

PMC-EF2a

**U.S. DEPARTMENT OF ENERGY  
EERE PROJECT MANAGEMENT CENTER  
NEPA DETERMINATION**



RECIPIENT: West Chester University

STATE: PA

**PROJECT TITLE :** Design and Implementation of Geothermal Energy Systems at West Chester University

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000116	DE-EE0004348	GFO-0004348-001	0

**Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:**

**CX, EA, EIS APPENDIX AND NUMBER:**

Description:

- A9** Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.
- 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.
- B5.2** Modifications to oil, gas, and geothermal facility pump and piping configurations, manifolds, metering systems, and other instrumentation that would not change design process flow rates or affect permitted air emissions.

Rational for determination:

West Chester University (WCU) would install twin high density polyethylene geo-exchange distribution supply/return piping that would extend existing mains and connect to several campus buildings. In addition, a pump house would be built to move geo-exchange water through the well field and to the buildings capable of using it. Some of these buildings would be converted to geo-exchange heating and cooling as well. New wells would be drilled to support the extra building loads.

WCU has launched a comprehensive transformation of its campus heating and cooling systems from traditional fossil fuels (coal, oil and natural gas) to geothermal. As a proportionally small part of this comprehensive transformation, there are three sources of federal funding as part of three separate awards for which the Department of Energy (DOE) has oversight. When the entire system is complete, it would service 24 buildings, totaling 2.2 million sqft with a combined individual load of 6,500 tons of cooling. DOE award monies would be used to convert Anderson Hall, Ruby Jones Hall, and Recitation Hall (133,000 sqft & 428 tons) and connect them to the district geo-exchange water distribution system. Additionally, the district system will be connected to a new building (the Student Recreation Center – 65,000 sqft) currently being constructed with a cooling load of 385 tons. Additionally, a pump house would be constructed and 65 boreholes would be drilled to augment the existing 350 boreholes to support the additional building cooling loads.

This NEPA determination is specific to Phase 2B – Award Number DE-EE0004348 (ARRA). Phase 2A – Award Number DE-EE0003217 (CDP) was approved by GFO-10-484 on September 1, 2010 and Phase 2C – Award Number DE-EE0004499 (Appropriation) was approved by GFO-0004499-001 on February 28, 2011.

Phase 2A – Award Number DE-EE0003217 (CDP) – Approximately \$300,000 in federal funds: Tasks 1 through 3 of the present Master SOPO.

Phase 2B – Award Number DE-EE0004348 (ARRA) – Approximately \$558,000 in federal funds: This phase would install piping for distributing geothermal water to the new Student Recreation Center and also to connecting Anderson Hall, Ruby Jones Hall, and Recitation Hall on the University's Academic Quad to the geo-exchange heating and



cooling distribution system.

4.0 Project Planning

5.0 Implement Project – subtasks include worksite preparation, excavation of trenches, piping installation, backfilling of trenches, system testing, restoration, and demobilization.

6.0 Project Management and Reporting

Phase 2C – Award Number DE-EE0004499 (Appropriation) – Approximately \$4,100,000 in federal funds: This phase would construct a pump house, convert Anderson Hall, Ruby Jones Hall, and Recitation Hall from a traditional HVAC system to a geo-exchange heating and cooling system, and drill new wells to support the extra building loads.

7.0 Restore Parking Lot L – this would include the installation of lights and fencing, resurfacing, creation of a rain garden, and landscaping.

8.0 Project Planning

9.0 Implement Project

9.1 Worksite Preparation

9.2 Replace Building HVAC systems – Anderson, Ruby Jones, and Recitation Halls

9.3 Excavation – trenches would be excavated to prep for well drilling operations, piping installation, and the basement of the Pump House would be excavated.

9.4 Drill Boreholes – 65 boreholes would be drilled to augment the existing 350 boreholes to support the additional building cooling loads.

9.5 Construct Building – Pump House construction

9.6 Pipe Installation – piping would connect the Pump House and new boreholes to the existing geo-exchange distribution system.

9.7 Install Mechanical Equipment – new mechanical and control equipment would be installed in the new Pump House

9.8 Backfill of Excavated Areas

9.9 System Testing

9.10 Restore Area

9.11 Demobilization

10.0 Project Management and Reporting

Reports and other deliverables would be provided in accordance with the Federal Assistance Reporting Checklist following the instructions included therein.

The geo-exchange system is a closed loop system. At no point during operation would any interaction take place with groundwater. Well drilling contractors would follow IGSHIP Association and NGWA recommendations for closed loop systems, sedimentation and erosion controls would be in place prior to all drilling and/or excavation activities, and all permits required for drilling and installation of the system would be obtained prior to project implementation.. This system employs high density polyethylene pipe that would be heat fused at the joints to prevent/minimize leaks. The system uses only potable water further minimizing impacts in the event of system leak. The area surrounding the location of the geo-exchange system is serviced by a municipal source of drinking water, therefore negating the risk of an impact to human health in the surrounding area. Project work would not occur in a wetland, floodplain, or coastal zone.

The recipient conducted a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search on March 26, 2010. The Pennsylvania Game Commission anticipated no impact to threatened and endangered species and/or special concern species or resources. The Pennsylvania Department of Conservation and Natural Resources provided a conservation measure of avoiding the introduction of invasive species in order to protect the integrity of nearby plant species of special concern. The Pennsylvania Fish and Boat Commission required further review of the project and on August 9, 2010, a letter was received from them determining that no adverse impacts were expected from the proposed project. The U.S. Fish and Wildlife Service responded that no impacts to federally listed or proposed species are anticipated.

The Bureau for Historic Preservation of the Pennsylvania Historical and Museum Commission reviewed the project and in a letter dated February 14, 2011, determined that "the proposed project will have no adverse effect on the National Register listed West Chester State College Quadrangle Historic District" and that "no archaeological resources will be affected by this project."

This project is comprised of document preparation and project design, actions to conserve energy through the use of a geothermal system, and modifications to geothermal pumps and piping; therefore CX A9, B5.1, and B5.2 apply.

#### **NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

EF2a prepared by Casey Strickland

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature:

  
NEPA Compliance Officer

Date:

2/28/11

**FIELD OFFICE MANAGER DETERMINATION**

Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature:

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Field Office Manager

Date:

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