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## Tools to Facilitate Lease Nominations and Permitting for Geothermal Development on Federal Lands

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### Keywords

*Geothermal, permitting, regulatory, NEPA, environmental, constraints, collaboration, mitigation*

### ABSTRACT

Over 256 million acres of federal land have potential for conventional geothermal development for electricity and heating. The Bureau of Land Management (BLM) has the delegated authority to lease and permit geothermal projects on most federal lands. Over the last few years the BLM has made great strides to improve the leasing and permitting process; however, there are still many challenges to bringing a project online. This paper discusses the current trends for geothermal development on federal lands, forecasts future permitting requirements based on recent guidance on renewable energy, and provides applicable tools to help developers navigate leasing and permitting in the new decade.

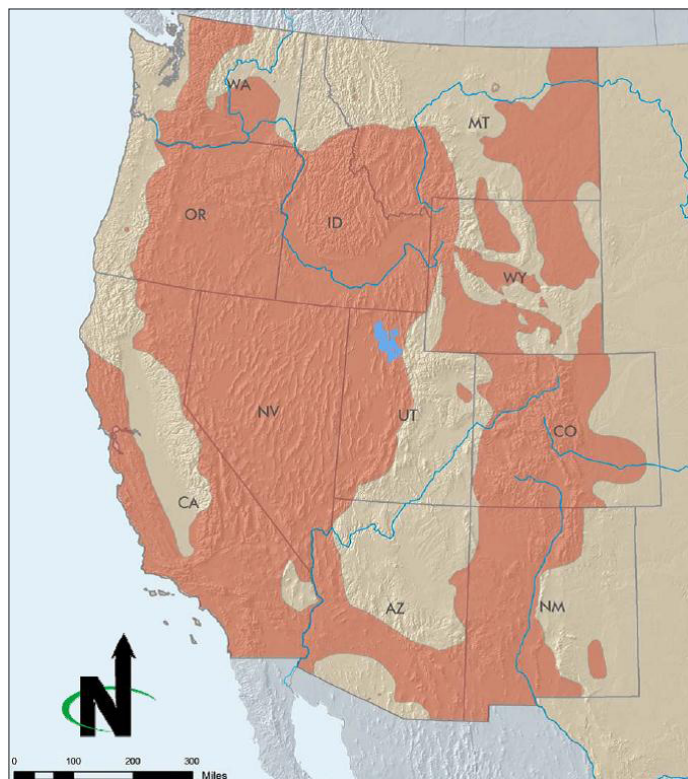
### Trends in Geothermal Leasing and Development

About 60 percent of the land within the 11 western states and Alaska is administered by the federal government. Of these federal lands, over 256 million acres have potential for conventional geothermal development for electricity and heating (Figure 1) (BLM 2008). The Bureau of Land Management (BLM) has the delegated authority to lease and permit geothermal projects on most federal lands.

Over the last few years the BLM has made great strides in improving the leasing and permitting process. Leasing has significantly increased since 2008, when the BLM implemented the findings of the Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States (BLM 2008). Likewise, the issuance of new guidance for permitting exploration and development has clarified expectations while the hiring of more agency staff dedicated to processing geothermal project applications, including the establishment of several Renewable Energy Coordination Offices, has helped to alleviate workloads. Yet all of these strides are working against the often-mentioned

challenge that “all the easy projects are done.” In other words, the most desirable and easy-to-permit locations, with high resource potential and low environmental and cultural conflicts, have already been developed, leaving a more challenging permitting process for current and future projects.

While BLM remains a highly decentralized agency, with nearly all requirements for baseline studies being at the discretion of the local Field Office or District Office, another trend is the push for more consistency and stringency across management units. The ongoing release of guidance at both the Federal and state levels



**Figure 1.** As shown in red, over 256 million acres in the western US have potential for conventional geothermal development for electricity and heating (BLM 2008).

means that the BLM decision makers in the local Field Offices and Districts have decreasing flexibility in employing their discretion. For biological resources, the BLM seems to be increasingly developing or adopting survey protocols for individual species as well as for classes of species. Adding this to the recently released guidance for golden eagle surveys, the exact details of which are defined by the local Fish and Wildlife Service on a project-by-project basis, geothermal proponents are seeing substantially higher costs for these baseline surveys than in the past.

In addition to these trends, there are a number of other actions that could influence geothermal leasing and permitting in the future.

## Crystal Ball on Permitting

While geothermal development has progressed over the last few years, so have other renewable energy programs. In 2010 and 2011, notable attention was given to all renewable energy projects, resulting in the federal government taking a hard look at how public lands are allocated and used for energy development. New guidance was issued for solar and wind projects focusing on complying with the National Environmental Policy Act (NEPA), project siting, and involving appropriate stakeholders early and often in the process.

Of note are two Instruction Memoranda (IM) issued by BLM in February 2011 that emphasize how pre-application activities are an essential part of the permitting and NEPA process for utility-scale renewable energy projects (BLM 2011a; BLM 2011b). The guidance provides clarification on documenting the project “purpose and need” statements and the range of alternatives, especially with respect to alternative site locations. In an effort to direct developers to focus on early coordination and site evaluation prior to submitting an application, all prospective applicants are now required to schedule and participate in at least two pre-application meetings with the BLM before filing an application for solar or wind energy development. While this latter requirement does not apply specifically to geothermal project, it does highlight the trend toward a more formal and structured project application process.

The most compelling direction that could affect how geothermal leasing and perhaps even permitting is conducted is the screening criteria used by BLM to prioritize the processing of right-of-way applications. The criteria are organized by level of potential resource conflicts: Low Potential for Conflict (timely or expedited authorization possible); Medium Potential for Conflict (resource conflicts can potentially be resolved); and High Potential for Conflict (complex projects that require greater analysis, mitigation, or may not be feasible to authorize). While this direction is not officially required for geothermal projects, the intent will likely influence how leasing and permitting is conducted on federal lands. The geothermal industry would be wise to incorporate this guidance in their nomination, planning, and permitting processes.

Another key development to watch is the response to recent changes to NEPA mitigation requirements. For those readers familiar with NEPA’s more stringent cousin, CEQA (California Environmental Quality Act), these two environmental regulations may now have more in common than ever before. In January

2011, the Council on Environmental Quality (CEQ) released final guidance on the “Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact.” The guidance mandates Federal agencies issuing permits to (1) commit to mitigation where the environmental analysis assumes implementation of that mitigation, (2) monitor the implementation and effectiveness of mitigation commitments, (3) make information on mitigation monitoring available to the public, and (4) remedy ineffective mitigation when there is Federal action remaining to be taken.

In terms of geothermal on Federal lands, these requirements place responsibility on the BLM to have a higher level of involvement in geothermal projects during their construction and operational phases. For the geothermal industry, it means there will be more eyes on exploration and development projects that do have mitigation, and that any mitigation included in an environmental document should be very carefully thought through in terms of feasibility, cost-effectiveness, and efficacy in protecting the intended resource or resource value.

Current trends and direction suggest that leasing and permitting will remain a difficult endeavor; however, we have developed five tools to facilitate the process.

## Five Tools for the Next Decade

To be successful in this decade of renewable energy, project proponents need the tools and commitment to conduct up-front planning and collaboration..

1. Early, continuous, and effective collaboration with all stakeholders and agencies. The demographics and social characteristics of the rural west are quickly changing, bringing much more interest and scrutiny of projects on federal lands. Transparency is the clear path to forming partnerships and alliances for projects. In general, there is public support for geothermal development; however, there may be better ways to implement a project. By involving stakeholders and regulators into the process early on, they will be vested in the outcome and in best cases, become advocates. An engaged public eases the job of permitting agencies, making for more positive and cooperative relations and often lubricating the permitting process. The tradeoff is that developers need to be willing to listen, be responsive, and accepting of modifications to their ideas. In a review of renewable energy projects permitted in 2010, the projects that did not face litigation had early and continuous involvement programs.
2. Comprehensive pre-leasing assessments. Prior to investing in a potential lease nomination area, a focused analysis is required not only on the geothermal resource potential, but also on environmental and cultural constraints. EMPSi has developed a *Constraint Assessment for Siting (CAS) model* that delineates the optimal areas for leasing and development (Figure 2). The CAS model factors in over 30 variables to identify lands with high resource potential and lowest resource conflicts. The model has been widely applied including for siting solar facilities in Nevada and transmission lines in New Mexico.



**Figure 2.** EMPSi's Constraint Assessment for Siting (CAS) model incorporates over 30 variables, including environmental and infrastructure, to show the best places for development (as shown in green) and methods to mitigate impacts.

3. Rigorous value engineering to encompass site-specific constraints. Seeing the project through the eyes of the regulator prior to submitting application materials is invaluable in both tangible and intangible terms. Plans of operation and utilization need to take the time to identify all constraints on the lease parcel, including environmental, cultural, and social. Upfront screening of potential resource conflicts is not only a smart planning approach from an environmental perspective, but it also helps geothermal developers avoid having to change project plans later in the permitting process, which inevitably involves increased costs, delayed schedules, and more work for

the regulatory agencies. This process also provides valuable information into the financing and investment costs of the site, and clarifies the encumbrances and potential permitting hurdles.

4. Proactive alternatives development; designing alternative project layouts. The applicant should prepare alternative project designs and be prepared to document other options that were considered but not carried forward. It is more efficient to identify alternatives early in the planning process; otherwise, they could surface during the NEPA process and result in delays.
5. Early consideration and incorporation of mitigation requirements. Through the permitting and NEPA processes, regulatory agencies commonly require developers to commit to mitigation measures for resource protection. These can be costly and difficult to implement into near final project designs. Therefore, it is critical that developers assess potential impacts as part of their siting and planning processes. Any measures that would help minimize impacts should be documented and built into the project as "design features."

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