HECATE ENERGY GULF WIND LLC
GULF WIND OFFSHORE WIND PROJECT 2

Unsolicited Application for an Outer Continental Shelf Renewable Energy Lease

Gulf of Mexico Wind Energy Areas C and D

US Department of the Interior,
Bureau of Ocean Energy Management

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Hecate Energy Gulf Wind LLC
621 W. Randolph St.
Chicago, IL 60661

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List of Acronyms

AIS	automatic identification system
AOI	Area of Interest
BOEM	Bureau of Ocean Energy Management
°C	degrees Celsius
CH4	methane
CT DEEP	Connecticut Department of Energy and Environmental Protection
CO2	carbon dioxide
COD	Commercial Delivery Data
COP	Construction and Operations Plan
Council	Texas Hydrogen Production Policy Council
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DPS	Distinct Population Segment
EA	Environmental Assessment
ERCOT	Electric Reliability Council of Texas
ESA	Endangered Species Act
°F	degrees Fahrenheit
GOM	Gulf of Mexico
EA	Environmental Assessment
FWS	U.S. Fish and Wildlife Service
GW	gigawatt
H2	hydrogen
Hecate/Hecate Energy	Hecate Energy Gulf Wind LLC
km	kilometer
LCE	Loop Current eddies
mi	mile
MMPA	Marine Mammal Protection Act
MW	megawatt
MWac	megawatt alternating current
MWh	megawatt hour
Navy	U.S. Department of the Navy
NCAR	National Center for Atmospheric Research
NEPA	National Environmental Policy Act

nm	nautical mile
NMFS	National Marine Fisheries Service
NO2	nitrogen dioxide
NORAD	North American Aerospace Defense Command's
NYSERDA	New York State Energy Research and Development Authority
OCS	Outer Continental Shelf
POI	point of interconnection
PPA	power purchase agreements
PPP	public private partnership
PV	photovoltaic
RAM	Radar Adverse Impact Management
RFI	Request for Interest
ROTHR	Relocatable Over the Horizon Radar
RRC	Railroad Commission
SDIC	State Development and Investment Corporation
SERL	SeaEnergy Renewables Limited
TPWD	Texas Parks and Wildlife Department
U.S.	United States
USCG	U.S. Coast Guard
WEA	Wind Energy Area
WTG	wind turbine generator

1.0 INTRODUCTION

Hecate Energy Gulf Wind LLC (Hecate/Hecate Energy) has prepared this unsolicited lease application to acquire Wind Energy Areas (WEAs) C and D, identified by the Bureau of Ocean Energy Management (BOEM) after extensive study and robust public review. The development of the proposed Gulf Wind Offshore Wind Project 2 “Gulf Wind 2” offshore wind project at WEAs C & D is critical to United States (U.S.) climate and economic development policies and has the potential to generate renewable energy at a scale that will significantly reduce the carbon footprint of electric power in the Gulf Region, while making clean energy available to the burgeoning Wind to X industry in the Gulf of Mexico (GOM). Hecate’s proposed offshore wind project would send a market signal to attract supply chain investments to the region and create tens of thousands of good-paying, union jobs in the offshore wind sector.

WEAs C & D were evaluated as options for development in May 2022, but were not recommended for auction due to their area being less than 90,000 acres each, which was presumed to be too small an area for an economic project. Hecate believes that these sites, developed in tandem, would provide adequate area for a commercial project.

Hecate is in a unique position, as a successful onshore renewable energy developer in Texas, to understand power offtake in the region. Hecate’s experience in Texas provides a level of confidence regarding offtake that may not be shared by other offshore wind developers.

The U.S. offshore wind industry could use a positive headline. The results of the August 29, 2023 GOM 1 renewable energy lease sale generated news stories suggesting that offshore wind in the GOM may be an unattractive business proposition. Along with headlines regarding rising supply chain costs, inadequate offtake agreement prices, and project cancellations from the East Coast and around the world, the results of the GOM 1 lease sale have contributed to a narrative that offshore wind is a struggling industry.

By proceeding with Hecate’s unsolicited lease application, BOEM will send a strong message countering that narrative. Hecate’s application will help to generate momentum, which could positively affect the outcome of the GOM 2 lease sale. The success of GOM 2 is crucial to creating the economies of scale needed to build out the supply chain in the GOM.

Finally, because offshore wind leasing is tied to offshore oil and gas leasing, creating exigency around the timing of GOM renewable energy leasing, by quickly initiating the review of Hecate’s application, BOEM reduces schedule risk for successful offshore wind development in the GOM.

2.0 OBJECTIVES

2.1 Federal Policy

First and foremost, the proposed Gulf Wind 2 project supports federal climate and economic development policy.

Offshore wind development in the GOM is critical to the U.S. climate and economic development policy. In 2021, the U.S. government established a target of employing tens of thousands of workers to deploy 30 gigawatts (30,000 megawatts) of offshore wind by 2030. Meeting this target will trigger more than $12 billion per year in capital investment in projects on U.S. coasts, create tens of thousands of good-paying, union jobs, with more than 44,000 workers employed in offshore wind by 2030 and nearly 33,000 additional jobs in communities supported by offshore wind activity. It will also generate enough power to meet the demand of more than 10 million American homes for a year and avoid 78 million metric tons of carbon dioxide (CO2) emissions. Achieving this target also will unlock a pathway to 110 GW by 2050, generating 77,000 offshore wind jobs and more than 57,000 additional jobs in communities supported by offshore wind activity – all while creating further economic opportunity and ensuring future generations have access to clean air and abundant renewable power (The White House 2021).

2.2 Generate Renewable Power and Clean Energy Resources

The proposed Gulf Wind 2 project would generate up to 2 GW of renewable energy, which could be injected into the power grid, sold in power purchase agreements to private offtakers, or used for Wind to X.

Hecate has had significant success in the Electric Reliability Council of Texas (ERCOT) securing offtake agreements for its solar portfolio over the past 5 years. Totaling well over 2,000 megawatts (MW), the commercial contracts are a reflection of Hecate's market knowledge and development experience. As a reflection of our commercial focus, Hecate is in negotiations to secure site control agreements for land next to three target substations where the offshore wind interconnect will occur. Hecate has entered the interconnection queue in Texas, specifically at the PH Robinson, 42500 Dow and Naismith substation. Hecate filed into the queue in June 2023 and are currently completing the screening studies.

Further, WEAs C and D also lend themselves to power offtake in Louisiana. Louisiana has announced a 5-GW offshore wind goal by 2035.

The GOM is ideal for offshore wind co-generation technologies, also known as Wind-to-X technologies, which use offshore wind energy to produce another energy solution, such as hydrogen co-generation, in support of widespread electrification and a net-zero economy. Offshore wind energy can be a key enabler of this transition because it can be deployed at utility scale, mitigates the land-use requirements of other generation sources, and can be coupled (on land or offshore) with other clean energy technologies (U.S. Department of Energy [DOE] 2023a). Both Texas and Louisiana are active in developing green hydrogen at scale.

Texas is already a leader in the hydrogen industry, producing approximately one third of U.S. total hydrogen (H2) gas annually. Texas has 48 H2 production plants and more than 900 miles of H2 pipelines, as well as a geologically unique, significant salt cavern storage located between Galveston and Texas City (DOE 2023b). Last year, Texas celebrated the construction of the largest green hydrogen facility in the U.S., Air Products and The AES Corporation's (AES) new $4 billion green hydrogen facility in Wilbarger County, TX (State of Texas 2022. Earlier this year,

the DOE announced HyVelocity, Inc.'s Gulf Coast Hydrogen Hub was chosen for one of seven Regional Clean Hydrogen Hubs, with a federal cost share of up to $1.2 billion.

Louisiana is using public-private partnerships (PPPs) to develop a green hydrogen industry. Significant PPPs have been announced recently. For example, in 2022, the U.S. Economic Development Administration awarded a $50 million federal grant to H2theFuture, a 25-organization partnership that plans to develop a new offshore wind-powered hydrogen energy industry cluster in south Louisiana. The federal grant will be supplemented by $24.5 million in matching funds from the State of Louisiana, bringing the total project size to $74.5 million (State of Louisianna 2022a). Another example is Monarch Energy's announcement earlier this year of plans to build a $426 million green hydrogen plant in Louisiana, backed with state government grants, to produce green H2 feedstock for local chemical and industrial processes (Hydrogen Insight 2023).

2.3 Climate Action

The proposed Gulf Wind 2 project would contribute significantly to the decarbonization of the energy mix in the GOM, which is particularly vulnerable to climate change.

The decade 2010 – 2020 was deemed the hottest decade globally since record keeping began in the 1880s (BOEM 2023a). Higher average global temperatures are driven by increased concentrations of greenhouse gases, such as CO2, methane (CH4), and nitrogen dioxide (NO2) within the atmosphere, which trap heat from the sun that would otherwise be released into space (BOEM 2023a). In 2016, BOEM conducted a comprehensive analysis of the emissions released during operations of offshore oil and gas leasing. These activities contribute to the total greenhouse gas emissions in the continental U.S., in which the average temperature has increased by 0.5 degrees Fahrenheit (°F) since 1895, with most of this increase occurring since 1970 (BOEM 2023a). The oceans absorb this additional heat energy, causing an increased average ocean temperature as well, which leads to higher snow/ice sheet melt rates, rising sea levels, more frequent and powerful storms, and irreparable damage to economically valuable ecosystems and habitats (BOEM 2023a).

The GOM is at risk for greater impacts of climate change due to its low-lying elevation and hurricane history. The region is well known for its oil/gas production, seafood industry and low-lying metropolitan areas. Increased and more frequent flooding and erosion due to sea level rise and storms will damage coastal infrastructure and habitats which costs millions of dollars to repair (BOEM 2023a). The impact on sensitive coastal wetland habitats and fishery areas will be felt globally due to food security fluctuations caused by disruption of availability, decreased production, and increasing in prices (BOEM 2023a). The United Nations Climate Change Annual Report 2022 rated the GOM as particularly vulnerable in the "atlas of human suffering," citing increased major hurricane activity, devastating storm surges, rising sea levels, economic hardship, un-insurability, collapsing fisheries, beaching corals, and toxic tides (United Nations Climate Change 2022).

3.0 AREA SELECTED FOR LEASE

Hecate formally submits its interest in an area of interest (AOI) as summarized in Table 1 and depicted in Figure 1a. WEAs C & D are 222.7 square miles (mi^2; 576.9 square kilometers [km^2]). Table 2 summarizes and Figure 1b depicts the area of interest overlaid on BOEM block numbers.

Table 1. Area Selected for Lease

Area of Interest	Square Miles (mi^2)	Square Kilometers (km^2)
WEA C	116.0	300.4
WEA D	106.7	276.5

Table 2. Lease Area Protractions

Protraction	Block Number Designation	Quantity of Blocks
WEA C		
NG14-03 (Corpus Christi)	6039 – 6042, 6090 – 6092	7
NH14-12 (Beeville)	7088 – 7090, 7138 – 71421	7
WEA D		
NH15-10 (Bay City)	6853 – 6855, 6902 – 6905, 6952 – 6954, 7003, 7004	12

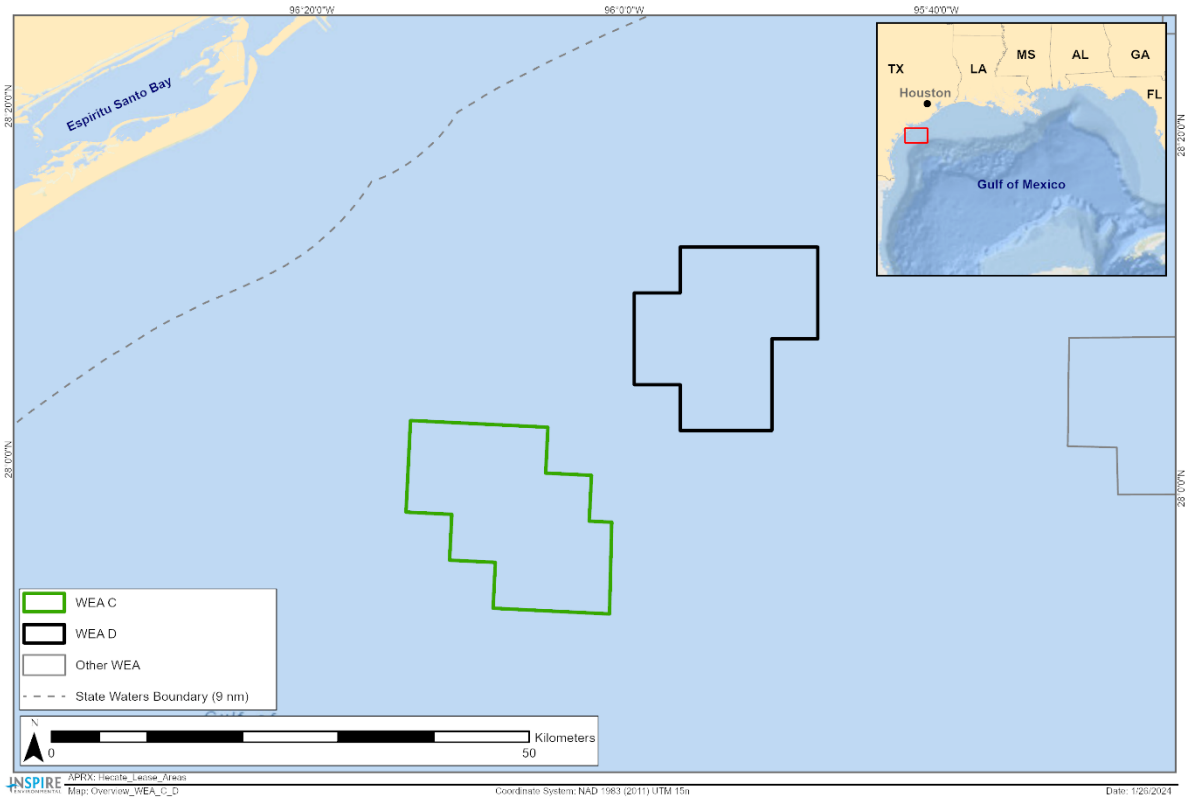

Figure 1a. Area Selected for Lease

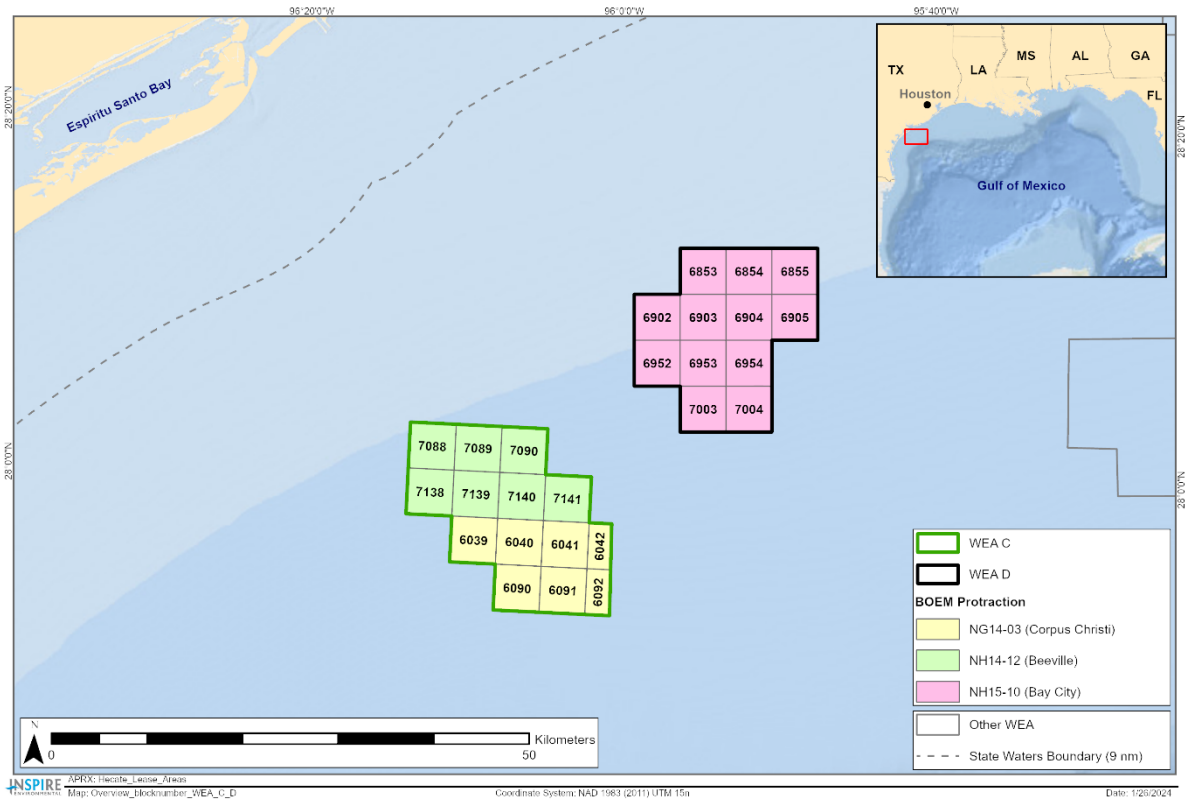

Figure 1b. Lease Area Protractions

4.0 FACILITIES

The proposed Gulf Wind 2 project would consist of up to 133 fixed-bottom WTGs, each with a capacity of 15-23 MW, resulting in an overall maximum capacity of approximately 2000 MW. Each turbine would be deployed on fixed monopile or jacket foundation types. Turbines would be connected by interconnection cables, which would be connected to an onshore transition point by an export transmission cable. Export cables may run separately from each of the two lease areas or the lease areas may be joined offshore with one substation and one central export cable.

4.1 Turbines

The WTGs under consideration include the Vestas V236-15.0 MW prototype or similar turbine. Specifications for these turbine models are summarized in Table 3.

Table 3. Wind Turbine Specifications

Specification	Measurement
Height	280 meters (m)
Rotor Diameter	236 m
Blade Length	115.5 m
Swept Area	43,732 m^2
Rated Power	15,000 Kilowatts

Cut-in Speed	3 meters per second
Cut-out Speed	30 meters per second

The selected foundation type will consider the hurricane risk in the Gulf of Mexico. Advancements are being made to address WTG risks to extreme winds and Hecate will continue to review and support that research. In the next few years, it is anticipated that turbines and foundations will be developed that can sustain hurricane force winds and those will be evaluated by project engineers to determine whether they can meet the purpose and need of the project.

4.2 Transmission

Hecate has performed an extensive transmission analysis of over 11 different points of interconnection (POI) in Texas and Louisiana. These 11 POI were reduced to three POI.

The three POI include the PH Robinson, 42500 Dow and Naismith substation. In addition, Hecate continues to examine 12 potential landfall locations with multiple paths to these three designated substations. These landfalls will continue to be evaluated based on offshore route and selected POI.

4.3 General Schedule

Hecate envisions a preliminary indicative schedule of proposed activities, assuming BOEM determines that there is no competitive interest, leading up and through the commercial operations of offshore wind energy facilities within the requested lease area (Table 4).

Table 4. Preliminary Schedule

Proposed Activities	Preliminary Schedule
Application Submission and Bureau of Ocean Energy Management and Determination of No Competitive Interest	2 months
Bureau of Ocean Energy Management Federal/State Agency Coordination; Zone Management Act (CZMA) Consistency Certification (15 Code of Federal Regulations part 930 subpart D)	<6 Months as this is substantially already complete through the WEA Selection Process
Bureau of Ocean Energy Management Issues Non-Competitive Lease	At completion of consultations (4 to 6 months)
Site Assessment Plan (SAP)	1 Year
Construction and Operations Plan (COP)/EIS/ROD	3 to 5 Years
Construction	2 Years
Operation	33 Years
Decommissioning	2 to 3 Years

5.0 RENEWABLE RESOURCES AND ENVIRONMENTAL CONDITIONS

To complete this section of the lease application, Hecate is relying on the extensive desktop environmental review documentation and interested party outreach BOEM conducted for the GOM Lease Sale 1. This documentation is incorporated by reference. The following figures illustrate some of the complex geospatial analysis that was performed to initially identify WEA C (Figure 2) and WEA D (Figure 3) as suitable for offshore wind development.

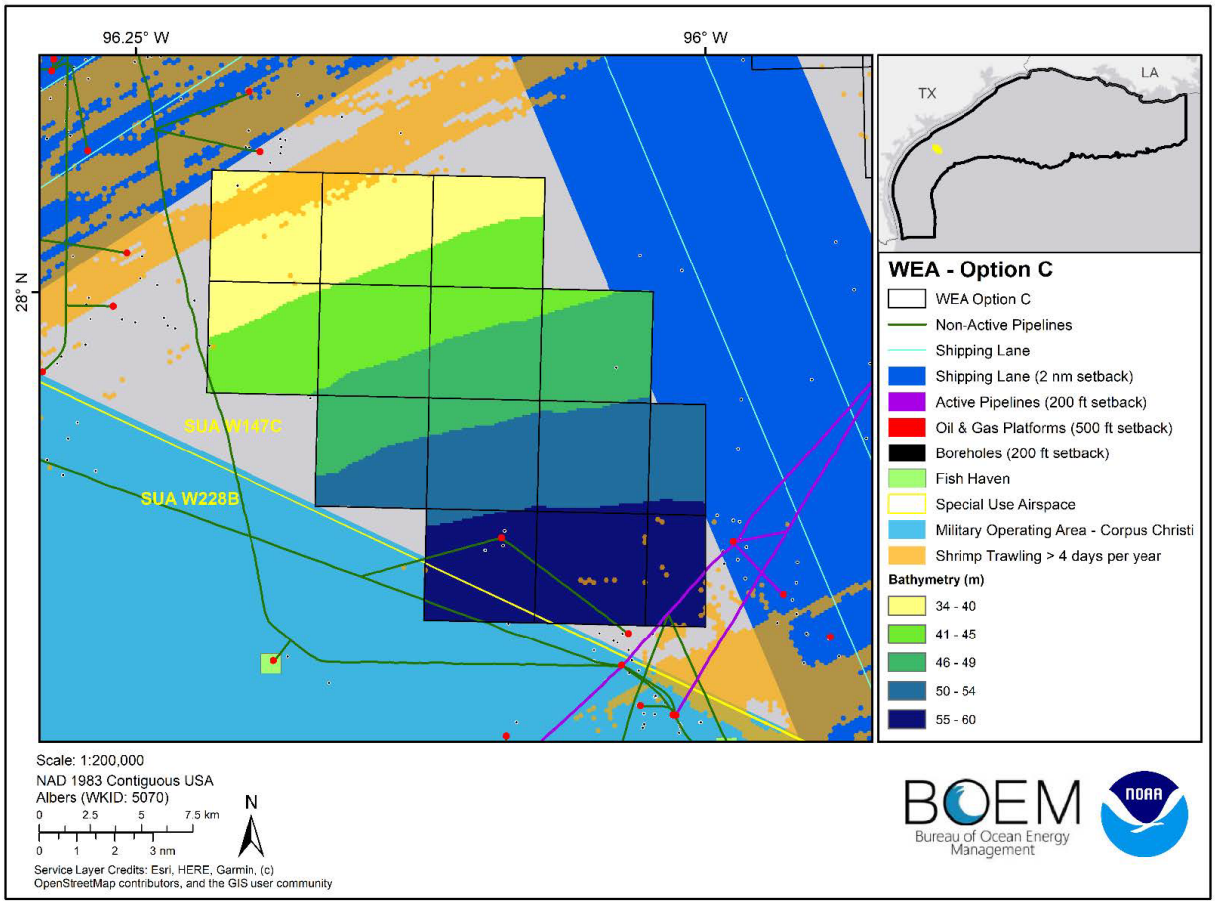

Figure 2. Map depicting noteworthy characterization features for WEA C (BOEM 2022a)

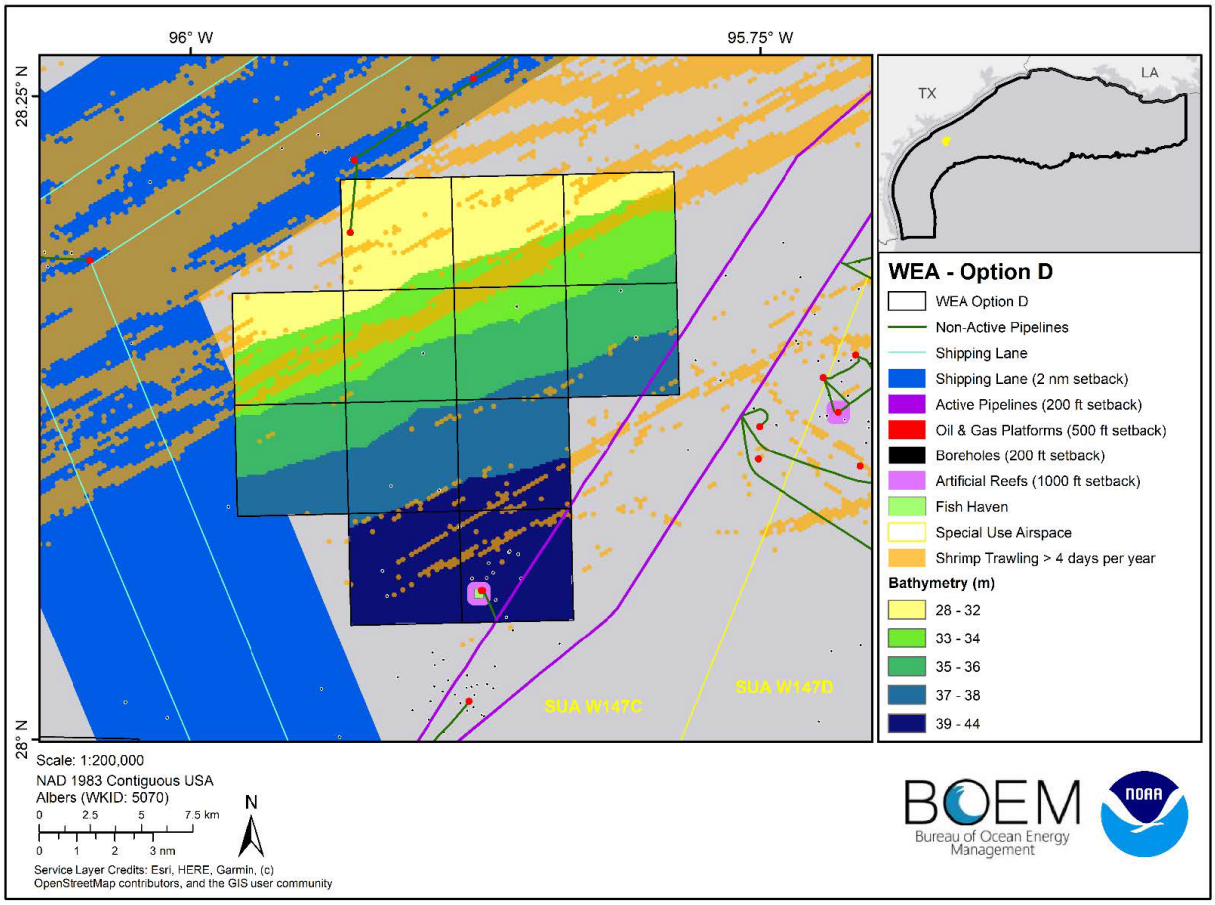

Figure 3. Map depicting noteworthy characterization features for WEA D (BOEM 2022a)

The site selection and environmental review process for the GOM began in 2021 with BOEM's publication of a Request for Interest (RFI) in the Federal Register on June 11, 2021, to assess interest in potential offshore wind development in the outer continental shelf (OCS). On Nov. 1, 2021, BOEM published a Call for Information and Nominations (Call) to further assess commercial interest in, and invite public comment on, possible commercial wind energy leasing in a proposed area within the RFI area.

On Jan. 11, 2022, BOEM announced that it prepared a draft Environmental Assessment (EA) considering potential offshore wind leasing in federal waters of GOM, which included the entire Call Area. The draft EA considered potential environmental consequences of site characterization activities and site assessment activities associated with the possibility of issuing wind energy leases in the Western and Central GOM. It relied heavily on the Biological Environmental Background Report for the GOM OCS Region, February 2021 (BOEM 2021).

Hecate understands that if its application for WEA C and D is approved and a lease is issued, that site investigation and characterization activities will be required, as well as the preparation

of a detailed Construction and Operations Plan (COP), which will be subject to additional National Environmental Policy Act (NEPA) review.

5.1 Wind Resource

In 2020, BOEM published a study, conducted by the National Renewable Energy Laboratory, which provided a feasibility assessment for offshore renewable energy technologies (Musial et al. 2020). The study demonstrated that GOM has sufficient gross offshore wind capacity potential to explore offshore wind power development (Musial et al. 2020). The results of the study are depicted in Figure 4 below.

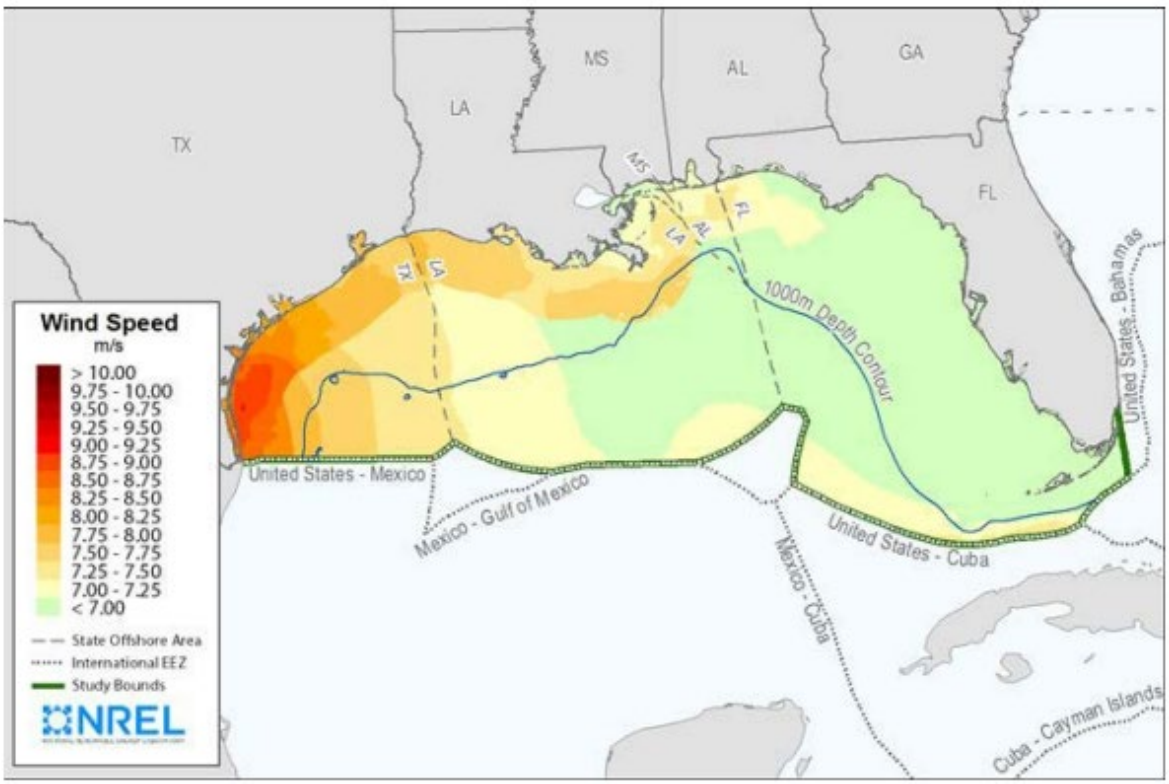

Figure 4. Average Annual Wind Speeds at a Hub Height of 100 m (328 ft) in the GOM for the Gross Resource Area

5.2 Physical Oceanography and Meteorology

The following information is excerpted and/or summarized from the Final EA, Appendix C: Regional Setting and Programmatic Concerns (BOEM 2023a).

The GOM is a semi-enclosed, subtropical sea with an area of approximately 1.5 million km^2 (371 million acres). The main physiographic regions of the Gulf Basin are the continental shelf, continental slopes and associated canyons, abyssal plains, the Yucatan Channel, and Florida Straits. The continental shelf width along the U.S. coastline is about 10 mi (16 km) off the Mississippi River and 97 mi (156 km) off Galveston, Texas, decreasing to 55 mi (88 km) off Port Isabel near the Mexican border. The depth of the central abyss ranges to approximately 12,139 ft (3,700 m).

The GOM is influenced by a maritime subtropical climate controlled mainly by the clockwise circulation around the semi-permanent area of high barometric pressure commonly known as the Bermuda High. The GOM is located to the southwest of this center of circulation. This proximity to the high-pressure system results in a predominantly southeasterly wind flow in the GOM region. Two important classes of storms occasionally occur with this circulation pattern. During the winter months, cold fronts associated with cold air masses from land influence the northern coast of the GOM. Behind the fronts, strong north winds bring drier air into the region. Secondly, hurricanes may develop in or migrate into the GOM during the warmer months.

Air temperature ranges from highs in the summer of 76.5-82.4°F to lows in the winter of 35.8-71.1°F. Air temperatures over the open GOM exhibit narrower limits of variations on a daily and seasonal basis due to the moderating effect of the large bodies of water. The average temperature over the center of the GOM is about 84°F in the summer and between 63 and 73°F in the winter.

5.2.1 Storms

Tropical cyclones (especially hurricanes) affecting the GOM originate over the equatorial portions of the Atlantic Ocean, Caribbean Sea, and GOM. Tropical cyclones occur most frequently between June and November. Based on 50 years of data, there are about 10.2 storms per year with about 5.9 of those becoming hurricanes in the Atlantic Ocean. Data from 1950 to 2000 show that 81 percent of these storms could affect the GOM.

A reduced translation speed over GOM waters leads to longer residence times in this basin. There is a high probability that tropical storms will cause damage to physical, economic, biological, and social systems in the GOM. Tropical storms also affect OCS operations and activities; platform design needs to consider the storm surge, waves, and currents generated by tropical storms. Most of the damage is caused by storm surge, waves, and high winds. Storm surge depends on local factors, such as bottom topography and coastline configuration, and storm intensity. Water depth and storm intensity control wave height during hurricane conditions.

There were 22 major hurricanes (Category 3 or higher at landfall) that impacted the Gulf Coast from 2000 through 2021. Hurricanes Katrina (2005) and Rita (2005) are historic major hurricanes, while more recent major storms include Hurricanes Harvey (2017), Irma (2017), Michael (2018), Laura (2020), Zeta (2020), and Ida (2021). The strength and duration of storms appears to be increasing in recent years. There is concern that the effects of climate change may exacerbate the frequency and intensity of hurricanes. Additionally, the average intensity of tropical cyclones, the proportion of Category 4 and 5 tropical cyclones, and the associated average precipitation rates are projected to increase for a 2 degrees Celsius (°C) global temperature rise above any baseline period (Collins 2019).

The National Center for Atmospheric Research (NCAR) conducted a modeling study of the impacts of climate change on GOM hurricane intensity and frequency (Bruyere et al. 2017). That study found a tendency towards fewer hurricanes in the GOM and a slight reduction in the proportion of Atlantic hurricanes entering the GOM; an increased proportion of Category 3, 4,

and 5 storms; increased precipitation for all cyclones; similar size and track speed of future hurricanes compared to current ones; and about a 10 percent increase in cyclone damage potential for the most intense hurricanes.

5.3 Currents

The following information is excerpted and/or summarized from the Final EA, Appendix C: Regional Setting and Programmatic Concerns (BOEM 2023a).

The Loop Current is the principal current and source of energy for the circulation in the GOM. Closed rings of clockwise-rotating (anticyclonic) water, called Loop Current eddies (LCEs), separate from the Loop Current at intervals of 5 to 19 months. Warm-core eddies can have life spans of 1 year or more. Therefore, their effects can persist at one location for weeks or months. Such currents would be of concern to offshore operators because they could induce structural fatigue of materials. The GOM is typically populated with numerous eddies, which are interacting with one another and with the margins (Hamilton and Lee 2005; Science Applications International Corporation 1989).

Generally, deepwater GOM currents have been observed to decrease in current speed with depth. The major large-scale permanent circulation feature present in the western and central GOM is an anticyclonic (clockwise-rotating) feature oriented about east-northeast to west-southwest.

5.4 Geology and Bathymetry

The following information is excerpted and/or summarized from the Final EA, Appendix C: Regional Setting and Programmatic Concerns (BOEM 2023a).

The GOM OCS region is comprised of a semi-enclosed marginal sea, which is fed by the Atlantic Ocean. Formed during the breakup of Pangaea in the Mesozoic Era, this area contains abundant deposits of salt, limestone, and sandstone. Along the Gulf Coast, the Mississippi River deposits an enormous fan of sediment, extending about 373 mi (600 km). Naturally occurring hydrocarbon resources (liquid, gaseous, or solid compounds of predominantly hydrogen and carbon that exist in the subsurface as crude oil and natural gas) are plentiful. More information on the assessment of offshore oil and gas resources can be found in the 2016a National Assessment of Undiscovered Oil and Gas Resources of the U.S. Outer Continental Shelf (BOEM 2017).

The present-day GOM is a small ocean basin with a water-surface area of more than 371 million acres (1.5 million km^2). The greatest water depth is approximately 12,000 feet (ft; 3,700 m). It is almost completely surrounded by land, opening to the Atlantic Ocean through the Straits of Florida and to the Caribbean Sea through the Yucatan Channel. In the GOM, the continental shelf extends seaward from the shoreline to about the 656-ft (200-m) water depth and is characterized by a gentle slope of a few meters per kilometer (less than 1 degree). The shelf is wide off Florida and Texas, but it is narrower where the Mississippi River delta has extended seawards to near the shelf edge. The topography of the slope is irregular and characterized by canyons, troughs, and salt structures.

5.5 Benthic Communities

The following information is excerpted and/or summarized from the Final EA, Section 4.4.3 Benthic Communities and Habitats (BOEM 2023a). The analysis in the EA focused on the hard bottom communities in the GOM (BOEM 2021). The EA concluded that if protections are put into place to move bottom-disturbing activities away from hard bottom habitats, the impacts from site characterization and site assessment activities would be negligible for either a single OCS wind energy lease issuance or for the issuance of up to 18 OCS wind energy leases.

Documented benthic ecosystems in the GOM include muddy soft bottom; oyster reefs; coral and sponge dominant banks; hydrocarbon seeps along the continental margin; and marine canyons, escarpments, and seamounts on the abyssal plain (Briones 2004). Connectivity with areas adjacent to and within the GOM depends on pelagic larval transport by surface currents. Most GOM hard bottom benthic communities are diverse and characterized by high species richness and low abundance, while soft-bottom communities are characterized by low species richness and high abundance. Suspension feeders are generally most abundant in high-energy environments, and deposit feeders are most abundant in low-energy environments in areas with fine-grained, muddy sediments (Snelgrove 1999).

The primary locations of the roughly 100 species of shallow-water zooxanthellate corals in the GOM are the East and West Flower Garden Banks, Florida Middle Grounds, Pulley Ridge, and the Dry Tortugas. Seven of these coral species (i.e., elkhorn coral, staghorn coral, Caribbean boulder star coral, lobed star coral, mountainous star coral, pillar coral, and rough cactus coral) are currently listed as threatened under the Endangered Species Act (ESA). As none of these areas are within or closely proximate to WEAs C and D, the proposed wind energy development would have no effect on any ESA-listed coral species. Deep-sea corals and sponges can also be found outside of the previously mentioned areas, occurring in suitable habitat at depths exceeding 300 m in the GOM region (Clark et al. 2018). Although historical occurrence records of corals exist outside WEAs C and D, the overlap of recent habitat suitability models and established Essential Fish Habitat boundaries with buffer zones around WEA C suggest the likelihood of coral occurring in this area is not zero. Regular or chronic anthropogenic activities impact and influence the formation, composition, and persistence of benthic habitats and communities. The physical disturbance of the seafloor may result in the destruction of sessile benthic organisms and hard bottom and/or chemosynthetic habitat and soft sediment turbation. Impacts that cause bottom disturbance may be temporary (e.g., anchoring) or more persistent within the environment (e.g., platform or pipeline installation). Potential effects from bottom disturbance may include crushing of hard substrates and structure-forming organisms including corals and sponges, burial of organisms, and scarring of the seafloor. Impacts that cause bottom disturbance may be temporary (e.g., anchoring) or more persistent within the environment (e.g., platform or pipeline installation). Potential effects from bottom disturbance may include crushing of hard substrates and structure-forming organisms including corals and sponges, burial of organisms, and scarring of the seafloor.

It is generally assumed that benthic communities associated with unconsolidated soft sediments will recover more quickly than those associated with hard bottom habitat (Dernie et al. 2003).

Anthropogenic bottom disturbance is often sufficient to cause loss of species diversity within benthic communities, particularly in the deep sea (summarized in Jones et al. 2006).

Potentially sensitive hard bottom benthic features and communities not subject to topographic features stipulations could potentially be impacted by site characterization and site assessment activities. Adverse impacts on benthic communities and habitats are expected to be negligible to minor because while hard bottom benthic habitat could potentially experience measurable impacts, they are expected to be localized and temporary. Protective measures will be applied during site characterization and assessment activities, which would distance bottom-disturbing activities from sensitive benthic habitat. For instance, to prevent adverse impacts to sensitive habitat and biota from site characterization and assessment activities, a conservative benthic survey approach will be applied that uses desktop information and preliminary geophysical data to proactively identify potential areas with sensitive habitat and biota. These features of interest can then be verified using noninvasive survey techniques (e.g., remotely operated vehicles) to determine the efficacy of collecting baseline benthic data using more traditional (and disruptive) sampling techniques.

5.6 Marine Mammals

The following information is excerpted and/or summarized from the Final EA, Section 4.4.5 Marine Mammals, which covers the entire GOM Call Area (BOEM 2023a). The EA concludes that if protections are put into place, the impacts from site characterization and site assessment activities would be negligible to minor for a single OCS wind energy lease issuance, because of the application of the protective measures; the scope, timing, and short-term nature of the proposed activities; and the wide range of marine mammal movements and distribution in the GOM. Without the application of protective measures, the incremental contribution of impacts from site characterization and site assessment activities expected to take place on marine mammals would be moderate because the potential for impacts from noise and vessel strikes (including entanglement) may not be minimized or eliminated.

The U.S. GOM marine mammal community is diverse and distributed throughout the northern GOM waters. The GOM's marine mammals include members of the taxonomic order Cetacea, including suborders Mysticeti (i.e., baleen whales) and Odontoceti (i.e., toothed whales), as well as the order Sirenia (i.e., manatee). Twenty-one species of cetaceans and one species of Sirenia regularly occur in the GOM and are identified in the National Marine Fisheries Service (NMFS) Stock Assessment Reports (Hayes et al. 2018; 2019; 2021; 2022). Habitat-based cetacean density models are found in Roberts et al. (2016). Two cetacean species, the sperm whale and the GOM Rice’s whale, regularly occur in the GOM and are listed as endangered under the ESA. The Rice’s whale has been observed within the Call Area at depths ranging from 328 ft to 1,312 ft (100 m to 400 m), a region for which critical habitat has been proposed (88 FR 47462, 7/24/2023). The West Indian manatee is listed as threatened under the ESA and has designated critical habitat in northeastern Florida (41 FR 41914). Further, 19 of the 20 toothed cetaceans (including beaked whales and dolphins) that regularly occur in the GOM are not ESA-listed. However, the Marine Mammal Protection Act protects all marine mammals, ESA-listed or not. NMFS is charged with protecting all cetaceans, while manatees are under the

jurisdiction of U.S. Fish and Wildlife Service (FWS). For more detail, refer to Chapter 3.7 of the Biological Environmental Background Report for the GOM OCS Region (BOEM 2021) and the 2020 NMFS BiOp (as amended) (NMFS 2020) and 2021 Amended Incidental Take Statement (NMFS 2021).

The primary concerns with potential adverse impacts to marine mammals are noise and vessel strikes.

Marine mammals in the GOM planning areas are exposed to several sources of anthropogenic noise, including OCS oil- and gas-related activities, maritime activities, dredging, construction, mineral exploration in offshore areas, geophysical (seismic) surveys, sonars, and ocean research activities. Further, these anthropogenic noises are generated by commercial and recreational vessels, aircraft, commercial sonar, military activities, seismic surveys, in-water construction activities, and other human activities. Noise impacts could be realized in association with seismic airgun surveys and certain military activities (i.e., sonars and explosives). These impacts are expected to be spatially localized and short-term in duration. The biological significance of behavioral responses to underwater noise and the population consequences of those responses are not fully understood (National Research Council 2005; Southall et al. 2007; 2019). Mounting evidence indicates that noise in the marine environment could interfere with communication in marine mammals, a phenomenon called acoustic masking (Clark et al. 2009; Erbe et al. 2016). In addition to masking, elevated ocean noise levels can increase stress in marine mammals (Wright et al. 2007), which in turn can lower reproductive output and increase susceptibility to disease (Kight and Swaddle 2011).

Sound exposure thresholds are useful to estimate when adverse reactions may occur in some measurable way that has potential significance to an animal. Sound exposure levels above certain thresholds, therefore, would have the greatest potential to disturb or cause injury (Ruppel et al. 2022).

Vessel strikes have been implicated in injuries and fatalities for several large whale species (Constantine et al. 2015; Laist et al. 2001). Deep-diving whales (e.g., sperm whales) may be more vulnerable to vessel strikes given the longer surface period required to recover from extended deep dives (Laist et al. 2001). Rice’s whales spend 90 percent of their time within 39 ft (12 m) of the ocean’s surface (Constantine et al. 2015), which could make them vulnerable to collisions with large ships. Based on vessel and aerial survey sightings, the primary core habitat of Rice’s whale (not legally protected under the ESA and Marine Mammal Protection Act (MMPA) is in the northeastern GOM, centered in De Soto Canyon in water depths between approximately 328 and 1,312 ft (100 and 400 m) (Rosel et al. 2021; Soldevilla et al. 2022). The core area has been changing over the years as baseline information becomes available (Rosel and Garrison 2022). Because of the highly endangered status of Rice’s whale, critical habitat for Rice’s whale has been proposed that encompasses the entire GOM in water depths between 100 to 400 m (88 FR 47462, 7/24/2023). The vast majority of strikes result from recreational and fishing vessels.

5.7 Protected Species

The following information is excerpted and/or summarized from the Request for Concurrence on Preliminary Wind Energy Areas for the Gulf of Mexico Area Identification Process Pursuant to 30 C.F.R. § 585.211(b) (BOEM 2022a). This document covers the entire GOM Call Area, and provides specific information about WEAs C and D.

For this analysis, protected species considered include those listed under the ESA and/or protected under the MMPA. BOEM identified 23 vulnerable species (Atlantic spotted dolphin (coastal), Atlantic spotted dolphin (oceanic), Beaked whale, Bottlenose dolphin (coastal), Bottlenose dolphin (oceanic), Clymene dolphin, Blackfish (False killer, Pygmy killer, and Melon-headed whales), Giant manta ray, Green sea turtle, Gulf sturgeon, Hawksbill sea turtle, Kemp's ridley sea turtle, Kogia (Dwarf and Pygmy sperm whale), Leatherback sea turtle, Loggerhead sea turtle, Oceanic whitetip shark, Pantropical spotted dolphin, Pilot whale, Rice's whale, Smalltooth sawfish (U.S. DPS), Sperm whale, Spinner dolphin, and Striped dolphin). Scores were assigned to each species based on species' status, population size, and trajectory. Twenty three protected resource data layers were combined into a single layer, using the product method, which provides the highest weight to the lowest score. The combined data depicts increasing levels of concern for areas with multiple overlapping protected species data layers. See Figure 5 below.

The majority of WEAs C and D have a score of .03 to .08, indicating a relatively greater level of protected resource considerations. BOEM indicated that it will conduct a more detailed analysis during the consultation process to further reduce risk to marine mammals and other protected species for WEAs C and D. BOEM also determined that site-specific mitigations to impacts on marine protected species would be identified at later stages in the development process, such as through lease stipulations and terms and conditions of COP approval.

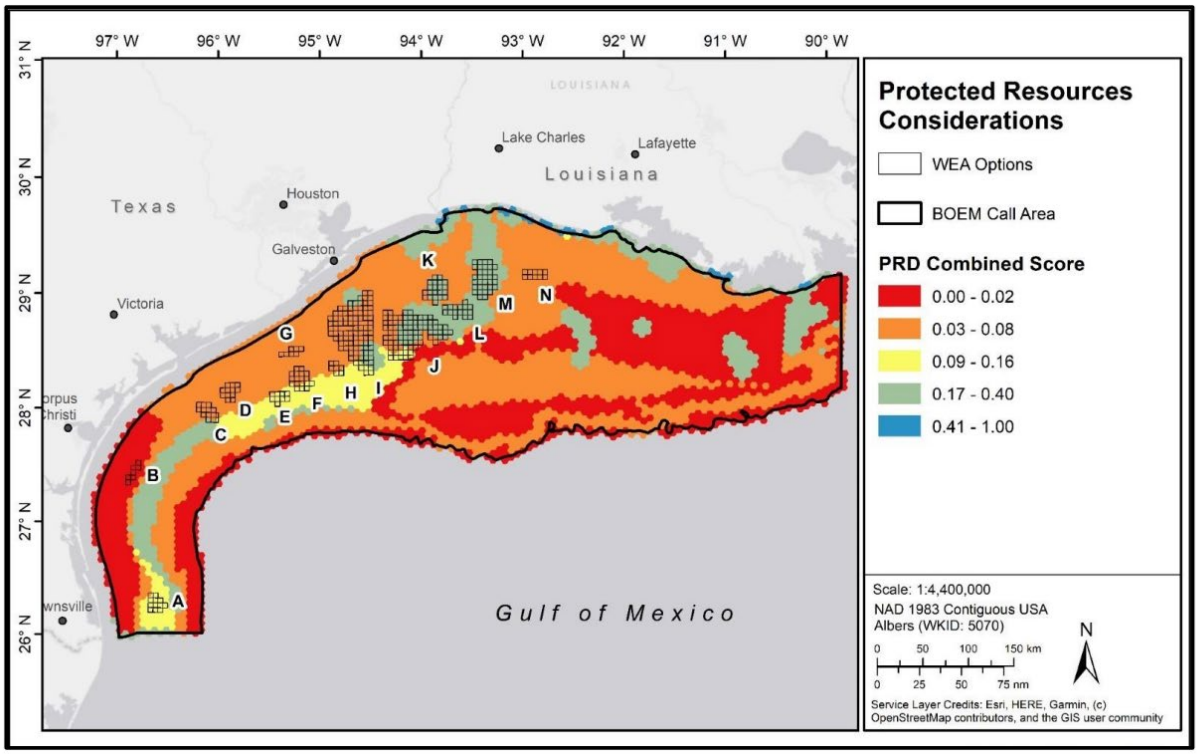

Figure 5. Protected resources considerations in relation to the WEA options

5.8 Sea Turtles

The following information is excerpted and/or summarized from the Final EA, Section 4.4.6 Sea Turtles (BOEM 2023a), which covers the entire GOM Call Area, and the BOEM Gulf of Mexico Area Identification Pursuant to 30 C.F.R. § 585.21 l(b) Memorandum (BOEM 2022b). The EA concluded that the incremental contribution of impacts from site characterization and site assessment activities expected on sea turtles, with the application of protective measures, would be negligible because the protective measures would reduce impacts from bottom disturbance, noise from acoustic sources, unintentional releases to the environment, and vessel strikes, and because of the small scope and temporary nature of the site assessment and site characterization activities.

Five ESA-listed sea turtles occur in the GOM, i.e., the loggerhead turtle, green turtle, hawksbill turtle, Kemp's ridley turtle, and leatherback turtle. The Northwest Atlantic DPS of loggerhead turtle and the North Atlantic DPS of green turtle are ESA-listed as threatened (81 FR 20058). Hawksbill turtles, Kemp's ridley turtles, leatherback turtles (proposed threatened as Northwest Atlantic DPS), and breeding populations of green sea turtles in Florida are ESA-listed as endangered. Floating Sargassum patches in the CPA and WPA are federally designated under the ESA as critical habitat for loggerhead turtles. The FWS and NMFS share jurisdiction for sea turtles. The FWS has responsibility for monitoring and managing sea turtles (i.e., nesting turtles, eggs, and hatchlings) on beaches, and NMFS has jurisdiction for sea turtles in the marine environment. The open waters of the GOM are used by the above five sea turtle species at different life phases. Juvenile sea turtles often are found in Sargassum mats floating on the

surface. Adult sea turtles are found throughout the GOM and feed near the surface, within the water column, and are associated with hard bottom communities, depending on the species of sea turtles and the type of prey being pursued. For more detail on the affected environment and below impact analysis, refer to Chapter 3.6 of the Biological Environmental Background Report for the Gulf of Mexico OCS Region (BOEM 2021) and the 2018 FWS Biological Opinion (FWS 2018; NMFS 2020), which are incorporated by reference here.

Bottom disturbance can impact sea turtles when coastal waters with benthic vegetation such as seagrass are destroyed or covered from turbidity generated by bottom disturbance. Many species of sea turtles feed over soft bottoms. Channel dredging or sand extraction may remove prey species with sediment removal locally impacting sea turtle prey abundance and/or distribution on a temporary basis (Conant et al. 2009).

Sea turtles could be vulnerable to a wide range of noises generated from a variety of activities or equipment that are used in GOM waters. Sea turtle hearing is not well understood, but it is generally accepted that sea turtles can detect sounds between 100 hertz and 2 kilohertz (BOEM 2021). Sea turtle responses to low-frequency sounds are expected to include behavior responses, acoustic masking, temporary hearing loss, permanent hearing loss, and mortality (Baker and Howson 2021).

Oil spills may be harmful to sea turtles through direct contact with oil and habitat or prey oiling. Sea turtles exposed to oil or tar balls had compromised respiration, affected skin, and affected blood chemistry and salt gland function (Vargo et al. 1986). Exposure and ingestion of oil can cause changes in respiration, can induce immune responses, and appear to impact biological regulatory systems, all which can negatively impact sea turtles' health (Vargo et al. 1986). Sea turtle exposure to oil can occur on beaches, in marshes, in seagrass habitats, in open waters of the GOM, and in floating Sargassum mats. The level of the impact will depend on the amount and duration of the exposure. The level of effects of oil spills would be event specific and greater impacts would occur if the releases happened near critical habitats during periods of sea turtle use.

Marine trash and debris affect marine habitats worldwide. A comprehensive review of marine debris by Gall and Thompson (2015) reported that sea turtles were among the most common species with documented occurrences of entanglement and ingestion of marine trash and debris.

Vessel strikes are an ongoing threat to sea turtles. Collisions with commercial and recreational vessels causing sea turtle mortalities are documented in the GOM (Foley et al. 2019; Lutcavage et al. 1997).

Entanglement is another serious threat to sea turtles (Balazs 1984). Discarded or intact fishing gear, ropes, trawl nets, plastic objects, cloth and parachute anchors are all types of debris that have been documented as sources of sea turtle entanglement (Balazs 1984). The scale of activities associated with the baseline are numerous and occur on an ongoing basis, even with

protective measures associated with some specific industries and, therefore, vessel strike and entanglement are expected to continue.

Additional impact producing factors that are not detailed above but contribute to baseline environmental impacts to sea turtles include coastal development, chronic pollution, and climate change. Coastal development, which can impact nesting beaches, cause light pollution, increase human disturbance, or disrupt sediment transport, is ongoing on the Gulf Coast and is expected to result in long-term impacts on sea turtles. Numerous discharges and wastes enter the waters of the GOM, resulting in chronic pollution. Chronic pollution can impact sea turtle health by stressing sea turtles' immune and endocrine systems or through food web interactions. Climate change can also impact sea turtles negatively due to sea-level rise that can increase inundation of nesting beaches and other sea turtle habitats or increase water temperatures, which may shift prey composition. For additional details on impacts of coast land disturbance, lighting, and climate change to sea turtles, refer to Chapters 4.6.4, 4.6.7, 3.6.6.2, and 3.6.6.5 of the Biological Environmental Background Report for the Gulf of Mexico OCS Region (BOEM 2021).

5.9 Fish and Fisheries

The following information is excerpted and/or summarized from the Final EA, Section 4.4.4 Fish and Invertebrates (BOEM 2023a), which covers the entire GOM Call Area and the Request for Concurrence on Preliminary Wind Energy Areas for the Gulf of Mexico Area Identification Process Pursuant to 30 C.F.R. § 585.211(b) Memorandum (BOEM 2022a). The EA determined that site characterization and site assessment activities were not likely to cause effects or to cause only negligible effects to commercial and recreational fisheries. Further, if protective measures were implemented to distance bottom-disturbing activity from hard bottom habitats and the associated fish and invertebrate communities, the incremental contribution of impacts for activities related to granting an offshore wind lease would be negligible.

The GOM has a taxonomically and ecologically diverse assemblage of fish and invertebrates due to its unique geologic, oceanographic, and hydrographic features. Felder and Camp (2009) reported that the GOM has a total of 1,541 fish species in 736 genera, 237 families, and 45 orders. Fifty-one of these species are sharks and 42 are comprised of rays and skates (Ward and Tunnell Jr. 2017). The GOM invertebrate assemblages are represented by over 13,000 species in 46 phyla (Felder and Camp 2009) and include recreationally and commercially valuable shellfish such as eastern oyster, blue crab, penaeid shrimp, spiny lobster, and stone crab. Additionally, the number of described species for both GOM fish and invertebrates continues to increase over time due to ongoing exploration of deep-sea ecosystems. For more detail regarding the fish and invertebrate species present within the Call Area and their habitat associations, including protected species such as the giant manta ray, Nassau grouper, and the oceanic whitetip shark, refer to Chapter 3.5 of BOEM's Biological Environmental Background Report for the Gulf of Mexico OCS Region (BOEM 2021).

Fish havens are defined as artificial reefs or "submerged structures deliberately constructed or placed on the seabed to emulate some functions of a natural reef, such as protecting,

regenerating, concentrating, and/or enhancing populations of living marine resources." As recommended by the U.S. Army Corps of Engineers, a setback of 500 ft (152 m) should be applied to preserve ecosystems associated with fish havens and artificial reefs, and to avoid recreational user activity for WEA planning. There are no fish havens in WEA C and just one within WEA D.

The GOM is home to a large and complex commercial fishing industry. Some of the most economically important commercial fisheries in the GOM are white shrimp (*Litopenaeus setiferus*), brown shrimp (*Farfantepenaeus aztecus*), eastern oysters (*Crassostrea virginica*), Gulf menhaden (*Brevoortia patronus*), blue crab (*Callinectes sapidus*), red grouper (*Epinephelus morio*), red snapper (*Lutjanus campechanus*), and tunas (*Thunnus* spp.). Commercial fishers caught 1.4 million pounds of fish and earned $890 million in the GOM, constituting 15.4 percent of total fish revenues in the U.S. (NMFS 2021).

Marine recreational fishing in the GOM is very popular with both residents and tourists, and it is economically important to the coastal states of Florida, Alabama, Mississippi, Louisiana, and Texas. The recreational fishing resource category includes land-based, coastal, and offshore fishing. Recreational fishing is primarily confined to smaller, closer inshore areas of the GOM than commercial fishing. This resource includes private land and vessel-based fishing, rental boat fishing, and charter boat fishing. Recreational fishing activities on the OCS take several forms (e.g., bottom fishing, trolling, and spearfishing).

In the Request for Concurrence on Preliminary Wind Energy Areas for the Gulf of Mexico Area Identification Process Pursuant to 30 C.F.R. § 585.211(b) Memorandum (BOEM 2022a), it states that during the WEA identification process, BOEM considered ways to minimize space-use conflicts between future offshore wind developments and commercial and recreational fisheries operating within and adjacent to the Call Area. The major commercial fisheries operating within and adjacent to the Call Area include the commercial shrimp, reef fish, pelagic longline, coastal migratory pelagic, and Gulf menhaden fisheries. Recreational fisheries can generally be separated into those targeting reef fish and pelagic/highly migratory species. For example, the 2019 AIS Tracking Data for fisheries showed relatively high usage in the northeast portions of WEAs C and D (Figure 6), with fisheries usage decreasing to the south throughout the WEAs. In comparison with the other WEA options, WEA C scored in the top six for most suitable for wind for fisheries with less than ten percent of moderate/high VMS shrimp fishing areas.

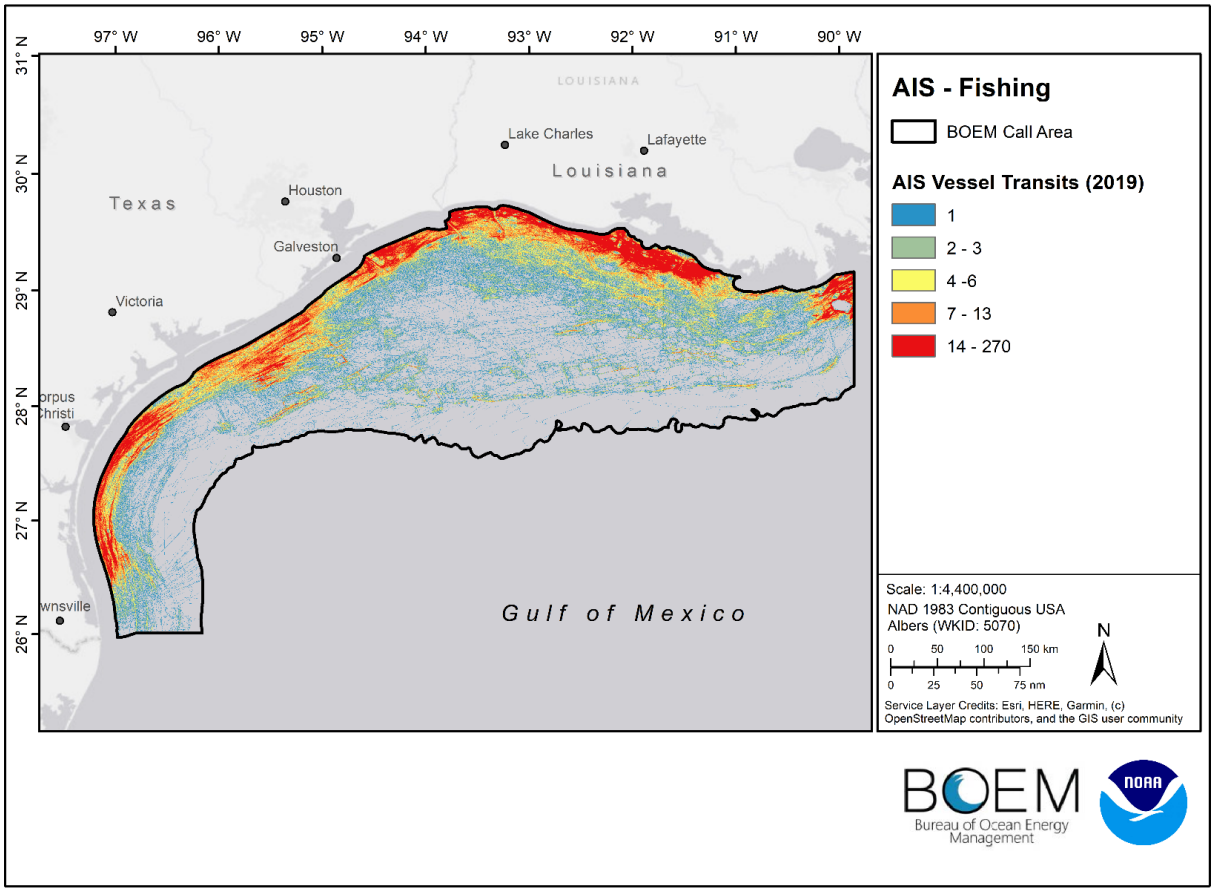

Figure 6. 2019 Automatic Identification System (AIS) Vessel transit data for fishing vessels in relation to the WEA options

5.10 Birds and Bats

The following information is excerpted and/or summarized from the Final EA, Appendix F, Assessment of Resources with No or Negligible Impacts (BOEM 2023a), which covers the entire GOM Call Area and the Gulf of Mexico Area Identification Pursuant to 30 C.F.R. § 585.21 l(b) Memorandum (BOEM 2022b). The EA determined that birds should not experience impacts from site characterization surveys and site assessment activities (e.g., biological surveys or the installation of meteorological buoys) because these activities occur at or below sea level, within unpreferred bird habitat, including diving birds' foraging habitat. The EA determined that bats would not experience impacts from site characterization surveys and site assessment activities (e.g., biological surveys or the installation of meteorological buoys) because these activities occur at or below sea level, within unpreferred bat habitat.

Several bird groups utilize the U.S. GOM environment, as the area serves multiple habitat and life staging purposes. Birds from six distinct taxonomic and ecological groups are represented within the GOM region, including passerines (i.e., Passeriformes), raptors (i.e., Falconiformes, Accipitriformes), seabirds (i.e., Charadriiformes, Pelecaniformes, Procellariiformes, Gaviiformes, Podicipediformes), waterfowl (i.e., Anseriformes, Gaviiformes), shorebirds (i.e.,

Charadriiformes), and wading or marsh birds (i.e., Ciconiiformes, Gruiformes). Seven ESA-listed species of birds (i.e., the Cape Sable seaside sparrow, Mississippi sandhill crane, piping plover, rufa red knot, roseate tern, whooping crane, and wood stork) are distributed across the GOM region, either year-round or migratory, with a strong seasonal component. These species are considered and analyzed in consultations with the FWS. For more detail on birds, refer to Chapter 3.8 of the Biological Environmental Background Report for the Gulf of Mexico F-6 GOM Wind Lease EA OCS Region (BOEM 2021).

The GOM includes three of the four North American Flyways for Migratory Birds. The FWS recommended a 20-nautical mile (nm) coastline buffer for migratory birds. BOEM included the 20-nm buffer in the ocean planning model that is described in the GOM WEA Memorandum.

While site characterization and assessment activities are not expected to have an adverse impact on birds, plans for offshore wind development in WEAs C and D will necessitate close coordination with the FWS to avoid or minimize adverse impacts during construction and operations.

There are four tree bat species that potentially migrate across the GOM. These species include the hoary bat (*Lasiurus cinereus*), northern yellow bat (*Lasiurus intermedius*), red bat (*Lasiurus borealis*), and Seminole bat (*Lasiurus seminolus*). Additionally, other uncommon species may be found in lease areas or in coastal areas where transmission lines could occur. While site characterization and assessment activities are not expected to have an adverse impact on bats, plans for offshore wind development in WEAs C and D will necessitate close coordination with the FWS to avoid or minimize adverse impacts during construction and operations.

5.11 Protected Areas

The following information is excerpted and/or summarized from the Gulf of Mexico Area Identification Pursuant to 30 C.F.R. § 585.21 l(b) Memorandum (BOEM 2022b).

The Texas Parks and Wildlife Department (TPWD) recommended a 1 run protective buffer around TPWD permitted artificial reefs. At this time, BOEM maintains in the final WEAs the same 1,000-ft protective polygon buffer around the permitted artificial reefs proposed in the preliminary WEAs. A 1,000-ft setback from artificial reefs was selected to be consistent with BOEM's distancing from other sensitive benthic habitats in the GOM, such as the Flower Garden Banks National Marine Sanctuary, and is a sufficient distance to avoid impacts to sensitive benthic habitats and/or artificial reef structures from bottom-disturbing activities associated with offshore wind development.

5.12 Military Use Areas and Aviation

The following information is excerpted and/or summarized from Request for Concurrence on Preliminary Wind Energy Areas for the Gulf of Mexico Area Identification Process Pursuant to 30 C.F.R. § 585.211(b) Memorandum (BOEM 2022a) and the Gulf of Mexico Area Identification Pursuant to 30 C.F.R. § 585.21 l(b) Memorandum (BOEM 2022b).

The U.S. Department of Defense (DoD) indicated that the GOM WEAs require further study relating to Relocatable Over the Horizon Radar (ROTHR). ROTHR supports DoD/U.S. Southern Command counter-narcotics missions. The identified lease blocks may be located within and adjacent to the look angle of ROTHR transmit and receive sites. Other assessments have shown that wind turbines located within the look angle can degrade ROTHR performance (based on modeling conducted for the Kitty Hawk Wind Energy Area off the coast of North Carolina). It is acknowledged that the conditions in Texas are different than North Carolina, such as the distance between the sites and potential offshore development. Figure 7 below depicts the initial DoD assessment for WEAs (red areas) for the GOM Call Area. WEAs C and D are located within the orange areas, which means they require further analysis and study.

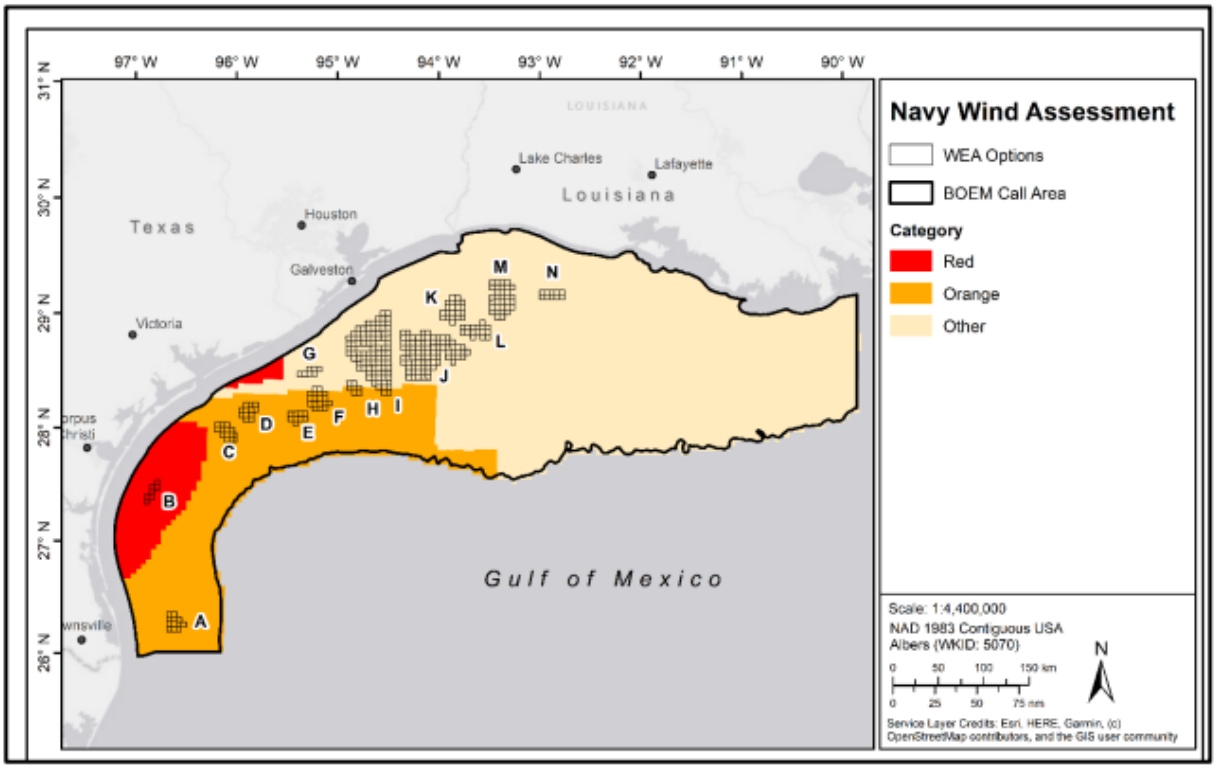

Figure 7. Initial DoD assessment for wind exclusion areas for the GOM Call Area

DoD has developed two mitigation strategies that would potentially mitigate the radar impacts: overlapping radar coverage and Radar Adverse Impact Management (RAM). The DoD did not request removal of these areas, but has asked BOEM to include the following in any conditions for leases issued, or plans or permits approved, within these WEAs:

1. Project operator will notify NORAD 30-60 days ahead of project completion and when the project is complete and operational for RAM scheduling;

2. Project operator will contribute funds ($80,000) for each affected radar for the execution of RAM;

3. Curtailment for National Security or Defense Purposes as described in the leasing agreement.

Since any lease issued will not authorize any activities on the OCS and will only grant the exclusive right to submit plans for BOEM' s consideration and approval, BOEM indicated that it would consider including these provisions as conditions of future plan approval that would allow the development of a wind energy facility. While site characterization and assessment activities are not expected to have an adverse impact on DoD operations, plans for offshore wind development in WEAs C & D will necessitate close coordination with the DoD to avoid or minimize adverse impacts during construction and operations.

5.13 Vessel Traffic and Navigation

The following information is excerpted and/or summarized from Request for Concurrence on Preliminary Wind Energy Areas for the Gulf of Mexico Area Identification Process Pursuant to 30 C.F.R. § 585.211(b) Memorandum (BOEM 2022a) and the Gulf of Mexico Area Identification Pursuant to 30 C.F.R. § 585.21 l(b) Memorandum (BOEM 2022b).

Commercial vessels 65 feet or greater in length are required to carry automatic identification system (AIS) transponders. BOEM conducted a review of 2019 (AIS) vessel information. BOEM analyzed the AIS track line and density data within the Call Area to determine historic vessel usage patterns and identify how they may conflict with potential offshore wind energy development. BOEM shared the findings with the U.S. Coast Guard (USCG) and sought their comments. Three main areas of concern emerged: the navigational complexity for deep draft vessels within the traffic lanes due to the smaller traffic lanes in the GOM, larger vessels entering or exiting traffic lanes, and tug and towing vessels crossing the Call Area. BOEM also considered vessel transit, using AIS and Shrimp Logbook data.

BOEM recognized that the proximity of WEAs C and D to fairways may present a concern to mariners in this region, particularly to vessels that may be experiencing mechanical or technical difficulties and require more room to maneuver. Based on the 2019 AIS track line analysis for Tanker Vessel traffic, however, most tanker vessel traffic is largely confined to shipping fairways transiting to the north or between the two WEAs.

Due to concerns expressed by USCG on lightering areas in the GOM, BOEM stated it will continue to work with the USCG to identify, quantify, and mitigate potential impacts and risks to lightering operations when considering any plans submitted for BOEM's consideration and approval after lease issuance. There are no lightering areas within WEAs C and D.

While site characterization and assessment activities are not expected to have an adverse impact on vessel traffic and navigation, plans for offshore wind development in WEAs C and D will necessitate close coordination with the USCG to avoid or minimize adverse impacts during construction and operations. Site-specific navigation studies may be required to inform the siting of any future wind energy facility.

5.14 Telecommunication Cables

The following information is excerpted and/or summarized from Request for Concurrence on Preliminary Wind Energy Areas for the Gulf of Mexico Area Identification Process Pursuant to 30 C.F.R. § 585.211(b) Memorandum (BOEM 2022a).

The GOM supplies trillions of dollars annually to the national economy via major marine industries (e.g., oil and gas production, commercial seafood, shipping). Given the substantial presence of ocean industries in the region, industry activity in and around the Call Area was spatially examined. Submarine cables transmit 95% of international communications and approximately $10 trillion dollars in financial transactions each day, therefore, these were considered critical infrastructure and were avoided in creating the WEAs, including WEA C and D.

5.15 Oil and Gas Exploration and Production

The Final EA, Appendix B, Issues and Impact-Producing Factors (BOEM 2023a), describes the issues and impacts associated with oil and gas exploration activities in the entire Call Area. The following is excerpted and/or summarized from Section B.8.2 of that document.

The oil and gas industry is one element in the socioeconomic landscape of the GOM. It exists in and is supported by other elements of the landscape, including communities, governments, industries, and individuals. The OCS oil- and gas-related activity in the GOM contributes significantly to regional employment and income arising from industry expenditures, government revenues, corporate profits, and other market impacts.

The GOM ocean economy has above-average wages, which is largely due to the high wages found in the offshore mineral extraction sector. In addition to spending on employment, industry has expenditures on various goods and services. The federal Government collects revenues from the production of oil and natural gas on the OCS through bonus bids, royalties, and rents from lessees. Federal revenues reported for all OCS oil and gas leases totaled over $4 billion in Fiscal Year 2021 (ONRR 2022). Some of these funds are deposited into the Historic Preservation Fund and the Land and Water Conservation Fund, shared with states through the Section 8(g) provision of the Outer Continental Shelf Lands Act, as amended, or shared with states and coastal political subdivisions through the GOM Energy Security Act revenue sharing. In addition to contributing to local and regional spending and government revenues, GOM OCS activity contributes to corporate profits to firms along the OCS supply chain. GOM OCS oil- and gas-related activity is intended to add to the Nation’s energy supply. This contributes to U.S. policy goals of energy independence and security. The heavy presence of the oil and gas industry can also contribute to the culture and sense of place in many parts of the GOM region, many of which would be concentrated along the immediately adjacent coasts.

While site characterization and assessment activities are not expected to have an adverse impact on oil and gas exploration activities or infrastructure, plans for offshore wind development in WEAs C & D will necessitate close coordination with BOEM to avoid or minimize adverse impacts during construction and operations.

5.16 Cultural Resources

The following information is excerpted and/or summarized from the Final EA, Section 4.4.7, Cultural, Historic and Archaeological Resources (BOEM 2023a). More detailed information is available in Appendix D: Resource Descriptions and Affected Environment for Air Quality and Cultural, Historic, and Archaeological Resources. The Final EA found that the incremental contribution of impacts from site characterization and site assessment activities expected to take place after issuance of a single OCS wind energy lease on cultural, historic, and archaeological resources would be negligible if protective measures were employed.

Archaeological resources are any material remains of human life or activities that are at least 50 years of age and that can provide a scientific or humanistic understanding of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques, such as controlled observation, contextual measurement, controlled collection, analysis, interpretation, and explanation. These resources include any physical evidence of human habitation, occupation, use, or activity, and further include the site, location, or context in which such evidence is situated (30 CFR § 550.105). The National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101), includes archaeological resources among potential "historic properties," defined as any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register of Historic Places, including artifacts, records, and material remains relating to the district, site, building, structure, or object (54 U.S.C. § 300308). Traditional cultural properties and sacred sites also may be designated as historic properties. To be eligible for inclusion on the National Register of Historic Places, a historic property typically must be at least 50 years old; retain the integrity of location, design, setting, materials, workmanship, feeling, and association; and meet at least one of four significance criteria (36 CFR § 60.4).

Archaeological resources on the OCS are categorized under one of two general designations: pre-contact or historic. Pre-contact generally refers to archaeological sites associated with the first peoples to occupy the Americas, before the advent of written history. Historic archaeological resources on the GOM OCS consist of historic shipwrecks, aircraft, and a single historic lighthouse, the Ship Shoal Light.

Wind site characterization, assessment, development, construction and operations activities would require a federal permit, subject to review under Section 106 of the National Historic Preservation Act, and the lead federal agency may require a pre-disturbance survey to identify any historic properties within the activity's area of potential effect, and further employ measures to avoid, minimize, or mitigate any adverse effects. Activities occurring on state bottomlands are also subject to state laws and may require further review by the relevant state Historic Preservation Office. Implementation of existing state and federal cultural resource laws and regulations may reduce the magnitude of overall impacts due to requirements to avoid, minimize, or mitigate project-specific impacts. These state and federal requirements may not be able to reduce the severity of impacts on some cultural resources due to the unique character of specific resources but would reduce the severity of potential impacts in a majority of cases.

The Final EA found that the incremental contribution of impacts from site characterization and site assessment activities expected to take place after issuance of a single OCS wind energy lease on cultural, historic, and archaeological resources would be negligible because existing regulatory measures, coupled with the information generated for a lessee's initial site characterization (e.g., geophysical and geotechnical surveys) and presented in the lessee's Site Assessment Plan, make the potential for bottom-disturbing activities to damage historic properties low. Should these protective measures not be applied, the incremental contribution of impacts from bottom-disturbing activities on cultural, historic, and archaeological resources from site characterization and site assessment activities could be minor to major depending on the unique characteristics of the affected historic property and the severity of the bottom disturbance.

While site characterization and assessment activities are not expected to have an adverse impact on cultural resources, plans for offshore wind development in WEAs C & D will necessitate close coordination with BOEM, the relevant state Historic Preservation Office, and native American tribes to avoid or minimize adverse impacts during construction and operations.

6.0 CONFORMANCE WITH STATE ENERGY PLANNING

6.1 Texas Policy on Green Hydrogen

The development of the proposed Gulf Wind 2 project would be in alignment with Texas policy on the development of a thriving green hydrogen industry, which relies upon massive amounts of renewable energy.

The Texas state government recently enacted legislation to provide the green hydrogen industry with regulatory certainty and policy frameworks for continued market development. The legislation establishes the Texas Hydrogen Production Policy Council (Council) within the Railroad Commission (RRC) and clarifies that the RRC has regulatory jurisdiction over hydrogen pipelines and underground storage facilities. The establishment of the Council is significant because it will coordinate state agencies' efforts toward establishing a regional clean hydrogen hub and develop a plan for hydrogen production oversight by the RRC (Mazur 2023).

The legislation went into effect in September 2023, just in time for the October 2023 federal approval of seven Regional Clean Hydrogen Hubs across the nation as part of the Bipartisan Infrastructure Law (DOE 2023c). One of the seven hubs, HyVelocity H2Hub, will be based in the Houston, Texas area. Hydrogen can be processed to be a clean energy product with near zero carbon emissions, if the processing is fueled by another renewable energy, such as offshore wind; this is known as Green Hydrogen (Banks et al. 2022).

As alluded to in Section 2,2 above, the Texas GOM coastline is an ideal location for the further development of green hydrogen due to the pre-existing hydrogen production, transmission, and storage infrastructure. Currently, three of six hydrogen storage salt caverns are located within Texas: Moss Bluff, Clemens Dome, and Spindletop (Londe 2021). These caverns are suitable for safely storing highly pressurized hydrogen before it is processed (Londe 2021). Due to the expensive cost of transporting hydrogen, Texas is also suitable for production because there

are 48 preexisting hydrogen processing plants and over 1,000 mi (1,610 km) of pipeline (HyVelocity Hub 2023). This pre-existing infrastructure will support the entire production of hydrogen energy and will help stimulate the global economy by decreasing the cost and create approximately 45,000 jobs (DOE 2023c).

By partnering with offshore wind to power the hydrogen process in the GOM, the green hydrogen industry can achieve economies of scale. Offshore wind is also supported by federal policies and has the capability to expand into the GOM to support the development of hydrogen as a renewable, clean energy source (Banks et al. 2022).

6.2 Louisiana Offshore Wind and Hydrogen Policies

The development of the proposed Gulf Wind 2 project would be in alignment with Louisiana's energy and climate plans.

Louisiana's Climate Action Plan, published in February 2022, aims to achieve net zero greenhouse gas emissions by 2050, and has the goal to produce 5 GW of energy from offshore wind by 2035 (State of Louisiana 2022b). Louisiana is ranked as the fourth state best suited for offshore wind in the U.S. due to its existing infrastructure and facilities that can manufacture turbine equipment. Louisiana played a significant role in the design and fabrication of the country's first offshore wind farm, Block Island Wind Farm off the coast of Rhode Island (Louisiana Economic Development 2023). Offshore wind in the GOM would help Louisiana meet its goal to replace older, less efficient energy inputs into the power grid, which in turn would help accelerate their energy goals outlined in the state's Climate Action Plan.

With regard to green hydrogen, in 2022 Louisiana, Oklahoma, and Arkansas announced their states have entered into a bipartisan three-state partnership to establish a regional hub for development, production, and use of clean hydrogen as fuel and manufacturing feedstock. The states committed to promoting investment in infrastructure for production and transportation of low-carbon hydrogen, working with industry, transportation networks and ports to connect major facilities with high carbon footprints to hydrogen infrastructure for fuel blending and reduction of CO2 emissions, and working to support hydrogen production to support all phases of industry that can use hydrogen as a fuel source (State of Louisiana 2022c). Examples of massive green hydrogen PPPs partially funded by Louisiana are provided in Section 2.2 above.

6.3 Texas Municipal Climate Plans and Policies

Although the state of Texas does not have an offshore wind policy, cities within Texas have municipal climate action plans. In Texas, four of the five largest cities – Austin, Dallas, Houston and San Antonio – have adopted climate action plans. Each of the four cities has committed to a goal of net zero carbon emissions by 2050 (Coleman 2021). The development of the proposed New Name project would help Texas municipalities achieve their climate goals.

For example, Houston, Texas partnered with 100 Resilient Cities (100RC) to finalize a citywide resilience strategy, which identifies 62 actions across 18 goals that would improve equity, individual and community resilience in the region's bayous, infrastructure, and regional economy

(Georgetown Climate Center 2022). Offshore wind would support three of the strategy's five main goals:

- Prepared and Thriving Houstonians, focuses on individual resilience, opportunity, and inclusivity. One offshore wind project would create around 4,470 construction jobs and 150 full time operating jobs (State of Louisiana 2022b). Houston identifies itself as the global energy capital, and states in its 2020 Climate Action Plan that it is ready to embrace renewable energy industries to meet its goal to also be carbon neutral by 2050 (City of Houston 2020).

- Healthy and Connected Bayous, focuses on living better within Houston's watersheds and recognizing their roles in improving physical, environmental, and economic resilience. Offshore wind within the Gulf would support this goal by providing clean, renewable energy and boosting the local economy.

- Innovation and Integrated Region, focuses on improving coordination and collaboration outside of Houston City limits. Offshore wind would boost the regional economy throughout the Gulf coast by creating jobs and introducing a new industry to the area.

6.4 Texas and Louisiana Industrialized Waterfront

The proposed New Name project is consistent with the way the states of Texas and Louisiana have developed their GOM coasts.

The GOM region has a long legacy of acceptance of using the ocean for energy development activities, which is key to establishing the social license for offshore wind development. Much of the required infrastructure for Offshore Wind is already present in the Gulf, due to its long history of industrialization; it has been a significant petroleum producing region of the U.S. since offshore oil drilling began in the 1930s. The first offshore oil drill was just one mile offshore in 14 feet of water off the coastline of Louisiana in 1936. The oil and natural gas industry in the Gulf has become a major source of energy production, employment, exports, and government revenue since then (Thom et al. 1950). Additionally, shipping ports along the Gulf are some of the most active in the country. In 2022, ports in Houston, Corpus Christi, New Orleans, and Mobile had increased volumes of steel, automotive parts, lumber and petroleum exports (Mahoney 2023).

6.5 Regional Oil and Gas Company ESG Goals

The proposed New Name project would provide renewable energy to help the GOM oil and gas industry achieve its decarbonization targets.

Oil and gas companies that have made the GOM the energy capital of the U.S. for more than a century recognize the need to reduce the carbon emissions associated with their operations and are looking to offshore wind to help achieve their sustainability goals. Oil and gas companies that lead on decarbonization have proven that they can reduce their carbon footprint while reducing operating costs, leading to higher revenues and a competitive advantage (Chaumontet et al. 2023).

Offshore wind is used by some oil and gas companies to electrify the extraction and refining processes, replacing fossil fuels. It has also been proposed as an energy source to power offshore geologic sequestration of carbon. As mentioned above, offshore wind is crucial to the development of green hydrogen, which has potential as a marine vessel fuel to reduce the emissions associated with the shipping of oil and gas (Beck et al. 2020).

It is no surprise that global oil and gas companies like Orsted, Equinor, Total, BP, and Shell are at the forefront of the offshore wind development industry. For example, Shell New Energies US LLC (Shell) has been working in the Gulf since 1947. In March 2023, Shell announced a partnership with New Name Technology, based in Avondale, Louisiana (State of Louisiana 2023). The company has invested $10 million to establish an offshore wind turbine research, training, and technology demonstration program. Louisiana is a hub for offshore wind development in the Gulf as its pre-existing infrastructure is ideal for turbine and vessel manufacturing. New Name Technology, which is globally recognized as an expert in wind turbine rotor technology built its headquarters in a redeveloped former industrial shipyard (State of Louisiana 2023). Amanda Dasch, Vice President of Shell Offshore Power Americas has stated that Shell sees the GOM as an opportunistic place for offshore wind development and is excited to support Louisiana's goal to produce 5 GW of net zero energy by 2035 (State of Louisiana 2023).

7.0 DOCUMENTATION OF LESSEE QUALIFICATIONS

Hecate Energy has the legal qualifications to hold a lease in accordance with 30 CFR 585.106 and 585.107(c) and the guidance found in the Qualifications to Acquire and Hold Renewable Energy Leases and Grants on the OCS. Specifically, Hecate Energy is a Delaware limited liability company with principal offices at 621 West Randolph Avenue, Chicago, IL 60661. A copy of the organizational formation certificate is provided in Attachment 1. Additional information regarding Hecate Energy's technical and financial capability are provided below.

Founded in 2012 by a team of industry veterans who have worked together for over 25 years, Hecate Energy has entered into over 3.6 GW of renewable power purchase agreements (PPAs) across 62 PPAs with 31 counterparties. Further, Hecate has raised financing for over $3.5+ billion of renewables projects, including three projects over $500 million each. Hecate has the technical and financial capability to construct, operate, maintain, and decommission a utility scale, offshore wind facility of this scope and capacity. Hecate has financed billions of dollars of power plant developments and acquisitions. Successful financings have ranged from 500-MW solar utility projects in the U.S., to battery storage projects in Canada, to a wind farm in Jordan. The total amount of financing for these portfolios has been in the billions of dollars and has included debt and equity investments from a wide range of private equity, infrastructure funds, energy investment funds, domestic utilities, foreign utilities, Japanese conglomerates, and commercial banks.

7.1 Technical Capability

Hecate is a leading renewables developer with a pipeline of about 40 GW under development, with 3.6 GW of offtake contracts signed. Over 1.1 GW of projects developed by Hecate are

currently under construction, including two 500-MW solar projects in east Texas. Hecate Energy solar projects will represent over 10% of the utility scale solar that went into operation in the U.S. in 2022 and projected for commercial delivery over the next five years.

Highlights of Hecate's experience include:

- Raised financing for over $2 billion of renewables projects in the past 12 months, including three projects of over $500 million each and over $1 billion for projects in Texas:
    - Developing and securing financing for a 500-MW alternating current (MWac) merchant solar photovoltaic (PV) project, which is currently under construction, in Wharton County, Texas.
    - Developed and secured financing for a 500-MWac project in Roseland, Texas.
- Secured a $250 million line of credit to support ongoing development and security requirements for Hecate Energy.
- Raised over $30 million in financing for our Johanna battery storage project in California, which is under construction.
- Developed a 400-MWac solar PV project in Ohio with three different offtake contracts and financed by a U.S. private equity fund and Algonquin, a Canadian utility (phase 1 is currently under construction).
- Raised financing for, developed and entered into REC contracts with New York State Energy Research and Development Authority (NYSERDA) and Connecticut Department of Energy and Environmental Protection (CT DEEP) for 40-MWac, 50-MWac and 60-MWac solar PV projects in New York.
- Awarded the largest solar project that NYSERDA has awarded to-date, a 500-MWac project.
- Developed and secured financing for 14.8 MWac/58.8-MW hour (MWh) of utility- scale battery storage in Ontario, Canada, which are operational.
- Developed and arranged financing for a 45-MWac wind project in Jordan, which is operational.
- Welcomed Repsol as a minority investor, improving Hecate's balance sheet and aligning with Repsol as a long-term investor and financier of many of the projects developed by Hecate.
- No legal or regulatory actions have been taken against Hecate in the past 5 years.

Hecate's minority investor, Repsol, is an integrated oil and gas company with presence in more than 40 countries, employing over 25,000 people. Repsol is present along the entire energy

value chain, including exploration, production, refining, transport, chemicals, retail sales, and new types of energy and is the market leader in refining and marketing in Spain. Repsol has mining rights in the U.S. over blocks located in the Gulf of Mexico (i.e., Green Canyon, Alaminos Canyon, Atwater Valley, Garden Banks, Keathley Canyon, Mississippi Canyon, and Walker Ridge) and Alaska. Additionally, the company is developing unconventional resources in the Mississippian Lime play. With the addition of production during 2014, the U.S. already represents almost 10% of the company's total hydrocarbon output. Repsol's domestic headquarters is located in Houston, Texas, and employs more than 600 people.

In 2011, Repsol agreed to acquire SeaEnergy Renewables Limited (SERL) from a United Kingdom offshore wind development company, SeaEnergy, and has interest in three projects: Moray Firth, Inch Cape, and Beatriz. Repsol also formed a consortium with Portuguese green power company EDP Renovaveis to develop Moray Firth and Inch Cape. Following the acquisition of SERL by Repsol, the Portuguese firm obtained 67% of Moray and 49% of Inch Cape Offshore Wind Limited. In 2016, Repsol sold the offshore wind business in the United Kingdom to State Development and Investment Corporation (SDIC) of China for 238 million euros. The sale includes the Inch Cape project (100%) and Repsol's share in the Beatrice project (25%), both of which are located on the east coast of Scotland.

Repsol is part of a consortium operating the 25-MW WindFloat Atlantic project. The WindFloat Atlantic project features three Mitsubishi Heavy Industries (MHI) Vestas 8.4 MW turbines mounted on Principle Power's semi-submersible floating foundations. The Windplus consortium comprises EDP Renewables, Engie, Repsol, and Principle Power.

Further, Repsol owns numerous offshore energy assets around the globe, including substantial assets in the Americas. In addition to assets in the U.S., Repsol owns offshore energy assets in Brazil, Columbia, Guyana, Trinidad and Tobago, Venezuela and Mexico.

7.2 Offtake Strategy

Hecate has strong relationships and has contracted with some of the largest energy buyers in the world to deliver innovative and cost-effective power generation and storage solutions (Figure 8).

Figure 8. Hecate Energy Selected Offtakers

7.3 Key Personnel

For one or more projects located in the western planning area, we presently envision that staff from Hecate Energy and Repsol would provide the key personnel to lead the planning and development of the project, supported by contracted consultants. Hecate's personnel are highly qualified to develop, finance, construct, own, and operate the proposed project. Key individuals are highlighted below.

Amy Krebs, Hecate Energy, Senior Director Offshore Wind
Amy serves as the Offshore Wind Director at Hecate Energy with an environmental permitting background and over 20 years of environmental consulting experience. She is also currently serving as a senior director leading environmental permitting and offshore wind development. Amy has over 8 years of experience leading offshore wind projects through federal and state permitting processes. She maintains important relationships with BOEM representatives and an understanding of the U.S. offshore wind market opportunities and risks. She is responsible for identifying offshore wind opportunities in the U.S. and neighboring territories including developing partnerships with other developers. She led the auction preparation for the Gulf of Mexico for Hecate as part of the Repsol/Shell team and is leading project outreach efforts in Washington State with state government leaders, tribes and other pertinent stakeholders.

Dr. Paul Turner, Hecate Energy, Senior Vice President, Business Development
Paul brings over 30 years of experience in the utility and energy industry. Before joining Hecate in 2012, Paul was the Chief Executive Officer of Nacel Energy Corporation, which was a publicly traded wind energy company based in Scottsdale, Arizona. While at Nacel, Paul was responsible for putting together the company's corporate strategy and developing a portfolio of wind projects across West Texas. At Hecate, Paul has led the site control, early-stage development, and community engagement on over 20 GW of solar and wind projects across the

continental U.S. In addition to his stateside work, Paul is leading offshore wind development at Hecate Wind, where the company recently announced a 10-GW offshore wind project in Iceland whose offtake will be sold into the United Kingdom. In addition to the Iceland project (referred to as Kári Energy), Paul is also leading the development efforts on an additional 46 GW of offshore wind projects in the U.S., Asia, and Africa. Paul was a Managing Director at Peoples Energy Resources Corp. While there, Paul led the development of multiple natural gas-fired combined cycle and simple cycle power plants, including the 1,150 MW COB Energy Facility near Klamath Falls, Oregon, and the 280 MW Valencia Energy Facility near Albuquerque, New Mexico. Both fully developed projects were sold, with Valencia going to Public Service Company of New Mexico and COB sold to J Power. Prior to joining Peoples Energy Resources Corp., Paul was a principal at CornerStone Energy Advisors.

Diane Sullivan, Hecate Energy, Senior Vice President, Environmental and Permitting
Diane leads environmental regulatory permitting at Hecate Energy. She has 25 years of land planning, ecological and environmental professional practice experience, with a focus on utilities and energy sectors. Her expertise is developing project strategies to effectively navigate regulatory processes, and environmental and engineering survey requirements. Diane oversees the preparation of environmental reviews pursuant to the National Environmental Policy Act and equivalent state and local regulations. She manages the preparation of associated resource evaluation reports required for impact analysis including land use, visual/aesthetic, cultural, ecological, surface waters, wetlands, erosion and sediment control, transportation, noise/sound, air quality, communication, community resources and socioeconomic impacts. She acts as the primary agency liaison for state and federal agency coordination, and where required, oversees the preparation of state licensing and federal certificate applications for energy generation and associated linear electric transmission projects.

Diane has been the project director or lead regulatory specialist during development and construction phases of energy projects for more than 4 GW of renewables, eight development phases, U.S.-based offshore wind projects, and more than 700 miles of domestic gas and electric transmission and distribution systems. Prior to joining Hecate Energy, Diane was the national renewable energy sector lead at Stantec Consulting Services Inc. In this capacity, she was the project director/principal-in-charge of the development of Construction and Operations Plans for the Orsted Skipjack Offshore Wind Farm in Delaware/Maryland, the Orsted South Fork Wind Farm in New York, and the Orsted Sunrise Wind Farm in New York.

Patricia Shorr, Hecate Energy, Senior Vice President, Project Development
Patti serves as Senior Vice President of Project Development and applies her extensive experience to managing Hecate Energy’s large utility-scale projects. Patti manages a network of outside contractors as well as Hecate Energy colleagues to help ensure successful delivery of some of the company’s most high-profile and complex projects. Patti led the development of the 45-MW wind project in Jordan and 1.5 GW of solar projects in Virginia, Ohio, and Texas. The Jordan wind project was competitively bid, and it provides energy to the National Electric Power Company in Jordan. She led the development of and participated in the permitting and monetization of the project, which achieved commercial operation in January 2021. The project

was permitted under the International Finance Corporation guidelines. Prior to joining Hecate Energy, Patti served as principal for Spectrum Capital Energy LLC, where, over the course of 20 years, she provided development and financial advisory services to private utility-scale developers of wind and solar projects both domestically and internationally. She has provided expertise in all stages of the development, construction, and operation of wind energy projects, and has often brought her skills to new markets where wind projects are new sources of energy starting her career as a financial advisor to a consortium of development, Japanese debt lenders and Mitsubishi Heavy Industries as they sought to enter the U.S. market. She led the financing of the first wind energy project in the United Kingdom and has worked in various development capacities for wind energy projects in California, Illinois, Iowa, Nebraska, Wisconsin, and Ohio.

While Hecate Energy has in-house capabilities for development, engineering, transmission interconnection, and finance matters, we recognize that a multi-disciplinary team of renewable energy professionals with specific expertise in offshore wind and marine systems will be required to successfully develop an offshore wind project in the Gulf Region. We have developed a consulting team to assist in the preliminary development phase of the Project.

During the pre-development activities, we have engaged with Stantec Consulting Services (Stantec) and INSPIRE Environmental to provide environmental due diligence. At the initiation of site assessment, survey, conceptual design and engineering for the Project and associated facilities, Hecate would expand the consulting team. Specifically, we would contract to address:

- wind measurement and assessment;
- engineering evaluations and cost estimation;
- geotechnical and geophysical surveys;
- avian surveys;
- archaeological and historic resource surveys;
- visual resource assessment;
- finfish, shellfish, EFH and other commercial or tribal fisheries studies;
- benthic habitat surveys;
- sediment transport modeling;
- air quality/emissions studies;
- marine mammal and sea turtle surveys;
- terrestrial and coastal habitat and fauna studies;
- transmission siting and routing;
- navigation and vessel traffic;
- military operations, airspace and communication interference;

- ports and harbors selection and improvements;
- socioeconomic impact analysis; and
- other site-specific studies.

7.4 U.S.-based Offshore Wind Projects, and More than 700 miles of Domestic Gas and Financial Capability

Hecate currently has an unsolicited lease request submitted March 29, 2022 and revised July 29, 2022 under review with BOEM. In support of this project Hecate has been engaged in stakeholder outreach (tribal, governmental agencies and other interested parties) and frequent correspondence with BOEM.

7.5 Financial Capability

Hecate Energy has financed billions of dollars of power plant development and acquisitions, including over $3.5+ billions of renewable projects in the U.S in the past 12 months. Successful financings include 500-MW solar utility projects in the U.S., battery storage projects in Canada, and a wind farm in Jordan. The total amount of financing for these portfolios has been in the billions of dollars and has included debt and equity investments from a wide range of energy investment funds, utilities, and commercial banks. A full financial report has been included as Attachment 2, “Consolidated Financial Statements Years Ended December 2022,2021 and 2020.” Hecate has strong relationships and has contracted with some of the most sophisticated project owners in the world to deliver innovative and cost-effective power generation and storage solutions (Figure 9). Representative projects for which Hecate has raised financing are listed in Table 5.

Figure 9. Selected Long-Term Financiers of Hecate Energy Projects

Table 5. Projects Financed by Hecate Energy that have reached Commercial Delivery Date (COD) or are Under Construction

Project	Status	PPA Counterparty	Financial Partner	MWac
Aktina Solar, El Campo, Texas	Under Construction	Merchant	Tokyo Gas America	500
Roseland	Under Construction	Google Energy	Enel	500
Highland 300	Under Construction	Major C&I Customer	DE Shaw	300
Beacon Solar Mojave, California	COD	Los Angeles Department of Water & Power	sPower	162
Cincinnati	Under Construction	Dynegy	Algonquin	100
Brewster Alpine, Texas	COD	City of Houston	Solairedirect (Engie)	50
Old Midville Millen, Georgia	COD	Georgia Power	Citizens Energy	20
Cherrydale Kendall Grove, Virginia	COD	Old Dominion Electric Cooperative	Dominion Energy	20
Johanna	Under Construction	Southern California Edison	InfraRed Capital Partners/Hecate Grid	20
Federal Shipping Service Los Angeles, California	COD	Los Angeles Department of Water & Power	True Green Capital	11
Port of Los Angeles Los Angeles, California	COD	Los Angeles Department of Water & Power	True Green Capital	10
Clarke White Post, Virginia	COD	Old Dominion Electric Cooperative	Dominion Energy	10
Blair Road Jacksonville, Florida	COD	Jacksonville Electric Authority	Synovus Bank (debt)	4
Forbes Street I East Providence, Rhode Island	COD	National Grid	DE Shaw	3
Monson Monson, Massachusetts	COD	Net Metering and Merchant SRECs	SunEdison	3

Project	Status	PPA Counterparty	Financial Partner	MWac
Forbes Street II East Providence, Rhode Island	COD	National Grid	Fifth Third Bank (debt)	3
West Newberry	Under Construction	Totality Renewables	Synovus Bank (debt)	3
Johns Hopkins University Baltimore, Maryland	COD	Johns Hopkins University	Synovus Bank (debt)	2
Turner Bend Rome, Georgia	COD	Georgia Power	Synovus Bank (debt)	1
Old Alabama Rd Woodland, Georgia	COD	Georgia Power	Synovus Bank (debt)	1
Old Alabama Rd 2 Woodland, Georgia	COD	Georgia Power	Boviet USA	1
Rome Highway Aragon, Georgia	COD	Georgia Power	Inman Solar	1
Morgan Rome, Georgia	COD	Georgia Power	Synovus Bank (debt)	1

7.6 Financing Plan

Hecate Energy maintains ready access to the capital needed to carry energy infrastructure projects through their multi-year development cycles. Hecate funds development form its balance sheet and raises long-term capital from leading global investors. Hecate has ample capital to fund the development of the contemplated projects, as Hecate dedicates tens of millions of dollars annually to development financing. Regarding long-term financing, Hecate Energy has raised over $3.5+ billions of capital for renewable projects in the U.S. within the past 12 months alone. Further, Repsol, with a $20 billion market cap, is a 40% owner of Hecate, and is actively providing long-term capital for Hecate's renewable projects. Hecate Energy's audited financial statements are available upon request.

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Attachment 1 - Certificate of Formation

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF FORMATION OF "HECATE ENERGY LLC", FILED IN THIS OFFICE ON THE FIRST DAY OF MAY, A.D. 2012, AT 4:38 O'CLOCK P.M.

Jeffrey W. Bullock, Secretary of State

5148034 8100

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AUTHENTICATION: 9543111

DATE: 05-01-12

You may verify this certificate online at corp.delaware.gov/authver.shtml

State of Delaware
Secretary of State
Division of Corporations
Delivered 05:05 PM 05/01/2012
FILED 04:38 PM 05/01/2012
SRV 120496362 - 5148034 FILE

CERTIFICATE OF FORMATION

OF

HECATE ENERGY LLC

The undersigned, an authorized natural person, for the purpose of forming a limited liability company, under the provisions and subject to the requirements of the State of Delaware (particularly Chapter 18, Title 6 of the Delaware Code and the acts amendatory thereof and supplemental thereto, and known, identified, and referred to as the "Delaware Limited Liability Company Act"), hereby certifies that:

FIRST: The name of the limited liability company is Hecate Energy LLC.

SECOND: The address of its registered office and the name of the registered agent at such address, as required to be maintained by Section 18-104 of the Delaware Limited Liability Company Act is 2711 Centerville Road, Suite 400, Wilmington, Delaware 19808, County of New Castle. The name of its registered agent at that address is Corporation Service Company.

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Formation this 1st day of May, 2012.

By: /s/ Michael H. Woolever
Michael H. Woolever, Authorized Person