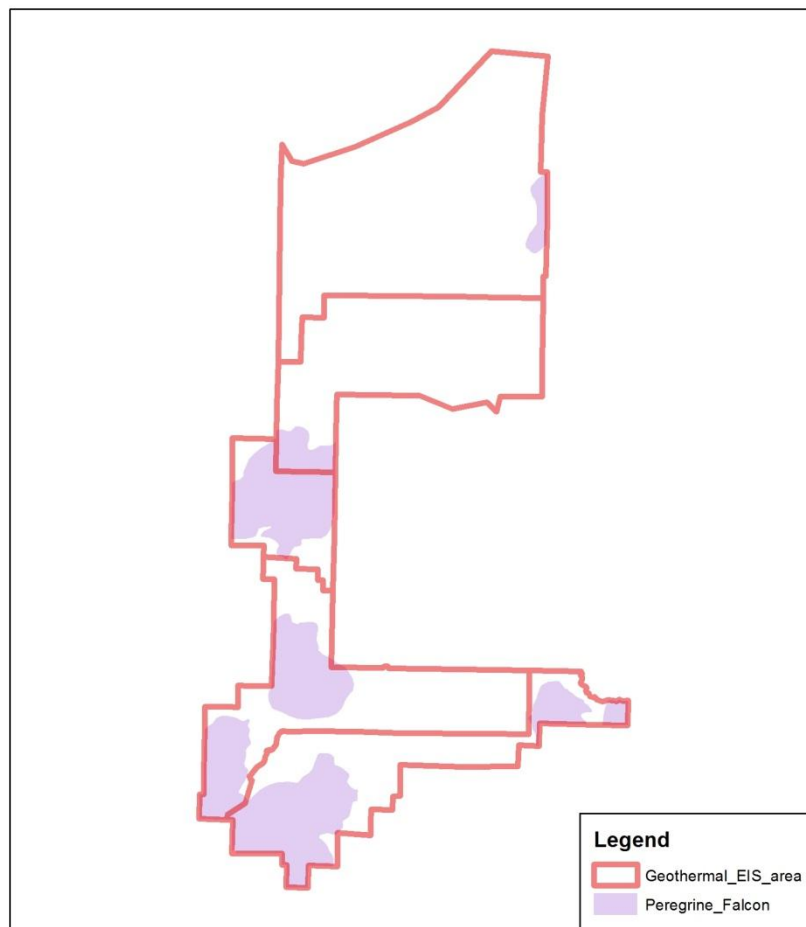
4 Location: Would apply wherever there is a designated eyrie.

5 Purpose: To protect and limit disturbance from drilling and construction within peregrine falcon
6 habitat to minimize risks to reproductive and post-fledging success of peregrine
7 falcons during the critical nesting/breeding period, consistent with the Forest Plan
8 (pg. 63) and Agency directives. This stipulation would not apply to daily
9 operation and maintenance of producing wells.

10 Exception: An exception, modification or waiver to the timing limitation may be granted if
11 surveys show that the area is not used for nesting.

12

**Geothermal Leasing EIS
Timing Limitation
Peregrine Falcon Nesting Areas**



13

1 ***Resource: Deer and Elk Winter Range***

2 Stipulation: Timing limitation on drilling operations and construction activities: December 15 to
3 March 15.

4 Location:

5 Purpose: To protect and limit disturbance from drilling and construction within prime deer and
6 elk winter range to minimize risks to health during a critical period. This
7 stipulation would not apply to daily operation and maintenance of producing
8 wells.

9 Exception: An exception, modification, or waiver to the timing limitation may be granted if the
10 operator demonstrates that the drilling/construction location would not disrupt deer and elk
11 winter habitat.

12
13

14 **No crucial winter elk habitat mapped within project area**

15

1 **Resource: Deer Fawning/Elk Calving Area**

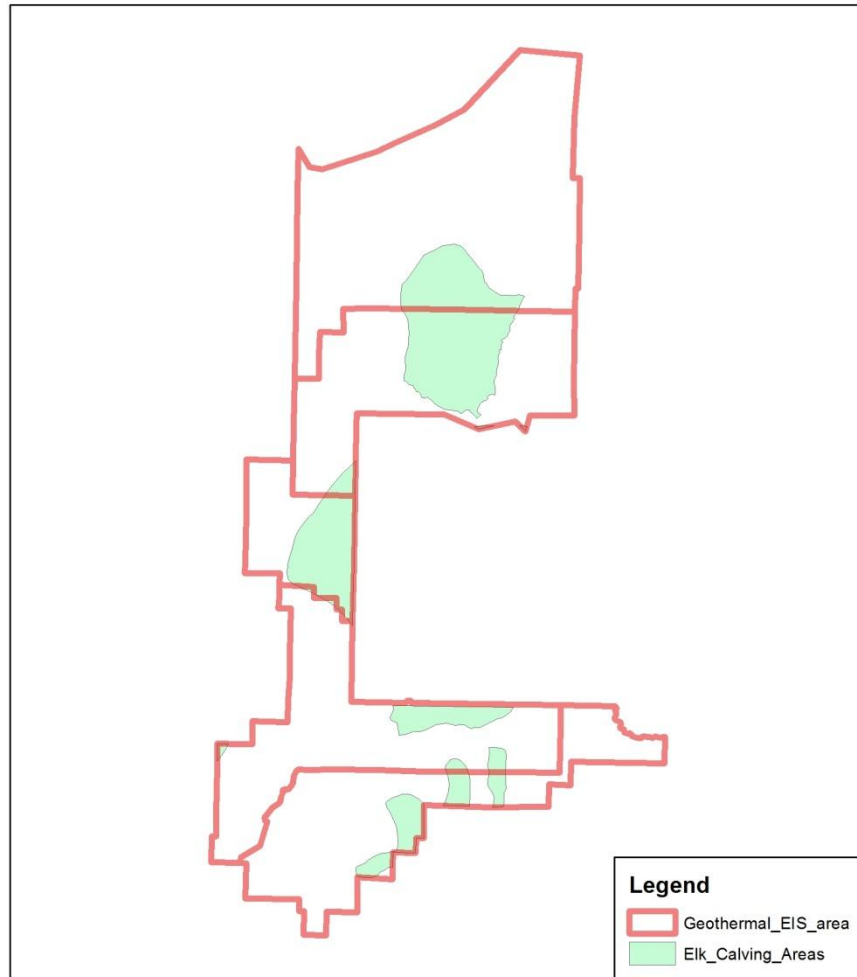
2 Stipulation: Timing limitation on drilling operations and construction activities: June 1 to July
3 31.

4 Location:

5 Purpose: To protect and limit disturbance from drilling and construction within important deer
6 fawning/elk calving area to minimize risks to herd reproduction during a critical period. This
7 stipulation would not apply to daily operation and maintenance of producing wells.
8

9 Exception: An exception or modification to the timing limitation may be granted if the operator
10 demonstrates that the drilling/construction location would not disrupt deer fawning and elk
11 calving.

**Geothermal Leasing EIS
Timing Limitation
Elk Calving Areas**



12

1 ***Resource: Migratory Bird Nesting Areas***

2 Stipulation: Timing limitation on clearing of vegetation between March 1 and August 15

3 Location:

4 Purpose: To protect migratory bird nesting habitat

5

6 Exception: An exception to the timing limitation may be granted if the operator demonstrates
7 there are no migratory birds nesting in the area.

8

9

NO MAP