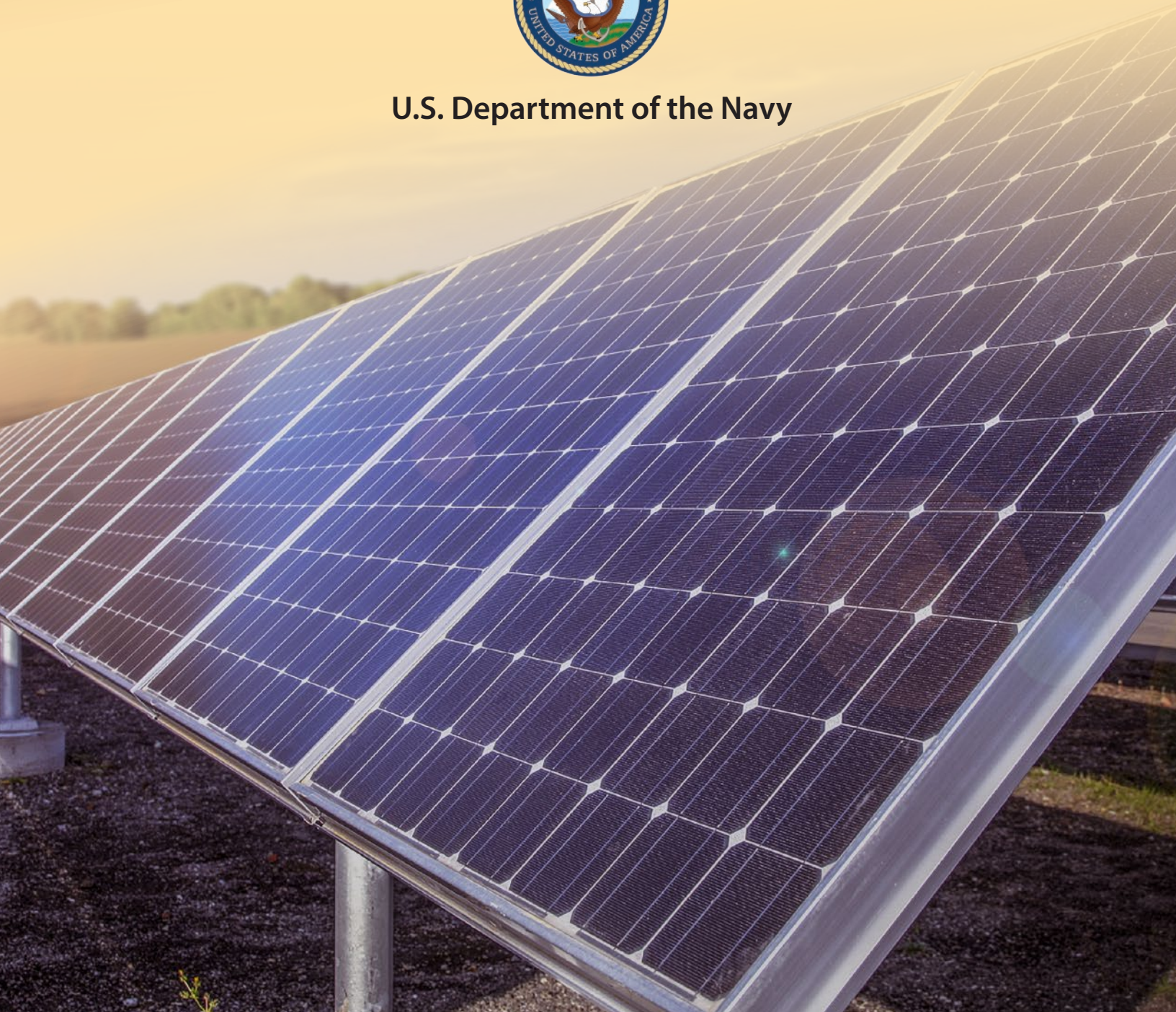
Draft EA
June 2015

Environmental Assessment
for the Lease of Property to Support the Construction and Operation of a Solar Photovoltaic System at

Naval Construction Battalion Center
Gulfport, Mississippi

U.S. Department of the Navy



Draft Environmental Assessment for the Lease of Property to Support the Construction and Operation of a Solar Photovoltaic System at Naval Construction Battalion Center Gulfport, Mississippi

June 2015

Prepared by:

United States Department of the Navy

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Lead Agency:
United States Department of the Navy

In accordance with Office of the Chief of Naval Operations M-5090.1

DRAFT ENVIRONMENTAL ASSESSMENT FOR THE LEASE OF PROPERTY TO SUPPORT THE CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

JUNE 2015

Abstract

The U.S. Department of the Navy is proposing to lease approximately 25 acres of land to an independently operated commercial power utility company (power utility) for the construction and operation of a solar photovoltaic (PV) system at Naval Construction Battalion Center (NCBC), Gulfport. The power utility would construct and operate the solar PV system, consisting of PV cells that collect energy from sunlight for the production of electricity, and transmission facilities. The renewable energy thus created would feed into the commercial electrical energy grid, which also distributes power to NCBC Gulfport. Land would be leased for an estimated 37 years, including two years for construction, 25 years of operation, and two five-year options. After the terms of the lease expire, the Navy and the power utility would consider a range of options, including renewing the lease or decommissioning the system. Two on-station sites were identified at NCBC Gulfport that could accommodate a solar PV project: 1) Installation Restoration (IR) Program Site 8A with an adjacent lot; and 2) an open area next to Building 200. The potential sites would be alternative site locations under the proposed action. The proposed system would generate up to 4.2 MW of electricity if a solar PV facility were constructed at all the sites. As required by the Council on Environmental Quality regulations, this assessment also analyzes the No Action Alternative.

The purpose of the proposed action is to increase Navy installation energy security, strategic flexibility, and resource availability through the development of renewable energy-generating assets at NCBC Gulfport. The proposed action is needed to meet the renewable energy standards put forth by the 1 GW Initiative and the Secretary of the Navy's 2009 energy goals, which include the requirement to produce 50 percent of the Navy's shore-based energy supply from alternative sources by 2020, as well as other federal directives, including the most recent Executive Order 13693.

Resource areas reviewed in the document include land use, the coastal zone, visual setting, utilities and infrastructure, socioeconomics and environmental justice, cultural resources, air quality, hazardous materials and waste, and public safety. The environmental analysis for these resource areas found no significant impacts.

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Executive Summary

ES.1 Introduction

This environmental assessment (EA) evaluates the reasonably foreseeable environmental consequences of the U.S. Department of the Navy's (the Navy's) leasing land for the construction and operation of a solar photovoltaic (PV) system at Naval Construction Battalion Center Gulfport (NCBC Gulfport). NCBC Gulfport is located in Harrison County, Mississippi, approximately 1 mile north of the Gulf of Mexico.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); (42 United States Code [U.S.C.] 4321); Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500; and Navy procedures for implementing NEPA (32 CFR 775). The Navy is the lead agency for the proposed action. The action proponent is the Commander, Navy Installations Command (CNIC).

ES.2 Description of the Proposed Action

The purpose of the proposed action is to increase Navy installation energy security, strategic flexibility and resource availability through the development of renewable energy generating assets at NCBC Gulfport. The proposed action is needed to meet the renewable energy standards put forth by the 1 Gigawatt (GW) Initiative and the Secretary of the Navy's (SECNAV) 2009 energy goals, which include the requirement to produce 50 percent of the Navy's shore-based energy supply from alternative sources by 2020, as well as other federal directives, including the most recent Executive Order (EO) 13693.

The Navy would lease up to 25 acres of Navy-owned property at NCBC Gulfport to be developed by an independently operated commercial power utility company (power utility) for a solar PV system. The power utility and third-party solar power company would construct and operate the solar PV system, consisting of PV cells that collect energy from sunlight for the production of electricity. The renewable energy thus created would feed into the commercial electrical energy grid, which also distributes power to NCBC Gulfport. Land would be leased to the power utility for an estimated 37 years, including 2 years for construction, 25 years of operation, and two 5-year options, after which the Navy and the power utility would either renew the lease or decommission the system.

ES.3 Alternatives

This EA evaluates two alternatives: leasing land for the construction and operation of the solar PV system and the No Action Alternative. In compliance with NEPA and CEQ regulations, the No Action Alternative must be considered and associated potential impacts evaluated. Other renewable technologies were also initially considered for development at NCBC Gulfport but were eliminated from further analysis in this EA as discussed in Chapter 2.

Under the No Action Alternative, the lease of Navy-owned land for the construction and operation of a solar PV system would not occur at NCBC Gulfport. Thus, various federal statutes and EOs that mandate changes in energy consumption and production would not be addressed, and the No Action Alternative would not increase renewable energy production or use. The No Action Alternative would neither meet the renewable energy objectives of the Navy, nor would it meet the purpose and need for the proposed action.

ES.4 Description of Site Locations

The proposed solar PV site locations at NCBC Gulfport are centrally located within the existing installation boundaries. Two on-station sites were identified at NCBC Gulfport that could accommodate a utility-scale solar PV facility project: 1) IR Program Site 8A with an adjacent lot (the IR Site 8A and

Adjacent Lot Site), and 2) an open area next to Building 200 (the Open Area Site). The two sites encompass an approximately 25-acre area that is of adequate size to allow the construction and operation of solar PV facilities capable of generating up to 4.2 MW.

IR Site 8A is covered by a concrete cap, while the Adjacent Lot is compacted soil cement and soils. A series of stormwater control ditches are located around the perimeter of the cap to reduce erosion. Both areas are currently used for vehicle storage by the Morale, Welfare, and Recreation (MWR) unit, the Construction Equipment Department (CED), and Seabee units.

The Open Area Site, which is located south of Building 200, is a flat, grassy lot with some brush and small trees growing along stormwater ditches that run along the north and west sides of the site. The site is currently used intermittently as a contractor lay-down area.

ES.5 Summary of Potential Environmental Impacts

This EA describes the potential environmental impacts of the proposed action on the existing environmental resources. Resource areas that were considered but were not carried forward for detailed analysis in the EA (because potential impacts from the proposed action would not be expected or would be considered to be discountable) are as follows:

- Noise
- Geology, Topography, and Soils
- Biological Resources
- Water Resources
- Water Supply and Wastewater Infrastructure
- Traffic and Transportation.

The resource areas that were analyzed in the EA are summarized below. No significant impacts would result from the proposed action**.**

ES.5.1 Land Use

- There would be minor long-term impacts on land use at the site because of the change in land use from logistical (*i.e.*, vehicle storage and helicopter landing) to a solar PV facility, although consistent with the Navy's on-station land use policies.
- No direct impact on the adjacent Navy buildings and facilities, or adjacent roadways would occur, although some vehicle storage may be relocated to adjacent land.
- The electrical utility lines, substations, and transformer equipment would be installed among existing compatible equipment and existing utility rights-of-way (ROWs).

ES.5.2 Coastal Zone Management

- The project would have no effect on Mississippi's coastal resources. A Negative Determination for the project received no objections by the Mississippi Department of Marine Resources.

ES.5.2 Visual Resources

- Installation of the solar PV facilities would change the visual character of both site locations. The resulting visual impacts would be minor for an individual site location, or

if both sites are developed, because the solar PV facilities would be viewed in relation to other industrial areas in the immediate vicinity. The impact would be moderate if both sites are developed because the sites could be in a single field of view for certain off-station residents.

ES.5.3 Utilities and Infrastructure

Electrical System

- Development of the solar PV system would increase renewable electrical energy (*i.e.,* replacing grid-supplied electricity) and would contribute to meeting Navy, state, and national renewable energy goals.
- There would be minor impacts on the electrical infrastructure of the station, which would have to be modified and upgraded to accommodate the new solar PV system.

Stormwater Management

- The minimal ground disturbance activities would require a notice of intent to comply with permit requirements for stormwater discharges. Stormwater management design, federal and state regulations, BMPs, and construction permits would minimize impacts.

ES 5.4 Air Quality

- Temporary, negligible, direct impacts on air quality from emitting criteria air pollutants during construction (and operation).
- Minor, beneficial, indirect impact on air quality from reduction in regional criteria pollutant emissions from replacing grid-supplied electricity with renewable energy electricity.
- Indirect and beneficial impact on greenhouse gas (GHG) emissions in the region from the replacement of grid-supplied electricity with renewable energy electricity.

ES.5.5 Socioeconomics and Environmental Justice

Socioeconomics

- No impacts on local or regional populations or demographics would occur during the construction or operation of the proposed solar PV system.
- Some short-term positive economic impacts on the local and statewide economy would occur during the construction phase and, to a lesser extent, during the operation phase of the proposed solar project.

Environmental Justice

- Environmental justice communities are present within the study area. These areas contain percentages of minority and Hispanic/Latino populations and/or populations living below the poverty level that are higher in the affected census block groups and census tracts than in Harrison County as a whole.
- There would be no disproportionately high or adverse human health or environmental effect on these populations because no significant negative environmental or human health impacts would be expected as a result of construction or operation of this project.

ES.5.6 Cultural Resources

- The Navy evaluated the potential effects of the solar PV system facility under Section 106 of the National Historic Preservation Act (NHPA) and determined that the proposed action would have no effect on architectural or archaeological resources, including architectural or archaeological resources that are historic properties, because none are located within or immediately adjacent to the project location. The Navy consulted with the Mississippi SHPO regarding the finding of no effect on architectural or archaeological resources that are historic properties. The Mississippi SHPO concurred that installation of the solar PV system would have no effect on architectural or archaeological resources, including architectural or archaeological resources that are historic properties (see Appendix A).
- The Navy also evaluated the potential impacts of the solar PV system facility under NEPA and determined that the proposed action would have no impact on known Native American resources because none have been identified to date. The Navy consulted with four federally recognized tribes with an interest in NCBC Gulfport property about the solar PV system (the Mississippi Band of Choctaw Indians, the Choctaw Nation of Oklahoma, the Jena Band of Choctaw Indians, and the Tunica-Biloxi Tribe of Louisiana). The Jena Band of Choctaw Indians and the Choctaw Nation of Oklahoma responded that they have no concerns with the proposed project. The Navy has not received responses from the other two tribes.

ES.5.7 Hazardous Materials and Waste

Environmental Restoration Program

- One ER Program site, IR Site 8A, is a proposed solar PV site. The site currently has a concrete cap and a series of stormwater drainage ditches designed to reduce erosion from around the cap. The developer or contractor would avoid compromising the integrity of the cap during construction and operation of the PV system and will maintain compliance with all state and federal requirements for IR Site 8A activities. By adhering to the land use controls established under CERCLA, there would be no significant impacts on human health and the environment related to the ER Program from implementing the proposed action.

Hazardous Waste and Hazardous Materials

- Implementation of the proposed action would result in negligible impacts related to the handling and disposition of hazardous materials and waste. Hazardous wastes generated during operation would be managed in accordance with the Hazardous Waste Management Plan (HWMP) and other applicable installation management plans. All applications of pesticides/herbicides would follow procedures and protocols outlined in the Integrated Pest Management Plan (IPMP) and in applicable local, state, and federal requirements, as well as manufacturer guidelines.

ES.5.8 Public Safety

Glint and Glare

- Based on a glint and glare analysis and because the Navy and the developer would comply with federal policy and guidance, the proposed action would not result in significant impacts on aviation-related safety.
- There would be negligible impacts from glint and glare on the occupants of multi-story buildings near the project sites based on the low likelihood that the majority of building windows would be oriented directly facing the solar panels and the short amount of time that an occupant of the buildings would be at the windows viewing a solar facility.
- There would be minor impacts on certain motorists approaching the solar PV facilities from a southerly direction.

Electromagnetic Fields

- EMF levels from the solar PV facilities and electrical lines would be below International Commission on Non-Ionizing Radiation Protection (ICNIRP)-recommended exposure guidelines for the general public, resulting in negligible impacts.

ES.6 Areas of Potential Controversy

Implementation of the proposed action is not expected to generate controversy.

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Acronyms and Abbreviations

AC	alternating current
ACHP	Advisory Council on Historic Preservation
APE	area of potential effect
AWEA	American Wind Energy Association
BLM	Bureau of Land Management
BMPs	best management practices
CAA	Clean Air Act
CED	Construction Equipment Department
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CNIC	Commander, Navy Installations Command
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CSP	concentrating solar power
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DC	direct current
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
EA	environmental assessment
EIA	Energy Information Administration
EMF	electromagnetic fields
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
FAA	Federal Aviation Administration
FEX	field exercise
FR	*Federal Register*

FY	fiscal year
GHG	greenhouse gas
GSHP	ground source heat pump
GW	gigawatt
GWP	global warming potential
HAPs	hazardous air pollutants
HO	herbicide orange
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICRP	International Commission on Radiological Protection
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
kV	kilovolt
kW	kilowatt
LBP	lead-based paint
LID	low-impact development
LQG	large-quantity generator
LUC	land use control
MBTA	Migratory Bird Treaty Act
MCP	Mississippi Coastal Program
MDEQ	Mississippi Department of Environmental Quality
MDMR	Mississippi Department of Marine Resources
mG	milligauss
MOA	Memorandum of Agreement
MSAT	Mobile Source Air Toxics
$MTCO_2e$	metric tons carbon dioxide equivalency
MW	megawatt
MWac	megawatts in alternating current
MWdc	megawatts in direct current
MWh	megawatt hours
MWR	morale, welfare, and recreation
NAAQS	National Ambient Air Quality Standards
NAVFAC	Naval Facilities Engineering Command
NAVSTA	Naval Station
Navy	U.S. Department of the Navy

NCBC	Naval Construction Battalion Center
NEPA	National Environmental Policy Act of 1969
NFESC	Naval Facilities Engineering Service Center
NHPA	National Historic Preservation Act
NIEH	National Institute of Environmental Health Sciences
NO_2	nitrogen dioxide
N_2O	nitrous oxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
O&M	operations and maintenance
PCS	power conditioning station
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
POL	petroleum, oil, and lubricants
PV	photovoltaic
RCRA	Resource Conservation and Recovery Act
REC	renewable energy certificate
REPO	Renewable Energy Program Office
ROW	right-of-way
RPO	Regional Program Office
SARA	Superfund Amendments and Reauthorization Act
SEIA	Solar Energy Industries Associates
SERC	Southeastern Electric Reliability Council
SHPO	State Historic Preservation Officer
SHW	solar hot water
SIP	state implementation plan
SO_2	sulfur dioxide
SPCC	spill prevention, control, and countermeasures
SRG	Seabee Readiness Group
SVP	solar ventilation pre-heating
SWMP	Stormwater Management Plan
SWPPP	stormwater pollution prevention plan

USACE	U.S Army Corps of Engineers
USAF	U.S. Air Force
U.S.C.	United States Code
USFS	U.S. Forest Service
UST	underground storage tank
V/m	volts per meter
WMI	Wind Measurement International
yr	year

1 Purpose and Need for the Proposed Action

1.1 Introduction

The United States Department of the Navy (Navy) has prepared this environmental assessment (EA) to evaluate the environmental consequences of leasing land for the construction and operation of a solar photovoltaic (PV) system at Naval Construction Battalion Center Gulfport (NCBC Gulfport), Gulfport, Mississippi. Other renewable technologies were also initially considered for development at NCBC Gulfport but were eliminated from further analysis in this EA (see Section 2.3).

The Navy would lease up to 25 acres of Navy property at NCBC Gulfport to be developed by an independently operated commercial power utility company (power utility) for a solar PV system. The power utility and a third-party solar developer would construct and operate a solar PV system, consisting of one or two solar PV facilities, at one or two sites and transmission facilities. Each solar PV facility would consist of arrays of PV cells that collect energy from sunlight for the production of electricity. The renewable energy generated at the sites would supply the existing commercial electrical energy grid, which also distributes power to NCBC Gulfport. Land would be leased for an estimated 37 years, including 2 years for construction, 25 years of operation, and two 5-year options. After the terms of the lease expire, the Navy and the power utility would consider a range of options, including renewing the lease or decommissioning the system.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); (42 United States Code [U.S.C.] 4321); Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500; and Navy procedures for implementing NEPA (32 CFR 775). The Navy is the lead agency for the proposed action. The action proponent for this project is the Commander, Navy Installations Command (CNIC).

1.2 Background

The Navy's energy strategy is centered on providing energy security, efficiency, and sustainability while remaining the pre-eminent maritime power.

- Energy security is critical to mission success. Energy security safeguards our energy infrastructure and shields the Navy from a volatile energy supply.
- Efficiency increases mission effectiveness. Efficiency improvements minimize operational risks while saving time, money, and lives.
- Sustainability efforts protect mission capabilities. Investment in environmentally responsible technologies afloat and ashore reduces greenhouse gas (GHG) emissions and lessens dependence on fossil fuels (Navy 2012b).

In October 2009, the Secretary of the Navy established renewable energy goals for the Navy's shore-based installations to be met by 2020. These goals include the following:

1) The Navy will produce or procure at least 50 percent of the total quantity of electric energy consumed by shore-based facilities and activities each fiscal year (FY) from alternative energy sources;
2) Fifty percent of Navy installations will be net zero (*i.e.*, over the course of a FY, an installation matches or exceeds the electrical energy it consumes ashore with electrical energy generated from alternative energy sources) (Navy 2012b).

The Navy's goals and energy strategy are aligned with renewable energy policies being developed throughout the federal government and contained in the following executive order and statutes:

- **Executive Order (EO) 13514, Federal Leadership in Environmental, Energy, and Economic Performance (2009):** This EO requires federal agencies to set percentage reduction targets for greenhouse gas (GHG) emissions for FY 2020. Agencies are instructed to consider measures for the targets by increasing energy efficiency, reducing the use of fossil fuels, and increasing the use of renewable energy and implementing renewable energy generation projects on agency property.[1]
- **Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852):** Section 203 of the EPAct requires that the federal government consume not less than 7.5 percent of its electricity from renewable sources after FY 2013.
- **Title 10 U.S.C. 2911(e):** This statute requires the submission of an energy performance master plan and performance goals, including the goal to produce or procure 25 percent of the total quantity of energy consumed within its facilities from renewable sources by 2025 and each FY thereafter.

On December 5, 2013, President Obama signed a presidential memorandum that requires federal agencies to produce or procure from renewable sources 20 percent of electricity consumed by facilities by FY 2020 and each fiscal year thereafter, an amount that represents a more aggressive goal than under the EPAct or 10 U.S.C. 2911(e). The memorandum also establishes interim goals of 10 percent by 2015, 15 percent by 2016, and 17.5 percent by 2018. The memorandum states that the renewable energy consumption target be achieved by 1) installing agency-funded renewable energy on site at federal facilities, or 2) contracting for energy that includes the installation of a renewable energy project on site at a federal facility. The memorandum implements the goal outlined by President Obama in the June 2013 Climate Action Plan. As part of this effort, agencies are instructed "to consider opportunities, to the extent economically feasible and technically practical, to install or contract for energy installed on current or formerly contaminated lands, landfills, and mine sites." [2]

In support of the EPAct and 10 U.S.C. 2911(e) renewable energy goals, the Secretary of the Navy created the 1 Gigawatt (GW) Initiative, which was named for the amount of renewable energy generation capacity to be deployed by 2020 either on or near Navy installations (Navy 2012a). This goal was initially stated in the President's 2012 State of the Union Address and is consistent with the Secretary of the Navy's 2009 alternative energy goal and the 2013 presidential memorandum.

With the 1 GW Initiative the Navy took a more aggressive approach to implementing cost-effective and mission-compatible projects at its shore facilities. To achieve 1 GW of renewable energy capacity by 2020, the Navy recognized the need to develop opportunities for large-scale projects that would be attractive to local commercial utilities and that leasing land for construction and operation of a solar PV system would support the goal of renewable energy for both on and off-station consumption using the commercial electrical energy grid (McGinn 2015).

[1] EO 13514 has been replaced by EO 13693, Planning for Federal Sustainability in the Next Decade, signed March 19, 2015.

[2] The presidential memorandum of December 5, 2013 has been replaced by EO 13693, Planning for Federal Sustainability in the Next Decade, signed March 19, 2015.

The Navy established the Renewable Energy Program Office (REPO) in order to specifically work with local commercial utilities to use private-sector funds to construct renewable energy facilities on Navy land. Three Regional Program Offices (RPOs) have been established to implement the projects at shore facilities across the country and abroad.

On March 19, 2015, President Obama issued EO 13693, Planning for Federal Sustainability in the Next Decade (80 FR 15872[March 25, 2015]). This EO replaced EO 13514 and the 2013 presidential memorandum and set new goals and timelines for use of renewable electrical energy by federal agencies. EO 13693 requires that

1) the percentage of the total amount of building electrical energy and thermal energy be clean energy, accounted for by renewable electrical energy and alternative energy, by the following dates:
    - Not less than 10 percent in FYs 2016 and 2017;
    - Not less than 13 percent in FYs 2018 and 2019;
    - Not less than 16 percent in FYs 2020 and 2021;
    - Not less than 20 percent in FYs 2022 and 2023; and
    - Not less than 25 percent by FY 2025 and each year thereafter.

2) The percentage of the total amount of building electrical energy consumed by the agency that is renewable electrical energy be met by the following dates.
    - Not less than 10 percent in FYs 2016 and 2017;
    - Not less than 15 percent in FYs 2018 and 2019;
    - Not less than 20 percent in FYs 2020 and 2021;
    - Not less than 25 percent in FYs 2022 and 2023; and
    - Not less than 30 percent by FY 2025 and each year thereafter.

Actions that may be considered to meet the percentage goals for building electrical energy and thermal energy include:

- Installing agency-funded renewable energy on site at federal facilities to include installing fuel cell energy systems; and
- Contracting for the purchase of energy that includes installing renewable energy on site at a federal facility.

1.3 Purpose and Need

The purpose of the proposed action is to increase Navy installation energy security, strategic flexibility, and resource availability through the development of renewable energy-generating assets at NCBC Gulfport. The proposed action is needed to meet the renewable energy standards put forth by the 1 GW Initiative and the Secretary of the Navy's 2009 energy goals, which include the requirement to produce 50 percent of the Navy's shore-based energy supply from alternative sources by 2020, as well as other federal directives, including the most recent Executive Order (EO) 13693.

1.4 Project Location

NCBC Gulfport encompasses approximately 1,100 acres of land on the western edge of the City of Gulfport within Harrison County, Mississippi. The station is located approximately 1 mile from the Mississippi Sound of the Gulf of Mexico (see Figure 1-1). The station is bordered by the City of Gulfport to the north, east, and south, by the City of Long Beach to the west, and Harrison County to the northwest.

NCBC Gulfport was established in June 1942 to serve as an Advanced Base Depot for the Navy during World War II. In 1952 all activities at the facility were consolidated into one unit, referred to as NCBC. Between the late 1940s and the early1960s, the facility size and staffing fluctuated in accordance with the amount of equipment and supplies stored or managed there, reaching a peak in the mid-1960s with the commitment of construction forces in Southeast Asia (CNIC n.d.).

NCBC Gulfport currently functions as a naval education, training, and research and development center and as a home base for the Atlantic Fleet Seabees, the Navy's construction battalions. The primary mission of NCBC is to support the Naval Construction Group 2 (former 20th Seabee Readiness Group), the 22nd - Naval Construction Regiment, three Naval Mobile Construction Battalions, the Naval Construction Training Center, and the Expeditionary Combat Skills command, as well as other Army, and U.S. Marine Corps (USMC) commands; the Department of Homeland Security (DHS), and the Defense Logistics Agency (DLA) ;and other small, tenant commands. NCBC Gulfport further provides storage and shipping services from the Mississippi Gulf Coast for the U.S. Navy and its fleet units (CNIC n.d.).

The majority of the station is developed to support mission requirements. Mission-support functions at NCBC Gulfport include administration, communications, general maintenance, parking, heavy equipment storage, supply, utilities, vehicle maintenance, and weapons. The remaining undeveloped portion of the station lies primarily at the western end and comprises natural areas and areas used for crane and dozer training and recreational programs.

1.5 Scope of the EA

This EA evaluates the reasonably foreseeable environmental impacts of the Navy's proposed action to lease up to approximately 25 acres of Navy property at NCBC Gulfport to a commercial power utility company for the construction and operation of a solar PV system that would generate electricity to supply the existing electrical energy grid. The type of solar PV facilities being considered are ground-mounted solar PV arrays.

1.5.1 Resource Areas Analyzed in Detail

The resource areas that have the potential to be affected by the proposed action evaluated in this EA are as follows:

- Land Use
- Coastal Zone Management
- Visual Resources
- Utilities and Infrastructure
- Socioeconomics and Environmental Justice
- Cultural Resources
- Air Quality

- Hazardous Materials and Waste
- Public Safety

1.5.2 Resource Areas Not Carried Forward for Detailed Analysis

Several other resource areas were considered but were not carried forward for detailed analysis in this EA because potential impacts from the proposed action were not expected to occur or would be considered negligible. Consistent with CEQ regulations (40 CFR 1501.7) for determining the scope of issues to be addressed in an environmental impact statement (EIS), the Navy has identified and eliminated from detailed study the issues or resources that are not potentially significant, narrowing the discussion of these issues to a brief presentation that demonstrates why they will not have a significant impact on the human environment. Resources not analyzed further in this EA are as follows:

- Noise
- Geology, Topography, and Soils
- Biological Resources
- Water Resources
- Water Supply and Wastewater Infrastructure
- Traffic and Transportation.

Noise

The ambient noise environment at NCBC Gulfport is dominated by existing on-station sources (*i.e.*, construction equipment, vehicles, generators, air conduction units, etc.). One of the primary activities at NCBC Gulfport is training on and storing heavy construction equipment. The closest off-station noise-sensitive receptors to NCBC Gulfport are the low-density residential areas to the north and south of the property (approximately 900 feet from the nearest site boundary to the north and 400 feet from the nearest site boundary to the south).

Construction noise could be audible during daytime hours at these receptors. However, given the short-term nature of the construction work, the impact at nearby residences would be considered to be temporary, minor, and similar to existing conditions. In addition, construction would likely take place only during daylight hours (sunrise to sunset) with no work on weekends except under exceptional conditions.

Noise associated with the operation of the solar PV system would be from the power conditioning stations (PCSs) that contain inverters and transformers. Inverters and transformers are used to convert direct current (DC) to alternating current (AC) and boost the voltage for connection to the grid. Each inverter/transformer unit would typically consist of two inverters and one inverter step-up transformer located inside a standard, manufacturer-supplied metal (13-gauge) enclosure, equipped with a fan. The SPL for this type of unit is typically about 59 dBA at 50 feet. Noise generated by the PCSs would not be noticeable at the nearest noise-sensitive receptors because of the distance between the solar PV system and the residential areas and because the noise levels would be consistent with existing ambient sound levels. Maintenance associated with solar PV system operations would include routine inspections and periodic washing, as needed, of the solar PV panels to remove accumulated dust. Noise generated by these activities would be minimal, and maintenance would not occur during weekend or nighttime hours.

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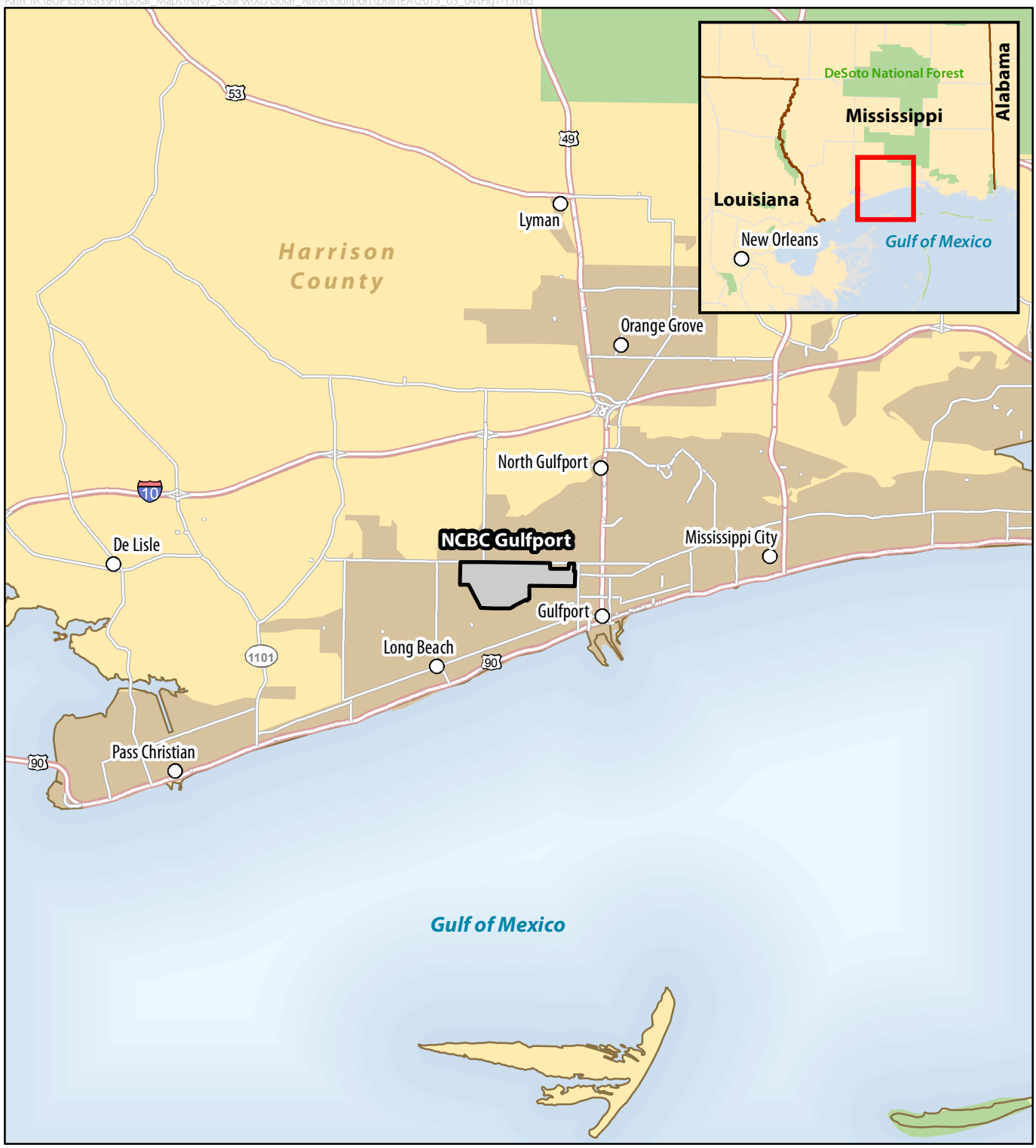

N

SCALE

0 5 Miles

Legend

Military Installation Boundary

Figure 1-1

Regional Location Map

NCBC Gulfport

Harrison County, Mississippi

Service Layer Credits: ESRI Basemap 2015,

Impacts on the ambient noise environment from the proposed action thus would be less than significant, and further analysis of the impacts on the noise environment is not warranted.

Geography, Topography, and Soils

Construction of the solar PV system would not require drilling or excavation to the extent that geological resources would be impacted. None of the sites have areas of unstable geology with the potential to result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. The proposed action would therefore have no impact on geological resources.

Construction of the proposed solar PV system would not require grading or extensive ground disturbance. The existing site locations are flat and have been previously cleared and disturbed for use as storage for vehicles, equipment, and supplies. In addition, a portion of one of the sites is covered with a concrete cap. Therefore, the need for site preparation work would be minimal and largely limited to minor excavation associated with the ground-mounted array footings, panel interconnections, poles for fencing, electrical poles, and a limited number of underground utility lines. Any potential ground disturbance from trenching would be minimal and would take place in previously paved, graded, and/or disturbed areas. The sites are not steeply sloped and would not result in drainage or erosion impacts. Any potential for soil erosion associated with construction would be controlled through the implementation of a site-specific Stormwater Pollution Prevention Plan (SWPPP) in association with the National Pollutant Discharge Elimination System (NPDES) construction permit. The NPDES permit will include best management practices (BMPs) to reduce the potential for soil erosion and prevent sediments from leaving the construction site. The SWPPP would also need to include low-impact development (LID) BMPs in compliance with Section 438 of the Energy Independence and Security Act (EISA) and the Navy's policy on LID for stormwater management. Compliance with the conditions and requirements of the permit as well as implementation of BMPs would reduce impacts on soil erosion and water quality from stormwater runoff. Following completion of construction, the site would be revegetated with an herbaceous groundcover to minimize soil erosion, and temporary construction laydown areas would be restored to pre-construction conditions.

Installation of the proposed solar PV facilities would not affect the existing stormwater collection and discharge system at the project sites. Runoff associated with solar PV system maintenance (*i.e.*, periodic washing to remove accumulated dust and debris) would be managed through the existing drainage system and by using BMPs. Because topography and soils would not be adversely affected by the proposed action these resources do not warrant detailed analysis in the EA.

Biological Resources (Vegetation, Wildlife, and Threatened and Endangered Species)

No state or federally listed threatened or endangered species occur on NCBC Gulfport. Suitable habitat for state or federally listed species is not present at NCBC Gulfport due to the urban nature of the station and fragmented natural communities (Navy 2007). Moreover, the habitat on the proposed project sites and the areas surrounding the sites do not support protected species.

The project sites are considered developed and heavily disturbed because of previous land uses and ongoing ground maintenance activities, *e.g.*, a large portion of one site is a concrete cap; these locations thus do not provide suitable habitat for any protected species. Sites that are not paved (*i.e.*, man-made) contain herbaceous groundcover consisting of non-native ornamental grasses and weeds typically found in developed areas and small new-growth trees and scrub brush growing along the drainage ditches. The sites have minimal vegetation and consist of poor habitat for bird species protected under the Migratory Bird Treaty Act (MBTA). Migratory birds could fly over the site, but as the sites are surrounded by industrial land uses, adverse impacts related to solar development, *e.g.*, the "lake effect," would not be expected to be significant. (Some studies have determined that birds could mistake the smooth surface of

solar panels for either the sky or water and collide with the solar panels.) The solar PV facilities would be constructed within a larger building complex, thus surrounding this area with active industrial uses, which should limit use of the site by migratory birds. Furthermore, the potential to harm migratory birds or potential to take bald or golden eagles would not be likely during construction and operation of the solar PV system.

The proposed action would have no impact on forests, trees, game and non-game wildlife species, species-at-risk, or any state or federally listed candidate, threatened, endangered, or otherwise protected or managed plant, animal, or bird species or ecologically sensitive habitat. Because of the low quality of vegetation and the previously disturbed nature of the sites, construction and operation/maintenance activities related to the proposed action would have negligible to no impact on biological resources. Because biological resources would not be adversely affected by the proposed action these resources do not warrant detailed analysis in the EA.

Water Resources

No federally regulated wetlands, floodplains, or waterways as defined by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) of 1972 are located within the footprint of the proposed sites. Water bodies closest to the sites include the 7-acre Seabee Lake, formerly known as Recreation Lake, and several small ponds associated with the on-station golf course, located approximately 1.0 mile west of the site. The existing site locations are flat and have been previously cleared and disturbed for use as vehicle, equipment, and supply storage. In addition, a portion of one of the sites is covered with a concrete cap. Neither the lake nor the ponds would be directly or indirectly impacted by the construction and operation of the solar PV system.

The proposed action would not increase the amount of impervious surface at the sites or result in additional stormwater runoff. As noted above, the majority of the land cover is concrete, and areas that are not paved contain herbaceous groundcover. The addition of the solar PV system on paved areas would not change the perviousness of those areas. Additionally, in the non-paved areas with herbaceous groundcover, the ground surface underneath the solar panels would remain primarily pervious and would continue to consist of maintained herbaceous vegetation.

To minimize any indirect water quality impacts on the larger watershed resulting from construction and operation activities, the Navy would implement erosion-control BMPs to prevent any increased erosion and sedimentation during construction activities in accordance with the SWPPP and the NPDES construction permit. Stormwater runoff during operation of the solar PV system would continue to be managed with the existing drainage system and coupled with any necessary permanent BMPs.

Minimal water usage would be expected for the solar PV system, either during construction or during operation for panel washing throughout the life of the system, as the amount of expected rainfall in the region would typically be adequate to keep the panels clean. However, if water is required for the panel washing, it would be supplied to the site by truck; no on-site surface or groundwater sources would be used.

No wetlands and/or 100-year floodplains lie within the sites. Implementation of the proposed action would not increase the impervious surface area (which could result in an increase in stormwater runoff). All on-site activities would adhere to the SWPPP. Therefore, there would be no adverse impacts on water resources that would result from implementation of the proposed action. Therefore, further analysis of the impacts on water resources in this EA is not warranted.

Water Supply and Wastewater Infrastructure

Water supply and wastewater infrastructure are present at the sites. However, the proposed action would not require changes to that infrastructure, would not affect drinking water capacity in the vicinity of the sites, and would not generate wastewater that would require transport to and treatment at local wastewater treatment facilities. The amount of water required would be minimal, and it would not impact the overall volume of the water supply for NCBC Gulfport or Harrison County. During operation of the solar PV system, minimal water usage would be required for panel washing throughout the life of the system, as the amount of expected rainfall in the region would typically be adequate to keep the panels clean. Any water needed for operations or maintenance at the site would be supplied by truck; no on-site surface or groundwater sources would be used. Therefore, the proposed action would have no impact on those resources.

Traffic and Transportation

Current roadway infrastructure allows access to the proposed sites. NCBC Gulfport is used as a storage and staging area for heavy construction equipment. As part of mission operations, large trucks routinely transport heavy equipment to and from the station using the existing infrastructure.

The traffic in and around NCBC Gulfport may increase temporarily during construction of the solar PV system. However, impacts would be short-term (estimated construction duration of approximately six to eight months), and delivery of equipment to the solar PV facility sites could be scheduled to avoid conflicts with scheduled deliveries of heavy construction equipment for mission operations.

Operation of the solar PV system would result in limited traffic associated with maintenance activities such as routine inspections and periodic washing of the solar PV panels to remove accumulated dust. Traffic would be minimal, and would not occur during weekend or nighttime hours. Therefore, impacts on the traffic would be less than significant, and further analysis of the impacts on traffic and transportation in this EA is not warranted.

1.6 Agency Coordination and Permit Requirements

NEPA requires that federal agencies responsible for preparing NEPA analyses and documentation do so "in cooperation with State and local governments" and other agencies with jurisdiction by law or special expertise (42 U.S.C. 4331[a] and 4332[2]). Table 1-1 provides a summary of applicable regulatory requirements and agencies.

Table 1-1 Agency Coordination and Permit Requirements

Regulation	Agency	Permit/Application	Regulated Activity
National Environmental Policy Act (42 U.S.C. 4321 et seq.)	Navy	Categorical Exclusion, Finding of No Significant Impact, or Record of Decision	Federal actions
Clean Air Act (42 U.S.C. 7401 et seq.)	U.S. Environmental Protection Agency	Compliance with National Ambient Air Quality Standards Conformity Determination	Federal actions that result in air emissions Compliance with the General Conformity Rule
Clean Water Act (33 U.S.C 1251 et seq.) Mississippi Air and Water Pollution Control Law	 Mississippi Department of Environmental Quality	National Pollutant Discharge Elimination System	Construction activities on areas equal to or larger than 1 acre
National Historic Preservation Act of 1966 as amended (16 U.S.C. 470 and amendments)	Advisory Council on Historic Preservation; Mississippi Department of Archives and History, State Historic Preservation Office	Section 106 consultation	Federal undertakings that may affect properties that have been formally listed or determined eligible for listing in the National Register of Historic Places
American Indian Religious Freedom Act of 1978, Archaeological Resources Protection Act of 1979, and Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)	Mississippi Band of Choctaw Indians the Choctaw Nation of Oklahoma, the Jena Band of Choctaw Indians, and the Tunica-Biloxi Tribe of Louisiana	Consultation with affected tribes	Presence of tribally significant cultural resources on federal land; presence of NAGPRA cultural items, sacred sites, or Traditional Cultural Properties
Coastal Zone Management Act (16 U.S.C. 1451-1464)	Mississippi Department of Marine Resources	Coastal Consistency Determination	Action by federal or state agencies that may affect coastal resources or uses in Mississippi
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. Chapter 103)	U.S. Environmental Protection Agency	Agency coordination/approval	Development on CERCLA sites undergoing remediation

2 Proposed Action and Alternatives

Chapter 2 provides a description of the proposed action (Section 2.1), the No Action Alternative (Section 2.2), and alternatives considered but eliminated (Section 2.3). Section 2.4 is a comparative summary of the environmental consequences of the proposed action and the No Action Alternative.

To achieve the 1 GW goal of renewable energy generation capacity by 2020, the Navy recognized the need to develop opportunities for large-scale projects that would be attractive to local public utilities. The Navy used a two-step evaluation to identify potential large-scale projects. Initially, the Navy evaluated alternative renewable energy technologies commercially available that could be implemented by a power utility company on Navy-owned land. Projects needed to be cost-effective and easily integrated into the existing electrical supply grid to be attractive. Alternative renewable energy technologies considered but eliminated from further consideration are discussed in Section 2.3.

Upon determining that the most viable renewable technology for a power utility company to implement at most installations at this time would be a solar PV system, the Navy REPO then requested installations to identify land areas within the installation that could potentially support a solar PV system. The site-selection process required the installations to consider a number of site-specific factors to identify suitable land areas for a solar PV system. The site-selection process is discussed further under the description of the proposed action in Section 2.1.

Either of the sites potentially viable for development of a solar PV system, either individually or in conjunction with the other site, is considered part of the proposed action. In the agreement between the Navy and the power utility company, one or both of these sites may be developed with a solar PV facility. If more than one site is developed, both facilities would be part of the larger solar PV system.

Chapter 2 also considers the No Action Alternative in Section 2.2. Although the No Action Alternative does not meet the Navy's purpose and need, the inclusion of this alternative is prescribed by CEQ regulations and this alternative is carried forward for analysis in this EA.

Section 2.4 provides a comparative summary of the environmental consequences of construction and operation of the proposed solar PV facility for each alternative site location at NCBC Gulfport and the No Action Alternative.

2.1 Proposed Action

The Navy proposes to lease up to 25 acres within NCBC Gulfport to be developed for a solar PV system by an independently operated commercial power utility company (power utility). The power utility would use a third-party solar power developer to construct and operate the solar PV system consisting of one or two solar PV facilities at one or both sites. The two potential sites would be alternative site locations under the proposed action. The proposed system would generate up to 4.2 MW of electricity to supply the power utility's existing electrical grid.

Solar PV technology uses solar cells to convert energy from direct and diffuse solar radiation into electricity. The basic unit in a PV system is a solar cell, made up of semiconductor material that absorbs solar radiation and converts it to an electrical current. Solar cells are contained within solar modules that are assembled into solar panels. A series of panels comprises a solar array.

The system to be constructed at one or both sites would be ground-mounted solar PV arrays. The facilities consist of panel-mounting brackets on vertical members within the site(s) as well as miscellaneous electrical equipment at the point of connection (*i.e.*, inverters, combiner boxes, electrical

switchgear, associated electrical wiring, and connections) and other items required for the solar PV system.

Solar PV systems generate DC electricity, which is converted to AC for transmission on the electrical grid and ultimate end-use in AC form. The conversion from DC to AC occurs at a power conditioning station that contains inverters and transformers. Once all electricity is collected, the power is transferred via a transmission line and substation to the nearest point of connection to the utility grid.

2.1.1 Site-selection Process

In July 2014, the REPO requested installations to identify land areas within the installation that could potentially support a solar PV system. The minimum criterion was that the land area, whether within one or both sites, needed to be of sufficient size to support a utility-scale project. A utility-scale project was considered a facility of 10 megawatts (MW) or more which, for a solar PV facility, would require approximately 50 acres of land (*i.e.*, about 5 acres per MW).

When evaluating whether on-station land areas could be considered for development of a solar PV facility, installations generally considered the following factors:

- Mission compatibility: The land area for site development would need to be compatible with the military missions and training occurring at the installation. Site development and operation of the solar PV facility may not adversely impact military training.
- Topography: Land areas for development of a ground-mounted solar PV facility need to be relatively flat (*i.e.*, less than 5 percent slope).
- Separation: The solar PV facility would be operated by an independent power utility company. Therefore, the land area to be leased to the power utility should be able to be isolated from the operational facilities and ongoing functions of the installation. Future development: The land area proposed for development would be committed to the solar PV facility for the terms of the lease, up to 37 years. Therefore, future growth and development potential of the site to support the military mission needed to be considered far into the future.
- Formerly contaminated lands and landfills: Consistent with the 2013 presidential memorandum, installations considered use of these land areas that due to their former use are not readily convertible to otherwise productive use.
- Protected environmental resources: Installations sought to identify land areas that were not encumbered by wetlands, protected plant or animal species habitat, or known cultural resources

2.1.2 Lease

In support of the Secretary of the Navy's energy goals, the Navy will use real estate outgrants to ensure fair compensation for the use of Navy lands where renewable energy generation will occur. A lease was determined to be the most appropriate real estate action for the NCBC Gulfport project to support the renewable energy goals. The lease action facilitates on-station generation of renewable energy for on- and off-station consumption. Land would be leased to the power utility company for an estimated 37 years, including 2 years for construction, 25 years of operation, and two five-year options.

The lease model provides on-station generation of renewable energy for on- and off-station consumption using the public utility grid while enabling the Navy to receive direct energy benefits with the terms of the lease. Under the NCBC Gulfport lease, on-station generation for off-station consumption would be

generated and the power utility would construct, operate, and maintain the solar PV system. The renewable energy generated would be provided directly to the off-station local power grid; however, during times of electrical grid outages or during emergency situations, the power could be provided to support the station.

In accordance with 10 U.S.C. § 2667, outgrants (leases) shall provide for consideration (rent) to be paid in an amount not less than the fair market value of the leasehold interest, either in cash or in-kind. Although the proposed action addresses the known impacts of the federal lease action, details regarding the specific method of consideration to be employed, to include the design, construction, management, and maintenance of any potential in-kind consideration projects or efforts, have not been developed at this time. Therefore, these projects and the potential decommissioning of the system at lease termination may be subject to further site-specific planning, environmental planning, and engineering analysis as necessary. Power utility companies and the third-party developers would be required to comply with all applicable federal regulations for Navy lands and assets, including the terms and conditions resulting from consultations with regulatory agencies.

2.1.3 Site Descriptions

After completing the site-selection process discussed in Section 2.1.1, NCBC Gulfport identified two on-station sites that could accommodate a utility-scale solar PV facility project either individually or in conjunction with another facility: 1) Installation Restoration (IR) Program Site 8A with an adjacent lot (the IR Site 8A and Adjacent Lot Site), and 2) an open area south of Building 200 (the Open Area Site). The alternative sites are summarized in Table 2-1 and shown on Figure 2-1. The sites are described further below. If a solar PV facility were constructed at each of the proposed sites, approximately 4.2 MW of electricity would be generated. Although less than 10 MW, the project was still considered cost-effective for the power utility.

Table 2-1 Proposed Solar PV Project Sites for NCBC Gulfport

Site	Site Area Estimated to be Available for Solar PV Development (acres)	Estimated Electricity Generation (MW)
IR Site 8A and Adjacent Lot	18	3.09[1]
Open Area	7	1.12[1]
TOTAL	25	4.21

[1] MWs indirect current (MWdc) provided by solar developer.
[2] Based on assumption of 5.0 acres/MW

2.1.3.1 IR Site 8A and Adjacent Lot Site

IR Site 8A is part of the larger IR Site 8, which occupies approximately 30 acres in the north-central portion of the base, north of 7th Street between Goodier Avenue and Lee Avenue. IR Site 8 comprises three areas: 8A, 8B, and 8C (Figure 2-2). IR Site 8A occupies approximately 12 acres.

The land area of IR Site 8 was used for equipment storage and staging until 1968. Between 1968 and 1977, an estimated 850,000 gallons of herbicide orange (HO) was stored and handled at the site. Between 1977 and 1984, drums containing the herbicide and contaminated soils were removed, and the site was secured with a fence. With the discovery of two adjacent sites, the original IR Site 8 became IR Site 8A, and the two new sites were identified as 8B and 8C.

IR Site 8A

IR Site 8A was later used for stockpiling wastes generated during remediation efforts (TetraTech 2011).

In 2007, dioxin-contaminated material at IR Site 8A was stabilized and capped. The concrete-covered area at IR Site 8A is currently used for vehicle storage by the Morale, Welfare, and Recreation (MWR), the Construction Equipment Department (CED), and Seabee units.

An adjacent lot of approximately 5.8 acres is located northeast of and adjacent to IR Site 8A and is considered part of the proposed site for a solar PV facility. This area does not contain any known contamination and is not part of the IR Program, although the area does contain a groundwater monitoring well used for the IR Site 8A monitoring program.

Adjacent lot next to IR Site 8A

The combined IR Site 8A and Adjacent Lot Site has no functional buildings. The topography of the combined site is relatively flat. Drainage ditches used for stormwater flow cross the site. No wetland areas have been identified at the combined site (TetraTech 2011).

With both areas (IR Site 8A and the adjacent lot), the Navy estimates that about 18 acres would be available for the installation of solar PV arrays, with a generating capacity of 3.09 MW in direct current (MWdc).

2.1.3.2 Open Area Site

A cleared open area occupies approximately 7 acres in the southeast portion of the base south of Building 200. The Open Area Site is north of 7th Street between Goodier Avenue and Lee Avenue (see Figure 2-3), south of Building 200. The land area was used for equipment storage and staging before 1968. It is currently used as a contractor lay-down area.

Open Area Site

The site has no functional buildings. The topography is flat. Drainage ditches used for stormwater flow cross the site. No wetland areas have been identified at the site (TetraTech 2011).

If the entire area is included in this site, the Navy estimates that about 7 acres would be available for the installation of solar PV arrays, with a generating capacity of 1.12 MWdc.

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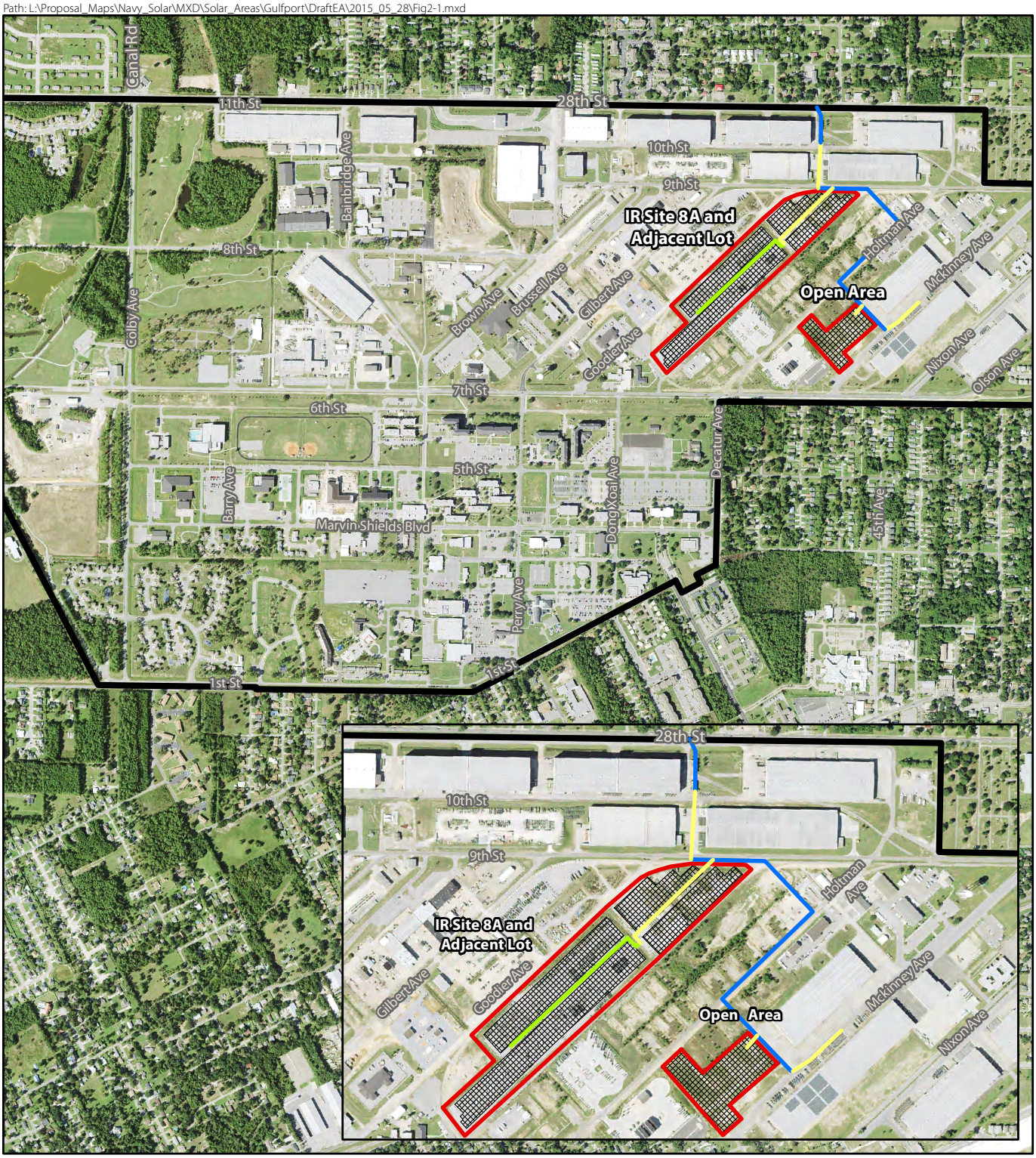

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SCALE

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Service Layer Credits: NAIP 2014

Legend

- 23KV Surface Duct Bank
- 23KV Underground Trench or Bore
- 23KV Overhead Pole Line
- Military Installation Boundary
- Proposed Solar Site Boundary
- Proposed Solar Array Location

Figure 2-1

Proposed Solar Project Locations

NCBC Gulfport

Harrison County, Mississippi

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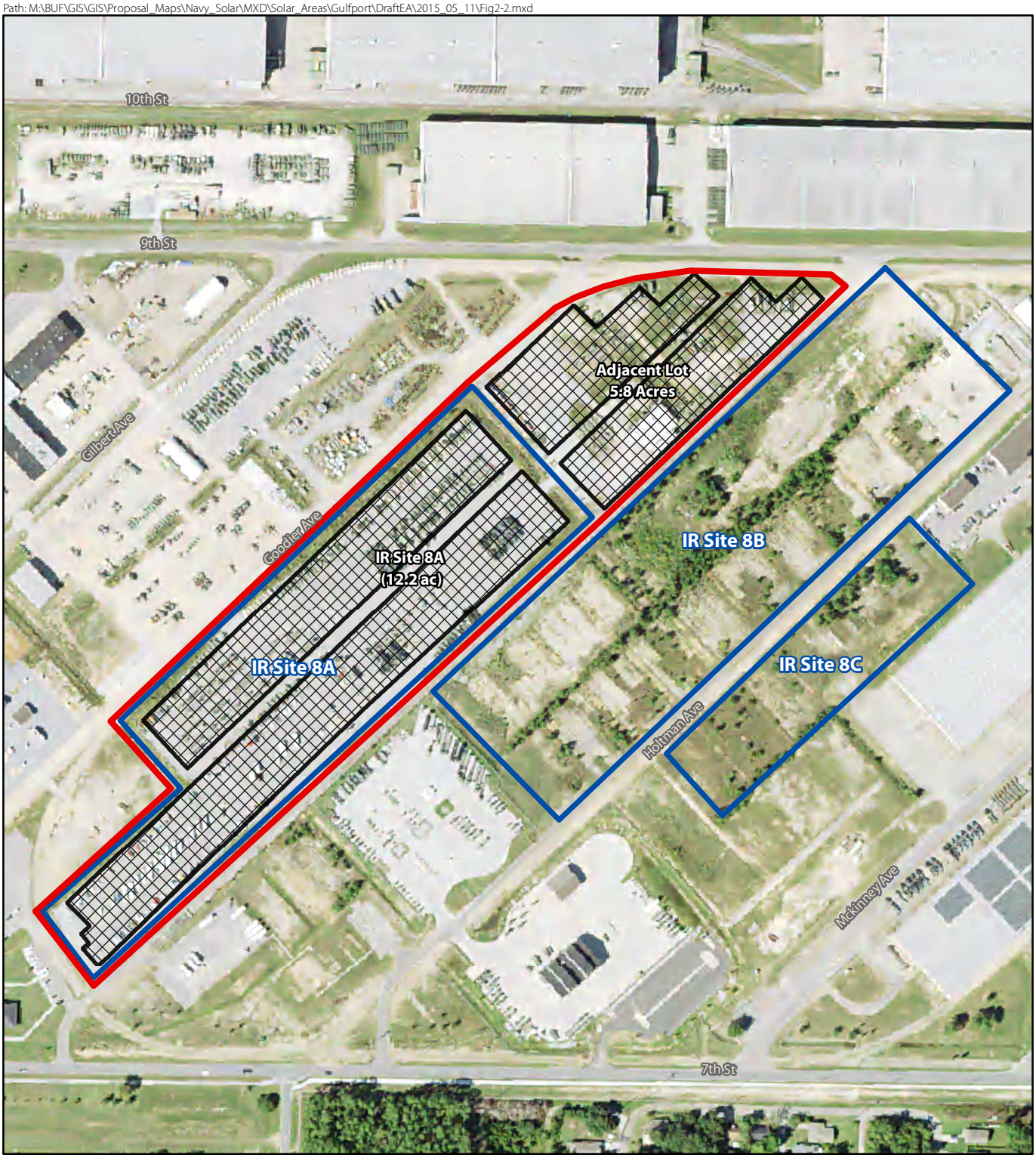

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Service Layer Credits: NAIP 2014

Legend

- Proposed Solar Site Boundary
- Proposed Solar Array Location
- Installation Restoration (IR) Site

Figure 2-2

Proposed Solar Project Location: IR Site 8A and Adjacent Lot NCBC Gulfport

Harrison County, Mississippi

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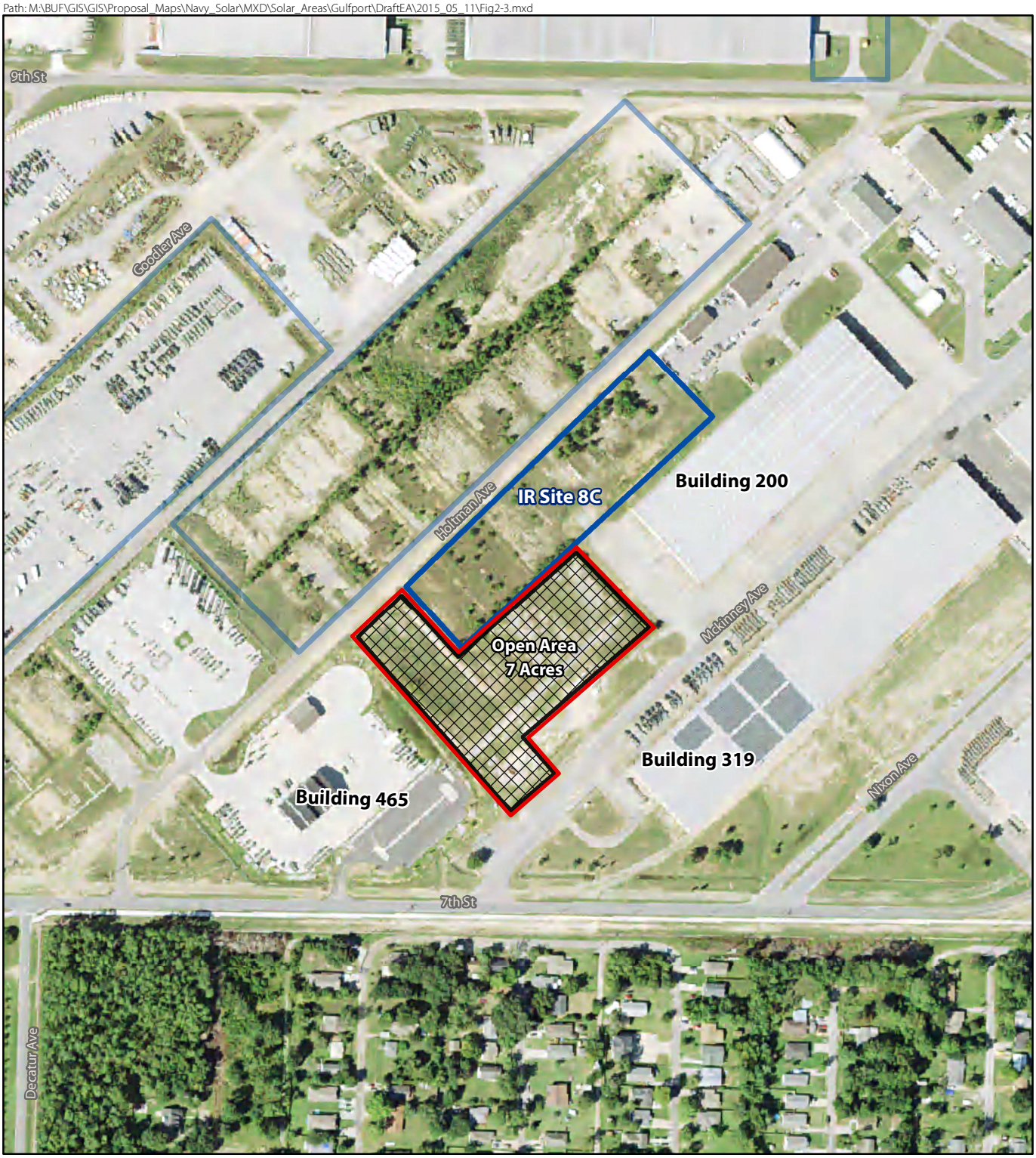

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SCALE

0 200 400 Feet

Service Layer Credits: NAIP 2014

Legend

- Proposed Solar Site Boundary
- Proposed Solar Array Location
- Installation Restoration (IR) Site

Figure 2-3

Proposed Solar Project Location: Open Area at NCBC Gulfport

Harrison County, Mississippi

2.1.4 Solar PV Technology

The Navy is proposing use of a ground-mounted solar PV system at the IR Site 8A and Adjacent Lot Site and the Open Area Site, south of Building 200. The ground-mounted systems are described below.

Description of the Ground-mounted Array

The solar PV arrays would be connected to a ground-mounted, fixed-tilt (stationary) system designed to optimize power production of the panels by ensuring proper orientation to the sun throughout the day and seasons (see Figure 2-4). In some designs, a single-axis tracking system would be used, which allows the panels to change direction to follow the sun's path throughout the day. The motor for a single-axis tracking system can be mechanical or hydraulic.

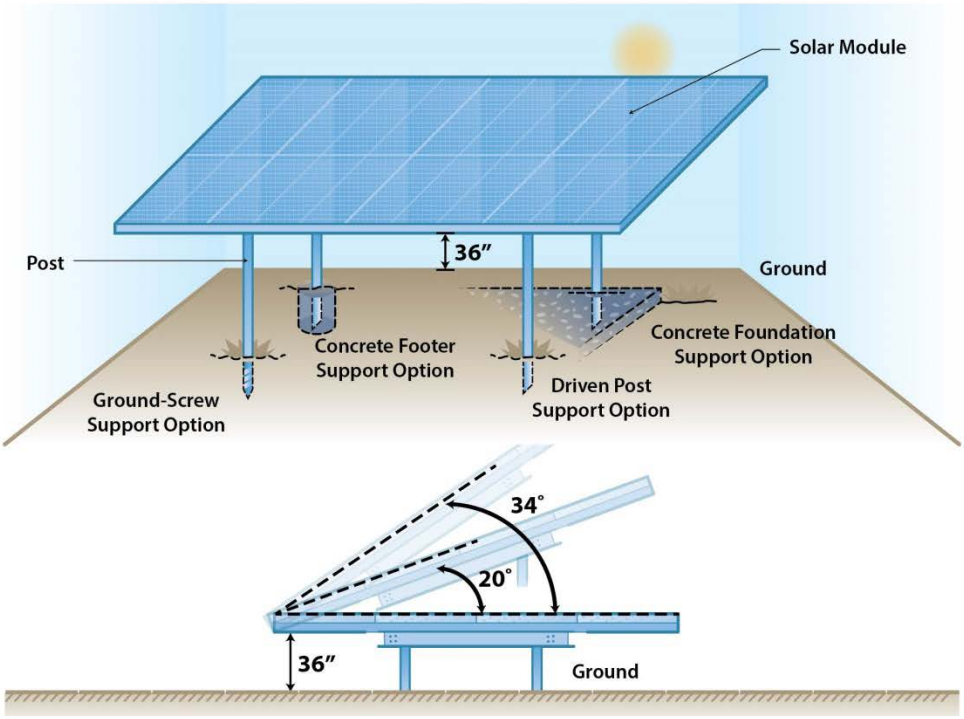

Figure 2-4 Typical Ground-mounted Solar Array

The panels would likely be constructed of glass encasing, which would be dark blue or black in color, with minimal light reflection. The highest point of the solar array for the ground-mounted solar PV system would typically not exceed 10 feet above the ground surface. The panels would be approximately 6 feet wide and 3 feet long. The number of panels in each array, the type of ground-mounted system used, and the array configuration would depend on the solar power developer's final site design.

Solar PV systems generate DC electricity, which is converted to AC for transmission on the electrical grid and ultimate end use in AC form. The conversion from DC to AC occurs at a PCS that contains inverters. Once all AC electricity is collected on site, the power is transferred to a transmission line and substation (see Section 2.1.5). The ground-mounted solar PV facilities would require either an underground or overhead electrical line to transfer electricity to the nearest point of connection.

In areas with surface vegetation, ground-mounted solar PV systems would require the site to first be cleared and grubbed (*i.e.*, have roots and stumps extracted) as needed. The site additionally could require grading in accordance with the specifics of the project design (*i.e.*, to a maximum slope of approximately

5 percent). Soil in applicable areas of the project site would be compacted as necessary for roads, inverter pads, switching stations, and other features. All soils disturbed during the construction process would remain on station. Depending on soil moisture at the site and the project design, water might need to be added to the soil or the site might need to be dewatered to effect proper soil compaction.

Construction materials would be transported by truck to the project site where they would be staged, assembled, and moved into place. Temporary construction laydown areas may be required adjacent to or near the project site for materials, equipment, and parking. Construction duration (from initial site preparation and staging of equipment and panels to completed solar PV facility) would be approximately six to eight months.

The proposed configuration for the ground-mounted facilities not associated with an IR Program site (*i.e.*, the Open Area Site and the adjacent lot portion of the IR Site 8A and Adjacent Lot Site) is to install vertical, pile-driven support post members into the ground and the panel-mounting hardware, frames, motors, and/or the solar panels themselves affixed atop the constructed mounting structure (see Figure 2-4). Electrical conduits would either be above ground or buried in trenches at a depth of approximately 3 feet between the solar PV panels and the point of connection to complete the electrical circuits. BMPs for erosion and sedimentation control would be implemented during the construction phase of the project to ensure compliance with stormwater management requirements and minimize effects on local surface and groundwater quality. Following construction of the arrays, the site would be revegetated with an herbaceous groundcover to minimize soil erosion.

Installing solar PV facilities on IR Program sites with existing protective caps such as IR Site 8A requires additional solar-specific design and construction considerations. The proposed configuration for this site is to install the vertical members using anchor bolts, epoxied into the concrete cap to a depth of no more than 6 inches, and the panel-mounting hardware, solar panels, etc., themselves affixed atop the constructed mounting structure as with the other ground-mounted facilities. The developer would follow all land use controls at the site and the load limit of the cap to maintain the integrity of the cover system

Existing site monitoring, stormwater management, and other systems would be considered in planning the solar PV system for a former IR Program site. DC and high-voltage wiring, which may be installed in a below-ground conduit in typical ground-mounted projects, would likely be installed aboveground to avoid penetrating the concrete cap.

Access to facilities would be restricted by a fence with a lockable gate. Each solar PV facility would occupy the majority of the space contained within the fenceline. The area may include gravel access roads between rows of solar arrays and around the site perimeter for maintenance access, as well as an operations/control building. Visual barriers could be used to screen the solar PV facility from sensitive receptors such as residents and recreationists. Visual barriers would consist of existing or installed features (*e.g.*, buildings, berms, natural ridges, vegetation, fences, or walls). A buffer area is often included at the perimeter of the solar PV system to accommodate access roads, visual barriers, and fencing.

Following construction, any temporary construction laydown areas would be restored to pre-construction conditions.

2.1.5 Interconnection

The project would include points of interconnection as well as electrical feeder and distribution lines to connect the project to electrical facilities owned and operated by the power utility (see Figure 2-1). Overhead or underground electric feeder lines would be installed and would typically be situated to take

advantage of existing electrical infrastructure and to avoid sensitive features such as wetlands and other habitats.

The primary distribution line to be used for both sites is located directly off-station and extends along the south side of 28th Street. The utility does not plan to install a new distribution line but would install feeder lines for connecting the project sites to the primary distribution line. If additional capacity would be needed, the utility plans to install another line using the same infrastructure. Installation of new feeder lines would not likely require site clearing and the establishment of applicable rights-of-way (ROWs). The utility anticipates that all poles and wire-carrying systems associated with the solar PV system would need to be replaced or upgraded.

2.1.6 Operation and Maintenance

Periodic maintenance would be required for the solar PV arrays, including panel washing and panel replacement. The estimated water use for panel washing would be approximately 360 gallons per year for a 6 MW system (NREL [National Renewable Energy Laboratory] 2014). However, the expected amount of rainfall in the region may be adequate to keep the panels clean. If panel washing is required, water trucks would be used to wash panels in accordance with manufacturer specifications and frequencies.

Grass, groundcover, and vegetation beneath and near the panels would be trimmed or mowed periodically and could be additionally controlled with herbicides to ensure that vegetation does not obscure or shadow the panels. Access roads would be maintained as needed.

2.2 No Action Alternative

In compliance with NEPA and CEQ regulations, the No Action Alternative must be considered and associated potential impacts evaluated. Under the No Action Alternative, the installation of a solar PV system would not occur at NCBC Gulfport. Thus, various federal statutes and EOs that mandate changes in energy consumption and production would not be addressed, and the No Action Alternative would not increase renewable energy production or use. The No Action Alternative would not meet the renewable energy objectives of the Navy or the goals, purpose, and need for the proposed project, as described in Sections 1.2 and 1.3.

Although the No Action Alternative does not meet the Navy's purpose and need, the inclusion of this alternative is prescribed by CEQ regulations. Therefore, the No Action Alternative will be carried forward for analysis in this EA. The No Action Alternative also serves as a baseline against which the impacts of the proposed action can be evaluated.

2.3 Alternatives Considered but Eliminated

In 2007, under the direction of the Naval Facilities Engineering Services Center (NFESC), the Department of Energy's (DOE's) National Renewable Energy Laboratory (NREL) began a study of renewable energy strategic opportunities at 70 Navy installations (NREL 2014a). The study investigated six renewable energy technologies, including solar PV, concentrating solar power (CSP), solar hot water (SHW), solar ventilation pre-heating (SVP), wind, and biomass. NREL identified where these technologies could best be used, based on 2010 energy and technology cost assumptions, technological maturity, maps of renewable resources, capital costs, operation and maintenance (O&M) costs, land area required, and project life expectancy. Payback estimates, with and without incentives, were estimated for each viable technology. NREL continues to work with Navy installations to evaluate and deploy renewable energy demonstration projects, and projects to promote energy efficiency. With the 1 GW Initiative established in 2009, the Navy took a more aggressive approach to implement cost-effective and mission-compatible projects at its shore facilities. To achieve 1 GW of renewable energy generation capacity by 2020, the Navy recognized the need to develop opportunities for large-scale projects that

would be attractive to local commercial utilities. The Navy established REPO specifically to work with local commercial utilities to use private-sector funds to construct renewable energy facilities on Navy land.

As discussed in the introduction to Chapter 2, projects need to be cost-effective and readily integrate into the existing electrical supply grid to be attractive to local commercial utilities. In addition, commercial utilities would receive revenue from the sale of the electricity and would also retain control and ownership of the renewable energy certificates (RECs) associated with the project. RECs represent the environmental, social, and other non-power benefits of renewable electricity generation, and they can be sold separately from the physical generating systems (EPA 2014d). Under the federal income tax code, utilities could also receive federal business energy investment tax credit under 26 U.S.C. 48 for eligible systems placed in service on or before December 31, 2016, and some projects can take advantage of state-level incentives.

In evaluating the various renewable energy technologies, REPO considered the following key criteria:

- Projects need to be implemented using a mature, reliable technology.
- Technology used should be cost-effective to implement.
- Projects should be implementable by December 31, 2016. Therefore, projects that would require additional study of the availability and reliability of the renewable resource could not be implemented by 2016.

2.3.1 Solar

While solar PV technology was determined to be the most viable alternative to meet the purpose and need of the proposed action, other solar technologies and applications were considered but eliminated. Solar energy electricity-generating technologies are divided into two broad categories—PV, which directly converts sunlight to electricity, and CSP, which generates heat to drive a steam turbine. Solar heat can also be collected in SHW and SVP systems, which are building-integrated renewable energy technologies that can reduce energy use for heating in facilities. They do not generate electricity and are not viable on a large scale.

In addition to ground-mounted and ballasted solar PV arrays, the Navy also considered rooftop and carport-mounted solar PV applications and CSP technology.

Concentrating Solar Power

CSP technologies use heat from solar energy to generate electricity. Multiple designs of CSP technologies have been developed; all are based on the concept of concentrating direct solar radiation to heat a fluid to very high temperatures, and this fluid is then used to generate electricity via a conventional turbine. These technologies include linear concentrators, solar towers, and dish/engines. Parabolic trough CSP collectors capture the sun's energy with large mirrors that reflect and focus the sunlight onto a linear receiver tube. The receiver contains a fluid that is heated by the sunlight and then used to create superheated steam that spins a turbine that drives a generator to produce electricity. In power tower systems, numerous large, flat, sun-tracking mirrors, known as *heliostats,* focus sunlight onto a receiver at the top of a tall tower. A heat-transfer fluid heated in the receiver is used to generate steam, which, in turn, is used in a conventional turbine generator to produce electricity. The solar concentrator dish, which looks like a satellite dish, gathers the solar energy coming directly from the sun. The resulting beam of concentrated sunlight is reflected onto a thermal receiver that absorbs the concentrated beams of solar energy, converts them to heat, and transfers the heat to the engine/generator. The engine/generator system is the subsystem that takes the heat from the thermal receiver and uses it to produce electricity.

CSP facilities range in height from approximately 30 feet for the linear concentrators to 20 to 30 feet for the heliostats and to 180 to 700 feet for the solar towers.

CSP technologies have been in operation since the early 1980s. In 2014, more than 1,400 MW of CSP plants were operating in the U.S., with an additional 390 MW currently in development that will begin operating in 2015 (SEIA 2014). Although the technology is mature, the number of CSP facilities in operation has not increased at the same pace as solar PV facilities. While the Department of Defense (DOD) has 511 solar PV systems in operation on DOD lands, no CSP systems have been implemented (DOD 2014). The acreage requirements for CSP technologies vary greatly due to the limited number of case studies of their application but can range between 5 and 8 acres per MW. However, CSP technologies are most cost-effective at a scale of 50 to 100 MW, which would require land areas of 300 to 400 acres for a 50 MW facility and 600 to 700 acres for a 100 MW facility (NREL 2012). In addition, CSP technologies require large volumes of water, ranging from 1.1 million to 180 million gallons of water per year for a 100 MW CSP plant (NREL 2012).

Although CSP technologies may be viable in certain locations and could be considered at Navy installations, particularly in the southwest where large land areas are available, the Navy determined that the Navy and/or a local commercial utility would need to conduct extensive study to implement a CSP facility project given the large land requirements, water demands, and potential operational impacts (*i.e.*, regarding the solar towers). Therefore, a CSP project would not be viable in the expedited timeframe.

2.3.2 Wind Power

Wind energy is the transformation of wind into mechanical power through a turbine, and this mechanical power is then converted into electricity through a generator. Turbines can range in size from small, residential units with capacities less than 100 kilowatts (kW) to large-scale 2 MW to 3 MW turbines used in commercial wind farms. In 2014, the U.S. had wind energy capacity of 62,300 MW, with an additional 13,600 MW of wind energy capacity under construction (AWEA [American Wind Energy Association] 2014). Therefore, the technology is a mature technology, and its use is growing.

Wind turbines are generally sited in wide-open spaces. A standard wind farm of 20 turbines (1 to 3 MW each) extends over an area of 247 acres. However, only 1 percent of the land is used for the turbines, electrical infrastructure, and access roads. The remainder of the land can be used for farming or natural habitat (WMI [wind Measurement International] 2014). While considering wind direction, turbine sizing, and setback requirements, a smaller number of turbines could be configured on less land.

Small wind-turbine technology is still emerging, and applications would be too small for a utility-sized project. In some cases, large-turbine wind generation can pose challenges to the missions of many Navy installations due to the height of the towers and the effects on various types of radar and aircraft operations. Tower heights typically range from 190 to 260 feet (NREL 2012).

As of 2013, the DOD operated 27 wind energy projects, which represented only 1 percent of renewable energy production throughout the DOD (DOD 2014).

Although wind turbines may be viable in certain locations and could be considered at Navy installations, the Navy determined that the Navy and/or a local commercial utility would need to conduct extensive study to implement a wind energy project, and such a project would not be viable in the expedited timeframe. NREL recommends that at least one year of wind resource data would be required for a developer to obtain project financing, as the cost-effectiveness of a project is directly related to location and size (NREL 2012). Research is occurring into the technology that would operate in areas of lower wind resources; however, this technology is still emerging (NREL 2012).

2.3.3 Geothermal Energy

Geothermal power is energy generated by heat stored beneath the Earth's surface, or the collection of absorbed heat in the atmosphere and oceans. This heat can be used to heat facilities directly or to drive steam turbines to generate electricity. As a base load source of energy, geothermal is distinct from other renewable energy sources, such as wind and solar, because it can provide consistent electricity without being part of a broader system. In 2013, the U.S. had 3,442 MW of installed geothermal electricity capacity, with more than 1,000 MW capacity in development (GEA [Geothermal Energy Association] 2014).

Geothermal energy can be harnessed through direct use, electrical generation, or heat pumps. Direct-use applications include heating buildings, growing plants in greenhouses, drying crops, heating water at fish farms, and several industrial processes such as pasteurizing milk. Electrical generation occurs when steam from underground wells rotates a turbine, which activates a generator to produce electricity. Geothermal heat pumps are able to heat, cool, and, if so equipped, supply homes and buildings with hot water. A geothermal heat pump system consists of a heat pump, an air delivery system (ductwork), and a heat exchanger—a system of pipes buried in shallow ground. In the winter, the heat pump removes heat from the heat exchanger and pumps it into the indoor air delivery system. In the summer, the process is reversed, and the heat pump moves heat from the indoor air into the heat exchanger. The heat removed from the indoor air during the summer can also be used to provide a free source of hot water.

Where heat sources exist, geothermal is an excellent source of energy for Navy installations, although exploration can be difficult and expensive. The Navy's Geothermal Program Office at China Lake, California, is actively exploring for resources in the southwest. At present, some of the geothermal potential for the Navy exists on Department of the Interior/Bureau of Land Management (DOI/BLM) land withdrawn by legislation for military use, and future development will have to be carefully coordinated. However, the exploration and production costs of geothermal wells are increased in the absence of proven resources.

The largest renewable energy project across the DOD is the Navy's China Lake geothermal power plant in California, which supplies nearly half of the DOD's renewable energy production. Throughout the DOD, 155 ground-source heat pump (GSHP) projects are contributing approximately 4 percent to the supply mix (DOD 2014).

Although geothermal energy may be viable in certain locations and could be considered at Navy installations, the Navy determined that the Navy and/or a local commercial utility would need to conduct extensive study to implement a geothermal energy project, and such a project would not be viable in the expedited timeframe.

2.3.4 Biomass Energy

Biomass electricity is generated from the burning of waste materials such as wood or agricultural residue for use as fuel in the cogeneration of heat and electricity in stream-driven generators (EPA 2014h). The use of landfill methane to drive electricity generation or waste-to-energy facilities is also considered a viable source of biomass energy with widespread use throughout the U.S.

In some parts of the country, various types of biomass sources may be very competitive with traditional fossil or "brown" power. As with geothermal, biomass has the advantage of providing base load power, enhancing an installation's energy security on a continuous basis. Power projects could use various sources of biomass or other waste streams, including leftover plant material (from farming, logging, etc.), animal waste, landfill gas capture, wastewater-treatment methane generation, or municipal solid waste.

One challenge for biomass projects is securing a long-term contract for a low-cost and locally available fuel source.

Land requirements for biomass facilities range from 1 to 2 acres per MW (NREL 2012), although available space is not the defining issue for these projects. Availability of feed stock, requirements for emissions control, and waste disposal represent the biggest challenges for biomass projects. In addition, the best use of biomass energy is in the application of cogeneration of electricity and heat, which requires .nearby building applications (NREL 2012).

The second largest renewable energy project in the DOD is a waste-to-energy generation project at the Norfolk Naval Shipyard in Virginia that produces both electricity and steam energy. Nationwide, biomass and biogas from captured methane account for up to 6 percent of the DOD's annual renewable energy (DOD 2014).

Although biomass energy may be viable in certain locations and could be considered at Navy installations, the Navy determined that the Navy and/or a local commercial utility would need to conduct extensive study to implement a project. To construct and operate a biomass facility, a steady source of fuel would need to be identified to determine the cost-effectiveness of the project, and such a project would not be viable in the expedited timeframe.

2.3.5 Review of Renewable Energy Technologies

Solar PV technology was chosen to meet the purpose and need of this action because it is a very mature technology and compatible with the missions at most installations. It is also readily available and cost-effective as a result of the recent expansion and efficiency of solar PV as a technology and a market. In 2013, new solar electricity generation provided 29 percent of the total U.S. new electricity capacity, second only to natural gas installation (EIA [U.S. Energy Information Administration] 2014b). New solar power capacity increased 41 percent from 2012, while the average price dropped 15 percent at the same time (GTM Research 2014). These trends support the availability of the technology for the large-scale projects planned by the Navy.

2.4 Comparison of Environmental Consequences of Site Alternatives

Table 2-2 presents a summary of the environmental consequences associated with construction and operation of a solar PV system at each of the alternative sites under the proposed action and for the No Action Alternative.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
Land Use	• Moderate long-term impacts on existing on-site land use. • No impact on adjacent land uses. • No significant impacts.	• Minor long-term impacts on existing on-site land use. • No impact on adjacent land uses. • No significant impacts.	• Minor long-term impacts on existing on-site land use. • No impacts on adjacent land uses. • No growth-induced changes in land use patterns. • No significant impacts.	• No change from existing conditions.
Coastal Zone Management	• No effect.	• No effect.	• No effect.	• No change from existing conditions.
Visual Resources	• Moderate change in visual character that would not be strongly noticeable due to the presence of other developed areas in the vicinity. • Minor impact on visual resources. • . • No significant impacts.	• Moderate change in visual character that would not be strongly noticeable due to the presence of other developed areas in the vicinity. • Minor impact on visual resources. • • No significant impacts.	• Overall minor impact on visual resources. • • No significant impacts.	• No change from existing conditions.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
Utilities and Infrastructure	**Electrical Distribution System** • New renewable electricity would contribute to Navy, state, and national renewable energy goals. • Minor impacts on electrical infrastructure to connect solar PV facility to existing system. • No significant impacts.	**Electrical Distribution System** • New renewable electricity would contribute to Navy, state, and national renewable energy goals. • Minor impacts on electrical infrastructure to connect solar PV facility to existing system. • No significant impacts.	**Electrical Distribution System** • New renewable electricity would contribute to Navy, state, and national renewable energy goals. • Moderate impacts on electrical infrastructure to upgrade/replace portions of existing system, install new components, and connect two solar PV facilities to existing system. • No significant impacts.	**Electrical Distribution System** • No contribution to Navy renewable energy goals. • No change from existing conditions of existing electrical infrastructure.
	Stormwater Management • No increase in impervious surface. • Stormwater management design, BMPs, revegetation under solar PV arrays with low-lying native plants (in the Adjacent Lot area), and construction permits would minimize impacts. • No significant impacts.	**Stormwater Management** • No increase in impervious surface. • Stormwater management design, BMPs, revegetation under solar PV arrays with low-lying native plants, and construction permits would minimize impacts. • No significant impacts.	**Stormwater Management** • No increase in impervious surface. • Stormwater management design, BMPs, revegetation under solar PV arrays with low-lying native plants (at the IR Site 8A and Adjacent Lot and Open Area Sites), and construction permits would minimize impacts. • No significant impacts.	**Stormwater Management** • No change from existing conditions.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
Air Quality	**Criteria Air Pollutants** • Temporary, negligible, direct impacts on air quality from release of criteria air pollutants during construction (and operation). • BMPs would be used to further reduce emissions and impacts. • Minor, beneficial, indirect impact on air quality from reduction in regional criteria pollutant emissions from replacing grid-supplied electricity with renewable energy electricity. • No significant impacts.	**Criteria Air Pollutants** • Temporary, negligible, direct impacts on air quality from release of criteria air pollutants during construction (and operation). • BMPs would be used to further reduce emissions and impacts. • Minor, beneficial, indirect impact on air quality from reduction in regional criteria pollutant emissions from replacing grid-supplied electricity with renewable energy electricity. • No significant impacts.	**Criteria Air Pollutants** • Temporary, negligible, direct impacts on air quality from release of criteria air pollutants during construction (and operation). • BMPs would be used to further reduce emissions and impacts. • Minor, beneficial, indirect impact on air quality from reduction in regional criteria pollutant emissions from replacing grid-supplied electricity with renewable energy electricity. • No significant impacts.	**Criteria Air Pollutants** • No change from existing conditions.
	GHG Emissions and Climate Change • Negligible direct impact from construction and operation on GHG emissions in the region. • Indirect beneficial impact on GHG emissions in the region from the replacement of grid-supplied electricity with renewable energy electricity. • No significant impacts.	**GHG Emissions and Climate Change** • Negligible direct impact from construction, and operation on GHG emissions in the region. • Indirect beneficial impact on GHG emissions in the region from the replacement of grid-supplied electricity with renewable energy electricity. • No significant impacts.	**GHG Emissions and Climate Change** • Negligible direct impact from construction, and operation on GHG emissions in the region. • Indirect beneficial impact on GHG emissions in the region from the replacement of grid-supplied electricity with renewable energy electricity. • No significant impacts.	**GHG Emissions and Climate Change** • No change from existing conditions.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
Socioeconomics and Environmental Justice	**Socioeconomics** • Moderate short-term positive economic impact from construction (and operation) expenditures and jobs. • Minor long-term positive economic impact from operations (expenditures and jobs). • No adverse impacts.	**Socioeconomics** • Minor short-term positive economic impact from construction (and operation) expenditures and jobs. • Minor long-term positive economic impact from operations (expenditures and jobs). • No adverse impacts.	**Socioeconomics** • Moderate short-term positive economic impact from construction (and operation) expenditures and jobs. • Minor long-term positive economic impact from operations (expenditures and jobs). • No adverse impacts.	**Socioeconomics** • No change from existing conditions.
	Environmental Justice and Protection of Children • Environmental justice communities are present in the study area. However, they would not experience a disproportionately high or adverse human health or environmental effect because no significant unmitigated impacts would be expected to occur in surrounding communities.	**Environmental Justice and Protection of Children** • Environmental justice communities are present in the study area. However, they would not experience a disproportionately high or adverse human health or environmental effect because no significant unmitigated impacts would be expected to occur in surrounding communities.	**Environmental Justice and Protection of Children** • Environmental justice communities are present in the study area. However, they would not experience a disproportionately high or adverse human health or environmental effect because no significant unmitigated impacts would be expected to occur in surrounding communities.	**Environmental Justice and Protection of Children** • No change from existing conditions.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
Cultural Resources	**Architectural Resources** • No effect on architectural resources that are historic properties because none are present within the area of potential effect (APE). • The Mississippi State Historic preservation Office (SHPO) concurred with a finding of no effect.	**Architectural Resources** • No effect on architectural resources that are historic properties because none are located within the APE. • Mississippi SHPO concurred with a finding of no effect.	**Architectural Resources** • No effect on architectural resources that are historic properties because none are present within the APEs. • Mississippi SHPO concurred with a finding of no effect.	**Architectural Resources** • No change from existing conditions.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
	Archaeological Resources • No effect on archaeological resources that are historic properties because none are present with the APE. • Mississippi SHPO concurred with a finding of no effect.	**Archaeological Resources** • No effect on archaeological resources that are historic properties because none are present within the APE. • Mississippi SHPO concurred with a finding of no effect.	**Archaeological Resources** • No effect on archaeological resources that are historic properties because none are present within the APEs. • Mississippi SHPO concurred with a finding of no effect.	**Archaeological Resources** • No change from existing conditions.
	Native American Resources • No Native American resources have been identified within the APE. • The Jena Band of Choctaw Indians concurred with Navy's finding of no historic properties affected. • The Choctaw Nation of Oklahoma indicated that they had no concerns regarding the project. • No responses to Navy's consultation have been received from other tribes to date.	**Native American Resources** • No Native American resources have been identified within the APE. • The Jena Band of Choctaw Indians concurred with Navy's finding of no historic properties affected. • The Choctaw Nation of Oklahoma indicated that they had no concerns regarding the project. • No responses to Navy's consultation have been received from other tribes to date.	**Native American Resources** • No Native American resources have been identified within the APEs. • The Jena Band of Choctaw Indians concurred with Navy's finding of no historic properties affected. • The Choctaw Nation of Oklahoma indicated that they had no concerns regarding the project. • No responses to Navy's consultation have been received from other tribes to date.	**Native American Resources** • No change from existing conditions.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
Hazardous Materials and Waste	**Environmental Restoration Program** • IR Site 8A is an ER Program site. By adhering to the land use controls established under the CERCLA process, there would be no significant impact on human and environmental health and safety related to the ER Program.	**Environmental Restoration Program** • No impact. The Open Area is adjacent to IR Site 8C but would not be affected by long-term remedial activities being conducted at IR Site 8C.	**Environmental Restoration Program** • No significant impact.	**Environmental Restoration Program** • No change from existing conditions.
	Hazardous Waste and Hazardous Materials • Negligible impacts on human and environmental health and safety related to the handling and disposition of wastes (used oils) and hazardous materials and wastes during construction (heavy equipment use, solvents, paints, fuel) and operation (pesticide usage). • No significant impacts.	**Hazardous Waste and Hazardous Materials** • Negligible impacts on human and environmental health and safety related to the handling and disposition of wastes (used oils) and hazardous materials and wastes during construction (heavy equipment use, solvents, paints, fuel) and operation (pesticide usage). • No significant impacts.	**Hazardous Waste and Hazardous Materials** • Negligible impacts on human and environmental health and safety related to the handling and disposition of wastes (used oils) and hazardous materials and wastes during construction (heavy equipment use, solvents, paints, fuel) and operation (pesticide usage). • No significant impacts.	**Hazardous Waste and Hazardous Materials** • No change from existing conditions.

Table 2-2 Comparison of Environmental Consequences

Resource	IR Site 8A and Adjacent Lot	Open Area	Both Site Locations	No Action Alternative
Public Safety	**Glint and Glare** • No significant impact on aviation-related safety. • Negligible impacts on occupants of nearby multi-story buildings. • Minor impacts on motorists. • No significant impacts.	**Glint and Glare** • No significant impact on aviation-related safety. • Negligible impacts on occupants of nearby multi-story buildings. • Minor impacts on motorists. • No significant impacts.	**Glint and Glare** • No significant impact on aviation-related safety. • Negligible impacts on occupants of nearby multi-story buildings. • Minor impacts on motorists. • No significant impacts.	**Glint and Glare** • No change from existing conditions.
	Electromagnetic Fields • Negligible impact associated with EMF from the solar PV facility and electrical lines. • No significant impacts.	**Electromagnetic Fields** • Negligible impact associated with EMF from the solar PV facility and electrical lines. • No significant impacts.	**Electromagnetic Fields** • Negligible impact associated with EMF from the solar PV facilities and electrical lines. • No significant impacts.	**Electromagnetic Fields** • No change from existing conditions.

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3 Existing Environment

This section provides a description of the existing environmental resources that could be affected by the lease and associated construction and operation of a solar PV system at NCBC Gulfport. Data used to describe the existing environment are from government agency websites or publically available documents, published literature, personal contacts, and other references, as cited in the section. To the extent feasible, data presented are current as of 2014. An analysis of the potential impacts on the resources described in this chapter is presented in Chapter 4.

3.1 Land Use

This section summarizes existing land use conditions at the proposed solar PV sites as well as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) land use controls (LUCs) that apply to the IR Program site. This section also provides information on land uses adjacent to the sites. For the purposes of the EA, land use conditions include existing development and zoning and planned future development. Information on planned future development at and in the vicinity of the sites was obtained by reviewing the comprehensive community plans prepared by the City of Gulfport and the City of Long Beach—the Redevelopment Master Plan Charrette Book: Gulfport, Mississippi and Long Beach, Mississippi Comprehensive Plan; and the NCBC Gulfport Master Plan.

3.1.1 IR Site 8A and Adjacent Lot Site

3.1.1.1 On-site Land Use

IR Site 8A is part of IR Site 8. IR Site 8 is an approximately 30-acre parcel located completely within NCBC Gulfport boundaries in the north-central portion of the base, north of 7th Street between Goodier Avenue and Lee Avenue.

IR Site 8 is divided into three areas: 8A, 8B, and 8C (see Figure 2-2). IR Site 8A consists of approximately 12.0 acres and is located west of 8B and 8C. The site is the former location of the storage and handling of herbicide orange (HO), which occurred from 1968 to 1977. All HO product has been removed from the site. In 2007, the IR Site 8A area was chemically stabilized, and a concrete cap was installed over the entire area (TetraTech 2011).

IR Site 8A has no functional buildings. The concrete-covered area at IR Site 8A is currently used for vehicle, machinery, and material storage by the MWR, the CED, and Seabee units. The site also contains the station's only helicopter landing area.

The Adjacent Lot portion of the site is northeast of IR Site 8A, west of Greenwood Avenue and south of 9th Street. This Adjacent Lot portion of the site is not part of the IR Program and does not contain any known contamination, although the area does contain one groundwater monitoring well associated with the IR Site 8 monitoring program. The Adjacent Lot has no functional buildings and is currently used as a staging area for equipment turned in for disposal through the Defense Reutilization and Marketing Office (DRMO).

The NCBC Gulfport Master Plan categorizes land uses by their mission criticality, *i.e.*, mission-critical uses that provide direct support to the mission of the installation and tenants; mission support uses that indirectly support the mission of the installation and tenants; and quality of life uses that support the well-being of the warfighter (NAVFAC SE 2009). Land uses such as logistics, training, training ranges, medical/dental and airfield operations are categorized as mission-critical and represent a large portion of land use on base. Both IR Site 8A and the Adjacent Lot are identified as mission-critical logistics in the

NCBC Gulfport Master Plan. The Master Plan also identifies IR Site 8A as having very low development potential and the Adjacent Lot as having low to very high development potential. Proposed future land uses for the sites include mission-critical logistics and training ranges and mission-support parking (NAVFAC SE 2009).

The status of cleanup activities at IR Site 8 under the Navy's ER Program is discussed in Section 3.8. Formal site LUCs were implemented upon completion of the Memorandum of Agreement (MOA) between the Navy and the Mississippi Department of Environmental (MDEQ) in September 2010. These LUCs include prohibiting extraction of groundwater for any use and residential or residential activities on the site. In addition, any change in land use or drilling and digging requires a permit from the MDEQ. Soil stabilization and LUCs were selected as the preferred remedial alternative to prevent soil erosion and exposure to surface soil. The land use of the site has remained unchanged since the LUCs were established (TetraTech 2011).

3.1.1.2 Adjacent Land Use

IR Site 8B is located east of IR Site 8A, north of 7th Street, east of Greenwood Avenue and west of Holtman Ave (Holtman Avenue divides areas B and C). IR Site 8C is east of Holtman Avenue. A portion of Site 8B is paved and used to park equipment assigned to Building 465. The remaining portion of Site 8B and all of Site 8C are currently open areas that have largely been revegetated with grasses, scrub brush, and small new-growth trees and periodically are used as overflow storage areas. No functional buildings are present on the sites. Additional facilities surrounding the site include a temporary working dog kennel and Building 436 to the south, and buildings used for construction equipment supplies to the north. In 2008, material from the drainage ditch excavation was brought to Site 8B and solidified. Restricted, non-intrusive land use is allowed on IR Site 8B and 8C (TetraTech 2011). The sites are surrounded by NCBC Gulfport buildings to the east, a parking lot to the west and open, undeveloped land to the south. The NCBC Master Plan identifies the surrounding land uses as primarily mission-critical logistics and mission-support supply and general maintenance.

Land use in the City of Gulfport shows NCBC Gulfport within the special districts (SD) zone that identifies areas of the city with existing specialized uses or unique community character that require individualized development standards. The city's comprehensive master plan designates future land use surrounding NCBC Gulfport as sub-urban zones comprising low density suburban residential (City of Gulfport 2005). Blocks in this zone are typically large, and some roads are irregularly aligned to accommodate natural conditions. Land use surrounding NCBC Gulfport is primarily residential, with residences less than 100 feet from NCBC Gulfport property boundaries in some areas. A commercial area is adjacent to the Broad Avenue Gate, and scattered commercial development lies between the Pass Road Gate and the commercial strip along Highway 49. Perimeter land uses within NCBC Gulfport are generally compatible with adjacent off-station land uses (Navy 2007).

3.1.2 Open Area Site

3.1.2.1 On-site Land Use

The Open Area Site is located south of Building 200, between Holtman Avenue and McKinney Avenue. The 7-acre open area is grass-covered and has no functional buildings. This area is designated for logistics use and included in the mission-critical areas at NCBC Gulfport (NCBC Gulfport 2009). The Master Plan also identifies the site as having low to very high development potential. Proposed future land uses for the site includes mission-critical logistics and mission-support vehicle maintenance. This site is not part of the IR Program. The site currently is used as a contractor lay-down area.

3.1.2.2 Adjacent Land Use

Buildings 319, 200, and 465 are located to the east, north, and south of the Open Area Site, respectively. Buildings 319 and 200 are used primarily for construction vehicle, equipment, and supplies storage. Building 465 is a battalion vehicle maintenance facility used for maintenance, service, and minor repair of heavy equipment. IR Sites 8B and 8C are located to the west of the site and used for temporary overflow storage of vehicles and supplies. The Open Area Site and adjacent lands are entirely within NCBC Gulfport. The nearest properties in the City of Gulfport are single-family residences to the south, on the other side of 7th Street, and more than 400 feet from the nearest boundary of the Open Area Site.

Land use and development in the City of Gulfport with respect to NCBC Gulfport are described in Section 3.1.1.2.

3.2 Coastal Zone Management

Congress passed the federal Coastal Zone Management Act (CZMA) in 1972 to encourage the appropriate development and protection of the nation's coastal and shoreline resources (16 U.S.C. 1451-1465). The CZMA gives states the primary role in managing these areas. To assume this role, each state develops a coastal zone management plan that describes the state's coastal resources and how these resources are to be managed. The CZMA applies to lands within the coastal zone but it excludes "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government, its officers or agents" (16 U.S.C. 1453). Although federal lands are excluded from direct application of the CZMA, a consistency review for projects on federal properties is conducted to determine if project-related impacts on neighboring properties would be consistent under CZMA regulations. Section 307 of the CZMA stipulates that when a federal project has reasonably foreseeable impacts on any coastal resource or use (land or water use or natural resource), the action must be consistent to the maximum extent practicable with the enforceable policies of the affected state's federally approved coastal zone management plan. Federal agencies must also consider management program provisions that are in the nature of recommendations. Federal agencies may issue a negative determination when a project on federal lands is not expected to affect a state's coastal resources (15 CFR § 930.35).

The State of Mississippi has developed and implemented a federally approved coastal resources management program, the Mississippi Coastal Program (MCP), describing current coastal legislation and enforceable policies. The MCP was legislatively mandated in Section 57-15-6 of the Mississippi Code of 1972 and approved by the National Oceanic and Atmospheric Administration (NOAA) under the provisions of the CZMA of 1972 (MDMR [Mississippi Department of Marine Resources] 2012).

Coastal wetlands are regulated primarily by the Coastal Wetlands Protection Act (Wetlands Act) , which is included as an enforceable policy under the MCP. Mississippi's wetlands are regulated state-wide by the MDEQ through Section 401 of the CWA; however, the Mississippi Department of Marine Resources has regulatory authority over wetlands in the three coastal counties of Mississippi (Jackson, Harrison, and Hancock) in accordance with the Mississippi Wetlands Act (Environmental Law Institute 2008).

NCBC Gulfport is in Harrison County, which is part of the Mississippi coastal zone, approximately 1 mile north of the Gulf of Mexico. Stormwater drainage ditches connect the project area to the Turkey Creek and Brickyard Bayou watersheds (Navy 2007). The proposed action is therefore subject to review under the approved MCP and, by reference, the Wetlands Act, in accordance with Section 307(c) of the CZMA.

3.3 Visual Resources

Visual resources are generally defined as the natural and built features of a landscape that may be viewed by the public and contribute to the visual quality and character of an area. Visual resources form the overall impression that an observer has of an area or its landscape character. Distinctive landforms, water bodies, vegetation, and manmade features that contribute to an area's aesthetic qualities are elements that contribute to an area's visual character. Visual quality is generally defined as the visual significance or appeal of a landscape based on cultural values and the landscape's intrinsic physical elements (USACE 1988).

The visual character and quality of the area around the proposed project sites are described using terminology and criteria commonly applied as part of established processes for visual resource management and assessment by federal agencies (BLM [Bureau of Land Management] 1984; USFS [U.S. Forest Service] 1995; FHWA [Federal Highway Administration] 1981; USACE 1988). The appearance of the landscape is described using the dominant elements of form, line, color, and texture, as appropriate. These dominant elements are the basic components used to describe visual character and quality for most visual assessments.

Visual sensitivity is a measure of viewer interest and concern for the visual quality of the landscape and potential changes to it. Visual sensitivity is determined based on a combination of viewer sensitivity and viewer exposure.

Viewer sensitivity is determined based on the types of viewers, activities they may be engaged in, and the expressed or anticipated level of public interest and concern for visual resources and quality. High viewer sensitivity is typically assigned to viewer groups engaged in recreational or leisure activities, traveling on scenic routes for pleasure or to or from recreational or scenic areas, experiencing or traveling to or from protected, natural, cultural, or historical areas, or experiencing views from resort areas or their residences. Low viewer sensitivity is typically assigned to viewer groups engaged in work or personal business activities or commuting to or from work (FHWA 1981; USFS 1974).

Viewer exposure varies for any particular view location or travel route depending on the number of viewers and the frequency and duration of their views. Viewer exposure would typically be highest for views experienced by high numbers of people, frequently, and for long periods. Other factors, such as viewing angle and viewer position relative to a feature or area, can also be contributing factors to viewer exposure.

The sections below summarize the existing environment for the proposed project sites and surrounding areas at the two solar PV project sites.

3.3.1 IR Site 8A and Adjacent Lot Site

The IR Site 8A and Adjacent Lot Site total approximately 18 acres and are located just west of Greenwood Avenue (see Figure 2-2). Facilities surrounding the site include vehicle storage areas to the east and west, a temporary working dog kennel and Building 436 to the south, and buildings used for construction equipment supplies to the north. Off-station single-family residences are approximately 900 feet southeast of the site.

View of IR Site 8C facing northwest from the Open Area Site

IR Site 8A, the Adjacent Lot, and the surrounding areas are generally flat. IR Site 8A is a paved area, while the Adjacent Lot is a soil- and gravel-covered open area. IR Site 8B and 8C to the east has some new-growth trees and scrub brush along the boundaries and drainage ditches that run through and around the site.

The site may be partially visible by residences off station, south of 7th Street. However, vegetation on IR Site 8B and 8C to the east screens the northern portion of the site from view from the residences. Viewers living, working, or otherwise engaged in activities at the base would have a low to moderate perception of changes to the landscape on the base and thus have low to moderate viewer sensitivity (FHWA 1981; USFS 1974). Off-station viewers engaged in recreational or leisure activities and off-station residential viewers would be considered to have a moderately high to high concern for changes to the landscape and thus have moderately high to high viewer sensitivity.

3.3.2 Open Area Site

The Open Area Site is approximately 7 acres and located just east of Holtman Avenue and north of 7th Street (see Figure 2-3). On-station facilities surrounding the site include Building 465 to the south, Building 200 to the north, IR Sites 8B and 8C to the west, and McKinney Avenue and Building 319 to the east. Off-station single-family residences are approximately 400 feet southeast of the site.


View of station fenceline south of the Open Area Site.

The site is generally flat and is used for overflow storage of equipment and supplies. The site is covered with grasses and scrub brush and is not fenced. Drainage ditches run through the site to control stormwater.

Some off-station residences near the site perimeter, south of 7th Street, may have views across the site and surrounding landscape. A portion of the site would be shielded from view from off-station residences by Building 465. Other than a chain-link fence that runs along the station perimeter and Building 465, no other visual barriers exist between this residential area and the site. On- and off-station viewer sensitivity would be the same as described in Section 3.3.1.

3.4 Utilities and Infrastructure

This section discusses the electrical distribution and stormwater management infrastructure for NCBC Gulfport and the proposed solar PV project sites.

3.4.1 Electrical System

Coast Electric and Mississippi Power are the electrical utilities that provide connection and distribution services in Gulfport, Mississippi. In FY 2012, NCBC Gulfport used 42,855 megawatt hours (MWh) of grid-supplied electricity, with an average load of 5 MW and a peak load of 7.9 MW (NREL 2014a).

Gulfport is part of the Southeastern Electric Reliability Council (SERC South (SRSO) eGRID subregion. The U.S. Energy Information Administration (EIA) reports that 54,584,295 MWh of electricity was generated in Mississippi in 2012 (EIA 2014a). Mississippi's primary source of electricity generation is natural gas (71 percent) with coal and nuclear each providing 13 percent (EIA 2014b); 2.8 percent of Mississippi's electricity comes from renewable sources, primarily wood (EIA 2014b).

3.4.2 Stormwater Management

Stormwater management in the state of Mississippi is regulated by the Mississippi Department of Environmental Quality (MDEQ). MDEQ issues stormwater general and discharge permits. In 2000, MDEQ granted NCBC Gulfport a Mississippi Small Municipal Separate Storm Sewer System General NPDES Permit (No. MSRMS4036) (MDEQ 2009). The general permit required the preparation of a Stormwater Management Plan (SWMP). The SWMP was submitted in April 1994 and updated in February 2009. To the extent that federal requirements of Section 438 of the Energy Independence and Security Act of 2007 (EISA) are applicable, LID attributes are incorporated in the design of stormwater systems.

IR Site 8A and Adjacent Lot Site and the Open Area Site have stormwater drainage ditches running through and around the perimeter of the sites. Stormwater from the IR Site 8A and Adjacent Lot Site drains to the northwest off station to Turkey Creek. The Open Area site drains to ditches running along 7th Street to a detention pond located on station. Overflow from this detention pond flows off station to the Brickyard Bayou (Navy 2007).

3.5 Air Quality

3.5.1 Regulatory Framework

Air quality is defined by ambient air concentrations of specific pollutants determined by the EPA to be of concern related to the health and welfare of the general public and the environment. The CAA of 1970, 42 U.S.C. 7401 et seq., amended in 1977 and 1990, is the primary federal statute governing air pollution. The CAA designates standards for the following criteria pollutants: particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb), and ozone (O_3). National Ambient Air Quality Standards (NAAQS) for these criteria pollutants have been promulgated to protect public health and welfare (see Table 3.5-1) (EPA 2014a).

Table 3.5-1 National Ambient Air Quality Standards

Pollutant [final rule citation]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO) [76 FR 54294, Aug 31, 2011]		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead (Pb) [73 FR 66964, Nov 12, 2008]		Primary and Secondary	Rolling 3-month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2) [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		Primary and Secondary	Annual	53 ppb(2)	Annual mean
Ozone (O_3) [73 FR 16436, Mar 27, 2008]		Primary and Secondary	8-hour	0.075 ppm(3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution [78 FR 3086, January 15, 2013](5)	$PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
		Primary and Secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2) [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		Primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: EPA 2014a.

Notes:

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for comparison to the 1-hour standard.

(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

(5) The EPA revised the annual primary $PM_{2.5}$ standard by lowering the level to 12.0 µg/m^3 and maintaining the 15.0 µg/m^3 $PM_{2.5}$ standard as a secondary standard. The final rule was effective on March 18, 2013.

Key:

FR = *Federal Register*.
µg/m^3 = Micrograms per cubic meter.
PM_{10} = Particulate matter less than 10 microns in diameter.
$PM_{2.5}$ = Particulate matter less than 2.5 microns in diameter.
ppb = Parts per billion
ppm = Parts per million.

Areas that do not meet the NAAQS are designated as "nonattainment" for that criteria pollutant standard. Nonattainment status is further defined by the extent the standard is exceeded. There are six classifications of ozone nonattainment status—transitional, marginal, moderate, serious, severe, and extreme—and two classifications of CO and PM_{10} nonattainment status—moderate and serious. The remaining criteria pollutants have designations of either attainment, nonattainment, or unclassifiable. Areas redesignated from nonattainment to attainment are commonly referred to as maintenance areas, indicating the area is in attainment but subject to an EPA-approved maintenance plan for a specific pollutant. In areas that exceed the NAAQS, the CAA requires preparation of a State Implementation Plan (SIP). The CAA prohibits federal agencies from engaging in, supporting, providing financial assistance for licensing, permitting, or approving any activity that does not conform to an applicable SIP. The General Conformity Rule is part of the CAA promulgated by the EPA to ensure that the actions of federal departments or agencies conform to the applicable SIP.

NCBC Gulfport is located in Harrison County, Mississippi, which is in attainment for all NAAQS (EPA 2015a). Therefore, the Navy's proposed action is exempt from applicability of the General Conformity Rule requirements of the CAA.

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs), which are regulated under Section 112(b) of the 1990 CAA Amendments. More recently, EPA issued a second mobile source air toxics (MSAT) rule in February 2007, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health (EPA 2014g). Unlike the criteria pollutants, there are no NAAQS for benzene and other HAPs. No major sources of HAPs are associated with the solar PV facility, only temporary mobile sources. The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of the pollutant generated during combustion.

3.5.2 Climate Change, Global Warming, and Greenhouse Gas Emissions

Climate change refers to any significant change in measures of climate lasting for an extended period. Global climate change threatens ecosystems, water resources, coastal regions, crop and livestock production, and human health. Many scientific studies correlate the observed rise in global annual average temperature and the resulting change in global climate patterns with the increase in GHGs in the Earth's atmosphere. Worldwide use of fossil fuels is the primary source of GHG emissions and thus federal actions to address climate change have focused on reducing fossil fuel energy use (EPA 2014b).

In May 2014, the EPA released the third report describing trends related to the causes and effects of climate change (EPA 2014b). The report defined the way climate change affects the environment and natural resources and impacts our way of life in many ways:

- Warmer temperatures increase the frequency, intensity, and duration of heat waves, which can pose health risks, particularly for young children and the elderly.
- Rising sea levels threaten coastal communities and ecosystems.
- Changes in the patterns and amount of rainfall, as well as changes in the timing and amount of stream flow, can affect water supplies and water quality and the production of hydroelectricity.
- Changing ecosystems influence geographic ranges of many plant and animal species and the timing of their lifecycle events, such as migration and reproduction.

- Increases in the frequency and intensity of extreme weather events, such as heat waves, droughts, and floods, can increase losses to property, create costly disruptions to society, and reduce the availability and affordability of insurance (EPA 2014b).

These changes impact food supply, water resources, infrastructure, ecosystems, and health, and these indicators document how these changes are already happening. Climate-related impacts are occurring across regions of the country and across many sectors of the U.S. economy. While current conditions will continue to contribute to climate change in the future, reducing the levels of GHG emissions may reduce the growing intensity of these impacts.

Federal agencies are required to address GHG emissions with emission-reduction planning. Currently, Navy guidance and goals are written to meet the goals of EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management, and EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance. On March 19, 2015, President Obama issued EO 13693, Planning for Federal Sustainability in the Next Decade, which replaces EO 13423 and EO 13514. EO 13693 requires federal agencies to meet emission-reduction goals associated with energy use, water use, building design and utilization, fleet vehicles, and procurement and acquisition decisions. The CEQ and federal agencies will provide implementation guidance and plans by June 2015 to meet these new goals.

The Office of the Chief of Naval Operations M-5090.1 Environmental Readiness Program Manual (U.S. Navy January 2014) states that the Navy must address the effects of climate change, identifying and quantifying GHG emissions (where possible) that may be generated in executing the proposed action and also describing the beneficial activities being implemented Navy-wide to reduce GHG emissions. The guidance also requires the Navy to consult the latest guidance on climate change from the CEQ.

On December 18, 2014, the CEQ issued new draft guidance "to provide Federal agencies direction on when and how to consider the effects of GHG emissions and climate change in their evaluation of proposed federal actions in accordance with NEPA and CEQ Regulations implementing the NEPA" (CEQ 2014). Although this guidance is in draft form, it is intended to describe controlling requirements under the terms of existing NEPA and the CEQ regulations. Guidance states that the impacts of climate change on the project, as well as the impact of the project on climate change, should be included in the assessment (CEQ 2014).

Many state and local governments are already preparing for the impacts of climate change through "adaptation," *i.e.*, planning for the changes that are expected to occur (EPA 2014c). In the Southeast, communities must prepare for increases in precipitation, sea level rise, and heat waves. Since 1970, average annual temperatures in the region have increased by about 2°F (EPA 2013a), and despite the increase in heavy downpours, the region is subject to more moderate and severe drought conditions. Increased temperatures may impact agriculture, fisheries, and ecosystems. While current conditions will continue to contribute to climate change in the future, reducing the levels of GHG emissions can affect the growing intensity of these impacts.

3.6 Socioeconomics and Environmental Justice

This section provides a discussion of the socioeconomic conditions in the communities surrounding the proposed solar PV project sites. For the purposes of projecting economic impacts, the impact area is defined as the City of Gulfport, where the NCBC is located, and the City of Long Beach, the municipality directly west of NCBC Gulfport. The following subsections also discuss Harrison County and the state of Mississippi as points of comparison.

3.6.1 Socioeconomics

In 2012, an estimated 68,158 residents were living in the City of Gulfport, and an estimated 14,981 residents living in the City of Long Beach. Population in the county as a whole declined during the last decade primarily due to the effects of Hurricane Katrina (Frey and Singer 2006). Total population in the City of Gulfport has declined by approximately 4.7 percent from 71,127 residents in 2000. During the same time period, the total population in the City of Long Beach has decreased by approximately 14.6 percent from 17,320 residents in 2000 (see Table 3.6-1).

Table 3.6-1 Total Population in the Project Area (2000 to 2012)

	2000 (actual)	2010 (actual)	2012 (estimated)	Percent Change 2000 to 2010	Percent Change 2010 to 2012
City of Gulfport	71,127	67,793	68,158	-4.7%	0.5%
City of Long Beach	17,320	14,792	14,981	-14.6%	1.3%
Harrison County	189,601	187,105	188,110	-1.3%	0.5%
State of Mississippi	2,844,658	2,967,297	2,967,620	4.3%	0.01%

Source: U.S. Census Bureau 2002, 2012a, n.d.(a)

The regional economy is strongly influenced by the Navy's presence in Harrison County; defense contractors and the Navy are major employers in the communities. In addition, tourism, health care and social service providers, and the University of Southern Mississippi are major employers in the region (Harrison County Development Commission 2015). In 2012, the largest employment sectors in Gulfport and Long Beach were educational services, health care, and social assistance sector, which employed approximately 20.4 percent (Gulfport) and 28.2 percent (Long Beach) of the employed civilian work force. The second largest employment sectors in the City of Gulfport and the City of Long Beach were the arts, entertainment, and recreation sector, and the accommodation and food service sector, which employed 17.3 percent and 14.4 percent of the employed civilian work force, respectively. Another large employment sector in the City of Gulfport was the retail trade sector (14.8 percent) (U.S. Census Bureau n.d.[b]).

The region and the state of Mississippi experienced relatively high unemployment rates in 2012. As shown on Table 3.6-2, the 2012 average annual unemployment rates ranged from 8.7 percent in Harrison County as a whole to 10.2 percent in the City of Gulfport. The study area as well as the state of Mississippi experienced higher unemployment rates in 2012 than the national rate of 8.1 percent for the same time period (Table 3.6-2).

Table 3.6-2 Selected 2012 Economic Statistics for the Project Area

	Total Labor Force 2012	Unemployment Rate 2012	Per Capita Income 2012	Median Household Income 2012	% of Persons Below Poverty Level 2012
City of Gulfport	31,257	10.2%	$21,579	$38,704	21.9%
City of Long Beach	NA	NA	$26,806	$56,886	11.4%
Harrison County	87,322	8.7%	$23,378	$43,593	18.2%
State of Mississippi	1,312,854	9.2%	$20,670	$38,882	22.3%

Sources: U.S. Bureau of Labor Statistics 2015 a, b, c; U.S. Census Bureau n.d.(b)

Note: NA- Not available. The U.S. Bureau of Labor Statistics does not collect labor force statistics for municipalities with less than 25,000 residents.

On average, residents of the city Long Beach were more affluent than the average resident in the state of Mississippi; however, residents of the City of Gulfport had a similar economic standing to the average

resident in Mississippi. In 2012, total per capita income was $21,579 in the City of Gulfport and $26,806 in the City of Long Beach. Comparatively, the statewide total per capita income was $20,670. Similarly, median household income for the City of Long Beach was higher than the statewide median household income, but the City of Gulfport had a median household income similar to the statewide income. In 2012, median household income was estimated to be $38,704 in the City of Gulfport and $65,886 in the City of Long Beach, while the statewide median household income was estimated to be $38,882 (Table 3.6-2).

Corresponding to the high per capita and median household income levels, the City of Long Beach also had a smaller percentage of residents living below the poverty level, as defined by the U.S. Census Bureau, than the state as a whole. In 2012, approximately 11.4 percent of the residents in the City of Long Beach had incomes that placed them below the national poverty level. During the same time period, an estimated 21.9 percent of the total population in the City of Gulfport had income levels that placed them below the national poverty level. Approximately 22.3 percent of all residents in the state of Mississippi had incomes below the national poverty level (Table 3.6-2).

3.6.2 Environmental Justice and Protection of Children

Consistent with EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), the Navy's policy is to identify and address any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. In addition, consistent with EO 13045, Environmental Health Risks and Safety Risks to Children (April 21, 1997), the Navy's policy is to make it a "high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure . . . that its policies, programs, activities, and standards address disproportionate risks to children." This order was issued because a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. Restoration Advisory Boards, which are local boards designed to provide a forum for effective two-way communications between the community and the Navy concerning cleanup activities at hazardous waste sites, will facilitate community involvement at the IR Site 8A solar facility.

3.7 Cultural Resources

This section discusses cultural resources identified for the proposed action at NCBC Gulfport, which may include architectural resources, archaeological resources, and/or Native American resources. Cultural resources at NCBC Gulfport currently would consist of architectural resources (buildings and structures); no archaeological resources have been identified at NCBC Gulfport to date. Additionally, cultural resources at NCBC Gulfport may include Native American resources that are associated with federally recognized Indian tribes with an interest in property on which NCBC Gulfport is located.

Compliance with Section 106 of the National Historic Preservation Act

Because the proposed action is considered a federal undertaking, the Navy must comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations (36 CFR 800). Compliance with Section 106 requires that federal agencies, such as the Navy, consider the effects of their undertakings, such as the proposed action, on historic properties (*e.g.*, cultural resources that have been included in or determined eligible for inclusion in the National Register of Historic Places [NRHP]).

The Navy would assess the significance of any cultural resources at NCBC Gulfport in accordance with National Register criteria to determine the NRHP-eligibility of each resource. Cultural resources are considered to be NRHP-eligible and, thus, historic properties, if they display the quality of significance in one or more of the following areas: American history, architecture, archaeology, engineering, and

culture. They also have to possess integrity of location, design, setting, workmanship, feeling, and association and generally have to meet one of the following four National Register criteria:

- **Criterion A** – properties that are associated with the events that have made a significant contribution to the broad patterns of American history; or
- **Criterion B** – properties that are associated with the lives of persons significant in our past; or
- **Criterion C** – properties that embody the distinctive characteristic of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant or distinguishable entity whose components may lack individual distinction; or
- **Criterion D** – properties that have yielded or may likely yield information important in prehistory or history (National Park Service 1995).

In accordance with Section 106, the Navy determined that the area of potential effects (APE) for the proposed action would be the footprints of both solar PV facilities and the buffers and ancillary facilities (including transmission lines) (see Figures 2-2 and 2-3). Cultural resources and/or historic properties identified within the APE for the proposed action are discussed below, in Section 3.7.1 (Architectural Resources/Historic Properties), Section 3.7.2 (Archaeological Resources), and Section 3.7.3 (Native American Resources).

3.7.1 Architectural Resources

Architectural resources of historic interest at NCBC Gulfport consist of World War II-era buildings, particularly four permanent World War II-era structures that were recommended for long-term preservation in the event that they should be reconsidered for NRHP-eligibility (three ammunition bunkers and one concrete parade ground) (Carbone n.d.; Walker 1993). None of these four resources are located within the APE for the proposed action at NCBC Gulfport and no other architectural resources at NCBC Gulfport have been recommended for NRHP-eligibility to date.

The Navy developed an Installation Appearance Plan for NCBC Gulfport, which documents the existing character of the built environment for the station and provides guidance for new construction (NAVFAC SE 2007). Both of the locations for the proposed action at NCBC Gulfport are located within the industrial functional district of NCBC Gulfport. This industrial functional district is characterized by a fully utilitarian appearance, with little architectural detailing or style. This area primarily comprises large utilitarian warehouses and outdoor storage areas, with buildings that are monolithic and simple in form, with minimal window or other embellishments. The district is also relatively devoid of landscape treatments, other than lawn between storage areas and buildings. As such, the pragmatic appearance of the industrial functional district is specifically related to its function of providing storage and staging areas to support the mission of the station (NAVFAC SE 2007).

Guidelines for new construction within the industrial functional district encourages built resources that complement this appearance, including but not limited to flat-roofed structures with exposed structural support systems; horizontal metal panels used for the upper portions of the structure; metal panel parapets for concealing roof-mounted equipment; and exposed structural elements that create strong geometric forms. Additionally, other than mowed areas or native grassland, landscaping will typically be absent from the industrial district and extensive paving, fencing, and exterior material storage will be prevalent (NAVFAC SE 2007).

3.7.1.1 IR Site 8A and Adjacent Lot Site

The APE at the IR Site 8A and Adjacent Lot Site is located in the industrial functional district of NCBC Gulfport, as described above. The APE consists of a large 12-acre concrete cap approved for storing ready-for-mobilization equipment such as earth movers, heavy equipment, armored vehicles, and various mobilization-support equipment. The area also contains a long-term storage area for personal property managed by MWR. A helicopter-pad is also present. The Adjacent Lot, the northeastern third of the site, is a 5.8-acre unpaved/gravel area used to store additional equipment trailers and vehicles; this area is not considered part of the IR site.

The Navy evaluated the APE at the IR Site 8A and Adjacent Lot Site and determined that no architectural resources are present on the site. However, several buildings are immediately adjacent to the site, including Buildings 215 and 216 to the north, Buildings 435, 436, and K10 to the south, and Buildings 229, 339, 400, 402, 403, 409, 424, 426, and K-1 to the west (KTU+A 2009). All of these buildings are also included in industrial functional district and, as such, reflect the overall industrial character of the built environment of this area.

The Navy consulted with the Mississippi SHPO regarding the architectural sensitivity of the APE at the IR Site 8A and the Adjacent Lot Site (Destafney 2015). The Mississippi SHPO response to this consultation indicated concurrence with the Navy's assessment of the architectural sensitivity of the APE at the IR Site 8A and the Adjacent Lot Site (Williamson 2015).

3.7.1.2 Open Area Site

The APE at the Open Area Site is located in the industrial functional district of NCBC Gulfport, as described above, and consists of undeveloped land. The Navy evaluated the APE at the Open Area Site and determined that no architectural resources are present on the site. However, three buildings immediately adjacent to the site— Buildings 193 and 319 to the east, Building 465 to the south, and Building 200 to the north (KTU+A 2009)—are also included in the industrial functional district and, as such, reflect the overall industrial character of the built environment of this area.

The Navy consulted with the Mississippi SHPO regarding the architectural sensitivity of the APE at the Open Area Site (Destafney 2015). The Mississippi SHPO response to this consultation indicated concurrence with the Navy's assessment of the architectural sensitivity of the APE at the Open Area Site (Williamson 2015).

3.7.2 Archaeological Resources

NCBC Gulfport is not sensitive for the presence of archaeological resources because of its setting on the coastal plain of Mississippi and because the station has sustained substantial surface and subsurface ground disturbance associated with previous construction, training, and other activities at the station (Carbone 1981, Carbone n.d.).

To address the potential for inadvertent discoveries of archaeological resources at NCBC Gulfport, the Navy includes an "inadvertent discovery clause" in all of its contracts for the protection of archaeological resources in compliance with 36 CFR 800.13 and Section 106 of the NHPA of 1966, as amended. The following text is an example of an inadvertent discovery clause that the Navy typically incorporates into all contracts: "Due diligence should be exhibited in the event that Archaeological Resources or Native American Artifact or Funerary Objects are INADVERTENTLY DISCOVERED during excavation and grading portions of this project. If such archaeological artifacts, human remains, or archaeological resources are encountered, the contractor shall immediately stop work in the vicinity of the find, secure the site, and contact the NCBC Gulfport cultural resources manager for further directions and instructions" (Navy 2007).

3.7.2.1 IR Site 8A and Adjacent Lot Site

The Navy evaluated the APE at the IR Site 8A and Adjacent Lot Site and determined that it consists of manmade land associated with the construction, expansion, and remediation of the IR site as well as leveling and grading associated with the development of the equipment storage areas. Therefore, the APE would not be considered archaeologically sensitive and has no potential for containing archaeological resources.

The Navy consulted with the Mississippi SHPO regarding the archaeological sensitivity of the APE at the IR Site 8A and Adjacent Lot Site (Destafney 2015). The Mississippi SHPO response to this consultation indicated concurrence with the Navy's assessment of the archaeological sensitivity of the APE at the IR Site 8A and Adjacent Lot Site (Williamson 2015).

3.7.2.2 Open Area Site

The Navy evaluated the APE at the Open Area Site and determined that it consists of land that has been altered by development and has been subject to previous surface and subsurface disturbance. Therefore, the APE would not be considered archaeologically sensitive and has no potential for containing archaeological resources.

The Navy consulted with the Mississippi SHPO regarding the archaeological sensitivity of the APE at the Open Area Site (Destafney 2015). The Mississippi SHPO response to this consultation indicated concurrence with the Navy's assessment of the archaeological sensitivity of the APE at the Open Area Site (Williamson 2015).

3.7.3 Native American Resources

As discussed in Section 3.7.2 above, no known archaeological sites have been identified within the APEs at either of the two locations for the proposed action at NCBC Gulfport. Additionally, no known Native American resources are located within the APEs. As part of its evaluation of the proposed action for Native American resources, the Navy consulted with four federally recognized tribes with a possible interest in the station property: the Mississippi Band of Choctaw Indians, the Choctaw Nation of Oklahoma, the Jena Band of Choctaw Indians, and the Tunica-Biloxi Tribe of Louisiana (see Appendix A). Specific information for Native American resources is presented below for both locations for the proposed action at NCBC Gulfport.

3.7.3.1 IR Site 8A and Adjacent Lot Site

The Navy evaluated the APE at the IR Site 8A and Adjacent Lot Site for Native American resources and determined that no Native American resources have been identified within the APE to date. Additionally, as noted in Section 3.7.2.1, the APE at the IR Site 8A and Adjacent Lot Site consists of manmade land associated with the construction, expansion, and remediation of the IR site as well as leveling and grading associated with the development of the equipment storage areas. Therefore, the APE would not be considered archaeologically sensitive and has no potential for containing archaeological resources.

The Navy consulted with the four federally recognized Indian tribes with an interest in NCBC Gulfport property regarding the solar PV project (see Appendix A). In a response dated April 23, 2015, the Jena Band of Choctaw Indians indicated that they concurred with Navy's assessment of the sensitivity of the APE for the solar PV project (Shively 2015). In a response dated April 24, 2015, the Choctaw Nation of Oklahoma also indicated that they concurred with Navy's assessment of the sensitivity of the APE for the solar PV project (Thompson 2015). The Navy has not received responses from the other two tribes.

3.7.3.2 Open Area Site

The Navy evaluated the APE at the Open Area Site for Native American resources and determined that no Native American resources have been identified within the APE to date. Additionally, as noted in Section 3.7.2.2, the APE for the Open Area Site consists of land that has been altered by development and has been subject to previous surface and subsurface disturbance. Therefore, the APE would not be considered archaeologically sensitive and has no potential for containing archaeological resources.

The Navy consulted with the four federally recognized Indian tribes with an interest in NCBC Gulfport property regarding the solar PV project (see Appendix A). In a response dated April 23, 2015, the Jena Band of Choctaw Indians indicated that they concurred with Navy's assessment of the sensitivity of the APE for the solar PV project (Shively 2015). In a response dated April 24, 2015, the Choctaw Nation of Oklahoma indicated that they concurred with Navy's assessment of the sensitivity of the APE for the solar PV project (Thompson 2015). The Navy has not received responses from the other two tribes.

3.8 Hazardous Materials and Waste

This section addresses sites the Navy is managing under its Environmental Restoration (ER) Program and the handling of specialized materials and wastes that could be a hazard to the public or the environment if not properly managed. Such materials and wastes consist of hazardous substances; hazardous waste; and hazardous materials such as petroleum, oil, and lubricants (POL) and pesticides.

3.8.1 Environmental Restoration Program

Under the Navy's ER Program, inactive hazardous waste sites and hazardous substance spills are investigated and cleaned up in compliance with CERCLA, commonly known as Superfund. CERCLA provides federal authority for response actions to clean up contamination from releases or threatened releases of hazardous substances that may endanger human health or the environment. CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, which mandated that the DOD follow the same cleanup regulations that apply to private entities. SARA established the Defense Environmental Restoration Program (DERP), which is the broader program encompassing the Navy ER Program. The Navy ER Program encompasses three main program categories, one of which has been identified at NCBC Gulfport, the IR Program.

In 1985, NCBC Gulfport began identifying potential sources of contamination requiring evaluation and possible cleanup under the IR Program. Although areas of contamination have been identified at NCBC Gulfport, it has not been placed on the EPA's National Priorities List (ATSDR [Agency for Toxic Substances and Disease Registry] 2005).

Eleven IR sites have been identified at NCBC Gulfport (see Figure 3.8-1). Only one of these—IR Site 8A—has been proposed as a solar PV project site.

IR Site 8 is a 30-acre area in the north-central portion of NCBC Gulfport, located north of 7th Street and between Goodier and Greenwood Avenues. From 1968 through 1977, the U.S. Air Force (USAF) used the site to store and handle HO in 55-gallon drums on what is now referred to as IR Site 8A (NCBC Gulfport 2004). In 1977, the HO drums at the site were removed and incinerated at sea. In 1984, contaminated contact soil also was incinerated. In the mid-1980s, two additional areas adjacent to IR Site 8A were confirmed to have HO-contaminated soils. These areas were included in the IR Site 8 area and were designated as IR Sites 8B and 8C (TetraTech 2011).

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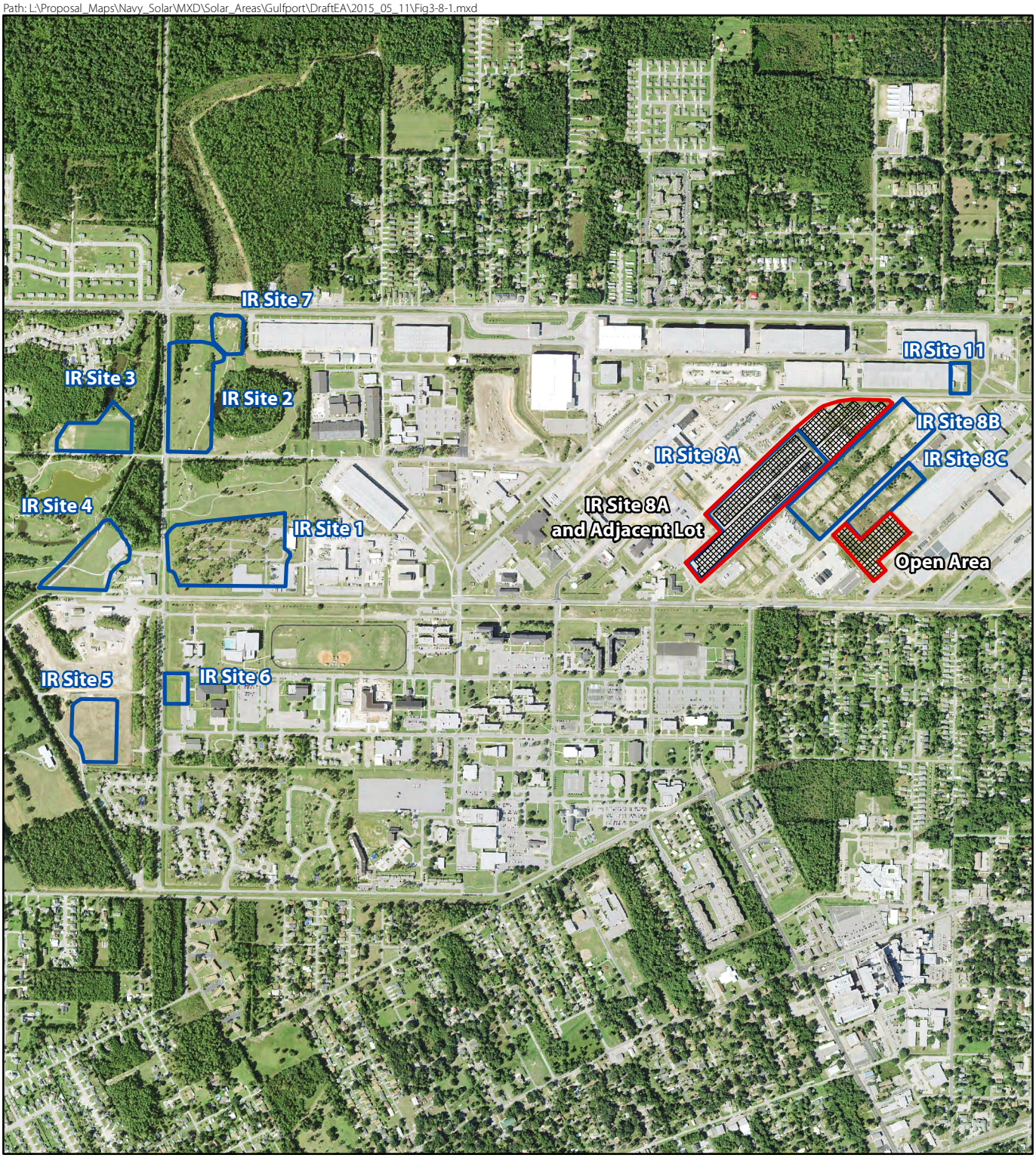

N

SCALE

0 1,000 2,000 Feet

Service Layer Credits: NAIP 2014

Legend

- Proposed Solar Site Boundary
- Proposed Solar Array Location
- Installation Restoration (IR) Site

Figure 3.8-1

Installation Restoration Sites at NCBC Gulfport

Harrison County, Mississippi

In March 2003, the USAF and the Navy submitted a focused feasibility study (FFS) to the MDEQ and EPA Region 4 in compliance with CERCLA and the Administrative Order. The FFS indicated the preferred alternative to clean up Site 8. A Decision Document was issued in 2004 and included a compilation of various remedial technologies, including excavation, landfilling, treatment/stabilization, capping, land use controls (LUCs), and long-term monitoring (NCBC Gulfport 2004).

In 2006, contaminated soil was chemically stabilized at IR Site 8A, and a concrete cap was built to contain the stabilized material, prevent exposure, and make the area available for future restricted use. The concrete cap at IR Site 8A was built according to American Association of State Highway Officials (AASHTO) Highway 20 (H20) specifications for the storage of heavy equipment (NCBC Gulfport 2004). Formal site LUCs were implemented upon completion of the Memorandum of Agreement (MOA) between the Navy and the Mississippi Department of Environmental (MDEQ) in September 2010. These LUCs include prohibiting extraction of groundwater for any use and residential or residential activities on the site. In addition, any change in land use or drilling and digging requires a permit from the MDEQ. Soil stabilization and LUCs were selected as the preferred remedial alternative to prevent soil erosion and exposure to surface soil. The land use of the site has remained unchanged since the LUCs were established. (TetraTech 2011). IR Site 8A is presently an approximately 12-acre open, concrete-covered area used for storing and staging vehicles and construction equipment and supplies. The impermeable concrete cap is inspected biannually. Groundwater monitoring (conducted every 12 months) indicates that groundwater has been stable for more than 10 years and that the cap is preventing infiltration of precipitation into the site soils. NCBC Gulfport conducts a five-year review of the site as part of its site management plan; the next review is due in 2016 (Tetra Tech 2011).

In 2008, contaminated soils at nearby IR Sites 8B and 8C were chemically stabilized and compacted on site. The contamination levels of the stabilized soils were below remediation goals, allowing controlled reuse of IR Sites 8B and 8C. IR Sites 8B and 8C presently consist of chemically stabilized soils with grasses, scrub brush, and small new-growth trees, and are used for overflow vehicle and equipment storage.

3.8.2 Hazardous Waste and Hazardous Materials

NCBC Gulfport stores and uses hazardous materials at multiple locations for vehicle and facility maintenance as well as for contingency war reserves. Hazardous materials such as POL, paints, and solvents are used routinely by various facilities. NCBC Gulfport ensures the safe management and control of hazardous materials through the implementation of the Navy Hazardous Material Control and Management (HMC&M) Program, which defines policy, guidance, and requirements for hazardous material and waste life-cycle control. In addition, the station's Spill Prevention, Control, and Countermeasures (SPCC) Plan addresses prevention of and specific response actions for spills of hazardous materials at the station (NAVFAC SE 2011). Pesticides and herbicides are used to control invasive and nuisance species in accordance with the NCBC Gulfport Integrated Pest Management Plan (NAVFAC ECA [NAVFAC Engineering Command Atlantic] 2009).

Under the Resource Conservation and Recovery Act (RCRA), hazardous wastes must meet either a hazardous characteristic of ignitability, corrosivity, toxicity, or reactivity or be listed as a waste under 40 CFR 261. Hazardous wastes also include universal wastes, such as certain pesticides. NCBC Gulfport is a large quantity generator (LQG) of hazardous waste but does not have a RCRA Part B Permit; thus, the station may store hazardous wastes on site for 90 days or less. The Navy ensures the safe management and control of hazardous waste at NCBC Gulfport through the implementation of its Hazardous Waste Management Plan (HWMP). The plan includes a Hazardous Waste Contingency Plan that describes emergency response in locations where hazardous waste and specialized wastes are generated and stored.

NCBC Gulfport operates one less than 90-day hazardous waste storage facility with multiple satellite accumulation areas throughout the station (NCBC Gulfport 2011).

Few hazardous materials are actively used and hazardous wastes are not routinely generated at the IR Site 8A and Adjacent Lot or the Open Area sites. Due to their use as vehicle storage sites, small quantities of motor oil and other POL would likely be used at the IR Site 8A and Adjacent Lot Site. Herbicides could be used to control vegetation at the Adjacent Lot Site and the Open Area Site.

3.9 Public Safety

Safety considerations associated with solar PV projects are largely different from those associated with other forms of energy generation because there is no combustible fuel source, fuel storage, or routine generation of toxic or hazardous materials with solar PV projects. Solar PV projects have electrical infrastructure requirements similar to conventional power generation facilities, such as medium-voltage power lines and substation equipment and so have similar public safety considerations in the form of electromagnetic fields (EMF). Solar PV systems also have a unique public safety consideration in the potential for glint and glare from reflective or shiny surfaces. The use in modern-day panels of light-absorptive and dark-colored materials to maximize the efficiency of the panels also helps to reduce the amount of glint and glare.

This section addresses existing conditions at the proposed project sites with respect to glint and glare and EMF. There are no explosive safety quantity distance arcs near the proposed solar PV project sites. Safety related to potential exposure to hazardous substances, wastes, and materials is discussed in Section 3.8, Hazardous Materials and Waste.

3.9.1 Glint and Glare

Light reflected off of a surface is referred to as reflectivity, which can create glint and glare (FAA 2010). Glint refers to a small flash of light, specifically as reflected from a shiny surface. Glare is reflective light that can be visually unpleasant or possibly unsafe due to the potential for temporary blindness. Glare may be caused by light from artificial sources or the sun reflecting off of light-colored or smooth surfaces such as metal, glass, concrete, sand, water, or snow. Glare intensity varies depending on the source and intensity of the light, time of day, time of year, angle of reflectance, weather, atmospheric conditions, color and texture of material surface finish, length of exposure, nature and sensitivity of receptors, and other factors.

The concrete-covered area at IR Site 8A is a minor source of glint and glare at the proposed solar PV project sites.

3.9.2 Electromagnetic Fields

EMF consists of invisible fields of electric and magnetic force associated with the movement of charged particles. Wherever electric currents flow, EMF is produced. These fields rapidly decrease in strength with distance from the source. Power lines and electrical equipment generate EMF.

Electric power is considered to be an extremely low-frequency electromagnetic energy that is typically generated at a frequency of about 60 hertz (Hz). (Examples of high-frequency EMF would be that generated by cellular telephone communication and radio and television broadcasts.) Typical electric field strengths in homes in the United States range up to about 10 volts per meter (V/m) (or 0.01 kilovolts per meter [kV/m]) (National Institute of Environmental Health Sciences [NIEHS] 2002). Electric field strengths directly beneath high-voltage power lines can reach up to several thousand V/m [NIEHS 2002] The electric field strength at the edge of a 50-foot ROW for a 230 kV transmission line is approximately

1.5 kV/m. Electric field strengths for distribution lines, which are lower in voltage (typically from 4 to 24 kV), are less than those for transmission lines.

Background magnetic field strength is considered to be about 0.8 milligauss (mG). Magnetic fields associated with common electrical appliances and equipment (such as computer terminals, photocopiers, hair dryers, power saws, and can openers) range from less than 10 mG up to about 1,000 mG at a distance of about 0.5 feet from the operating appliance. The average magnetic field for a home has been reported to be about 0.9 mG. The average magnetic field strength at the edge of a 50-foot ROW for a 230 kV transmission line is about 20 mG (NIEHS 2002).

Few adverse health effects have been definitively associated with exposure to low-frequency EMF, and any causal link to cancer induction is uncertain (International Commission on Non-Ionizing Radiation Protection [ICNIRP] 2010; NIEHS 2002). Because of the uncertain relationship between exposure to EMF and possible health effects, there currently are no U.S. standards for occupational or public exposure to EMF. At least six U.S. states have set EMF exposure standards for transmission lines; Mississippi has not set such standards. The ICNIRP has established EMF exposure guidelines for workers and the general public based on the available health effects information. ICNIRP guidelines for 60 Hz electric power components are 8.3 kV/m (occupational) and 4.2 kV/m (general public) for the electrical component of EMF, and 10,000 mG (occupational) and 2,000 mG (general public) for the magnetic component of EMF (ICNIRP 2010).

EMF has not been measured at the proposed solar PV sites. There are aboveground electrical distribution or connection lines at most of the sites. It can be assumed that some low-level EMF is produced by those relatively low-voltage electrical lines.

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4 Environmental Consequences

Chapter 4 describes the potential direct, indirect, short-term, and long-term impacts on the human and natural environment from the construction and operation of solar PV facilities at one or both sites at NCBC Gulfport. The potential impacts are evaluated individually, as applicable, for the alternative site locations as well as collectively for both of the site locations, which would represent the maximum build-out of the project.

4.1 Land Use

This section summarizes changes in land use at each of the on-station sites that would occur as a result of implementing the proposed action. Potential impacts on the site could occur if the proposed action resulted in a change in existing land use. The proposed action also would impact adjacent land use on base if the proposed action conflicts with the Navy's site-selection process and NCBC Master Plan. The proposed action would impact adjacent land use off station if the proposed action conflicts with existing adjacent land uses or the future land use plans of the adjacent land as guided by the *Redevelopment Master Plan Charrette Book: Gulfport, Mississippi* (City of Gulfport 2005), the *Long Beach, Mississippi Comprehensive Plan* (City of Long Beach 2006) and regulated by the town's zoning ordinance, Chapter 152 of the town's code of ordinances (City of Gulfport 2012).

4.1.1 Solar PV Project

The sites for the proposed action were determined through NCBC Gulfport's site-approval process. The station uses the site-approval process to ensure that proposed development would not conflict with existing operations, adjacent on-station land uses, or planned future use of the site or adjacent areas. The sites have been approved by the station. While the proposed action would result in changes in land use at the two sites, as described below, the proposed action would be consistent with Navy policies for on-station land use.

The proposed action would change land use at the IR Site 8A and Adjacent Lot Site and the Open Area Site from logistical land use to solar PV facility site(s). IR Site 8A has a concrete-covered cap that cannot be penetrated. A ground-mounted solar PV facility, associated electrical equipment and feeder lines, and gravel access roads would be constructed or installed as described in Section 2.1. The Adjacent Lot portion of the site and the Open Area Site would be cleared of tall vegetation, and ground-mounted solar PV facilities would be constructed.

Construction and operation of the solar PV system would not conflict with the goals or recommendations of the *Redevelopment Master Plan Charrette Book: Gulfport, Mississippi*. The city's comprehensive master plan designates future land use surrounding NCBC Gulfport as sub-urban zones comprising low density suburban residential areas. The proposed solar PV system located on the station would not impact off-station residential uses since the station is industrial and the solar PV system would be passive.

4.1.1.1 IR Site 8A and Adjacent Lot Site

Construction and operation of the solar PV facility would occur on Navy property. There would be minor long-term impacts on land use at the site because of the change in land use designation from "logistics" to a solar PV facility site. IR Site 8A has a concrete-covered cap that cannot be penetrated. The site design would avoid any damage to the cap. Engineering controls would be used during construction to prevent compromising the integrity of the IR Site 8A cap. Engineering controls would be reviewed and approved by the Navy and the EPA before construction begins. Compliance with the LUCs (see Section 3.1.1) would prevent impacts on the continued management of IR Site 8.

The proposed action would be consistent with the Navy's site-selection process and use of previously contaminated lands not readily convertible to otherwise productive use. IR Site 8A has limited potential alternative uses because it is a previously contaminated site and has existing LUCs. The NCBC Master Plan does not recommend the construction of any new structures on the site. Vehicle storage and the helicopter landing area currently located at the site are considered a mission-critical land use. However, consolidation of the vehicles could occur on other sites (e.g., 8B and 8C) used for overflow storage. The Master Plan recommends Seabee Readiness Group (SRG) Mount-Out exercises, and Field Exercise (FEX) could be conducted on portions of the site that also would require relocating stored vehicles. These proposed training land uses would not require constructing new structures and could be proposed at other locations on base. Therefore, although considered mission critical, the IR Site 8A would have limited alternative uses and would be consistent with existing land uses and the NCBC Master Plan.

As a passive land use, operation of the solar PV facility would have no direct impact on adjacent existing or planned future land uses or open space, either on- or off-station, and would not conflict with goals or recommendations of the *Redevelopment Master Plan Charrette Book: Gulfport, Mississippi.* The proposed land use would be consistent with adjacent open and overflow storage areas. The proposed feeder lines would not cross any other public or privately owned land and therefore would not impact adjacent land uses.

As a result, the proposed action would result in minor long-term impacts on land use because of the change in land use from "logistics" to a solar PV facility. This change would be consistent with IR LUCs and the Navy's current land use and on-station land use policies. Therefore, impacts on land use would not be significant.

4.1.1.2 Open Area Site

Construction and operation of the solar PV facility would occur on Navy property. There would be minor long-term impacts on land use at the site because of the change in land use designation from logistics to a solar PV facility site.

Vehicle storage currently located at the site is considered a mission-critical land use. However, new vehicles could be consolidated to other sites currently used for overflow storage (e.g., 8B and 8C). The Master Plan recommends construction of a new warehouse on IR Site 8C that could occupy a portion of the Open Area Site and would also require relocating existing stored vehicles. The Open Area Site is currently used as a contractor yard; therefore, although the proposed action would not be mission critical, the land use would be consistent with current non-mission critical land use.

As a passive land use, the solar PV facility would have no direct impact on adjacent existing or planned future land uses or open space, either on- or off-station; and would not conflict with goals or recommendations of the *Redevelopment Master Plan Charrette Book: Gulfport, Mississippi.* The proposed feeder lines would not cross any other public or privately owned land and therefore would not impact adjacent land uses.

The proposed action would result in minor long-term impacts on land use because of the change in land use from logistics to a solar PV facility. This change would be consistent with the Navy's on current land uses and on station land use policies. Therefore, impacts on land use would not be significant.

4.1.1.3 Both Site Locations

Construction of solar PV facilities at both sites could have aggregate impacts on land uses greater than the impacts described above for either individual site. Construction and operation of the solar PV facility would occur on Navy property. There would be minor long-term impacts on land use because of the

change in land use designation from mission-critical logistics to solar PV facilities. There would be minor long-term indirect impacts on adjacent land use to accommodate current vehicle storage and the existing helicopter landing area. Construction and operation of the solar PV facilities would be consistent with the Navy's site-selection process and the NCBC Master Plan and would not conflict with the goals or recommendations in the *Redevelopment Master Plan Charrette Book: Gulfport, Mississippi*.

4.1.2 No Action Alternative

Under the No Action Alternative, solar PV facilities would not be installed at NCBC Gulfport, and the existing land use at each of the sites would remain the same as exiting conditions. The No Action Alternative would have not change existing land use.

4.2 Coastal Zone Management

4.2.1 Solar PV Project

As required by Section 307(c) of the CZMA, the proposed federal action must be consistent with the enforceable policies of the approved MCP to the maximum extent practicable. Installation of the solar PV system at NCBC Gulfport would be confined to the existing property. The proposed activities would not affect land or water uses or the natural resources of Mississippi's coastal zone. Accordingly, the Navy has submitted a Negative Determination for the proposed action to the Mississippi Department of Marine Resources (DMR), in compliance with the CZMA (Nottingham 2015). A copy of the Negative Determination, provided in Appendix C, includes the Navy's evaluation of the enforceable policies of the MCP as they pertain to the proposed action and the determination that the proposed action would no effects on any coastal use or resource. The Mississippi DMR reviewed the Negative Determination and had no objections (Brantley 2015).

4.2.2 No Action Alternative

Under the No Action Alternative, a solar PV system would not be installed at NCBC Gulfport. Implementation of the No Action Alternative would not change existing conditions or have a direct or indirect impact on coastal uses or resources. The No Action Alternative would not trigger any applicable policies under the MCP.

4.3 Visual Resources

The existing visual character of the project sites and viewer sensitivity provide the baseline for determining impacts on visual resources from implementation of the proposed solar PV project. Visual impacts were assessed based on the level of contrast of the proposed action with existing conditions (*i.e.*, landscape character and quality) and the visibility and proximity of the proposed action to sensitive viewers. High viewer sensitivity is typically assigned to viewer groups engaged in recreational or leisure activities; traveling on scenic routes for pleasure or to or from recreational or scenic areas; experiencing or traveling to or from protected, natural, cultural, or historical areas; or experiencing views from resort areas or their residences. Low viewer sensitivity is typically assigned to viewer groups engaged in work activities or commuting to or from work (FHWA 1981; USFS 1974).

For the purposes of impact analysis, visual contrast is assessed based on a project's contrast in form, line, color, and texture with landscape features of topography, water, vegetation, and structures. Visual impacts are considered substantial, or major, where visual contrast is moderately strong to strong for viewers with moderately high to high viewer sensitivity in foreground views. The foreground distance zone for this visual impact assessment was defined as up to 0.5 miles from the proposed project (USFS 1995).

The degree of contrast that would be introduced by the project was assessed using the following ratings:

- Strong: the element contrast demands attention, will not be overlooked, and is dominant in the landscape;
- Moderate: the element contrast begins to attract attention and begins to dominate the characteristic landscape;
- Weak: the element contrast can be seen but does not attract attention; and
- None: the element contrast is not visible or perceived (BLM 1986).

Impacts resulting from introducing new sources of substantial light or glare into the landscape were also assessed. Glare is reflective light that can be visually unpleasant or possibly unsafe due to the potential for temporary blindness. Glare may be caused by light from artificial sources or the sun reflecting off of light-colored or smooth surfaces such as metal, glass, water, or polished stone. According to the BLM's "Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands," the potential for solar PV panel glare varies "depending on panel orientation, sun angle, viewing angle, viewer distance, and other visibility factors" (BLM 2013). Because of the high number of variables, glare is not measured quantitatively but, rather, is assessed qualitatively in this visual assessment.

4.3.1 Solar PV Project

Visual impacts of construction activities and the presence of construction equipment would be minor due to the short duration and temporary nature of the construction period. The analysis focuses on the visual impacts from operation of the solar PV facilities.

Visual Attributes of Ground-Mounted Solar PV Systems

The ground-mounted solar PV system would include single-axis ground-mounted arrays that would not exceed approximately 10 feet above the ground surface. The solar panel surfaces would be dark blue or black in color and have the low reflectivity common to modern-day panels, which seek to reduce reflectivity in order to maximize efficiency (the potential for solar panels to create glint and glare is discussed in Section 4.9.1.1). A perimeter fence would enclose the solar PV facility area. For the purposes of this analysis, it was assumed that the perimeter fence would be the equivalent of an 8-foot-high chain link fence. Existing vegetative screening would be retained or additional natural or manmade screening would be used to the extent practicable.

The visible form of the ground-mounted solar PV arrays would consist of parallel rows of tilted, rectilinear solar PV panels mounted on vertical metal support poles. Lines would be mostly horizontal, with repeated angular elements due to the tilt of the panels. Associated electrical lines and point of connection equipment would be installed underground or aboveground among existing compatible equipment to blend in with the surrounding environment. Additional structures that may be part of the project include power conditioning stations (that contain inverters), battery storage units (to be located near the power conditioning stations), and other equipment.

Other measures that could be used to minimize visual impacts include the use of anti-reflective coatings on the solar panels and minimal site lighting. Such measures would not be standard components of the design and would be optional.

4.3.1.1 IR Site 8A and Adjacent Lot

Within the development area, solar PV panels would be aligned in evenly spaced, parallel arrays running generally in northeast-southwest directions (see Figure 2-2). Access roads would run between the rows of

solar arrays and around the perimeter for maintenance access. Based on the soil type and frequency of use, it is not anticipated that permanent access roads would be constructed for maintenance in the Adjacent Lot portion of the site. IR Site 8A is paved and additional access roads would not be needed.

The open storage areas would be replaced with alternating rows of solar panels that could create a rigid linear pattern visible from nearby on- and off-station locations. The rigid pattern could produce strong contrast in form, line, color, and texture with the surrounding landscape and be noticeable to on-station personnel with low to moderate viewer sensitivity. Views of the site from off-station residences would be partially obstructed by station buildings to the south.

The solar PV system as proposed for the IR Site 8A and Adjacent Lot Site would result in a moderate change in the site's visual character, from a partially paved open storage space to a more industrial-looking space, and would have strong contrast in views for nearby residents with high viewer sensitivity. However, views from nearby residents would be partially obstructed by existing station buildings. Although the solar PV facility would result in a change in the site's visual character, the fence and the industrial nature of the station itself would lessen the impact of this change. The visual impacts of implementing the solar PV system as proposed for the IR Site 8A and Adjacent Lot Site would be minor because the solar PV facilities would be viewed in relation to other industrial areas in the immediate vicinity. The impacts would not be significant.

4.3.1.2 Open Area Site

The development of the Open Area Site would be similar to that described above for the IR Site 8A and Adjacent Lot Site and is shown in Figure 2-3. The Open Area Site would be replaced with alternating rows of solar panels that could create a rigid linear pattern that would be visible from on-station facilities and off-station residences. The rigid pattern could produce strong contrast with the surrounding landscape and would be noticeable to on-station personnel with low to moderate viewer sensitivity. Off-station residences would have mostly unobstructed views of the site, with the exception of residences south of Building 465.

The solar PV system as proposed for the Open Area Site would result in a moderate change in the site's visual character, from an open space to somewhat industrial, and strong contrast for views for nearby residents with high viewer sensitivity. However, the area surrounding the Open Area Site is currently used for Seabee operational equipment and a lay-down area for installation support equipment, and is visible from nearby residences. Although the solar PV facility would result in a change in the site's visual character, the fence and the industrial nature of the station would lessen the impact of this change. The resulting visual impacts would be minor because the solar PV facilities would be viewed in relation to other industrial areas in the immediate vicinity. The impacts would not be significant.

4.3.1.3 Both Site Locations

Implementation of the project at all locations would result in overall moderate changes in visual character and contrast with the surrounding landscape for off-station residential or recreational viewers with moderately high or high viewer sensitivity. The changes in visual character would be viewed in relation to other industrial areas in the immediate vicinity. The resulting aggregate impact would be minor because the two sites would be viewed in relation to other industrial areas in the immediate vicinity. The impacts would not be significant.

4.3.2 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented, and the solar PV facilities and associated infrastructure development would not take place at either of the sites. The

existing visual environment would not change; therefore, there would be no change compared to existing conditions.

4.4 Utilities and Infrastructure

This section discusses the utility and infrastructure systems at the proposed sites at NCBC Gulfport. The utility and infrastructure systems evaluated consist of the electrical distribution system and stormwater management.

4.4.1 Solar PV Project

4.4.1.1 Electrical System

Development of the solar PV facility would result in an increase in renewable electrical energy supplied to the commercial electrical grid. In FY 2012, NCBC Gulfport consumed 42,855 MWh of grid-supplied electricity (NREL 2014a). Annual electricity generation from the solar PV facilities was estimated using the NREL's PV Watts Calculator (NREL 2015a). Table 4.4-1 provides the estimated capacity and electricity generation of the solar PV facility at each of the proposed site locations. If the solar PV facilities are constructed at both of the sites, approximately 4.21 MW(DC) of electricity capacity would be added, generating 5,481 MWh(AC). While this energy would be provided to the grid, the installed capacity would help meet the Navy's 1 GW Initiative goals (Navy 2012b). Appendix B provides the results from the PV Watts Calculator.

Table 4.4-1 Electricity Capacity and Annual Generation, Both Site Locations

Sites	Estimated Electricity Generation[1] (MWdc)	Estimated Annual Electricity Generation (MWh[AC])[2]	Percentage of NCBC Gulfport FY2012 Usage
IR Site 8A and Adjacent Lot	3.09	4,023	9%
Open Area	1.12	1,458	3%
Total	**4.21**	**5,481**	**13%**

[1] Based on conceptual estimate of 5 acres per MW; see Table 2-1, Section 2.1.3.
[2] Calculated with NREL's PV Watts Calculator (NREL 2015a) using a 4.21 MW commercial system.

The proposed solar PV facilities would be owned and operated by the power utility, and the electricity generated would be supplied to the grid. The power utility would also retain control and ownership of the RECs associated with the project. RECs represent the environmental, social, and other non-power benefits of renewable electricity generation, and they can be sold separately from the physical generating systems (EPA 2014d). However, the renewable energy would contribute to the Navy's goal of supplying 50 percent of its electricity from renewable energy sources and the installation of 5 MW capacity would contribute to the Navy's goal of installing 1 GW of renewable energy by 2020 (Navy 2012b). In addition, the renewable energy generated from implementation of the solar PV facilities at both of the sites would also increase state-wide renewable energy generation by 0.5 percent (EIA 2014a).

The amount of electricity used at NCBC Gulfport would not change as a result of the proposed solar PV facilities. The increase in annual electricity generation (5,481 MWh[AC]) from the operation of the solar PV facilities at all the sites would represent an increase of less than 0.01 percent of all electricity generation in the state (EIA 2014b).

Construction and operation of the solar PV system at one or both locations would have no impact on the capacity or functionality of the existing electrical distribution infrastructure because the infrastructure

would be upgraded to accommodate the new facilities. Upon full build-out of the solar PV system at one or both site locations, the solar PV facilities and associated electrical equipment (*e.g.,* electrical feed meters, switchgear, inverters, circuit breakers, and transformers) would connect to the existing primary distribution lines for delivery to the existing substation. If additional capacity is needed for transmission, the developer or commercial power utility could upgrade the existing line to meet the new demand. An interconnection station would be constructed near the property boundary at one or both of the project sites to house the electrical equipment.

The existing electrical connection lines and poles located on the project site(s) either would be upgraded or replaced to satisfy the size requirements of the project. The construction of the electrical connection lines in the IR Site 8 area would minimize disturbance of the concrete cap (IR Site 8A) and compacted soil areas (IR Sites 8B and 8C). In addition, the electrical feeder lines would be constructed aboveground/underground to connect to the primary distribution line located directly off-station along the south side of 28th Street and would be adequately sized to transport the generated electricity (see Figure 2-1).

The IR Site 8A and Adjacent Lot Site would be connected to the primary distribution line using a combination of overhead and underground feeder lines. Underground feeder lines would be used to connect the solar PV system's interconnection station to an overhead line along Goodier Avenue. The overhead line along Goodier Avenue connects to an overhead line along 9th Street, which eventually connects to the main distribution line along the south side of 28th Street (Hogue 2015).

The Open Area Site would be connected to the primary distribution line using a combination of overhead and underground feeder lines. Underground feeder lines from the site would be used to connect the solar PV system's interconnection station to an overhead line along Holtman Avenue. The overhead line along Holtman Avenue connects to an overhead line along 9th Street which eventually connects to the main distribution line along the south side of 28th Street (Hogue 2015).

O&M of the electrical system and associated electrical equipment would be conducted in accordance with the lease agreement to ensure the successful operation of the solar PV system. O&M activities would be specified in the lease agreement between the Navy and the commercial power utility. The additional infrastructure required as part of the proposed action would have a minor impact on the existing electrical distribution system.

4.4.1.2 Stormwater Management

Construction of the solar PV system would not increase the impervious surfaces at the sites. Minimal ground disturbance and grading would be expected because the sites have already been disturbed, graded, and leveled. Access roadway construction would not be required due to the presence of existing roadways and stable soil conditions.

The minimal ground disturbance activities during construction would require a notice of intent to comply with the *General Permit for Storm Water Discharge from Large Construction Activities* (ACT4 (LCGP) Large Construction Notice of Intent (LCNOI) Mississippi Air and Water Pollution Control Law 49-17-29(2)(b)). A site-specific SWPPP would be required in association with the NPDES construction permit that includes BMPs to reduce soil erosion and prevent stormwater from leaving the construction site. The SWPPP would include specific measures to minimize the potential for soil erosion and stormwater runoff, including but not limited to hay bales, silt fences, and phasing of construction-related activities (MDEQ 2011).

In addition to these regulations, Section 438 of the EISA of 2007 (EPA 2013b) requires that any development or redevelopment project involving a federal facility with a footprint exceeding 5,000 square

feet shall use site planning, design, construction, and maintenance strategies in order to maintain or restore the pre-development hydrology of the property with regard to temperature, rate, volume, and duration of flow.

Installation of the proposed solar PV facility would not affect the existing stormwater collection and discharge system at the sites. Runoff associated with maintenance (*i.e.*, periodic rinsing to remove accumulated dust and debris) would be managed through the existing station drainage system.

Compliance with the local, state, and federal regulations may require implementing temporary (during construction) and permanent BMPs that maintain or restore pre-development hydrology and reduce the contaminant loading of stormwater. The utility provider or developer will obtain the required permits and comply with applicable local, state, and federal regulations. As the pre-development hydrology would be restored through the installation of permanent BMPs, any impacts on the stormwater infrastructure would be minimal.

4.4.2 No Action Alternative

Under the No Action Alternative, the solar PV facilities would not be constructed at NCBC Gulfport and there would be no change in existing infrastructure and utilities.

4.5 Air Quality

This section provides a summary of the projected changes in direct and indirect emissions associated with the construction and operation of the solar PV facility at one or both of the sites and the impact of the projected changes in emissions on local and regional air quality, GHG levels, and climate change. The General Conformity Rule does not apply to this action because the region is in attainment for all NAAQS.

4.5.1 Solar PV Project

4.5.1.1 Criteria Air Pollutants

The proposed action would result in direct emissions of criteria air pollutants associated with construction and operation of one or both of the solar PV facilities. In addition, the proposed action would result in reductions in indirect emissions associated with the replacement of grid-supplied electricity with solar energy-generated electricity.

Construction Activities

Construction activities would result in temporary and minor increases in air emissions from the combustion of fossil fuels in equipment and vehicles and from the fugitive dust and dirt emissions associated with site ground disturbance. Debris from land-clearing of scrubby vegetation is assumed to be composted; and that burning of debris would be prohibited. Table 4.5-1 shows estimated criteria pollutant emissions from construction, assuming solar PV facilities were constructed at both of the site locations.

Criteria pollutant emissions were calculated assuming that ground disturbance would occur on 13 acres (ground disturbance would not occur on the concrete cap at IR Site 8A) and that construction would be conducted in a six- to eight-month period. Emission factors for non-road vehicles and equipment were obtained from EPA's NONROAD2008 model (EPA 2014e), and on-road emission factors were obtained from EPA fact sheet information (EPA 2008). Appendix B provides the assumptions and calculations used to estimate the total emissions.

The projected construction emissions summarized in Table 4.5-1 would be negligible and temporary and would not be expected to result in significant impacts on air quality. Criteria pollutant emissions from

construction associated with each site would be only a fraction of the estimated emissions determined for construction at all alternative sites. Therefore, construction of a solar PV facility at either of the individual sites would also be negligible and temporary and would not be expected to result in significant impacts on air quality.

Table 4.5-1 Annual Criteria Pollutant Emissions from Construction for Both Sites

Activity	Total Emissions (tons per year [TPY])					
	VOCs	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
Non-road Equipment	0.56	2.63	6.09	0.011	0.55	0.55
On-road Equipment	0.33	2.96	0.80	0.015	1.09	0.13
PM_{10} from Site Preparation					1.39	0.14
Total	**0.89**	**5.60**	**6.88**	**0.03**	**3.02**	**0.82**

Key:
CO = Carbon monoxide.
NO_x = Nitrogen oxides.
PM_{10} = Particulate matter less than 10 microns in diameter.
$PM_{2.5}$ = Particulate matter less than 2.5 microns in diameter.
SO_2 = Sulfur dioxide
VOCs = Volatile organic compounds.

Construction emissions could be reduced using BMPs. Exhaust emissions from construction vehicles can be reduced by using fuel-efficient vehicles with emission controls and ensuring that all equipment is properly maintained. Dust emissions from ground disturbance and road traffic could be controlled by spraying water on soil piles and graded areas and keeping roadways clean.

Operational Activities

Operational activities that would result in direct air emissions would be minimal. Vehicles used to travel to and from the site for maintenance and landscaping would be a source of operational emissions. Since operational activities would be considerably less on an annual basis than the construction activities evaluated, operational emissions would result in a negligible impact on air quality in the region.

Operation of the solar PV facility at one or both sites would also potentially result in an indirect reduction in regional criteria pollutant emissions associated with the replacement of grid-supplied electricity with solar PV renewable energy electricity. Mississippi's primary source of electricity generation is natural gas (71 percent) with coal and nuclear each providing 13 percent (EIA 2014b). Using state average electricity emission factors provided by the EIA (EIA 2014a), replacement of the grid-supplied electricity with 5,481 MWh(AC) of renewable energy annually would result in a reduction of 2.47 tons per year of NO_2 emissions and 4.66 tons per year of SO_2 emissions regionally. Appendix B provides the results from the PV Watts Calculator as well as emission factors and calculations. The reduction in indirect emissions resulting from the proposed action would have a minor beneficial impact on air quality in the region.

4.5.1.2 GHG Emissions and Climate Change

The Office of the Chief of Naval Operations M-5090.1 Environmental Readiness Program Manual (U.S. Navy January 2014) states that the Navy must address the effects of climate change, identifying and quantifying GHG emissions (where possible) that may be generated in executing the proposed action, and also describing the beneficial activities being implemented Navy-wide to reduce GHG emissions. The guidance also requires the Navy to consult the latest guidance on climate change from the CEQ.

On December 18, 2014, the CEQ issued new draft guidance "to provide Federal agencies direction on when and how to consider the effects of GHG emissions and climate change in their evaluation of proposed federal actions in accordance with NEPA and CEQ Regulations implementing the NEPA"

(CEQ 2014). Although this guidance is in draft form, it "does not change or substitute for any law, regulation, or of legally binding agreement and is not legally enforceable," and it is intended to describe controlling requirements under the terms of NEPA and the CEQ regulations (CEQ 2014). The analysis of this action has considered the recommendations in this guidance and has included the quantitative and qualitative review and documentation of GHG emissions and climate change effects for the action.

The proposed action is one of the beneficial activities being implemented Navy-wide to reduce GHG emissions and address climate change. The Navy's renewable energy goals address the use of fossil fuels as one of the causes of climate change, thereby addressing renewable energy, energy reductions, and GHG reduction goals. By increasing renewable energy generation at NCBC Gulfport, the proposed action would have a beneficial impact on climate change.

The proposed action would result in the direct emission of GHGs associated with construction and operation of the solar PV facilities at one or both sites. CO_2, methane (CH_4), and nitrous oxide (N_2O) would be emitted from the combustion of fossil fuels in equipment and vehicles during construction and operation activities and from vehicles used to travel to and from the site for maintenance during operation of the solar PV facilities. Direct emissions of GHGs during construction and operation would be minimal, and for construction activities, emissions would be temporary. Therefore, direct GHG emissions from the construction and operation of the solar PV facilities would have a negligible impact on GHG emissions in the region.

The proposed action would have indirect impacts on the regional GHG emissions of CO_2, CH_4, and N_2O resulting from the replacement of grid-supplied electricity with renewable energy. Table 4.5-2 shows the reduction in annual GHG emissions in metric tons carbon dioxide equivalency ($MTCO_2e$) resulting from operation of a solar PV facility at both site locations. GHG emission reductions for all project site locations were estimated using eGRID 9th edition year 2010 annual non-baseload output emission rates for CO_2, CH_4, and N_2O in the SERC South (SRSO) eGRID subregion (EPA 2014i). The effect of a particular GHG on global climate change depends on its global warming potential (GWP). The GWP for GHGs other than CO_2 is calculated relative to CO_2 and reported in terms of CO_2 equivalency (CO_2e). By multiplying the mass of a GHG emitted by its GWP, an equivalent amount of CO_2 is calculated (*e.g.*, with a GWP of 25, one pound of CH_4 is equivalent to 25 pounds of CO_2e) (EPA 2015c).

Table 4.5-2 Annual GHG Emissions Reductions for All Project Site Locations

Electricity Generated (MWh)	Emission Reductions per Year ($MTCO_2e$)			
	CO_2	CH_4	N_2O	Total CO_2e Reduced from Electricity Replaced
5,481	3,913	2	16	3,931

Key:
CO_2 = Carbon dioxide.
CH_4 = Methane.
N_2O = Nitrous oxide.
$MTCO_2e$ = metric tons carbon dioxide equivalent

Annual reductions in GHG emissions for each individual site have been estimated using the MWdc capacity of each site and calculating a proportional amount of renewable energy generation (MWh[AC]) and GHG emission reductions at each site (see Table 4.5-3). Appendix B provides the results from the PV Watts Calculator as well as emission factors and calculations. The proposed action would have an indirect beneficial impact on GHG emissions in the region.

Table 4.5-3 Annual GHG Emissions Reductions for Individual Site Locations

Site	System Size (MWdc)	Estimated Annual Electricity Generation (MWh(AC))	Estimated Annual Reduction in GHG Emissions ($MTCO_2e$)
IR Site 8A and Adjacent Lot	3.09	4,023	2,885
Open Area	1.12	1,458	1,046
Total	**4.21**	**5,481**	**3,931**

Table 4.5-2 shows the reduction in annual GHG emissions in $MTCO_2e$ resulting from the action. The proposed action would have an indirect beneficial impact on GHG emissions in the region.

4.5.2 No Action Alternative

The No Action Alternative would have no impact on criteria air pollutant emissions or GHG levels. No additional renewable energy would be generated and, therefore, no indirect reductions in criteria air pollutants or GHG emissions would occur.

4.6 Socioeconomic and Environmental Justice

4.6.1 Solar PV Project

4.6.1.1 Socioeconomics

Only minor impacts on the social and economic environment at, and surrounding, NCBC Gulfport as a result of the proposed solar PV project would be expected to occur. No impacts on local or regional populations or demographics would be anticipated during the construction or operation of the proposed project. Additionally, no impacts on the local or regional housing market (*e.g.*, the demand or supply of housing units and local and regional property values) would be expected to occur as a result of construction or operation of the proposed project. Some short-term positive economic impacts on the local and statewide economy during the construction phase and to a lesser extent during the operations phase of the proposed solar project would occur. The construction of 4.21 MW of solar power generating capacity at NCBC Gulfport would inject a substantial amount of funds into the region through construction expenditures. According to the Jobs and Economic Development Impacts (JEDI economic model, developed by the NREL, a typical 4.21 MW fixed-mounted, crystalline-silicon solar PV energy project in the state of Mississippi would cost approximately $21.3 million to construct. On average, approximately $10.2 million of these construction expenditures would be spent locally, and the remaining $11.1 million would be spent outside of Mississippi for the purchase of specialty equipment/services (NREL n.d.[a]).

As shown on Table 4.6-1, construction and installation of the solar PV facilities would generate an estimated 29 full-time equivalent (FTE) jobs and $1.9 million in earnings in Mississippi. An additional 45 FTE jobs and $1.3 million in earnings would be created as a result of construction and installation-related services (*i.e.*, architectural and engineering designs, permit processing, and environmental planning services). In total, a typical project of this size would directly employ approximately 74 FTE workers for the duration of construction and directly create approximately $3.2 million in additional payroll (see Table 4.6-1).

Table 4.6-1 Economic Impacts of Construction of a 4.21 MW Capacity Solar PV Project in the State of Mississippi

Type of Impact	Jobs (Full-Time Equivalent)	Earnings (in million $)	Output (in million $)
IR Site 8A and Adjacent Lot			
Direct Impacts	**54**	**$2.3**	**$4.2**
Construction and Installation Labor	21	$1.3	NA
Construction and Installation-related Services	33	$1.0	NA
Indirect Impacts	**49**	**$1.7**	**$5.1**
Induced Impacts	**23**	**$0.7**	**$2.4**
Total Impacts	**126**	**$4.8**	**$11.7**
Open Area			
Direct Impacts	**20**	**$0.9**	**$1.5**
Construction and Installation Labor	8	**$0.5**	NA
Construction and Installation-related Services	12	**$0.4**	NA
Indirect Impacts	**18**	**$0.6**	**$1,9**
Induced Impacts	**8**	**$0.2**	**$0.9**
Total Impacts	**46**	**$1.7**	**$4.2**
Total Both Site Locations			
Direct Impacts	**74**	**$3.2**	**$5.7**
Construction and Installation Labor	29	$1.9	NA
Construction and Installation-related Services	45	$1.3	NA
Indirect Impacts	**67**	**$2.4**	**$7.0**
Induced Impacts	**31**	**$0.9**	**$3.2**
Total Impacts	**171**	**$6.5**	**$15.9**

Source: NREL n.d (a)-(d).

Note: All figures are expressed in 2010 dollars.

Due to rounding, totals may not sum.

An additional 67 FTE jobs and $2.4 million in earnings would be indirectly generated in Mississippi as materials and services for the project would be purchased from vendors throughout the state. Finally, the increase in economic activity would support an additional 31 FTE-induced jobs and $0.9 million in earnings in the state economy. In total, an estimated 171 FTE direct, indirect, and induced jobs and $6.5 million in earnings would be created as a result of this project. These jobs and these earnings, however, would be short-term in nature and would last only for the duration of construction (see Table 4.6-1).

Table 4.6-1 also provides the economic impacts associated with constructing a solar PV system at each of the proposed sites. The positive economic impacts expected to occur directly correspond to the size of the solar PV facility being proposed at the individual site. The IR Site 8A and Adjacent Lot Site, with its estimated generating capacity of 3.09 MW, would account for more than 73 percent of the positive economic impacts associated with the entire project. On the other hand, the 1.12 MW Open Area Site would account for only 27 percent of the overall economic impacts (see Table 4.6-1).

Operations of the proposed solar project would have a minor, long-term impact on the local and regional economy. Total annual operational expenses, excluding financial costs and loan repayments, of a project of this size typically would amount to approximately $83,000 per year. An estimated 0.8 FTE personnel with an expected payroll of approximately $47,000 would be employed to operate and maintain these facilities. An additional $36,000 in annual payments would be made locally for the purchase of materials and equipment. These positive economic impacts would occur annually as long as the facilities are operational (NREL n.d. [a-c]).

Table 4.6-2 provides the economic impacts associated with operating a solar PV facility at each of the proposed sites and for the project as a whole. As shown on the table, the IR Site 8A and Adjacent Lot Site would generate the most positive economic impacts during operations, while the Open Area Site would generate a much smaller portion of the positive economic impacts (NREL n.d.[a-c]).

Table 4.6-2 Economic Impacts of Operation of a 4.21 MW Capacity Solar PV Project in the State of Mississippi

Type of Impact	Jobs (Full-Time Equivalent)	Earnings (in thousands $)	Output (in thousands $)
IR Site 8A and Adjacent Lot			
Direct (On-site) Impacts	0.6	$34	$34
Indirect Impacts	0.2	$8	$28
Induced Impacts	0.1	$4	$13
Total Impacts	**0.9**	**$46**	**$75**
Open Area			
Direct (On-site) Impacts	0.2	$12	$12
Indirect Impacts	0.1	$3	$10
Induced Impacts	>0.1	$1	$5
Total Impacts	**0.3**	**$17**	**$27**
Total Both Site Locations			
Direct (On-site) Impacts	0.8	$47	$47
Indirect Impacts	0.3	$11	$38
Induced Impacts	0.2	$5	$17
Total Impacts	**1.2**	**$63**	**$102**

Source: NREL n.d.(a) – (c)

Note: All figures are expressed in 2015 dollars.

Due to rounding, totals may not sum.

4.6.1.2 Environmental Justice and Protection of Children

Table 4.6-3 lists the census block groups and census tracts in which each proposed site is located and, where appropriate, the table also lists census block groups and census tracts that are directly adjacent to the proposed sites.

Table 4.6-3 Census Tracts and Census Block Groups Potentially Impacted by the Proposed Action

Site	Location	Adjacent Census Tract/ Census Block Group
IR Site 8A and Adjacent Lot	Census Tract 25, Block Group 1	
Open Area	Census Tract 25, Block Group 1	Census Tract 26, Block Group 1

Demographic and economic data for all census block groups that are adjacent to or wholly or partially encompass the proposed project sites (*i.e.*, the study area) were compared with similar countywide demographic and economic data to determine whether the proposed action could have disproportionately high and adverse effects on minority or low-income populations. A minority population is identified as an area where the minority population of the affected area exceeds 50 percent or where the minority population percentage of the affected area is "meaningfully greater" than the minority population percentage in the general population or other appropriate unit of geographic analysis. In this analysis, "meaningfully greater" is defined as anything 3 percent or greater than the area of comparison, namely

Harrison County. Low-income populations in the affected area are identified with the annual statistical poverty thresholds from the U.S. Census Bureau.

As shown on Table 4.6-4 and based on the threshold levels described above, the Navy has determined the following:

- Census Tract 25, Block Group 1, has relatively larger Hispanic/Latino populations than the community of comparison; and
- Census Tract 26, Block Group 1, has relatively more minority populations than the community of comparison and a relatively larger low-income population than the community of comparison.

Table 4.6-4 Environmental Justice Population Characteristics in the Project Area (2010 and 2012)

Geographic Unit	Total Population	Percent Minority	Percent Hispanic or Latino	Percent Below Poverty Level[1]
Harrison County	**187,105**	**30.3%**	**5.3%**	**18.2%**
Census Tract 25, Block Group 1	1,812	31.3%	12.2%	14.4%
Census Tract 26, Block Group 1	1,238	63.0%	4.0%	34.3%

Source: U.S. Census Bureau 2012a, 2012b, n.d.(b)

Note: Data for Total Population, Percent Minority, and Percent Hispanic are from the *2010 Census of Population and Housing*. Data for Percent Below Poverty Level are from the *American Community Survey 2008-2012.*

[1] Income statistics are not provided at the census block group level by the U.S. Census Bureau; therefore, poverty level data presented on the table are for the larger census-tract level.

Environmental justice communities are present within the study area. These areas contain percentages of minority, Hispanic or Latino and low-income populations that are higher in the affected census block groups and census tracts than in Harrison County as a whole.

However, no disproportionately high or adverse effects on these populations would occur because no significant negative environmental or human health impacts would be expected to occur as a result of construction and operation of this project. The property will be fenced during construction and operation, and access would be permitted only to authorized personnel. Some short-term impacts associated with construction, including increased truck traffic, noise, dust, or vibration impacts, may occur but these impacts would be expected to be short-term and minor

Minor visual impacts would occur in the vicinity of the proposed sites. Fencing would be used to minimize visual impacts for sensitive receptors. The panels would be constructed of glass encasing, which would be dark blue or black in color, with minimal light reflection. Any lighting installed on the solar PV facility areas would be shielded and directed downward and would be the minimum necessary for construction, operations, safety, and security.

In addition, there would be no disproportionately high or adverse effects on these environmental justice communities during construction and operation of the proposed project with regard to hazardous substances, wastes, or materials. As discussed in Section 4.8, human health and the environment would be protected with respect to hazardous substances, wastes, or materials possibly associated with the IR Site 8A and Adjacent Lot Site because the Navy and the utility provider or developer would be required to follow LUC requirements. As a result, no significant environmental impacts from hazardous

substances, wastes, or materials would occur. Accordingly, potential environmental health or safety risks to children from hazardous substances at these sites would not occur as a result of these projects.

4.6.2 No Action Alternative

The No Action Alternative would have no impact on the local or regional population, demographics, housing market or economy. No additional expenditures from construction or operation would occur and, therefore, there would be no impacts on employment, earnings, or output in the local or regional economy. There would be no environmental justice effects under the No Action Alternative.

4.7 Cultural Resources

NEPA guidance requires the evaluation of the potential impacts of a proposed action on cultural resources, including architectural or built resources, archaeological resources, and Native American resources. The Navy has evaluated potential impacts of the proposed action on architectural and archaeological resources in terms of their effects on cultural resources that are historic properties, pursuant to Section 106 of the NHPA. Potential impacts of the proposed action on Native American resources have been evaluated below in terms of direct or indirect impacts that are permanent or temporary (long-term or short-term).

To comply with Section 106 of the NHPA, including its implementing regulations codified in 36 CFR Part 800 (Table 4.7-1), the Navy is required to identify historic properties within the APE, as defined previously in Section 3.7, and to consider the effects of a proposed action on these properties. The effects of the impacts of the proposed action on historic properties were evaluated pursuant to Section 106 of the NHPA, using the Advisory Council on Historic Properties' (ACHP's) guidance on determining effects, including findings of no effect on historic properties, no adverse effect on historic properties, and adverse effect on historic properties (36 CFR 800.4(d) and 800.5; ACHP 2004).

Table 4.7-1 Finding of Effects on Historic Properties

Finding of No Historic Properties Affected (No Effect on Historic Properties)
"If the agency official finds that either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them as defined in §800.16(i), the agency shall provide documentation of this finding, as set forth in §800.11(d), to the SHPO/THPO" (36 CFR 800.4[d][1]).
Finding of No Adverse Effect
"If the agency official finds that there are historic properties which may be affected by the undertaking, the agency official shall notify all consulting parties, including Indian tribes and Native Hawaiian organizations, invite their views on the effects and assess adverse effects, if any, in accordance with §800.5" (36 CFR 800.4[d][2]). "The agency official, in consultation with the SHPO/THPO may propose a finding of no adverse effect when the undertakings' effects do not meet the criteria of paragraph (a)(1) [of 36 CFR 800.5] or the undertaking is modified or conditions are imposed, such as the subsequent review of plans for rehabilitation by the SHPO/THPO . . . to avoid adverse effects" (36 CFR 800.5[b]). The agency official shall maintain a record of the finding of no adverse effect and provide information on the finding to the public on request consistent with the confidentiality provisions of §800.11(c)" (36 CFR 800.5[d]).

Table 4.7-1 Finding of Effects on Historic Properties

Finding of Adverse Effect
"An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or cumulative" (36 CFR 800.5[a][1]).
Examples of Adverse Effect
"Adverse effects on historic properties include but are not limited to: • Physical destruction of or damage to all or part of the property • Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines • Removal of the property from its historic location • Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance • Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features • Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization • Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance" (36 CFR 800.5[a][2]).

Source: Advisory Council on Historic Preservation 2004.

4.7.1 Solar PV Project

4.7.1.1 IR Site 8A and Adjacent Lot Site

4.7.1.1.1 Architectural Resources

The Navy evaluated the potential effects of the solar PV facility at IR Site 8A and Adjacent Lot Site under Section 106 of the NHPA and determined that the solar PV facility would have no effect on architectural resources that are historic properties because none are present within the APE at the IR Site 8A and Adjacent Lot Site. The Navy consulted with the Mississippi SHPO regarding the finding of no effect on architectural resources that are historic properties (Destafney 2015). The Mississippi SHPO concurred that installation of the solar PV facility within the APE at the IR Site 8A and Adjacent Lot Site would have no effect on architectural resources that are historic properties (Williamson 2015).

4.7.1.1.2 Archaeological Resources

The Navy evaluated the potential effects of the solar PV facility at the IR Site 8A and Adjacent Lot Site under Section 106 of the NHPA and determined that the solar PV facility would have no effect on archaeological resources that are historic properties because none are present within the APE at the IR

Site 8A and Adjacent Lot Site. The Navy consulted with the Mississippi SHPO regarding the finding of no effect on archaeological resources that are historic properties (Destafney 2015). The Mississippi SHPO concurred that installation of the solar PV facility within the APE at the IR Site 8A and Adjacent Lot Site would have no effect on archaeological resources that are historic properties (Williamson 2015).

4.7.1.1.3 Native American Resources

The Navy evaluated the potential for the proposed solar PV facility to impact Native American resources and determined that no Native American resources have been identified within the APE for the IR Site 8A and Adjacent Lot Site to date. The Navy consulted with four federally recognized tribes with an interest in NCBC Gulfport property about the solar PV project (the Mississippi Band of Choctaw Indians, the Choctaw Nation of Oklahoma, the Jena Band of Choctaw Indians, and the Tunica-Biloxi Tribe of Louisiana [see Appendix A]). In a response dated April 23, 2015, the Jena Band of Choctaw Indians concurred with the Navy's determination of no historic properties by the solar PV project and requested that they be contacted immediately if any inadvertent discoveries occur (Shively 2015). In a response dated April 24, 2015, the Choctaw Nation of Oklahoma's indicated that they have no immediate concerns about the solar PV project because it does not involve ground disturbance or significant changes to the local viewscape (Thompson 2015). The Navy has not received responses from the other two tribes.

4.7.1.2 Open Area Site

4.7.1.2.1 Architectural Resources

The Navy evaluated the potential effects of the solar PV facility at the Open Area Site under Section 106 of the NHPA and determined that the solar PV facility would have no effect on architectural resources that are historic properties because none are present within the APE at the Open Area Site. The Navy consulted with the Mississippi SHPO regarding the finding of no effect on architectural resources that are historic properties (Destafney 2015). The Mississippi SHPO concurred that installation of the solar PV facility within the APE at the Open Area Site would have no effect on architectural resources that are historic properties (Williamson 2015).

4.7.1.2.2 Archaeological Resources

The Navy evaluated the potential effects of the solar PV facility at the Open Area Site under Section 106 of the NHPA and determined that the solar PV facility would have no effect on archaeological resources that are historic properties because none are present within the APE at the Open Area Site. The Navy consulted with the Mississippi SHPO regarding the finding of no effect on archaeological resources that are historic properties (Destafney 2015). The Mississippi SHPO concurred that installation of the solar PV facility within the APE at the Open Area Site would have no effect on archaeological resources that are historic properties (Williamson 2015).

4.7.1.2.3 Native American Resources

The Navy evaluated the potential for the proposed solar PV facility to impact Native American resources and determined that no Native American resources have been identified within the APE for the Open Area Site to date. The Navy consulted with four federally recognized tribes with an interest in NCBC Gulfport property about the solar PV project (the Mississippi Band of Choctaw Indians, the Choctaw Nation of Oklahoma, the Jena Band of Choctaw Indians, and the Tunica-Biloxi Tribe of Louisiana; see Appendix A). In a response dated April 23, 2015, the Jena Band of Choctaw Indians concurred with Navy's determination of no historic properties affected by the solar PV project and requested that they be contacted immediately if any inadvertent discoveries occur (Shively 2015). In a response dated April 24, 2015, the Choctaw Nation of Oklahoma's response indicated that they has no immediate concerns about the solar PV project, as it does not involve ground disturbance or significant changes to the local viewscape (Thompson 2015). The Navy has not received responses from the other two tribes.

4.7.1.3 Both Site Locations

4.7.1.3.1 Architectural Resources

The Navy evaluated the potential aggregate impacts of the solar PV project at all locations at NCBC Gulfport under Section 106 of the NHPA and determined that the project would have no effect on architectural resources that are historic properties because none are located within the APE of either of the proposed solar PV facility locations. The Navy consulted with the Mississippi SHPO regarding the finding of no effect on architectural resources that are historic properties (Destafney 2015). The Mississippi SHPO concurred that installation of the solar PV facility within the APE of either of the proposed solar PV facility locations would have no effect on architectural resources that are historic properties (Williamson 2015).

4.7.1.3.2 Archaeological Resources

The Navy evaluated the potential aggregate or collective impacts of the project at all locations at NCBC Gulfport under Section 106 of the NHPA and determined that the project would have no direct, permanent effect on archaeological resources that are historic properties because none are present within the APE of either of the proposed solar PV facility locations. The Navy consulted with the Mississippi SHPO regarding the finding of no effect on archaeological resources that are historic properties (Destafney 2015). The Mississippi SHPO concurred that installation of the solar PV facility within the APE of either of the proposed solar PV facility locations would have no effect on archaeological resources that are historic properties (Williamson 2015).

4.7.1.3.3 Native American Resources

The Navy evaluated the potential aggregate or collective potential for the solar PV project to impact Native American resources and determined that no Native American resources or traditional cultural places have been identified within the APE of either of the proposed solar PV facility locations. The Navy consulted with four federally recognized tribes with an interest in NCBC Gulfport property about the solar PV project (the Mississippi Band of Choctaw Indians, the Choctaw Nation of Oklahoma, the Jena Band of Choctaw Indians, and the Tunica-Biloxi Tribe of Louisiana [see Appendix A]). In a response dated April 23, 2015, the Jena Band of Choctaw Indians concurred with Navy's determination of no historic properties affected for the solar PV project, and requested that they be contacted immediately if any inadvertent discoveries occur (Shively 2015). In a response dated April 24, 2015, the Choctaw Nation of Oklahoma's response indicated that they has no immediate concerns about the solar PV project, as it does not involve ground disturbance or significant changes to the local viewscape (Thompson 2015). The Navy has not received responses from the other two tribes.

4.7.2 No Action Alternative

Under the No Action Alternative, no construction of a solar PV system would occur, and there would be no new ground disturbance within the APEs at either of the proposed locations for the solar PV facilities at NCBC Gulfport. Therefore, under NEPA, there would be no change to architectural resources or prehistoric or historic archaeologically sensitive areas or archaeological sites identified within the APEs at either of the proposed locations for solar PV facilities at NCBC Gulfport. Pursuant to Section 106 of the NHPA, the No Action Alternative would have no effect on any architectural, archaeological, or Native American resources that are historic properties because none have been identified within the APEs for solar PV facilities at NCBC Gulfport to date.

4.8 Hazardous Materials and Waste

4.8.1 Solar PV Project

4.8.1.1 IR Site 8A and Adjacent Lot Site

4.8.1.1.1 Environmental Restoration Program

CERCLA and DERP provisions require that the Navy implement remedial actions necessary to adequately protect human health and the environment from risks associated with actual or potential releases of hazardous substances, pollutants, or contaminants into the environment. The long-term monitoring and LUCs in place for IR Site 8A are to ensure the continued effectiveness of the remedial actions being performed under CERCLA. The solar PV facility at this site would be constructed using anchor bolts installed at a depth from 4 to 6 inches into the 12-inch-thick concrete cap. The surficial loading requirements of the landfill and slope stability would need to be integrated into the solar PV facility design to ensure that the integrity of the landfill and its cap are not compromised. The solar PV facility would be situated to ensure access to the groundwater monitoring well located at the lot adjoining IR Site 8A used for the long-term monitoring program. The Navy and the developer would provide notification to the EPA and MDEQ for the installation of the solar PV facility on the site.

By adhering to the land use controls established under CERCLA, construction workers, operations workers, Navy personnel, and the public would be protected from CERCLA contaminants during construction and operation of the solar PV facility. As such, there would be no significant impacts on human and environmental health and safety related to the ER Program from implementing the proposed action at the IR Site 8A and Adjacent Lot Site.

4.8.1.1.2 Hazardous Waste and Hazardous Materials

Small amounts of wastes, such as used oil, and hazardous wastes, such as paints and solvents, would be generated during construction and operation of the solar PV facility and would be managed in accordance with RCRA and the station's HWMP. If pesticides are applied to control vegetation during O&M of the solar PV facility, the pesticides would be applied and managed in accordance with the station's pest management plan. No other hazardous wastes or materials would be generated from operation of the solar PV facility.

If the project design includes battery storage, any batteries associated with the project would require proper disposition at the time of project decommissioning. The batteries commonly used for electricity storage for solar PV facilities contain hazardous materials such as lead, lithium, vanadium, or molten salts (Resch 2013). The batteries would be removed and disposed of at an approved facility in accordance with the station's HWMP.

Implementation of the proposed action at the IR Site 8A and Adjacent Lot Site would result in negligible impacts on human and environmental health and safety related to the handling and disposition of hazardous materials and waste. Those impacts would not be significant.

4.8.1.2 Open Area Site

4.8.1.2.1 Environmental Restoration Program

IR Site 8C is located north of and adjacent to the Open Area Site. Long-term groundwater monitoring under the ER Program at IR Site 8C would not affect construction and operation of the solar PV facility at the Open Area Site. Therefore, there would be no impact on human and environmental health and safety related to the ER Program from implementing the proposed action at the Open Area Site.

4.8.1.2.2 Hazardous Waste and Hazardous Materials

The use and generation of hazardous materials and wastes from constructing and operating the solar PV facilities at the Open Area Site would be the same as described for the IR Site 8A and Adjacent Lot Site. There would be negligible impacts on human and environmental health and safety related to the handling and disposition of hazardous materials and wastes from implementing the proposed action.

4.8.1.3 Both Site Locations

Implementation of the proposed action at both of the alternative site locations would result in impacts similar to those discussed for the individual site locations. For work at or near ER Program sites, following the land use controls established under the CERCLA process would ensure that Navy personnel, contractors, and the public are protected from CERCLA contaminants during construction and operation of the solar PV facilities. As such, there would be no significant impacts on human and environmental health and safety related to the ER Program from implementing the proposed action at both sites.

The use and generation of hazardous materials and wastes from construction and operation of the solar PV facility at both proposed sites would be the same as described for the individual sites. There would be negligible impacts on human and environmental health and safety related to the handling and disposition of hazardous materials and wastes from implementing the proposed action at both sites.

4.8.2 No Action Alternative

Under the No Action Alternative, CERCLA activities would continue at IR Site 8 in accordance with the site management plans. There would be no significant impacts on human and environmental health and safety from continuing CERCLA activities at the ER Program site. Under the No Action Alternative, no new hazardous wastes or materials would be handled or generated, and there would be no change in human and environmental health and safety related to the handling and disposition of hazardous materials and waste.

4.9 Public Safety

4.9.1 Solar PV Project

4.9.1.1 Glint and Glare

Glint and glare are potential concerns for regional aviation operations due to the potential for ocular impacts on pilots and air traffic controllers, which could affect air traffic safety. The Gulfport-Biloxi International Airport is located approximately 3 miles northeast of NCBC Gulfport. Gulfport Memorial Hospital, which has a helipad, is located less than 1 mile south of the solar PV sites. Glint and glare also could be a concern for occupants of multi-story buildings that might overlook the solar PV facilities, as well as for motorists.

The amount of light reflected off a solar panel surface depends on two primary factors: the amount of sunlight hitting the surface and the reflectivity of that surface (FAA 2010). The solar panels used for the proposed action would be dark blue or black in color, with minimal light reflection. As discussed in the FAA's *Technical Guidance for Evaluating Selected Solar Technologies on Airports* (2010), today's solar PV panels are constructed of dark, light-absorbing materials. As a result, they reflect as little as 2 percent of the incoming sunlight, depending on the angle of the sun and assuming the use of an anti-reflective coating (which is optional and not necessarily a standard feature of all solar panels) (FAA 2010). In addition to the potential for glint and glare from the panel surfaces, other metal components that are part of solar PV facilities, such as the support poles and inverter boxes that house the electrical equipment, may reflect sunlight in the form of glint and glare.

From a study the FAA conducted of pilots and air traffic controllers at six airports where solar facilities have been operational for one to three years, the FAA concluded that significant glare is not occurring during operation of the airports or, if it is occurring, it is not creating a negative effect (FAA 2010). Another recent study completed by Nellis Air Force Base and NV Energy found that a slight potential would exist for flash glare resulting from reflected direct sunlight off of flat plate solar PV modules and that this flash glare is similar to glare off of water and would be less than that produced by weathered white concrete or snow. The study concluded that pilots would be able to mitigate this flash glare by using glare shields and sunglasses, which would reduce light reflection by approximately 80 percent (U.S. Air Force 2011).

A recent NREL study of the impacts of siting solar PV systems at airports and airfields cites current policy and guidance, including the potential for ocular impacts to pilots from glint and glare from the solar facilities (NREL 2014b). In addition to the FAA 2010 guidance discussed above, which is under review, two other recent documents address glint and glare with respect to solar facilities sited at airports. In *Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports* (78 FR 63276) (*Federal Register* 2013), the FAA and the U. S Department of Energy (DOE) established a standard for measuring the ocular impact of glint and glare from reflective surfaces, as well as thresholds for when glint and glare would impact aviation safety. The solar glare hazard analysis plot and associated Solar Glare Hazard Analysis Tool (SGHAT) are the methods recommended in the interim policy. The policy also encourages the use of the guidance and tools for non-federally obligated airports or solar energy systems adjacent to airports.

The SGHAT is used to calculate the potential for after-image and eye damage, which are divided into three categories: 1) potential for permanent eye damage (retinal burn); 2) potential for temporary after-image; and 3) low potential for temporary after-image. The FAA interim policy (*Federal Register* 2013) states that a solar energy system constructed at a federally obligated airport must meet the following standards:

1. No potential for glint or glare in the existing or planned Airport Traffic Control Tower cab; and
2. No potential for glare or low potential for after-image along the final approach path for any existing landing threshold or future landing thresholds as shown on the current FAA-approved airport layout plan. The final approach path is defined as 2 miles from 50 feet above the landing threshold using a standard 3-degree glidepath.

The NREL used the SGHAT to perform a glint and glare analysis for the proposed action with respect to aviation operations at Gulfport-Biloxi International Airport and use of the helipad at Gulfport Memorial Hospital (NREL 2015b). The study found that proposed solar PV facilities at either of the project sites would not create glint or glare in the airport traffic control tower or for landing approaches for the airport. For the helipad, the study showed that a low potential for glare would result from the proposed solar PV facilities for most of the landing approaches, and a potential for glare (which is more glare than "a low potential for glare") would result from one of the proposed solar PV facilities for one of the landing approaches. The FAA interim policy does not apply to helicopter operations; however, it should be noted that a potential for glare on a landing approach is not permitted for a federally obligated airport and aircraft under the FAA's purview (per item 2 above). The glint and glare analysis showed that the potential for glare could be reduced to a level of low potential for glare if the pilot wears sunglasses (NREL 2015b).

Although the FAA interim policy does not directly apply to the solar PV facilities proposed for NCBC Gulfport because the solar facilities would not be constructed on airport property, "… the FAA urges proponents of off-airport solar installations to voluntarily implement the provisions in this policy" (*Federal Register* 2013). During the project siting and approval process, the Navy and the developer would coordinate with the FAA as appropriate regarding the solar PV designs selected for the sites and any requirements for further evaluating glint and glare for air traffic. Similarly, the Navy and the developer could coordinate with personnel at the Gulfport Memorial Hospital regarding the proposed solar PV project and the results of the glint and glare study for the hospital helipad. As a result of following a siting and approval process, as well as federal policy and guidance, there would be no significant impacts on aviation-related safety associated with glint and glare for the proposed action.

Some multi-story on-station buildings are located near the IR Site 8A and Adjacent Lot and the Open Area sites. No information could be found in published literature regarding the potential for persons above the ground floor in multi-story buildings to experience glint and glare by looking down at a nearby solar PV facility. For this EA, the potential was assumed to exist, and it was concluded that the resulting impact would be negligible for both of the solar PV sites due to the low likelihood that the majority of above-ground-floor windows would be oriented directly facing the solar panels and the short amount of time that an occupant of the building would be at those windows viewing a solar PV facility. Glint and glare could be experienced by motorists on certain roadways near the solar PV facilities, especially when motorists approach the areas from a southerly direction. The impact on public safety related to motorists would be minor because natural and man-made visual barriers would be used to the extent practicable and because the roadways are on-station, where a reduced speed limit is enforced. The impacts would not be significant.

Glint and glare that would be potentially produced by the solar PV facilities would be more than what is currently produced by the existing concrete surface at IR Site 8A and the existing partial solar PV array at Building 319 because more metallic components would be introduced when the solar PV facilities are installed. The majority of the installed panels would consist of dark-colored and light-absorptive materials, which is a standard design component that has been accounted for in the impacts discussed above. Certain measures could be used to further minimize impacts from glint and glare, such as optimizing panel placement (both in the direction the panels face and the tilt of the panels) and the use of an anti-reflective coating on the solar panels.

4.9.1.2 Electromagnetic Fields

There are no U.S. standards for public exposure to EMF, and Mississippi has not established EMF exposure standards for power facilities. The ICNIRP has established EMF exposure guidelines for the general public (*i.e.*, not an electrical worker). For 60 Hz electric power components (including electrical lines, inverters, and interconnection areas), the ICNIRP exposure guidelines for the general public are 4.2 kV/m for the electrical component of EMF and 2,000 mG for the magnetic component of EMF (ICNIRP 2010).

There is little information in published literature concerning EMF measurements for solar PV facilities. Using results from a study conducted at three utility-scale solar PV facilities in Massachusetts (Tech Environmental 2012), EMF levels from ground-mounted facilities were approximated for a receptor to the solar facility planned for the IR Site 8A and Adjacent Lot Site. A solar PV system such as the one proposed for that site would typically situate multiple sets of 1 MW inverters throughout the facility in groups of two inverters that are located in conjunction with a transformer on a concrete pad. According to the study, a group of two 1 MW inverters and its associated transformer would generate less than 5 V/m from the electric field and about 1,000 mG from the magnetic field at a distance of about 5 feet from the inverter pad. EMF radiation decreases quickly with distance. If an inverter pad were to be located 50 feet from the nearest receptor (a conservative assumption since the nearest receptor is estimated to be

farther away than 50 feet), extrapolations from the study indicate that the electric field strength at that receptor would not be measurable and the magnetic field strength would be a maximum of 5 mG. Both of those levels would be well below the ICNIRP-recommended exposure guidelines for the general public.

The EMF levels along the edge of the 50-foot ROW for a typical 230 kV transmission line are approximately 1.5 kV/m and 20 mG (NIEHS 2002). Both levels are below the ICNIRP-recommended exposure guidelines for the general public. Electrical lines that would be installed for the project would not be expected to exceed 230 kV. Therefore, the EMF levels at the edge of a ROW for any electrical lines installed for the project would be below the ICNIRP guidelines.

Therefore, implementation of the proposed action at either of the proposed sites would have a negligible impact on public safety associated with EMF from electrical components associated with the action, including inverters/transformers and interconnecting electrical lines. The collective impact from both of the sites also would be negligible because no individual receptor would be exposed to EMF generated by more than one site. There would be no significant impact on public safety from EMF.

4.9.2 No Action Alternative

Under the No Action Alternative, no solar PV systems would be installed; therefore, there would be no change in public safety related to glint and glare and EMF as compared with existing conditions.

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5 Cumulative Impacts

5.1 Introduction

The CEQ regulations for implementing NEPA define a cumulative impact as:

> *The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7).*

Cumulative impacts can result from individually minor but collectively significant actions that take place over time. Accordingly, a cumulative impacts analysis identifies and defines the scope of other actions and their interrelationship with the proposed action if their effects may overlap in space and time. In order to analyze cumulative impacts, a geographic region must be identified for which impacts of the proposed action and other past, present, and reasonably foreseeable future actions would be cumulatively recorded or experienced.

The focus of this cumulative impacts assessment is on military and non-military construction actions in Harrison County, near the cities of Gulfport and Long Beach. Various sources of information were used to identify past, present, and reasonably foreseeable future actions, *e.g.*, public documents, local government websites, and NCBC Gulfport personnel's first-hand knowledge. The time frame for cumulative impacts in the project area is 2010 through 2020 and is based on the span of time encompassing the actions analyzed. This time frame extends four years beyond the anticipated end of the construction of the proposed solar PV facilities in 2016.

5.2 Past, Present, and Reasonably Foreseeable Future Actions

To ensure an assessment of potential cumulative impacts, this analysis sought information on past, present, and reasonably foreseeable future actions, both federal and non-federal. Those actions, summarized in Table 5-1 and depicted on Figure 5-1, warranted consideration due to the potential for spatial or temporal overlap of their impacts with those of the proposed action, as analyzed in Chapter 4.

5.3 Cumulative Impacts Analysis

Potential cumulative impacts of the proposed action with other past, present, and reasonably foreseeable actions are discussed below. The geographic area considered for cumulative impacts is determined separately for each resource listed below. The two proposed alternative solar PV sites were assessed in total when considered with other actions in order to present the most conservative analysis of cumulative impacts. The resource areas that are evaluated herein for cumulative impacts consist of land use utilities and infrastructure and air quality (with a focus on GHG emissions and climate change).

5.3.1 Land Use

The geographic study area for analyzing land use included NCBC Gulfport and the southern portion of Harrison County, Mississippi.

Construction and operation of the solar PV facilities would have direct impact on the on-station land use. The proposed action would result in a change in land use at each proposed solar PV site, from logistical land use to a solar PV facility. With the exception of the animal kennel and shelter at NCBC Gulfport

Table 5-1 Past, Present, and Reasonably Foreseeable Future Actions Potentially Relevant to Cumulative Impacts

Project Number (Keyed to Figure 5-1)	Project	Proponent	Date	Description and Location
Past and Present Actions				
1	Building 319 Solar Array	Navy	2012 (completed)	A rooftop solar array was installed on roof of Building 319. Power generated, approximately 0.8 MW, is used exclusively by NCBC Gulfport
2	Harper McCaughan Elementary	City of Long Beach	2013 (completed)	Pineville Road Elementary School rebuilt after Hurricane Katrina on new site just under 2 miles west of NCBC Gulfport.
3	Port of Gulfport Restoration Program	City of Gulfport	Target completion date of December 2015	Program intended to restore the infrastructure and facilities, provide long-term recovery of the operating capacity, and provide mitigation against future storm damage.
Reasonably Foreseeable Future Actions				
4	New Animal Kennel Building	Navy	TBD	Construction of a new animal kennel and shelter south of IR Site 8, north of 7th Avenue; NCBC Gulfport
5	U.S. 49/25th Avenue	City of Gulfport	TBD	Principle Arterial Capacity Improvement: Improve existing four-lane road from 28th Street north to O'Neil Road (short term timeline), and from 28th Street south to Pass Road (intermediate term timeline)
6	SR 601/Port Connector	City of Gulfport	TBD	Construct new four-lane parkway from 28th Street to Interstate 10 (short term timeline) and a new parkway from Port to 28th Street (intermediate term timeline)
7	28th Street	City of Gulfport	TBD	Minor Arterial Capacity Improvement: Add lanes from 28th Avenue to 34th Avenue (short term timeline), reconstruct as a super two-lane or three-lane from U.S. 49 to Pass Road (intermediate term timeline), and improve to a four-lane boulevard from 34th Avenue west to Beatline Road (intermediate term timeline)

Table 5-1 Past, Present, and Reasonably Foreseeable Future Actions Potentially Relevant to Cumulative Impacts

Project Number (Keyed to Figure 5-1)	Project	Proponent	Date	Description and Location
8	John Hill Boulevard Connector	City of Gulfport	TBD	Construct new super two-lane road from U.S. 49 to 8th Avenue as eastern extension of John Hill Boulevard (short term timeline)
9	Canal Road	City of Gulfport	TBD	Minor Arterial Capacity Improvement: Improve existing 2 lane road from Interstate 10 to 28th Street (intermediate term timeline)
10	Railroad Street/East-West Corridor Road	City of Gulfport	TBD	Construct new four-lane divided road from Long Beach to Biloxi. Upgrade some portions of existing and/or construct new connections along both sides of rail line (intermediate term timeline).
11	Casino/Resort north of 28th Avenue	Harrison County	TBD	Community Plan for Pineville Area: Property adjacent to NCBC Gulfport, North of 28th Avenue and West of Canal Road is designated for casino/resort development in the Conceptual Plan. No specific project developed to date
12	Potable Water Supply System Improvements	City of Long Beach	TBD	Proposed project will provide transmission system improvements along 28th Street, connecting existing water mains from Beatline Road to Klondyke Road with 10 inch pipe.
13	Wastewater System Improvements	City of Long Beach	TBD	Proposed project will provide wastewater transmission mains in the 28th Street area.

Source: City of Gulfport 2010; Harrison County 2008; City of Long Beach 2006.

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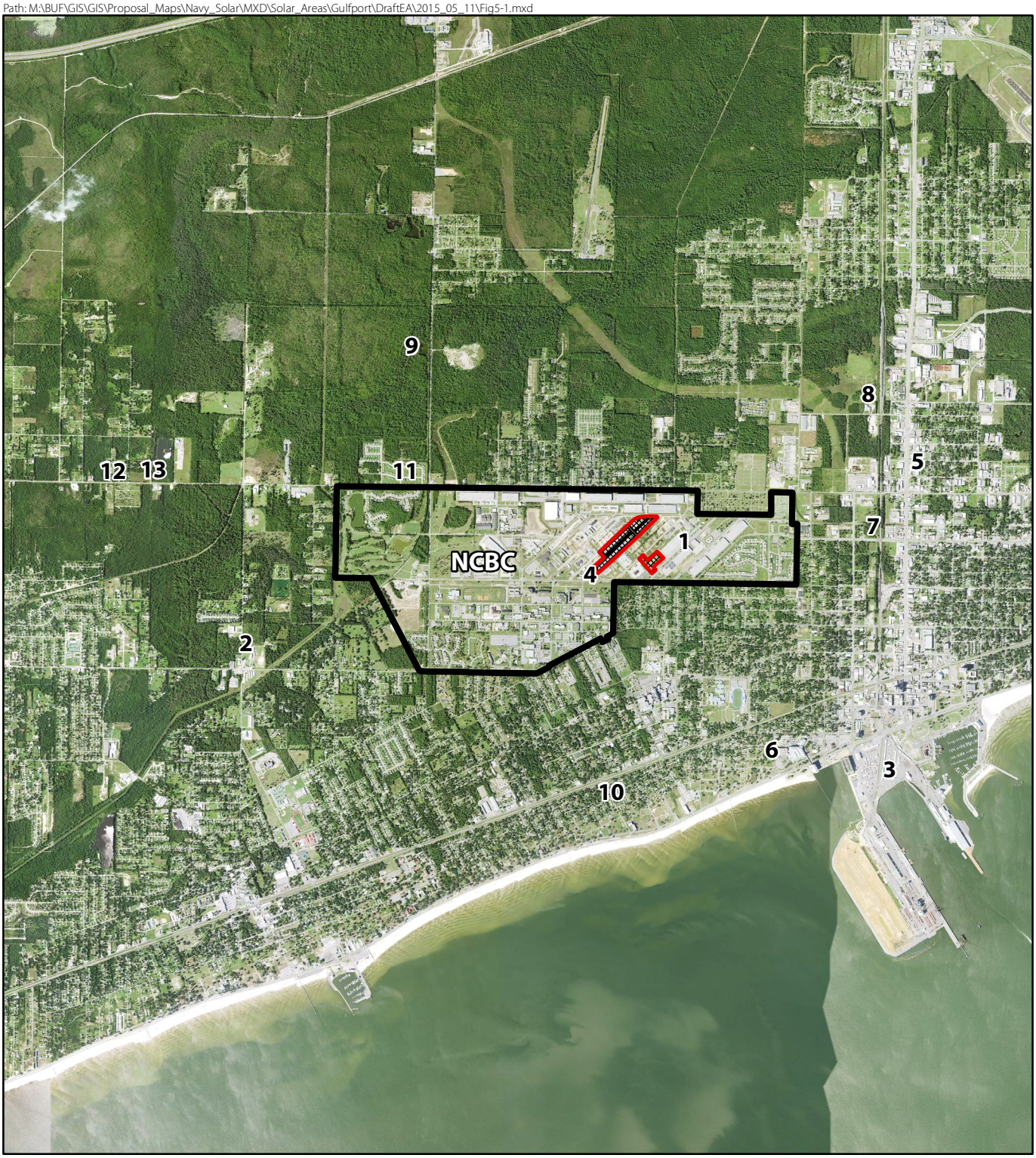

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SCALE

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Service Layer Credits: NAIP 2014

Legend

- Military Installation Boundary
- Proposed Solar Site Boundary
- Proposed Solar Array Location

Figure 5-1

Past, Present, or Reasonably Foreseeable Actions in the Project Area at NCBC Gulfport

Harrison County, Mississippi

and the Casino/resort north of 28th Avenue, the other reasonably foreseeable actions listed in Table 5-1 would not result in any changes in existing land use because they largely involve the reconstruction of existing structures or infrastructure. However, adjacent existing or planned future open space available on station (potentially IR Site 8B and 8C) would need modification to accommodate a storage area or training space. As a result, cumulative direct and indirect impacts on land use could occur from implementation of the proposed action and other reasonably foreseeable actions. The animal kennel and shelter at NCBC Gulfport and the casino/resort north of 28th Avenue would likely result in long-term impacts on land use due to a change from existing land uses. However, the animal kennel and shelter would need to be approved by NCBC Gulfport and the casino/resort project would be required to go through a local planning review both of which would identify recommendations for measures to implement these projects in a way that would be consist with local land use goals.

Based on the discussion above, the proposed action, when considered with the past, present, and reasonably foreseeable actions identified in Table 5-1, could have long-term changes and potential cumulative impacts on land use. The station and local planning processes would ensure that changes in land use would be consistent with pertinent planning documents and not be significant.

5.3.2 Utilities and Infrastructure

The geographic study area for analyzing utilities and infrastructure includes NCBC Gulfport and the towns located adjacent to NCBC Gulfport in southern Harrison County.

Electrical Distribution System

Electricity usage at NCBC Gulfport would not change as a result of this action. All electricity generated by the solar PV system would be dedicated to the local energy grid, a beneficial impact on the commercial electrical supply.

Of the projects identified in Table 5-1, only the elementary school and the casino/resort would be associated with demands on the regional electrical supply and grid network. The extent of additional electrical capacity associated with this project cannot be accurately determined with the currently available project information. Demand for electricity for the other projects would vary depending on the type and size of the development. However, implementation of the proposed action would increase power capacity for existing and future uses on the regional electrical supply and grid network. Therefore, cumulative impacts on the electrical supply and system would be anticipated to be negligible.

Stormwater Management

Construction of the solar PV system would not increase the impervious surface areas at the proposed site. Minimal ground disturbance and grading would be expected because the IR Site 8A has already been disturbed, graded, and capped. The existing perimeter road negates the need for access roadways.

The Adjacent Lot portion of the IR Site 8A and Adjacent Lot Site and the Open Area Site have already been disturbed, graded, and leveled so only minimal ground disturbance and grading would be expected. The existing perimeter roads and compacted surface can be used for access. The minimal ground disturbance activities during construction of the solar PV systems would require permits from the state of Mississippi for stormwater discharges associated with construction activities. A SWPPP would be required in accordance with good engineering practices and would include BMPs and erosion and sediment control practices that would reduce stormwater pollution.

It is assumed that state and local permits and regulations pertaining to stormwater management would be adhered to for the projects identified in Table 5-1. Similarly, local ordinances that focus on stormwater

management would need to be followed. Therefore, cumulative impacts on stormwater management could occur but would likely be minimal

5.3.3 Air Quality: GHG Emissions and Climate Change

The geographic study area for analyzing cumulative impacts on GHG emissions and climate change consists of NCBC Gulfport and the western portion of the City of Gulfport, and the eastern portion of the City of Long Beach.

GHG emissions occur locally, but GHG impacts and climate change are both global in scale and cumulative over time. The proposed action is one of the beneficial activities being implemented by the Navy to address climate change and reduce GHG emissions. The Navy's renewable energy goals described in Chapter 1 address the use of fossil fuels as one of the causes of climate change, thereby addressing renewable energy, energy reductions, and GHG reduction goals established by current Navy guidance and requirements (Navy 2012b). By increasing renewable energy generation at NCBC Gulfport, the proposed action may have a beneficial impact on climate change. Therefore, the proposed action would not likely contribute to any negative impacts on climate change, when considered in conjunction with the past, present, and reasonably foreseeable actions identified in Table 5-1.

6 Mitigation Measures

Construction, operation, and maintenance of the proposed solar PV facility would require certain mitigation measures to prevent or minimize both short- and long-term impacts on resources. Mitigation measures for potentially impacted resources are presented below in Table 6-1.

Table 6-1 Summary Table of Mitigation Measures

Description of Mitigation Measure	Anticipated Benefit	Criteria for Evaluating Efficacy	Description of How Mitigation Measure Would be Implemented	Responsible Party	Estimated Completion Date
Cultural Resources					
In the event of an inadvertent discovery of previously undocumented historic/archaeological resources during any phase of the project, the utility company or subcontractor shall cease work in the immediate vicinity and contact the installation natural/cultural resources manager for further instructions.	Avoid impacts to previously undocumented archaeological or historic resources	No adverse impacts to archaeological/historic resources	Installation natural resources or cultural resources manager is contacted in the event of an inadvertent discovery	Solar developer and utility company	Primarily, actions will be completed during site preparation and construction phase, but measures will extend through the lease period

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A Agency Correspondence

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST
JACKSONVILLE, FL 32212-0030

5090
Ser EV23/082
March 9, 2015

Mr. Greg Williamson
Review and Compliance Officer
Mississippi Department of Archives & History
P.O. Box 571
Jackson, MS 39205-0571

Dear Mr. Williamson:

SUBJECT: PROPOSED RENEWABLE ENERGY PROJECT AT NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, HARRISON COUNTY, MS

The Navy Renewable Energy Program Office (REPO) is proposing to install a renewable energy, photovoltaic (PV) array, facility at Naval Construction Battalion Center (NCBC) Gulfport in Harrison County, Mississippi. This letter serves to initiate consultation with your office in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, to ensure that potential effects on historic properties are taken into account at the earliest planning opportunity. Please see the attached Project Description (Enclosure 1) for a more complete explanation of the REPO effort at NCBC Gulfport.

The project includes the installation of photovoltaic solar panels on the flat roof of Building 319. Constructed in 1971, Building 319 is a large standard-plan warehouse that was used to store various Construction Battalion equipment for units assigned to NCBC Gulfport. The building is not an "exceptional" construction nor does it qualify as a Cold War resource subject to Criteria G Consideration of the National Register of Historic Places. Moreover, the solar panels will be affixed to the flat roof of the building and will not be visible from the adjacent streets and activity areas. In similar regard, the ground installation of solar units in the vicinity of the warehouse will not incur adverse viewshed effects.

NCBC Gulfport is a very dynamic industrial facility that has been in operation since 1942. Previous consultation with the Mississippi SHPO and the Department of the Interior have resulted in the Navy being informed that, owing to the previous disturbance associated with military construction activities at the installation, that there is no potential for archaeological resources to be present. The Navy has therefore determined, based on the lack of viewshed effects and the lack of potential for archaeological resources, that the implementation of this project will have no effect on historic properties. We ask for your concurrence with this finding pursuant to the terns of Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations found at 36 CFR 800: *Protection of Historic Properties*.

5090
Ser EV23/082
March 9, 2015

The REPO project at NCBC Gulfport marks a critical first step in capturing renewable energy for use within the larger community. If you have any questions, please contact Dr. John Calabrese, Staff Archaeologist at (904) 542-6985) or email: john.calabrese@navy.mil. Written correspondence can be sent to:

Commanding Officer
NAVFAC Southeast
Attn: Dr. John Calabrese (EV23)
PO Box 30A, Bldg 903, NAS
Jacksonville, FL 32212-0030

Thank you for supporting the REPO action in Mississippi.

Sincerely,

C. R. DESTAFNEY, PE
Environmental Business Line
Coordinator
By direction of the
Commanding Officer

Enclosure: REPO Project Description, NCBC Gulfport

Copy to:
Commanding Officer, NCBC Gulfport
Ms. Lisa Noble, IEPD, NCBC Gulfport

Enclosure 1

REPO PROJECT DESCRIPTION, NCBC GULFPORT

In October 2009, the Secretary of the Navy (SECNAV) established renewable energy goals for the Navy's shore-based installations to meet by 2020. These goals include: (a) the procurement or production of at least 50 percent of the total quantity of electric energy consumed by shore-based facilities and activities each fiscal year from alternative energy sources, and; (b) 50 percent of Navy installations will be net zero (i.e., over the course of a fiscal year, an installation matches or exceeds the electrical energy it consumes ashore with electrical energy generated from alternative energy sources). These goals are consistent with renewable energy policies being developed throughout the federal government and contained in numerous executive order and statutes, including Executive Order (EO) 13514, the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852), and Title 10 U.S.C. § 2911(e).

In December 2013, President Obama signed a presidential memorandum that requires federal agencies to produce or procure from renewable sources 20 percent of electricity consumed by facilities by FY 2020 and each fiscal year thereafter, an amount that represents a more aggressive goal than under the EPAct or 10 U.S.C §2911(e). The memorandum also establishes interim goals of 10 percent by 2015, 15 percent by 2016, and 17.5 percent by 2018. The memorandum states that the renewable energy consumption target be achieved by installing Government-funded renewable energy projects at federal facilities, or contracting for energy that includes the installation of a renewable energy project on-site at a federal facility.

In support of the EPAct and 10 U.S.C. §2911(e) renewable energy goals, SECNAV established the "1-Gigawatt (GW) Initiative" –- named for the amount of renewable energy generation capacity to be deployed by 2020, either on or near Navy installations. This goal was initially stated in the President's 2012 State of the Union Address and is consistent with the alternative energy goal presented in 2009 by SECNAV and the 2013 presidential memorandum.

In keeping with energy goals established by the White House and the Department of Defense, the Navy proposes to establish a renewable-energy facility at Naval Construction Battalion Center in Harrison County, Mississippi.

CBC Gulfport Project Overview

NCBC Gulfport encompasses approximately 1,100 acres of land on the western edge of the city of Gulfport within Harrison County, Mississippi. The installation is located approximately 1 mile from the Mississippi Sound of the Gulf of Mexico (see Figure 1). The installation is bordered by the city of Gulfport to the north, east,

and south, by the city of Long Beach to the west, and Harrison County to the northwest.

NCBC Gulfport was established in June 1942 to serve as an Advanced Base Depot for the Navy during World War II. In 1952 all activities at the facility were consolidated into one unit, referred to as NCBC. Between the late 1940s and the early 1960s, the facility size and staffing fluctuated in accordance with the amount of equipment and supplies stored or managed there, reaching a peak in the mid-1960s with the commitment of construction forces in Southeast Asia.

NCBC Gulfport currently functions as a naval education, training, and research and development center and as a home base for the Atlantic Fleet Seabees, the Navy's construction battalions. The primary mission of NCBC is to support the Naval Construction Group 2, the 22nd and 27th Naval Construction Regiment, five Naval Mobile Construction Battalions, the Naval Construction Training Center, and other small, tenant commands. NCBC Gulfport further provides storage and shipping services from the Mississippi Gulf Coast for the U.S. Navy and its fleet units.

The majority of the installation is developed to support mission requirements. Mission-support functions at NCBC Gulfport include administration, communications, general maintenance, parking, heavy equipment storage, supply, utilities, vehicle maintenance, and weapons. The remaining undeveloped portion of the installation lies primarily to the western end and comprises natural areas and areas used for recreational programs. Approximately 400 acres of the installation are used for outdoor recreational activities.

The Navy would lease up to 30 acres of Navy-owned property at NCBC Gulfport to be developed by an independently operated commercial power utility company (power utility) for a solar PV system. The power utility and a third-party solar developer would construct, and operate one or several solar facilities at one or more sites, consisting of arrays of PV cells that collect energy from sunlight for the production of electricity. Solar arrays will be placed on the roof of Building 319, constructed in 1971, and at various ground locations (Figure 2). Figures 3 and 4 illustrate the ground aspects of locations of the proposed arrays.

The proposed solar arrays would be connected to roof- and ground-mounted, fixed-tilt (stationary) systems designed to optimize power production of the panels by ensuring proper orientation to the sun throughout the day and seasons. The panels may be constructed of glass encasing, which would be dark blue or black in color with minimal light reflection. The highest point of the solar array for a ground-mounted solar PV system would be approximately 6-9 feet, depending upon the angle of the panels, above the ground surface. The panels would be approximately 5 feet (1.5 meters) wide and 3 feet (0.930 meter) long. The number of panels in each array, the type of

ground-mounted system used, and the array configuration would depend on the solar power developer's final site design.

PV systems generate direct current (DC) electricity, which is converted to alternating current (AC) for transmission on the electrical grid and ultimate end use in AC form. The ground-mounted solar PV systems would require either an underground or overhead electrical line to transfer electricity to the nearest point of connection. Underground electrical lines would be buried 3 feet (0.9 meter) deep, as required by Unified Facilities Criteria (UFC) codes.

The facility to be constructed would include multiple solar PV panels, panel-mounting brackets on vertical members, and steel tracking structures within the project solar PV system site, as well as miscellaneous electrical equipment at the point of connection (i.e., inverters, combiner boxes, electrical switchgear, associated electrical wiring, and connections) and other items required for the solar PV system. Materials would be transported to the project site by truck where they would be staged, assembled, and moved into place. Construction duration (from initial site grading and staging of equipment and panels to completed solar array) would be approximately six to eight months. A normal configuration for this type of system is to install vertical members into the ground, either concrete pier, ground-screw, slab, or pile driven support post, with panel-mounting hardware, frames, motors, and/or the solar panels themselves affixed atop the constructed mounting structure. Foundations would be built on engineered fill or native soil at a minimum of 24 inches (61 centimeters) below adjacent grade or finished grade (typical for combined footings). If pole footings are to be used, each footing would consist of a 4-inch (10-centimeter) cross-sectional area and would require a depth of 4 feet to 6.5 feet (1.2 meters to 2 meters) below ground surface. Construction will occur on previously graded and cleared ground, or on the roof of Building 319.

Project power will be connected to the local electrical grid via overhead distribution lines. The overhead electric feeder lines would be installed adjacent to existing roads or utility rights-of-way. Final siting of utility lines would be reviewed by CNBC Gulfport personnel prior to construction.

MISSISSIPPI DEPARTMENT *of* ARCHIVES AND HISTORY

MDAH

HISTORIC PRESERVATION
Jim Woodrick, director
PO Box 571, Jackson, MS 39205-0571
601-576-6940 • Fax 601-576-6955
mdah.state.ms.us

April 8, 2015

Commanding Officer
Naval Facilities Engineering Command Southeast
Attention: Dr. John Calabrese (EV23)
P. O. Box 30A (Bldg 903) NAS
Jacksonville, Florida 32212-0030

RE: Proposed renewable energy project: installation of photovoltaic solar panels on the flat roof of Building 319 at Naval Construction Battalion Center Gulfport, MDAH Project Log #03-112-15, Harrison County

Dear Mr. Calabrese:

We have reviewed your request to comment, received on March 18, 2015, regarding potential impacts to cultural resources for the above referenced undertaking in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. After review, we concur with your determination of no effect to cultural resources eligible for listing in the National Register of Historic Places. As such, we have no reservations with the proposed undertaking.

Should the project have a significant change in scope, we would appreciate it if you would contact this office so that we may offer comments.

If you have any questions, please contact me at 601-576-6538.

Sincerely,

Greg Williamson
Review and Compliance Officer

FOR: Katie Blount
State Historic Preservation Officer

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST
JACKSONVILLE, FL 32212-0030

5090
Ser EV23/089
March 11, 2015

Mr. Kenneth H. Carleton
Tribal Archaeologist
Mississippi Band of Choctaw Indians
P.O. Box 6010
Philadelphia, MS 39350

Dear Mr. Carleton:

SUBJECT: PROPOSED RENEWABLE ENERGY PROJECT AT NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, HARRISON COUNTY, MISSISSIPPI

The Navy Renewable Energy Program Office (REPO) is proposing to install a renewable energy, photovoltaic (PV) array facility at Naval Construction Battalion Center (NCBC) Gulfport in Harrison County, Mississippi. This letter serves to initiate consultation with the Mississippi Band of Choctaw Indians in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, to ensure that potential effects on historic properties are taken into account at the earliest planning opportunity.

The project includes the installation of photovoltaic solar panels on the flat roof of Building 319. Constructed in 1971, Building 319 is a large standard-plan warehouse that was used to store various Construction Battalion equipment for units assigned to NCBC Gulfport. The building is not an "exceptional" construction nor does it qualify as a Cold War resource subject to Criteria G Consideration of the National Register of Historic Places. Moreover, the solar panels will be affixed to the flat roof of the building and will not be visible from the adjacent streets and activity areas. In similar regard, the ground installation of solar units in the vicinity of the warehouse will not incur adverse viewshed effects on other properties.

NCBC Gulfport is a dynamic industrial facility that has been in operation since 1942. Previous consultation with the Mississippi SHPO and the United States Department of the Interior have resulted in the Navy being informed that, owing to the previous disturbance associated with military construction activities at the installation, there is no potential for archaeological resources to be present. The Department of the Navy has therefore determined, based on the lack of viewshed effects and the lack of potential for archaeological resources, that the implementation of this project will have no effect on historic properties. Consultation with the Mississippi SHPO is ongoing regarding these findings.

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The Navy will consult with your tribe in the unlikely event that sites of religious or cultural importance are identified, or in the event that artifacts subject to the Native American Graves Protection and Repatriation Act of 1990 are identified in the course of the project.

The REPO project at NCBC Gulfport marks a critical first step in capturing renewable energy for use within the larger community. Please direct any questions to Dr. John Calabrese, Staff Archaeologist, at (904) 542-6985 or e-mail: john.calabrese@navy.mil. Written correspondence can be mailed to:

Commanding Officer
NAVFAC Southeast
Attn: Dr. John Calabrese (EV23)
PO Box 30A, Bldg 903, NAS
Jacksonville, FL 32212

Thank you for supporting the REPO action in Mississippi.

Sincerely,

C. R. DESTAFNEY, PE
Environmental Business Line
Coordinator
By direction of the
Commanding Officer

Copy to:
Ms. Lisa Noble, IEPD, NCBC Gulfport

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST
JACKSONVILLE, FL 32212-0030

5090
Ser EV23/090
March 11, 2015

The Choctaw Nation of Oklahoma
Attn: Dr. Ian Thompson
Tribal Historic Preservation Officer
P.O. Box 1210
Durant, OK 74702-1210

Dear Dr. Thompson:

SUBJECT: PROPOSED RENEWABLE ENERGY PROJECT AT NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, HARRISON COUNTY, MISSISSIPPI

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Commanding Officer
NAVFAC Southeast
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Jacksonville, FL 32212

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Environmental Business Line
Coordinator
By direction of the
Commanding Officer

Copy to:
Ms. Lisa Noble, IEPD, NCBC Gulfport

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST
JACKSONVILLE, FL 32212-0030

5090
Ser EV23/091
March 11, 2015

Jena Band of Choctaw Indians
Attn: Ms. Dana Masters
Tribal Historic Preservation Officer
P.O. Box 14
Jena, LA 71342

Dear Ms. Masters:

SUBJECT: PROPOSED RENEWABLE ENERGY PROJECT AT NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, HARRISON COUNTY, MISSISSIPPI

The Navy Renewable Energy Program Office (REPO) is proposing to install a renewable energy, photovoltaic (PV) array facility at Naval Construction Battalion Center (NCBC) Gulfport in Harrison County, Mississippi. This letter serves to initiate consultation with the Mississippi Band of Choctaw Indians in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, to ensure that potential effects on historic properties are taken into account at the earliest planning opportunity.

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Commanding Officer
NAVFAC Southeast
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Jacksonville, FL 32212

Thank you for supporting the REPO action in Mississippi.

Sincerely,

C. R. DESTAFNEY, PE
Environmental Business Line
Coordinator
By direction of the
Commanding Officer

Copy to:
Ms. Lisa Noble, IEPD, NCBC Gulfport

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST
JACKSONVILLE, FL 32212-0030

5090
Ser EV23/092
March 11, 2015

Tunica-Biloxi Indian Tribe
Attn: Mr. Earl J. Barbry, Jr.
Tribal Historic Preservation Officer
P.O. Box 1589
Marksville, LA 71351

Dear Mr. Barbry:

SUBJECT: PROPOSED RENEWABLE ENERGY PROJECT AT NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, HARRISON COUNTY, MISSISSIPPI

The Navy Renewable Energy Program Office (REPO) is proposing to install a renewable energy, photovoltaic (PV) array facility at Naval Construction Battalion Center (NCBC) Gulfport in Harrison County, Mississippi. This letter serves to initiate consultation with the Mississippi Band of Choctaw Indians in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, to ensure that potential effects on historic properties are taken into account at the earliest planning opportunity.

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Jacksonville, FL 32212

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Sincerely,

C. R. DESTAFNEY, PE
Environmental Business Line
Coordinator
By direction of the
Commanding Officer

Copy to:
Ms. Lisa Noble, IEPD, NCBC Gulfport

From: Alina Shively [mailto:ashively@jenachoctaw.org]
Sent: Thursday, April 23, 2015 3:42 PM
To: Calabrese, John A CIV NAVFAC SE, EV
Subject: Proposed Renewable Energy Project at Naval Construction Battalion Center Gulfport, Harrison County, MS

Dear Sir:

Regarding the above-mentioned project, the Jena Band of Choctaw Indians' THPO hereby concurs with the determination of No Properties. Should any inadvertent discoveries occur, please contact our office immediately via the information below. Thank you.

Sincerely,

Alina J. Shively
Jena Band of Choctaw Indians
Deputy THPO
P.O. Box 14
Jena, LA 71342
(318) 992-1205

ashively@jenachoctaw.org <mailto:ashively@jenachoctaw.org>

From: Ian Thompson [mailto:ithompson@choctawnation.com]
Sent: Friday, April 24, 2015 5:25 PM
To: Calabrese, John A CIV NAVFAC SE, EV
Subject: Re: Proposed Renewable Energy Project at Naval Construction Battalion Center Gulfport, Harrison County, Mississippi

The Choctaw Nation of Oklahoma thanks the Department of the Navy for consultation on the above-referenced project. As this project does not involve ground disturbance or significant changes to the local viewscape, the Choctaw Nation would not consider this an undertaking that is likely to affect historic properties. Accordingly, the Choctaw Nation of Oklahoma has no immediate concerns about this project.

Thank you,

Ian Thompson PhD, RPA

THPO, Tribal Archaeologist,

Director, Historic Preservation Dept.

Choctaw Nation of Oklahoma

PO Drawer 1210

Durant, OK 74701

1-800-522-6170 ext. 2216

_____

B Electricity and Air Quality Calculations

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Navy Photovoltaic System Installations
Proposed Solar PV Project Sites for NCBC Gulfport

Sites	Site Size (Acres)[1]	System Size (MW(DC))[2]	Estimated Annual Electricity generation (MWH(AC))	Percentage of NCBC Gulfport Annual usage[3]	Estimated Annual Reduction in GHG Emissions (MTCO2e)
Ground mounted Sites					
IR Site 8A and Adjacent Open Area	18	3.09	4,023	9%	2,885
Open Area	7	1.12	1,458	3%	1,046
Roof Top Sites					
Bldg 319	3.8	0.76	989	2%	710
Total	28.8	4.96	6,457	15%	4,631
Total Acreage	25				

[1] Based on some site constraints; see Table 2-1 of EA, Section 2.2.

[2] Based on placement of 7,695 and 21,330 Stion 145W panels at ground mounted sites.

[3] Based on total usage at NCBC Gulfport in FY 2012 of 42,855 MWH (NREL 2014)

Estimated Emissions avoided Energy Generated by PV system

			Emissions factors (lbs/MWH)			Emissions per year (tons)		Emissions per year (MT)
Energy Supply	**Unit**	**Total**	**NOX**	**SO2**	**CO2**	**NOX**	**SO2**	**CO2**
Electricity	KWH	6,456,895	0.900000	1.7	979	2.91	5.49	2,867
	MWH	6,457	0.900000	1.7	979	2.91	5.49	2866.71
	% of state total	0.012%				0.012%		
	increase in state renewable energy	0.4%						
	FY 2012 total electricity usage (KWH)	42,855,200						
	% of site total	15%						

NREL (National Renewable Energy Laboratory). 2014a. Navy Renewable Energy Screening Results (FY 2012). Updated January 9, 2014. Excel Workbook "Navy REopt DATABASE 01 9-14 Net Zero and LLCC only.xlsx"

Mississippi Electricity Profile 2012 Edition

http://www.eia.gov/electricity/state/mississippi/index.cfm

	MWH	KWH
Net Generation	**54,584,295**	54,584,295,000

Pollutant	**Emissions (see unit)**	**Metric tons**	**lbs**	**lbs/KWH**
Sulfur Dioxide (short tons)	47337	42,935	94654720.41	0.0017
Nitrogen Oxide (short tons)	25853	23,449	51695470.5	0.0009
Carbon Dioxide (thousand MT)	24,285	24,285,000	53539260327	0.9809
Sulfur Dioxide (lbs/MWh)	1.7			
Nitrogen Oxide (lbs/MWh)	0.9			
Carbon Dioxide (lbs/MWh)	979			

Table 5. Electric Power industry generation by primary source

Source type	**MWH**	**%**
Total Electric Industry	54,584,295	100.00%
Coal	7,211,973	13.21%
Natural Gas	38,549,893	70.62%
Nuclear	7,296,134	13.37%
Other	23	0.00%
Other Biomass	16,441	0.03%
Other Gas	0	0.00%
Petroleum	17,082	0.03%
Wood	1,492,748	2.73%
Total Renewable	1,509,189	2.76%

Results from NREL "PVWATTS" online solar calculator

http://pvwatts.nrel.gov/

PVWatts: Monthly PV Performance Data

Requested Location:	Gulfport, MS
Location:	GULFPORT BILOXI INT, MS
Lat (deg N):	30.4
Long (deg W):	89.07
Elev (m):	9
DC System Size (kW):	49600
Module Type:	Standard
Array Type:	Fixed (open rack)
Array Tilt (deg):	20
Array Azimuth (deg):	180
System Losses:	14
Invert Efficiency:	96
DC to AC Size Ratio:	1.1

Month	AC System Output(kWh)	Solar Radiation (kWh/m^2/day)	Plane of Array Irradiance (W/m^2)	DC array Output (kWh)	Value ($)
1	504,395.28	4.09	126.87	526,791	$ 43,983
2	413,326.41	3.73	104.53	433,642	$ 36,042
3	581,157.13	4.80	148.95	607,555	$ 50,677
4	540,790.06	4.67	139.97	566,723	$ 47,157
5	654,298.50	5.64	174.77	684,331	$ 57,055
6	594,755.81	5.33	159.90	622,351	$ 51,863
7	662,203.38	5.87	181.89	691,683	$ 57,744
8	683,128.75	6.07	188.10	713,089	$ 59,569
9	535,013.94	4.80	143.98	559,595	$ 46,653
10	506,916.47	4.30	133.31	530,667	$ 44,203
11	396,952.94	3.32	99.61	416,579	$ 34,614
12	383,955.84	3.07	95.08	402,817	$ 33,481
Annual	**6,456,895**	**4.64**		**6,755,824**	**$ 563,041**

Estimated Annual KWH by Site

Sites	MW	MWH
Old Nursery	3.09	4,023
Driving Range	1.12	1,458
Wisteria Triangle	0	-
Landfill	0.76	989
Golf Course	0	-
	#REF!	#REF!
Total	4.960	6,457

Onroad Vehicle Exhaust Emission Factors

Equipment Type	Fuel Type	Exhaust Emission Factor[a] (g/VMT)							Road Dust Emission Factor[d] (g/VMT)		Total PM Emission Factor[e] (g/VMT)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Gasoline Light Trucks	Gasoline	1.03	9.40	0.69	0.0106	0.0044	0.0041	368	3.13	0.341	3.13	0.345
Gasoline Passenger Cars	Gasoline	1.22	11.84	0.95	0.0147	0.0049	0.0045	514	3.13	0.341	3.13	0.346
Average Gasoline Vehicles	Gasoline	1.13	10.62	0.82	0.013	0.005	0.004	440.95	3.13	0.341	3.13	0.346
Diesel Vehicles	Diesel	0.28	1.10	8.06	0.158	0.17	0.17	1,400	3.13	0.341	3.30	0.511

Notes:

a. Emission factors for gasoline worker vehicles from "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks (EPA420-F-08-024, EPA 2008). It was assumed that the vehicle make-up included 50% cars and 50% light-duty trucks/SUVs.

b. Emission factors for diesel worker and delivery vehicles (except SO2 and CO2) from "Assessing the Effects of Freight Movement on Air Quality at the National and Regional Level- Final Report" (U.S. Federal Highway Administration 2005).

c. CO2 and SO_2 emission factors for diesel worker and delivery vehicles from "Greenhouse Gas Protocol - Corporate Accounting and Reporting Standard / Mobile Guide" (World Resources Institute/World Business Council for Sustainable Development 2005). SO2 emission factor calculated from diesel consumption rate and a sulfur content of 348 ppm.

d. See emission factor derivation table below.

e. Sum of exhaust and road dust emission factors.

Paved Roads - Emission Factor Derivation Table

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = average vehicle weight (tons)
C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	3	3	Assumption
k factor	g/VMT	7.3	1.1	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.6	0.6	Table 13.2.1-3
Emission factor, C	g/VMT	0.2119	0.1617	Table 13.2.1-2
Emission factor, E	g/VMT	3.13	0.341	Table 13.2.1-3

Construction Equipment Exhaust Emission Factors, Based on EPA NONROAD emission rates

Equipment Type	Type	SCC	Avg Size[1] (hp)	Load[2]	Engine Size Range	Emission Factor[3] (g/hp-hr)					Equipment Emission Rate[4] (lbs-hr)				
						NO_x	VOC	CO	SO_2	PM_{10}	NO_x	VOC	CO	SO_2	PM_{10}
Asphalt Paving Machine	Diesel	2270002003	91	0.59	75<hp≤100	2.63	0.27	2.83	0.006	0.38	0.31	0.03	0.33	0.001	0.04
Vibratory Compactor	Diesel	2270002009	8	0.43	6<hp≤11	4.95	0.68	4.49	0.007	0.50	0.04	0.01	0.03	0.000	0.00
Generators	Diesel	2270006005	22	0.43	16<hp≤25	5.36	0.74	3.03	0.007	0.49	0.11	0.02	0.06	0.000	0.01
Air Compressors	Diesel	2270006015	37	0.43	25<hp≤40	4.28	0.25	1.28	0.007	0.23	0.15	0.01	0.04	0.000	0.01
Excavator/Loaders/Backhoes	Diesel	2270002066	77	0.21	75<hp≤100	5.14	1.03	6.13	0.008	0.91	0.18	0.04	0.22	0.000	0.03
Aerial Lifts (Cherry Pickers)	Diesel	2270003010	43	0.21	40<hp≤50	5.88	1.81	6.78	0.008	0.98	0.12	0.04	0.13	0.000	0.02
Crawler Tractor/Dozers	Diesel	2270002069	157	0.59	100<hp≤175	2.44	0.21	1.00	0.006	0.24	0.50	0.04	0.20	0.001	0.05
Off-Highway Trucks	Diesel	2270002051	489	0.59	300<hp≤600	1.97	0.15	0.78	0.006	0.13	1.25	0.10	0.50	0.004	0.08
Marine Equipment	Diesel	2282005010	1250	0.51	hp>750	4.50	0.30	1.00	0.006	0.40	6.32	0.42	1.41	0.008	0.56
Misc. Light Pumps	Diesel	2270006010	20	0.74	16<hp≤25	5.36	0.74	3.03	0.007	0.49	0.17	0.02	0.10	0.000	0.02
Commercial Welder	Diesel	2270006025	35	0.45	25<hp≤40	4.28	0.25	1.28	0.007	0.23	0.15	0.01	0.04	0.000	0.01
Pressure Washers	Diesel	2270006030	9	0.3	6<hp≤11	4.95	0.68	4.49	0.007	0.50	0.03	0.00	0.03	0.000	0.00
Roller	Diesel	2270002015	95	0.61	75<hp≤100	5.14	1.03	6.13	0.008	0.91	0.66	0.13	0.78	0.001	0.12
Crane (Hydraulic Truck)	Diesel	2270002045	194	0.47	175<hp≤300	2.80	0.20	1.00	0.006	0.40	0.56	0.04	0.20	0.001	0.08
Crane (Crawler)	Diesel	2270002045	489	0.47	200<hp≤500	8.38	0.68	2.70	0.006	0.40	4.25	0.34	1.37	0.003	0.20
Scraper	Diesel	2270002018	311	0.7	300<hp≤600	1.97	0.15	0.78	0.006	0.13	0.95	0.07	0.38	0.003	0.06
Surfacing Equipment	Diesel	2270002024	183	0.49	150<hp≤250	2.80	0.20	1.00	0.006	0.40	0.55	0.04	0.20	0.001	0.08
Trencher	Diesel	2270002030	77	0.66	50<hp≤100	8.30	0.99	3.49	0.008	0.72	0.93	0.11	0.39	0.001	0.08
Concrete Saw	Diesel	2270002039	79	0.78	75<hp≤100	5.14	1.03	6.13	0.008	0.91	0.70	0.14	0.83	0.001	0.12
Cement Mixer	Diesel	2270002042	11	0.59	6<hp≤20	5.20	0.70	2.00	0.007	0.60	0.07	0.01	0.03	0.000	0.01
Drill Rig	Diesel	2270002033	209	0.79	100<hp≤250	8.38	0.68	2.70	0.006	0.40	3.05	0.25	0.98	0.002	0.15
Grader	Diesel	2270002048	172	0.64	150<hp≤250	4.50	0.40	1.00	0.006	0.40	1.09	0.10	0.24	0.001	0.10
Skid Steer	Diesel	2270002072	131	0.58	50<hp≤250	3.30	0.20	1.00	0.006	0.72	0.55	0.03	0.17	0.001	0.12
Telehandler	Diesel	2270003020	111	0.3	100<hp≤125	6.90	0.20	1.00	0.006	0.40	0.51	0.01	0.07	0.000	0.03

Notes:

1. Avg hp from "Nonroad Engine and Vehicle Emissions Study Report" EPA 460/3-91-02. Nov 1991.
2. Load from "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling" EPA420-P-04-005. April 2004.
3. Emission factors from EPA's NONROAD model (Year 2014) and NR-009A, June 15, 1998.
4. Equipment Emission Rate = Average HP x Load x Emission Factor x 453.6 g/lb.

Equipment List	Equipment quantity	Days Used	Emission Factors (lb/day)[1]					Emissions (lbs/year)				
			NOx	VOC	CO	SO_2	PM_{10}	NOx	VOC	CO	SO_2	PM_{10}
Asphalt Paving Machine	1	30	2.49	0.25	2.68	0.01	0.36	74.80	7.64	80.31	0.17	10.65
Vibratory Compactor	1	30	0.30	0.04	0.27	0.00	0.03	9.01	1.24	8.17	0.01	0.91
Generators	2	130	0.89	0.12	0.50	0.00	0.08	232.51	32.01	131.27	0.30	21.17
Air Compressors	2	130	1.20	0.07	0.36	0.00	0.06	312.47	18.24	93.24	0.51	16.63
Excavator/Loaders/Backhoes	2	130	1.47	0.29	1.75	0.00	0.26	380.97	76.60	454.38	0.59	67.62
Aerial Lifts (Cherry Pickers)	2	130	0.94	0.29	1.08	0.00	0.16	243.43	74.95	280.78	0.33	40.50
Crawler Tractor/Dozers	2	130	3.98	0.34	1.63	0.01	0.39	1034.29	87.50	424.76	2.55	102.37
Off-Highway Trucks	2	130	10.03	0.77	3.98	0.03	0.66	2607.58	201.09	1035.89	7.94	171.99
Marine Equipment	0	130	50.60	3.37	11.24	0.07	4.50	0.00	0.00	0.00	0.00	0.00
Misc. Light Pumps	0	130	1.40	0.19	0.79	0.00	0.13	0.00	0.00	0.00	0.00	0.00
Commercial Welder	4	130	1.19	0.07	0.36	0.00	0.06	618.66	36.11	184.60	1.01	32.93
Pressure Washers	4	130	0.24	0.03	0.21	0.00	0.02	122.62	16.86	111.18	0.17	12.41
Roller	1	10	5.25	1.06	6.26	0.01	0.93	52.51	10.56	62.63	0.08	9.32
Crane (Hydraulic Truck)	4	130	4.50	0.32	1.61	0.01	0.64	2341.41	167.24	836.22	5.02	334.49
Crane (Crawler)	1	60	33.97	2.76	10.94	0.02	1.62	2038.07	165.38	656.66	1.46	97.28
Scraper	1	10	7.57	0.58	3.01	0.02	0.50	75.68	5.84	30.06	0.23	4.99
Surfacing Equipment	1	10	4.43	0.32	1.58	0.01	0.63	44.28	3.16	15.81	0.09	6.33
Trencher	2	60	7.44	0.89	3.13	0.01	0.65	892.71	106.48	375.37	0.86	77.44
Concrete Saw	1	30	5.58	1.12	6.66	0.01	0.99	167.52	33.68	199.79	0.26	29.73
Cement Mixer	1	30	0.60	0.08	0.23	0.00	0.07	17.86	2.40	6.87	0.02	2.06
Drill Rig	1	30	24.40	1.98	7.86	0.02	1.16	732.08	59.40	235.87	0.52	34.94
Grader	1	10	8.74	0.78	1.94	0.01	0.78	87.37	7.77	19.41	0.12	7.77
Skid Steer	1	10	4.42	0.27	1.34	0.01	0.96	44.22	2.68	13.40	0.08	9.65
Telehandler	1	10	4.05	0.12	0.59	0.00	0.23	40.52	1.17	5.87	0.04	2.35
38						Annual Emissions lbs/year, Alternative 1		12170.6	1118.0	5262.5	22.4	1093.5
								6.09	**0.56**	**2.63**	**0.011**	**0.55**

Annual Site Preparation and Demolition Particulate Emissions

Activity	Acres	Site Preparation		Vehicles (lbs)	PM_{10} Emissions (lbs/yr)	PM_{10} Emissions (tons/yr)	$PM_{2.5}$ Emissions (tons/yr)
		Topsoil Removal (lbs)	Earthmoving (lbs)				
Alternative 1	25.00	3,135.00	660.00	1,540.00	5335	2.67	0.27

Emission factors obtained from EPA-450/2-92-004 Fugitive Dust document (U.S. Environmental Protection Agency September 1992)

Factors for	Topsoil Removal	5.70 kg/VKT
	Earth Moving	1.20 kg/VKT
	Vehicles	2.80 kg/VKT

Assume vehicle kilometers traveled (VKT) per acre: 10 km

Debris Burning							
	Vegetation Removal Acres	PM10 EF lbs/ton load factor	Load Factor tons/acre	Emissions from Debris burning (LBS)	Assumed efficiency of air curtain %	Total PM10 emissions TPY	Total PM2.5 emissions TPY
Alternative 1	0.00	17	57.0	0.0	50%	0.0	0.0

Source: Kirstin B. Thesing, Roy Huntley

Open Burning and Construction Activities: Improved PM Fine Emission Estimation Techniques in the National Emissions Inventory, n.d.

http://www.epa.gov/ttnchie1/conference/ei10/pm/huntley.pdf

Table 4 Loading factors for land clearing debris burning

Fuel type	Fuel loading (tons/acre)
Hardwood	99
Softwood	57
Grass	4.5

Note

Georgia DNR EPD (Ch 391-3-1) requires use of air curtain destructors for open burning for land clearing. Control capability is conservatively assumed to achieve 50% reduction in PM emissions

http://www.georgiaair.org/airpermit/html/planningsupport/openburning/index.htm

Assumes 10% of PM10 emission are PM2.5

Emissions from On Road Vehicle Activity

Source	Number of daily trips	Number of days[1]	Total number of trips	Average trip distance (miles)	Total Annual Miles	Emissions TPY[2]						
						VOC	CO	NOx	SO2	CO2	PM_{10}	$PM_{2.5}$
Worker Commute	76	130	9880	25	247,000	0.307	2.885	0.223	0.0034	119.806	0.851	0.094
Deliveries	5	130	650	100	65,000	0.020	0.079	0.576	0.0113	100.100	0.236	0.037
						0.327	**2.964**	**0.799**	**0.015**	**219.906**	**1.086**	**0.130**

[1] Assumes all construction activities will be performed within six months. One worker per piece of equipement estimated in "Equipment" Table.

[2] Calculated using EPA420-F-05-22(EPA 2008)emission rates

Construction Emissions Summary Table

Table 4.8-1 Annual Criteria Pollutant Emissions from Construction, Alternative 1

Activity	Total Emissions (Tons)					
	VOCs	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
Alternative 1						
Nonroad equipment	0.56	2.63	6.09	0.011	0.55	0.55
On road equipment	0.33	2.96	0.80	0.015	1.09	0.13
PM_{10} from site preparation					2.67	0.27
Total	**0.89**	**5.60**	**6.88**	**0.03**	**4.30**	**0.94**
General Conformity *de minimis* thresholds						

Key:

CO = Carbon monoxide.

NO_x = Nitrogen oxides.

PM_{10} = Particulate matter less than 10 microns in diameter.

SO_2 = Sulfur Dioxide

VOCs = Volatile organic compounds.

TPY = Tons per year

Estimated GHG Emissions avoided Energy Generated by PV systems

Buildings				SERC South Emissions factors (lbs/MWH)			Emissions per year ($MTCO_2E$)			
	Energy Supply	Unit	Total	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	Total CO_2e
Alternative 1										
	Electricity	KWH	6,456,895	1,574.37	0.02652	0.02149	4,610.07	1.94	18.75	4,630.77
		MWH	6,457	1,574.37	0.02652	0.02149	4,610.07	1.94	18.75	4,630.77

Source: eGRID 9th edition Version 1.0 Year 2010 GHG Annual Output Emission Rates, non-baseload output emission rates
http://www.epa.gov/cleanenergy/energy-resources/egrid/
http://www.epa.gov/cleanenergy/documents/egridzips/eGRID_9th_edition_V1-0_year_2010_GHG_Rates.pdf

Global Warming Potential (GWP) values are from the U.S. Inventory of Greenhouse Gas Emissions and Sinks: 1990-2013

	CO_2	CH_4	N_2O
GWP	1	25	298

http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html

Table 4.8-2 Annual GHG Emissions Reductions

Electricity Generated (MWH)	Emissions per year ($MTCO_2E$)			
	CO_2	CH_4	N_2O	Total CO_2e
6,457	4,610	2	19	4,631

C Coastal Consistency Determination

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DEPARTMENT OF THE NAVY
NAVAL CONSTRUCTION BATTALION CENTER
4902 MARVIN SHIELDS BLVD
GULFPORT MS 39501-5001

5090
March 17, 2015

Ms. Willa Brantley
Mississippi Coastal Program
Department of Marine Resources
1141 Bayview Avenue
Biloxi, MS 39530

SUBJECT: FEDERAL COASTAL ZONE MANAGEMENT ACT (CMZA) NEGATIVE DETERMINATION FOR THE LEASE OF PROPERTY, CONSTRUCTION, AND OPERATION OF A SOLAR PHOTOVOLTAIC (PV) SYSTEM AT NAVAL CONSTRUCTION BATTALION CENTER (NCBC) GULFPORT, MISSISSIPPI.

Dear Ms. Brantley,

In accordance with 15 Code of Federal Regulations (CFR) 930.35, the Navy has reviewed Mississippi's Coastal Management Program (CMP), including the enforceable policies contained therein, and has determined the proposed lease, construction, and operation of a solar PV system at NCBC Gulfport, would have no effects on any coastal use or resource.

The enclosed Negative Determination provides detailed information with respect to the proposed project and the Navy's evaluation of the relevant enforceable policies of Mississippi's CMP.

In accordance with 15 CFR § 930.35(c), the State of Mississippi has 60 days from receipt of this document to concur with or object to this Negative Determination or request an extension. Mississippi's concurrence will be presumed if a response is not received by the Navy within 60 days from receipt of the Negative Determination.

Your expedited review of this Negative Determination is greatly appreciated. The Navy point of contact for this matter is Ms. Lisa Noble, NCBC Environmental Director, can be reached at (228) 871-2026 or lisa.noble@navy.mil.

Sincerely,

Brian Nottingham
By Direction

Enclosure: CZMA Negative Determination

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NEGATIVE DETERMINATION
FOR
LEASE OF PROPERTY, CONSTRUCTION, AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

1. Introduction

This document provides the State of Mississippi with the United States Department of the Navy's (Navy) Negative Determination under Section 307 (c) (1) of the federal Coastal Zone Management Act (CZMA) of 1972, as amended, for the proposed lease of property, construction, and operation of a solar photovoltaic (PV) system at Naval Construction Battalion Center (NCBC) Gulfport, located in Harrison County, Mississippi.

In accordance with 15 Code of Federal Regulations (CFR) 930.35, the Navy has reviewed Mississippi's Coastal Management Program (CMP), including the enforceable policies contained therein, and has determined that the proposed lease, construction, and operation of a solar PV system at NCBC Gulfport would have no effects on any coastal use or resource. This negative determination is based on the Navy's evaluation of the relevant enforceable policies of the CMP, as described in this document.

2. Proposed Federal Agency Action

The Navy proposes to lease up to 30 acres of Navy-owned property at NCBC Gulfport to an independently operated commercial power utility company (power utility). The power utility and a third-party solar developer would construct and operate the solar PV facilities to supply up to 10 megawatts of renewable energy. The renewable energy generated at the site would supply the power utility's existing electrical energy grid, which also distributes power to NCBC Gulfport. Land would be leased for an estimated 31 year, including one year for construction, 25 years of operation, and a five-year option. After the terms of the lease expire, the Navy and the power utility would consider renewing the lease or decommissioning the system and restoring the pre-lease land use conditions.

2.1 Project Location

NCBC Gulfport encompasses approximately 1,100 acres of land on the western edge of the city of Gulfport within Harrison County, Mississippi. The installation is located approximately 1 mile from the Gulf of Mexico (see Figure 1-1). NCBC Gulfport currently functions as a naval education, training, and research and development center and as a home base for the Atlantic Fleet Seabees, the Navy's construction battalions. The primary mission of NCBC is to support the Naval Construction Group 2, the 22nd Naval Construction Regiment, three Naval Mobile Construction Battalions, and the Naval Construction Training Center, and other small, tenant commands.

NCBC Gulfport identified three on-base sites that could accommodate a utility-scale solar PV facility project: 1) Installation Restoration Program (IRP) Site 8A with an adjacent lot, 2) an open area next to Building 200, and 3) the rooftop of Building 319. The alternative site locations are summarized in Table 2-1 and shown on Figure 2-1.

Table 1 Proposed Solar PV Project Sites for NCBC Gulfport

Site	Site Area Estimated to be Available for Solar PV Development (acres)	Estimated Electricity Generation (MW)
Ground-based Site		
IRP Site 8A and Adjacent Lot	18.0	3.6
Open Area	7.0	1.4
Rooftop Site		
Building 319	3.8	0.8

Figure 1-1 Regional Location Map, NCBC Gulfport

IRP Site 8 occupies approximately 30 acres in the north-central portion of the base, north of 7th Street between Goodier Avenue and McKinney Avenue. Site 8 comprises three areas: 8A, 8B, and 8C. Site 8A occupies approximately 12 acres. In 2007, dioxin-contaminated material at Site 8A was stabilized and capped. The concrete-covered area at Site 8A is currently used for vehicle storage (parking). An adjacent lot next to Site 8A, occupying approximately 5.8 acres, has also been included in this proposed site. This adjacent lot site is not part of the IR Program and does not contain any known contamination. The portion of the site is northeast of Site 8A and west of Greenwood Avenue. This portion of the site has similar features and topography as Site 8A. Site 8A and the adjacent lot have no functional buildings. The topography of the site is relatively flat, with drainage ditches running through the site to manage storm water. No wetland areas have been identified at the site (TetraTech 2011).

A cleared open lot occupies approximately 7 acres in the southeast portion of the base, north of 7th Street between Holtman Avenue and McKinney Avenue. This lot contains non-native ornamental grasses and weeds. The lot is routinely mowed and is currently used as equipment storage. The open area has no functional buildings. The topography of the site is flat, with drainage ditches running through the site to manage stormwater. No wetland areas have been identified at the site (TetraTech 2011).

Building 319 is located in the north-central portion of the facility, on the east side of McKinney Avenue north of 7th Street. Built in 1971, it is a large, single-story warehouse used to store construction vehicles, equipment, and supplies. Access to the rooftop is via a secured ladder on the external south side of the building. In 2012, a rooftop solar PV array was installed on a portion of the building. Nearly 1,900 panels generate approximately 0.8 MW, used exclusively on NCBC Gulfport. Support for the building roof structure was increased to handle the additional weight of the existing solar array. The proposed project includes the installation of additional solar PV panels on the remaining rooftop. It is anticipated that, as with the existing project, a flush-mounted system would be used and additional roof-supporting structures or materials would be needed to handle the additional weight of the proposed array (Seabee Courier 2012).

2.2 Proposed Action Description

Solar PV technology uses solar cells to convert energy from direct and diffuse solar radiation into electricity. The basic unit in a PV system is a solar cell, made up of semiconductor material that absorbs solar radiation and converts it to an electrical current. Solar cells are contained within solar modules that are assembled into solar panels. A series of panels comprises a solar array.

The facility to be constructed at one or more sites would include solar PV arrays and panel-mounting brackets on vertical members within the site(s) as well as miscellaneous electrical equipment at the point of connection (i.e., inverters, combiner boxes, electrical switchgear, associated electrical wiring, and connections) and other items required for the solar PV system.

The solar panels are likely to be approximately 5 feet wide and 3 feet long, constructed of glass encasing, and dark blue or black in color with minimal light reflection. The height of the solar array panels for the ground-mounted system would not exceed 10 feet above the ground surface. The ground-mounted solar PV systems would require both an underground or overhead electrical line to transfer electricity to the nearest point of interconnection to Mississippi Power Company distribution system off-base. The existing rooftop array on a portion of Building 319 is a flush-mounted rooftop system.

Figure 2-1 Proposed Site Location Map within NCBC Gulfport

Occasional maintenance would be required for the solar PV arrays, including panel washing and panel replacement. Water use for operations and maintenance would include washing of the solar panels when necessary; however, minimal water usage would be expected for the project, either during construction or for operations and maintenance washing throughout the life of the system, as the amount of expected rainfall in the region would be adequate to keep the panels clean.

In the event the Navy and the power utility decide to decommission the facility, a decommissioning plan would be prepared in accordance with Navy requirements. The plan would ensure the site would be restored to pre-construction conditions. Soils and impacted areas would be reclaimed to a level that would, at a minimum, support uses for the land consistent with pre-construction activities.

2.3 Activities That Have the Potential to Impact Mississippi's Coastal Zone

Construction of the proposed solar PV system would not require extensive ground disturbance and grading. Given the flat terrain of the existing locations, as well as the cleared and pre-disturbed state of the site, the need for site preparation work would be expected to be minimal and largely limited to minor excavation associated with the ground-mounted array footers, panel interconnections, poles for fencing, electrical poles, and a limited number of underground utility lines. Any potential ground disturbance from trenching would be minimal and would take place in previously paved, graded, and/or disturbed areas.

Prior to implementation of the proposed action, all appropriate permits and authorizations would be obtained. A notice of intent will be prepared to comply with the *General Permit for Storm Water Discharge from Large Construction Activities* Large Construction Notice of Intent Mississippi Air and Water Pollution Control Law 49-17-29(2)(b). A site-specific Stormwater Pollution Prevention Plan (SWPPP) would be required in association with the Nation Pollution Discharge Elimination System (NPDES) construction permit that includes Best Management Procedures (BMPs) to reduce soil erosion and prevent storm water from leaving the construction site. The SWPPP would include specific measures to minimize the potential for soil erosion and storm water runoff, including but not limited to hay bales, silt fences, and phasing of construction-related activities (MDEQ 2011). Installation of the proposed solar PV arrays would not affect the existing stormwater collection and discharge system at the sites, and would not significantly increase the amount of impervious surface. Runoff from the project site would be managed through NCBC Gulfport's existing drainage system. The sites do not contain any wetlands or lie within any 100-year floodplains.

No state or federally listed threatened or endangered species occur on NCBC Gulfport. Suitable habitat for state or federally listed species is not present at project sites due to the urban nature of the installation and fragmented natural communities. Moreover, the habitat on the proposed project sites and the areas surrounding the sites do not support protected species.

The Navy has evaluated the potential impacts of the solar PV project at all locations at NCBC Gulfport under Section 106 of the National Historic Preservation Act (NHPA) and determined that the project would have no effect on cultural or historic resources due to the fact that there are no such resources located within the area of potential effect of any of the proposed solar PV facility locations. The Navy is consulting with the Mississippi State Historic Preservation Office (SHPO) and other consulting parties in compliance with the Section 106 process.

The project would have no direct, permanent effect on previously identified archaeological sites because none are present within the APE of any of the proposed solar PV facility locations. The Navy is in the process of evaluating the potential aggregate or collective potential for the solar PV project to impact Native American resources and/or traditional cultural places. No Native American resources or

traditional cultural places have been identified within the APE of any of the proposed solar PV facility locations.

3. Enforceable Polices of the Mississippi Coastal Program

In accordance with the CZMA, the Navy has reviewed the Mississippi Coastal Program (MCP) to identify enforceable policies relevant to the Proposed Action, approved as part of the coastal program, and enforceable on the Navy. Based on this review, the proposed action will not have any direct or indirect effects on the land and water uses or coastal natural resources of the State of Mississippi. Table 2 below lists the ten goals of the MCP, and briefly discusses their enforceability on the Navy and their applicability to the project. These goals reflect the salient aspects of the following enforceable policy categories identified in Chapter 8 of the MCP: wetlands management, fisheries management, policy coordination, special management areas, scenic preservation, and national interest.

Table 2 Mississippi Coastal Program Goals and Relevancy to the Proposed Action

MCP Goal	Enforceability or Project Applicability
GOAL 1: To provide for reasonable industrial expansion in the coastal area and to insure the efficient utilization of waterfront industrial sites so that suitable sites are conserved for water dependent industry.	Not enforceable on the Navy. The policy is directed at state agency management of the coastal area.
GOAL 2: To favor the preservation of the coastal wetlands and ecosystems, except where a specific alteration of specific coastal wetlands would serve a higher public interest in compliance with the public purposes of the public trust in which the coastal wetlands are held.	The project will not affect the biological integrity of coastal wetlands and ecosystems.
GOAL 3: To protect, propagate, and conserve the state's seafood and aquatic life in connection with the revitalization of the seafood industry of the State of Mississippi.	The project will not affect the state's seafood industry or other aquatic life.
GOAL 4: To conserve the air and waters of the state, and to protect, maintain, and improve the quality thereof for public use, for the propagation of wildlife, fish, and aquatic life, and for domestic, agricultural, industrial, recreational, and other legitimate beneficial uses.	The project will not affect the air and waters of the state, the public use thereof, or the propagation of wildlife, fish and aquatic life. A site-specific SWPPP will be developed to control soil erosion and storm water runoff.
GOAL 5: To put to beneficial use to the fullest extent of which they are capable the water resources of the state, and to prevent the waste, unreasonable use, or unreasonable method of use of water.	Not enforceable on the Navy. The policy is directed at state agency management of the coastal area.
GOAL 6: To preserve the state's historical and archaeological resources, to prevent their destruction, and to enhance these resources wherever possible.	The project will not affect the state's historical and archaeological resources. The Navy is consulting with the Mississippi SHPO.
GOAL 7: To encourage the preservation of natural scenic qualities in the coastal area.	The project will not affect the scenic qualities of the coastal area.

Table 2 Mississippi Coastal Program Goals and Relevancy to the Proposed Action

MCP Goal	Enforceability or Project Applicability
GOAL 8: To consider the national interest involved in planning for and in the siting of facilities in the coastal area.	Not enforceable on the Navy. The policy is directed at state agency management of the coastal area.
GOAL 9: To assist local governments in the provision of public facilities services in a manner consistent with the coastal program.	Not enforceable on the Navy. The policy is directed at state agency management of the coastal area.
GOAL 10: To insure the effective, coordinated implementation of public policy in the coastal area of Mississippi comprised of Hancock, Harrison and Jackson Counties.	Not enforceable on the Navy. The policy is directed at state agency management of the coastal area.

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MISSISSIPPI
DEPARTMENT OF MARINE RESOURCES

March 30, 2015

Ms. Lisa Noble, NCBC Environmental Director
Department of the Navy
Naval Construction Battalion Center
4902 Marvin Shields Boulevard
Gulfport, MS 39501-5001

RE: DMR-150268; Solar Photovoltaic System

Dear Ms. Noble:

The Department of Marine Resources in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The Department has received a request to review a proposal for the Department of the Navy to construct a solar photovoltaic system at the Naval Construction Battalion Center in Gulfport, Harrison County, Mississippi. The Department has no objections provided there are no direct or indirect impacts to coastal wetlands and no coastal program agency objects to the proposal. If wetland impacts are anticipated, an application should be submitted to this office for review. Thank you for the opportunity to comment on your project.

For more information, questions concerning this correspondence, or to obtain an application packet, contact Jennifer Wilder with the Bureau of Wetlands Permitting at (228) 523-4121 or jennifer.wilder@dmr.ms.gov.

Sincerely,

Willa J. Brantley
Bureau Director, Wetlands Permitting

WJB/jjw

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