



**Bureau of Land Management
Casper Field Office**



EA No. WY-060-EA06-145

RockWell Petroleum

**UNDERGROUND ACCESS ENHANCED OIL RECOVERY FACILITY
POISON SPIDER FIELD
NATRONA COUNTY, WYOMING**

**DECISION RECORD
AND
FINDING OF NO SIGNIFICANT IMPACT**

DECISION

It is my decision to approve the RockWell Petroleum (RWP) Application for Permit to Drill (APD) for the underground-access portal and the applicable components of the Poison Spider Field Plan of Development (POD). RWP has proposed the construction of an Underground Access Oil Recovery Facility (UAORF) that is an enhanced oil recovery (EOR) project utilizing underground gravity drainage to extract previously unrecoverable oil from the existing Poison Spider Field. The UAORF project components approved by this decision include:

1. Vertical shaft construction;
2. Tunnel construction;
3. Applicable surface-related construction, operations, maintenance, abandonment, reclamation activities, and any other surface activity associated with the Poison Spider UAORF project as described in this decision and in the POD.

Successful implementation of the proposed action will result in the recovery of oil through an underground enhanced oil recovery project from federal oil and gas lease WYC038870. The surface lands in the project area are public lands administered by the BLM Casper Field Office (CFO). Maps and diagrams of the proposed surface construction areas, facility operations and storage areas, associated infrastructure construction, and reclamation areas are included in the POD and the EA. Diagrams and photographs of underground excavation and production equipment, shaft and tunnel construction designs, and ventilation shaft designs are also included in the POD.

The APD for the tunnel portal was originally submitted to the BLM Casper Field Office (CFO) on April 7, 2006; a revised APD proposing a vertical shaft instead of an inclined tunnel was

submitted to the CFO on August 28, 2006. A Reclamation Plan for the proposed action was submitted by RWP to the CFO on May 23, 2006, and the final Plan of Development (POD) was submitted to the CFO on September 1, 2006. Reclamation cost calculations for the proposed action were submitted to the CFO on August 17, 2006; these were evaluated for adequacy by the BLM State Engineer and the CFO Civil Engineer to determine Bonding requirements for the project.

The proposed action is described in detail in Chapter 2.0 of the “Environmental Assessment For The Poison Spider Oil Field Underground-Access Oil Recovery Facility Project” (EA) No. WY-060-EA06-145, and in the POD. The APD includes a surface use and operations plan and a drilling prognosis that briefly describe the surface and drilling operations for the vertical shaft and tunnel construction and the reclamation plans for the portal surface area. A summary of the proposed action as submitted in the POD is included in the Project Background and Description section below.

The proposed action in the POD and Chapter 2.0 of the EA includes a detail description of the following components of the proposed action:

1. Project access;
2. Surface shaft area;
3. Vertical shaft construction;
4. Tunnel construction including drill station construction;
5. Underground well drilling operations;
6. Well completions;
7. Underground production operations;
8. Surface service facilities including tank battery;
9. Water injection;
10. Mine ventilation;
11. Vent shaft escapeway;
12. Electrical power requirements, generation, and line installations;
13. Production flowlines;
14. Waste management and fuel storage;
15. Transportation requirements;
16. Reclamation plans;
17. Work force and timing;
18. Disturbance summary.

In addition to the environmental mitigation measures developed in Chapter 4 of the EA and those proposed in the POD, the following sections of the EA include environmental protection measures that also require implementation to ensure that undue or unnecessary environmental impacts to the environment do not occur as a result of the proposed action:

- Section 2.1.11: Reclamation
- Section 2.1.14: Applicant Committed Environmental Protection Measures (ACEPM)
- Appendix A: Poison Spider Reclamation Plan (from the POD).

Appendix C of the EA contains an Emergency Plan for the proposed action that includes a Mine Escape and Evacuation Plan required pursuant to MSHA Standard 57.11053.

Section 1.6 of the EA outlines the relationship of federal, state, county and local agencies to the Poison Spider UAORF project regarding NEPA compliance; BLM APD and Sundry Notice approvals; U.S. Fish and Wildlife consultation and coordination; Mine Safety and Health Administration (MSHA) healthy and safety requirements; local emergency response coordination; Wyoming DEQ air, water, and hazardous waste permitting and compliance; Wyoming DOT conformance; Wyoming State Division of Mine Inspections and Safety conformance and oversight inspections; Wyoming State Engineer's Office (WSEO) permitting requirements; Wyoming Oil and Gas Conservation Commission (WOGCC) authority, permitting, and regulatory requirements; and the Wyoming State Historic Preservation Office (SHPO) consultation requirements.

All of the above-referenced sections of the EA, the SUP, the Drilling Prognosis, the Reclamation Plan, and other applicable environmental protection, mitigation, monitoring, and safety measures presented and developed in the EA are incorporated by this decision into the POD for the Poison Spider UAORF project.

Necessary permits and authorizations from the Bureau of Land Management will be issued pursuant to the Mineral Leasing Act of 1920, as amended, and the Federal Land Policy and Management Act of 1976, as amended, and will be subject to the rules and regulations in 43 CFR 2800 and 43 CFR 3000, and the terms and conditions described below.

PROJECT BACKGROUND

Jones Draw and Greybull Projects

RWP has developed the technology for their underground access enhance oil recovery technique over several years and presently have four ongoing projects, including the Poison Spider project, in Wyoming involving similar applications of the UAOR process although differing somewhat in depth of tunneling and underground access methods. The Jones Draw project in southwestern Natrona County on the north flank of the Rattlesnake Hills is on federal oil and gas leases and involves an inclined tunnel to be constructed beneath the steeply dipping Lower Cretaceous Muddy Formation starting at a surface point beneath the Muddy Formation outcrop. The Jones Draw Notice of Staking was submitted to the CFO on January 31, 2006, and to date several core holes have been drilled to evaluate the subsurface extent and quality of the Muddy Formation target. The final POD and EA for the Jones Draw project have not been submitted to the CFO at this date.

The Greybull Project, located on fee mineral lands in the Greybull Field in Washakie County, Wyoming, involves an inclined tunnel extending from the surface downward several hundred feet to an underground location in a downthrown fault block from which wells are being drilled horizontally into the productive Upper Cretaceous Peay Sandstone reservoir located across the trapping fault in the up-thrown fault block. On September 12, 2006, CFO BLM representatives inspected the Greybull site and observed the underground construction, completed wells, and the

production facilities where 31 underground wells had been drilled to date and put into production.

RWP has another UAORF project in Eastern Wyoming on the west flank of the Black Hills that is in the early stages of development

Poison Spider UAORF Project

The Poison Spider project is located on the 560-acre federal oil and gas lease WYC 037870 and involves the construction of a 7.5-acre shaft surface area from which a 10½-foot diameter vertical shaft will be drilled with a large-bore drill rig to 1600 feet, which is below the level of the target Jurassic-age Sundance Formation. A grout curtain will be injected into the penetrated formations while drilling to protect water and oil zones. After completion, the vertical shaft will be lined with casing and cemented to surface. The casing provides the support for the installation of the utilities needed for the underground operations such as water and production lines, ventilation ducts, electric lines, and an equipment and personnel lift.

The 14-foot by 16-foot tunnel construction will extend 2000 feet horizontally from the vertical shaft below the target Sundance Formation; the tunnel roof will be supported by standard mining techniques including roof bolts, reinforcing mesh, and shotcrete. Disassembled tunnel construction equipment including a loader, header, haul trucks, drill, etc. will be lowered into the tunnel area and re-assembled in the tunnel/shaft area for service. During tunnel construction, the work area will be ventilated by a temporary fan and duct system; a permanent combination vent and emergency exit will be drilled from the surface to intersect the tunnel once tunneling operations reach the proposed vent shaft area.

Two or more drill stations capable of handling over 250 drill sites each will be constructed at pre-determined intervals along the tunnel. Each drill station will be permitted as a single APD by the BLM and WOGCC, and each APD will specify the center point of the drill station and the estimated number and location of well bores within each drill station. The wells will be drilled with a pneumatic drill from the drill station upward at various angles and distances into the overlying Sundance Formation; each drilling station will contain a closed mud-handling system designed to remove mud and cuttings from the drill hole to the surface and return fresh mud to the drill hole. Water for the drilling operations will be supplied from existing surface field operations initially, and eventually, from a new-drill water supply well in the project area or from project-produced water.

The 5 to 6-inch production boreholes will be completed either open-hole or through perforated casing in the oil reservoir and cased with 3-inch pipe from the tunnel wall into the oil reservoir. The produced fluids will flow through a closable 4-inch wellhead connection, through 1-inch flexible hydraulic line to a multiple well receiver header before being pumped to the surface. The receiver header is designed to monitor flow rates of any or all of the wellheads and contains a central pressure vessel designed to withstand pressures up to 1440 psi, well above the estimated working pressure of 810 psi. From the receiver header, the production fluids will be pumped to the surface oil-water treatment and storage facilities.

Four BLM and WOGCC-approved water injection wells will be required to dispose of the anticipated 20,000 bbl of water at peak production.

In addition to the portal entrance and its associated facilities, the 7.5-acre shaft surface area will be utilized for shaft and tunnel spoil storage, a drilling reserve pit, and an equipment and facility operational area. A 4.0-acre surface service facility will be constructed adjacent and east of the shaft area that will contain storage, maintenance, office, and parking facilities for the project. Another 5.5 acres of surface disturbance for a total of 17.0 acres of total disturbance will be required for additional access roads, water disposal wells, vent shaft construction, and storage areas. Approximately 8.4 acres of this surface disturbance will be phased short-term disturbance that will be reclaimed as the shaft and tunnel construction, and then the drilling phase of the proposed action is completed. Tables 2.2 and 2.3 in the EA summarize the amount of surface disturbance and the reclamation time frame for the proposed action.

In addition to the reclamation of surface disturbance resulting from implementation of the proposed action, the Poison Spider Reclamation Plan outlines a reclamation plan for 31.51 acres pre-existing surface disturbance in the project area commencing within one year of initiating tunnel excavation. Table 2 in the Reclamation Plan summarizes the pre-existing disturbance to be reclaimed and a timetable for reclamation, and includes the Poison Spider oil camp, existing well pads and access roads, and the slope area below the oil camp impacted by previous oil spills.

Shaft and tunnel construction is expected to last 12 to 18 months, while drilling is expected to last one to two years.

MITIGATION AND MONITORING

All construction, operations, maintenance, abandonment, reclamation, and any other activity associated with the Poison Spider UAORF project shall be implemented in accordance with the September 1, 2006 POD and the all of the measures incorporated into the POD as discussed above.

In order to ensure that undue or unnecessary environmental impacts to the environment are not occurring as a result of the proposed action RWP and representatives of the BLM authorized officer shall monitor project implementation through routine compliance inspections. All of the components of the submitted POD are not approved with this decision, and the approved components of the proposed action require additional notification to the BLM Authorized Officer prior to initiating construction, installation, and reclamation activities. The following table summarizes the BLM approval and notification requirements for the proposed action through the life of the project. The BLM Authorized Officer may impose additional reporting and monitoring requirements for the proposed action at a later date in order to ensure that undue or unnecessary environmental impacts to the environment are not occurring as a result of the proposed action. The BLM Authorized Officer may also impose additional mitigation or corrective measures if it is perceived that the proposed action is causing undue adverse impact to the environment in the project area.

**POISON SPIDER UDERGROUND ACCESS OIL RECOVERY PROJECT
SUMMARY OF BLM APPROVAL STATUS AND OTHER REQUIREMENTS**

Project Phase	Components	Approval Status	Additional Requirements	Comments
Portal area, service facility, topsoil storage area, access road construction	Portal, drilling pit, spoil storage, service facility area, topsoil storage, access roads, pipeline and power lines, access shaft, tunnel	Pre-approved with portal APD and POD	48 hour notification prior to beginning each separate construction phase	Sundry Notice required for any changes to POD submittal
Vent shaft surface area	Vent shaft drilling and associated installation	Requires approved APD for vent shaft drilling	48 hour notification prior to beginning each construction phase	Sundry Notice required for any changes to POD submittal
Tunnel drilling station with associated wells and production facilities	Drilling station, underground well drilling, underground and surface production facilities and pipeline installation	Requires approved APD for each drilling station	Center point location and estimated number and location of boreholes in APD	Maps and diagrams required for each new drilling station; new surface facilities maps not required if no change from POD
Water disposal well	Well drilling, pipelines and power lines	Requires approved APD for each water disposal well	Require POD that includes all potential water disposal wells	Require new maps for wells and infrastructure not included in POD
Interim reclamation	Interim reclamation of portal and vent shaft areas and other project-related disturbance areas including pit closure	Pre-approved with POD	48 hour notification prior to beginning each separate construction phase	Sundry Notice required for any changes to POD submittal
Reclamation of pre-existing disturbance	Oil camp, well pads, well access roads, oil spill impacted slope area	Pre-approved with POD	48 hour notification prior to beginning each separate reclamation phase	Sundry Notice required for any changes to POD submittal
Plugging and Abandonment (P&A)	Access and vent shafts, water disposal wells, underground wells	P&A Notice requires approval	Sundry Subsequent Report when completed	Master P&A procedure developed for wells in Drilling Station APDs
Final Abandonment Notice (FAN)	All project-related and pre-existing surface disturbance areas as described in the POD	Submit FAN when all surface reclamation successful	Requires successful reclamation for FAN approval and Bond release	Pre-existing disturbance reclamation approved through Sundry Notice approval.

RATIONALE FOR THE DECISION

The decision to approve the RWP Poison Spider UAORF project is based on the impact analysis contained in the above referenced EA. The analysis shows that there will be no undue or

unnecessary environmental impacts to the surface environment caused by construction, reclamation, operation, maintenance, or abandonment of the approved components of the proposed action which include:

1. Vertical shaft construction;
2. Tunnel construction;
3. Vent shaft construction;
4. Applicable surface-related construction, operations, maintenance, abandonment, reclamation, and any other surface activity associated with the Poison Spider UAORF project as described in this decision.

It is expected that as project phases are completed the information gained will lead to minor modifications to the proposed action outlined in the EA and POD; however, the overall environmental consequences from the modifications to the proposed action are anticipated to be similar to the impacts identified and described in the project EA. The determination that the reasonably foreseeable development can occur and likely not exceed the identified impacts relies upon the successful implementation of the following environmental protection and mitigation measures that were developed:

1. In Chapter 4 of the EA and included as Conditions of Approval (attached) to the proposed action;
2. In the proposed POD;
3. In the following sections of the EA:
 - o Section 2.1.11: Reclamation
 - o Section 2.1.14: Applicant Committed Environmental Protection Measures;
4. In the Surface Use Plan and Drilling Prognosis of the APD;
5. In the Surface Reclamation Plan.

The proposed action will recover oil from the existing Poison Spider Field by enhanced oil recovery methods utilizing underground gravity drainage technology that would otherwise remain in the reservoir, representing a significant loss of domestic oil production. Positive economic benefits will be realized from the increased daily oil production and the extended field life of the Poison Spider Field.

A No Action and an In-fill Drilling Alternative were analyzed in the EA. As presented in Table 2.4 of the EA, the total Life of Project (LOP) surface disturbance of 8.6 acres from the proposed action is much less than the estimated 80 acres of LOP surface disturbance that would be associated with the conventional In-fill Drilling Alternative for field development or the 31.7 acres LOP surface disturbance resulting from the No Action Alternative. Also, the No Action Alternative would not provide for additional oil production or an extended field life for Poison Spider Field. The proposed action is the preferred alternative because it involves less surface disturbance than the In-fill Drilling Alternative, and it will recover oil from the existing Poison Spider Field by enhanced oil recovery methods that would otherwise remain unrecoverable in the reservoir.

The approved components of the Poison Spider Underground Access Oil Recovery Facility project included in this decision are in conformance with the Platte River RMP (1985), BLM's land use plan guiding management of the federal land within the project area.

SCOPING

The CFO did not initiate public scoping on the Poison Spider UAORF project because the proposed action utilizes enhanced oil recovery technology and is entirely contained within a producing oil field. All project drilling submittals are posted for public review in the CFO.

Internal BLM scoping led to the identification of the following issues and concerns associated with the proposed action:

- Project impacts to the surface water (Poison Spider Creek and Oil Camp Spring) and groundwater resources, specifically water quality and quantity.
- Impacts to wildlife and their habitats.
- Increased traffic and associated impacts on existing county roads.
- Emissions from shaft and tunnel construction, and production operations, and power generation equipment.
- Noise from the construction operation and operation of the tunnel vent.
- Reclamation of disturbed areas.
- Social and economic impact to local communities and landowners.
- Effects to cultural resources.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Based on the analysis of the potential environmental impacts contained in the above referenced EA, I have determined that the impacts are not expected to be significant and an environmental impact statement is not needed.

APPEAL OPPORTUNITY

This decision is subject to appeal. Under BLM regulation, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) State Director Review, including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, WY, 82003 within 20 business days of the date of this decision.

APPROVED BY: _____
Patrick J. Moore
Assistant Field Manager,
Minerals and Lands

DATE: 9/29/2006

Attachment: Conditions of Approval