

**National Environmental Policy Act (NEPA),Categorical Exclusion (CX) for Installation of  
MAXLAB Geothermal System (3618X)**

The Department of Energy Oak Ridge Office (DOE-ORO) proposes to install a geothermal heat pump system for the proposed Maximum Energy Efficiency Building Research Laboratory (MAXLAB) that is planned to be constructed at the Oak Ridge National Laboratory (ORNL). The geothermal heat pump system has been proposed for the new building to meet the DOE requirement for building energy efficiency of 30 percent better than the American Society of Heating, Refrigerating and Air-Conditioning Engineers requirements. Construction of the MAXLAB is covered by the *Oak Ridge National Laboratory Facilities Revitalization Project* (DOE/EA-1362, June 2001). Subsequent planning and initial design after the issuance of the Finding of No Significant Impact for the ORNL revitalization project have resulted in efforts to conserve energy in future new facilities. The proposed action would take place south-east of the intersection of Bethel Valley Road and Fifth Street in existing asphalt-paved parking and surrounding cleared areas at the Laboratory.

The proposed action would involve installing a 60-ton closed loop geothermal cooling system that would include an intermediate biodegradable propylene glycol heat exchange medium running through piping buried vertically in the ground at the proposed MAXLAB site. Depending on information obtained from the exploratory well, either a shallow or deep well system would be installed. A shallow geothermal system would consist of an array of approximately 20 to 30 one-to two-inch diameter horizontal pipes buried 5 to 10-feet deep, and a deep well geothermal system would consist of approximately 20 to 30 well pipes (4.5-to 6-inch diameter with 1 to 2-inch diameter U-tube pipes) installed vertically approximately 350 feet deep and grouted with a silicate base grouting material.

An exploratory well would be installed at the site to obtain data to determine whether the final design requirements would support a shallow or deep heat pump system. The exploratory well will help determine zones of excess porosity in addition to locating water bearing zones so that grouting issues are known prior to design, drilling, and installation of a deep closed loop geothermal system if selected.

Waste would include standard excavation debris (soil, rock) which would be collected at the site and either reused as fill material or disposed of at a State permitted landfill site. Liquid waste, which will include rinse water from drilling and grouting equipment, will be properly disposed of in accordance with existing waste management procedures and practices.

The proposed geothermal well system would be located within the CERCLA Bethel Valley Groundwater Operable Unit. Although the location of the geothermal well array is within this unit, appropriate techniques will be taken during drilling and installation of the geothermal well array to minimize impacts to groundwater resources. Also, the geothermal system will operate within design parameters, to minimize impacts to groundwater resources. No surface water would be impacted by the proposed action.

Drilling activities will be performed by a certified driller and the installation of the geothermal system will follow guidelines of the International Ground Source Heat Pump Association and the National Groundwater Association recommendations. A Notice of Intent will be submitted to the Tennessee Department of Environment and Conservation for the proposed action. However, no new permits or modifications to existing permits would be needed.


The proposed action would not adversely impact architectural or historic resources and would not involve disturbing sites that provide a natural habitat for threatened or endangered animal or plant species. No wetland disturbance would take place, and the proposed action would not take place within the 100-year floodplain of any surface water body.

This project would pose no threat of significant individual or cumulative environmental effects. The proposed action would not be part of an ongoing Environmental Assessment or Environmental Impact Statement. No extraordinary circumstances would be related to this action, and the proposal would not be connected to other actions with potentially significant impacts.

The applicable CX under 10 CFR 1021, Subpart D, Appendix B, for this action is as identified below:


B5.1 Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

The above description accurately describes the proposed action, which reflects the requirements of the CX cited above. Therefore, I recommend that the proposed action be categorically excluded from further NEPA review and documentation.

  
W. Mark Belvin  
DOE-ORO Program Manager

12/22/10  
Date

Based on my review and the recommendation of the DOE-ORO Program Manager, I have determined that the proposed action is categorically excluded from further NEPA review and documentation.

  
Gary S. Harman  
DOE-ORO NEPA Compliance Officer

1/6/2011  
Date