UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WIND RIVER-BIGHORN BASIN DISTRICT, LANDER FIELD OFFICE

ENVIRONMENTAL ASSESSMENT (EA) #: WY050-EA16-48

DUBOIS POPO AGIE FORMATION 2016 PALEONTOLOGICAL EXCAVATION PERMIT

Department of Geoscience, University of Wisconsin Geology Museum
University of Wisconsin - Madison
Township 41 North, Range 106 West, Section 7 N1/2SW1/4SW1/4
and Section 18 N1/2NE1/4NW1/4

I. INTRODUCTION:

On February 20, 2016, Dr. David Lovelace of the University of Wisconsin – Madison applied for a paleontological excavation permit with the Bureau of Land Management, Wyoming State Office. The specific proposal is to excavate fossil remains at a location in the red beds just south of the town of Dubois, in west-central Wyoming. These fossil remains are contained within the geological Popo Agie Formation of the Late Triassic Period (the Late Triassic Period roughly dates from 201-235 million years ago).

II. PURPOSE AND NEED FOR THE PROPOSED ACTION:

The Proposed Action is to allow University of Wisconsin-Madison to hand excavate up to 50 cubic meters on the bare slopes of two different badland clay-silt/sandstone locations. These localities may contain significant fossil resources, which can reveal important information about the Earth's geological and biological past.

III. CONFORMANCE TO APPLICABLE LAND USE PLAN:

The Proposed Action is subject to the Lander Resource Management Plan (RMP), approved on June 25, 2014. The Lander Field Office, as required by 43 CFR 1610.5, has determined that the Proposed Action is in conformance with the decisions, guidelines, terms, and conditions as described in the Lander RMP. The Lander RMP does not preclude surface disturbance in areas with fossil potential. The proposed research meets RMP Goal HR 14 and related objectives: "Facilitate the appropriate scientific, educational and recreational uses of paleontological resources, such as research and interpretation." HR 14.2: "Continue to work closely with paleontological researchers who carry permits to scientifically survey, collect, and excavate fossil resources on BLM-administered lands."

IV. COMPLIANCE WITH OTHER STATUTES AND REGULATIONS:

This Environmental Assessment is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended. The authority for the Paleontological Excavation Permit is Section 302(b) of the Federal Land Policy and Management Act of 1976, and Section 6304 of the Omnibus Public Land Management Act of 2009. The permit application has been submitted in conformance with Department of the Interior and Bureau of Land Management (BLM) regulations.

V. REMARKS:

In response to a paleontological resources excavation permit application from the University of Wisconsin-Madison, an on-site inspection (and archeological field inventory) was performed on June 24, 2016, by Craig Bromley, archeologist with the Lander Field Office of the BLM.

VI. PROPOSED ACTION AND ALTERNATIVES

Proposed Action: The Proposed Action is to authorize the Excavation Permit submitted by University of Wisconsin-Madison through David Lovelace, PhD. As a result of this approval, there will be on-the-ground actions as described below. Authorization of this permit is subject to the attached Conditions of Approval (see Exhibit "C").

Summary: Two separate localities are covered under the permit application: the Serendipity Site in the SW1/4SW1/4 of Section 7, and the Nobby Knob Site in the NE1/4NW1/4 of Section 18. Excavations would occur at these localities for several weeks each summer over the next three years.

The Serendipity Site locality is a long exposure of sandstone and mudstone on the top of a ridge. The mudstone has fossils in it and will be the matrix that the paleontologists are focusing on. This site has the potential for excavations at several locations along a 70 m stretch of exposed outcrop surface; they estimate a total of 15-20 square meters disturbance of surface area along the outcrop, with no more than 1 meter in total depth over the three years of the requested permit. The Nobby Knob Site locality is an exposure of loose mudstone at the base of bare 'badland' hill. Excavation at this locality would consist of at least 4 and up to 8 meters of lateral excavation. The lateral depth of the excavation would be no more than 3 meters back into the hill.

More details provided by the paleontologist are quoted here:

> "The two sites we propose to excavate are located very near the town of Dubois, WY. The first locality (aka, BLM fossil localities: Serendipity Site/D1/D15) is actually a stratigraphic bed that extends 70 meters along a north south trend. While we don't intend to excavate the whole length of the bed extensively, this entire interval is a zone of incredible interest. The second locality (Nobby Knob)

is 600 meters to the southeast and is located at the base of an isolated 'badlands' style mudstone knob. The mudstone overlies a competent intra-formational silty-conglomerate that forms a platform with some breadth. The following descriptions will discuss the…..methodology proposed for each site."

"The initial plan [at the Serendipity Site] is to remove a section of the overlying sandstone (3x2 m) to expose the bed of interest in order to map out burrow density and size distribution. Depending on the success of the first pit, we would like to have the ability to do this at several points along the outcrop, which is effectively 70 meters long. Fortunately the amount of overburden is not extensive, and the bed of interest itself is not very thick. This will minimize the total amount of disturbance. Thus far, the only effective way of locating specimens is by splitting and breaking the layers apart. This is mainly due to the fact that these small skeletons are completely surrounded by a very indurated fine-grained sandstone. Also, considering the amount of effort it will take to split the rock we do not anticipate there being a great deal of total disturbance (15-20 square meters of surface area along the outcrop, and no more than 1 meter in total depth over the three years of the requested permit). The excavations, although close to the road, would not impact the long-term stability of the trail."

Nobby Knob Site: "Excavation [at the Nobby Knob Site] would consist of at least 4 and up to 8 m of lateral excavation. The site is located at the bottom of the hill, and as such there is a reasonable limit to the depth into the hill we could go before the amount of overburden becomes excessive; this would likely be within three meters of depth. The parent matrix is a mudstone that has been (paleo) pedogenically modified and erodes at the surface into typical badlands topography. Natural erosion of the mudstone would help reclaim the site, and there is no vegetation that will be disturbed. Ingress and egress is simplified by the presence of a trail, initially part of the same road above the Serendipity Site, and then splits into smaller one track (motorcycle/cattle trail?) that leads to the base of the outcrop. Excavated matrix, removed by small hand tools, would be transported to a 'spoils pile' that would be used to backfill the quarry each season. Erosion controls would be implemented where possible to protect both the quarry and the local environment."

"Excavations would take place during the last week of July and into the first two weeks of August. If there are other times that this is not reasonable due to potential impact to wildlife we will be certain to avoid those date ranges. Considering the site is literally on the edge of town I would envision this not being too great of a concern, although, as always, we will ensure a responsible and respectful relationship with the environment. This includes cleaning up and back filling excavations to the best of our abilities, minimizing foot traffic impact (the road is an obvious ingress and egress point), and maintaining the leave no trace policy with respect to all non-excavation activities. All fossils will be curated at the UW Geology Museum, Madison, WI."

Principal Investigators and Supervisors: Dr. David Lovelace and Dr. Richard Slaughter, both paleontologists at the University of Wisconsin, Madison, will be responsible for planning, supervising, and coordinating the excavations and removal of any fossils that are discovered.

1. Field Camp: No field camp is envisioned for this project. The crew (no more than 8 persons) will stay in Dubois and will park on existing trails near the fossil locality areas.
2. Access: After driving on existing trails to get close to the localities, the crew will walk into the excavation site each day. No off-road motorized travel has been proposed.
3. Excavation and Screening: At the locality, the crew would use hand tools to excavate the matrix. Screening would occur on bare ground close to the excavation area, and the hole would be backfilled each year with the screened material.
4. Collection and Curation: Any recovered fossils or associated materials would be transported to University of Wisconsin - Madison for preparation, detailed photography, measurement, and analysis. After completion or research, the fossils would be curated at UW-Madison.
5. Reclamation: All excavation areas would be backfilled by hand after each field season. Topsoil, if any, would be saved to enhance re-vegetation.

Alternatives: No alternatives other than the No Action Alternative are practicable for this project. There are no alternative locations that would be suitable to achieve the identified research objectives.

Under the No Action Alternative, the excavation permit would not be approved, and the area would not be disturbed. The paleontological specimens would not be recovered, and potentially significant scientific information would not be retrieved.

VII. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES - PROPOSED ACTION

General Setting: The proposed excavation locality is approximately ½ mile south of Dubois, Wyoming, in west-central Wyoming. The general area is a badland and bench landscape of tilted sandstone, siltstone, and mudstone rocks and sediments cut by north flowing ephemeral and perennial drainages. The area is used for bighorn sheep habitat, recreational activities, and livestock ranching activities.

Affected Resources: The following mandatory critical elements have been reviewed for the Proposed Action:

Critical Element	Affected Yes	Affected No	Critical Element	Affected Yes	Affected No
Air Quality	___	X	T & E Species	___	X
ACECs	___	X	Waste, Hazard./Solid	___	X
Cultural Resources	___	X	Water Quality (Surface & Ground)	___	X
Farmlands,Prime/Unique	___	X	Wetland/Ripar. Zones	___	X
Nat.Amer.Relig.Concerns	___	X	Wilderness	___	X
Invasive, Non-native Species	___	X	Environmental Justice	___	X

Additionally, a more detailed description of resources affected by the Proposed Action is listed here:

1. Vegetation: The rather barren area contains a limited range of vegetation. Some of the native plants that inhabit the sites are: Wyoming Big sagebrush, milkvetches, rabbitbrush, globemallow, and grasses such as bluebunch wheatgrass, needle and thread, Indian ricegrass, and junegrass.

   The area also has a variety of noxious and secondary weeds present. The noxious weeds present are: houndstongue, leafy spurge, hoary cress, Russian knapweed, musk thistle, quackgrass, and Canada thistle. Annual mustards and cheatgrass occur along the dirt roads and areas of heavy historic livestock use.

   It is anticipated that only a slight loss of vegetation will occur from this project, as the small crews will be on foot and the excavation area is largely devoid of vegetation.

2. Wildlife/T&E Species:

   General Wildlife: The paleontological permit area is located in the Northern Intermountain Desertic Basin (NRCS 2006) and is typically inhabited primarily by small mammals such as ground squirrels, prairie dogs, and various other rodents, rabbits, and burrowing species. In addition, it may also include various small bird species. These lesser species are, in turn, preyed upon by larger carnivores such as fox, coyote, badger, skunk and raptor species such as golden eagles and various hawks. In addition, the project area is within crucial winter and yearlong habitat for bighorn sheep, but the biologist has stated that this project will no effect on the habitat. Larger carnivores such as wolves and mountain lion may also be present.

Threatened, Endangered, Special Status Species: The BLM Wildlife Biologist has determined that there are currently no federally-listed, threatened, endangered, or candidate species or suitable habitats known to occur in the area (see attached wildlife clearance). However, a review of the Wyoming BLM Sensitive Species List indicates that the following animal species may occur in the project area: Raptors and Sagebrush Obligate Bird Species (i.e. Sage Thrasher, Loggerhead Shrike, and Sage Sparrow). However, a survey by biological interns done on July 7, 2016 did not discover any nests.

Surface disturbance or occupancy with 0.75 mile of raptor nests is prohibited from February 1 through July 31 of each year. The July 7 survey saw some red-tailed hawks hovering in the area, but they left after a few minutes and did not indicate that they had nests nearby.

Sensitive Species: The July 7 survey also searched for occurrences of Dubois milkvetch, a BLM Sensitive Species plant. A total of nine probable Dubois milkvetch plants were flagged and GPS'd in or near the proposed permit area. Avoidance of these individual plants will be stipulated to protect them.

3. Cultural/Paleontological Resources. A Class III intensive field inventory was conducted over the two project areas. No cultural resources were located in or near the project areas. Paleontological resources are present and would be affected through scientific excavation and study. Through removal of the fossils found at these localities, greater understanding of the life forms and environment that existing during the Triassic Period could occur.

4. Visual Resources. The project area is visible from the town of Dubois and was analyzed for visual impacts on the general area's setting. The short duration of the visits by the paleontologists and the very minor surface disturbance that would be caused each year would not cause any significant visual impact on the area, and no further consideration is necessary.

VIII. CUMULATIVE AND RESIDUAL IMPACT ANALYSIS:

This portion of BLM lands in Fremont County has been reserved for the maintenance and improvement of Bighorn sheep habitat, and BLM has actively participated in encouraging this use. The proposed paleontological project is expected to disturb less than 50 cubic meters in an area of bare mudstone/sandstone-covered slopes and very sparse vegetation. Repeated use of this location for excavation of fossil remains could cause a slight loss of vegetation, which may temporarily increase erosion in the area. Some displacement of animals may also occur from increased human presence. However, these effects will be temporary and will be largely mitigated by backfilling and the removal of human presence after the project is finished.

The paleontological resources will also be affected in the long term as well. Removal and study of the resources could result in greater knowledge of the geological and biological history of the

Triassic Period. These specimens have the potential to add significantly to our understanding of the environment in which the Popo Agie Formation was laid down.

IX. DESCRIPTION OF MITIGATION MEASURES:

All mitigation has been added to the excavation permit as BLM-applied Conditions of Approval (see Exhibit "C"). This EA was written with the Conditions of Approval as part of the Proposed Action. Refer to previous sections for detailed mitigation discussions. Monitoring will be done by LFO Archeologists and Wildlife Specialists to insure compliance with this authorization.

X. PERSONS/AGENCIES CONSULTED:

David Lovelace, Paleontologist Ph.D, University of Wisconsin - Madison
Tom Verheul, Ranch Manager, Three Spear Ranch, Dubois, Wyoming
Brent Breithaupt, Paleontologist, Bureau of Land Management Wyoming State Office, Cheyenne
Tim Vosburgh, Wildlife Biologist, Lander Field Office
Emma Freeland, Botanist, Lander Field Office
Rachel Dennis and Lara Grevstad, Botanical Interns, Lander Field Office

XI. ADDENDA:

Exhibit "A": Excavation Localities Topographic Map
Exhibit "B": Conditions of Approval
Exhibit "C": Cultural Resources Clearance
Exhibit "D": Wildlife Clearance
Exhibit "E": Photographs of the Project Area