FINDING OF NO SIGNIFICANT IMPACT

Denver Federal Center Energy Conservation Measures
Final Environmental Assessment
Lakewood, Colorado

May 2024

In accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's regulations for implementing NEPA (40 Code of Federal Regulations parts 1500-1508), the U.S. General Services Administration's (GSA) Public Buildings Service NEPA Desk Guide (1999), and GSA Administrative Order 1095.1F – Environmental Considerations in Decision Making, I find that the Denver Federal Center Energy Conservation Measures Project, as described in the Final Environmental Assessment, is not a major federal action significantly affecting the quality of the human environment. Therefore, an environmental impact statement will not be prepared. The mitigation measures provided below will be implemented to ensure that the action avoids or minimizes potentially adverse environmental impacts.

APPROVED: DocuSigned by: Tanisha Palermo 780C7FC486DE4F7... DATE: 5/20/2024

Tanisha Palermo
Regional Commissioner
Rocky Mountain Region (Region 8)
Public Buildings Service
U.S. General Services Administration

This Finding of No Significant Impact will become final 30 days after publication of its Notice of Availability at https://www.gsa.gov/dfc-environmental-assessment, provided that no information leading to a contrary finding is received or comes to light during the 30-day review period.

1.0 INTRODUCTION

The U.S. General Services Administration (GSA) Rocky Mountain Region (Region 8) prepared a Final Environmental Assessment (Final EA) to assess and document potential impacts resulting from the Denver Federal Center (DFC) Energy Conservation Measures (ECMs) Project (Project). The DFC is located on U.S. Route 6 in the city of Lakewood, Colorado (project area). The Project would support the objectives of Executive Order (EO) 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, GSA's *Strategic Plan for Fiscal Years 2022-2026*, and the agency's *National Deep Energy Retrofit* (NDER) *Program*, which seek to reduce energy and water use through integrative ECMs.

The Final EA explains the need for the Project, the alternatives that were considered to meet the need, the impacts that were identified, and how impacts will be avoided or minimized. The anticipated impacts, mitigation of impacts, and other information discussed below are from the published Final EA.

2.0 PURPOSE OF AND NEED FOR THE PROJECT

The purpose of the Project is to decarbonize and electrify the DFC, to the extent practicable, using clean onsite renewable energy generation and electrification solutions. To achieve this, GSA would install a geothermal heat pump system and a solar photovoltaic (PV) system to supply year-round heating and cooling and electrical power. These systems, along with other ECMs (e.g., quad-pane windows, HVAC improvements, etc.), would replace approximately 90 percent of fossil fuel consumption on the DFC and allow for self-generated solar PV to electrify approximately half of the DFC. The Project is needed to cut DFC grid-purchased energy use by approximately 65 percent and water usage by approximately 29 percent.

The Project would also allow GSA to reduce its carbon footprint and become less dependent on nonrenewable energy sources. Federal government operations began at the DFC in the 1940s, and the DFC has historically relied on energy generated from carbon-heavy methods. The ECMs would modernize energy infrastructure on the DFC, reduce lifecycle operating costs, and mitigate risk associated with future fossil-fuel price volatility.

3.0 SELECTED ALTERNATIVE AND RATIONALE FOR DECISION

GSA selected *Alternative A – Centralized Geothermal System with Ground-Mounted Solar Array* as the alternative for implementation because it best meets the purpose of, and need for, the Project without causing significant impacts on the resources analyzed in the Final EA. Alternative A has a smaller area of ground disturbance than *Alternative B - Decentralized Geothermal System with Ground-Mounted Solar Array* because it is isolated to the southeast field of the DFC rather than dispersed across the project area.

An advantage of Alternative A is lower ongoing utility costs due to the layout of the system (Ameresco 2024). The geothermal pipeline network offers an additional benefit. Not only will it transport geothermal energy, but the pipes within the loop will also provide heat exchange, supplementing the bore field piping. Finally, the overall layout of the system has more future load handling ability. If loads are increased or a new building be added in the future, Alternative A would have capacity to handle the increased load. The selected alternative is described in more detail below.

3.1 Alternative A – Centralized Geothermal System with Ground-Mounted Solar Array

Alternative A incorporates sustainable, climate-resilient, and operationally efficient design that complies with GSA *Facilities Standards for the Public Buildings Service* (P100) and its associated 2022 *Addendum* (GSA PBS 2021). Alternative A seeks to meet or exceed energy and sustainability goals established by federal guidelines and policies, along with industry-standard building codes and best practices.

Under Alternative A, a single geothermal bore field would be co-located with the ground-mounted solar PV array. The conceptual layout of this alternative includes a ground-mounted solar PV array located above the geothermal bore field, which would consist of approximately 2,880 boreholes. Under this alternative, the co-located solar PV array and bore field would require approximately 27 acres of land. The site has been previously cleared and would not require removal of any large trees or shrubs.

Alternative A would require a pump house, due to the distance of the geothermal field from the serviced buildings, and three valve houses. Each valve house would serve a third of the geothermal wells. This design would allow any leak to be narrowed down to a portion of the larger bore field.

A GSA contractor used a screening process that included existing aerial photography and utility mapping to layout the geothermal pipeline network in a way that minimized environmental impacts and decreased the piping distance to serviced Buildings 15, 25, 41, 44, 45, 48, 50, 54, 56, 67, 95, and 810; along with the proposed FDA Building (Building 22). Decreased piping distance would reduce pressure (head) losses. The pipeline network would be configured in a loop with the pipe traveling from the bore field to and along Main Avenue to service Building 810. The pipe loop then follows 7th Street to service Building 95. From here, the pipe travels along Center Avenue to service Buildings 44, 45, 48, 54, 56, and 67. Buildings 15, 22, and 25 are serviced from a pipeline that follows 3rd Street and parallels the Agricultural Ditch. Finally, the pipe follows Federal Avenue to 5th Street to service Buildings 41 and 50 before returning back to the geothermal bore field pump house.

Construction required for the development of the geothermal bore field, the solar PV array, and the supporting pipeline network and utilities would necessitate grading and ground disturbance. Disturbance to existing parking lots and roads would occur during construction and during repaving. Construction could begin in the fall of 2024 and last approximately two years.

4.0 IMPACTS AND MITIGATION MEASURES

GSA places a strong emphasis on avoiding and minimizing potentially adverse environmental impacts. Table 1 summarizes the potential impacts and applicable mitigation measures that will be implemented to ensure the selected alternative will have no significant impact on the human environment.

TABLE 1. SUMMARY OF IMPACTS FROM THE SELECTED ALTERNATIVE AND MITIGATION MEASURES.

Resource	Impacts	Mitigation Measures
Geology and Soils	Impacts on soils (all previously disturbed) would be approximately 27 acres, in addition to the amount required for the installation of the geothermal heating and cooling system pipeline network. Construction activities may expose the project area soils to wind, erosion, sedimentation, and compaction, resulting in direct, minor, adverse impacts onsite over the short-term. Installation of the geothermal bore field would result in direct, site-specific, minor to moderate, adverse impacts on geology over the short- and long-term due to the need to drill through bedrock and the presence of permanent geothermal well infrastructure.	• Apply water to exposed soils and revegetating exposed areas immediately following construction using native seed mixes and plants. • Implement a detailed stormwater pollution prevention plan (SWPPP) in accordance with the required National Pollutant Discharge Elimination System (NPDES) permit. • Implement an approved erosion control plan. • Grout boreholes, top to bottom. • Design ECMs to meet seismic safety standards.
Wildlife and Habitat	Impacts to onsite wildlife and habitat would be direct, negligible to minor, and adverse, and would occur over the short- and long-term. Species onsite would be accustomed to frequent human activity and could relocate to nearby areas of suitable habitat. Concerns exist about the potential for solar PV arrays to adversely affect bird populations, as an array may create a reflective glare that could be mistaken as a body of water.	• During final design of the Project consideration will be given to ways to reduce glare (e.g., panel types, panel tilt, or other available measures) from the solar panels.
Vegetation and Invasive Species	Impacts on vegetation (previously disturbed) would be approximately 27 acres, in addition to the amount required for the installation of the pipeline network associated with the geothermal heating and cooling system. Direct, negligible,	• Eradicate non-native invasive species in disturbed areas, where possible. • Revegetate with native seed mixes and plants. • Construction equipment will be washed, where possible, before entering or leaving the site to

Resource	Impacts	Mitigation Measures
	adverse impacts to onsite vegetation could occur over the short- and long-term from construction activities; however, the site has been previously cleared and supports limited, previously disturbed vegetation.	avoid transfer of non-native or invasive species to other areas.
Water Resources	Construction activities could result in temporary increases in runoff and an increased risk of leaks or spills of contaminants, resulting in direct, negligible to minor, adverse impacts to localized water quality within adjacent surface waters and wetlands, as well as groundwater over the short-term. Pipeline crossings would avoid direct impacts to surface waters, wetlands, and floodplains. Drilling of boreholes could also expose groundwater to contamination. Operation risks associated with geothermal systems and the management of the systems are minimal. Alternative A has been designed with three valve houses in the bore field, which allows isolation of portions of the field if a leak occurs during operations. The fluid used in the system, propylene glycol and water, is non-toxic, food safe, and readily biodegradable, and would not adversely affect groundwater.	• Implement stormwater controls and best management practices. • Implement a detailed SWPPP in accordance with required NPDES permit and approved Erosion Control Plan. • Revegetate disturbed areas following construction where possible. • Only permit construction access from existing roadways and bridges (no instream work; no work in wetlands). • Grout boreholes, top to bottom. • Space boreholes a minimum of 19 feet apart to minimize the potential for well damage resulting from the use of heavy equipment at the ground surface. • Direct construction activities such that heavy equipment does not drive over installed geothermal wells. • Piping to be hermitically sealed, and pressure tested prior to use. • Isolate any encountered shallow groundwater to avoid mixing with drinking water aquifers. • Pipelines under the Agricultural Ditch must be 4 feet below streambed elevation, construction of these crossings can only occur from October 31st to April 1st during the dry season, and the Agricultural Ditch and Reservoir Company must be afforded the opportunity to review final plans for the crossing. • The pipeline parallel to the Agricultural Ditch should, if possible, be installed during the dry season, if not possible, access must be provided for required maintenance.
Cultural Resources	No effect on either Building 710 or the Office of Civil Defense Emergency Operations Center would occur. The southeast field is either not visible or obscured from view from both historic buildings. Views of both resources would not be altered, and no vibration impacts would occur.	• If previously unidentified cultural resources are discovered during construction, GSA Region 8 Regional Historic Preservation Officer/Colorado State Historic Preservation Office would be contacted for evaluation (an archaeology monitor would be onsite during ground disturbing activities).
Air Quality and Greenhouse Gas (GHG)	Direct, negligible to minor, adverse impacts over the short-term to local air quality are anticipated. Negligible, adverse impacts on GHGs, due to construction emissions, over the long-term. Indirect, minor, beneficial effects on air quality and GHG emissions over the long-term due to cleaner, renewable energy production.	• Use water for dust control when grading roads or clearing land. • Promptly remove spilled or tracked dirt or other materials from paved streets. • Minimize the use and number of trips of heavy equipment. • Maintain and tune all engines per manufacturer specifications to perform at US Environmental Protection Agency certification levels, where

Resource	Impacts	Mitigation Measures
		applicable, and to perform at verified standards applicable to retrofit technologies. • Encourage use of energy and fuel-efficient fleets and best available control technology. • Conduct periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained tuned and, maintained consistent with established specifications. • Recycle construction debris to the maximum extent feasible. • Reduce construction related trips of workers and equipment, including trucks.
Land Use and Aesthetics	Direct, site-specific, negligible to minor, adverse impacts would occur over the short- and long-term, as what is currently an open field would be converted to a solar PV array and geothermal bore field. As the site has been previously disturbed and does not contain noteworthy visual resources, impacts would be minor.	• Revegetate disturbed areas or otherwise return them to pre-construction conditions, where possible.
Environmental Justice (EJ)	No minority, low-income, tribal, or disabled populations occur within the DFC, although it is possible that disabled individuals may work at or visit the DFC. There would be no interruptions to public transportation or assistance services under Alternative A, although there may be a need for temporary pedestrian detours and occasional lack of access to handicapped parking. Overall, Alternative A would not result in disproportionally high and adverse effects on EJ populations.	• When implementing temporary transit and pedestrian rerouting consider the locations of transit bus stops and the availability of handicapped access routes to minimize impact to disabled individuals working at or visiting the DFC. • Return parking lots, roadways, and pedestrian routes to existing conditions following construction. • Limit disturbance that restricts access to handicapped parking. • Implement Architectural Barriers Act-accessible pedestrian detours, where necessary.
Environmental Contamination and Waste Management	Alternative A has the potential to encounter contamination in the southeast field of the DFC. With implementation of mitigation measures, adverse impacts associated with construction are anticipated to be direct, short-term, site-specific, and minor. Operation of the ECMs would result in negligible adverse impacts over the short- and long-term.	• Conduct a hazardous material pre-alteration assessment prior to the disturbance of any building materials on or inside buildings, in accordance with federal and state asbestos control regulations and GSA policy. • Conduct a geotechnical study and subsurface analysis of the site to determine the existence of debris and hazardous materials. • Comply with GSA standard operating procedures related to site remediation and excavation ‘dig’ permits. • Remediate any encountered contamination in accordance with the Colorado Department of Public Health and the Environment Orders on Consent and all other applicable federal and state regulations. • Maintain and adhere to existing spill prevention and response plans. • Adhere to proper management and disposal requirements.

Resource	Impacts	Mitigation Measures
Transportation	Traffic delays may occur during planned detours and as a result of increased personnel and equipment entering and exiting the DFC during construction. Most traffic impacts would occur within the DFC and not on the surrounding roadway network, and would be a direct, minor, adverse impact over the short-term. Following construction, existing conditions would return.	• Consider staggering of construction personnel and supplier/truck arrival and departure times to avoid peak traffic hours. • Ensure that adequate measures are in place to prevent bus stop closures and to ensure that access to bus stops remains safe for the public. • Implement Architectural Barriers Act-compliant pedestrian detours where needed. • Implement traffic detours where needed, with consideration for emergency service access.
Noise and Vibration	During construction of Alternative A, direct, minor, adverse noise impacts would be expected over the short-term due to intermittent noise level increases. Construction noise would be primarily limited to the southeast field of the DFC. Following construction, noise levels would return to existing conditions. Vibration impacts are not anticipated.	• Utilize standards noise control measures, such as noise controls on equipment, and scheduling construction activities in such a way that minimizes noise disturbance during business hours. • Ensure properly fitted and functioning mufflers on construction equipment.
Utilities	Short-term adverse impacts to onsite utilities would be direct and negligible to minor due to the possibility for temporary disruptions on the DFC. No disruption to public utilities would be anticipated.	• If utility relocation is necessary, develop an approved utility relocation plan. • In the event of temporary utility interruptions, affected buildings/tenants would be notified in advance. • Minimize temporary utility interruptions. • See “Water Resources” above for measures related to the Agricultural Ditch.
Safety and Security	During construction, the increase in construction personnel within the secured DFC, as well as the increased potential for construction related injuries and accidents, may result in minor onsite safety and security concerns over the short-term.	• Install signs, barriers, and traffic cones to direct vehicles and pedestrians, as needed, in accordance with approved pedestrian and traffic control plans. • Ensure access for emergency vehicles at all times. • Require contractors and vendors to present government-issued identification when arriving at the DFC. • The general contractor would be responsible for ensuring coordination of facility security related to construction operations.
Socioeconomics	Construction of Alternative A would have direct, minor, beneficial impacts on job availability and unemployment in the short-term, as construction activities would temporarily support employment in the construction industry. Population, housing, schools, and other public and private services would not be impacted.	• None required – no adverse impacts on socioeconomics are anticipated.
Cumulative Effects	Negligible, adverse cumulative effects to geology and soil are anticipated as Alternative A would permanently change the geology and soils underlying the DFC. Similarly, a negligible to minor, adverse cumulative effect is anticipated to vegetation, land use and aesthetics, and wastes onsite due to permanent changes to the lands within the DFC and potential	• None required – the previous mitigation measures will minimize cumulative effects.

Resource	Impacts	Mitigation Measures
	for additional waste generation (including eventual disposal of solar panels containing batteries and metals). A minor beneficial cumulative effect is anticipated to air quality, climate change, and GHGs.	

5.0 OTHER ALTERNATIVES ANALYZED IN THE FINAL EA

5.1 Alternative B – Decentralized Geothermal System with Ground-Mounted Solar Array

Alternative B would disperse multiple geothermal bore fields across the DFC to decrease the piping distance to serviced buildings, thus reducing pressure (head) losses. Like Alternative A, Alternative B would install the solar PV array in the southeast field of the DFC, on 27 acres of previously cleared land. Unlike Alternative A, Alternative B would require an additional 23 acres of land on which smaller bore fields would be installed. Approximately 2,805 total boreholes would be used to service the adjacent buildings. A pump house would not be required under Alternative B, as bore fields would be located within close proximity to the serviced buildings. One valve house would be constructed within each proposed bore field, except for the two bore fields proposed to service Building 25, which would utilize one valve house. Nine valve houses would be required. Each valve house would allow for shut down of individual bore fields if a leak is detected.

The proposed Alternative B geothermal bore fields were preliminarily sited, using aerial photography, in areas that minimized environmental impacts. The proposed bore field locations for specific buildings are:

- Building 25: 78-borehole field to the southeast and 338-borehole field off the building's northeast corner; both would be under an existing parking lot. A pipeline would connect the two fields along the parking lot's western edge and then feed directly into the building via one service pipeline.
- Building 41: installation of two similarly sized fields of 330 boreholes each, one under an existing parking lot along Main Avenue's north side and one located within the southeast field of the DFC. A pipeline would follow 5th Street to service the building.
- Buildings 45 and 48: a field of 169 boreholes in the cleared area just off the southeast corner of Building 48 with a pipeline directly into the building.
- Building 56: an L-shaped field under the parking area just to the south of the building to include approximately 235 boreholes and a service pipeline directly into the building.
- Building 67: 560 boreholes field under the parking lot to the south of Building 67 and a direct service pipeline into the building.
- Building 95: a field off the southeast corner of the building (135 boreholes) and another off the northeast corner (300 boreholes) with pipelines directly to the building. A portion of one of the bore fields would be installed under an existing parking lot. The majority of both bore fields would be installed beneath landscaped, manicured open areas between buildings.
- Building 810: a field of approximately 330 boreholes to the southwest of the building under a cleared area at the corner of Routt Street and Alameda Avenue with a pipeline directly to the building.

Construction of the dispersed geothermal bore fields, the solar PV array, and the supporting pipeline network and utilities would necessitate grading and ground disturbance under Alternative B. Disturbance to existing parking lots and roads would occur during construction and during repaving.

Alternative B would achieve the same climate, sustainability, and energy goals as outlined in the selected alternative.

5.2 Alternative C – No Action Alternative

NEPA requires federal agencies to consider a No Action Alternative to provide a baseline for comparing the environmental impacts of the action alternatives. Under Alternative C, No Action Alternative, GSA would not implement the proposed ECMs at the DFC and would continue to utilize fossil-fuel-fired equipment to provide the electric and heating and cooling needs of the associated facilities. Alternative C would not meet the purpose and need of the Project, nor would it meet the objectives of EO 14057, GSA's Strategic Plan, and the agency's NDER Program, which seek to reduce energy and water use through integrative ECMs.

6.0 REFERENCES

Ameresco. 2024. GSA Region 8 – Denver Federal Center Energy Savings Performance Contract 90% Investment Grade Audit. Volume I – Technical. May, 2024.

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