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MEMORANDUM TO: Rasool Anooshehpoor, Seismologist/Geophysicist
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Office of Nuclear Regulatory Research

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SUBJECT: CATEGORICAL EXCLUSION DETERMINATION
PALEOLIQUEFACTION STUDIES OF THE CENTRAL VIRGINIA SEISMIC ZONE

The Office of Nuclear Regulatory Research proposes to investigate earthquake-induced paleoliquefaction features in alluvial sediment along rivers near the 2011 Mineral, Virginia earthquake location in central Virginia. The objective is to gain a better understanding of the earthquake history of the Central Virginia Seismic Zone (CVSZ). The scope of work is outlined in Solicitation No. RFP-31310019R0043 (NRC 2018). It consists of selecting study areas, conducting river surveys, analyzing and interpreting results, and preparing a final report and scientific articles. The investigation will increase NRC's understanding of the earthquake potential in the CVSZ and contribute to hazard assessments of nuclear power plant sites in the Mid-Atlantic region.

The Office of Nuclear Regulatory Research has selected M. Tuttle and Associates (MTA) to perform the work. Work activities under MTA's proposal (MTA 2019) follow the Statement of Work. The proposed field work consists of experts visiting river cutbanks (eroded cliffs at the edge of the channel) along 75 kilometers of river in central Virginia, describing and photographing liquefaction features and stratigraphic units, recording locations of interest using global positioning system (GPS units), and collecting soil samples from the cutbanks for laboratory analysis (MTA 2019). The exact river segments to be visited are to be determined, but are expected to involve portions of the James, North Anna, Pamunkey, Mattaponi, Rivanna, and South Anna Rivers, their tributaries, as well as possibly some tributaries of the Potomac River. Field locations will be visited using canoes, motorboats, or on foot (MTA 2019).

The NRC staff has evaluated the proposed action against the standard set forth in 10 CFR 51.22, and has determined that the proposed action meets the provisions of Categorical Exclusion 10 CFR 51.22(c)(6). Categorical Exclusion 10 CFR 51.22(c)(6) covers:

> Procurement of technical assistance, confirmatory research provided that the confirmatory research does not involve any significant construction impacts, and personal services related to the safe operation and protection of commercial reactors, other facilities, and materials subject to NRC licensing and regulation.

The scope of work constitutes “technical assistance” and “confirmatory research” that is “related to the safe operation and protection of commercial reactors.” Therefore, as long as the proposed work does not result in “any significant construction impacts,” it falls within the purview of the categorical exclusion. The following analysis therefore focuses on the potential for the work to result in “significant construction impacts,” especially the potential for field investigation work to physically disturb soils, substrates, banks, and aquatic and riparian vegetation and other biota. Other than the field work, the proposed action is purely administrative with no potential for significant environmental impacts.

Normal operation of canoes or motorboats in rivers or streams would not significantly disturb the river structure, including banks, substrates, riparian lands, or the aquatic or terrestrial biota contained therein. Traversing riparian areas on foot, including climbing on banks or wading in the riverbed, by small groups of scientists and technicians would also not result in significant temporary or permanent physical disturbance of soils, substrates, vegetation, or other biota. Hand collection of small quantities of soil from river banks for laboratory analysis would result in a small amount of permanent physical disturbance, but is unlikely to noticeably affect the physical integrity of the banks or the geological information they contain. The personnel collecting the samples would be trained in proper geological sampling techniques.

No use of motorized grading or excavation equipment such as bulldozers or backhoes is proposed. Should motorized excavation equipment be needed, NRC staff would have to reevaluate whether the action is still covered by the categorical exclusion.

Accordingly, the action meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(6). Pursuant to 10 CFR 51.22(b), the staff will therefore not prepare an environmental impact statement or environmental assessment.

The staff has determined that, because the proposed action would not substantially disturb natural aquatic or terrestrial habitats, it would have no effect on threatened or endangered species or critical habitats protected under the Endangered Species Act. The staff therefore does not plan to consult with the U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 7 of the Endangered Species Act.

The staff has also determined that, because the proposed action would not involve substantial ground disturbance or alter the visual appearance of any landscapes, it would not have any effect on historical or archaeological cultural resources. The staff therefore does not plan to consult with the State Historic Preservation Officer or with tribal officials under Section 106 of the National Historic Preservation Act.

References

MTA (M. Tuttle and Associates). 2019. Proposal in response to U.S. Nuclear Regulatory Commission RFP-31310019R0043 entitled “Paleoliquefaction Studies of the Central Virginia Seismic Zone,” August.

NRC (US Nuclear Regulatory Commission). 2018. Solicitation RFP-31310019R0043. November

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PALEOLIQUEFACTION STUDIES OF THE CENTRAL VIRGINIA SEISMIC ZONE, DATED: APRIL 30, 2020

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