PMC-EF2a

(2.04.02)

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

RECIPIENT: District Energy **STATE:** NE

PROJECT TITLE : Recovery Act: Dirstrict Energy SW 40th Street Thermal Plant

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-EE0000116	DE-EE0002953	GFO-10-249	GO2953

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.

Rational for determination:

District Energy Corporation (DEC) would use DOE funding to install a Ground Source Heat Pump (GSHP) to service the Lancaster County Adult Detention Center, which is currently under construction. Federal funds will be used to finance the following: installation of the borefield, the supply/return lines to and from the borefield to the District Energy Center (DOE funding will not be used for service lines running to and/or connections made at the Adult Detention Facility), and the chiller units and heat exchange equipment (both of which will be housed within the new District Energy Center, which is currently under construction). The system's intertie and GSHP HVAC equipment will be considered an equipment purchase internal to the District Energy Center.

The Adult Detention Center and the District Energy Center are financed through a municipal bond for ~$59 million dollars (financed through local Nebraska investment firms with the, bond approved by the Lancaster County Board of Commissioners). DOE funding is strictly for the geothermal GSHP. Therefore, this NEPA determination is limited to the impacts associated with the installation, commissioning, and operation of the GSHP system. DOE has determined that the proposed GSHP project is not an integral element of the project and is not an enabling action that would require DOE to analyze the entire construction of the Adult Detention Facility and the District Energy Center. The construction of the Adult Detention Facility and District Energy Center are already under way, DOE had no influence on the decision to construct these facilities, nor did DOE have an influence on the site selection.

The proposed system will consist of drilling 667 boreholes to a depth of 300 feet each; the total area of the borefield will be 253,360 square feet. A header trench will be excavated 6 feet in depth with a total excavation area of 22,785 square feet. The system will circulate potable water through ¾ - 1 ¼ inch High Density Polyethylene (HDPE) Piping. While system leakage will only lead to the release of potable water, steps have been taken to mitigate any risk of leakage. The HDPE Piping will be jointed together using an electric/heat fusion technique, enabling the bond at the joint to be stronger than any other location along the pipe. Each U-bend loop will be pressure tested to 100 psi for leaks and flow by International Ground Source Heat Pump Association (IGSHPA) - 21020 recommended procedures. The proposed boreholes will be entirely encased with a thermally enhanced Bentonite grout with a thermal conductivity of 1.0 Btu/hr-ft-F. This improvement in conductivity mitigates the risk of cracking or fracturing of the cement/piping during extreme levels of expansion and contraction that occur during normal operation of the GSHP system, thus mitigating any risk of surface to ground-water contamination. The boreholes are spaced at a 20 foot interval which allows for ample heat diffusion potentials. This spacing mitigates the risk of permanent residual heating and cooling loads which could lead to system infeasibility and possible damage to microorganisms within the soil. This spacing also ensures that the ground loops are not sharing thermal space with each other. K2 Driling has provided proof of licensure by the State of Nebraska and membership in the IGSHPA, the Geothermal Heat Pump Consortium, the Nebraska Well Drillers Association, and the National Ground Water Association (NGWA). Key personnel are

IGSHPA accredited installers and HDPE fusion rated for geothermal applications. Specific license and certification numbers are on file with the drilling contractor and can be made available upon request.

The site was originally comprised of a series of farmsteads used for agricultural purposes and the land was recently acquired from a group of land owners for both the Adult Detention Center and the GSHP. Because the farmstead had three Above-Ground Storage Tanks used to store diesel for farming equipment, a Phase 2 Environmental Site Assessment was prepared for the site. Three temporary monitoring wells were installed and soil samples and water samples were collected and sent to a lab for hydrocarbon testing including a BTEX and TRPH analysis. Of the three water and soil samples, none had concentrations above the acceptable levels of contamination for the Nebraska Department of Environmental Quality maximum contaminant levels (MCLs). The contractor responsible for the Environmental Site Assessment concluded the following: "Petroleum hydrocarbons were not identified in the tested areas of on-site soils or ground water." The three test wells border the proposed GSHP system site location directly to the south, which is the area that buffers the proposed project from the railroad line. The water table on the proposed project site ranges from 6 to 8 feet. The water table is highly brackish, due to the salt mines and creek located in this part of Nebraska. The ground water is not used for domestic use, and all domestic use water is provided via Lincoln's municipal system.

This project has received support letters from: U.S. Senator E. Benjamin Nelson, the City of Lincoln's Mayor Chris Beutler, and the Lancaster County Board of Commissioners. The proposed geothermal system was also highlighted in the local newspaper ("New Jail to go Geothermal" Lincoln Journal Star- 5/04/09). They have received no negative comments from this announcement. There was an extensive public scoping meeting held during the site selection process and most of the discussion was in regard to the use of the site, not the geothermal system. DOE has confirmed that no negative feedback was received for the proposed geothermal system.

Collection and disposal of waste from construction areas and elsewhere will occur daily. DEC has committed to comply with requirements of National Fire Protection Association Reg. 241 for removal of combustible waste material and debris. DEC will handle hazardous, dangerous, or unsanitary waste materials separately from other waste by ensuring proper containerizing. DEC has committed to the DOE that all material will be disposed of lawfully and in accordance with applicable local, state, and federal regulations. DEC is required, when warranted, to obtain written special waste permits from the Lincoln-Lancaster County Health Department for their facilities. DEC will fully comply with the requirements of Title 8, Chapter 32, Section 080 of the Lincoln Municipal Code, which requires special handling, treatment, or disposal methodologies of special wastes in order to protect public health, safety, and the environment.

The proposed site location for the geothermal system is within the 500/100 year Floodplain and Emergent PEMA Wetland. A Floodplain/Wetland statement has been prepared for this project and is attached. The project has already obtained permits from the responsible agencies for Floodplain and Wetland Development. The Floodplain permit was obtained and is on file with the FEMA delegated authority for Lancaster County, the Building & Safety Department. The project will be a temporary disturbance to the floodplain and DEC committed to the DOE that they will comply with all site restoration requirements set forth in the Floodplain Development Permit and will not cause a rise in the floodplain. There are specific stipulations outlined within the Floodplain Development Permit, and DEC has committed to following them.

The wetland development permit was obtained through a 404 permit from the Army Corps of Engineers. The project was issued a 404 nationwide permit with general stipulations pertaining to site restoration post construction. The Army Corps reviewed the project, including all future expansion zones (Phase 1 & Phase 2). The proposed project has two phases for the borefield, Phase 1 will be funded by DOE is for one section of the borefield, Phase 2 is for future expansion and it is not planned nor necessary at this time to pursue Phase 2. Phase 2 involves more of the wetland, however the Army Corp review was conducted for both Phases. The permit concluded that only 0.006 acres of wetland would be disturbed by the project. The DEC has no alternative but to site this project in this location because of the easement requirements for future road expansion set forth by the Nebraska Department of Transportation for SW 40 St. (directly west of borefield). While the Army Corps reviewed all future expansion (Phase 2) only 78 bores (Phase 1) will be located within the emergent wetland. No permanent wetland disturbance is expected. The Army Corps review consisted of an additional 72 boreholes within the emergent wetland. DEC has committed that they will follow all stipulations outlined within the 404 nationwide permit.

The project has also obtained a Class II "Synthetic Minor" Air Emissions Permit for construction operations for all planned construction on the site.

The largest concern for the DOE with this type of development in a floodplain and wetland is controlling and mitigating against erosion and sedimentation. DEC has extensive protocols, procedures, and guidelines to control and mitigate the risk of erosion from the site. The entire site including the borefield is in and will remain in compliance with the NPDES Construction Stormwater Pollution Prevention Plan. The NPDES permit was secured through Nebraska's Department of Environmental Quality (NER11688, 9/17/2009). The applicant will remain compliant throughout the project with all stormwater regulations outlined within the NPDES permit. All requirements are also documented within the borefield construction bid documents which outline the specific requirements for the contractor performing the construction The contractor is obligated to coordinate all aspects of construction activities in compliance with the

Construction Stormwater Pollution Prevention Plan for the duration of the contractor's scope of work. The contractor is required to follow all erosion and sediment control requirements specified in the Lower Platte South Natural Resources District Manual of Erosion and Sediment and Storm Management Standards (w/ approved Supplements (1994)). DEC has committed to DOE that construction activities will not compromise the overall site compliance with stormwater regulations. All disturbed erosion and sediment control improvements shall be fully reconstructed at the end of each work day prior to leaving the site. All cuttings deposited on grade due to drilling operations shall be removed and deposited on site at a location designated by the owner's representative and will not be within 500 feet of the floodplain or wetland. In addition, the contractor must follow Best Management Practices regarding waste disposal, hazardous waste, sanitary waste, and avoid mud tracking off-site. Erosion control efforts will be verified through inspections performed by a third party under the direction of DEC as well as by representatives of the Lower Platte South Natural Resources District. Melissa McKibbin, DEC's Environmental Specialist, will oversee the borehole installation and will be on-site for much of the construction activities. Re-vegetation for wetland areas is required by specifications and Wetlands Permit are as follows: reseed with native seed with all areas restored to pre-construction elevations. Until the hydrophytic vegetation re-establishes, all sediment and erosion control measures under the Construction Stormwater section shall remain in place. This includes site stabilization until such time as re-vegetation can occur which will require the contractor to seed. Re-vegetation for non-wetland areas as required by specifications consist of planting grass seed that complies with AOSA's "Journal of Seed Technology; Rules for Testing Seeds". The exact mixture varieties shall be approved by owner's representative prior to installation. Specifications also describe watering, soil amendments, and fertilizer requirements.

All design and installations will be in accordance with the requirements set forth in the IGSHPA and NGWA Guidelines and Procedures. All applicable construction and erosion control permits have already been obtained. DEC has included the language from the stipulations and requirements set forth within permits obtained and from best management techniques in their construction bid documents. This project will comply with all state and local regulations regarding well drilling and geothermal installation.

After a thorough review of the information provided, it is hereby determined that the project as outlined above will not have a significant impact on human health and/or environmental. This project is therefore Categorically Excluded under B5.1 "Actions to Conserve Energy" and A9 "Information Gathering."

A site visit was conducted by John Jediny (EERE NEPA) on 4/2/10 and the report is attached to this determination.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Insert the following language in the award:

You are required to:
This project shall adhere to the following stipulations outlined within the Army Corps 404 nationwide permit:

1. All areas disturbed by construction shall be revegetated with appropriate perennial, native grasses and forbs and maintained in this condition. Phalaris arundinacea (Reed Canary Grass), Lythrum salicaria (Purple Loosestrife), Bromus inermus (Smooth Brome), Phragmites, sp. (Common Reed, River Reed) and Tamarix, sp. (Salt Cedar), are NOT appropriate choices of vegetation. The disturbed areas shall be reseeded concurrent with the project or immediately upon completion. Revegetation shall be acceptable when ground cover of desirable species reaches 75%. If this seeding cannot be accomplished by September 15 the year of project completion, then an erosion blanket will be placed on the disturbed areas. The erosion blanket will remain in place until ground cover of desirable species reaches 75% If the seeding can be accomplished by September 15, all seeded areas will be properly mulched to prevent additional erosion.

2. The permittee and/or the permittee's contractor and/or any of the employees, subcontractors and/or other persons working in the performance of a contract or contracts to complete the work authorized herein, shall cease work and report the discovery of any previously unknown historic or archeological remains to the Nebraska Regulatory Office. Notification will be by telephone or FAX within 24 hours of the discovery and in writing within 48 hours. Work will not resume until the permittee is notified by the Nebraska Regulatory Office.

*- The applicant must follow all stipulations outlined in the issued 404 nationwide permit (1-27 of the Fact Sheet Nationwide Permit 12). Failure to do so will put the applicant out of compliance with the Army Corp of Engineers. If Army Corp of Engineers rescinds your permit for any reason, DOE reserves the right to rescind funds for the project.

This project will adhere to the following stipulation outline within the Lancaster County Building & Safety Department's permit:

This project will adhere to the following stipulation outline within the Lancaster County Building & Safety Department's permit:

"…All provisions of the Lincoln Municipal Code, Section 27.52 or 27.53; or Lancaster County Zoning Resolution, Article 11, on Flood Plain Management shall be complied with."

Note to Specialist :

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 4/28/10

NEPA Compliance Officer

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: _____ Date: _____

Field Office Manager