

**Finding of No Significant Impact (FONSI)  
U.S. Department of the Interior  
Bureau of Land Management  
White River Field Office  
220 E Market St  
Meeker, CO 81641**

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DOI-BLM-CO-110-2011-0177-EA**

**BACKGROUND**

As provided for by Federal Register notice 74 FR 56867-56869 (November 3, 2009), the BLM solicited nominations for a second round of parcels to be leased for research, development, and demonstration (RD&D) of shale oil recovery technologies as authorized in Energy Policy Act of 2005, Public Law 109-58, §369(c), which codified procedures for leasing the public lands for oil shale RD&D projects.

Natural Soda holdings Inc. (NS) and ExxonMobil Exploration Company (EM) submitted nominations which were warranted for further consideration by the Colorado State Office of the Bureau of Land Management (BLM) for a RD&D Oil Shale Lease and any supporting rights-of-way pursuant to the BLM's authority to lease Federal lands for oil shale development under section 21 of the Mineral Leasing Act, 30 U.S.C. 241. The Proposed Action includes the construction, operation, and maintenance of oil shale research facilities located in the Piceance Creek Basin approximately 36 miles southwest of Meeker, Colorado.

As a result of further consideration of nominations, the Bureau of Land Management (BLM), White River Field Office (WRFO) conducted an environmental analysis (DOI-BLM-CO-110-2011-0177-EA) for a Proposed Action and Alternatives related to the leasing of two 160-acre tracts of land administered by the BLM for the purpose of exploring the economic viability of shale oil extraction, and to conduct research on modern technologies as a means to extract the liquid fuels from oil shale in an environmentally responsible manner. BLM has determined that the proposed Oil Shale Research, Development and Demonstration (RD&D) projects will have no significant impact on health or the human environment.

NS and EM have proposed research projects to evaluate the feasibility and commercial viability of in-situ oil shale development geologically located in an area association with sodium minerals. The intent of this proposal is to achieve a "proof of concept". That is, while laboratory experiments and theoretical calculations indicate that various in-situ methodologies are viable commercial options, none have been thoroughly field tested to evaluate their practical application. The Proposed Action provides the opportunity to apply those specific technologies under field conditions. The project results will advance our knowledge of these methodologies regardless of whether or not they prove to be commercially viable.

The proponents' research will gather additional data on recovery of oil and gas from oil shale deposits with high concentration of sodium minerals using conventional drilling methods, controlled fracturing, and heating technologies to convert kerogen to oil and gas.

The intent of the NS proposal is to prove an in-situ development and production method that initially recovers the sodium resource (nahcolite - sodium bicarbonate) followed by liquefying the kerogen left in place with the use of down hole burners.

The intent of EM proposal is to create an in-situ electrical resistive heating element by filling controlled horizontal fractures with nonhazardous conductive material. This methodology utilizes horizontal and vertical wells to control the horizontal fracture network, and to contain the process within a vertically and horizontally limited production interval. EM would demonstrate the availability of the sodium resources for future recovery upon completion of the hydro carbon removal from the oil shale,

The BLM has concluded that analyzing the proposed recovery processes is warranted and may advance knowledge regarding the commercial viability of in-situ technologies for hydrocarbon recovery from oil shale.

In addition to the Proposed Action, the BLM has analyzed the environmental impacts of the Proposed Action with Mitigation measures applied to the project design. The analysis assesses the environmental consequences of the Proposed Action, enumerates alternative mitigation actions, and evaluates the consequences of the mitigation. The mitigation measures, in addition to the project design features of the Proposed Action, are intended to reduce the impacts to human health and environment and to minimize surface use conflicts. A summary of the applicant committed design features (ACDF) associated with the Proposed Action is provided in appendices A and B of the EA. Additional BLM mitigations associated with the alternative mitigation actions, is provided in Appendices C and D of the EA.

The BLM proposes leasing two a 160-acre tract located approximately 36 miles southwest of Meeker, Colorado, and requiring the applicant to submit, as a standard lease term, a Plan of Development for an oil shale research, development, and demonstration project. The tracts are adjacent to each other and are situated on a ridge between Ryan Gulch and Yellow Creek at elevations ranging from 6,600 to 6,760 feet.

## **FINDING OF NO SIGNIFICANT IMPACT**

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, and considering the significance criteria in 40 CFR 1508.27, I have determined that the Proposed Action with Mitigation will not have a significant effect on the human environment. An environmental impact statement is therefore not required.

### **Context**

The projects are site-specific actions directly involving up to 120 acres of surface disturbance within 320 acres of land administered by the BLM and. While the technology advanced by the EM and NS oil shale RD&D projects could have national, regional, and state-wide importance for their contribution to unlocking significant shale oil resources that could help to supply the Nation's future domestic energy needs, these projects, in and of their self, are not likely to produce oil in quantities that would contribute to domestic supplies.

The primary human influences on the project area are oil and gas development, historic oil shale and current oil shale RD&D, nahcolite mining, and livestock grazing. Existing environmental conditions in the project area reflect changes based on past projects and activities. The project area is rural and relatively undeveloped but is experiencing growth related to energy development.

### **Intensity**

The following discussion is organized around the 10 Significance Criteria described at 40 CFR 1508.27. The following have been considered in evaluating intensity for this Proposed Action:

**1. Impacts that may be both beneficial and adverse.** The beneficial effects of the proposed RD&D projects include the advancement of innovative technologies to explore and develop the abundant oil shale resources within the Piceance Creek Basin to meet the needs of our nation's future energy requirements. Opting for a small-scale, staged approach to oil shale development provides an opportunity to prove the concept of the technologies involved so as to ensure operation at economic and environmentally acceptable levels before expansion of the RD&D leases to commercial operations can be authorized on public lands. The proposed RD&D projects could add to the collective knowledge regarding the viability of an un-tested technology for use in oil shale development on a commercial scale.

The in-situ (in-place) technologies proposed would not permanently modify the land surface, and if the RD&D efforts prove to be sub-economic, the project would be more easily dismantled and lands could be more easily reclaimed with minimal adverse environmental impact.

Adverse effects include the potential for impacts to air, soils, vegetation, water resources, wildlife, recreation, and visual resources that would occur during construction and operation of the Proposed Action with Mitigation.

**2. The degree to which the Proposed Action affects public health or safety.**

The design features, environmental commitments, permit requirements, and industry standards and regulations included in the Proposed Action with Mitigation for the construction, operation, and maintenance of the oil shale RD&D facilities would minimize any public safety effects during project construction and operation.

**3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.** There are no known park lands, prime farmlands, wild and scenic rivers or ecologically critical areas in the project area. As described in the EA, impacts to wetlands resulting from water usage for the projects would be minimal due to source location and the relatively low water demand of the projects. As results of cultural surveys of the EM lease tract no National Register of Historic Places (NRHP) eligible sites have been located within the EM lease tract. The NS lease tract contains one site determined as Officially Needs Data by the Colorado Office of Archaeology and Historic Preservation (OAHP) due to its potential for buried cultural deposits. The Proposed Action with Mitigation provides protection of the site located on the NS lease by a requirement applying a No Surface Occupancy (NSO) on an area that includes a 100 meter buffer of the site. In addition, the Proposed Action with Mitigation contains requirements and contingencies in the event that previously unknown cultural resources are identified.

**4. Degree to which the possible effects on the quality of the human environment are likely to be highly controversial.** Public input regarding the Proposed Action with Mitigation has been solicited throughout the RD&D leasing process. Public involvement included open house forums that provided opportunities for the public to view the technologies proposed and to interact with industry representatives about the proposed oil shale leases and activities. Letters for comments were sent to 12 different local, state and federal agencies.

During the public scoping period six written comments were received: four from members of the general public, one from environmental advocacy groups and one from Colorado Parks and Wildlife (CPW). Concerns were raised about impacts to surface and ground water resources, air quality, wilderness values, and wildlife resources. These impacts have been reduced or minimized through the implementation of mitigation measures. Other comments included; inefficient process design of the proposed technologies, oil and gas leasing and operations, the ongoing oil shale Programmatic Environmental Impact Statement (PEIS), resource recovery, and support for a third round of RD&D leasing.

Based on the number and content of the comments received from the public, the effects of the RD&D program on the quality of the human environment are not considered highly controversial. However, the past oil shale boom and bust cycles, most recently the bust of May 2, 1983 which resulted in significant adverse impact to the social and economic stability of western Colorado, increase the likelihood that a high level of public interest in the implementation and demonstration of feasibility associated with the RD&D leases can be expected.

**5. Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risk.** The projects utilize conventional drilling techniques, and modified fracturing and heating technologies to convert kerogen to oil and gas. Anticipated effects on the quality of the human environment as a result of the proposed technology have been thoroughly identified, analyzed, and mitigated to an insignificant level. Due to the nature of the RD&D program, some degree of uncertainty is to be expected. The small-scale approach of initiating research on 160 acre parcels reduces risk by providing an opportunity to field test operations at environmentally acceptable level of risk. The technologies proposed would disturb up to a total of 120 surface acres for both projects. ExxonMobil and Natural Soda will develop various response and mitigation plans as part of their approved Plan of Development.

No highly uncertain or unknown risks to the human environment were identified during the analysis of the Proposed Action.

**6. Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

The Proposed Actions are site-specific actions directly involving 320 acres of land administered by the BLM. ExxonMobil and Natural Soda Holdings., Inc. have applied for leases to be issued for a term of ten years with the option for an extension not to exceed five years upon demonstration of the satisfaction of the Authorized Officer that a process leading to production in commercial quantities is being diligently pursued. The leases are subject to conversion to a twenty-year lease upon documenting to the satisfaction of the Authorized Officer that it has produced commercial quantities of shale oil from the lease. The Lessee has the exclusive right to convert the research and development lease acreage to a commercial lease and acquire any or all portions of the remaining preference lease area up to a total of 640 contiguous acres each.

Additional NEPA analysis would be required prior to commercial development of the preference lease acreage.

The demonstration of the feasibility of the proposed technologies could result in increased interest in using BLM-administered lands for energy production. However, this action does not represent a decision in principle about a future consideration.

The BLM in a separate proceeding is considering whether to amend the resource management plans (RMPs) for oil shale and tar sands in Colorado, Utah and Wyoming. Future decisions regarding commercial leasing of oil shale will be made in accordance with the RMPs in effect when such leasing will be under consideration. Those decisions will be made independently of this action, except insofar as results of the proposed EM and NS projects may add to our information about in-situ technology.

**7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The study area for cumulative impacts is the area within CPW's Game Management Unit (GMU) 22. Of the 632,894 acres of land within GMU 22, the surface of 444,758 acres is managed by the BLM WRFO. Estimates of the total past, present, and foreseeable future surface disturbance from oil and gas development and oil shale and nahcolite mining are estimated to equate to 3.2 percent of GMU 22. The 120 acres of surface disturbance associated with these two projects equate to 0.6 percent of all past, present, and future proposed actions, and 0.03 percent of GMU 22 managed by BLM WRFO.

The Proposed Action with Mitigation would not individually have a significant impact on any natural resource within the Piceance Creek Basin or within the communities of the region. However, cumulative impacts to natural resources could occur as the Proposed Action with Mitigation operates in conjunction with other past, present, or reasonably foreseeable future actions, such as the expanding oil and gas production operations in northwestern Colorado. These impacts would be long term, but not permanent, would occur over a relatively small percentage of land when compared to the overall size of GMU22 and would not result in significant impact to any areas of historic, cultural, or biological importance. Monitoring, pollution prevention and permitting requirements further alleviate the possibility of any significant cumulative impacts associated with the RD&D projects.

**8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.** As mention above, results of cultural surveys of the EM lease tract identified no sites eligible for National Register of Historic Places (NRHP) within the EM lease tract. The NS lease tract contains one site determined as Officially Needs Data by the Colorado Office of Archaeology and Historic Preservation (OAHP) due to its of its potential for buried cultural deposits. The Proposed Action with Mitigation provides protection of the site located on the NS lease by a requirement applying a No Surface Occupancy (NSO) on an area that includes a 100 meter buffer of the site. In addition, the Proposed Action with Mitigation contains requirements and contingencies in the event that previously unknown cultural resources are identified.

**9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA) of 1973.** The third party contractor for the BLM prepared a Biological Assessment (BA) in compliance with Section 7(c) of the Endangered Species Act (ESA) and submitted to the BA

to USFWS in April 2012 to commence formal consultation of the potential impacts to federally listed, proposed, and candidate endangered and threatened species and address water depleting activities associated with the projects. Cumulative water depletions from the Colorado River Basin are considered likely to jeopardize the continued existence of the Colorado pikeminnow, as well as downstream populations of humpback chub, bonytail, and razorback sucker and result in the destruction or adverse modification of their critical habitat. The May 31, 2012 USFWS Biological Opinion (BO) in response to the BA is summarized as follows:

- The four endangered Colorado River fish species (Colorado pikeminnow, razorback sucker, humpback chub, bonytail), would be adversely affected by water depletions associated with the projects. The biological assessment states that up to 80 total acre-feet of water would be used for the two RD&D projects over a period of 10-15 years (65 acre-feet for ExxonMobil plus 15 acre-feet for Natural Soda).
- These water depletions are addressed in the December 19, 2008 programmatic biological opinion (PBO) for water depletions associated with BLM's fluid mineral program within the upper Colorado River Basin in Colorado (ES/GJ-6-CO-08-F-0006). As discussed with Jay Thompson, lead fisheries biologist in the Colorado BLM state office, research-scale oil shale projects are adequately addressed by the 2008 fluid minerals depletion PBO.
- The USFW concurred with the BLM determination that the RD&D projects may affect, but are not likely to adversely affect the Dudley Bluffs bladderpod and Dudley Bluffs twinpod.
- Because the greater sage-grouse is not federally listed as threatened or endangered at this time, USFW concurrence with the BLM determination is not necessary. However, neither project would take place in sage-grouse habitat recently identified by the Colorado Parks and Wildlife as primary habitat or general habitat. Impacts to greater sage-grouse from the RD&D projects are not likely to be significant.
- Since the proposed RD&D projects would have no effect on the following listed species: black-footed ferret (*Mustela nigripes*), Canada lynx (*Lynx canadensis*), Mexican spotted owl (*Strix occidentalis lucida*), *Spiranthes diluvialis* (Ute ladies-tresses orchid), and *Penstemon grahamii* (Graham's beardtongue) (proposed for listing), consultation for these species is not necessary.
- Since the proposed RD&D projects have no effect on the following candidate species that may be found in vicinity: North American wolverine (*Gulo gulo luscus*), yellow-billed cuckoo (*Coccyzus americanus*), and *Penstemon scariosus albifluvus* (White River beardtongue), consultation for these species is not necessary.

**10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** To the best of my knowledge the Proposed Action does not violate or threaten violation of any federal, state, local, or tribal law or

requirement imposed for the protection of the environment. Federal, state, local and tribal interests were given the opportunity to participate in the environmental analysis process.

Based on the above analysis of the context and intensity of potential impacts resulting from the Proposed Action with Mitigation, BLM has determined that the proposed oil shale RD&D projects will have no significant impact on health or the human environment.

**SIGNATURE OF AUTHORIZED OFFICIAL:**

  
Acting Field Manager

**DATE SIGNED:** 8/30/12