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Regulatory
Commission

Office of
Energy Projects

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Venture Global Plaquemines LNG, LLC

Docket No. CP22-92-000

Venture Global Plaquemines LNG Uprate Amendment Project

Environmental Assessment

Cooperating Agencies



Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 2
Venture Global Plaquemines LNG, LLC
Venture Global Plaquemines LNG Uprate
Amendment Project
Docket No. CP22-92-000

TO THE INTERESTED PARTY:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Venture Global Plaquemines LNG Uprate Amendment Project (Amendment), proposed by Venture Global Plaquemines LNG, LLC (Plaquemines LNG) in the above-referenced docket. Plaquemines LNG requests authorization to increase the authorized peak liquefaction capacity of the existing Plaquemines LNG Export Terminal (Terminal) in Plaquemines Parish, Louisiana.

The EA assesses the potential environmental effects of the Amendment in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The U.S. Department of Energy, U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration, and U.S. Coast Guard participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the NEPA analysis.

Plaquemines LNG proposes to increase the Terminal's authorized peak liquefaction capacity achievable under optimal conditions from 24.0 million metric tons per annum (MTPA) to 27.2 MTPA of liquified natural gas (LNG) – or from approximately 1,240 billion cubic feet to 1,405 billion cubic feet per year (gas equivalence). According to Plaquemines LNG, this proposed increase in the peak liquefaction capacity is based on updated engineering and vendor data, reflecting actual equipment performance. The Amendment does not involve the construction of any new facilities, and there would be no land disturbance outside of the original footprint that was approved by the Commission in the September 30, 2019 Order Granting Authorizations Under Sections 3 and 7 of the Natural Gas Act, issued for the Venture Global Plaquemines LNG Project in Docket Nos. CP17-66-000 and CP17-67-000.

The Commission mailed a copy of the Notice of Availability of the EA to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested

individuals and groups; and newspapers and libraries in the project area. The EA is only available in electronic format. It may be viewed and downloaded from the FERC's website (www.ferc.gov), on the natural gas environmental documents page (<https://www.ferc.gov/industries-data/natural-gas/environment/environmental-documents>). In addition, the EA may be accessed by using the eLibrary link on the FERC's website. Click on the eLibrary link (<https://elibrary.ferc.gov/eLibrary/search>), select "General Search" and enter the docket number in the "Docket Number" field (i.e. CP22-92-000). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

The EA is not a decision document. It presents Commission staff's independent analysis of the environmental issues for the Commission to consider when addressing the merits of all issues in this proceeding. Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this project, it is important that we receive your comments in Washington, DC on or before 5:00pm Eastern Time on **February 6, 2023**.

For your convenience, there are three methods you can use to file your comments to the Commission. The Commission encourages electronic filing of comments and has staff available to assist you at (866) 208-3676 or FercOnlineSupport@ferc.gov. Please carefully follow these instructions so that your comments are properly recorded.

- (1) You can file your comments electronically using the eComment feature on the Commission's website (www.ferc.gov) under the link to FERC Online. This is an easy method for submitting brief, text-only comments on a project;
- (2) You can also file your comments electronically using the eFiling feature on the Commission's website (www.ferc.gov) under the link to FERC Online. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "eRegister." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing"; or
- (3) You can file a paper copy of your comments by mailing them to the Commission. Be sure to reference the project docket number (CP22-92-000) on your letter. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852.

Filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered. Only intervenors have the right to seek rehearing or judicial review of the Commission's decision. At this point in this proceeding, the timeframe for filing timely intervention requests has expired. Any person seeking to become a party to the proceeding must file a motion to intervene out-of-time pursuant to Rule 214(b)(3) and (d) of the Commission's Rules of Practice and Procedures (18 CFR 385.214(b)(3) and (d)) and show good cause why the time limitation should be waived. Motions to intervene are more fully described at <https://www.ferc.gov/how-intervene>.

Additional information about the project is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the eLibrary link. The eLibrary link also provides access to the texts of all formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to <https://www.ferc.gov/ferc-online/overview> to register for eSubscription.

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TECHNICAL ACRONYMS AND ABBREVIATIONS

2019 Order	Commission's September 30, 2019 Order in Docket No CP17-66-000
2019 Final EIS	May 2019 Final Environmental Impact Statement
Amendment	Docket No. CP22-92-000 limited amendment
AQCRs	Air quality control regions
BAHX	Brazed aluminum heat exchanger
bcf	Billion cubic feet
bcf/y	Billion cubic feet per year
BG	Block Group
BOG	Boil off gas
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH ₄	Methane
CEQ	Council on Environmental Quality
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalents
COPT	U.S. Coast Guard Captain of the Port
Census Tract	CT
Deep South	Deep South Center for Environmental Justice
DOE/FE	Department of Energy - Office of Fossil Energy and Carbon Management
EA	Environmental Assessment
EEZ	Economic Exclusion Zone
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
ESA	Endangered Species Act
FEED	<u>front-end engineering design</u>
FERC or Commission	Federal Energy Regulatory Commission
FTA	Free trade agreements
FWS	U.S. Fish and Wildlife Service
GHG	Greenhouse gas
HAPs	Hazardous Air Pollutants
HMB	Heat and material balances
IPaC	Information for Planning and Consultation
IWG	Interagency Working Group on the Social Cost of Greenhouse Gases
LDEQ	Louisiana Department of Environmental Quality
LNG	Liquefied natural gas
LOD	Letter of Determination
LOR	Letter of Recommendation

m ³	Cubic meters
MTPA	million metric tons per annum
N ₂ O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NMFS	National Marine Fisheries Service
NOS	<i>Notice of Scoping Period Requesting Comments on Environmental Issues for the Proposed Venture Global Plaquemines LNG Uprate Amendment Project</i>
OEP	Office of Energy Projects
OPP	Office of Public Participation
PFD	Process flow diagram
Plaquemines LNG Project	Venture Global Plaquemines LNG, LLC Venture Global Plaquemines LNG Project
ROI	Radius of Impact
Secretary	Secretary of the Commission
SIL	Significant Impact Levels
SCC	Social Cost of Carbon
Terminal	Plaquemines LNG Terminal
USDOT PHMSA	U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration
USCG	U.S. Coast Guard
USGCRP	U.S. Global Change Research Program
WSA	Water Suitability Assessment
°F	Degrees Fahrenheit

A. PROPOSED ACTION

1.0 INTRODUCTION

On March 11, 2022, Venture Global Plaquemines LNG, LLC (Plaquemines LNG) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket No. CP22-92-000 for a limited amendment (Amendment) to the Commission's September 30, 2019 Order in Docket No CP17-66-000 and CP17-67-000 (2019 Order). The 2019 Order authorized the Venture Global Plaquemines LNG Project (Project) under section 3 of the Natural Gas Act (NGA). The facilities authorized in the 2019 Order include 18 liquefaction blocks, each containing two single mixed refrigerant process trains with a total production capacity of 24 million metric tons per annum (MTPA) of liquefied natural gas (LNG) at the Plaquemines LNG Terminal (Terminal) in Plaquemines Parish, Louisiana. Plaquemines LNG commenced construction of the Project in August of 2021. Initial commencement of service is planned in 2024.

In the Amendment, Plaquemines LNG requests to increase the total LNG production capacity of the Terminal from the currently authorized 24.0 MTPA (equivalent to 1,240 billion cubic feet of natural gas per year [Bcf/y]) to 27.2 MTPA (1,405.3 Bcf/y). Plaquemines LNG states the increase is based on refinements in the conditions and assumptions concerning the maximum potential output of the facility and would not require any new facilities or modification. The refinements in the conditions and assumptions made in the engineering design to achieve the proposed liquefaction capacity are discussed in more detail in the Reliability and Safety section.

We¹ prepared this environmental assessment (EA) in compliance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) regulations for implementing NEPA (Title 40 of the Code of Federal Regulations [CFR], Parts 1500-1508 [40 CFR 1500-1508]), and the Commission's regulations for implementing NEPA (18 CFR 380).²

FERC is the lead federal agency for authorizing LNG export facilities under the NGA, and the lead federal agency for preparation of this EA, in accordance with NEPA (40 CFR 1501) and the Energy Policy Act of 2005. Consistent with NEPA (40 CFR 1501.6) and their respective responsibilities and regulations, the U.S. Department of Energy (DOE), U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (USDOT PHMSA), and U.S. Coast Guard (USCG) participated as cooperating agencies in the preparation of this EA.

¹ "We," "us," and "our" refer to the environmental and engineering staff of the Office of Energy Projects.

² The EA was prepared consistent with the CEQ's April 20, 2022 final rule, National Environmental Policy Act Implementing Regulations Revisions (Final Rule, 87 FR 23453), that was effective as of May 20, 2022.

Cooperating agencies have jurisdiction by law or special expertise with respect to the environmental impacts associated with Plaquemines LNG's proposal.

The assessment of environmental impacts is an integral part of the Commission's decision-making process to determine whether to authorize Plaquemines LNG's proposal. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that would result from the implementation of the proposed action;
- identify and recommend reasonable alternatives to avoid or minimize adverse environmental impacts;
- identify and recommend mitigation measures, as necessary, to minimize environmental impacts; and
- facilitate public involvement in the environmental review process.

2.0 PURPOSE AND NEED

Plaquemines LNG is requesting authorization to increase the authorized production capacity of natural gas of the Project from 1,240 billion cubic feet of natural gas per year (Bcf/y) to a facility wide production capacity of 1,405.3 Bcf/y. Plaquemines LNG states that the proposed Amendment is necessary to utilize the maximum design liquefaction capacity of the export facilities and meet market demand.

The Commission is an independent regulatory agency and conducts a complete independent review of project proposals, including an environmental review of proposed facilities. Under Section 3 of the NGA, FERC considers, as part of its decision to authorize natural gas facilities, all circumstances bearing on the public interest. Specifically, regarding whether to authorize natural gas facilities used for importation or exportation, FERC shall authorize the proposal unless it finds that the proposed facilities would not be consistent with the public interest.

The EA is not a decision-making document; rather, it will aid the Commission in its decision-making process. The Commission will consider the findings of the EA as well as non-environmental issues in its review of the Amendment.

3.0 PUBLIC PARTICIPATION AND COMMENT

On May 11, 2022, the Commission issued a *Notice of Scoping Period Requesting Comments on Environmental Issues for the Proposed Venture Global Plaquemines LNG Uprate Amendment Project* (NOS). The NOS was published in the Federal Register and was mailed to federal, state, and local officials; agency representatives; affected landowners (as defined by the Commission's regulations); environmental and public interest groups; Native American tribes; and local libraries and newspapers. This notice opened the scoping period for 30 days. Comments were filed by the Choctaw Nation of Oklahoma, Louisiana Bucket Brigade, Deep South Center for Environmental Justice (Deep South), Sierra Club and Healthy Gulf stating

concerns with cultural resources, aquatic resources, reliability and safety, air quality impacts and compliance, climate change, environmental justice, noise pollution, and economic impacts. All substantive comments are addressed in the relevant resource sections of the EA.

The Choctaw Nation of Oklahoma stated that because the Amendment has no ground disturbing activities, they concur with the finding of no effect to historic properties. The environmental impacts on cultural resources remain unchanged from that analyzed in the May 2019 Final Environmental Impact Statement (2019 final EIS) for the Plaquemines LNG and Gator Express Pipeline Project in Docket No. CP17-66-000 and CP17-67-000, respectively, and are therefore not addressed further in this EA.

The Louisiana Bucket Brigade, and Sierra Club and Healthy Gulf state that the Commission must produce an EIS to consider upstream, downstream, and direct greenhouse gas (GHG) emissions, climate risks, and the cumulative impacts of GHG emissions from the Terminal, and that the 2019 final EIS be reopened to include the proposed Amendment. They further contend that a supplemental EIS should be produced, stating the proposed Amendment is part of the authorization for the Terminal and constitutes a substantial change to the Terminal.

Regarding the Louisiana Bucket Brigade and Sierra Club and Healthy Gulf's comment on the Commission decision to proceed with the Amendment as an EA, as the Project is a result of system optimization and would not result in any Project-related construction impacts, including no construction of new or modified facilities that would invalidate or increase the previously assessed impacts above those that the existing authorization is based upon and no new environmental permits, we find the EA to be appropriate. A discussion on upstream and downstream impacts as they relate to the proposed Amendment are discussed in section B.6.2.

Regarding the Louisiana Bucket Bridge comments on cybersecurity threats targeting LNG facilities with physical impacts, owners and operators of energy infrastructure, and the governmental entities that regulate them, have key roles to play in maintaining safe, reliable, secure, and efficient systems. Owners and operators have the responsibility for establishing policy, procedures, and controls to guard against cybersecurity threats to energy system architectures. Government agencies establish regulatory requirements and coordinate and share threat information, promote best protection practices, and help improve energy sector response for mitigation of adverse impacts. Nearly all of the government agencies authorized for security are under the Department of Homeland Security (DHS). The DHS Cybersecurity and Infrastructure Security Agency (CISA) leads the effort in defending against cybersecurity threats to U.S. infrastructure and partners with private sector facility owners/operators to detect and mitigate cyber threats and vulnerabilities.³ In addition, under the Maritime Transportation

³ CISA is also authorized under Chemical Facility Anti-Terrorism Standards (CFATS), 6 U.S.C. 621-629, to promulgate performance-based regulations. The CISA codified these requirements under 6 CFR 27. However, 6 U.S.C. 621 and 6 CFR 27 specifically excludes facilities subject to Marine Transportation Security Act of 2002 (MTSA). LNG terminals under section 3 of the Natural Gas Act often constitute waterfront facilities handling LNG subject to the MTSA requirements and therefore are not subject to CISA regulatory requirements.

Security Act of 2002, 46 U.S.C. 2101, the USCG within DHS has authority to establish security requirements for any structure or facility of any kind located in, on, under, or adjacent to any waters subject to the jurisdiction of the United States. The USCG has codified these requirements under 33 CFR parts 104 and 105 and has issued NVIC 01-20, Guidelines for Addressing Cyber Risks at MTSA Regulated Facilities, which establishes requirements to assess and address computer system or network vulnerabilities in the Facility Security Assessment under 33 CFR 105.. The DHS Transportation Security Administration (TSA) is also assessing its programs related to cybersecurity oversight for pipelines and other transportation infrastructure. On November 30, 2022, TSA published an advance notice of proposed rulemaking titled, Enhancing Surface Cyber Risk Management, under TSA Docket No TSA-2022-0001. The notice requests input on how the pipeline sector, including natural gas facilities, implements cyber risk management in its operations so that TSA has a better understanding for developing a comprehensive and forward-looking approach to cybersecurity requirements for its jurisdictional facilities. On November 30, 2022, TSA published an Advanced Notice of Proposed Rulemaking seeking public comment on more comprehensive formal cybersecurity regulations for pipeline facilities. Comments are due by January 17, 2023. The Federal Bureau of Investigation within DHS is the lead federal agency for investigating cyber attacks and intrusions.

Regarding Louisiana Bucket Bridge comments on explosions and hazards from LNG facilities, the FERC NEPA process considers consequences from both accidental and intentional incidents at LNG terminals to inform its safety and security reviews and recommendations, as described in the 2019 final EIS, which were adopted as conditions of the authorization of the facilities under Docket CP17-66. As described in the final EIS, appropriate regulatory requirements, standards, and layers of protection would be applied to design and engineering, construction, operation, and maintenance to protect the public and avoid or minimize the potential for accidental or intentional incidents. In addition, FERC also coordinates in security reviews with USDOT PHMSA and USCG, which enforce security requirements at the LNG terminals and LNG marine vessels. The USDOT PHMSA also evaluated certain accidental scenarios at the LNG terminal to preclude certain impacts to the public as part of its Letter of Determination to FERC, which provides USDOT PHMSA's determination as to whether LNG facilities meet the siting requirements, under 49 CFR 193 Subpart B. Similarly, the USCG evaluated accidental and intentional incidents from the LNG marine vessels along the waterway as part of its Letter of Recommendation to FERC, which provides USCG's recommendation as to whether the waterway would be suitable for the proposed LNG marine traffic, under 33 CFR 127.

In regard to Sierra Club and Healthy Gulf's comments on compliance with the Endangered Species Act ("ESA"), analyze amendment impacts, and initiate consultation and reconsider its previous ESA analysis concerning the project, Plaquemines LNG initiated consultation with the U.S. Fish and Wildlife Service (FWS) and NMFS, Protected Resources Division regarding potential impacts on federally-listed threatened and endangered species related to modified LNG carrier operations. Further details are discussed in section B.2.0.

However, LNG facilities not subject to MTSA (e.g., LNG peakshavers under Section 7 of Natural Gas Act) would be subject to CISA regulations.

Additionally, the Commission issued the 2019 Order authorizing the Plaquemines LNG Project on September 30, 2019 and granted Plaquemines LNG authorization to commence construction of the Terminal. Since construction commenced, Plaquemines LNG has submitted monthly construction status reports for the Terminal in compliance with the 2019 Order. FERC staff also conducted construction inspections of the Terminal starting in June 2022. These reports and inspections were conducted to ensure compliance with Plaquemines LNG's proposed mitigation, conditions of the 2019 Order, and the Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan*.

Deep South also stated that an increase in the LNG that is produced and sold would likely require excavation of waterways for the ships to pass through, disturbing marine areas; and increased operations and export at the Terminal could lead to the permanent loss and conversion of wetland areas, altering the present ecosystem and reducing the amount of protection from storms. The Amendment does not include any excavation of waterways or impacts on wetlands.

4.0 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

Plaquemines LNG states that the revised estimate of peak LNG production and export capability is based on taking into account design refinements and seasonal production variation due to changes in average monthly temperature would result in a proportionally higher LNG production rate and increased liquefaction efficiency.

Based on our independent analysis, we believe it is reasonably foreseeable that the production rate increase could result in an increase in the number of LNG carrier transits, compared to the number of LNG carrier transits analyzed in 2019 final EIS, depending on LNG density and availability of the contracted LNG carrier fleet. In addition, we evaluated regulatory aspects of a potential change in marine traffic and verified that the hazard and engineering designs would not be affected by the Amendment. Accordingly, the topics addressed in this EA include surface waters, aquatic resources, environmental justice (including visual impacts), air quality, reliability and safety, cumulative impacts (including climate change) and alternatives. This EA describes the affected environment as it currently exists and the potential environmental consequences of the Amendment.

The environmental impacts for the following resources remain unchanged from that analyzed in the 2019 final EIS for the Plaquemines LNG Project in Docket No. CP17-66-000 and CP17-67-000, and are therefore not addressed further in this EA:

- geology and soils;
- groundwater;
- wetlands;
- vegetation and terrestrial wildlife;
- land use and recreation;
- socioeconomics;
- cultural resources; and
- noise.

Additionally, because the Amendment would not extend Terminal construction outside of the original footprint reviewed in the 2019 final EIS, impacts from potential vessel traffic increases would be minor, and vessel trips per year would remain within the upper limit of port calls per year previously approved, we conclude there would be no adverse cumulative impacts. Therefore, cumulative impacts outside of environmental justice and climate change are not addressed further in this EA.

COOPERATING AGENCIES

The DOE, USDOT PHMSA, and USCG participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law or special expertise with respect to environmental impacts involved with a proposal. The roles of the DOE, USDOT PHMSA, and USCG in the Amendment review process are described below. The EA provides a basis for coordinated federal decision making in a single document, avoiding duplication in the NEPA environmental review process. In addition to the lead and cooperating agencies, other federal, state, and local agencies may use this EA in approving or issuing permits for all or part of the Amendment.

Federal Energy Regulatory Commission

FERC authorizes the siting and construction of LNG terminals under Section 3 of the NGA and delegated authority from the DOE. As the lead federal agency, FERC prepared this document in compliance with the requirements of NEPA. FERC requires standard information to be submitted to perform environmental and safety and reliability engineering reviews. FERC's filing regulations for engineering and safety information are codified in 18 CFR 380.12 (m) and (o). As part of the safety review required for a FERC Order, we use this information from the Applicant to assess whether the proposed facilities would have adequate layers of protection to reduce the risk of public safety impacts. We also suggest additional mitigation measures to further reduce the risk of public safety impacts for the Commission to consider as conditions in the Order. A layers of protection approach ensures a safe operation of the facility by having multiple independent design features protect against hazardous releases. The reliability of these layers of protection is informed by occurrence and likelihood of root causes and the potential severity of consequences from incidents caused by a range of natural hazards, accidental events, intentional events, and potential for cascading damage based on past incidents and validated hazard modeling, including higher likelihood scenarios with lower onsite consequences up to worst case scenarios with extremely low likelihoods. FERC staff reviewed the layers of protection proposed at the Plaquemines LNG facility to determine what impact, if any, the uprated liquefaction capacity may have on their effectiveness.

In addition, the Plaquemines LNG Project is currently under construction along the Mississippi River in Plaquemines Parish, Louisiana, and the selection of final design at facility would include considerations for any impacts the capacity increase would have on process conditions, engineering designs, and hazard mitigation. Therefore, FERC staff recommends in section C that Venture Global comply with all environmental and engineering conditions set forth in the Appendix of the 2019 Order issued in Docket No. CP17-66-000 and include final design considerations of impact from the Plaquemines LNG Uprate Amendment Project. FERC staff observed certain design progressions since the authorized design, and any design change

would be reviewed in accordance with Conditions 1 and 32 of the 2019 Order. Condition 1 of the 2019 Order requires Plaquemines LNG to request any modification, justify each modification, explain how that modification provides equal or greater level of protection and receive written approval prior to using any modification. Therefore, any change that increases capacity must also take into account any changes necessary in the final design for each layer of protection to provide an equal or greater level of protection. FERC staff would review the final design of each layer of protection as stipulated in the 2019 Order to ensure the performance- and risk-based layer of protection requirements are maintained such that the layers of protection remain effective and reliable and subsequently that there is no increase in risk to the safety of the public.

U.S. Department of Energy

Under Section 3 of the NGA, the DOE's Office of Fossil Energy (DOE/FE) is responsible for authorizing imports and exports of natural gas, including LNG, from or to a foreign country. By law, under Section 3(c) of the NGA, applications to export natural gas to countries with which the United States has free trade agreements (FTA) are deemed to be consistent with the public interest and the Secretary of the DOE/FE must grant authorization without modification or delay. In the case of applications to export LNG to non-FTA nations, NGA Section 3(a) requires DOE/FE to conduct a public interest review and grant authority to export unless DOE/FE finds that the proposed exports would not be consistent with the public interest. Additionally, NEPA requires DOE/FE to consider the environmental effects of its decisions regarding applications to export natural gas to non-FTA nations.

The export authorizations issued by the DOE/FE for Plaquemines LNG, for exports to both FTA nations and non-FTA nations are for 1,240 Bcf/y, or approximately 24.0 MTPA. *See* DOE/FE Order No. 4446, "Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations" for Plaquemines LNG, which was issued on October 16, 2019 in DOE/FE Docket No. 16-28-LNG; DOE/FE Order No. 3866, "Order Granting Long-Term, Multi- Contract Authorization to Export Liquefied Natural Gas by Vessel From The Proposed Plaquemines LNG Terminal in Plaquemines Parish, Louisiana, to Free Trade Agreement Nations," issued on July 21, 2016 in that same docket. On October 21, 2020, DOE/FE extended the export term for both of these authorizations through December 31, 2050 in its consolidated Order Nos. 3866-A and 4446-A. Plaquemines LNG is filing its application with DOE/FE contemporaneously to align its export authorizations to the peak capacity of the facility, as proposed in the Amendment.

U.S. Department of Transportation

The USDOT PHMSA is responsible for promulgating and enforcing minimum safety standards for onshore LNG facilities. Those regulations are codified in 49 CFR Part 193 covering LNG facility siting, design, construction, operation, maintenance, personnel qualifications and training, fire protection, and security.

On August 31, 2018, USDOT PHMSA and FERC signed a Memorandum of Understanding to improve coordination throughout the LNG permit application process for FERC jurisdictional LNG facilities relating to application compliance with USDOT PHMSA

siting standards. To show compliance with the USDOT PHMSA siting standards, Plaquemines LNG submits materials which USDOT PHMSA will review to verify the uprated capacity will comply with the USDOT PHMSA 49 CFR Part 193, Subpart B siting requirements. USDOT PHMSA will provide its analysis and determination to FERC in a Letter of Determination (LOD) that will serve as one of the considerations for the Commission to deliberate in its decision to authorize or deny the uprated capacity application. The issuance of the LOD does not abrogate USDOT PHMSA's continuing authority over the terminal facilities and the operator's obligation to comply with 49 CFR Part 193 during future operation. The terminal facilities would remain subject to USDOT PHMSA's inspection and enforcement programs to ensure compliance with the requirements of 49 CFR Part 193.

U.S. Coast Guard

The USCG is the principal federal agency responsible for the safety of an LNG terminal's marine transfer area codified in 33 CFR 127, as well as over security plans for the waterfront facilities handling LNG codified in 33 CFR 105. In addition, the USCG is the principal federal agency responsible for the safety and security of the LNG carrier traffic in U.S. ports and waterways codified in 46 CFR 154 and 33 CFR 104. The USCG would continue to exercise regulatory oversight of the safety and security of the LNG terminal facilities and LNG marine vessels in compliance with these regulations.

As part of these responsibilities, the USCG issues a Letter of Recommendation (LOR) discussing the suitability of the waterway for LNG marine traffic to FERC. The USCG issued a LOR on January 23, 2017 recommending that the Lower Mississippi River be considered suitable for accommodating the type and frequency of LNG marine traffic to the Project. This LOR was based on an upper bound of up to 380 carriers per year to and from the facility.

Plaquemines LNG stated in their application that if the Terminal increases export from 24.0 to 27.2 MTPA, the number of average annual vessel calls could increase from 312 to 360 based on 185,000 cubic meters (m^3) LNG carriers - the maximum LNG carrier size the authorized dock is designed to receive. Due to the designated route distances and future LNG carrier size increases, Plaquemines LNG expects the majority of the vessels trading and calling on the Gulf of Mexico will be in the range of 165,000 to 185,000 m^3 . Approximately 28% of the world fleet is between 165,000 m^3 and 185,000 m^3 . As discussed in the 2019 final EIS for the Plaquemines Liquefaction Project, the Terminal would be capable of receiving LNG vessels with capacities up to 185,000 m^3 . Approximately 90% of the world LNG fleet is less than or equal to 185,000 m^3 . Exporting 27.2 MTPA with average vessel size of 170,000 m^3 , the number of calls would result in approximately 356 to 373 LNG carriers, varying based on actual LNG densities, which is still within the limits of the 380 upper bound that was approved by the USCG in the Water Suitability Assessment (WSA). In addition, based on the upper bound of 380 LNG carriers per year, FERC calculated the average LNG exported per call would be between approximately 159,000 and 167,000 m^3 based on rich or lean LNG, respectively, which is close to the average LNG capacity of approximately 156,000 m^3 .

Plaquemines LNG conferred with the USCG Captain of the Port (COTP) regarding the potential for increases in expected vessel traffic above the level reflected in the approved WSA associated with optimization of the ship class utilized to transport LNG. As proposed, export of

27.2 MTPA utilizing an expected vessel size of an average of 170,000 m³, would still be within the limits of the 380 upper bound that was approved by the USCG in the WSA. Based on available carrier sizing, an incremental increase in LNG available for export would not result in any significant deviation in ship traffic. Any changes to the WSA would be driven by ship class optimization and not just the capacity increase.

5.0 PERMITS, APPROVALS, AND REGULATORY CONSULTATIONS

Table 1 provides a list of known federal, state, and local permits for the Amendment, as well as pertinent permits for the Project received to date. The proposed Amendment would not result in any footprint changes which would affect the previously received environmental clearances and authorizations for the Terminal. Additionally, the proposed increase in production capacity would not require any revisions of the air permit, as discussed further in section B.4 of this EA. Plaquemines LNG would be responsible for maintaining all permits and approvals required for the Amendment.

Table 1			
Supplemental Permits, Reviews, and Consultations			
Agency	Permit/Approval	Status	Notes
FERC	Authorization for Limited Amendment under Section 3 of the Natural Gas Act	<i>Pending</i>	<p>FERC Order issued September 30, 2019 authorized Plaquemines LNG to site, construct, and operate LNG export facilities for peak liquefaction capacity of 24.0 MTPA</p> <p>Abbreviated Application for Limited Amendment of Authorization to increase peak liquefaction capacity to 27.2 MTPA filed with FERC on March 11, 2022</p>
Department of Energy, Office of Fossil Energy and Carbon Management (DOE/FE)	Authorization to Increase Export Quantity to FTA countries from 1,240 Bcf/yr to 1,405.33 Bcf/yr and to non- FTA countries from 1,240 Bcf/yr to 1,405.33 Bcf/yr	<p>Issued (for FTA nations) – June 13, 2022</p> <p><i>Pending (for non-FTA nations)</i></p>	<p>Application filed on March 11, 2022 for limited amendment of export authorization to FTA and non-FTA countries; Notice of Application published on May 12, 2022 in Federal Register for limited amendment to export to non-FTA countries, with comment close on July 11, 2022; Order 3866-B amending authorization to export to FTA countries issued on June 13, 2022; Order amending authorization to export to non- FTA countries pending</p>

USCG	WSA consultation	Initial WSA concurrence, May 12, 2016 Letter of Recommendation issued January 23, 2017 <i>Concurrence received December 15, 2022</i>	USCG confirmed that no additional analysis is required as the previously approved upper-bound of 380 vessels has not been exceeded.
USDOT PHMSA	49 CFR Part 193 consultation (standards for LNG facilities) for capacity amendment project	<i>Pending</i>	PHMSA review of the capacity amendment is awaiting Plaquemines LNG siting package submittal
U.S. Fish and Wildlife Service (FWS)	Endangered Species Act Section 7 consultation	Concurrence received – June 17, 2022	Official Species List report and Consistency Letter requested using the Louisiana DKey within the USFWS IPaC system on June 13, 2022 <i>Request for concurrence of not likely to adversely affect effects determinations sent on June 16, 2022</i>
National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA/NMFS)	Endangered Species Act Section 7 consultation	Concurrence received December 1, 2022	NOAA/NMFS review of capacity amendment. <i>Request for concurrence of not likely to adversely affect effects determinations sent on June 28, 2022.</i>

B. ENVIRONMENTAL ANALYSIS

The following sections discuss the Amendment's potential direct and indirect impacts on environmental resources, regulatory oversight, and engineering design. An impact would be considered significant if it would result in a substantial adverse change in the physical environment.

1.0 SURFACE WATERS

Surface water resources potentially affected by the Amendment includes the area within the Economic Exclusion Zone (EEZ) and the Mississippi River channel from the river mouth upriver to the Terminal site. Brackish water habitat is present within the river channel segment where salinities and freshwater are influenced by strong river flows and tides. River channel bottom substrates are comprised of silts and sand with dredged channel depths maintained for large vessels. Near shore marine habitat occurs along the coast where beaches provide suitable nesting substrates for sea turtles. Further offshore, deep water marine habitat extends to the EEZ boundary with bottom substrates comprised of sand, fine silts, marine organism hard parts, and mud. LNG carrier open water sea routes travel in three generalized directions to foreign ports. Easterly towards the Atlantic Ocean with potential destinations in Europe and Africa, southerly through the Caribbean, and southwesterly towards Central America and the Panama Canal.

Operation of the Terminal at a peak liquefaction capacity of 27.2 MTPA would require approximately 356 LNG carriers per year to transport the LNG produced by the Terminal, based on an average vessel size of 175,000 cubic meters, assuming Plaquemines LNG design case density of LNG. This estimate represents an increase in 46 LNG carrier trips compared to the 310 trips analyzed in the 2019 final EIS. This increase equals about one additional LNG carrier visiting the Terminal per week.

The primary impacts on water resources associated with the Amendment would be due to the additional LNG carrier trips required to transport the increased LNG production, therefore, we have assessed impacts on surface waters from this potential increase.

LNG carriers serving the Amendment would access the Terminal from the Gulf of Mexico through the Mississippi River. LNG carriers would arrive carrying sufficient ballast water to control stability of the vessel. As indicated in the 2019 final EIS, ballast water discharge typically would be less than 16 million gallons. During loading of LNG, ballast water would be discharged after treatment using a USCG-approved ballast water management system, in accordance with USCG regulations (33 CFR Part 151, subpart D and 46 CFR §162.060). These ballast water management systems process ballast water to kill or remove invasive species.

As described in section 4.3.2.2 of the 2019 final EIS, ballast water discharges at the Terminal could impact water quality by changing the salinity, temperature, pH, and dissolved oxygen level of water within the vicinity of the Terminal docks. The primary potential impact on water quality due to ballast water discharge would be a temporary increase in salinity. The Mississippi River is typically freshwater at the Terminal location except for periods of low flow, when a saltwater wedge can encroach upstream to the Terminal site. As indicated in the 2019 final EIS, ballast water would generally consist of open ocean water and have a salinity of

approximately 35 parts per thousand. Ballast water is stored in the ship's hull below the waterline; as a result, the temperature of the discharged water is not expected to deviate markedly from that of the ambient water. The pH of the ballast water would be reflective of open ocean conditions and would likely range from 8.1 to 8.5. The pH within the Mississippi River ranges from 7.2 to 7.9 with a median of 7.7 at Belle Chasse, Louisiana, which is less alkaline than seawater. Ballast water is also characterized by low dissolved oxygen and could decrease existing dissolved oxygen levels in the immediate vicinity of the discharge point.

Based on the Terminal location and the minimal volume of discharge (relative to the Mississippi River), the physicochemical profile (in terms of salinity, dissolved oxygen, temperature, and pH) of ballast water from one additional LNG carrier per week would have no measurable effects on local water characteristics. We expect that the discharged ballast water would quickly dilute and normalize in the vicinity of the discharge due to the natural flow within the Mississippi River, and increased salinity would represent a temporary and minor impact on ambient water quality.

While berthed at the Terminal, ship engines would cycle surface water for cooling main engines, generators, condensers, and other shipboard equipment, which increases the temperature of the discharged water. In the Driftwood final EIS (FERC, 2019b), FERC discusses an average LNG carrier cooling water volume of 396,255 gallons per hour. Thus, the daily volume of cooling water discharged from a berthed LNG carrier would be 9,510,120 gallons per day. The discharge is a relatively small volume, representing less than 0.01 percent of the total streamflow in the Mississippi River at the Terminal location. The discharged water could cause a temporary increase in water temperature in the immediate vicinity of the discharge ports, but the discharged water would mix with the surrounding water, aided by strong currents in the Mississippi River, quickly becoming indistinguishable from ambient conditions.

LNG carrier operations could result in the inadvertent release of equipment-related fluids into the Mississippi River at the Terminal location or in the Gulf of Mexico during transit. The introduction of equipment-related fluids into the water would decrease affected water quality. However, depending on the amount of fluid released, impacts on water quality would be temporary and localized. To reduce the potential for an inadvertent release of equipment-related fluids and to address a release should one occur, all vessels with 400 gross tonnage and above, such as LNG carriers, are required by guidelines outlined by the International Maritime Organization under the Marine Environmental Protection Committee to develop and implement a USCG-approved Shipboard Oil Pollution Emergency Plan.

Based on the characteristics of the Mississippi River and the impacts on this waterbody resulting from additional LNG carriers calling on the Terminal, we conclude that increasing the authorized export capacity would not significantly affect water resources.

2.0 AQUATIC RESOURCES

Fisheries and Aquatic Resources

As described in section 4.6.3.1 of the 2019 final EIS, a wide variety of commonly-occurring fish and other aquatic organisms (aquatic invertebrates and plankton) are present within the Mississippi River, as well as recreational and commercial fishing activities. Potential effects on aquatic resources (e.g., fisheries, marine mammals, and protected species) from the Amendment's additional 46 LNG carriers per year would primarily be due to water intakes or discharges while LNG carriers are docked at the Terminal during transfer of LNG to the vessel.

LNG carriers calling on the Terminal are non-jurisdictional facilities. As such, the Commission has no authority to regulate these vessels and cannot require them to adhere to any impact avoidance, minimization, or mitigation measures. Therefore, consistent with the Commission's regulatory authority and its NEPA responsibilities, we are merely disclosing the impacts of their transits through the Gulf of Mexico and the Mississippi River in this analysis.

LNG carriers traversing the Gulf of Mexico and berthed in the Mississippi River (thru the uptake and discharge of marine/estuarine waters or the inadvertent release of equipment-related fluids) would affect fisheries and other aquatic organisms. Changes to water quality, ship generated noise, and the physical disturbance of the water column would affect species present, causing fish to avoid the LNG carriers, and increasing the rates of stress, injury, and mortality experienced by fish and other aquatic organisms.

Surface water would be used for vessel cooling. As discussed above, cooling water intakes would have an average flow rate of about 6,600 gallons per minute. The intake pump would have a suction caisson extending down about 5 feet below the pump entrance and the intake would be screened with ½-inch steel mesh to allow small turtles, fish, and other mobile organisms to avoid entrainment and impingement. When combined with the relatively strong currents in the Mississippi River, this would mitigate the potential for impingement or entrainment of aquatic organisms.

Water discharges would occur from vessel cooling water and ballast discharge. Discharges of cooling water into the Mississippi River may increase ambient water temperatures near the LNG carriers by between 5.4 and 7.2 degrees Fahrenheit (FERC, 2019b). Any effect on sea turtles, fish, and other mobile organisms from this increase in temperature would be minor (affecting the waters in the immediate vicinity of the vessel), intermittent (reflecting up to 1 additional vessel per week), and insignificant due to the small volume of cooling water discharged relative to the total volume of water moving through the Mississippi River and the limited temperature difference. Organisms that may swim close enough to the cooling water discharge ports to detect the temperature difference are expected to swim out of the warmer plume and continue normal activities in the large expanse of unaffected ambient water surrounding the berthing area.

Due to the variable origins of ballast water carried by LNG carriers, the possibility exists of ballast water introducing exotic species into coastal freshwater and marine ecosystems. LNG carriers can harbor marine organisms in ballast water that may be foreign and exotic to the LNG

carrier's port of destination. Ballast water that is introduced into the river at the Terminal site would be composed mainly of Gulf of Mexico open ocean water, up taken through ballast water exchange activities during trans-ocean transit. LNG carriers docking at the Terminal would use a USCG-approved ballast water management system in compliance with 33 CFR 151, as discussed above. Based on the small volume of discharged ballast water relative to the volume of ambient water, and the fact that differences in temperature, salinity, pH, and dissolved oxygen levels are expected to be minor, there should be no measurable effect on aquatic life. Assuming the LNG carriers that visit the Terminal adhere to ballast water discharge rules and regulations, no significant impacts on surface waters and aquatic resources are anticipated.

Therefore, based on the size of the Mississippi River, the fisheries and other aquatic resources present, and the frequency and amounts of water associated with LNG carrier operations and ballast water discharges; we conclude impacts on fisheries and other aquatic organisms from the Amendment would be highly localized, temporary, and not significant.

Essential Fish Habitat

The Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA) was established, along with other goals, to promote the protection of Essential Fish Habitat (EFH) during the review of projects to be conducted under federal permits and licenses or other authorities that affect or have the potential to affect such habitat. EFH is defined in the MSFCMA as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. Federal agencies that authorize, fund, or undertake activities that may adversely affect EFH must consult with National Marine Fisheries Service (NMFS).

As indicated in section 4.6.4.1 of the 2019 final EIS, the portion of the Mississippi River located in the Terminal area does not provide EFH since managed fish species would not be common this far upriver (river mile 55). Therefore, we conclude that the LNG terminal facilities located in the Mississippi River would not effect EFH. EFH is present (and would be traversed by LNG carriers) within the Gulf of Mexico for numerous species including brown shrimp, white shrimp, red drum, and coastal migratory species.

Based on our review of the Amendment and the effects of additional 46 LNG carriers per year calling on the Terminal, it is the view of staff that these vessels may (thru the uptake and discharge of marine waters) affect EFH in the Gulf of Mexico in the same manner as currently authorized for the Project. Effects on EFH could include changes to water quality and the physical disturbance of the water column. Subsequently, fish dependent on affected EFH may experience increased rates of stress, injury, and mortality. However, as described previously, and based on the size of the Gulf of Mexico and the frequency and amounts of water that would be required for LNG carrier operations and ballast, this affect would be highly localized, temporary, minor, and not significant. The measures developed during EFH consultations for the Terminal would continue to remain in effect. Therefore, we conclude that effects on EFH from the Amendment would not be adverse and because these effects are not adverse, an EFH assessment and further consultation with the NMFS is not required.

Federally-listed Threatened and Endangered Species and other Protected Species

Acting as FERC's non-federal representative for Section 7 ESA consultation, Plaquemines LNG initiated consultation with the FWS and NMFS, Protected Resources Division regarding potential impacts on federally-listed threatened and endangered species related to modified LNG carrier operations.

On June 13, 2022, Plaquemines LNG requested an Official Species List report and Consistency Letter using the Louisiana DKey within the FWS Information for Planning and Consultation (IPaC) system to identify federally listed species within the 55-mile river channel segment to be utilized by the LNG carriers and Terminal docking facility. Review of the Official Species List determined that two federally listed species (pallid sturgeon and west Indian manatee) and one candidate species (Monarch butterfly) are known to potentially occur in aquatic or riverbank habitat of the river channel and docking facility. Plaquemines LNG requested concurrence with *not likely to adversely affect* determinations for these species on June 16, 2022. Concurrence was received on June 17, 2022, therefore ESA consultation with the FWS is complete.

Plaquemines LNG requested initiation of informal consultation under the ESA with the NMFS on June 28, 2022.⁴ In this letter, Plaquemines LNG described the proposed action before the Commission, identified and described federally-listed threatened and endangered species and marine mammals known to occur or potentially occurring in the project area, indicated potential occurrence, and anticipated effects of a potential increase in vessel transits. Based on prior consultation with NMFS, ESA-listed species under NMFS' jurisdiction do not occur within the Terminal area, including all marine facilities (LNG loading docks and temporary offloading facilities), along the Mississippi River (NMFS 2019). Plaquemines LNG anticipates the only element of the proposed project that may have the potential to affect ESA-listed species under NMFS' jurisdiction is the expected increase in LNG carrier traffic through the Gulf of Mexico. Species analyzed include four species of whales, five species of sea turtles, and one species each of fish, shark, and ray. On December 1, 2022, the NMFS provided concurrence with the *not likely to adversely affect* determination for NMFS ESA-listed species and/or designated critical habitat. Therefore, ESA consultation for species and/or designated critical habitat under the NMFS's purview is complete.

In addition to the ESA, the Marine Mammal Protection Act (MMPA) prohibits the "take" of marine mammals in U.S. waters without appropriate authorization. As indicated in section 4.6.4.2 of the 2019 final EIS, a total of 25 mammals protected under the MMPA may occur along the LNG transit routes moving between the Mississippi River and the Gulf of Mexico. There is also a potential for bottlenose dolphins to occur in the Mississippi River, and they have been documented in Barataria Bay.

LNG carrier transits to and from the Terminal would disturb the water column and could affect water quality in the immediate vicinity of the ship. Ship generated noise could affect

⁴ Copies of Plaquemines LNG correspondence with the FWS and NMFS are available on FERC's eLibrary at accession number [20220701-5233](#).

marine mammals use of sound to communicate, navigate, avoid predators, mate, and locate food. However, as described previously, and based on the size of the Gulf of Mexico and the frequency of LNG carrier operations, these affects would be highly localized, temporary, minor, and not significant.

There is the potential for interaction and injury to marine mammals and sea turtles during LNG carrier transit in the Gulf of Mexico. LNG carriers could collide with marine mammals and sea turtles, which might cause injury or mortality, although such collisions would be unlikely on the Mississippi River, where established, well-traveled, deep-water shipping lanes are used. Mitigation measures for non-listed marine mammals would be the same as those for listed whales and manatees. As indicated in section 4.7.1.1 of the 2019 final EIS, Plaquemines LNG would provide LNG ship captains with NOAA's Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS, 2008), which outlines collision avoidance measures in order to minimize impacts on marine mammals and sea turtles from vessel strikes. Measures include, but are not limited to, maintaining watch for protected species, maintaining a buffer zone if species are sighted, and engine speed reduction. Plaquemines LNG would provide this document to LNG carrier captains and would advocate compliance with the measures identified in the document. Further, the number of vessel trips to be generated by the Amendment is extremely small compared to the existing vessel traffic within the Gulf of Mexico. We continue to find that implementation of the above-mentioned measures would minimize the risk of collisions with the whale and sea turtle species protected under the ESA, as well as with all marine mammals protected under the MMPA. Based on implementation of the strike avoidance measures, we conclude that the additional vessel trips generated by the Amendment would not result in a measurable increase in the potential for vessel strikes.

We concur with Plaquemines LNG's analysis of impacts on federally-listed threatened and endangered species. We conclude that LNG carriers associated with the Amendment would result in *no effect* and *are not likely to adversely affect* federally-listed threatened and endangered species. Lastly, we conclude that authorizing the Amendment would not affect any other federal or state protected species.

3.0 ENVIRONMENTAL JUSTICE

According to the USEPA, "environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies (USEPA 2020b). Meaningful involvement means:

1. people have an opportunity to participate in decisions about activities that may affect their environment and/or health;
2. the public's contributions can influence the regulatory agency's decision;
3. community concerns will be considered in the decision-making process; and

4. decision makers will seek out and facilitate the involvement of those potentially affected (USEPA 2020b).

In conducting NEPA reviews of proposed natural gas projects, the Commission follows the instruction of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, which directs federal agencies to identify and address the “disproportionately high and adverse human health or environmental effects” of their actions on minority and low-income populations (i.e., environmental justice communities).⁵ Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, also directs agencies to develop “programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.”⁶ The term “environmental justice community” includes disadvantaged communities that have been historically marginalized and overburdened by pollution.⁷ Environmental justice communities include, but may not be limited to minority populations, low-income populations, or indigenous peoples.⁸

Commission staff used USEPA’s Federal Interagency Working Group on Environmental Justice & NEPA Committee’s publication, *Promising Practices for EJ Methodologies in NEPA Reviews (Promising Practices)* (USEPA 2016), which provides methodologies for conducting environmental justice analyses throughout the NEPA process for this Amendment. Commission staff’s use of these methodologies is described throughout this section.

Commission staff used EJScreen 2.0 as an initial step to gather information regarding minority and/or low-income populations; potential environmental quality issues; environmental and demographic indicators; and other important factors. USEPA recommends that screening tools, such as EJScreen be used for a “screening-level” look and a useful first step in understanding or highlighting locations that may require further review.

Meaningful Engagement and Public Involvement

The CEQ’s *Environmental Justice Guidance Under the National Environmental Policy Act* (CEQ 1997) and *Promising Practices* recommend that federal agencies provide opportunities for effective community participation in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of public meetings, crucial documents, and notices.⁹ They also recommend using adaptive approaches to overcome linguistic, institutional, cultural, economic, historical, or other potential barriers to effective participation in the decision-making processes of federal agencies. In addition, Section 8 of Executive Order 13985, *Advancing Racial Equity and Support for*

⁵ Exec. Order No. 12,898, 59 Fed. Reg. 7629, at 7629, 7632 (Feb. 11, 1994).

⁶ Exec. Order No. 14,008, 86 Fed. Reg. 7619, at 7629 (Jan. 27, 2021).

⁷ *Id.*

⁸ See USEPA, *EJ 2020 Glossary* (Aug. 18, 2022), <https://www.epa.gov/environmentaljustice/ej-2020-glossary>.

⁹ 1997 CEQ Guidance at 4.

Underserved Communities Through the Federal Government, strongly encourages independent agencies to “consult with members of communities that have been historically underrepresented in the Federal Government and underserved by, or subject to discrimination in, federal policies and programs.”

As discussed in section A.3, there have been opportunities for public involvement during the Commission’s environmental review processes. FERC’s communication and involvement with the surrounding communities began when the *Notice of Application to Amend and Establishing Intervention and Protest Deadline* was issued in March 2022 and continued with the *Notice of Scoping Period Requesting Comments on Environmental Issues for the Proposed Venture Global Plaquemines LNG Uprate Amendment Project* (NOS) in May 2022. These notices were mailed to the parties on FERC’s environmental mailing list, which included federal and state resource agencies; elected officials; environmental groups and non-governmental organizations; Native American Tribes; potentially affected landowners (as defined by the Commission’s regulations); local libraries and newspapers; and other stakeholders who had indicated an interest in the Amendment. Prior to application filing on March 11, 2022, Plaquemines LNG met with community and industry leaders to provide an update on activities, including this application. Plaquemines LNG provided a summary of outreach conducted over the last seven months, which include over 70 meetings held with local government and elected officials, and more than 40 meetings with organizations and neighboring communities.¹⁰ Commission staff also included environmental justice stakeholders on the mailing list, as well as local churches, schools, community centers, retail establishments, public health clinics, and community groups to engage the environmental justice communities near the Project. Issuance of the Notice of Application and the NOS opened separate 20 day and 30-day scoping periods, respectively.

Regarding future engagement and involvement, in 2021, the Commission established the Office of Public Participation (OPP) to support meaningful public engagement and participation in Commission proceedings. OPP provides members of the public, including environmental justice communities, landowners, Tribal citizens, and consumer advocates, with assistance in FERC proceedings—including navigating Commission processes and activities relating to the Amendment.

We recognize that not everyone has internet access or is able to file electronic comments. Each notice was physically mailed to all parties on the environmental mailing list. Further, FERC staff has consistently emphasized in meetings with the public that all comments, whether spoken or delivered in person at meetings, mailed in, or submitted electronically, receive equal weight by FERC staff for consideration in the EIS.

FERC received comments from the Sierra Club, Healthy Gulf, and Deep South, concerning the EA’s environmental justice analysis:

Sierra Club and Healthy Gulf state FERC must conduct an EIS to evaluate projected environmental and health impacts of nitrogen dioxide (NO₂) NAAQS exceedances and their

¹⁰ Accession no. 20221114-5200

added burden to environmental justice communities, citing a lack of confidence in the existing air pollution monitoring system. Based on the previously performed air dispersion modeling for the Terminal, coupled with updated projected emissions from additional marine vessel trips, the proposed Project would not cause or contribute to a violation of the NAAQS, and no exceedances of NO₂ are associated with the Project. Air quality is discussed further below and in section B.4., Air Quality.

Deep South comments that: 1) The FERC must not only quantify the additional tons of emissions that will be generated as a result of this uprate, but also fully account for the impending climate change, environmental, economic, and public health effects of this proposed project; and 2) FERC must look at not only the uprate, but the steps of exploration, hydraulic fracturing, extraction, processing, pipeline construction and transport, shipment, re-gasification, and delivery that will all be increased as a result of Plaquemines LNG's increased liquefaction capacity. Air emissions are addressed in section B.4; climate change and upstream impacts are addressed in section B.6.2. In regard to natural gas development and transportation, the Commission does not have a program to direct the development of the natural gas industry's infrastructure, either on a broad regional basis or in the design of specific projects and does not engage in regional planning exercises. As the Commission acts on individual applications, we provide a project-specific analysis here to encompass impacts caused by the increased vessel traffic associated with this Amendment.

As stated in section A.4, the requested increase in the Terminal's authorized peak liquefaction capacity does not involve the construction of any new facilities nor any modification of the previously authorized facilities that would invalidate or increase the previously assessed impacts above those that the existing authorization is based upon. Section B.4 states that Amendment operation (i.e., uprate) would not result in changes to the existing, permitted emissions of the facility and would not require modifications to the existing air permits. However, emissions have changed from those estimated in the 2019 final EIS due to the projected increase in marine vessel traffic. Therefore, as appropriate, we address these emission impacts on environmental justice communities and comments received below.

Identification of Environmental Justice Communities

According to the CEQ's *Environmental Justice Guidance and Promising Practices*, minority populations are those groups that include: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Following the recommendations set forth in *Promising Practices*, FERC uses the **50 percent** and the **meaningfully greater analysis** methods to identify minority populations. Using these methodologies, minority populations exist when either: (a) the aggregate minority population of a block group in the affected area exceeds 50 percent; or (b) the aggregate minority population of a block group in the affected area is 10 percent higher than the aggregate minority population percentage in the county. The guidance also directs low-income populations to be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau. Using *Promising Practices*' **low-income threshold criteria** method, low-income populations exist when the percentage of low-income population in the identified block group is equal to or greater than that of the county. Here, Commission staff selected Plaquemines and Jefferson Parish, as the comparable reference community to ensure that affected environmental justice communities are properly identified. A

reference community may vary according to the characteristics of the particular project and the surrounding communities.

Table 2 identifies the minority populations by race and ethnicity and low-income populations within Louisiana, for the parish affected, and census block groups¹¹ within a 17.92-kilometers radius of the Terminal.¹² We believe the 17.92-kilometer radius is sufficiently broad considering the likely concentration of air emissions impacts proximal to the Terminal.¹³ In addition, table 2 identifies minority and low-income populations along the LNG vessel transit route. To ensure we are using the most recent available data, we use U.S. Census American Community Survey File# B03002 for the race and ethnicity data and Survey File# B17017 for poverty data at the census block group level. As presented in table 2, minority and low-income populations exist within the Amendment area. Figure 1 provides a geographic representation of potential environmental justice communities relative to the location of the Terminal. Figure 2 provides a geographic representation of potential environmental justice communities relative to the LNG vessel transit route.

The Terminal is within Census Tract (CT) 504, Block Group (BG) 1, which is an environmental justice community. An additional six block groups are within the 17.92-kilometer radius for the Terminal site. Out of seven total block groups within this radius, six are identified as environmental justice communities (figure 1). One of the block groups is identified as an environmental justice population based on the minority threshold alone (CT 504, BG 1); two are based on the low-income threshold alone (CT 504, BG 3, and CT 279.03, BG 2); and three are identified as an environmental justice population based on both the minority and low-income thresholds (CT 501, BG 1; CT 501, BG 2, and CT 505 BG 1).

An additional eight block groups along the transit route for LNG vessels are identified as environmental justice communities. Two of the block groups is identified as an environmental justice population based on the minority threshold alone (CT 507, BG 2 and CT 505, BG 2); three based on both the minority and low-income thresholds (CT 505, BG 3; CT 506, BG 2, and CT 507, BG 1); and three are identified as an environmental justice populations based on low-income threshold only (CT 506, BG 1; CT 508, BG 1, and CT 508, BG 2) (figure 2).

¹¹ Census block groups are statistical divisions of census tracts that generally contain between 600 and 3,000 people.

¹² Table 4.11-8 of 2019 FEIS, accession no. 20190503-3011

¹³ The radius represents a conservative distance based on the radius of impact (ROI) for air quality, which is the distance from the center of the facility to the further receptor (in this case 17.92 kilometers for 1-hour NO₂) that is equal or greater than the Significant Impact Level (SIL). See section B.4 Air Quality for further discussion. The ROI is consistent with the previously determined ROI for the Plaquemines LNG facility as the SIL would not be increased due to the addition of the additional vessel trips.

**Table 2
Minority Populations by Race and Ethnicity and Low-Income
Populations in the Project Area**

State/Parish/ Census Block Group/(Census Tract, Block Group)	Total Population	White, non- Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian or Other Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Total Minority ^b (%)	Population Below Poverty Level ^b (%)
Louisiana	4,664,616	58.3	31.9	0.5	1.7	0.0	0.3	2.0	5.2	41.7	18.1
<i>Plaquemines Parish</i>	23,305	63.5	18.7	1.3	4.1	0.1	0.1	4.6	7.6	36.5	18.6
CT 501, BG 1	754	0	98.9	0	0	0	0	1.1	0	100.0	67.1
CT 501, BG 2	458	58.1	39.3	0	0	0	0	0	2.6	41.9	28.9
CT 504, BG 1 (Terminal Site)	834	35.9	53.8	6.3	0.0	0.0	0.6	0.0	0.0	60.6	0.0
CT 504, BG 2	845	72.3	10.3	0	0	0	0	10.8	6.6	27.7	15.5
CT 504, BG 3	1,780	80.8	17.4	0.4	0	0	0.4	1	0	19.2	21.5
CT 505, BG 1	355	3.4	74.1	12.7	0	0	0	9.9	0	96.6	50.4
CT 505, BG 2 (Vessel route only)	870	7.2	48.6	0	0	0	0	44.2	0	92.8	11.2
CT 505, BG 3 (Vessel route only)	583	33.7	32.4	0	3.6	0	0	27.8	2.7	66.3	57.9
CT 506, BG 1 (Vessel route only)	622	61.8	5.5	0	21.5	0	0	4.9	6.4	38.2	37.7
CT 506, BG 2 (Vessel route only)	502	15.4	53	0	15.1	0	6.9	9.7	0	84.6	30.5
CT 507, BG 1 (Vessel route only)	831	51.5	7.2	0	40.0	0	0	1.4	0	48.5	28.6
CT 507, BG 2 (Vessel route only)	385	46.2	0	0	45.6	0	0	8.2	0	53.8	11.49
CT 508, BG 1 (Vessel route only)	448	59.4	9.2	2.3	0	3.8	0	6.5	25.4	40.6	20.3
CT 508, BG 2 (Vessel route only)	534	63.9	20.4	10.2	0	0	3.8	1.8	3.8	36.1	25.7
<i>Jefferson Parish</i>	434,903	52.0	27.0	<0.1	4.0	<0.1	<0.1	2.0	15.0	48.0	17.3
CT 279.03, BG 2	321	85.4	1.9	0.0	0.0	0.0	0.0	6.2	6.5	14.6	30.0

Source: U.S. Census Bureau (2020). File # B03002 and File # B17017, 5-year American Community Survey (2016-2020).

- a. “Minority” refers to people who reported their ethnicity and race as something other than non-Hispanic White.
- b. Low-income or minority populations exceeding the established thresholds are indicated in bold type. Due to rounding differences in the dataset, the totals may not reflect the sum of the addends.

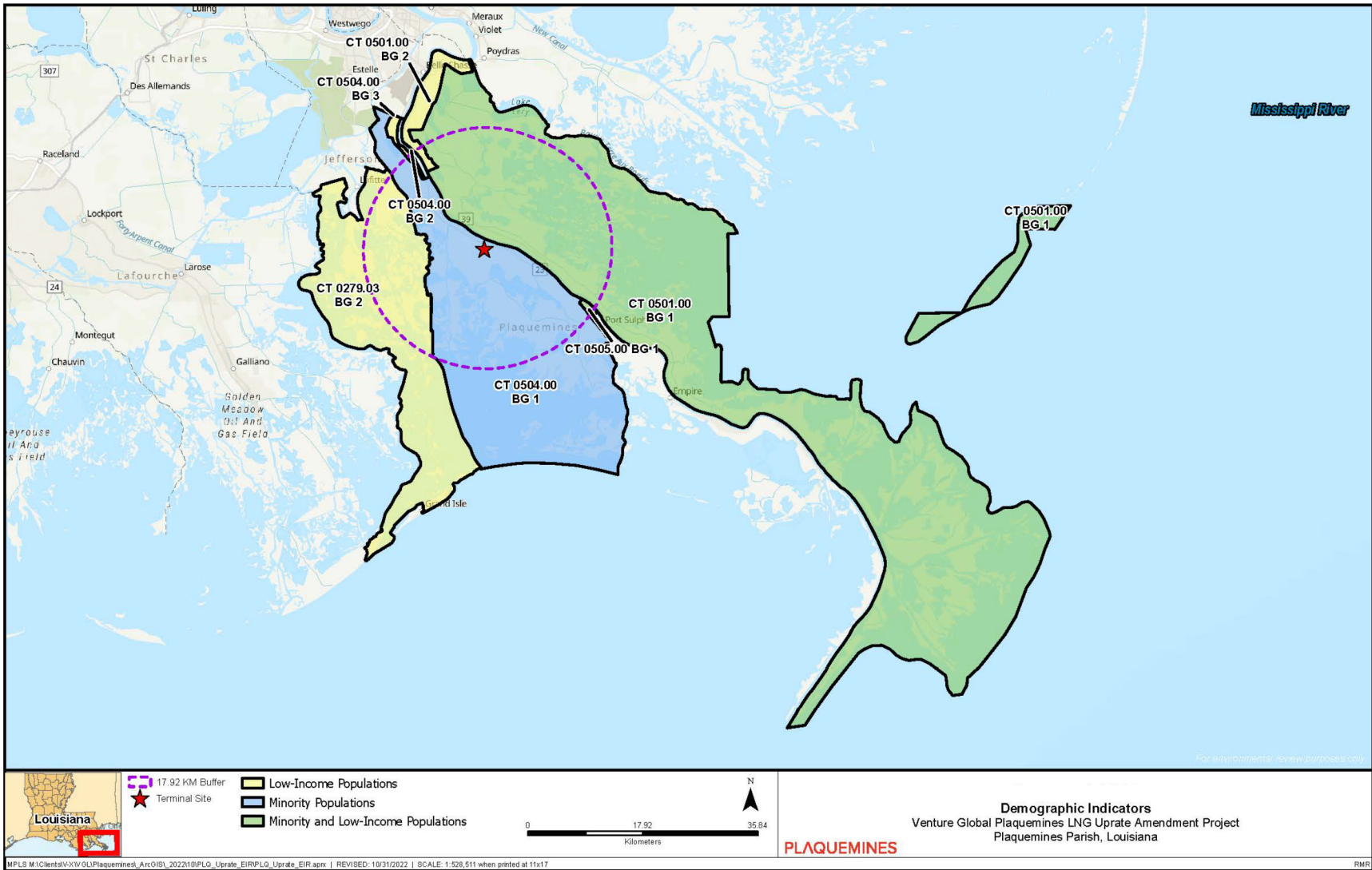


Figure 1

Impacts on Environmental Justice Communities

As previously described, *Promising Practices* provides methodologies for conducting environmental justice analyses. Issues considered in the evaluation of environmental justice include human health or environmental hazards; the natural physical environment; and associated social, economic, and cultural factors. Consistent with *Promising Practices* and Executive Order 12898, we reviewed the Amendment to determine if its resulting impacts would be disproportionately high and adverse on minority and low-income populations and also whether impacts would be significant.¹⁴ *Promising Practices* provides that agencies can consider any of a number of conditions for determining whether an action will cause a disproportionately high and adverse impact.¹⁵ The presence of any of these factors could indicate a potential disproportionately high and adverse impact. For this Project, a disproportionately high and adverse effect on an environmental justice community means the adverse effect is predominantly borne by such population. Relevant considerations include the location of Project facilities and human health and environmental impacts on identified environmental justice communities, including direct, indirect, and cumulative impacts. The analysis of impacts is included in this section.

Project work within the identified environmental justice community (CT 504, BG 1) includes a revised estimate of peak LNG production and export capability based on updated engineering and vendor data, reflecting actual equipment performance. The Amendment does not require the construction of new facilities or the modification of previously authorized facilities.

Impacts from the Amendment are identified and discussed throughout this document. Factors that could affect environmental justice communities include operational air impacts, visual, and GHG (which is discussed under cumulative impacts). In general, the magnitude and intensity of the aforementioned impacts would be greater for individuals and residences closest to the Terminal and would diminish with distance. These impacts are addressed in greater detail in the air quality, reliability and safety, and cumulative sections of this EA. Environmental justice concerns are not present for other resource areas such as geology, groundwater, surface water, wetlands, wildlife, threatened and endangered species, noise, transportation, or cultural resources due to the minimal overall impact the Amendment would have on these resources.

Visual Resources

With respect to visual impacts on environmental justice populations, the Project area is predominately characterized as industrial, with an estimated 243,363 vessel trips occurring along the Mississippi River between Baton Rouge and the Mouth of Passes at the Gulf of Mexico

¹⁴ See *Promising Practices* at 33 (stating that “an agency may determine that impacts are disproportionately high and adverse, but not significant within the meaning of NEPA”).

¹⁵ See *Promising Practices* at 45-46 (explaining that there are various approaches to determining whether an impact will cause a disproportionately high and adverse impact). We recognize that CEQ and EPA are in the process of updating their guidance regarding environmental justice and we will review and incorporate that anticipated guidance in our future analysis, as appropriate.

annually. We estimate approximately 46 additional LNG carrier trips each year, which represents a 0.0004 percent increase in vessel traffic in the area. The Terminal is situated on the Mississippi River in an environmental justice community, with residences and non-residential receptors located along both sides of the waterbody. Although the additional vessels would be visible to residences and non-residential receptors, due to the current high levels of vessel traffic within the lower reach of river, the incremental visual impacts would likely not be perceptible. Visual impacts on environmental justice communities would be less than significant.

Air Quality

As discussed in section B.4, emissions from the Amendment are limited to transient vessel emissions from the increased number of LNG transport vessels. Section B.4 states that Amendment operation would not result in changes to the existing, permitted emissions of the facility and would not require modifications to the existing air permits. However, though the radius of impact (ROI) would remain the same as previously assessed during air dispersion modeling for the Terminal operational activities, estimated operational emissions have changed from those estimated in the 2019 final EIS, due to the projected increase in marine vessel traffic.

The USEPA has promulgated the National Ambient Air Quality Standards (NAAQS) to protect human health and welfare. The NAAQS include primary standards, which are designed to protect human health, including the health of sensitive subpopulations such as children and those with chronic respiratory problems. The NAAQS also include secondary standards designed to protect public welfare, including economic interests, visibility, vegetation, animal species, and other concerns not related to human health. Areas meeting the NAAQS are termed attainment areas, and areas not meeting the NAAQS are termed nonattainment areas. Areas that have insufficient data to make a determination of attainment or nonattainment are unclassified or are not designated but are treated as being attainment areas for permitting purposes. The attainment designation of an area is determined on a pollutant-by-pollutant basis and for each established primary standard.

The Amendment would be in Plaquemines Parish, Louisiana, which is designated as attainment for all criteria pollutants. The Project would not cause or significantly contribute to an exceedance of the NAAQS and would not result in a significant increase in air quality impacts in the region. Although the Amendment would be in compliance with the NAAQS and the NAAQS are designated to protect sensitive populations, we acknowledge that NAAQS attainment alone may not assure there is no localized harm to such populations due to operational changes. Air quality impacts are more fully addressed in section B.4.

Determination of Disproportionately High and Adverse Impacts on Environmental Justice Communities

As described throughout this EA, the Amendment would have a range of impacts on the environment and on individuals living in the vicinity of the Project facilities, including environmental justice populations. Fourteen out of fifteen block groups within the geographic scope of analysis are considered environmental justice populations. Visual impacts due to increased vessel traffic, although visible to environmental justice communities, would not likely be perceptible due to the large volume of vessel traffic. The proposed increases in emissions

from the Amendment would be limited to an increase in transient marine vessel traffic to and from the Terminal. Emission estimates have increased from those previously analyzed by Commission staff as a result of the capacity uprate, and would have permanent air quality impacts on individuals living in the vicinity of the Terminal facilities and along the vessel transit route, including environmental justice populations. However, because the Amendment would not cause or significantly contribute to an exceedance of the NAAQS and the Amendment would not result in a significant increase in air quality impacts in the region, we conclude Amendment impacts on environmental justice communities would be less than significant as defined by NEPA.

In conclusion, impacts from the Amendment would be disproportionately high and adverse as they would be predominantly borne by environmental justice communities. However, these impacts would be less than significant.

4.0 AIR QUALITY

Local and regional air quality in the Terminal area would potentially be affected by the Amendment. This section characterizes the existing air quality, discusses the difference in emissions between the 2019 final EIS and the estimated emissions disclosed in Amendment application, and describes potential impacts on air quality regionally and locally.

Existing Air Quality

Ambient air quality is protected by the Clean Air Act of 1970, as amended in 1977 and 1990. The USEPA oversees the implementation of the Clean Air Act and establishes the NAAQS to protect human health and welfare (USEPA 2020).¹⁶ NAAQS have been developed for seven “criteria air pollutants,” These criteria pollutants are ground-level ozone (O₃), carbon monoxide (CO), Oxides of Nitrogen NO_x, sulfur dioxide (SO₂), fine particulate matter (i.e., inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns [PM₁₀] and less than or equal to 2.5 microns [PM_{2.5}]), and airborne lead. Ozone is not emitted into the atmosphere from an emissions source but develops as a result of a chemical reaction between NO_x and VOC in the presence of sunlight; therefore, NO_x and VOCs are often referred to as O₃ precursors and are regulated to control the potential for O₃ formation. The NAAQS include primary standards that are designed to protect human health, including the health of “sensitive” individuals such as children, the elderly, and those with chronic respiratory problems. The NAAQS also include secondary standards designed to protect public welfare, including visibility, vegetation, animal species, economic interests, and other concerns not related to human health.

Combustion of fossil fuels also produces VOCs, a large group of organic chemicals that have a high vapor pressure at room temperature, and NO_x. VOCs react with NO_x, typically on warm summer days, to form O₃, which is another criteria air pollutant. Other byproducts of combustion are GHG and Hazardous Air Pollutants (HAPs). HAPs are chemicals known to

¹⁶ The current NAAQS are listed on the USEPA’s website at <https://www.epa.gov/criteria-air-pollutants/naqs-table>.

cause cancer and other serious health impacts. Other pollutants, not produced by combustion, are fugitive dust and fugitive emissions. There are no national air quality standards for HAPs, but their emissions are limited through permit thresholds and technology standards.

States have the authority to adopt ambient air quality standards if they are at least as stringent as the NAAQS. While states can promulgate more stringent standards than the NAAQS, the Louisiana Department of Environmental Quality (LDEQ) has adopted all the NAAQS established by the USEPA.

Sierra Club and Healthy Gulf filed comments stating that the Louisiana air permitting process is insufficient to ensure NAAQS compliance. The LDEQ reviews active facility emissions on an annual basis to ensure compliance with operating permits. Failure to comply with the conditions of the permit would require mitigation efforts.

The USEPA, state, and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the United States. The data are then averaged over a specific time period and used by regulatory agencies to determine compliance with the NAAQS and to determine if an area is in attainment (criteria pollutant concentrations are below the NAAQS), nonattainment (criteria pollutant concentrations exceed the NAAQS), or maintenance (area was formerly nonattainment and is currently in attainment). Plaquemines Parish is currently in attainment with the NAAQS.

GHGs occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO₂), methane, and nitrous oxide. GHGs' status as a pollutant is not related to toxicity, as they are non-hazardous to health at normal ambient concentrations. GHGs absorb infrared radiation in the atmosphere, and an increase in emissions of these gases is the primary cause of warming of the climatic system.¹⁷ GHGs occur in the atmosphere both naturally and as a result of fossil-fuel combustion and land use change. The primary GHGs that would be emitted by the Project are CO₂, methane, and nitrous oxide. Emissions of GHGs are typically quantified and regulated in units of CO₂ equivalents (CO₂e). The CO₂e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO₂. Thus, CO₂ has a GWP of 1, methane has a GWP of 25, and nitrous oxide has a GWP of 298.¹⁸ There are no applicable ambient standards or emission limits for GHG under the CAA.

¹⁷ Further information regarding GHGs and increasing levels of CO₂ can be found at <https://www.epa.gov/climate-indicators>

¹⁸ These GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs the USEPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

Amendment Emissions

Plaquemines LNG states that the changes described as the basis for increased production capacity would not increase the levels of any criteria pollutants or GHG emissions above what was authorized by the terminal's air permit issued by the LDEQ. The air permit conservatively used the daily LNG maximum production fuel gas rate annualized without consideration for downtime. The proposed Amendment is not expected to result in any emissions changes that would require an increase in the facility's LDEQ permitted potential to emit; therefore, no air permit amendment or alteration would be required to authorize the production capacity increase. An amendment to the LDEQ air permit would be submitted to reflect detailed design updates and vendor guarantees prior to operation of the facility as part of the normal progression of the Project facilities approved in the 2019 Order in Docket No. CP17-66-000.

The effect of proposed changes in the Amendment would be to increase equipment availability and align the authorized liquefaction capacity with the maximum design LNG production capability of the Project facilities. The production capacity requested can be achieved without any design modifications, additional construction, air permit amendment, or exceedance of the emission rates documented in the LDEQ permit, if larger capacity LNG carriers (185,000 cubic meters [m³]) are used. Plaquemines LNG expects the majority of the LNG carriers will be in the range of 165,000 to 185,000 m³. It is estimated that the Project's LNG carrier traffic could increase from 310 to 356 vessel transits per year. Table 3 presents the potential change in vessel operational emissions.

If an incremental increase in LNG carriers occurs, the Amendment would, during normal operation, result in increases to boil-off gas (BOG). The facility is designed to recover all BOG from loading operations at the marine berths into the facility fuel gas system. BOG from the berth increases during ship loading activity, which reduces the amount of fuel from feed gas make-up required for the facility. No increase in GHG emissions is expected, and since any additional boil-off gas would displace fuel from feed gas make-up, overall fuel consumption in loading operations would not change.

The Amendment is not anticipated to increase emission estimates; if an increase in LNG carriers per year becomes necessary due to fleet availability, the incremental emissions would be de minimus. Based on the nature of the Amendment and minimal potential for changes to emissions as analyzed in the 2019 final EIS and LDEQ's air permits for the Terminal, we conclude the Amendment would not have significant impact on air quality in the area.

Table 3			
Change In Marine Vessels Operational Emissions			
Pollutant	Pre-Amendment Marine Vessel Operational Emissions¹	Post-Amendment Marine Vessel Operational Emissions²	Change in Emissions³
	tpy	tpy	tpy
PM ₁₀	7.4	8.4	(+) 1.0
PM _{2.5}	6.7	7.6	(+) 0.9
SO ₂	12.6	14.3	(+) 1.7
NO _x	140	160	(+) 20
CO	72	82	(+) 10
VOC	22	25	(+) 3
CO _{2e}	31,942	36,446	(+) 4,504
<p>1. Based on 312 LNG carriers per year, Table 4.11-4 (Final Operational Emissions) of the Final Environmental Impact Statement for the Plaquemines LNG and Gator Express Pipeline Project, Docket Nos. CP17-66-000 and CP17-67-000, May 2019. Available at https://www.energy.gov/sites/prod/files/2019/05/f62/final-eis-0539-plaquemines-lng-2019-05-1chapters.pdf</p> <p>2. Based on prorated emissions from the increased number of LNG carriers, tugboats, and pilot boats.</p> <p>3. Based on 356 LNG carriers per year.</p>			

5.0 RELIABILITY AND SAFETY

The regulatory oversight, hazards, and engineering designs remain largely unchanged from that analyzed in the 2019 final EIS for the Plaquemines LNG Project in Docket No. CP17-66-000. Venture Global states the increased peak liquefaction capacity achievable during optimal conditions does not involve construction of new facilities, or modification to facilities approved in the 2019 Order under CP17-66-000. Rather, Venture global indicates the increase in peak liquefaction is due to refined assessments that more accurately reflects conditions and assumptions concerning liquefaction capacity instead of more conservative estimations which formed the basis of the 2019 final EIS. However, FERC staff observed certain design progressions since the authorized design in the final design, and any design changes in final design would be reviewed in accordance with the 2019 Order, as discussed futher below.

Process Design

Venture Global requests under this application to increase their peak liquefaction and export capacity to 27.2 MTPA from 24.0 MTPA. LNG facilities experience some losses from liquefaction rundown due to flashing of LNG into natural gas as it depressurizes upon entering the LNG storage tank and due to boil-off of LNG into natural gas from heat gain through the LNG storage tank and piping. The Plaquemines LNG facility collects and compresses the LNG that flashes, vaporizes, and boils off for use as fuel gas. Therefore, all of the LNG rundown from the liquefaction process is not available for export. FERC staff reviewed the Heat and Material Balances (HMB) filed under this application and confirmed the peak liquefaction rate exceeds the export rate. Furthermore, the HMBs provided with the amended application support a peak liquefaction rate of 27.2 MTPA under peak design at average ambient temperature conditions or cold ambient temperature conditions.

FERC staff reviewed the available HMBs to assess the nature of the increased gross liquefaction capacity. Plaquemines LNG stated in the amended application that the increase in peak liquefaction does not propose construction of any new facilities, modification of authorized facilities, or new environmental permits or amendments to existing permits. However, certain process designs have progressed since the design analyzed in the 2019 final EIS and authorization in the 2019 Order under docket number CP17-66-000. For example, the process flow diagrams (PFD) for the amended application indicate the flow paths have been updated, such that feed gas from the pipeline does not require a feed gas compressor, and instead the feed gas directly enters the pre-treatment process. The design previously assessed in the 2019 final EIS also included space for connections to a future tie in to a mercury removal unit, and the amended application PFDs now includes a mercury removal unit consistent with Condition 41 of the 2019 Order. The mercury removal unit would safeguard their equipment and reduce the likelihood of potential losses of containment because mercury can react with damaging effects with downstream aluminum heat exchangers. In addition, the feed gas heater is now proposed to be located downstream of the mercury removal unit, instead of upstream of the mercury removal tie-in as part of the bypass line around the previously proposed feed gas booster compressor as assessed in the 2019 final EIS. The updated process design also does not have the previously included non-regenerative hydrogen sulfide (H₂S) removal beds and instead sends feed gas from the mercury removal units through a feed gas heater into the acid gas removal units. After the acid gas removal units the updated process design now includes new hybrid pretreatment units trains that would be designed to remove components, including heavier hydrocarbons and moisture, that could freeze out and clog the liquefaction equipment or would otherwise be incompatible with the liquefaction process or equipment as oppose to removing heavier hydrocarbons within the main cryogenic heat exchanger.

The refinements in process design results in feed gas from the pipeline entering the mercury removal units to limit mercury concentrations to less than 0.01 micrograms per normal cubic meter. Then, the feed gas would pass through a feed gas heater and enter the acid gas removal unit to remove CO₂ and H₂S from the feed gas. This stream then enters new hybrid pretreatment unit trains that removes heavy hydrocarbons and moisture before the dry treated gas enters the feed gas booster compressor to increase pressure prior to entering the liquefaction trains. The Liquefaction Project proposes to install 36 liquefaction trains (2 trains per liquefaction block), each consisting of a brazed aluminum heat exchanger (BAHX). The LNG

exiting the BAHX would be routed and stored in four full-containment LNG storage tanks. Plaquemines LNG must request approval of these modifications prior to implementing them in their final design. All subsequent changes to the final process design and associated layers of protection would be reviewed in accordance with Condition 32 of the 2019 Order or as necessary reviewed under Condition 1 of the 2019 Order. In addition, reviews and approvals of the process designs would be required in accordance with Conditions 33 and 36 through 59 of the 2019 Order.

FERC staff assessed the differences between the CP17-66-000 application HMBs and the CP22-92-000 liquefaction capacity increase HMBs which were used to assess process efficiency and operating capabilities of key components of the pretreatment and liquefaction process systems across various ambient temperature conditions and gas compositions. As a result of the updated HMBs, a few process streams would see higher operational flow rates, pressures, and temperatures from those authorized in the CP17-66-000 liquefaction project. In addition, the facility would include many utilities and associated auxiliary equipment. The major auxiliary systems required for the operation of the liquefaction facility include fuel gas, hot oil, instrument and utility air, water, demineralized water, steam, nitrogen, power generation, and flares. The process system design includes three flare systems: warm (wet), cold (dry), and low pressure flares each routed to a separate flare stack that would be designed to handle the vent gases from the process areas. The sizing of these flares would be further assessed during final design to ensure they are properly design based on updates from the authorized preliminary design. Boil-off Gas Flowrates that were used for the low pressure flare design sizing are proposed to be increased. Design margins would also need to be assessed for the warm flare design sizing using selected equipment data to confirm the sizing. Lastly, the equipment and relief valves contributing to the design sizing for the cold flare would also be finalized during detailed design. Reviews and approvals of the sizing basis and capacity for the final design of the flares are required prior to construction of final design, specifically in accordance with Condition 58 of the 2019 Order.

Mechanical Design

FERC staff reviews applications of LNG export terminals for the adoption and implementation of industry codes and standards, and that process piping and vessels are designed to ASME B31.3 and ASME Section VIII, respectively. During the CP17-66-000 final design and construction phase, FERC staff verifies piping and vessel material selection is appropriately selected for the expected process conditions and in accordance with Venture Global's and their EPC's quality assurance and control program upon material receipt. Since the operating process pressures and temperatures have changed from the reviewed and authorized design, the impact to the piping and vessel material selection would be further assessed during final design. Piping specifications were assessed from piping and instrumentation diagrams filed in the application and most piping specifications were verified to be adequate for higher pressures, however, with the addition of the feed gas booster compressor after the new hybrid units, the piping specification and design pressures in the liquefaction trains and BAHX would need to be reviewed prior to construction of final design. FERC staff would review the final specifications to ensure they are consistent with any revised heat and material balances, piping and instrumentation diagrams, and change logs in accordance with Conditions 32, 36, and 40 of the

2019 Order prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

FERC staff also reviewed the piping velocities in streams which would have a higher flowrate because of the uprated liquefaction capacity. FERC staff found that the velocities of some streams were at the higher end of recommended limits from industry recommendations, however the velocities should not present erosional concerns which would increase the risk of leaks or piping failures. Process streams in the liquid phase with higher flowrates may also impact the mechanical design through dynamic surge effects following valve closures and pump startup. Several liquid streams will experience elevated flowrates with the uprated performance, including, but not limited to, LNG rundown from the liquefaction trains, mixed refrigerant, hot oil, and amine. Therefore, FERC staff would review the final evaluation of dynamic pressure surge effects from valve opening and closure times and pump startup and shutdown operations in accordance with Condition 51 of the 2019 Order prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

Another feature of the mechanical design associated with safety is pressure relief valves, which protect equipment and piping from overpressure events caused by either process upsets, or external events such as a fire. FERC staff would review the final design of pressure relief valves in accordance with Conditions 36, 40, 58, and 59 of the 2019 Order to ensure they account for changes prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

We also note that the withdrawal rate from the LNG tank remains unchanged, such that vacuum scenarios are not expected to change. FERC staff would review the pressure or vacuum relief design, including if there were any changes, in accordance with Conditions 36, 40, and 58 of the 2019 Order prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

Hazard Mitigation Design

The hazard mitigation layers of protection at the Plaquemines LNG facility conditionally authorized in the 2019 Order are numerous and varied. These mitigation measures work to contain and direct hazardous fluid spills to safe and remote areas, prevent ignition of flammable releases, detect hazardous fluid releases and ignitions, and reduce escalation of incidents.

Spill Containment

We received comments from Sierra Club citing concerns on spills resulting from Amendment activities. As previously described in 2019 final EIS under docket number CP17-66-000, in the event of a release, sloped areas at the base of storage and process facilities would direct a spill away from equipment and into the impoundment system. This arrangement would minimize the dispersion of flammable vapors into confined, occupied, or public areas and minimize the potential for heat from a fire to impact adjacent equipment, occupied buildings, or public areas if ignition were to occur.

Plaquemines LNG proposed four full-containment LNG storage tanks, where the outer tank wall would also serve as the impoundment system in addition to a berm (i.e., 26-foot

storm surge barrier) around the facility. The berm would prevent liquid in the storage tank area from flowing off-site in the event of an outer tank impoundment failure. Likewise, in the LNG transfer area, Plaquemines proposes to install an impoundment basin between the LNG Storage tanks in order to mitigate a potential spill from the LNG transfer line. There is also an LNG spill impoundment basin that will be installed at each marine berth area as well as containment for the pipe in pipe system for LNG transfer lines. Each of the aforementioned spill containment design proposals are further discussed in the 2019 final EIS under docket number CP17-66-000. FERC staff reviewed the Plaquemines LNG spill containment design features for the LNG storage tanks, the LNG transfer area, marine areas, and the pipe-in-pipe system and concluded that the spill containment design would not be impacted by the increase in the peak liquefaction export capacity since the changes to process conditions associated with the liquefaction capacity increase occur upstream of the LNG tanks. These spill containment systems are designed based on the sizing of the LNG storage in tank pump discharge and in this case the spill containment sizing scenarios would not change. However the peak liquefaction could impact the process area spill containment design. In the Process Area, Plaquemines LNG proposes to install a Process Area Impoundment Basin near each of the two liquefaction trains. These basins would collect a potential spill from the liquefaction equipment and piping in the process area. FERC staff reviewed the updated HMBs for the increased peak liquefaction capacity and determined that there is potential that the authorized design of the process area impoundment basin may not be able to contain a potential spill in this area. FERC staff would review the final spill containment design in accordance with Conditions 30, 61, and 68, in the 2019 Order prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

Plaquemines LNG also proposed a Refrigerant Impoundment Basin designed to contain a spill from the refrigerant storage tanks and refrigerant truck transfer area as well as diked or curbed impoundments for each of the solvent, hot oil, diesel and aqueous ammonia storage tanks, as well as the diesel/hot oil truck transfer area. FERC staff reviewed and found that the refrigerant storage impoundment basin and other diked and curbed impoundments as described above would not be impacted by the increase peak liquefaction capacity as these impoundments would be designed based on the size of the vessels holding these hazardous fluids.

Spacing and Plant Layout

The 2019 final EIS discusses the Plaquemines LNG facility must meet the requirements of 49 CFR 193 Subparts C, D, and E, which incorporate NFPA 59A (2001). NFPA 59A (2001) includes requirements for spacing and plant layout, and further references NFPA Standards 30, NFPA 58, and NFPA 59 for additional spacing and plant layout requirements. LNG facilities, as defined in 49 CFR 193, must comply with the requirements of 49 CFR 193 and would be subject to USDOT's inspection and enforcement programs.

In addition, we evaluated the spacing and plant layout in the 2019 final EIS to determine if there could be cascading damage and to inform what low temperature and fire protection measures may be necessary for structural supports and equipment. Included in the assessment was flammable or toxic vapor ingress into building and combustion air intakes, flammable vapors reaching areas that could result in cascading damage from explosions, overpressures from

vapor cloud explosions that could result in cascading damage to surrounding equipment, and pool and jet fires that could result in cascading damage.

The spacing and layout is not significantly impacted by the increased liquefaction capacity as hazard distances are minimally impacted with the increases of the operational pressures and temperatures from those proposed in the CP17-66-000 liquefaction project. FERC staff would review the final design of the layout and spacing in accordance with Conditions 32, 65, 74, 82-85, 87, and 94, in the 2019 Order prior to any approvals being granted under the 2019 Order.

Ignition Controls

To prevent the ignition of unintentionally released hazardous fluids, hazardous area zones around potential leak sources are used to define electrical classification drawings based on industry codes such as NFPA 59A, 70, 497, and American Petroleum Institute (API) Recommended Practice 500. Depending on the potential risk of an area containing hazardous fluids, the area is designated either unclassified, Class 1 Division 1, or Class 1 Division 2 and a Group based on associated maximum experimental safety gap and ignition energy properties. Equipment installed in these areas is then rated accordingly to prevent ignition from a release. In addition, submerged electric motor pumps and instrumentation that have a direct interface with a flammable fluid must be equipped with electrical process seals, and leak detection in accordance with NFPA 59A (2001) and NFPA 70 at each interface between a flammable fluid system and an electrical conduit or wiring system.

Any new piping or equipment associated with the progression of the final design would need to be assessed and added to electrical classification drawings. Electrical area classification would need to meet NFPA 59A, NFPA 70, NFPA 497, API 500, or equivalent, per Condition 63 in the 2019 Order. Some of these standards allow for modification to the electrical area classification based on flows and pressures. Since the operating pressures in the liquefaction system is changing, existing classified areas which may utilize process pressure in determination of the hazardous area classification may be updated. Final design of the process seals are also required to be filed under Conditions 66 and 67 in the 2019 Order. FERC staff would review the final designs in accordance with Conditions 63, 66, and 67 in the 2019 Order to ensure they still provide adequate ignition control prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

Hazard Detection, Emergency Shutdown, and Depressurization Systems

In the event of a hazardous fluid release, the Plaquemines LNG facility would utilize hazard detection systems to detect cryogenic spills, flammable and toxic vapors, and fires. The hazard detection systems would then either result in alarms and notification to personnel in the area and/or control room to initiate an emergency shutdown, depressurization, or initiate appropriate procedures or result in automatic shutdowns, depressurization, or other automatic safety instrumented function.

The Plaquemines LNG facility would utilize both open path gas detectors, which detects when flammable gasses have crossed the linear path between two detectors, as well as point

detectors which detect when flammable gases reach a stationary detector. If a flammable fluid release happens to ignite, the Plaquemines LNG facility would utilize flame detectors to detect fires. Plaquemines LNG would also install low temperature detection in spill containments systems including LNG and refrigerant impoundments and trenches. FERC staff would review the final design of the hazard detection system and associated cause and effects in accordance with Conditions 36, 49, 60, 68, and 71-78 in the 2019 Order to ensure their continued effectiveness prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

Hazard Control

In the event of an ignition of a hazardous fluid release, the Plaquemines LNG facility utilizes several methods of controlling the hazards, including portable fire extinguishers fixed fire suppression systems, and firewater systems. The 2019 final EIS assessed Plaquemines LNG preliminary hazard control designs in accordance with NFPA 59A (2001); NFPA 10, 12, 15, 17, and 2001; API 2510A; as well as other recommended and generally accepted good engineering practices. The assessment included Plaquemines Fire Protection Philosophy, Preliminary Fire Protection Evaluation, Hazard Control Matrix, Hazard Control Drawings, Firewater Matrix, Firewater Drawings, and Firewater calculations. The preliminary hazard control design featured a combination of wheeled dry power extinguishers, wheeled CO₂ extinguishers, portable dry chemical extinguishers, portable CO₂ extinguishers, N₂ snuffing and fixed dry chemical systems, fire hydrants and fire water monitors. The Preliminary Fire Protection Evaluation and Fire Protection Philosophy also indicated the use of clean agent systems installed in areas with critical electrical equipment, firewater deluge systems at the facility, and factory installed suppression systems inside turbine enclosures.

Selection and placement of handheld extinguishers depends on the location of the potential hazard, and the type of hazardous fluid. Final placement would be reviewed during final design including an assessment of any new potential sources of hazardous releases which would necessitate additional handheld or wheeled portable fire extinguishers. Firewater in the liquefaction area is provided by a combination of deluge systems and firewater monitors and hydrants. Deluge systems provide coverage for certain vessels within the liquefaction system. Deluge systems and firewater monitors and hydrants are sized and located to primarily provide specified firewater densities, expressed as gallons per min per square foot, to cool exposed vessels, equipment, and structural supports. FERC staff would review the final design of the hazard control and firewater systems in accordance with Conditions 36, 60, 79-81, and 88-93 in the 2019 Order to ensure their continued effectiveness prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

Passive Cryogenic Temperature and Fire Protection

Process structures in the liquefaction facility are potentially exposed to both cold temperatures from cryogenic releases, and high temperatures from fires. Structural steel is treated with a combination low temperature structural passive protection, and high heat structural passive protection. Cryogenic releases or fires considered under the base project would be reviewed during final design based on final equipment locations and final hazard mitigation designs. FERC staff would review the final design of the passive cryogenic temperature and fire

protection systems in accordance with Conditions 36, 60, and 82-85 in the 2019 Order to ensure their continued effectiveness prior to any approvals being granted to proceed with construction of final design of those systems under the 2019 Order.

Civil and Geotechnical Design

Civil and Geotechnical designs of LNG facilities are required to withstand loads from natural hazards, as well as the dead and live loads from the process equipment. A geotechnical analysis was conducted for the base liquefaction project under docket number CP17-66-000, and from the results of that analysis, equipment foundations were specified to adequately support these loads. Furthermore, the uprate results in process fluids circulating and passing through the liquefaction facilities at a higher flowrate and the volumes of process fluids contained in the liquefaction equipment may or may not change. The addition of the hybrid pretreatment units, and modified and repurposed booster compressors as described in the process design section would require design drawings and calculations, stamped and sealed by the professional engineer-of-record, registered in Louisiana in accordance with Condition 22 of the 2019 Order prior to construction of their final design. In addition, as stated in Section 4 above, the Plaquemines LNG Project is currently under construction along the Mississippi River in Plaquemines Parish, Louisiana, and final designs of pilings, foundations, and structures are underway in accordance with Condition 22 of the 2019 Order.

External Impacts

FERC staff reviews the potential risk to the facility from external incidents at nearby roads, railways, aircraft, pipelines, and other hazardous material facilities and power plants. The infrastructure reviewed in the 2019 final EIS has not changed since the analysis was conducted, therefore, there is no additional risk to the facility from the aforementioned external incidents.

Although a higher liquefaction rate could result in a higher hydrocarbon condensate production, it would not increase the risk to the facility from a trucking incident. The Plaquemines LNG facility would send condensate product to the condensate surge drum where the condensate vapors would be directed to the hot oil furnace fuel gas system and the condensate liquids would be vaporized and directed into the hot oil furnace fuel gas system rather than trucking the condensate.

Onsite and Offsite Emergency Response Plans

LNG facilities are required to develop plans to protect personnel and the public following an emergency at the facility. Emergency response plans (ERP) are often tailored to the specific hazards located at each facility. FERC staff evaluated the potential impacts from incidents caused by a range of natural hazards, accidental events, intentional events, and potential for cascading damage at the LNG terminal, including higher likelihood scenarios with lower onsite consequences up to worst case scenarios with extremely low likelihoods that would lead to a potential catastrophic failure of a tank required to be accounted in emergency response plans by PHMSA regulations in 49 CFR 193.2509, and along the LNG carrier route using the Zones of Concern referenced in USCG NVIC 01-11. The proposed Amendment would not exacerbate the hazard distances used for off-site emergency planning and response, and there are no additional

hazards beyond the existing hazards covered by the existing Emergency Response Plan. Therefore, there would be no new potential impacts to areas from incidents, the characteristics of population, including those with potential access and functional needs, or the infrastructure that require special considerations in pre-incident planning. However, the potential impacts would include people with access and functional needs, as defined in NFPA 1600 and NFPA 1616, and environmental justice communities, as defined in the 3.0 Environmental Justice Section.¹⁹

FERC staff used EJScreen as an initial screening tool to identify the potential impacts from incidents identified at the LNG terminal, including potential impacts to people with access and functional needs as defined in NFPA 1600 and 1616. Table 4 shows the resultant percentages of people with potential access and functional needs within these areas based on 2016-2020 U.S. Census Bureau, American Community Survey (ACS) as follows:

Table 4 People With Access and Functional Needs within Potential Impact Areas						
Potential Incident Impact Area	Population Density (per square mile)¹	Households^{1,4}	Housing Units^{1,4}	Age 0-4 (percent)¹	Age 65+ (percent)¹	Linguistically Isolated Households (percent)^{1,2,3}
Zone 1 (LNG marine vessel - Accidental)	5	3	5	10%	15%	0%
Zone 2 (LNG marine vessel - Accidental)	199	1,203	1,565	8%	14%	4.7%
Zone 3 (LNG marine vessel - Accidental)	113	2,380	3,166	7%	14%	5.8%
Zone 1 (LNG marine vessel - Intentional)	85	409	521	9%	17%	5.1%
Zone 2 (LNG marine vessel - Intentional)	115	2,380	3,166	7%	14%	7.9%
Zone 3 (LNG marine vessel - Intentional)	347	2,702	3,653	8%	13%	7.1%
10,000 BTU/ft ² -hr (LNG Terminal)	32	22	40	0%	18%	0%
1,600 BTU/ft ² -hr (LNG Terminal)	21	83	152	0%	18%	0%
Flammable Vapor Cloud (LNG Terminal)	24	393	547	3%	16%	0%

¹ American Community Survey, 2016-2020, ACS Estimates
² Households in which no one 14 and over speaks English “very well” or speaks English only.
³ Calculated by dividing the number of linguistically isolated households by the total number of households multiplied by 100.
⁴ Households and Housing Units for “Zone 3 LNG marine vessel – Intentional” are totals from all eleven Census Block Groups along the vessel transit route.

¹⁹ NFPA 1600 defines “access and functional need” as “Persons requiring special accommodations because of health, social, economic, or language challenges.” NFPA 1616 defines people with access and functional needs as “People with Access and Functional Needs” as “Persons with disabilities and other access and functional needs include those from religious, racial, and ethnically diverse backgrounds; people with limited English proficiency; people with physical, sensory, behavioral and mental health, intellectual, developmental and cognitive disabilities, including individuals who live in the community and individuals who are institutionalized; older adults with and without disabilities; children with and without disabilities and their parents; individuals who are economically or transportation disadvantaged; women who are pregnant; individuals who have acute and chronic medical conditions; and those with pharmacological dependency.”

The worst-case distances from these potential incidents would potentially impact 11 block groups, all of which are considered environmental justice communities, as defined in the 3.0 Environmental Justice Section and figure 2. The block groups located with environmental justice communities that exceed the thresholds for minority and low income identified in 3.0 Environmental Justice Section would include CT 504, BG 1; CT 505, BG 2, and CT 507, BG 2 (based on minority threshold only); CT 501, BG 1; CT 505, BG 1; CT 505, BG 3; CT 506, BG 2, and CT 507, BG 1 (based on the minority and low-income thresholds), and CT 506, BG 1; CT 508, BG 1, and CT 508, BG 2 (based on low-income threshold only). Minority and low-income population percentages for these Census Tract Block Groups are provided in 3.0 Environmental Justice Section table 2.

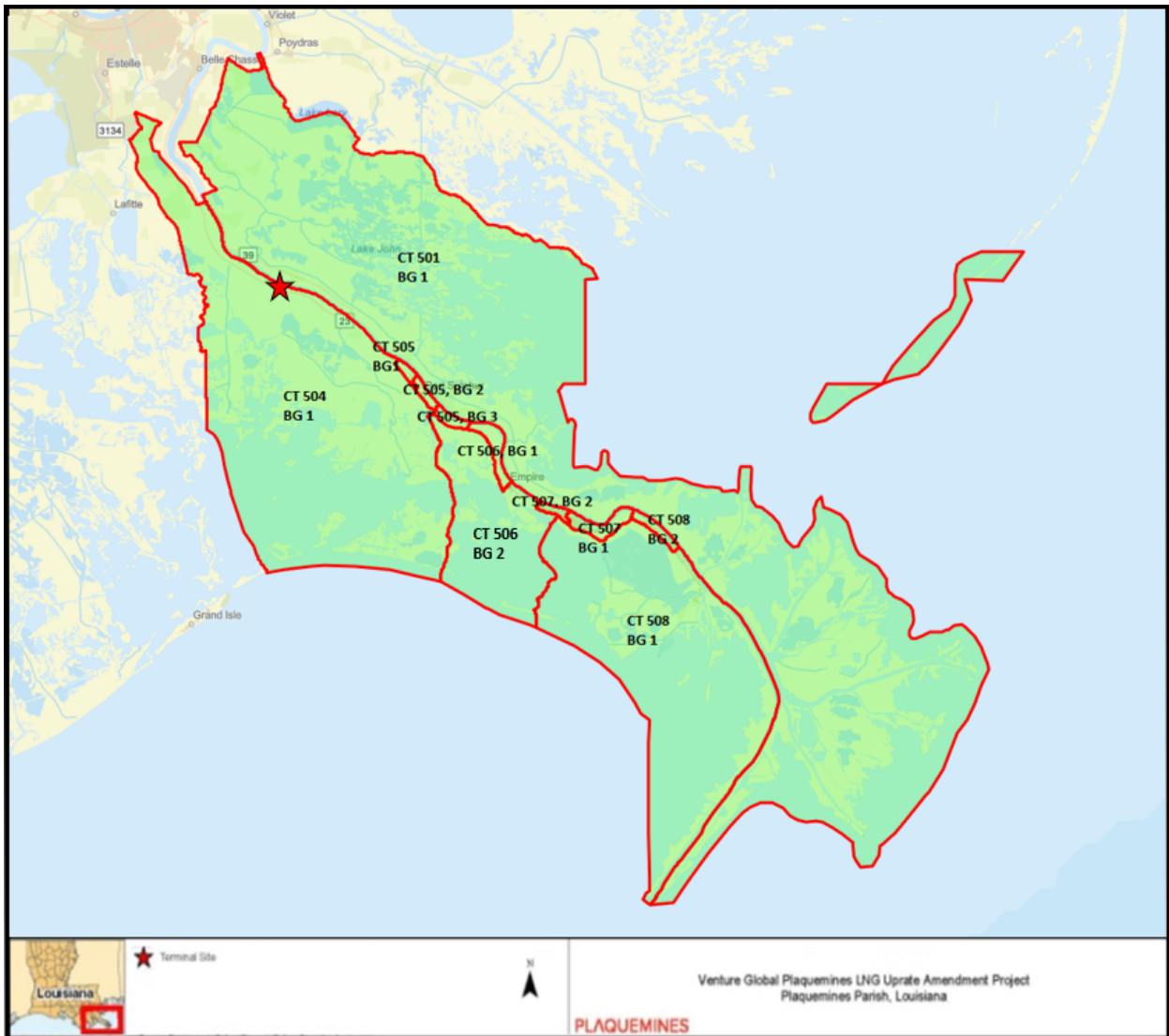


Figure 2

Should a catastrophic incident or other more likely emergency occur at the Plaquemines LNG Terminal or at the LNG marine vessel along its route, people with access and functional needs and environmental justice communities could experience significant public safety impacts

and impacts on environmental justice communities would be disproportionately high and adverse as the impacts of such an accident would be predominately borne by environmental justice communities. However, Commission staff has determined that the risk (i.e., likelihood and consequence) of accidental and intentional events would be less than significant with implementation of the proposed safety and security measures recommendations. These measures further enhance the safety and security of the engineering design of the layers of protection for review subject to the approval by Commission staff and in accordance with recommended and generally accepted good engineering practices, which go above the minimum federal requirements that would also be required at the LNG terminal by USDOT PHMSA regulations under 49 CFR 193 and USCG regulations under 33 CFR 127 and 33 CFR 105, such that they would further reduce the risk of incidents impacting the public to less than significant levels, including impacts to those with access and functional needs and environmental justice communities.

Furthermore, FERC staff has reviewed and approved the preliminary ERP and Cost-Sharing Plan developed in coordination with U.S. Coast Guard and state and local emergency response organizations under Conditions 28 and 29 of the 2019 Order. As part of that initial review, FERC staff verified the ERP would be consistent with recommended and generally accepted good engineering practices, such as NFPA 1600, NFPA 1616, and NFPA 1620, including taking into account those with access and functional needs and environmental justice communities. This included identification of infrastructure for people with access and functional needs that may require pre-incident planning²⁰. In addition, the initial review and approval of the ERP and Cost Sharing Plan entailed ensuring there were:

- plans for periodic dissemination of public education and training materials for evacuation and/or shelter in place of the public within LNG terminal hazard areas;
- plans and cost sharing to competently train emergency responders required to effectively and safely respond to hazardous material incidents including, but not limited to LNG fires and dispersion;
- plans and cost sharing to competently train emergency responders to effectively and safely evacuate or shelter public within hazard areas from LNG terminal;

²⁰ Infrastructure that requires special considerations in pre-incident planning, includes but is not limited to: daycares; elementary, middle, and high schools and other educational facilities; elderly centers and nursing homes and other boarding and care facilities; detention and correctional facilities; stadiums, concert halls, religious facilities, and other areas of assembly; densely populated commercial and residential areas, including high rise buildings, apartments, and hotels; hospitals and other health care facilities; police departments, stations, and substations; fire departments and stations; military or governmental installations and facilities; major transportation infrastructure, including evacuation routes, major highways, airports, rail, and other mass transit facilities as identified in external impacts section; and industrial facilities that could exacerbate the initial incident, including power plants, water supply infrastructure, and hazardous facilities with quantities that exceed thresholds in EPA RMP and/or OSHA PSM standards.

- designated contacts with federal, state and local emergency response agencies responsible for emergency management and response within hazard areas from LNG terminal;
- scalable procedures for the prompt notification of appropriate local officials and emergency response agencies based on the level and severity of potential incidents;
- scalable procedures for mobilizing response and establishing a unified command, including identification, location, and design of any emergency operations centers and emergency response equipment required to effectively and safely to respond to hazardous material incidents and evacuate or shelter public within LNG terminal hazard areas;
- scalable procedures for notifying public, including identification, location, design, and use of any permanent sirens or other warning devices required to effectively communicate and warn the public prior to onset of debilitating hazards within hazard areas from LNG terminal;
- scalable procedures for evacuating the public, including identification, location, design, and use of evacuation routes/methods and any mustering locations required effectively and safely evacuate within hazard areas from LNG terminal; and
- scalable procedures for sheltering the public, including identification, location, design, and use of any shelters demonstrated to be needed and demonstrated to effectively and safely shelter public prior to onset of debilitating hazards within hazard areas that may benefit from sheltering in place.

FERC staff will continue to review further development and updates to the ERP and Cost Sharing Plan, and would also review the training of plant personnel and emergency response staff, including incident notification practices, that are incorporated into the LNG facility's ERP in accordance with Conditions 28, 29, 107, and 128 in the 2019 Order. Based on the review and approval of the preliminary ERP and Cost-Sharing Plan that was conducted prior to initial site preparation and continued oversight under existing Conditions in the 2019 Order, FERC staff does not believe there would be a significant public safety impact, including those with access and functional needs or environmental justice communities.

Conclusions

As part of the NEPA review, Commission staff assesses the potential impact to the human environment in terms of safety and whether the proposed Amendment would operate safely, reliably, and securely.

As a cooperating agency, the USDOT PHMSA assists the FERC by determining whether Plaquemines LNG proposed capacity increase would meet the USDOT PHMSA 49 CFR 193 Subpart B siting requirements. USDOT PHMSA will provide its analysis and determination to FERC in a LOD that will serve as one of the considerations for the Commission to deliberate in its decision to authorize or deny the uprated capacity application.

As a cooperating agency, the USCG also assisted the FERC staff in review of the proposed Amendment. The USCG issued a LOR on January 23, 2017 that considered an upper bound of up to 380 carrier per year that recommended the Lower Mississippi River be considered suitable for accommodating the type and frequency of LNG marine traffic to the Project. As proposed, export of 27.2 MTPA utilizing an expected vessel size of an average of

170,000 m³, would still be within the limits of the 380 upper bound that was approved by the USCG.

FERC staff conducted a preliminary engineering and technical review of the Plaquemines LNG capacity increase. Plaquemines LNG Project is currently under construction along the Mississippi River in Plaquemines Parish, Louisiana, and the selection of final design at facility should include considerations for any impacts the capacity increase would have on process conditions, engineering designs, and hazard mitigation. Therefore, FERC staff recommends in section C that Venture Global comply with all environmental and engineering conditions set forth in the Appendix of the 2019 Order issued in Docket No. CP17-66-000 and include final design considerations of impact from the Plaquemines LNG Uprate Amendment Project. FERC staff observed certain final design progressions since the authorized preliminary design, and any changes in final design would need to be reviewed in accordance with Conditions 1 and 32 of the 2019 Order.

6.0 CUMULATIVE IMPACTS

As defined by the CEQ, a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. The CEQ guidance states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. Consistent with CEQ guidance, the scope of the cumulative impact analysis is related to the magnitude of the environmental impacts of the proposed action. As the Amendment involves no construction outside of the original footprint reviewed in the 2019 final EIS and approved in the 2019 Order, the potential cumulative impacts associated with the Amendment are limited to any operational impacts of the proposed action combined with the impacts of other proposed developments occurring within the vicinity. In this analysis, we consider the impacts of past projects within the region as part of the affected environmental baseline. We also considered potential cumulative impacts associated with other concurrent projects including recently constructed projects, or proposed projects for which a definitive project scope has been developed and necessary facilities have been identified. Plaquemines LNG did not identify any activities for which impacts are ongoing or reasonably foreseeable that are also in close enough proximity to be cumulative with the effects of the Amendment. We have also not identified any such impacts.

The changes described as the basis for increased production capacity would not increase the levels of any criteria pollutants, volatile organic compounds, or hazardous air pollutants above what was authorized by the terminal's air permit issued by the LDEQ. The Amendment would not contribute to an exceedance of the NAAQS when added to the previously approved emissions, nor change the affected ROI obtained from dispersion modeling of the facility. Additional marine vessel traffic would have no significant impact on surface waters or aquatic resources. The additional marine vessel traffic would increase the amount of GHG emissions in the area from those previous analyzed. However, GHG emissions do not result in proportional local and immediate impacts; it is the combined concentration in the atmosphere that affects the global climate system. GHG emissions are considered in a cumulative context within the Climate Change section of this EA.

6.1 ENVIRONMENTAL JUSTICE

The Amendment itself would not result in increased operational air emissions; however, the Amendment could result in increased air emissions related to additional marine vessel trips to and from the Terminal. Air quality impacts were analyzed in conjunction with past, present, and reasonably foreseeable projects within the previously determined ROI (17.92 km) to determine cumulative impacts on air quality. The original Plaquemines LNG Project in Docket No CP17-66-000 , Venture Global Delta LNG, NOLA Oil Terminal, IGP Methanol, and Phillips 66 Alliance Terminal Facility were identified within the ROI as potential to contribute to cumulative impacts when considered with the Amendment. None of these projects are operational yet, but once they are, each would have to adhere to their respective operational air permits from the LDEQ to remain in compliance with the NAAQS and demonstrate it would not contribute to a significant impact to air quality impacts in the Amendment area.

For the annual averaging period, based on the previously performed air dispersion modeling analysis, the increase in annual emissions would not cause or contribute to a violation of the NAAQS for NO₂, PM_{2.5} and SO₂. Plaquemines LNG performed a quantitative analysis to demonstrate compliance with the NAAQS, presented in table 5, which shows updated values would not contribute to an exceedance of the NAAQS or have a significant impact on environmental justice communities.

Table 5
Updated Marine Vessel Emission NAAQS Compliance

Pollutant	Averaging Period	Previously Modeled Emission Rates for Marine Vessels ¹ Tpy	Previously Modeled Concentrations ² mg/m ³	Proposed Emission Rates for Marine Vessels ³ Tpy	Predicted Concentration mg/m ³	NAAQS mg/m ³
NO ₂	Annual	140	36.6	160	41.8	100
PM _{2.5}		6.7	8.2	7.6	9.3	12
SO ₂		12.6	14.2	14.3	16.1	80

1. Based on Table 4.11-4, Final Operational Emissions, Final Environmental Impact Statement for the Plaquemines LNG and Gator Express Pipeline Project, Docket Nos. CP17-66-000 and CP17-67-000, May 2019 (FERC Accession No. 20190503-3011).
 2. Based on Table 4.11-10, NAAQS Assessment Results – Project Stationery and Vessel Sources, Final Environmental Impact Statement for the Plaquemines LNG and Gator Express Pipeline Project, Docket Nos. CP17-66-000 and CP17-67-000, May 2019 (FERC Accession No. 20190503-3011).
 3. Based on Table 13-1, Plaquemines LNG Capacity Amendment Project Marine Vessels Operational Emissions, Attachment A Responses to April 29, 2022 Engineering Information Request (FERC Accession No. 20220817-5187).

Marine traffic emissions are transient in nature and would not be a consistent permanent source at the Terminal. As the previously determined SIL’s are still applicable with the Amendment additions with no additional modeling required, and that the additional vessels associated with the Amendment do not contribute to an exceedance of the NAAQS, we conclude that the Amendment would not contribute significantly to cumulative operational air quality impacts on environmental justice communities.²¹

The change in operational emissions disclosed in this EA would increase the atmospheric concentration of GHG (CO_{2e} would increase national 2020 levels by 0.00008 percent from what was disclosed in the final EIS issuance), in combination with past and future emissions from all other sources and would contribute incrementally to future climate change impacts. While the climate change impacts taken individually may be manageable for certain communities, the impacts of compounded extreme events (such as simultaneous heat and drought, or flooding associated with high precipitation on top of saturated soils) may exacerbate preexisting community vulnerabilities and have a cumulative adverse impact on environmental justice communities. This EA is not characterizing the Amendment’s GHG emissions as significant or insignificant because the Commission is conducting a generic proceeding to determine whether and how the Commission will conduct significance determinations going forward.²² GHG impacts are more fully addressed in the climate change discussion in this section below.

²¹ Table 4.11-8 of the final EIS, accession no. 20180503-3011

²² *Consideration of Greenhouse Gas Emissions in Natural Gas Infrastructure Project Reviews*, 178 FERC ¶ 61,108 (2022); 178 FERC ¶ 61,197 (2022).

6.2 CLIMATE CHANGE

Deep South states that the Amendment would result in increased GHG emissions from the Terminal that would result in climate change impacts, including accelerated coastal erosion. Climate change is the variation in the Earth's climate (including temperature, precipitation, humidity, wind, and other meteorological variables) over time.

Climate change is driven by accumulation of GHGs in the atmosphere due to the increased consumption of fossil fuels (e.g. Coal, petroleum, and natural gas) since the early beginnings of the industrial age and accelerating in the mid- to late-20th century.²³ The GHGs produced by fossil-fuel combustion are CO₂, methane, and nitrous oxide.

In 2017 and 2018, the U.S. Global Change Research Program (USGCRP) issued its *Climate Science Special Report: Fourth National Climate Assessment*, Volumes I and II.²⁴ This report and the recently released report by the Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis*, states that climate change has resulted in a wide range of impacts across every region of the country and the globe.²⁵ Those impacts extend beyond atmospheric climate change alone and include changes to water resources, agriculture, ecosystems, human health, and ocean systems.²⁶ According to the Fourth Assessment Report, the United States and the world are warming; global sea level is rising and oceans are acidifying; and certain weather events are becoming more frequent and more severe. These impacts have accelerated throughout the end of the 20th and into the 21st century.²⁷

GHG emissions do not result in proportional local and immediate impacts; it is the combined concentration in the atmosphere that affects the global climate. These are fundamentally global impacts that feed back to local and regional climate change impacts. Thus,

²³ Intergovernmental Panel on Climate Change, United Nations, Summary for Policymakers of *Climate Change 2021: The Physical Science Basis*. (Valerie Masson-Delmotte et al., eds.) (2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf (IPCC Report) at SPM-5. Other forces contribute to climate change, such as agriculture, forest clearing, and other anthropogenically driven sources

²⁴ U.S. Global Change Research Program. *Climate Science Special Report: Fourth National Climate Assessment, Volume 1, Chapter 3 Detection and Attribution of Climate Change* (2017), available at: https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf (accessed June 3, 2021).

²⁵ IPCC, 2021: *Climate Change 2021: The Physical Science Basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.

²⁶ 6 IPCC Report at SPM-5 to SPM-10.

²⁷ See, e.g., USGCRP Report Volume II at 99 (describing accelerating flooding rates in Atlantic and Gulf Coast cities).

the geographic scope for cumulative analysis of GHG emissions is global rather than local or regional. For example, a project 1 mile away emitting 1 ton of GHGs would contribute to climate change in a similar manner as a project 2,000 miles distant also emitting 1 ton of GHGs.

Climate change is a global concern; however, for this analysis, we will focus on the existing and potential climate change impacts in the general project area. The USGCRP's Fourth Assessment Report notes the following observations of environmental impacts attributed to climate change in the Southeast region of the United States (USGCRP 2017, USGCRP 2018):

- the near decade of 2010 through 2017 has been warmer than any previous decade since 1920 for average daily maximum and average daily minimum temperature;
- since 1960, there have been lower numbers of days above 95°F compared to the pre-1960 period but during the 2010's the number of nights above 75°F has been nearly double the average over 1901 – 1960. The length of the freeze free season was 1.5 weeks longer on average in the 2010s compared to any other historical period on record;
- number of days with 3 or more inches of rain has been historically high over the past 25 years. The 1990s, 2000s, and 2010s rank first, third and second, respectively in number of events;
- summers have been either increasingly dry or extremely wet, depending on location;
- due to a combination of sea level rise and soil subsidence, approximately 2,006 square miles of land have been lost in Louisiana between 1932 and 2016, or about 23 square miles per year; and
- in southeast Louisiana, relative sea level is rising at a rate of 1 to 3 feet per 100 years.

The USGCRP'S Fourth Assessment Report notes the following projections of climate change impacts in the Amendment's Southeast United States region with a high or very high level of confidence²⁸ (USGCRP, 2018):

²⁸ The report authors assessed current scientific understanding of climate change based on available scientific literature. Each "Key Finding" listed in the report is accompanied by a confidence statement indicating the consistency of evidence or the consistency of model projections. A high level of confidence results from "moderate evidence (several sources, some consistency, methods vary and/or documentation limited, etc.), medium consensus." A very high level of confidence results from "strong evidence (established theory, multiple sources, consistent results, well documented and accepted methods, etc.), high consensus." <https://science2017.globalchange.gov/chapter/front-matter-guide/>

- climate models project nighttime temperatures above 75°F and daytime maximum temperatures above 95°F become the summer norm. Nights above 80°F and days above 100°F, which are now relatively rare, would become common;
- lowland coastal areas are expected to receive less rainfall on average, but experience more frequent intense rainfall events followed by longer drought periods;
- coastal areas along the Gulf of Mexico are flat; therefore, expected sea level rises may cause inundation in certain low-lying areas;
- drought and sea level rise will create stressful conditions for coastal trees that are not adapted to higher salinity levels;
- other coastal species may also be stressed by sea level rise and warmer temperatures, prompting migration out of the area; and
- tropical storms and hurricanes may become more intense.

It should be noted that while the impacts described above taken individually may be manageable for certain communities, the impacts of compound events (such as simultaneous heat and drought, or flooding associated with high precipitation on top of saturated soils) can be greater than the sum of the parts.

Deep South and the Louisiana Bucket Brigade, state that the Amendment would result in increased upstream and downstream emissions. The Louisiana Bucket Brigade states that the Commission must produce an EIS to consider upstream, downstream, and direct greenhouse GHG emissions, climate risks, and the cumulative impacts of GHG emissions from the Terminal. Deep South also states that the Amendment would result in increased hydraulic fracturing and natural gas infrastructure in Louisiana.

The courts have explained that because the authority to authorize LNG exports rests with DOE, NEPA does not require the Commission to consider the upstream or downstream GHG emissions that may be indirect effects of the export itself when determining whether the related LNG export facility satisfies section 3 of the NGA.²⁹ Nevertheless, NEPA requires that the Commission consider the direct GHG emissions associated with a proposed LNG export facility.³⁰

The additional GHG emissions associated with the increased vessel transit emissions, expressed in terms of CO₂e, were identified and quantified in section B.4 of this EA.³¹ The

²⁹ See *Sierra Club v. FERC*, 827 F.3d 36, 46-47 (D.C. Cir. 2016) (*Freeport*); see also *Sierra Club v. FERC*, 867 F.3d 1357, 1373 (D.C. Cir. 2017) (*Sabal Trail*) (discussing *Freeport*).

³⁰ See *Freeport*, 827 F.3d at 41, 46.

³¹ GHG gases are converted to CO₂e by means of the global warming potential, the measure of a particular GHG's ability to absorb solar radiation as well as its residence time

increase in CO₂e emissions identified would be about 4,504 tons per year (equivalent to 4,086 metric tons) more than those estimated in the 2019 final EIS due to the increased marine vessel traffic.³²

Amendment operation would increase the atmospheric concentration of GHGs, in combination with past and future emissions from all other sources globally and would contribute incrementally to future climate change impacts.

To date, Commission staff have not identified a methodology to attribute discrete, quantifiable, physical effects on the environment resulting from a project's incremental contribution to GHGs. Without the ability to determine discrete resource impacts, Commission staff are unable to assess the Amendment's contribution to climate change through any objective analysis of physical impact attributable to the Amendment. Additionally, Commission staff have not been able to find an established threshold for determining the GHG significance when compared to established GHG reduction targets at the state or federal level. Ultimately, this EA is not characterizing the GHG emissions as significant or insignificant because the Commission is conducting a generic proceeding to determine whether and how the Commission will conduct significance determinations going forward.³³

As noted above, the Amendment would not result in increased emissions from the Terminal facilities; however, the EA discloses that marine vessel transits emissions have changed from those estimated in the 2019 final EIS as a result of potential increased vessel transits associated with the proposed increase in LNG production capacity. In order to provide context of the changed GHG emissions on a national level, we compare the GHG emissions to the total GHG emissions of the United States as a whole. At a national level, 5,222.4 million metric tons of CO₂e were emitted in 2020 (inclusive of CO₂e sources and sinks) (USEPA 2022). The change in emissions could potentially increase CO₂e emissions based on the national 2020 levels by 0.00008 percent.

In order to provide context of the changed GHG emissions on a state level, we compare the GHG emissions to the state GHG inventory. At the state level, energy related CO₂ emissions in Louisiana were 183.3 million metric tons of CO₂e in 2020.³⁴ GHG emissions in Louisiana would result from increased transits of LNG carriers to and from the Terminal; no end-use is expected in Louisiana as the natural gas would be exported from the United States. The change in emissions could potentially increase state emissions by 0.002 percent.

within the atmosphere, consistent with the USEPA's established method for reporting GHG emissions for air permitting requirements that allows a consistent comparison with federal regulatory requirements.

³² Section B.7.1 of the EA, table 13 and pg 68.

³³ Consideration of Greenhouse Gas Emissions in Natural Gas Infrastructure Project Reviews, 178 FERC ¶ 61,108 (2022); 178 FERC ¶ 61,197 (2022).

³⁴ U.S. Energy Information Administration, Table 1, State Energy-Related Carbon Dioxide Emissions by Year, Unadjusted: Louisiana (October 11, 2022), <https://www.eia.gov/environment/emissions/state/> (accessed December 2022).

We also evaluate the change in emissions in the context of Louisiana’s GHG reduction goals. The state of Louisiana established executive targets in 2020 to reduce net GHG emissions 26 to 28 percent by 2025 and 40 to 50 percent by 2030, compared to 2005 levels. The targets also aim for net-zero GHG emissions by 2050. GHG emission increases disclosed in this EA would represent 0.003 percent and 0.004 percent of Louisiana’s 2025 and 2030 projected GHG emission levels, assuming the reductions from 2005 levels summarized above.³⁵

The Louisiana Bucket Brigade, Deep South, Sierra Club and Healthy Gulf state that FERC should use the social cost of GHG estimates to monetize net climate damages of GHG emissions from the Amendment. Deep South, Sierra Club and Healthy Gulf state that in the 2019 final EIS, FERC failed to discuss the climate damages that were and are caused by Plaquemines LNG’s emissions. Deep South also states that FERC should not selectively monetize benefits such as tax revenue and job creation while not monetizing the costs of the proposed action. Deep South recommends FERC monetize the social costs of greenhouse gases from the Amendment.

The social cost of GHGs is an administrative tool intended to quantify, in dollars, an estimate of long-term damage that may result from future emissions of carbon dioxide, nitrous oxide, and methane. To provide additional context, we are disclosing Commission staff’s estimate of the social cost of GHGs associated with the reasonably foreseeable emissions from GHG emission increases disclosed in the Amendment using the calculations described below.³⁶ However, noting pending litigation challenging federal agencies’ use of the Interagency Working Group on the Social Cost of Greenhouse Gas’ (IWG) interim values for calculating the social cost of GHGs,³⁷ we are not relying on or using the social cost of GHGs estimates to make any finding or determination regarding the impact of the GHG emissions.³⁸

As both the USEPA and CEQ participate in the IWG, Commission staff used the methods and values contained in the IWG’s current draft guidance but note that different values will result

³⁵ *Id.* Louisiana’s CO₂ emissions in 2005 were 205.1 million metric tons; therefore, we consider the 2025 GHG emission target to be 149.7 million metric tons and the 2030 target to be 112.8 million metric tons.

³⁶ See also *Vecinos para el Bienestar de la Comunidad Costera v. FERC*, 6 F.4th 1321, 1329-30 (D.C. Cir. 2021).

³⁷ *Missouri v. Biden*, 8th Cir. No. 21-3013; *Louisiana v. Biden*, No. 21-cv-1074-JDC-KK (W.D. La). On February 11, 2022, the U.S. District Court for the Western District of Louisiana issued a preliminary injunction limiting federal agencies’ employment of estimates of the social costs of GHGs and use of the IWG’s interim estimates. On March 16, 2022, the U.S. Court of Appeals for the Fifth Circuit issued a stay of the district court’s preliminary injunction, finding among other things that the federal agency respondent’s continued use of the interim estimates was lawful. *Louisiana v. Biden*, No. 22-30087 (5th Cir. Mar. 16, 2022).

³⁸ Furthermore, the Commission is not applying the social cost of carbon herein because it has not determined which, if any, modifications are needed to render that tool useful for project-level analyses. See CEQ’s May 27, 2021 Comments filed in Docket No. PL18-1-000, at 2 (noting that it is working with representatives from the IWG to develop forthcoming additional guidance regarding the application of the social cost of GHGs tool in federal decision-making processes, including in NEPA analyses).

from the use of other methods.³⁹ Accordingly, Commission staff calculated the social cost of carbon dioxide, nitrous oxide, and methane. For the analysis, staff assumed discount rates of 5%, 3%, and 2.5%,⁴⁰ assumed the Amendment would begin service in 2023 and that the emissions would be at a constant rate throughout the life of a assumed generic 20-year contract. Noting these assumptions, the emissions from increased GHGs disclosed in the Amendment are calculated to result in a total social cost of GHGs equal to \$1,050,789, \$3,896,231 and \$5,868,418 respectively (all in 2020 dollars).⁴¹ Using the 95th percentile of the social cost of GHGs using the 3% discount rate,⁴² the total social cost of GHGs from the Amendment is calculated to be \$11,705,291 (in 2020 dollars).

7.0 ALTERNATIVES

Sierra Club supporters commented on utilizing an alternate, less conflicted location for the Amendment activities. Commenters also stated that the Project utilize alternative energies. As the Amendment is limited to uprating the existing allowable capacity at the approved LNG Terminal, adding infrastructure to facilitate alternate energy production would be outside the scope of this Amendment. As no new facilities are proposed, this alternative is not a feasible alternative to the Amendment. Because the proposed Amendment does not involve any change in the Project footprint, we did not evaluate any site alternatives.

We assessed the No-Action Alternative; that is, if the newly proposed capacity uprate is not initiated and the LNG production capacity remains at 24 MTPA. According to CEQ guidance, in instances involving federal decisions on proposals for projects, no-action would mean the proposed activity would not take place and the resulting environmental effects from taking no-action would be compared with the effects of permitting the proposed activity. Further, the No-Action Alternative provides a benchmark for decisionmakers to compare the

³⁹ *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990*, Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, February 2021 (IWG Interim Estimates Technical Support Document).

⁴⁰ IWG Interim Estimates Technical Support Document at 24. To quantify the potential damages associated with estimated emissions, the IWG methodology applies consumption discount rates to estimated emissions costs. The IWG's discount rates are a function of the rate of economic growth where higher growth scenarios lead to higher discount rates. For example, IWG's method includes the 2.5% discount rate to address the concern that interest rates are highly uncertain over time; the 3% value to be consistent with Office of Management and Budget Circular A-4 (2003) and the real rate of return on 10-year Treasury Securities from the prior 30 years (1973 through 2002); and the 5% discount rate to represent the possibility that climate-related damages may be positively correlated with market returns. Thus, higher discount rates further discount future impacts based on estimated economic growth. Values based on lower discount rates are consistent with studies of discounting approaches relevant for intergenerational analysis. *Id.* at 18-19, 23-24.

⁴¹ The IWG draft guidance identifies costs in 2020 dollars. *Id.* at 5 (Table ES-1).

⁴² This value represents "higher-than-expected economic impacts from climate change further out in the tails of the [social cost of CO₂] distribution." *Id.* at 11. In other words, it represents a higher impact scenario with a lower probability of occurring.

magnitude of environmental effects of the proposed activity and alternatives. We have prepared this EA to inform the Commission and stakeholders about the expected impacts that would occur if the Amendment were approved. Under the No-Action Alternative, the Amendment would not be authorized and Plaquemines LNG would not be authorized to increase its peak liquefaction capacity. The Commission, in its order, will ultimately determine if the Amendment meets the public interest standard in section 3 of the NGA and could choose the No-Action Alternative.

C. CONCLUSIONS

Based on the analysis in this EA, we have determined that if Plaquemines LNG operates the proposed Amendment in accordance with its application and supplements, approval of the Amendment would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Order contain a finding of no significant impact and include the following mitigation measures listed below as conditions to any authorization the Commission may issue.

1. Plaquemines LNG shall follow the procedures and mitigation measures described in its application and supplements and as identified in the EA, unless modified by the Order. Plaquemines LNG must:
 - a. request any modification to these procedures, measures, or conditions in a filing with the Secretary of the Commission (Secretary);
 - b. justify each modification relative to site-specific conditions;
 - c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
 - d. receive approval in writing from the Director of the Office of Energy Projects (OEP), or the Director's designee, **before using that modification.**
2. The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of life, health, property, and the environment during construction and operation of the project. This authority shall allow:
 - a. the modification of conditions of the Order;
 - b. stop-work authority and authority to cease operation; and
 - c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from project operation.
3. Plaquemines LNG shall continue to comply with all environmental and engineering conditions set forth in the Appendix of the September 30, 2019 Order issued in Docket No. CP17-66-000.

4. **Prior to implementation of an increase in export rate above 24.0 MTPA,** Plaquemines LNG shall file with the Secretary for review and written approval by the Director of OEP, or the Director's designee, updated engineering designs and layers of protection that account for the increased liquefaction rates.

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D. REFERENCES

Council on Environmental Quality (CEQ). 1997. Environmental Justice: Guidance Under the National Environmental Policy Act. Available online at:

https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf.

Federal Energy Regulatory Commission (FERC). 2019a. Plaquemines LNG and Gator Express Pipeline Project Final Environmental Impact Statement. Venture Global Plaquemines LNG, LLC and Venture Global Gator Express, LLC. Docket Nos. CP17-66-000 and CP17-67-000. FERC/EIS-0287F. May 2019.

FERC. 2019b. Driftwood LNG Project Final Environmental Impact Statement. Driftwood LNG, LLC and Driftwood Pipeline, LLC. Docket Nos. CP17-117-000 and CP17-118-000. FERC/FEIS-0284F. January 2019.

National Oceanic and Atmospheric Administration (NOAA). 2004. Climatography of the United States No. 20 1971-2000. Available online at:

<http://www.homesteadcollective.org/mpg/files/nc30ysum.pdf>. Accessed April 2014.

National Marine Fisheries Service (NMFS). 2019. Section 7 Consultation Response Letter to FERC. Venture Global Plaquemines LNG, LLC and Venture Global Gator Express, LLC. Docket Nos. CP17-66-000 and CP17-67-000. SERO-2018-00280. September 2019.

NMFS. 2008. Vessel Strike Avoidance Measures and Reporting for Mariners. NOAA National Marine Fisheries Service, Southeast Region. Revised February 2008. Website:

http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/copy_of_vessel_strike_avoidance_february_2008.pdf. Accessed: May 2018.

U.S. Environmental Protection Agency (USEPA). 2014a. Climate Impacts in the Southeast. Available online at: <https://www.epa.gov/climatechange/impacts-adaptation/southeast.html>.

USEPA. 2020e. NAAQS Table. Available at: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

USEPA. 2016. Promising Practices for EJ Methodologies in NEPA Reviews. Available online at: https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

USEPA. 2016a. Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter. 82 Federal Register 10, page 5,182, January 17, 2017.

(Rule signed by the USEPA Administrator December 20, 2016.) 40 CFR 51. Available online at: https://www3.epa.gov/ttn/scram/appendix_w/2016/AppendixW_2017.pdf.

USEPA. 2021e. Learn About Environmental Justice. Available online at:
<https://www.epa.gov/environmentaljustice/learn-about-environmental-justice>

USEPA. 2022. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020 – Executive Summary. Available online at: <https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-main-text.pdf>. Accessed May 2022.

U.S. Global Change Research Program (USGCRP). 2017. Climate Science Special Report: Fourth National Climate Assessment, Volume I, Chapter 3 Detection and Attribution of Climate Change (Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock [eds.]). U.S. Global Change Research Program, Washington, DC, USA, 470 pp., doi: 10.7930/J0J964J6. Available at:
https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf Accessed January 2022 .

USCGRP. 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II: Report-in-Brief [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 186 pp.