MEMORANDUM TO: Office of the Secretary

FROM: Gertrude Johnson, FERC Staff

SUBJECT: Rio Grande LNG Project
Docket Nos. CP16-454-000, CP16-455-000

DATE: January 18, 2018

Please place the attached documents in the public files for the Rio Grande LNG Project proposed by Rio Grande LNG, LLC and Rio Bravo Pipeline Company, LLC in Docket Nos. CP16-454-000 and CP16-455-000. The documents include a cover letter and the U.S. Coast Guard's Letter of Recommendation for the project.

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Sector/Air Station Corpus Christi

Valent Hall
249 Glasson drive
Corpus Christi, TX 78406
Staff Symbol: (s)
Phone: (361) 939-0201

16611
26Dec17

Director of Gas Environment and Engineering, PJ 11
Attn: Rich McGuire
Federal Energy Regulatory Commission
888 First St NE
Washington, DC 20426

Dear Mr. McGuire:

This Letter of Recommendation (LOR) is issued pursuant to 33 CFR 127.009 in response to the Letter of Intent (LOI) submitted by Acutech on behalf of Rio Grande Liquefied Natural Gas (LNG), LLC on March 18, 2015. Rio Grande LNG, LLC proposes to operate the Rio Grande LNG in Brownsville, Texas at which LNG would be transferred in bulk to or from a vessel.[1] It conveys the Coast Guard's recommendation on the suitability of the Brownsville Ship Channel for LNG marine traffic as it relates to safety and security. In addition to meeting the requirements of 33 CFR 127.009, this letter fulfills the Coast Guard's commitment for providing information to your agency under the Interagency Agreement signed in February 2004.

After reviewing the information in the applicant's LOI and Waterway Suitability Assessment (WSA) and completing an evaluation of the waterway in consultation with a variety of state and local port stakeholders, I recommend that the Brownsville Ship Channel be considered ***suitable*** for LNG marine traffic. My recommendation is based on review of the factors listed in 33 CFR 127.007 and 33 CFR 127.009. The reasons supporting my recommendation are outlined below.

On November 17, 2017, I completed a review of the WSA for the Rio Grande LNG Project, submitted to the Coast Guard by Acutech on December 17, 2015. This review was conducted following the guidance provided in U.S. Coast Guard Navigation and Vessel Inspection Circular (NVIC) 01-2011, dated January 24, 2011. In conducting this review and analysis, I focused on the navigation safety and maritime security aspects of LNG vessel transits along the affected waterway. My analysis included an assessment of the risks posed by these transits and validation of the risk management measures proposed by the applicant in the WSA. During the review, I consulted a variety of stakeholders including Port of Brownsville Navigation District representatives, Port Isabel Navigation District representatives, local facility security representatives, the Brazos Santiago Pilots Association, and Signet Maritime representatives.

Based upon a comprehensive review of the applicant's WSA and after consultation with state and local port stakeholders, I recommend that the Brownsville Ship Channel be considered suitable for accommodating the type and frequency of LNG marine traffic associated with this project.

The attached LOR Analysis contains a detailed summary of the WSA review process that has guided this recommendation. It documents the assumptions made during the analysis of Rio

[1] Vessel to vessel LNG bunkering operations fall outside the scope of this Letter of Recommendation.

Grande LNG, LLC's WSA. It discusses details of potential vulnerabilities and operational safety and security measures that were analyzed during the review. The portion of the LOR Analysis which addresses matters that affect maritime security is marked as Sensitive Security Information and is withheld from distribution.[2] The LOR Analysis sets forth the navigational safety and maritime security resource gaps that currently exist in, on, and adjacent to the waterway, including the marine transfer area of the proposed facility, and which, to the extent allowable under Federal Energy Regulatory Commission's (FERC) existing legal authority, may be addressed in its Commission Order if one is issued. To the extent implementation of specific mitigation measures fall outside the scope of FERC's legal authority, the applicant is expected to examine the feasibility of implementing such mitigation measures, in consultation with the Coast Guard and state and local agencies as applicable.

This recommendation is provided to assist in the Commission's determination of whether the proposed facility should be authorized. This letter is not an enforceable order, permit, or authorization that allows any party, including the applicant, to operate a facility or a vessel on the affected waterway. Similarly, it does not impose any legally enforceable obligations on any party to undertake any future action be it on the waterway or at the proposed facility. It does not authorize, nor in any way restrict, the possible future transit of properly certificated vessels on the Brownsville Ship Channel. As with all issues related to waterway safety and security, I will assess each vessel transit on a case by case basis to identify what, if any, safety and security measures are necessary to safeguard the public health and welfare, critical marine infrastructure and key resources, the port, the marine environment, and vessels. In the event the facility begins operation and LNG vessel transits commence, if matters arise concerning the safety or security of any aspect of the proposed operation, a Captain of the Port Order could be issued pursuant to my authority under the Ports and Waterways Safety Act of 1972, as amended by the Port and Tanker Safety Act of 1978, 33 U.S.C. § 1221 – 1232, among other authorities, to address those matters.

If you have questions, my point of contact is LCDR Russell Pickering. He may be reached at 249 Glasson Drive Corpus Christi, TX 78406, (361) 939-5130 or at russell.t.pickering@uscg.mil.

Sincerely,

R. A. HAHN
Captain, U.S. Coast Guard
Captain of the Port, Corpus Christi, TX

Enclosures: (1) LOR Analysis, SSI
(2) LOR Analysis, Public Release

Copy: Commander, Eighth Coast Guard District (dw), (dl)
Commander, Coast Guard Atlantic Area (LANT-544)
Commandant, U.S. Coast Guard (CG-5), (CG-522), (CG-532), (CG-544), (CG-741)
Rio Grande LNG

[2] Documents containing SSI may be made available upon certification that the requestor has a need to know and appropriate document handling and non-disclosure protocols have been established.

UNITED STATES COAST GUARD

Rio Grande LNG

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR CORPUS CHRISTI ON NOVEMBER 17, 2017

Enclosure (2)

1. This analysis is a supplement to my Letter of Recommendation (LOR) dated November 17, 2017 that conveys my recommendation on the suitability of the Brownsville Ship Channel for liquefied natural gas (LNG) marine traffic associated with the Rio Grande LNG (RGLNG) export terminal project Brownsville, Texas. It documents the processes followed in analyzing RGLNG's Waterway Suitability Assessment (WSA) and the suitability of the waterway.

2. For the purposes of this analysis, the following assumptions were made:

a. The applicant is fully capable of, and would fully implement, any and all risk management measures they identified in their WSA.
b. The conditions of the port identified in the WSA fully and accurately describe the actual conditions of the port at the time of the WSA submission.
c. The conditions of the port have not changed substantially during the analysis process.
d. The applicant will fully meet all regulatory requirements including the development and submission of a Facility Security Plan, Emergency Manual, and Operations Manual.

3. The Port of Brownsville is the only deepwater port located on the U.S. and Mexico border. It connects to the Gulf of Mexico via the Brazos Santiago Pass (BSP) and Brownsville Ship Channel (BSC). The Port of Brownsville offers easy access to three international bridge crossings and rail connections to facilitate the international movement of goods between the United States and Mexico. The BSC is managed under the jurisdiction of the Brownsville Navigation District and has a depth of 42 feet, with full congressional authorization to deepen its channel to 52 feet. The Turning Basin has a depth of 36 feet and a width of 1,200 feet. The port stretches for 17 miles. The primary import/export commodities handled by the ports include Steel products, Hot and Cold Roll, Iron Ore, Petro Products and Lubricants.

The Port of Brownsville is the largest land-owning public port authority in the nation with approximately 40,000 acres and handling more than 9.3 million tons of cargo in 2016 and 10.1 million tons of cargo in 2015.

The U.S. Coast Guard regulates the port under the Maritime Transportation Security Act (MTSA), Security and Accountability for Every Port Act (SAFE Port Act), Ports and Waterways Safety Act (PWSA) and other laws applicable to maritime safety and security. These facilities include oil refineries, chemical plants, oil terminals, grain terminals, and various facilities handling bulk cargos. The various industries that comprise this petroleum and chemical complex have pro-actively cooperated over the years to establish and maintain a robust mutual aid emergency response program as well as an integrated security and surveillance network which includes five separate law enforcement agencies that are recognized throughout the country for their effectiveness.

Certain vessels entering or departing Texas ports require a pilot in accordance with Title 46 of the Code of Federal Regulations, part 15, Section 812 and Texas Transportation

Code Chapter 61. The Brazos-Santiago Pilots are state licensed Texas pilots responsible for ensuring the safe transit of vessels transiting through the Port of Brownsville. They handle approximately 600 vessel transits through the Port of Brownsville each year. The Brownsville Pilots are among the 150 members of the Texas State Pilots Association (TSPA) which includes the Matagorda Pilots, Aransas-Corpus Christi Pilots, Brazos Pilots, Galveston-Texas City Pilots, Houston Pilots, and Sabine Pilots.

Inbound and outbound traffic density in the Port of Brownsville include a variety of vessels sizes and classes which are projected to increase on average by 6 LNG Carriers per week once the terminal and facility are operational with 6 liquefaction trains. The maximum anticipated port calls per year is expected to be around 312. These projections are based on a maximum nominal output of 27.0 Metric Tonnes Per Annum (MTPA). Other traffic transiting through the BSC include offshore rigs, aircraft carriers, fishing vessels, recreational vessels, towing vessels, non-piloted barges and also include a mix of narrow, deep draft and wide vessels. Two additional companies are exploring LNG facilities which could increase the traffic density of the BSC as well. The U.S. Coast Guard is responsible for screening LNG carriers transiting from flag states prior to arrival to the port. The port is conducting a feasibility study to examine widening and deepening its ship channel.

The terminal will be sited along the BSC located in Cameron County, Texas. All terminal facilities will be located within an approximately 1,000-acre parcel of land owned by the Brownsville Navigation District (BND) of Cameron County, Texas and situated along the north embankment of the BSC. The property is roughly centered between the eastern end of the BSC at Laguna Madre and the Port of Brownsville turning basin at its western end. The center point of the terminal property has the approximate coordinates: Latitude 26°1' N and Longitude 97°16' W. Pursuant to an existing binding lease option agreement, the terminal site will be secured by RGD through a long-term lease with the BND. Approximately 774 acres of the parcel will be developed as part of the terminal facilities, and the balance of the parcel (approximately 210 acres) will be retained as a natural buffer.

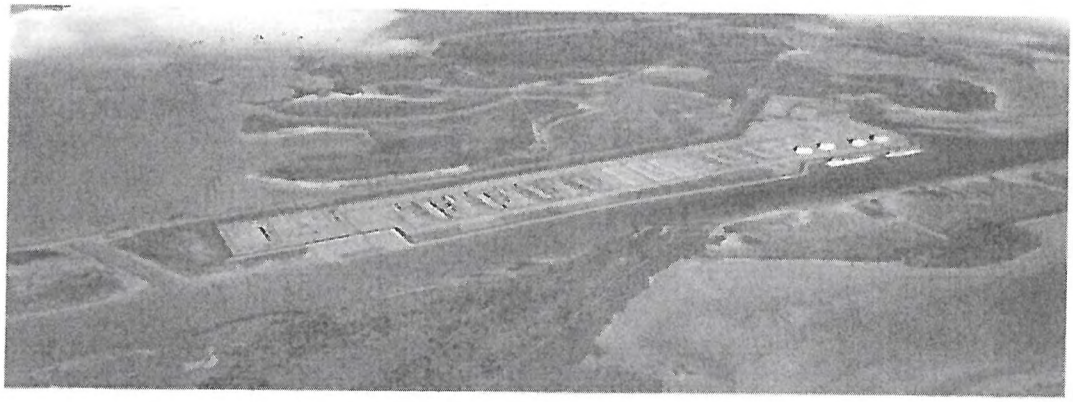

Figure 1. Rio Grande Conceptual Rendering of Facility

Factors Adjacent to the Facility:

a. **Depth of Water** – The BSC is currently maintained at a 42' depth and 250' width, starting at the jetty entrance to the BSC and extending 17 miles to the Port of Brownsville turning basin. Dredging (and disposal) of seabed material will be required to create a berthing area and turning basin at the terminal. The volume of dredged material has been preliminarily estimated at 7.2 million cubic yards.
b. **Tidal Range** - The normal tidal range along the ship channel is approximately outlined in Table 3 below.

Table 1 Tidal Datums, Brownsville, TX NOAA Tide Station 8779977, 1983-2001 Tidal Epoch

Tidal Datum	Elevation Relative to NAVD88	
	Feet	Meters
Mean Higher – High Water (MHHW)	+ .52	+ .16
Mean High Water (MHW)	+ .46	+ .14
NAVD88	**0.00**	**0.00**
Mean Tide Level (MTL)	- .04	- .01
Mean Low Water (MLW)	- .69	- .21
Mean Lower – Low Water (MLLW)	- .85	- .26
Mean Range of Tide (MN) *(MHW - MLW)*	1.15	.35

c. **Protection from High Seas** – Protection from High Seas – The proposed facility is located within the BSC and therefore only exposed to high water as a result of a severe storm surge from a hurricane or tropical storm.
d. **Natural Hazards** - The only navigational hazards in the vicinity of the project site are rock jetties on either side of the channel entrance extending into the Gulf of Mexico. Discussions and simulations with the Brazos Santiago Pilots Association (BSPA) have shown that this hazard will not interfere with normal navigation and mooring operations.
e. **Underwater Pipelines and Cables** - Based on current pipeline charts that are available, there are currently no active pipelines running across/underneath the channel in the vicinity of the LNG Carrier transit route or Terminal mooring operations. There is a pipeline project currently underway that will bury a 42" pipeline, 3,185 feet long 48 feet deep below the ship channel at a maximum ship channel depth of 52 feet. Due to the depth of the pipeline, this will have no affect on ship channel traffic.
f. **Maximum Vessel Size by Dock** – The dock can accommodate a vessel with a maximum length of 1,000 feet and capacities ranging from 125,000 m^3 to 185,000 m^3, including the minimum number of mooring hooks, safe working loads, minimum fender sizes, and the appropriate location and distribution of mooring and berthing dolphins. The mooring assessment has also been performed to establish safety and environmental procedures to ensure safe

mooring operations for LNG Carriers at each berth. The maximum size ship to call on the facility will be a Post Panamax size ship.

g. **Space X Spaceport** – This launch site is 5 miles away from the proposed facility location and is intended to support launches of space vehicles. FERC Staff reviewed a space launch analyses for impacts from the spaceport to the facility. Based on FERC assumptions (for modeling inputs) and risk criteria used internationally, by NFPA 59A, and FERC's hydro-dam Divisions, FERC staff found that the risk of public impact from a projectile in the 10,000 to 100,000 ft-lb range would be just inside the tolerable region (i.e., within the ALARP region) after accounting for 10% probability factor for wind.

Included in the proposed assessment, was a plan to divide the LNG Carrier transit routes into six (6) inbound, one (1) loading at berth, and six (6) outbound segments. The total inbound transit from the sea buoy (pilot boarding area) to the terminal berth is approximately eight (8) miles and will take approximately 2.5 hours to berth. The route is reversed for outbound LNG Carrier transits with the exception of the turning/maneuvering basin which is bypassed on the outbound transit where the LNG Carrier is moved directly into the BSC. The route and segments are shown below in Figure 2.

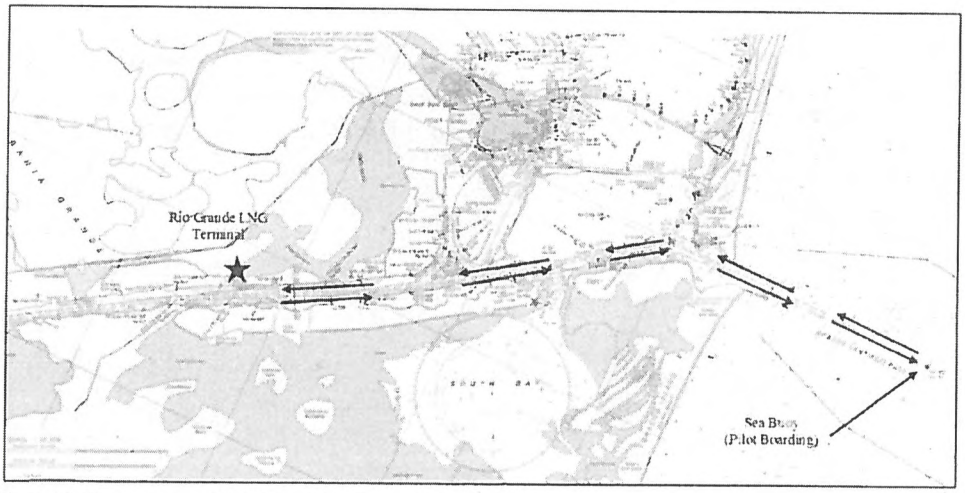

Figure 2. Overview of LNG Carrier Transit Route

The LNG vessels exporting cargo from the two proposed marine loading berths are expected to accommodate both membrane and spherical designed LNG vessels with capacities between 125,000 m^3 to 185,000 m^3. The terminals will be built in accordance with applicable international and domestic design requirements giving due consideration to collision and grounding protection as show in Figure 3. Double bottom and double side protection are sized appropriately based on the hazard associated with the cargo being carried.

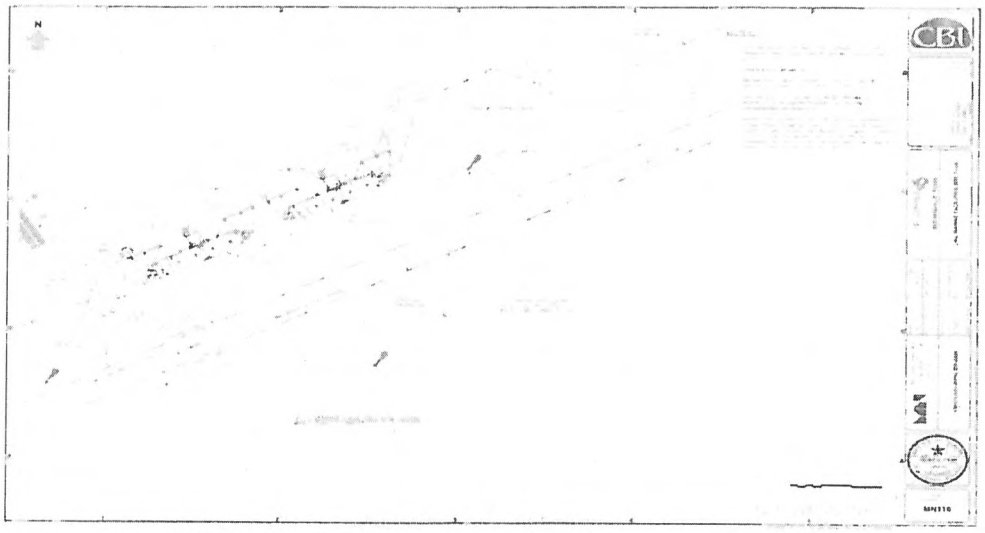

Figure 3. Dredging Contour Plan and Turning Basin

All factors regarding the condition of the waterway, vessel traffic, and facilities upon the waterway, were taken into consideration during the LOR process. The processes used are detailed in Section 4 of this analysis.

4. To ensure all regulatory processes were met, Sector Corpus Christi took a systematic approach in the decision-making process as outlined in Figure 4. To streamline and ensure transparency in the LOR process, Sector Corpus Christi worked with RGLNG, the Consulting Group AcuTech, and port partners though a series of ad-hoc meetings and a one day workshop.

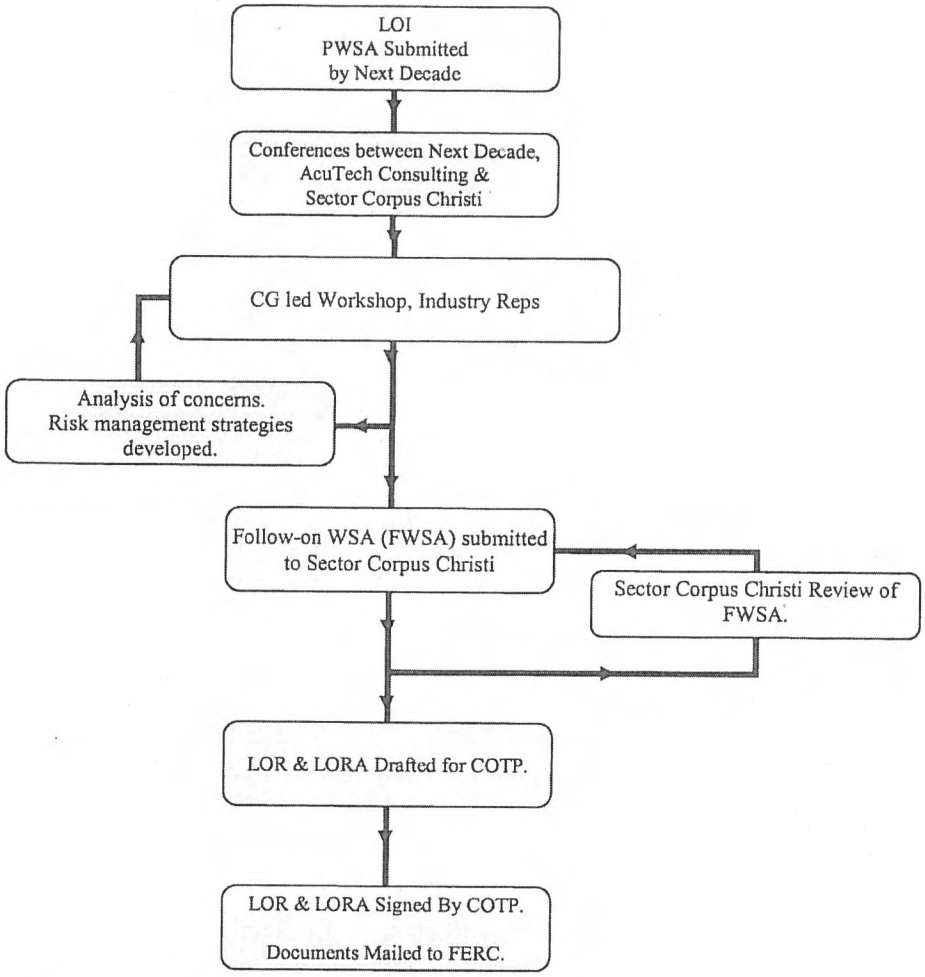

Figure 4 - LNG LOR Process
(Sector Corpus Christi)

Enclosure (3) of NVIC 01-2011 provides guidance on the review of a WSA. To meet the expectations of NVIC 01-2011, my staff held several in-house reviews of the WSA, and facilitated discussions during a workshop held in Brownsville, TX on October 14, 2015. The workshop included a wide range of participants, including representatives from; Next Decade; AcuTech Consulting Group; the USCG; Brazos-Santiago Pilots Association; terminal operators; refinery operators; Port Authorities; shipping agents and law enforcement agencies.

Members	Position/Role
LCDR Russell Pickering	Waterways Management Division Chief, Sector Corpus Christi
LT Terri Parris	MSD Brownsville Supervisor, Sector Corpus Christi
MST1 Mitchell Priest	MSD Brownsville, Sector Corpus Christi

MST3 Rebekah Wagner	Waterways Management Division, Sector Corpus Christi
Sammy Mock	Local Charter Fishing
James Bryant	Keppel Amfels
Steve Bearden	Port Isabel Navigation District
Stephen Calabrese	Acutech
Eduardo A. Campirano	Port of Brownsville
Carlos Martinez	Brownsville Navigation District
Martin Medrano	Brownsville Navigation District
Michael Davis	Port of Brownsville
Khon-Whey Tay	Keppel AmFels
Charlie Milstead	CITGO
Donna Eymard	Port of Brownsville
Jonathan Willett	Brazos-Santiago Pilots Association
Kevin Gibson	Signet Maritime
Brad Fuller	Acutech
CAPT Gene Tuttle	Brazos-Santiago Pilots Association
Carlos Garcia	Port of Brownsville
John Wood	Port of Brownsville
James Markham-Hill	Next Decade/Rio Grande LNG
Clarence Leu	Next Decade/Rio Grande LNG
David Moore	Next Decade/Rio Grande LNG
Dennis Klein	Next Decade/Rio Grande LNG
Kenny Warr	Vulcan Construction Materials
David Farrar	Vulcan Construction Materials

Figure 5 – Brownsville WSA Team 14 Oct 2015
(Port of Brownsville)

The participants of this "ad-hoc" workshop, authorized by NVIC 01-2011 enclosure (3), utilized their expertise on the physical characteristics and traffic patterns of the waterway, as well as their respective specialty knowledge of the marine, LNG, safety, security, and facility fields, to analyze the feasibility of the project.

Participants considered the changes in the area's safety and security dynamics due to the introduction of additional LNG ship traffic associated with the RGLNG Project. Next Decade and AcuTech used the American National Standards Institute (ANSI)/American Petroleum Institute (API) Standard 780 Security Risk Assessment (SRA) Methodology, as the basic approach for assessing risk. The standard was published in June 2013 as a U.S. standard for security risk assessments on petroleum and petrochemical facilities. The standard represents a model standard for evaluating all security risks of petroleum and petrochemical infrastructure and operations, and assists industries conducting thorough and consistent SRAs. Safety factors considered include the potential impacts of groundings, collisions, and allisions. For security purposes, participants considered potential threats and consequences of intentional act of aggression to the facility and developed security measures to mitigate the risks. At a minimum, each of the recommended risk management measures from enclosure (7) of NVIC 01-2011 were considered, yet in the WSA workshop, additional risks and recommendations were discussed.

The WSA workshop members considered each scenario along each transit segment and evaluated the causes of accidental or intentional events. The workshop analyzed the contributing factors for each scenario and their likelihood of occurrence given the adequacy of safety and security layers.

In addition, Sector Corpus Christi submitted a Notice and Request for Comment to the Federal Register to notify the public of the receipt of a WSA and to solicit public comments on the proposed construction of the LNG facility. Five major themes emerged after reviewing the comments. Safety, security, environmental, economics, public outreach and physical characteristics of the ship channel were the major themes identified in the public comments.

Safety

The comments revolved around how safe residents were from any hazards associated with LNG and the ability to properly respond to that hazard. Title 33 of the Code of Federal Regulations (CFR), part 127 subpart B, Waterfront Facilities handling Liquefied Natural Gas outlines safety measures required by the facility to ensure safety measures are in place to include sensing and alarms systems, emergency shutdown procedures, general maintenance of equipment, general training of personnel and general firefighting procedures.

Security

The comments revolved around how secure residents were from a terrorist attack. Title 33 of the CFR, part 105 subpart D, Facility Security Plan, a Facility Security Officer must ensure a Facility Security Plan (FSP) is developed and implemented. The FSP must be approved by the USCG Sector Corpus Christi Captain of the Port. The FSP must address eighteen points from security measures for access control to handling cargo.

Environmental

The comments revolved around how vulnerable the environment was to a spill or the possibility of the environment suffering from any spills associated with this facility. As required by title 33 of the CFR, part 127 and section 307, the facility is required to have an Emergency Manual and must contain LNG release response procedures. This manual is examined by the Coast Guard to ensure it meets the requirements set forth in section 307.

Economics

Comments revolved around the impact of the shrimping fleet and tourism boats taking a hit due to the congested traffic caused by the increase of vessels on the ship channel. Despite the increased traffic on the ship channel, the waterway is suitable to handle the additional stream of traffic and accommodate the shrimping fleet. There will be a

disruption to the normal operations of the ship channel, however through a robust working group, similar to a Harbor Safety Committee, this issue can be addressed and logistics can be worked out to all waterway users' satisfaction.

Public Outreach

Comments revolved around the Coast Guard not being open to the public in their process. As discussed earlier, USCG Sector Corpus Christi hosted a workshop to discuss the WSA process for the LNG facilities proposed for Brownsville. There were also public meetings held on August 10, 2015 in Raymondville, TX, August 11, 2015 in Port Isabel, TX and August 13, 2015 in Kingsville, TX sponsored by FERC that allowed the public to make comments regarding the proposed facilities.

Physical Characteristics

Comments revolved around the ship channel depth not being deep enough to accommodate the LNG vessels. The depth of the channel will dictate how much LNG can be loaded onto a vessel. Although it makes economical sense for the channel to be deeper for the facility and the vessel, the facility will load product to the depth of the channel until efforts to increase the depth have been completed.

Sector Corpus Christi followed the checklist found in enclosure (4) of NVIC 01-2011 during the review. Through this review, Sector Corpus Christi clarified certain points in the WSA to ensure that the document contained accurate information, and that all references were proper. With the final draft of the WSA, Next Decade and AcuTech has satisfied the requirements of the LOR process.

5. Based on my review of the WSA completed on November 17, 2017 and input from state and local port stakeholders, and taking into account previously reviewed expansion projects, I am recommending to the Federal Energy Regulatory Commission that the waterway in its current state be considered suitable for LNG marine traffic associated with the proposed project.

Document Content(s)