

U.S. Department of the Interior
Bureau of Land Management
White River Field Office
220 E Market St
Meeker, CO 81641

CATEGORICAL EXCLUSION

NUMBER: DOI-BLM-CO-110-2013-0025-CX

CASEFILE/PROJECT NUMBER: COC69166

PROJECT NAME: Minor Modification to Shell Oil Shale RDD POD (COC69166)

LEGAL DESCRIPTION: Sixth Principal Meridian
T. 2 S., R. 98 W.
Sec. 4: Lots 9, 10, 15, and 16;

APPLICANT: Shell Frontier Oil and Gas Inc. (Shell)

DESCRIPTION OF PROPOSED ACTION:

Background/Introduction: In January 2007, Shell Frontier Oil and Gas Inc. (Shell) received the Oil Shale Research, Development and Demonstration (RDD) Lease COC69166. Prior to the lease issuance the Bureau of Land Management (BLM) conducted an environmental assessment (CO-110-2006-117-EA) to address Shell's oil shale RDD projects in accordance with BLM's Oil Shale RD&D Program announced in the Federal Register (FR, June 9, 2005, Vol. 70, No. 110). The analysis was based on Shell's Plan of Operations 2nd Generation ICP (In-situ Conversion Process) Project. In 2008 Shell submitted and received approval of the "Addendum to the Plan of Operations for the 2nd Generation ICP Project Shell Frontier Oil and Gas Inc. Lease COC 69166". This addendum reduced the size of the research operation and includes recovery of shale oil below the fresh water aquifer zones of the Green River Formation without implementing freeze wall technology. In 2009 Shell received approval of their appraisal program to drill geo-hydro wells located on three well pads: 135-4-298, 137-4-298, and 138-4-298.

Terms of the RDD lease require the operator to submit a detailed Plan of Development (POD) for approval. Shell submitted a detailed POD for a pilot test, "Plan of Development for Research, Development, and Demonstration Activities on Oil Shale Research, Development and Demonstration (RDD) Lease COC 69166 and Nahcolite Preference Right Sodium Lease C-0120057", which was approved by the BLM in August 2011. The designed project initially removes the nahcolite resources from a zone 40 foot in diameter by 153 feet in height. The mining zone is located below the freshwater aquifer zones of the Green River Formation. Nahcolite resources are solution mined through a single injection/recovery well using hot water. Once the nahcolite is recovered the water remaining in the leached area is removed and down hole heating of the leached zone commences. This heating phase employs vertical down-hole

electrical heaters in 13 designated heater holes to pyrolyze the oil shale. Two producer wells are utilized to remove the produced oil. There are also 6 observation wells for a total of 21 wells associated with the production of the shale oil recovery. It is anticipated a minimum of 1,500 barrels (bbl) of shale oil would be produced with peaked daily rate of greater than 10 barrels per day. Pyrolysis of the oil shale is contained within the mining interval.

The surface processing facilities cool and separate the produced fluids and gas. Fluids are stored in tanks until trucked off site and the gases will be sent to the flare.

The POD identifies the processing wells and facilities would be fenced with a game proof fence of a minimum height of 8 feet which would enclose up to approximately 21 acres. The currently constructed fenced encloses approximately 17 acres. Surface disturbance within the fenced area was estimated at approximately 15 acres with actual design and construction currently at slightly more than 12 acres. This is comparison to 110 acres of disturbance analyzed in environmental assessment (EA) CO-110-2006-117-EA.

Proposed Action: Shell proposes to include the addition of a long heater test (LHT) in their approved POD. This test would consist of three 1,000 feet long heaters and one observation hole (see Figure 3) on the East RDD pilot (COC69166) south and adjacent of existing pad site (see Figures 1 and 2). These wells would be drilled toward the southwest from their surface location. Each of these three horizontal heaters would be located in a characteristically different non-water-bearing interval of the oil shale horizon. The main objective of the horizontal heater wells is to measure the response of the formation to heating and to identify development of hot spots along the heater due to variations of the geothermal properties within the formation. There would be minor production of gasses and fluids from the heater and observer wells due to pressure created during heating; however, it is not the intent of the wells to be developed for production. Any gasses or fluids volumes recovered would be monitored and sent to the processing facilities of the approved POD for the RDD. Implementation of the LHT would increase the area of existing disturbance of the approved POD by approximately 2.6 acres for a total of approximately 15 acres. The eight foot high site fenced area would increase existing fenced by approximately 3 acres to approximately 21 acres (See Figure 2). Construction and drilling is scheduled to commence in late spring 2013 and heating to commence in 2014. It is estimated heating would occur concurrently with the RDD Pilot for a two year time period with a potential for an additional two years of heating. Total construction time for the addition could be up to 270 days with intervals of as much as 120 days between some of the construction activities.

Design Features: Construction, operation and reclamation of the modification would be according to the design features are included in “Plan of Development for Research, Development, and Demonstration Activities on Oil Shale research, development and Demonstration (RDD) Lease COC 69166 and Nahcolite Preference Right Sodium Lease C-0120057”.

Decision to be Made: Whether or not to approve the minor modification to include a long heater test in Shell’s “Plan of Development for Research, Development, and Demonstration Activities on Oil Shale research, development and Demonstration (RDD) Lease COC 69166 and Nahcolite Preference Right Sodium Lease C-0120057”.

PLAN CONFORMANCE REVIEW:

Name of Plan: White River Record of Decision and Approved Resource Management Plan (ROD/RMP).

Date Approved: July 1, 1997

Decision Number/Page: Page 2-6

Decision Language: "...At the discretion of the Secretary of the Interior, research scale lease tracts will be considered within lands available for oil shale leasing. Approval of research tracts will be based on the merits of the technology proposed."

CATEGORICAL EXCLUSION REVIEW: The Proposed Action qualifies as a categorical exclusion under 516 DM 11.9, Number F-8: "Approval of minor modifications to or minor variances from activities described in an approved underground or surface mine plan for leasable minerals (e.g., change in mining sequence or timing)."

The Proposed Action has been reviewed with the list of extraordinary circumstances (43 CFR 46.215) described in the table below.

Extraordinary Circumstance	YES	NO
a) Have significant adverse effects on public health and safety.		X
b) Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands; floodplains; national monuments; migratory birds; and other ecologically significant or critical areas.		X
c) Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources.		X
d) Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks.		X
e) Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects.		X
f) Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects.		X
g) Have significant impacts on properties listed, or eligible for listing, in the National Register of Historic Places as determined by the bureau.		X
h) Have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have adverse		X

Extraordinary Circumstance	YES	NO
effects on designated Critical Habitat for these species.		
i) Violate a Federal law, or a State, local or tribal law or requirement imposed for the protection of the environment.		X
j) Have a disproportionately high and adverse effect on low income or minority populations.		X
k) Limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly affect the physical integrity of such sacred sites.		X
l) Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species.		X

INTERDISCIPLINARY REVIEW:

The Proposed Action was presented to, and reviewed by, the White River Field Office interdisciplinary team on December 11, 2012. A complete list of resource specialists who participated in this review is available upon request from the White River Field Office. The table below lists resource specialists who provided additional remarks concerning cultural resources and special status species.

Name	Title	Resource	Date
Michael Selle	Archaeologist	Cultural Resources, Native American Religious Concerns	1/7/2013
Laura Dixon	Wildlife Biologist	Special Status Wildlife Species	12/20/2012
Zoe Miller	Ecologist	Special Status Plant Species	12/14/2012

REMARKS:

Cultural Resources: The proposed drill holes are within the area inventoried at the Class III (100 percent pedestrian) level for the RDD lease (Darnell 2006 compliance dated 4/10/2006). No cultural resources were identified on the surface during inventory. Subsurface remains are unlikely but cannot be completely ruled out.

Native American Religious Concerns: No Native American religious concerns are known in the area, and none have been noted by Northern Ute Tribal authorities. Should recommended inventories or future consultations with Tribal authorities reveal the existence of such sensitive properties, appropriate mitigation and/or protection measures may be undertaken.

Paleontological Resources: The project is located in an are generally mapped as the Uintah Formation (Tweto 1979) which the BLM, WRFO has classified as a potential Fossil Yield Classification (PFYC) 4/5 formation meaning it is known to produce scientifically noteworthy fossil resources (c. f Armstrong and Wolny 1989). Provided that there are no excavations into the

underlying sedimentary rock formation, other than the drill holes, there will be no new impacts to fossil resources. The drill holes may result in impacts to fossil resources but identifying and evaluating resources in a drill hole is virtually impossible. Some loss of data to the regional paleontological database may occur. The loss is irreversible and irretrievable but cannot be evaluated due to the nature of the proposed disturbance.

Threatened and Endangered Wildlife Species: There are no threatened or endangered wildlife species that are known to inhabit or derive important use from the project area. The Proposed Action will represent an incremental loss of sagebrush habitat by directly removing 2.6 acres of habitat and indirectly by fencing off an additional 3 acres. The BLM sensitive Brewer's sparrow is generally common in sagebrush habitats throughout the field office. However, due to the proximity of the Proposed Action to existing disturbances, it is likely that project area already provides reduced utility to Brewer's sparrow. Mitigation regarding wildlife friendly fences and water depletion for endangered Colorado River fishes is carried forward from the POD.

Threatened and Endangered Plant Species: There are no concerns with special status plant species associate with the Proposed Action.

REFERENCES CITED

Armstrong, Harley J., and David G. Wolny

1989 Paleontological Resources of Northwest Colorado: A Regional Analysis. Museum of Western Colorado, Grand Junction, Colorado.

Darnell, Nicole

2006 Class III Cultural Resources Inventory of a 160-Acre Block Area for the 2nd Generation ICP Site in Rio Blanco County, Colorado, for Shell Frontier Oil and Gas. Grand River Institute, Grand Junction, Colorado. (06-11-10: SHPO #RB.LM.NR1799)

Tweto, Ogden

1979 Geologic Map of Colorado. United States Geologic Survey, United States Department of the Interior, Reston, Virginia.

MITIGATION:

1. The operator is responsible for informing all persons who are associated with the project that they will be subject to prosecution for knowingly disturbing archaeological sites or for collecting artifacts.
2. If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. The operator will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously

determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. The operator, under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.

3. Pursuant to 43 CFR 10.4(g), the operator must notify the AO, by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), the operator must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
4. The operator is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate fossils, collecting large amounts of petrified wood (over 25lbs./day, up to 250lbs./year), or collecting fossils for commercial purposes on public lands.
5. If any paleontological resources are discovered as a result of operations under this authorization, the operator or any of his agents must stop work immediately at that site, immediately contact the BLM Paleontology Coordinator, and make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. Work may not resume at that location until approved by the AO. The BLM or designated paleontologist will evaluate the discovery and take action to protect or remove the resource within 10 working days. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (a) following the Paleontology Coordinator's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (b) following the Paleontology Coordinator's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.
6. Any excavations into the underlying native sedimentary stone must be monitored by a permitted paleontologist. The monitoring paleontologist must be present before the start of excavations that may impact bedrock.
7. All proposed activities shall be in accordance with Shell's approved "Plan of Development for Research, Development, and Demonstration Activities on Oil Shale Research, Development and Demonstration (RDD) Lease COC 69166 and Nahcolite Preference Right Sodium Lease C-0120057"

COMPLIANCE PLAN: "Plan of Development for Research, Development, and Demonstration Activities on Oil Shale research, development and Demonstration (RDD) Lease COC 69166 and Nahcolite Preference Right Sodium Lease C-0120057"

NAME OF PREPARER: Paul Daggett

NAME OF ENVIRONMENTAL COORDINATOR: Heather Sauls

COMPLIANCE WITH NEPA

The Proposed Action is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance with 516 DM 11.9, Number F-8. This categorical exclusion is appropriate in this situation because there are no extraordinary circumstances potentially having effects that may significantly affect the environment. The Proposed Action has been reviewed, and none of the extraordinary circumstances described in 43 CFR 46.215 apply.

SIGNATURE OF AUTHORIZED OFFICIAL: *Kent E. Walter*
Field Manager

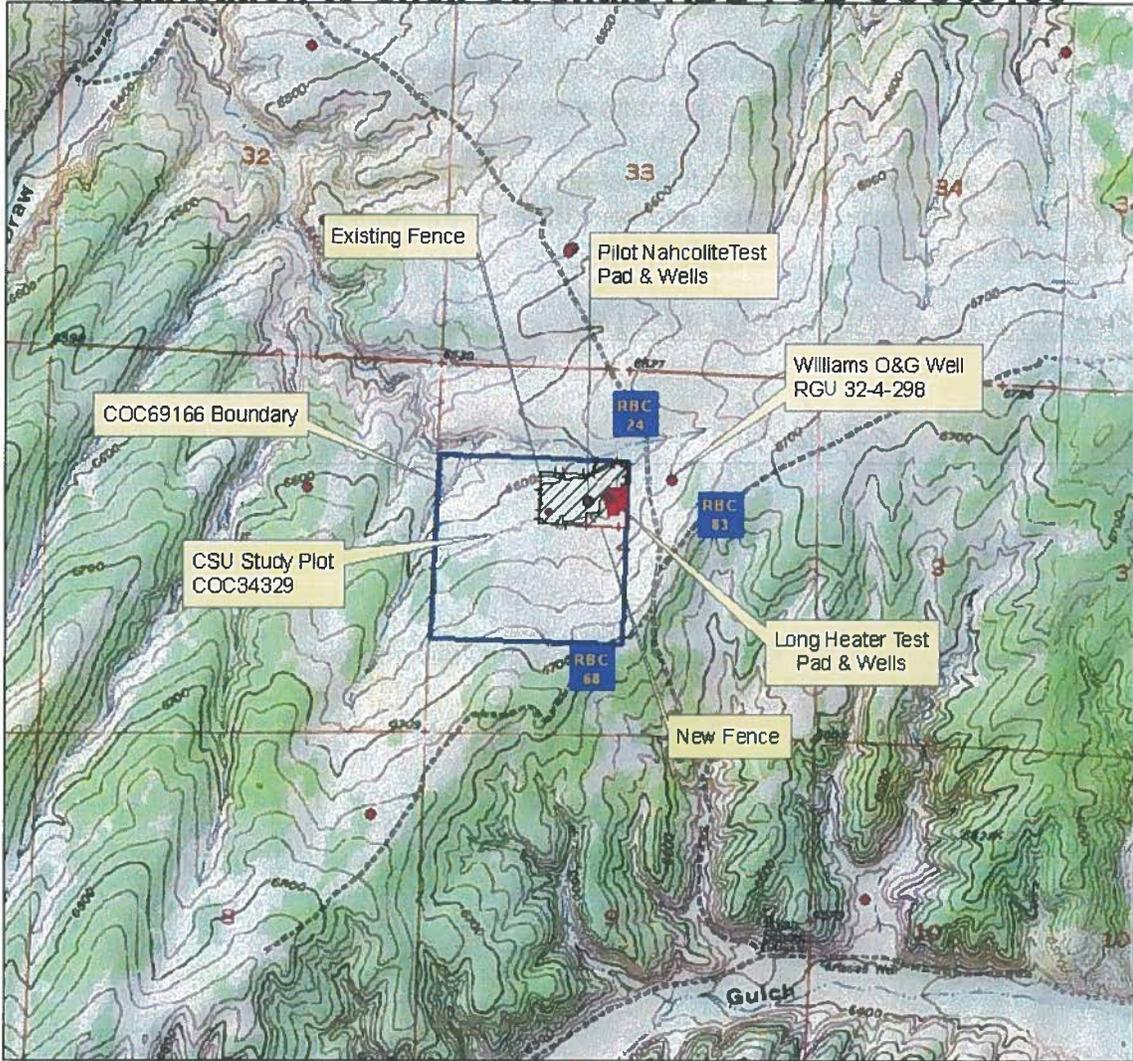
DATE SIGNED: *03/06/13*

ATTACHMENTS:

- Figure 1 Topographic Map
- Figure 2 Aerial Photo
- Figure 3 Cross-Section of the Long Heater Test Well Configuration

Figure 1 Topographic Map

**DOI-BLM-CO-110-2013-0025-CX
Modification to Shell Oil Shale RDD POD COC69166**



T. 2 S., R. 98 W. 6th P.M.
Sec. 4: Lots 9, 10, 15, & 16

12/10/2012

-  Producing Gas Well
-  Existing Disturbance
-  Existing Fence
-  New Fence
-  LHT well pad



Source:
BLM, UCGS, CDOW, etc.

Disclaimer:
Although the data presented within this map, and the map itself, have been processed electronically by computers of BLM, no warranty, expressed or implied, is made by BLM regarding the use of this map or the data represented, nor does the fact that the data constitute or imply any such warranty.

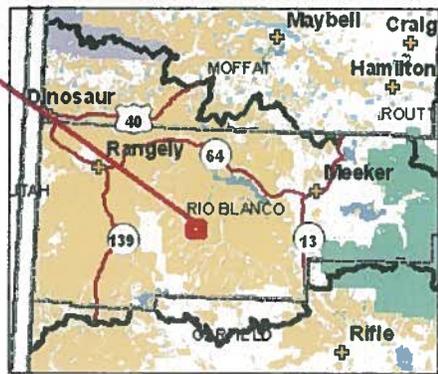
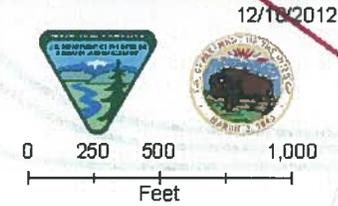


Figure 2 Aerial Photo



T. 2 S., R. 98 W. 6th P.M.
Sec. 4: Lots 9, 10, 15, & 16

-  Existing Disturbance
-  Existing Fence
-  New Fence
-  LHT well pad



Sources:
BLM, USGS, CDOW, etc.

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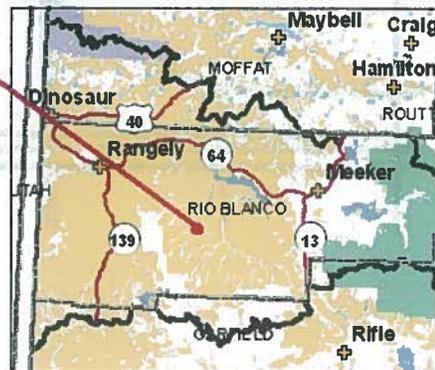
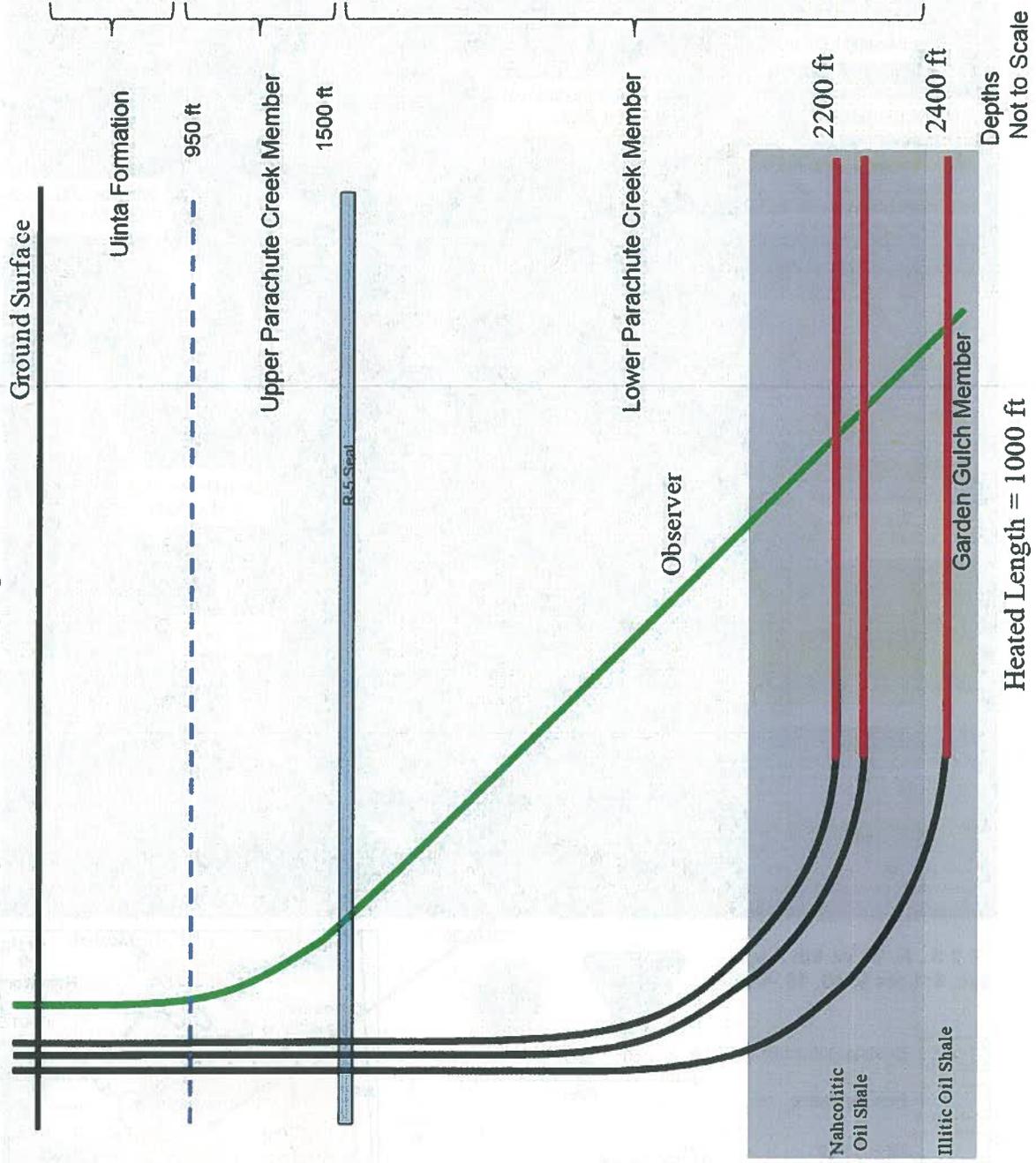


Figure 3 Schematic Cross-Section of Long Heater Test Well Configuration



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220 E Market St
Meeker, CO 81641**

DECISION RECORD

PROJECT NAME: Minor Modification to Shell Oil Shale RDD POD (COC69166)

CATEGORICAL EXCLUSION NUMBER: DOI-BLM-CO-110-2013-0025-CX

DECISION

It is my decision to implement the Proposed Action, as mitigated in DOI-BLM-CO-110-2013-0025-CX, authorizing approval of a minor modification to include a long heater test in Shell's "Plan of Development for Research, Development, and Demonstration Activities on Oil Shale research, development and Demonstration (RDD) Lease COC 69166 and Nahcolite Preference Right Sodium Lease C-0120057", allowing for the construction, operation, and maintenance of three long heater holes and one observation hole.

Mitigation Measures

1. The operator is responsible for informing all persons who are associated with the project that they will be subject to prosecution for knowingly disturbing archaeological sites or for collecting artifacts.
2. If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. The operator will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. The operator, under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.
3. Pursuant to 43 CFR 10.4(g), the operator must notify the AO, by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), the operator must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
4. The operator is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate fossils, collecting large amounts of petrified wood (over 25lbs./day, up to 250lbs./year), or collecting fossils for commercial purposes on public lands.

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7. All proposed activities shall be in accordance with Shell's approved "Plan of Development for Research, Development, and Demonstration Activities on Oil Shale Research, Development and Demonstration (RDD) Lease COC 69166 and Nahcolite Preference Right Sodium Lease C-0120057".

COMPLIANCE WITH LAWS & CONFORMANCE WITH THE LAND USE PLAN

This decision is in compliance with the Endangered Species Act and the National Historic Preservation Act. It is also in conformance with the 1997 White River Record of Decision/Approved Resource Management Plan.

PUBLIC INVOLVEMENT

The BLM informed the public about this project by listing it on the online WRFO NEPA Register on December 11, 2012 and a copy of the completed Categorical Exclusion will be posted on the WRFO website. As of March 4, 2013, no comments or inquiries have been received.

RATIONALE

The Proposed Action is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance with 516 DM 11.9, Number F-8. This categorical exclusion is appropriate in this situation because there are no extraordinary circumstances potentially having effects that may significantly affect the environment. The Proposed Action has been reviewed, and none of the extraordinary circumstances described in 43 CFR 46.215 apply.

ADMINISTRATIVE REMEDIES

Any appeal of this decision must follow the procedures set forth in 43 CFR Part 4. Within 30 days of the decision, a Notice of Appeal must be filed in the office of the Authorized Officer at White River Field Office, 220 East Market St., Meeker, CO 81641 with copies sent to the Regional Solicitor, Rocky Mountain Region, 755 Parfet St., Suite 151, Lakewood, CO 80215, and to the Department of the Interior, Board of Land Appeals, 801 North Quincy St., MS300-

QC, Arlington, VA, 22203. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals at the above address within 30 days after the Notice of Appeal is filed with the Authorized Officer.

SIGNATURE OF AUTHORIZED OFFICIAL: *Kurt T. Walter*
Field Manager

DATE SIGNED: *03/06/13*

