UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
BURNS DISTRICT OFFICE

CATEGORICAL EXCLUSION ENVIRONMENTAL REVIEW AND APPROVAL

CX Number: DOI-BLM-OR-B050-2012-0034-CX
File Code (Project/Serial Number):
Preparer: Rick Wells, Geologist
Title of Proposed Action: Diamond Crater coring investigation

Date: 6/06/2012
Applicant: David R. Sherrod, U.S. Geological Survey
1300 SE Cardinal Court, Vancouver, WA 98683

Description of Proposed Action and Project Design Elements (if applicable): The proposal is for 3-5 people to use a portable Milwaukee drill, 1000-watt generator, and small water pumps to supply up to 10 gallons of water per hole (two holes total) in a coring operation for research purposes. The coring or drill holes are approximately three inches in diameter to a depth that is less than 15 feet. The water and all accessories (including water) are hauled in my hand with the largest being the generator. The noise generated would be from the portable generator and drill. There is expected to be several vehicles that remain on the roads and within designated parking areas. No overnight camping. The location would be in each of the Twin Craters also referred to as the explosion craters. The purpose of the work would be research in determining the cause of the flat floor; with the expectation that the crust of a 7000-year old "lave lake" is the cause. The information collected will be utilized within a soon to be published professional paper that will help to explain the history of the Craters; thus could be used for public education and resource appreciation of the area.

The purpose of the drilling is to get below the thick ash layer to aid in uncovering the geologic history of the site to improve our understanding of its history. The plan is to follow the 'Leave No Trace' guideline, containment for gasoline, water will be used for the drilling, and the drill cuttings will be used to backfill the hole so that it will be flush with the surface. The expectation is that after a few months there will be little visible signs of the work. Please note that this has been an on-going investigation and nearing completion and we will be provided with the information that can be utilized in our public education efforts. The work is planned after min-July and prior to the end of September.

See the attached documentation provided from the applicant.

Legal Description (attach Location Map): WM. NE ¼ of Section 31, T. 28 S., R. 32 E.

B. Conformance with Land Use Plan (LUP) (name): Three River Resource Management Plan Record of Decision
Date Approved/Amended: September 1992

The proposed action is in conformance with the applicable LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decision(s) (objectives, terms, and conditions):

The proposed project is within the Diamond Craters ONA/ACEC (Outstanding Natural Resource/Area of Critical Environmental concern (Map ACEC-3, page 2-143). Under objective R2.16 (page 2-121) it states "Provide information and educational opportunities to enhance experiences and increase knowledge of the use and protection of natural resources,..", subsection 2. states "Interpretation of designated special management areas… Diamond Craters ONA…", and in subjection 4. it discusses interpretive sites. The LUP provides for interpretation, which is the end goal of the on-site work; Page 2-125 13. Provide interpretation using trailguides and brochures and small on-site location makers rather than installing interpretive signs. The LUP does not allow the resource to be destroyed or significantly altered; there the proposed action is stated to not be detected after short period of time; Page 2-126 Maintain natural conditions at points of interest where visitors use and recreational developments could destroy or significantly alter resource values.

BLM Categorical Exclusion Reference (516 DM, Chapter 11):

DOI Categorical Exclusion Reference (516 DM 2, Appendix 1): 1.11 Activities which are educational, informational, advisory, or consultative to other agencies, public and private entities, visitors, individuals or the general public.

Screening for Exceptions: The following extraordinary circumstances (516 DM 2, Appendix 2) may apply to individual actions within the categorical exceptions. The indicated specialist recommends the proposed action does *not*:

CATEGORICAL EXCLUSION EXTRAORDINARY CIRCUMSTANCES DOCUMENTATION
2.1 Have significant impacts on public health or safety.
Specialist (Print Name and Title): John Petty, Safety and Occupational Health Manager Signature and Date: 6/6/12
Rationale: No significant impacts on public health or safety.

2.2 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 (Executive Order 11990); flood plains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas.

Migratory Birds
Specialist (Print Name and Title): Jason Brewer, Wildlife Biologist
Signature and Date: Jason Brewer 6/6/12

Rationale: Work started after the raven's fledge (typically mid-July (Stiehl 1985)) from the nest in the eastern crater would avoid impacts to this species, as well as other birds that may be nesting in the immediate area of the craters. Due to the proximity of the drilling to the active nest, any of the proposed work started prior to fledging would likely cause raven nest to fail. The short duration, minimal area impacted, and timing of the proposal (if done after mid-July) would not cause or lead to significant impacts to migratory birds.

Historic and Cultural Resources
Specialist (Print Name and Title): Scott Thomas, District Archeologist
Signature and Date: 6/6/12

Rationale: No historic or cultural resource would be affected by this proposed project.

Areas of Critical Environmental Concern/Research Natural Areas
Specialist (Print Name and Title): Caryn Meinicke, Natural Resource Specialist (Botany)
Signature and Date: 6-6-12

Rationale: There are no ACEC/RNAs within the proposed project area.

Water Resources/Flood Plains
Specialist (Print Name and Title): Lisa Grant\Lindsay Davis, Biologist
Signature and Date: L Davis 6/11/12

Rationale: No water resources or flood plains would be affected by this proposed action.

Soils, Biological Soil Crust, Prime Farmlands
Specialist (Print Name and Title): Caryn Meinicke, Natural Resource Specialist (Botany)
Signature and Date: 6-6-12

Rationale: Soils and BSCs will not be impacted by the proposed action. There are no prime farmlands within the proposed project area.

Recreation/ Visual Resources
Specialist (Print Name and Title): John Bethea, Outdoor Recreational Planner
Signature and Date: John P. Bethea 6-6-12

Rationale: Diamond Craters is in a VRM Class II area which requires retention of the landscape character. The core drilling operations are for 3-5 people to drill two small holes 3" in diameter and 15' deep which will only take 2-3 days. After the project is completed the holes will be filled in with the same material that was drilled out. The visual effects would be minimal and short term with no lasting impacts. The short duration, minimal area impacted, and any noise created by the drilling operations would have very little effect on any recreational activities.

Wilderness/Wild and Scenic River Resources
Specialist (Print Name and Title): Eric Haakenson, Outdoor Recreational Planner (Wilderness Specialist)
Signature and Date: Eric Haakenson 06/06/12

Rationale: The site is not located within a WSA, WSR, or CWC

2.3 Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section 102(2) (E)].

Specialist (Print Name and Title): Rhonda Karges, Planning and Environmental Coordinator
Signature and Date: Rhonda Karges 6/6/12

Rationale: There are no known highly controversial environmental effects or unresolved conflicts concerning alternative uses of available resources. The effects would be short-term (days) and would not have any lasting effects.

2.4 Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks.

Specialist (Print Name and Title): Rhonda Karges, Planning and Environmental Coordinator
Signature and Date: Rhonda Karges 6/6/12

Rationale: Implementation would not have any known uncertain or potentially significant environmental effects or involve unique or unknown environmental risks. The effects of the research project would last only a few days and would not have any lasting, visual effects.

2.5 Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects.

Specialist (Print Name and Title): Rhonda Karges, Planning and Environmental Coordinator
Signature and Date: Rhonda Karges 6/6/12

Rationale: Implementation would not establish a precedent or future actions or represent a decision in principle about future actions with potentially significant environmental effects. The effects of the research project would last only a few days and would not have any lasting effects.
2.6 Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects.
Specialist (Print Name and Title): Rhonda Karges, Planning and Environmental Coordinator Signature and Date: Rhonda Karges 6/6/12
Rationale: Implementation would not have any known direct relationship to other actions with individually insignificant but cumulatively significant environmental effects. The effects of the research project would last only a few days and would not have any lasting effects.
2.7 Have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by either the bureau or office.
Specialist (Print Name and Title): Scott Thomas, District Archeologist Signature and Date: 6-6-12
Rationale: No eligible or National Register listed properties would be affected by this proposed project.
2.8 Have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species.
Endangered or Threatened Species-Fauna Specialist (Print Name and Title): Jason Brewer, Wildlife Biologist Signature and Date: Jason Brewer 6/6/12
Rationale: There are no Threatened or Endangered terrestrial species or designated critical habitat at or near the proposed project.
Endangered or Threatened Species-Aquatic Specialist (Print Name and Title): Lisa Grant/Lindsay Davis, Fish Biologist Signature and Date: L. Davis 6/11/12
Rationale: There are no Threatened or Endangered aquatic species or designated critical habitat within the vicinity of the proposed action.
Endangered or Threatened Species-Flora Specialist (Print Name and Title): Caryn Meinicke, Natural Resource Specialist (Botany) Signature and Date: 6.6.12
Rationale: There are no documented Threatened or Endangered or Special Status plant species or designated critical habitat within the proposed project area.
2.9 Violate a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment.
Specialist (Print Name and Title): Rhonda Karges, Planning and Environmental Coordinator Signature and Date: Rhonda Karges 6/6/12
Rationale: No known law or requirement imposed for the protection of the environment would be violated
2.10 Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898).
Specialist (Print Name and Title): Rhonda Karges, Planning and Environmental Coordinator Signature and Date: Rhonda Karges 6/6/12
Rationale: Implementation would not have a disproportionately high or adverse effect on low income or minority populations as such populations do not exist in the project area.
2.11 Limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007).
Specialist (Print Name and Title): Scott Thomas, District Archeologist Signature and Date: 6-6-12
Rationale: Access to or integrity of Indian sacred sites would not be affected by this proposed action.
2.12 Contribute to the introduction, continued existence, or spread of noxious weeds or nonnative invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112).
Specialist (Print Name and Title): Lesley Richman, Natural Resource Specialist (District Weed Coordinator) Signature and Date: Lesley Richman 6/7/2012
Rationale: Noxious weeds are known to be present in relatively close proximity to this area. Treatments are on-going. The weeds are not present in sufficient quantity to be considered a significant impact at this time. The proposed project should cause minimal impacts to noxious weeds.

Additional review (As determined by the Authorized Officer):

RMP conformance and CX review confirmation:

Specialist (Print Name and Title): Rhonda Karges, Planning and Environmental Coordinator

Signature: Rhonda Karges Date: 6/6/12

Management Determination: Based upon review of this proposal, I have determined the Proposed Action is in conformance with the LUP, qualifies as a categorical exclusion and does not require further NEPA analysis.

Authorized Officer (Print Name and Title): Richard Roy, Three River Field Manager

Signature: Richard Roy Date: 6/8/12

Note: A separate decision document may be prepared for the action covered by this Categorical Exclusion following program-specific guidance.

Decision: It is my decision to implement the Proposed Action with Project Design Elements (if applicable) as described above.

This decision may be appealed to the Interior Board of Land Appeals (IBLA), Office of the Secretary, in accordance with regulations contained in 43 Code of Federal Regulations (CFR), Part 4 and Form 1842-1. If an appeal is filed, your notice of appeal should be mailed to the Burns District Office, 28910 Highway 20 West, Hines, Oregon 97738, within 30 days of receipt of the decision. The appellant has the burden of showing the decision appealed is in error.

A copy of the appeal, statement of reasons, and all other supporting documents should also be sent to the Regional Solicitor, Pacific Northwest Region, U.S. Department of the Interior, 805 SW Broadway, Suite 600, Portland, Oregon 97205. If the notice of appeal did not include a statement of reasons for the appeal, it must be sent to the Interior Board of Land Appeals, Office of Hearings and Appeals, 801 North Quincy Street, Arlington, Virginia 22203. It is suggested appeals be sent certified mail, return receipt requested.

Request for Stay

Should you wish to file a motion for stay pending the outcome of an appeal of this decision, you must show sufficient justification based on the following standards under 43 CFR 4.21:

- The relative harm to the parties if the stay is granted or denied.
- The likelihood of the appellant's success on the merits.
- The likelihood of immediate and irreparable harm if the stay is not granted.
- Whether or not the public interest favors granting the stay.

As noted above, the motion for stay must be filed in the office of the authorized officer.

Richard Roy
Richard Roy, Three River Field Manager

6/8/12
Date

May 7, 2012

Richard Roy (rroy@blm.gov)
BLM Burns district office
28910 Hwy 20 West
Hines, OR 97738

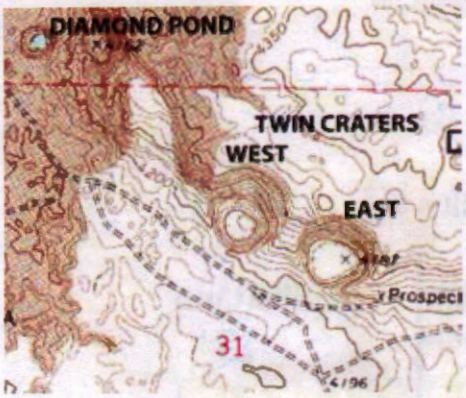
Richard,

Herein is a request to conduct research on BLM land within Diamond Craters ONA in Harney County, Oregon, in June 2012. This request is specifically for determining the cause of the flat floors at Twin Craters (explosion craters). The request may meet the criteria of 43 CFR 2932.12 (a), a deliberation for you to decide. Included with this letter is, I hope, sufficient information to judge the merits of my request.

WHAT?
I propose to use a small generator-powered coring drill to penetrate the 3-4 m of expected ash thickness, with the expectation that the crust of a 7000-yr-old "lava lake" is the cause of the flat floor in each of these craters. Figuratively, it's like pushing a straw through the icing on a flat-topped cake to see if similar cake is encountered at three random sites (three points define a geometric plane).

WHEN?
Early June 2012, probably two or three days in the June 11-15.

WHERE?
See attached map showing the east and west Twin Craters, on the Diamond Craters lava field.



WHAT IS THE LONG-TERM GOAL?
To determine the sequence of events during the Diamond Craters eruptive period as it may have been preserved at depths in the east and west craters (Twin Craters), the only flat-floored explosion craters in the Diamond Craters complex.

This drilling approach is necessary because the craters are now thickly mantled with ash. The geologic sequence of events, hopefully to be resolved is (1) emplacement of lava flows across the flow field, (2) inflation of the western part of the flow field into what is called the northwest or west dome, (3) explosions that ripped through the new domed area to make the Twin Craters, (4) **upwelling of lava to form a lava lake (cooled now!) whose surface in each crater would be essentially flat**, and (5) eruption of great quantities of ash from Diamond Craters vents farther east, burying the lava lake surface beneath 3-4 m of ash.

If I can get through the ash at random points in each crater (and hit youthful lava in each case), then the idea about lava lakes as explanation for the flat flooring would be nailed, so to speak.

HOW DOES IT WORK?
I've included some photos. The set-up is fairly basic and simple, more so than it might seem on its face. A two-person job.
The drill: 10-amp Milwaukee drill on a drill stand. The coring bit is 3-inch diameter. Water cooled. A 1000-watt generator powers the drill and the small pump used for the water cooling.
Size of operation: Everything is small enough to be carried by hand (two people lug the generator). Water use is about 10 gallons per hole. We portage the stuff to site. No offroad vehicle use is proposed.
Noise: The generator is as noisy as that of an RV generator in a campground. It would be noticed only by people who approach the rim of each crater.

HAZARDS AND AMELIORATION
Fire hazard is low in June. Conventional tools, including water, would be on site for fire surpression if needed.
Gasoline spillage. This is largest hazard, stemming from the need to fuel the generator. The generator will be placed on a tarp to catch potential spills. A haz-mat kit suitable for the operation will be on hand.
Cooling water is clean potable water, so we waste it in the hole.
Noise from the operation is probably the most objectionable thing.

THE DAMAGE?

I expect zero net damage. Material removed during the drilling is spread onto an adjacent tarp temporarily, then replaced into the hole at conclusion. Some soil disturbance from the work might be recognizable for a few weeks following the drill, but the sites would be indistinguishable from neighboring ground after one rainy season.

CONDITIONS WE ARE PLEDGED TO MEET (PLUS OTHERS YOU MAY SPECIFY)

**This sampling will follow the description contained herein.

**"Leave No Trace" guidelines will be followed.

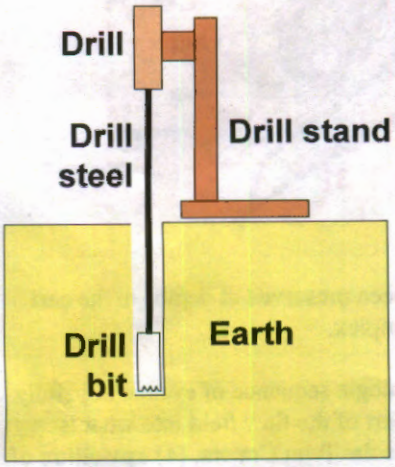
**No off-road vehicle use is needed.

**We agree to contact a designated BLM representative three days prior to visiting the area for any last-minute information on closures or restrictions that may be in effect.

IS THIS WORK REALLY NECESSARY?

I've pushed my mapping, sampling, dating, and interpretation of the flow field as far as I can. One of the few remaining questions that may be addressed handily is the sequence of geologic events. This proposal arises because the technique is simple, the materials few, the hazard nil, and the lasting landscape effect essentially zero.

Applicant and permittee: David R Sherrod, U.S. Geological Survey, 1300 SE Cardinal Court, Vancouver, WA 98683 (360-993-8915).
dsherrod@usgs.gov



Basic setup. The drill is the kind commonly used for sidewalk coring or other light construction purposes. We have the equipment because of the need for rock drilling for GPS masts or for borehole tiltmeters.

Here's how it looks in operation, in this case from about 11,000 ft altitude on Mauna Loa. Electric drill powered by portable generator. Hose brings water from the blue cans in background. Drill stand guides the drill up or down. Everything can be carried by one person (repeated trips, of course). The generator, 100 pounds, requires two people.