As Of: 09/26/2018			MMBtu				
Location: Mont Belvieu TX	Heat Content	91330	0.09133				
nstrument: LDH Propane Futures (\$/gal)							
As Of: 9/26/2018							
Term	Mont Belvieu TX						
	LDH Propane						
	Futures						
September 2018	1.0581		11.58502				
October 2018	1.0542		11.54243				
November 2018	1.0542		11.54243			-	
December 2018	1.0517		11.51506				
January 2019	1.0467		11.46031			1	+
February 2019	1.0371		11.3553 10.67557			-	
March 2019	0.975		10.07336		_	-	+
April 2019	0.92		9.854374			-	+
May 2019 June 2019	0.9		9.753969			_	+
July 2019	0.8896		9.740282				+
August 2019	0.8904		9.74948		_		+
September 2019	0.8929		9.776853		+	<b>+</b>	+
October 2019	0.8954		9.804226		+	+	+
November 2019	0.8979		9.8316		+	+	+
December 2019	0.8992		9.845286				+
January 2020	0.9		9.854374				1
February 2020	0.8896		9.740282				1
March 2020	0.8608		9.42549				$\overline{}$
April 2020	0.8379		9.174641				1
May 2020	0.8304		9.092522				1
June 2020	0.8288		9.074236				
July 2020	0.8296		9.083324				
August 2020	0.8308		9.097011				
September 2020	0.8342		9.133582				
October 2020	0.8371		9.165444				
November 2020	0.8404		9.202015				
December 2020	0.8429		9.229388				
January 2021	0.8282		9.068652				
February 2021	0.8256		9.040184				
March 2021	0.7891		8.639987				
April 2021	0.7798		8.538487				
May 2021	0.7774		8.511989			-	
June 2021	0.7786		8.525238			-	
July 2021	0.7834		8.578014				
August 2021	0.7884		8.63276 8.723202				
September 2021	0.7967		8.775758		_	+	
October 2021	0.8015		8.828753			-	+
November 2021	0.8063		8.881419				
December 2021 January 2022	0.8111 0.7917		8.668784		+	<u> </u>	+
February 2022	0.7917		8.633855		+	<del>                                     </del>	+
March 2022	0.7643		8.368992	+		+	+
Narch 2022 April 2022	0.7487		8.197963		+	<del> </del>	+
May 2022	0.7462		8.17059	<del>-  </del>		1	+
June 2022	0.7475		8.184277				+
July 2022	0.7531		8.245812		1		+
August 2022	0.7587		8.307456			1	+
September 2022	0.7681		8.410051				1
October 2022	0.7737		8.471696				+
November 2022	0.7793		8.533231			1	1
December 2022	0.785		8.594876				1
	0.700						1



# GOBIERNO DE PUERTO RICO

#### JUNTA DE CALIDAD AMBIENTAL

3107 YAN 5

1 6 MAY 2019

## Luisette X. Ríos Castañer

Jefa, División de Protección Ambiental y Confiabilidad de Calidad Autoridad Energía Eléctrica PO Box 364267 San Juan, PR 00936-4267

141-19-0193
Conversión de Combustible Dual para las Unidades 5 y 6
Central Termoeléctrica San Juan
PR-28, Zona Portuaria (Ave. Mercado Central)
San Juan, Puerto Rico

Estimada señora Ríos:

Hacemos referencia a la comunicación sometida por la Sra. Marylin N. Mendoza, el 13 de mayo del 2019, para convertir las unidades 5 y 6 de la facilidad de referencia a gas natural como combustible principal, manteniendo la capacidad de quemar combustible destilado #2 (diésel). Este proyecto incluye la instalación de una estación de medición, sistema de control de emisiones de las unidades, y tuberías sobre el terreno para el transporte del gas natural, entre otros equipos adicionales que viabilizarán esta conversión para la quema dual de combustible. Las labores propuestas solo requerirán movimiento de tierra para el establecimiento de las fundaciones de los distintos equipos (skids, tanques, entre otros) y el soterrado de la tubería de gas en sólo dos puntos del camino para un área total estimada de 145 metros cuadrados, y el resto de las áreas será sobre el terreno donde existen calles internas que van a ser cruzadas.

Esta Junta, amparada en la Regla 141 del Reglamento Núm. 8858 del 23 de noviembre de 2016, conocido como el "Reglamento Para el Proceso de Evaluación Ambiental" ha determinado que la acción propuesta no ocasionará impactos significativos al ambiente. El documento sometido para la acción propuesta cumple con lo requerido en el Artículo 4-B (3) de la Ley sobre Política Pública Ambiental, Ley 416-2004, según enmendada.

No obstante, se le requiere que cumpla con todas las disposiciones de las leyes y reglamentos estatales y federales aplicables, incluyendo las siguientes:

1. Obtener de esta Junta las correspondientes modificaciones de los permisos otorgados por el Área de Calidad de Aire de esta Junta, conforme al Reglamento Núm. 5300 del 28 de agosto de 1995, conocido como el "Reglamento para el Control de la Contaminación Atmosférica".



Ave Ponce de León 1375, Carretera 8838, Sector el Cinco, Río Piedras, PR / PO Box 11488, San Juan, PR 00910

Luisette X. Ríos Castañer 141-19-0193 Página 2 1 6 MAY 2019

6 MAY 2019

2. Tomar las medidas necesarias para evitar que residuos de sustancias orgánicas e inorgánicas tales como: aceites, combustibles u otras sustancias químicas, puedan ser arrastradas por la escorrentía y ganen acceso a cualquier cuerpo de agua o al sistema pluvial del área.

Esta determinación de cumplimiento ambiental no afectará el estado de las fuentes de emisión que tenga autorizada la facilidad.

Las recomendaciones y requisitos presentados en esta comunicación no eximen de cualquier otro requerimiento o permiso(s) de esta Junta u otras agencias concernientes que sean aplicables a la acción propuesta.

Cordialmente,

Tania Vázquez Rivera Directora Ejecutiva

ADL/adl



# GOBIERNO DE PUERTO RICO

DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES

Área de Calidad de Aire

0 3 OCT 2019

# ING DANIEL HERNÁNDEZ

DIRECTOR GENERACIÓN AUTORIDAD DE ENERGIA ELÉCTRICA DE PUERTO RICO PO BOX 364267 SAN JUAN PR 00936-4267

Estimado ingeniero Hernández:

Re:

MODIFICACIÓN PERMISO DE CONSTRUCCIÓN

DE FUENTE DE EMISIÓN

PREPA SAN JUAN POWER PLANT

PROYECTO GAS NATURAL: UNIDADES 5 Y 6

SAN JUAN, PUERTO RICO PFE-65-0499-0365-I-II-C

El Departamento de Recursos Naturales y Ambientales (DRNA) le incluye la **modificación** al permiso en referencia. La modificación se autoriza con el propósito de autorizar el uso de gas natural en las unidades 5 (SJCC5) y 6 (SJCC6). Le informamos que los demás términos y condiciones no incluidos en esta autorización permanecen vigentes.

Si necesitan más información puede comunicarse al 787-767-8181.

Cordialmente,

Luis R. Sierra Torres, P.E.

Gerente Interino

Área de Calidad de Aire

LRST/LDM



# GOBIERNO DE PUERTO RICO

DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES

Área de Calidad de Aire

#### MODIFICACIÓN PERMISO DE CONSTRUCCIÓN DE FUENTE DE EMISIÓN ÁREA DE CALIDAD DE AIRE DIVISIÓN DE PERMISOS E INGENIERÍA

03 OCT 2019

#### Sección I - Información General

Nombre de la Fuente:

PREPA SAN JUAN POWER PLANT

Número de Permiso:

PFE-65-0499-0365-I-II-C

Dirección Física:

AVE. MERCADO CENTRAL LOTE 28 ZONA PORTUARIA PUERTO NUEVO SAN JUAN, PUERTO RICO 00936

Dirección Postal:

PO BOX 364267

SAN JUAN P.R. 00936-4267

Oficial Responsable:

ING. DANIEL HERNÁNDEZ

DIRECTOR GENERACIÓN

AUTORIDAD DE ENERGIA ELÉCTRICA DE PUERTO RICO

Teléfono:

(787)521-6421

#### Sección II - Fuentes de Emisión Incluidas en el Permiso

Se sustituyen las siguientes fuentes de emisión:

Unidad de Emisión	Equipo de Control	Descripción
Unidad SJCC5	Sistema de inyección de vapor	La unidad de ciclo combinado consiste de una turbina de combustión Westinghouse 501FC y un Heat Recovery
(unidad 5 o CT5)	Implementación de buenas prácticas de combustión	Steam Generator (unfired) <sup>2</sup> .  Heat Input LNG: 1,748 MMBtu/hr,  Heat Input Diésel: 1,694 MMBtu/hr
	Sistema de Reducción Catalítica Selectiva (SCR, en inglés) y Oxidador Catalítico (OxCat) en <u>una</u> de las dos unidades.¹ Eficiencia mínima de remoción SCR: NOx: 80% Eficiencia mínima de remoción OxCat: CO: 95%	Razón máxima de consumo diésel: 12,548 gal/hr Razón máxima de consumo LNG: 1.714E <sup>6</sup> scf/hr
Unidad SJCC6 (unidad 6 o CT6)		La unidad de ciclo combinado consiste de una turbina de combustión Westinghouse 501FC y un <i>Heat Recovery</i> <i>Steam Generator (unfired)</i> <sup>2</sup> . Heat Input LNG: 1,748 MMBtu/hr, Heat Input Diésel: 1,694 MMBtu/hr
		Razón máxima de consumo diésel: 12,548 gal/hr Razón máxima de consumo LNG: 1.714E <sup>6</sup> scf/hr

<sup>&</sup>lt;sup>1</sup> Este equipo se instalará no más tarde de 6 meses luego de comenzar a quemar ambos combustibles.

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<sup>&</sup>lt;sup>2</sup> El *Heat Recovery Steam Generator* (HRSG) no posee quemadores suplementarios. No aplica el 40 CFR Parte 60 Subparte Da ya que sólo las emisiones resultantes de la quema de combustible en las unidades están sujetas a la Subparte Da. [40 CRF §60.40a(b)]

MODIFICACIÓN PERMISO DE CONSTRUCCIÓN PREPA SAN JUAN POWER PLANT PROYECTO GAS NATURAL - UNIDADES 5 Y 6 SAN JUAN, PUERTO RICO PFE-65-0499-0365-I-II-C PÁGINA 2 DE 22

#### Sección XXII - Contaminantes Atmosféricos Peligrosos

#### Se añade la siguiente condición de permiso que lee como sigue:

11. Las emisiones permisibles para las dos unidades SJCC5 y SJCC6 se describen en la tabla a continuación:

Contaminantes Atmosféricos Peligrosos <sup>3</sup>	Emisiones Permisibles (ton/año)
Acetaldehido	0.61
Benceno	0.71
1-3 butadiene	0.21
Etilbenceno	0.49
Formaldehido	3.35
Toluene	1.99
Xilenos	0.98
PAH (total)	0.52
Arsénico	0.32
Berilio	0.03
Cadmio	0.03
Cromo	0.03
Manganeso	0.03
Mercurio	0.32
Níquel	0.06
Selenio	0.32
Acrolein	0.10
Antimonio	0.32
Cobalto	0.06
TOTAL	10.50



<sup>&</sup>lt;sup>3</sup> Sin incluir plomo.

Se añaden las siguientes secciones del permiso:

Sección XIV – Condiciones adicionales para el escenario de quema de combustible dual para las unidades SJCC5 y SJCC6

Condiciones del PSD Non Applicability Analysis del 19 de julio de 2019:

- 1. Las unidades SJCC5 y SJCC6 de la PREPA<sup>4</sup> San Juan deberán modificarse para permitir la capacidad de combustible dual (dual fuel capacity) para quemar gas natural o diesel fuel oil<sup>5</sup>.
- 2. PREPA instalará, operará y mantendrá un sistema catalítico de reducción selectiva que utilizará amonia acuosa al 19% (aqueous ammonia selective catalytic reduction system) (SCR, en inglés) diseñado con una eficiencia del 80% de control para NO<sub>x</sub> y un sistema de oxidación catalítica (OxCat, en inglés) con una garantía de las emisiones de CO de al menos de 10 ppmvd corregido al 15% de oxígeno, en la unidad SJCC5 o SJCC6 para reducir las emisiones atmosféricas. La instalación del sistema SCR/OxCat combinado será instalado en solo una turbina y ocurrirá dentro de los seis (6) meses posteriores al inicio de la operación de la capacidad combustible dual (dual fuel capability). Este sistema SCR/OxCat combinado será optimizado, operado y mantenido de acuerdo con las instrucciones del manufacturero.
- 3. PREPA instalará, si no lo ha hecho ya, y mantendrá, metros de flujo de combustible para tanto gas natural y *fuel oil* en las unidades SJCC5 y SJCC6 (por separado) para que se pueda mantener registros del consumo actual de combustible para cada unidad.
- 4. PREPA realizará pruebas de chimeneas en las unidades SJCC5 y SJCC6 para verificar las emisiones dentro de 180 días después de que se haya comenzado ambas operaciones, el proyecto de cambio de combustible y se haya completado la instalación del sistema SCR/OxCat combinado.
- 5. No hay restricciones en las horas de operación para las unidades SJCC5 y SJCC6, siempre que estas unidades cumplan con los límites de emisiones anuales descrito en la condición 6 de esta sección del permiso.
- 6. A partir de la combustión inicial de gas natural en la unidad SJCC5 o SJCC6, PREPA administrará de manera diligente las emisiones actuales de estas dos unidades para que las emisiones combinadas se mantengan por debajo de los límites anuales que se indican a continuación en una base rotativa de 365 días, según la base de contaminantes regulados, y en cualquier momento durante los primeros 364 días. Las emisiones actuales asociadas al comienzo (startups), apagado (shutdowns) y malfuncionamientos, también se incluirán en los límites a continuación<sup>6</sup>:

<sup>&</sup>lt;sup>4</sup> Autoridad de Energía Eléctrica de Puerto Rico

<sup>&</sup>lt;sup>5</sup> En adelante Diésel.

<sup>&</sup>lt;sup>6</sup>SJCC5 es la Unidad 5, SJCC6 es la Unidad 6 del PSD, Tons es la abreviatura de toneladas, *CEMS* es un sistema continuo de monitoreo de emisiones, *Avg* es la abreviatura de *average* (promedio, en español), NG es natural gas (gas natural, en español), lbs es libras y MMBtU es la abreviatura de *one million British Thermal Units (BTU). VOC (Volatile Organic Compounds,* en inglés) es la abreviatura para compuestos orgánicos volátiles (COV, en español).

a. NOx:

U5  $NO_x ton/día + U6 NO_x ton/día + NO_x Total (364 días previos) < 1,016.7 ton de <math>NO_x$  (365 días rotativos)

Donde:

U5 NO<sub>x</sub> ton/día = [(U5CEMS Avg NG NO<sub>x</sub> lb/MMBtu X U5NG MMBtu/día) + (U5CEMS Avg diésel NO<sub>x</sub> lb/MMBtu X U5diésel MMBtu/día)]  $\div$  2,000 lb/ton

 $U6 NO_X ton/día = [(U6CEMS Avg NG NO_X lb/MMBtu X U6NG MMBtu/día) + (U6CEMS Avg diésel NO_X lb/MMBtu X U6diésel MMBtu/día)] ÷ 2,000 lb/ton$ 

b. CO:

U5 CO ton/día + U6 CO ton/día + CO Total (364 días previos) < 179.6 ton de CO (365 días rotativos)

Donde:

**U5 CO ton/día** = [(U5CEMS Avg NG CO lb/MMBtu X U5 NG MMBtu/día) + (U5CEMS Avg diésel CO lbs/MMBtu X U5diésel MMBtu/día)] ÷ 2,000 lb/ton.

**U6 CO ton/día** = [(U6CEMS Avg NG CO lb/MMBtu X U6 NG MMBtu/día) + (U6CEMS Avg diésel CO lbs/MMBtu X U6diésel MMBtu/día)] ÷ 2,000 lb/ton.

c. VOC:

U5 VOCs ton/día + U6 VOCs ton/día + VOCs Total (364 días previos) < 119.6 ton de VOCs (365 días rotativos)

Donde:

U5 VOC ton/día = [(0.0021 lb/MMBtu X U5 NG MMBtu/día) + (0.0083 lb/MMBtu X U5 diésel MMBtu/día)]  $\div$  2,000 lb/ton

U6 VOC ton/día = [(0.0021 lb/MMBtu X U6 NG MMBtu/día) + (0.0083 lb/MMBtu X U6 diésel MMBtu/día)] ÷ 2,000 lb/ton

d. SO<sub>2</sub>:

U5  $SO_2$  ton/día + U6  $SO_2$  ton/día +  $SO_2$  Total (364 días previos) < 229.0 ton de  $SO_2$  (365 días rotativos)

Donde:

U5 SO<sub>2</sub> ton/día= [(NG sulfur gr/100dscf  $\div$  7000 gr/lb + 1020 Btu/dscf X 1,000,000 Btu/MMBtu X U5NG MMBtu/día X 2 SO<sub>2</sub>-lb/S-lb) + (Diésel %S (por peso) X U5 Diésel (gal) X 7.05 lb/gal X 2 SO<sub>2</sub> - lbs/S-lbs)]  $\div$  2,000 lb/ton

U6 SO<sub>2</sub> ton/día = [(NG sulfur gr/100dscf  $\div$  7000gr/lb  $\div$  1020 Btu/dscf X 1,000,000 Btu/MMBtu X U6NG MMBtu/día) X 2 SO<sub>2</sub>—lbs/S-lbs) + (Diésel %S (por peso) X U6 Diésel (gal) X 7.05 lb/gal X 2 SO<sub>2</sub>-lbs/S-lb)]  $\div$  2,000 lb/ton

El contenido de azufre (S) del combustible *fuel oil* no será mayor que 0.050% por peso. PREPA utilizará el contenido de azufre(S) actual del fuel oil muestreado para calcular las emisiones de  $SO_2$  al suponer una conversión del 100% de azufre en  $SO_2$ . Para el gas natural, PREPA requerirá que el suplidor de combustible proporcione los resultados de las pruebas para cada embarque (*shipment*) de LNG (*liquefied natural gas*) para demostrar que el contenido de azufre del gas natural no es mayor que 1.0 granos por cada 100 pies cúbicos estándar [*grains per 100 dry standard cubic feet*] (1.0 gr/100dscf). PREPA mantendrá estos registros.

Al calcular las emisiones, PREPA asumirá que el *fuel oil* tiene un contenido de calor (*heat content*) de 138,000 Btu/gal (HHV) y una densidad de 7.05 lb/gal y que el gas natural tiene un contenido de calor de 1,020 Btu/dscf.

e. H<sub>2</sub>SO<sub>4</sub>:

U5  $H_2SO_4$  ton/día + U6  $H_2SO_4$  tons/día +  $H_2SO_4$  Total (364 días previos) < 36.1 ton de  $H_2SO_4$  (365 días rotativos)

Donde:

U5  $H_2SO_4$  ton/día = (U5  $SO_2$  ton/día X 98 lb  $H_2SO_4$  ÷ 64 lb  $SO_2$ ) X 10%

 $U6 H_2SO_4 ton/día = (U6 SO_2 ton/día X 98 lb H_2SO_4 \div 64 lb SO_2) X 10%$ 

PREPA asumirá una conversión de emisiones del 10% de las emisiones de SO<sub>2</sub> a H<sub>2</sub>SO<sub>4</sub> para ambos combustibles.

f. PM:

U5 PM ton/día + U6 PM ton/día + PM Total (364 días previos) < 297.4 ton de PM (365 días rotativos)

Donde:

**U5 PM ton/día**= [(0.0066 lb/MMBtu X U5 NG MMBtu/día) + (0.0284 lb/MMBtu X U5 diésel MMBtu/día)] ÷ 2,000 lb/ton

**U6 PM ton/día**= [(0.0066 lb/MMBtu X U6 NG MMBtu/día) + (0.0284 lb/MMBtu X U6 diésel MMBtu/día)] ÷ 2,000 lb/ton

g. PM<sub>10</sub>:

U5  $PM_{10}$  ton/día + U6  $PM_{10}$  ton/día +  $PM_{10}$  Total (364 días previos) < 357.4 ton de  $PM_{10}$  (365 días rotativos)

Donde:

**U5 PM**<sub>10</sub> ton/día= [(0.0066 lb/MMBtu X U5 NG MMBtu/día) + (0.0357 lb/MMBtu X U5 diésel MMBtu/día)] ÷ 2,000 lb/ton

U6 PM<sub>10</sub> ton/día= [(0.0066 lb/MMBtu X U6 NG MMBtu/día) + (0.0357 lb/MMBtu X U6 diésel MMBtu/día)]  $\div$  2,000 lb/ton

h. PM<sub>2.5</sub>:

U5  $PM_{2.5}$  ton/día + U6  $PM_{2.5}$  ton/día +  $PM_{2.5}$  Total (364 días previos) < 352.4 ton de  $PM_{2.5}$  (365 días rotativos)

Donde:

MMBtu/día)]

**U5 PM**<sub>2.5</sub> ton/día= [(0.0066 lb/MMBtu X U5 NG MMBtu/día) + (0.0357 lb/MMBtu X U5 diésel MMBtu/día)] ÷ 2,000 lb/ton

**U6 PM<sub>2.5</sub> ton/día**= [(0.0066 lb/MMBtu X U6 NG MMBtu/día) + (0.0357 lb/MMBtu X U6 diésel MMBtu/día)] ÷ 2,000 lb/ton

i. Plomo:

US Pb ton/día + U6 Pb ton/día + Pb Total (364 días previos) < 0.686 ton of Pb (365 días rotativos)

Donde:

**U5** Pb ton/día = [(0.000009 lb/MMBtu x U5 diésel MMBtu/día)] ÷ 2,000 lb/ton

U6 Pb ton/día = [(0.000009 lb/MMBtu x U6 diésel MMBtu/día)] ÷ 2,000 lb/ton

7. PREPA mantendrá todos los registros utilizados para determinar el cumplimiento de los límites anuales antes mencionados, incluyendo los registros de todos los *inputs* para los cálculos en el punto 6(a)-(i), por un período de al menos cinco (5) años. Las copias de estos registros deben estar disponibles según solicitados para la EPA o el Departamento de Recursos Naturales y Ambientales (DRNA)<sup>7</sup>.

#### Condiciones adicionales

8. De acuerdo con el Análisis de No Aplicabilidad de Prevención de Deterioro Significativo (PSD, en inglés) de la EPA del 1 de julio de 2019, las emisiones procedentes de las unidades SJCC5 y SJCC6 deberán ser menores a las cantidades establecidas en la siguiente tabla en una base rotativa de 365 días y en cualquier momento durante los primeros 364 días para evitar la aplicabilidad de una revisión de PSD. De igualar o exceder las cantidades establecidas, deberá someter no más tarde de 10 días una notificación a la EPA con copia al DRNA.

Contaminante	Cantidades (ton/año)
NOx	1,016.7
CO	179.6
VOC	119.6
SO <sub>2</sub>	229.0
H <sub>2</sub> SO <sub>4</sub>	36.1
PM	297.4
PM <sub>10</sub>	357.4
PM <sub>2.5</sub>	352.4
Pb Pb	0.686

THE

- 9. El tenedor del permiso notificará al DRNA la fecha exacta en que haya comenzado la combustión inicial de gas natural en cada unidad (SJCC5 y SJCC6). Dicha notificación deberá realizarse no más tarde de 10 días de comenzada la combustión inicial de gas natural en cada unidad.
- 10. El tenedor del permiso notificará al DRNA la fecha exacta en que haya completado la instalación del sistema SCR/OxCat combinado. Dicha notificación deberá realizarse no más tarde de 10 días de completada la instalación de dicho sistema.
- 11. Las pruebas de funcionamiento requeridas en la **condición 4** de esta sección de permiso es para cada contaminante incluido en la **condición 6** de esta sección de permiso e incluidos en la tabla de la **condición**

<sup>&</sup>lt;sup>7</sup> De acuerdo con el Plan de Reorganización del Departamento de Recursos Naturales y Ambientales de 2018, Ley 171 del 2 de agosto de 2018, Sección 28, se transfiere al Departamento de Recursos Naturales y Ambientales, para su ejecución por el Secretario, los poderes y funciones previamente delegadas a la Junta de Calidad Ambiental, su Presidente y/o su Junta de Gobierno mediante la Ley 416-2004, según enmendada, conocida como, "Ley sobre Política Pública Ambiental". Es por esto, que donde quiera que el permiso establezca JCA, Junta, Junta de Calidad Ambiental o agencia, se entenderá que se refiere actualmente al Departamento de Recursos Naturales y Ambientales (DRNA).

8 de esta sección. De los resultados de dichas pruebas, se determinarán los parámetros de operación y el monitoreo de las unidades y su equipo de control, de ser necesario, para asegurar que se cumplen con los límites de emisión aplicables. El tenedor del permiso deberá someter al DRNA los parámetros específicos a ser monitoreados como resultado de las pruebas, no más tarde de 60 días de entregados los resultados de las pruebas a la EPA y al DRNA para que formen parte de este permiso de construcción.

- Todas las pruebas de funcionamiento requeridas en la condición 4 de esta sección de permiso, deberán cumplir con los métodos de pruebas de la EPA aplicables y todas las notificaciones y requisitos establecidos en la Regla 106 del RCCA. Adicionalmente, de acuerdo con la Regla 106(D) del RCCA, el tenedor del permiso deberá proveerle al DRNA una notificación por escrito de la fecha del muestreo con 15 días de anticipo, para permitirle al DRNA tener un observador presente.
- Todas las pruebas de funcionamiento requeridas en la condición 4 de esta sección de permiso, deberán ser conducidas en condiciones de carga base (100%) y 60% de la carga base y/o a otra carga autorizada por el DRNA, la EPA o ambas. El tenedor del permiso deberá conducir tres corridas para cada condición de carga y el cumplimiento deberá basarse en la razón de emisión promedio de las tres corridas.
- 14. El DRNA se reserva el derecho de requerir pruebas adicionales con el fin de demostrar cumplimiento con las condiciones incluidas en este permiso y los límites aplicables.
- 15. El tenedor del permiso no podrá utilizar el resultado de las pruebas de una unidad para determinar cumplimiento de la otra unidad sin una solicitud y aprobación escrita de la EPA, el DRNA o de ambas.
- 16. El tenedor del permiso deberá actualizar los registros requeridos en la Sección XVIII (Requisitos de Mantenimiento de Registros) de este permiso para incluir, pero sin limitarse al, registro de consumo de gas natural quemado por hora por unidad, resultados de muestras de combustible del suplidor, etc. En dicho registro deberá indicar bajo cuál escenario operacional se encuentra operando cada unidad, esto es, la identificación del combustible quemado en cada unidad.
- 17. Deberá continuar en cumplimiento con los requisitos de informes de la Sección XX del permiso.
- 18. Operación del Sistema de Reducción Catalítica Selectiva (SCR, en inglés)
- a. El tenedor del permiso operará y mantendrá un sistema de Reducción Catalítica Selectiva (SCR, en inglés), en una de las dos unidades, de acuerdo con las especificaciones de diseño del fabricante. El sistema SCR utilizará continuamente un catalítico de tecnología comprobada en la reducción de emisiones de NOx.
  - b. Límite de deslizamiento de amoníaco: El deslizamiento de amoniaco<sup>8</sup> no podrá exceder de 5 ppmvd corregido al 15% de O<sub>2</sub>.
    - i. El límite de deslizamiento de amoníaco se cumplirá manteniendo la razón optima de flujo máximo de amoníaco a varias cargas de operación. La razón máxima de amoníaco deberá

<sup>&</sup>lt;sup>8</sup> Establecido en la solicitud de permiso.

determinarse durante las pruebas de funcionamiento. El tenedor del permiso deberá someter al DRNA los parámetros específicos a ser monitoreados para el SCR como resultado de las pruebas, no más tarde de 60 días de entregados los resultados de las pruebas a la EPA y al DRNA para que formen parte de este permiso de construcción.

- ii. El tenedor del permiso instalará y operará un medidor de flujo para el SCR para medir y registrar el flujo de amoníaco. El metro de flujo de amoniaco deberá ser instalado, calibrado, operado y mantenido de acuerdo con las especificaciones del manufacturero.
- iii. El tenedor del permiso deberá realizar una prueba de chimenea anualmente para verificar el cumplimiento con el límite de deslizamiento de amoníaco.
- 19. Sistema de Inyección de Vapor: El tenedor del permiso deberá operar continuamente el sistema de inyección de vapor en cada unidad y deberá establecer durante las pruebas de funcionamiento, una curva demostrando las variaciones de la razón de vapor a combustible por cada unidad. El tenedor del permiso deberá someter al DRNA dicha información, no más tarde de 60 días de entregados los resultados de las pruebas a la EPA y al DRNA para que formen parte de este permiso de construcción.
- 20. De ocurrir un fallo en los sistemas de monitoreo continuo de NOx y CO, el tenedor del permiso deberá utilizar los siguientes valores en las fórmulas de la condición 6 de esta sección del permiso para calcular las emisiones, siempre y cuando, estos valores hayan sido validados en las pruebas de funcionamiento.

Parámetro	(lb/MMBtu)	Combustible
NOx (60% - 100% carga base)	0.131	Diésel
CO (carga base)	0.06	Diésel
CO (60% de carga)	0.14	Diésel
NOx (75% - 100% carga base)	0.0921	Gas natural
CO (75% - 100% carga base)	0.0224	Gas natural



#### 21. Plan de Emergencia: De acuerdo con la Regla 107 del RCCA:

- a. El tenedor del permiso tendrá disponible un Plan de Emergencia, el cual será consistente con las prácticas adecuadas de seguridad y proveerá para la reducción o detención de las emisiones de la instalación durante períodos clasificados por la Junta como alertas, avisos o emergencia de contaminación atmosférica. Dichos planes deberán identificar la fuente de contaminación, indicará la reducción a obtenerse y la forma en que se obtendrá dicha reducción. Estos planes estarán disponibles a cualquier representante de la Junta en todo momento. [Regla 107(C)(1) del RCCA]
- b. El tenedor del permiso preparará y someterá a la Junta conjuntamente con la enmienda a la solicitud de su permiso de operación Título V un plan de reacción a emergencia de acuerdo con las disposiciones establecidas en la Sección 2 de la Regla 107(C) del RCCA. [Regla 107(C)(1) del RCCA]

- c. Luego de su aprobación por la Junta, el tenedor del permiso deberá mantener el plan de reacción a emergencia al día y todo personal involucrado deberá estar adiestrado y con conocimientos y tareas y funciones de reacción de emergencia. [Regla 107(C)(3) del RCCA]
- d. El tenedor del permiso deberá mantener el plan de reacción a emergencia accesible a todos los involucrados y deberá presentarlo a los representantes de la Junta cuando le sea requerido. [Regla 107(C)(4) del RCCA]
- 22. Plan de Manejo de Riesgo: Si durante la vigencia de este permiso, el tenedor del permiso estuviera sujeto al 40 CFR parte 68 deberá someter las notificaciones y un Plan de Manejo de Riesgo de acuerdo con el itinerario de cumplimiento en el 40 CFR parte 68.10 y deberá incluir una certificación de cumplimiento con los requisitos de la Parte 68, incluyendo el registro y el Plan de Manejo de Riesgo como parte de la certificación anual de cumplimiento requerida en el 40 CFR parte 70.
- Obligación General: El dueño u operador de una fuente estacionaria que produce, procesa, maneja o almacena cualquier sustancia reglamentada bajo la sección 112(r) de la Ley Federal de Aire Limpio, o cualquier otra sustancia extremadamente peligrosa, tiene la obligación general de identificar peligros que resulten del escape de contaminantes peligrosos mediante el uso de técnicas generalmente aceptables de evaluación y debe tomar los pasos apropiados para prevenir las descargas y reducir al mínimo las consecuencias del escape accidental. Aquellas fuentes que tengan sustancias en cantidades mayores a las cantidades de umbral, como se especifica en la Parte 68 del Volumen 40, deberán registrarse con la Junta o la APA<sup>9</sup> y deberán someter un Plan de Manejo de Riesgo según lo requiere la Regla 604 (e) del RCCA.
- 24. Las emisiones permisibles de GHG's para las dos unidades SJCC5 y SJCC6 se describen en la tabla a continuación:

	Emisiones Permisibles
	Por unidad
GHG's	(ton/año)
CO₂e	1,240,927

M

<sup>&</sup>lt;sup>9</sup> Agencia de Protección Ambiental federal (EPA, en inglés) o el Administrador conforme se define en la Reglamentación Federal.

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#### Sección XV - Condiciones Específicas 40 CFR Parte 60 Subparte GG

- Las unidades de emisión SJCC5 y SJCC6 están afectadas por el 40 CFR Parte 60 Subparte GG: Standards of Performance for Stationary Gas Turbines. Deberá cumplir con todos los requisitos aplicables de esta reglamentación de acuerdo, pero sin limitarse a, estándares de emisión, muestreo (testing), monitoreo (monitoring), cumplimiento continuo, registros e informes.<sup>10</sup>
- 2. Una vez completadas las pruebas de rendimiento requeridas en la sección 60.8 del 40 CFR, el tenedor del permiso deberá cumplir con las disposiciones aplicables del 40 CFR 60.332(a). Según el 40 CFR 60.332(a)(2), no causará la descarga a la atmósfera de cualquier gas de combustión que contenga óxidos de nitrógeno (NOx) en exceso de:

 $STD = [0.0150 (14.4/Y)] + F donde,^{11}$ 

- STD = emisiones de NOx permitidas (en por ciento por volumen a 15 porciento de oxígeno en base seca)
- Y= razón de calor establecida por el manufacturero a la razón de carga máxima suplida por el manufacturero (kilojulios por vatio hora), o la razón de calor actual medido, basado en el valor calórico más bajo del combustible medido a la carga máxima actual para la instalación. El valor de Y no deberá exceder 14.4 kilojulios por vatio hora.
- emisión de NOx permitida debido al enlace de nitrógeno fijado en el combustible, según definido en la Sección 60.332(a)(3) del 40 CFR Parte 60 Subparte GG. En el caso de las turbinas contempladas en este permiso, el valor de F será 0, basado en la opción provista en la Sección 60.332(a)(3) del 40 CFR.
- 3. De acuerdo con el 40 CFR 60.333, una vez completadas las pruebas de rendimiento requeridas en el 40 CFR 60.8, el dueño u operador sujeto a la Subparte GG no quemará ningún combustible con un contenido total de azufre en exceso de 0.8 porciento por peso (8,000 ppmv).<sup>12</sup>
- 4. De acuerdo con el 40 CFR 60.334(a), excepto por lo dispuesto en el párrafo (b) de esta sección 60.334, el propietario u operador de cualquier turbina de gas estacionaria sujeta a las disposiciones de esta Subparte GG y que use inyección de agua o vapor para controlar las emisiones de NO<sub>X</sub> deberá instalar, calibrar,

<sup>&</sup>lt;sup>10</sup> El tenedor del permiso deberá cumplir con cada requisito aplicable de esta regulación independientemente este citado o no en el permiso.

 $<sup>^{11}</sup>$  El tenedor del permiso establece un valor de 75% por volumen al 15%  $O_2$  en base seca, que es igual a 75 ppmvd usando E igual a 14.4 y F igual a 0 (contenido de nitrógeno en el combustible ≤ 0.015% por peso). El permiso PSD y este permiso de construcción ya establece un límite de NOx de 34.2 ppmvd mientras se queme diésel en las turbinas y el manufacturero de las turbinas certifica emisiones de 25 ppmvd cuando queme gas natural.

<sup>&</sup>lt;sup>12</sup> Opción de cumplimiento escogida por PREPA. El permiso PSD y este permiso de construcción ya limita el contenido de azufre en las turbinas están limitadas a 0.05% por peso en diésel.

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mantener y operar un sistema de monitoreo continuo para monitorear y registrar el consumo de combustible y la proporción de agua o vapor a combustible que se dispara en cada turbina.<sup>13</sup>

- 5. De acuerdo con el 40 CFR 60.334(b), el propietario u operador de cualquier turbina de gas estacionaria que comenzó la construcción, reconstrucción o modificación después del 3 de octubre de 1977, pero antes del 8 de julio de 2004, y que utiliza inyección de agua o vapor para controlar las emisiones de NO<sub>x</sub> puede, como alternativa a operar el sistema de monitoreo continuo descrito en el párrafo (a) de esta sección 60.334 (ver condición anterior), instalar, certificar, mantener, operar y asegurar la calidad de un sistema de monitoreo continuo de emisiones (CEMS, en inglés) que consiste en monitores NO<sub>x</sub> y O<sub>2</sub>. Como alternativa, puede usar un monitor de CO<sub>2</sub> para ajustar las concentraciones de NO<sub>x</sub> medidas al 15 porciento de O<sub>2</sub> mediante la conversión de los promedios de CO<sub>2</sub> por hora a concentraciones equivalentes de O<sub>2</sub> utilizando la Ecuación F-14a o F-14b en el apéndice F de la parte 75 del 40 CFR y haciendo los ajustes al 15 porciento de O<sub>2</sub>, o usando las lecturas de CO<sub>2</sub> directamente para hacer los ajustes, como se describe en el Método 20. Si se elige la opción de usar un CEMS, el CEMS se instalará, certificará, mantendrá y operará según se requiere en el 40 CFR 60.334(b)(1) (3).<sup>14</sup>
- 6. De acuerdo con el 40 CFR 60.334(h), el tenedor del permiso:
- a. Controlará el contenido total de azufre del combustible que se queme en cada turbina, excepto lo dispuesto en el párrafo (h)(3) de esta sección 60.334. El contenido de azufre del combustible debe determinarse utilizando los métodos de azufre total descritos en el 40 CFR 60.335(b)(10). Alternativamente, si el contenido total de azufre del combustible gaseoso durante la prueba de funcionamiento más reciente fue inferior al 0.4 porciento en peso (4000 ppm en peso), se podrá utilizar el ASTM D4084-82, 94, D5504-01, D6228-98, o el Estándar de Asociación de Procesadores de Gas 2377-86 (todos los cuales se incorporan por referencia en el 40 CFR 60.17), que miden los principales compuestos de azufre; y
  - b. Deberá monitorear el contenido de nitrógeno del combustible quemado en la turbina, tenedor del permiso reclama una asignación para el nitrógeno ligado al combustible (es decir, si el tenedor del permiso utiliza o utilizará un valor F mayor que cero) calcular STD en el 40 CFR 60.332). El contenido de nitrógeno del combustible se determinará utilizando los métodos descritos en el 40 CFR 60.335(b)(9) o una alternativa aprobada.
  - c. No obstante lo dispuesto en el párrafo (h)(1) de esta sección 60.334, el tenedor del permiso puede optar por no controlar el contenido total de azufre del combustible gaseoso quemado en la turbina, si se demuestra que el combustible gaseoso cumple con la definición de gas natural en el 40 CFR 60.331(u), independientemente de si un programa personalizado existente aprobado por el Administrador para la Subparte GG requiere dicho monitoreo. El tenedor del permiso deberá utilizar una de las siguientes fuentes de información para hacer la demostración requerida:
    - Las características de calidad del gas en un contrato de compra, hoja de tarifas o contrato de transporte vigente y válido para el combustible gaseoso, especificando que el contenido máximo de azufre total del combustible es 20.0 granos/100 scf o menos; o

<sup>&</sup>lt;sup>13</sup> El permiso PSD le requiere la instalación y operación de CEMS.

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- ii. Datos representativos de muestreo de combustible que muestran que el contenido de azufre del combustible gaseoso no excede de 20 granos/100 scf. Como mínimo, se requiere la cantidad de datos de muestreo de combustible especificados en la sección 2.3.1.4 o 2.3.2.4 del apéndice D de la parte 75 del 40 CFR.
- d. Para cualquier turbina que comenzó la construcción, reconstrucción o modificación después del 3 de octubre de 1977, pero antes del 8 de julio de 2004, y para la cual se haya aprobado previamente un itinerario de monitoreo de combustible personalizado, el propietario u operador puede, sin presentar una petición especial al Administrador, continuar monitoreando en este itinerario.
- 7. De acuerdo con el 40 CFR 60.334(i), la frecuencia para determinar el contenido de azufre y nitrógeno del combustible será la siguiente:
  - a. Aceite combustible (diésel). Para fuel oil, use una de las opciones de muestreo de azufre total y la frecuencia de muestreo asociada descrita en las secciones 2.2.3, 2.2.4.1, 2.2.4.2 y 2.2.4.3 del apéndice D de la parte 75 del 40 CFR (es decir, flujo proporcional muestreo, muestreo diario, muestreo del tanque de almacenamiento de la unidad después de cada adición de combustible al tanque, o muestreo de cada entrega antes de combinarlo con aceite combustible ya en el tanque de almacenamiento previsto). Si se reclama un margen de emisión para nitrógeno unido al combustible, el contenido de nitrógeno del aceite se determinará y registrará una vez día de operación de la unidad.
  - b. Combustible gaseoso (LNG). Cualquier valor de contenido de nitrógeno aplicable del combustible gaseoso se determinará y registrará una vez por día de operación de la unidad. Para los propietarios y operadores que eligen no demostrar el contenido de azufre utilizando las opciones del párrafo (h) (3) de esta sección 63.334 (Ver condición 6 arriba), y para los cuales el combustible se suministra sin almacenamiento intermedio a granel, se determinará y registrará el valor del contenido de azufre del combustible gaseoso una vez por día de operación de la unidad.
  - c. Itinerarios personalizados (custom). No obstante los requisitos del párrafo (i)(2) de esta sección 63.334 (ver inciso anterior), los operadores o vendedores de combustible pueden desarrollar programas personalizados para determinar el contenido total de azufre de los combustibles gaseosos, en función del diseño y operación de la instalación afectada y las características del suministro de combustible. Salvo lo dispuesto en los párrafos (i)(3)(i) e (i)(3)(ii) de esta sección 63.334 (ver dos incisos anteriores), los itinerarios personalizados se justificarán con los datos y deberán ser aprobados por el Administrador antes de que puedan utilizarse para cumplir con el estándar en el 40 CFR 60.333.
- 8. De acuerdo con el 40 CFR 60.334(j), para turbina que elija monitorear continuamente los parámetros o emisiones, o para determinar periódicamente el contenido de azufre en el combustible o el contenido de nitrógeno en esta Subparte GG, el tenedor del permiso deberá presentar informes de exceso de emisiones y monitorear el tiempo de inactividad, de acuerdo con el 40 CFR 60.7(c). Deberá informar las emisiones en exceso para todos los períodos de funcionamiento de la unidad, incluidos el arranque, el apagado y el

mal funcionamiento. Para propósitos de los informes requeridos según el 40 CFR 60.7(c), los períodos de exceso de emisiones que deben reportarse y el tiempo de inactividad (*downtime*) del monitor se definen en el 40 CFR 60.334(j)(1) al (5).

- 9. De acuerdo con el 40 CFR 60.335(a), el tenedor del permiso deberá realizar las pruebas de funcionamiento requeridas en el 40 CFR 61.8, utilizando cualquiera de los métodos especificados en la misma sección (40 CFR 60.335(a)).
- 10. De acuerdo con el 40 CFR 60.335(b), el tenedor del permiso deberá determinar cumplimiento con el límite aplicable de NOx en el 40 CFR 60.332 (ver condición 2 de esta sección de permiso) y deberá cumplir con los requisitos de pruebas de funcionamiento requeridas en el 40 CFR 60.8, según se establece en la misma sección (40 CFR 60.335(b)).
- 11. De acuerdo con los resultados de las pruebas se determinarán los parámetros de operación y el monitoreo de las turbinas y su equipo de control, de ser necesario, para asegurar que se cumplen con los límites de emisión aplicables.
- Todas las pruebas de eficiencia deberán cumplir con los métodos de pruebas de la EPA aplicables y todas las notificaciones y requisitos establecidos en la Regla 106 del RCCA. Adicional a lo que se dispone en las condiciones 9 y 10 de esta sección de permiso, y de acuerdo con la Regla 106(D) del RCCA, el tenedor del permiso deberá proveerle al DRNA una notificación por escrito de la fecha del muestreo con 15 días de anticipo, para permitirle al DRNA tener un observador presente.
- 13. El DRNA se reserva el derecho de requerir pruebas adicionales con el fin de demostrar cumplimiento con las condiciones incluidas en este permiso y los límites aplicables.
- 14. El tenedor del permiso no podrá utilizar el resultado de las pruebas de una turbina para determinar cumplimiento de la otra turbina sin una solicitud y aprobación escrita de la EPA, el DRNA o ambas.



#### Sección XVI - Condiciones Específicas 40 CFR Parte 63 Subparte YYYY

- 1. Las turbinas SJCC5 y SJCC6 están afectadas por el 40 CFR Parte 63 Subparte YYYY: National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines. El tenedor del permiso deberá cumplir con todos los requisitos aplicables de esta reglamentación de acuerdo, pero sin limitarse a, estándares de emisión, muestreo (testing), monitoreo (monitoring), cumplimiento continuo, registros e informes.<sup>14</sup>
- 2. Fechas de Cumplimiento: El tenedor del permiso deberá demostrar cumplimiento con esta Subparte de acuerdo con el 40 CFR 63.6095.
- 3. Límites de emisión y operacionales: De acuerdo con el 40 CFR 63.6100, para cada unidad, el tenedor del permiso deberá cumplir con los límites de emisión y de operación en la Tabla 1 y 2 de esta Subparte YYYY. [40 CFR 63.6100]
  - a. Límite de emisiones: De acuerdo con la Tabla 1 del 40 CFR Subparte YYYY, cada unidad deberá cumplir con el límite de concentración de formaldehido de 91 ppbvd o menor a 15 porciento O<sub>2</sub>.
  - b. **Límites operacionales:** De acuerdo con la Tabla 2 del 40 CFR Subparte YYYY, cada unidad deberá mantener los límites operacionales aprobados por el Administrador.<sup>15</sup>
- 4. Requisitos Generales: De acuerdo con el 40 CFR 63.6105, el tenedor del permiso:
  - a. Debe cumplir con las limitaciones de emisión y las limitaciones operativas que se aplican en todo momento, excepto durante el arranque, el apagado y el mal funcionamiento.
  - b. Si debe cumplir con las limitaciones de emisión y operación, debe operar y mantener su turbina de combustión estacionaria, equipo de control de emisiones de oxidación catalítica u otro equipo de control de contaminación del aire, y equipo de monitoreo de manera consistente con las buenas prácticas de control de contaminación del aire para minimizar emisiones en todo momento, incluso durante el arranque, el apagado y el mal funcionamiento.
- 5. Fechas de Cumplimiento Prueba inicial o Demostración inicial: El tenedor del permiso deberá demostrar cumplimiento con las fechas establecidas de acuerdo con el 40 CFR 63.6110, según aplique.
- 6. Pruebas de funcionamiento subsiguientes: De acuerdo con el 40 CFR 63.6115, el tenedor del permiso deberá realizar pruebas de funcionamiento subsiguientes en una base anual según se especifica en la Tabla 3 de la Subparte YYYY.

<sup>15</sup> Para turbinas que se le requiere cumplir con el límite de emisión de formaldehído y no utiliza oxidador catalítico.

<sup>&</sup>lt;sup>14</sup> El tenedor del permiso deberá cumplir con cada requisito aplicable de esta regulación independientemente este citado o no en el permiso.

- 7. De acuerdo con el 40 CFR 63.6120, el tenedor del permiso deberá cumplir con todos los requisitos de pruebas de funcionamiento y demostración de cumplimiento inicial establecidas en la Tabla 3 del 40 CFR Subparte YYYY.
  - a. El tenedor del permiso deberá demostrar que las emisiones de formaldehído cumplan con los límites de emisión establecidos en la Tabla 1, y la condición 2.a. de esta sección mediante la realización de prueba de funcionamiento inicial y anualmente.
  - b. Deberá utilizar el Método de Prueba 320 del 40 CFR parte 63, Apéndice A; ASTM D6348-03 siempre que el %R como se determina en el Anexo A5 de ASTM D6348-03 sea igual o mayor que 70% y menor o igual que 130%; u otros métodos aprobados por el Administrador.
- 8. De acuerdo con el 40 CFR 63.6125, el tenedor del permiso deberá cumplir con los requisitos de instalación, operación y mantenimiento de un monitor:
  - a. Si está operando una turbina de combustión estacionaria que debe cumplir con la limitación de emisión de formaldehído y no está utilizando un oxidador catalítico, deberá monitorear continuamente cualquier parámetro especificado en su petición aprobada al Administrador, para cumplir con las limitaciones operativas en la Tabla 2 de la Subparte YYYY y como se especifica en la Tabla 5 de la misma subparte.<sup>14</sup>
  - b. Si está operando una turbina de combustión estacionaria de gas premezclada (*lean premix*) o una turbina de combustión estacionaria de gas de llama de difusión como se define en esta Subparte YYYY, y utiliza cualquier cantidad de aceite destilado para encender cualquier turbina de combustión estacionaria nueva o existente que está ubicado en la misma fuente principal, debe monitorear y registrar su uso de aceite destilado diariamente para todas las turbinas de combustión estacionarias nuevas y existentes ubicadas en la fuente principal con un medidor de horas no reiniciable para medir la cantidad de horas que se quema el aceite destilado.
- 9. De acuerdo con el 40 CFR 63.6130, el tenedor del permiso deberá demostrar el cumplimiento inicial de las limitaciones de emisión y operación:
  - a. Debe demostrar el cumplimiento inicial de cada emisión y limitación operativa que se aplique a usted de acuerdo con la Tabla 4 de la Subparte YYYY.
  - b. Debe enviar la Notificación del estado de cumplimiento que contiene los resultados de la demostración inicial de cumplimiento de acuerdo con los requisitos del 40 CFR 63.6145(f).
- 10. Monitoreo y recolección de datos: El tenedor del permiso deberá demostrar el cumplimiento con el monitoreo y recolección de datos para demostrar el cumplimiento continuo inicial de las limitaciones de emisión y operación de acuerdo con el 40 CFR 63.6135.



MODIFICACIÓN PERMISO DE CONSTRUCCIÓN PREPA SAN JUAN POWER PLANT PROYECTO GAS NATURAL - UNIDADES 5 Y 6 SAN JUAN, PUERTO RICO PFE-65-0499-0365-I-II-C PÁGINA 17 DE 22

- 11. De acuerdo con el 40 CFR 63.6140, el tenedor del permiso:
  - a. Deberá demostrar el cumplimiento continuo de cada limitación de emisión y limitación operativa en la Tabla 1 y la Tabla 2 de esta Subparte YYYY de acuerdo con los métodos especificados en la Tabla 5 de esta Subparte YYYY.
  - b. Deberá informar cada instancia en la que no cumplió con cada limitación de emisión o limitación operativa. También deberá informar cada instancia en la que no cumplió con los requisitos de la Tabla 7 de esta Subparte YYYY aplicables. Estas instancias son desviaciones de las emisiones y limitaciones operativas en esta Subparte YYYY. Estas desviaciones deben informarse de acuerdo con los requisitos del 40 CFR 63.6150.
  - c. De conformidad con el 40 CFR 63.6(e) y 63.7(e)(1), las desviaciones que se producen durante un período de arranque, apagado y mal funcionamiento no son violaciones si ha operado su turbina de combustión estacionaria de acuerdo con el 40 CFR 63.6(e)(1)(i).
- 12. El tenedor del permiso deberá demostrar cumplimiento con los requisitos de notificación aplicables de acuerdo con el 40 CFR 63.6155:
  - a. Deberá enviar todas las notificaciones en el 40 CFR 63.7(b) y (c), 63.8(e), 63.8(f)(4) y 63.9(b) y (h) que le correspondan en las fechas especificadas.
  - b. Como se especifica en el 40 CFR 63.9(b)(2), si enciende su turbina de combustión estacionaria nueva o reconstruida antes del 5 de marzo de 2004, deberá enviar una Notificación inicial a más tardar 120 días calendario después del 5 de marzo de 2004.
  - c. Como se especifica en el 40 CFR §63.9(b), si enciende su turbina de combustión estacionaria nueva o reconstruida el 5 de marzo de 2004 o después, deberá enviar una Notificación inicial a más tardar 120 días calendario después de estar sujeto a esta Subparte YYYY.
  - d. Si debe enviar una Notificación Inicial pero no se ve afectado por los requisitos de limitación de emisiones de esta Subparte YYYY, de acuerdo con el 40 CFR 63.6090(b), su notificación debe incluir la información en el 40 CFR 63.9(b)(2)(i) a (v) y una declaración de que su turbina de combustión estacionaria nueva o reconstruida no tiene requisitos adicionales de limitación de emisiones y debe explicar la base de la exclusión (por ejemplo, que funciona exclusivamente como una turbina de combustión estacionaria de emergencia).
  - e. Si debe realizar una prueba de rendimiento inicial, debe enviar una notificación de intención de realizar una prueba de rendimiento inicial al menos 60 días calendario antes de que la prueba de rendimiento inicial esté programada para comenzar como se requiere en el 40 CFR 63.7(b)(1).
  - f. Si debe cumplir con la limitación de emisiones de formaldehído, deberá enviar una Notificación de estado de cumplimiento de acuerdo con en el 40 CFR 63.9(h)(2)(ii). Para cada prueba de rendimiento requerida para demostrar el cumplimiento de la limitación de emisiones de formaldehído, deberá enviar la Notificación de estado de cumplimiento, incluidos los resultados



de la prueba de funcionamiento, antes del cierre del negocio en el 60<sup>vo</sup> día calendario siguiente a la finalización de la prueba de funcionamiento.

#### 13. De acuerdo con el 40 CFR 63.6150,

- a. Cualquier persona que posea u opere una turbina de combustión estacionaria que debe cumplir con la limitación de emisiones de formaldehído deberá presentar un informe de cumplimiento semestral de acuerdo con la Tabla 6 de esta Subparte YYYY. El informe de cumplimiento semestral debe contener la información descrita en los párrafos (a)(1) a (a)(4) de esta sección 63.6150. El informe de cumplimiento semestral debe presentarse en las fechas especificadas en los párrafos (b)(1) a (b)(5) de esta sección 63.6150, a menos que el Administrador haya aprobado un itinerario diferente.
  - 1. Nombre y dirección de la empresa.
  - 2. Declaración de un funcionario responsable, con el nombre, título y firma de ese funcionario, que certifique la exactitud del contenido del informe.
  - 3. Fecha del informe y fechas de inicio y finalización del período del informe.
  - 4. Para cada desviación de una limitación de emisiones, el informe de cumplimiento debe contener la información en los párrafos (a)(4)(i) a (a)(4)(iii) de esta sección 63.6150.
    - El total de operación de cada turbina de combustión estacionaria durante el periodo de informe.
    - ii. Información sobre el número, la duración y la causa de las desviaciones (incluida la causa desconocida, si corresponde), según corresponda, y las medidas correctivas adoptadas
    - iii. Información sobre el número, la duración y la causa de los incidentes de tiempo de inactividad del monitor (incluida la causa desconocida, si corresponde, que no sea el tiempo de inactividad asociado con cero y rango y otras comprobaciones de calibración diarias).
- b. Las fechas de presentación del informe de cumplimiento semestral se proporcionan en (b)(1) a (b)(5) de esta sección 63.6150.
  - El primer informe de cumplimiento semestral debe cubrir el período que comienza en la fecha de cumplimiento especificada en el 40 CFR 63.6095 y termina el 30 de junio o el 31 de diciembre, la fecha que sea la primera fecha después del final del primer semestre calendario después de la fecha de cumplimiento especificada en el 40 CFR 63.6095.



- 2. El primer informe semestral de cumplimiento debe tener matasellos o entregarse a más tardar el 31 de julio o el 31 de enero, la fecha que siga al final del primer semestre calendario después de la fecha de cumplimiento que se especifica en el 40 CFR 63.6095.
- 3. Cada informe de cumplimiento semestral posterior debe cubrir el período de informe semestral del 1 de enero al 30 de junio o el período de informe semestral del 1 de julio al 31 de diciembre.
- 4. Cada informe de cumplimiento semestral subsiguiente debe ser matasellado o entregado a más tardar el 31 de julio o el 31 de enero, la fecha que sea la primera fecha después del final del período de informe semestral.
- 5. Para cada turbina de combustión estacionaria que esté sujeta a las regulaciones de permisos de conformidad con 40 CFR parte 70 o 71, y si la autoridad de permisos¹6 ha establecido la fecha para presentar informes anuales de conformidad con 40 CFR 70.6(a)(3)(iii)(A) o 40 CFR 71.6(a)(3)(iii)(A), puede presentar el primer informe de cumplimiento y el posterior, de acuerdo con las fechas establecidas por la autoridad de permisos en lugar de las fechas de los párrafos (b)(1) a (4) de esta sección 63.6150.

#### c. [Reservada]

- d. Las fechas de presentación del informe anual se proporcionan en (d)(1) a (d)(5) de esta sección 63.6150.
  - 1. El primer informe anual debe cubrir el período que comienza en la fecha de cumplimiento especificada en el 40 CFR 63.6095 y termina el 31 de diciembre.
  - 2. El primer informe anual debe enviarse por correo o entregarse a más tardar el 31 de enero.
  - 3. Cada informe anual posterior debe cubrir el período de informe anual desde el 1 de enero hasta el 31 de diciembre.
  - 4. Cada informe anual posterior debe ser matasellado o entregado a más tardar el 31 de enero.
  - 5. Para cada turbina de combustión estacionaria que esté sujeta a las regulaciones de permisos de conformidad con 40 CFR parte 70 o 71, y si la autoridad de permisos ha establecido la fecha para presentar informes anuales de conformidad con 40 CFR 70.6(a)(3)(iii)(A) o 40 CFR 71.6(a)(3)(iii)(A), puede presentar el primer informe de cumplimiento y el posterior de acuerdo con las fechas establecidas por la autoridad de permisos en lugar de las fechas de los párrafos (d)(1) a (4) de esta sección 63.6150.



<sup>&</sup>lt;sup>16</sup> En este caso se refiere a las fechas establecidas en el permiso Título V por el DRNA.

- e. Si está operando una turbina de combustión estacionaria de gas premezclada pobre o una turbina de combustión estacionaria de gas de llama de difusión como se define en esta Subparte YYYY, y utiliza cualquier cantidad de aceite destilado para encender cualquier turbina de combustión estacionaria nueva o existente que se encuentra en la misma fuente principal, debe enviar un informe anual de acuerdo con la Tabla 6 de esta Subparte YYYY en la fecha especificada a menos que el Administrador haya aprobado un itinerario diferente, de acuerdo con la información descrita en los párrafos (d)(1) a (5) de esta sección 63.6150. Deberá informar los datos especificados en (e)(1) a (e)(3) de esta sección 63.6150.
  - 1. El número de horas que se disparó el aceite destilado por cada turbina de combustión estacionaria nueva o existente durante el período del informe.
  - 2. Los límites operativos provistos en su permiso federalmente exigible, y cualquier desviación de estos límites.
  - 3. Cualquier problema o error sospechado con los medidores.

#### 14. De acuerdo con el 40 CFR 63.6155,

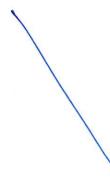
- a. Deberá mantener los registros como se describe en los párrafos (a)(1) a (5) del 40 CFR 63.6155.
  - Una copia de cada notificación e informe que envió para cumplir con esta Subparte YYYY, incluida toda la documentación que respalda cualquier Notificación inicial o Notificación de estado de cumplimiento que envió, de acuerdo con los requisitos del 40 CFR 63.10 (b)(2)(xiv).
  - 2. Registros de pruebas de funcionamiento y evaluaciones de desempeño como se requiere en el 40 CFR 63.10 (b)(2)(viii).
  - 3. Registros de la ocurrencia y duración de cada arranque, apagado o mal funcionamiento, como se requiere en el 40 CFR 63.10(b)(2)(i).
  - Registros de la ocurrencia y duración de cada mal funcionamiento del equipo de control de contaminación del aire, si es aplicable, como se requiere en el 40 CFR 63.10 (b)(2)(ii).
  - 5. Registros de todo el mantenimiento en el equipo de control de contaminación del aire como se requiere en el 40 CFR 63.10(b)(iii).
- b. Si está operando una turbina de combustión estacionaria que dispara gas de relleno sanitario, gas digestor o RSU gasificado equivalente al 10 porciento o más de la entrada de calor bruto sobre una base anual, o si está operando una turbina de combustión estacionaria a gas de premezcla (lean premix), una turbina de combustión estacionaria de combustión de gas de llama de difusión, tal como se define en la Subparte YYYY, y utiliza cualquier cantidad de aceite destilado en

THE

cualquier turbina de combustión estacionaria nueva o existente que se encuentre en la misma fuente principal, debe mantener los registros de su monitores diarios de uso de combustible.

- c. Debe mantener los registros requeridos en la Tabla 5 de la Subparte YYYY para mostrar el cumplimiento continuo de cada limitación operativa que aplique a cada turbina.
- 15. De acuerdo con el 40 CFR 63.6160,
  - a. Deberá mantener todos los registros aplicables de tal manera que puedan accederse fácilmente y sean adecuados para la inspección de acuerdo con el 40 CFR 63.10(b)(1).
  - b. Como se especifica en el 40 CFR 63.10(b)(1), deberá mantener cada registro durante 5 años después de la fecha de cada ocurrencia, medición, mantenimiento, acción correctiva, informe o registro.
  - c. Deberá conservar sus registros de los 2 años más recientes en la instalación o sus registros deberán estar accesibles en la instalación. Sus registros de los 3 años restantes pueden conservarse fuera de la instalación.
- 16. De acuerdo con el 40 CFR 63.6165, el tenedor del permiso deberá cumplir con las Disposiciones Generales del 40 CFR 63.1 a 63.15 aplicables establecidas en la Tabla 7 de la Subparte YYYY del 40 CFR.
- 17. De acuerdo con los resultados de la prueba se determinarán los parámetros de operación y el monitoreo de las turbinas y su equipo de control, de ser necesario, para asegurar que se cumplen con los límites de emisión aplicables.
- 18. Todas las pruebas de eficiencia deberán cumplir con los métodos de pruebas de la EPA aplicables y todas las notificaciones y requisitos establecidos en la Regla 106 del RCCA. Adicional a lo que se dispone en las condiciones 6 y 16 de esta sección de permiso, y de acuerdo con la Regla 106(D) del RCCA, el tenedor del permiso deberá proveerle al DRNA una notificación por escrito de la fecha del muestreo con 15 días de anticipo, para permitirle al DRNA tener un observador presente.
- 19. El DRNA se reserva el derecho de requerir pruebas adicionales con el fin de demostrar cumplimiento con las condiciones incluidas en este permiso y los límites aplicables.
- 20. El tenedor del permiso no podrá utilizar el resultado de las pruebas de una turbina para determinar cumplimiento de la otra turbina sin una solicitud y aprobación escrita de la EPA, el DRNA o ambas.





MODIFICACIÓN PERMISO DE CONSTRUCCIÓN PREPA SAN JUAN POWER PLANT PROYECTO GAS NATURAL - UNIDADES 5 Y 6 SAN JUAN, PUERTO RICO PFE-65-0499-0365-I-II-C PÁGINA 22 DE 22

#### Apercibimiento de esta Modificación

De conformidad con la Sección 5.4 de la Ley Núm. 38-2017, conocida como, Ley de Procedimiento Administrativo Uniforme del Gobierno de Puerto Rico, se le apercibe que: "Toda persona a la que la agencia deniegue la concesión de una licencia, franquicia, permiso, endoso, autorización o gestión similar, tendrá derecho a impugnar la determinación de la agencia por medio de un procedimiento adjudicativo, según se establezca en la ley especial de que se trate y en el Capítulo III de dicha Ley." Para esto, se concede un término de veinte (20) días a partir de la notificación del mismo.

#### Aprobación de esta Modificación

Esta modificación tiene el propósito de autorizar el uso de gas natural en las unidades 5 y 6 y vencerá tres (3) años luego de la fecha de emisión de esta autorización, a menos que la construcción autorizada por este permiso haya comenzado. Le informamos que los demás términos y condiciones no incluidos en esta revisión permanecen vigentes. La información y condiciones sometidas en su solicitud de permiso forman parte de esta autorización.

La agencia podrá revocar esta autorización en cualquier momento si se suspenden los trabajos por un período de un año o más, o si los mismos no se prosiguen diligentemente hasta su terminación o si se violan las condiciones del mismo o reglamentos y regulaciones aplicables. La agencia, además, podrá emitir una Orden de Cese y Desistimiento y Mostrar Causa. En caso de revocación, los cargos por este permiso no serán devueltos. La agencia se reserva el derecho de intervenir con la fuente en otros aspectos no cubiertos en esta autorización.

Otorgado en San Juan, Puerto Rico el 3 de codore de 2019.

Tania Vázquez Rivera

Secretaria

A. C.

## RFP 81412 Fuel Supply CSJ Conversion of Units 5 and 6

First Committee Meeting, 09/27/2018 @ 1:30pm

Draft of Agenda and Minutes, for Committee Review

Evaluation Committee – Designated members and advisors
 Procurement – Edgardo Díaz, Delis Zambrana
 End-user (inherencia en el proyecto) – Eng. Jaime Umpierre
 Technical expertise – Fuels Office, Eng. Edgardo Vázquez
 Generation, Eng. Roberto Rivera
 Filsinger Energy, Eng. Paul Harmon

2. Sub-Committees Section 3.2 of the RFP Guide

This could be beneficial for redundancy, quality assurance of the pass/fail requirements and specific compliance sections within each proposal. Committee members must email the Supply Chain Division Head to inform/request sub-committee.

3. Committee members, for this initial phase, must read the entire Overview Document, especially section 3 to evaluate proposals and select short list participants. All requirements mentioned with a 'must' or 'shall' need to be evaluated and they must be included in the proposals.

RFP81412 does not mention specific pass / fail or minimum requirements. Therefore, all proposals will be evaluated and scored.

4. Committee members should read the *Guía para Procesos de Adquisiciones de Bienes y Servicios a Través de Solicitud de Propuestas (Requests for Proposals) rev. 2016* for instructions and to familiarize themselves with their responsibilities as committee members.

A copy of the Guide was handed out to all Eval. Committee members, emphasized Section 3.

 Single Point of Contact for any communication having to do with this RFP, as it is under evaluation and until a selection is officially notified, MUST be Edgardo Díaz or Delis Zambrana.

Any request for information from anyone outside of the committee, PREPA employees, suppliers, consultants, government agencies, etc., must be referred to PREPA Procurement for evaluations and official replies. Evaluation Committee members are not authorized to provide information during the evaluation and selection phase of the RFP.

#### 6. Adjusted target dates

#### **ADDENDUM 2**

This addendum notifies the following:

#### I. MODIFICATIONS TO THE REQUEST FOR PROPOSALS DOCUMENT

a. Article 1.6 RFP Timeline is modified as follows:

Key Review Process Events	Targeted Timeline
Request for Proposal Issued	July 30, 2018
RFP Kick-off Meeting	August 9, 2018
Visit to the Job Site	August 10, 2018
Supplier Questions Deadline	August 28, 2018
Questions Answered	September 7, 2018
RFP Proposal Submission Deadline	September 25, 2018
RFP Short List Announcement*	October 16, 2018
RFP Short List Requests for Clarifications, Presentations, Updated Proposals and Negotiation Process Begins*	October 24-25, 2018
Evaluate Proposals and Conduct Supplier Final Negotiations*	October 26 to November 16, 2018
Selection Notification*	November 23, 2018

<sup>\*</sup>At PREPA's discretion

#### 7. RFP flow-chart

The Committee was informed that their evaluation process and selection of a proposal would further require the evaluation of:

- A. OCPC
- B. CEO
- C. PREPA Governing Board
- D. FOMB
- 8. Plan to evaluate the first phase, pass or fail criteria to select short list. Important to reference the pages where the proponent proves compliance (passes) or fails to comply with minimum requirements. Importance of possibly including a Sub-Committee...

Eng. Jaime Umpierre to prepare a matrix of all requirements mentioned in the RFP documents (overview, addenda, PREPA responses to supplier questions, etc.) to share with the Committee for their review on 09/28/2018. Committee will meet on Saturday, Sept. 29, and Monday, Oct. 1, 2018, to continue the evaluation process of the 6 proposals with the matrix.

### RFP 81412 Fuel Supply CSJ Conversion of Units 5 and 6

Second Committee Meeting, 09/29/2018 @ 9:00pm Draft of Agenda and Minutes, for Committee Review

Evaluation Committee – Designated members and advisors
 Procurement Process – Delis Zambrana o/b/o Edgardo Díaz
 End-user (inherencia en el proyecto) – Eng. Jaime Umpierre
 Technical expertise – Fuels Office, Eng. Edgardo Vázquez
 Generation, Eng. Roberto Rivera
 Filsinger Energy, Eng. Paul Harmon
 Filsinger Energy, Nathan Pollak

- Plan to review the scoring matrix prepared for each proposal by individual committee
  members and to work on the requests for clarifications (to be published today or
  tomorrow, with submittals due at 11:59pm, Thursday 10/04 or Friday 10/05).
- Jaime Umpierre prepared the preliminary evaluation matrix. The committee decided to distribute proposals, evaluate each proposal independently (fill in matrix with page reference, preliminary score), and then present their review to the rest of the committee for discussion on Monday, Oct. 1, 2018.

#### **ADDENDUM 2**

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Evaluate Proposals and Conduct Supplier Final Negotiations*	October 26 to November 16, 2018
Selection Notification*	November 23, 2018

<sup>\*</sup>At PREPA's discretion

# RFP 81412 Fuel Supply CSJ Conversion of Units 5 and 6

Third Committee Meeting, 10/01/2018 @ 1:30pm

Draft of Agenda and Minutes, for Committee Review

Evaluation Committee – Designated members and advisors
 Procurement – Edgardo Díaz, Delis Zambrana
 End-user (inherencia en el proyecto) – Eng. Jaime Umpierre
 Technical expertise – Fuels Office, Eng. Edgardo Vázquez
 Generation, Eng. Roberto Rivera
 Filsinger Energy, Eng. Paul Harmon
 Filsinger Energy, Nathan Pollak

- Plan to review the scoring matrix prepared for each proposal by individual committee
  members and to work on the requests for clarifications (to be published today or
  tomorrow, with submittals due at 11:59pm, Thursday 10/04 or Friday 10/05.
- 3. Committee members requested clarification on the evaluation criteria and eventual OCPC review, Nathan provided background and comments on what OCPC typically expects to see (they will want to see how the committee decided to apply the 1-5 scores per criterion).
- 4. Puma proposal was presented with the preliminary grading criteria discussed by all present members and FEP advisors.

#### **ADDENDUM 2**

This addendum notifies the following:

# I. MODIFICATIONS TO THE REQUEST FOR PROPOSALS DOCUMENT

#### a. Article 1.6 RFP Timeline is modified as follows:

Key Review Process Events	Targeted Timeline
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<sup>\*</sup>At PREPA's discretion



# Galway Energy Advisors LLC\*

Delivering Global Energy Transactions

# LNG and Natural Gas Import and Delivery Options Evaluation for PREPA's Northern Power Plants – Feasibility Study & Fatal Flaw Evaluation

### **Submitted**

to

# Puerto Rico Public-Private Partnership Authority And

**Puerto Rico Electric Power Authority** 

# 1st June 2015



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# 1 – STUDY BACKGROUND, REQUIREMENTS, AND METHODOLOGY

#### STUDY BACKGROUND

The Puerto Rico Electric Power Authority ("PREPA") owns and operates two power plants in the vicinity of San Juan – the San Juan Power Plant and the Palo Seco Power Plant.

Map 1 – San Juan Area with San Juan and Palo Seco Power Plants



In order to i) comply with upcoming Mercury and Air Toxics Standards ("MATS") administered by the US Environmental Protection Agency ("EPA") and ii) to reduce the cost of fuel for the production of electricity and the overcall cost of electricity in Puerto Rico, PREPA has elected to convert a number of the power generation units at its San Juan and Palo Seco Power Plants to burn natural gas as the primary fuel instead of No. 6 and No. 2 fuel oil. PREPA has partnered with the Puerto Rico Public-Private Authority ("P3A") to identify and assess the feasibility of various options to deliver natural gas to its two power plants in the San Juan metropolitan area without relying on a cross-island natural gas transmission pipeline. The consequence of this requirement is that PREPA and the P3A have elected to focus on options to deliver natural gas into the San Juan area in the form of Liquefied Natural Gas ("LNG") or Compressed Natural Gas ("CNG) using specialized ships.

Galway Energy Advisors LLC ("Galway") has been retained by the P3A to identify and evaluate

such potential options. Galway is a commercial advisory firm that provides clients in the energy industry services that include commercial structuring and negotiation, strategy development, project development advice and support, economic analysis, risk management, market analysis, and high level technical and operational evaluation and due diligence. Galway has been advising and supporting PREPA since late 2007 on defining and implementing its LNG initiatives. At PREPA's request, Galway started to interface with the Government Development Bank of Puerto Rico ("GDB") in mid-2010 regarding PREPA's LNG initiatives and since June 2011 has been advising both PREPA and the GDB on PREPA's LNG plans, negotiations for LNG and natural gas supplies, the development of the floating LNG terminal offshore the Aguirre Complex, and miscellaneous issues related to the importation and distribution of LNG and natural gas in Puerto Rico.

In order to properly identify and assess options to deliver natural gas to PREPA's power plants, Galway complimented its LNG techno-commercial capabilities by retaining the services of an engineering firm (CH-IV International – "CH-IV"), an environmental firm (TRC Environmental Corporation - "TRC"), and a regulatory law firm (WilmerHale - "WH"). CH-IV is a wellknown engineering firm with significant LNG specific experience such as feasibility studies, FEED studies, technical studies and filings to support permitting applications with the Federal Energy Regulatory Commission ("FERC") and project management. The scope of their experience includes LNG import terminals (both onshore and floating), LNG peak shaving plants, and LNG liquefaction and export plants. As the owner's engineer for the EcoElectrica facility in Peñuelas, CH-IV offers a unique set of experience related to LNG projects in Puerto Rico. TRC is a nationally recognized leader in facility siting; environmental impact assessment; permitting; and licensing of natural gas pipelines, storage facilities, and LNG terminals. TRC has significant experience with LNG import and export projects in North America and has supported FERC filings for LNG projects as environmental consultant to both applicants and the FERC. WH is a well-known law firm with significant experience in natural gas and LNG regulatory matters. WH is currently advising the GDB on LNG, natural gas and EPA matters related to PREPA's initiatives. This multi-disciplinary team ("Team") collaborated closely to identify and assess potential options to deliver LNG or CNG and prepare this draft report that documents the Team's findings and recommendations. TRC and CH-IV prepared detailed environmental and technical reports that are included in this draft report as Appendices I and II respectively.

#### PREPA'S NATURAL GAS REQUIREMENTS

During a kick-off meeting held at PREPA's main offices in San Juan on August 12, 2014 with the Galway multi-disciplinary team, representatives from the P3A and representatives from PREPA, PREPA's natural requirements were discussed in detail.

## NATURAL GAS VOLUMES REQUIREMENTS

PREPA informed the Team about both its average and peak volumetric natural requirements for both the Palo Seco and San Juan Power Plants as follows:

- Average Daily Requirement is equivalent to 115,000 million british thermal units ("MMBtu) per day
- Peak Daily Requirement is equivalent to 125,000 MMBtu per day

Consequently, for the purpose of this study, the Team focused on a facility that would be sized to handle approximately 125,000 MMBtu per day which is equivalent to approximately 1 million tons per annum ("MTPA") of LNG.

### INFRASTRUCTURE SCOPE

The scope of the infrastructure options to be identified and evaluated was also discussed during the kick-off meeting:

- 1) Infrastructure must allow and support the safe and reliable berthing and unloading of specialized ships carrying and delivering either LNG or CNG.
- 2) Infrastructure must allow the storage of sufficient volumes of LNG or CNG to efficiently and rapidly unload the product from the specialized ships. LNG tanks can be located on land or in floating configuration such as a Floating Storage Unit ("FSU") or Floating Storage and Regasification Unit ("FSRU"). Any CNG storage system would likely consist of a floating solution.

LNG or CNG storage capacity must be sufficient to provide a reliable supply of natural gas to PREPA's power plants with sufficient volumes of "buffer" inventory to address potential shipping schedule deviations due to inclement weather, loading port conditions, unloading port conditions, etc.

The US Coast Guard ("USGC") imposes safety zones around LNG ships transiting through US ports and navigable waterways. These safety zones can result in limiting the traffic and operations of other vessels while an LNG ship is transiting. Activity in the port of San Juan is quite dynamic (as shown in Figure 8.1 in CH-IV's technical evaluation report in Appendix I) and, therefore, PREPA expressed a desire to minimize the number of monthly deliveries of LNG or CNG in order to mitigate the potential impact from the transiting of LNG or CNG ships on the other users of the port of San Juan. The goal is to mitigate potential concerns and opposition to LNG or CNG shipping activity from other port users. Therefore, PREPA would prefer that fewer larger

deliveries of LNG or CNG be planned for, preferably no more than one or two deliveries per month. Given PREPA's daily requirements, this would require the use of standard scale LNG ships with storage capacity in the range of 90,000 to 160,000 m3 (equivalent to 2 to 3.6 million MMBtu). The LNG storage capacity would have to be consistent with these size ships to ensure efficient and rapid unloading. As of today, there are no CNG projects in the US and no such projects have been presented to the FERC or USCG. Consequently, there are no explicit rules with regards to safety zones for CNG ships transiting through US ports or navigable waterways. However, the Team expects that similar activity restrictions that apply to LNG ships would also apply to CNG ships. Proposed CNG ship designs provide for significantly smaller storage capacity because of the lower volumetric density of CNG versus LNG and, therefore, significantly higher transiting activity would be required to satisfy PREPA's daily natural gas requirements. Consequently, the Team fears that frequent potential traffic restriction associated with CNG deliveries would likely increase the likelihood of opposition from other port users to the delivery of CNG in the port of San Juan.

- 3) The infrastructure must allow for the vaporization of LNG back to a gaseous state, or for the safe pressure reduction and reheating of CNG to the appropriate pressure and temperature for natural gas to be used in PREPA's power plants. The LNG vaporizers can be located either on land (in association with on land storage tanks or FSU), or as part of an FSRU. It is assumed that the CNG pressure reduction system would be included with the floating CNG storage system.
- 4) The infrastructure must ensure that natural gas is delivered to both PREPA's Palo Seco and San Juan Power Plants.
- 5) The infrastructure must allow PREPA to implement competitive LNG or CNG procurement processes and therefore must be compatible with sourcing LNG or CNG from multiple sources of LNG.
  - LNG can be sourced from the global markets and imported to Puerto Rico from such countries as Trinidad and Tobago, Nigeria, Equatorial Guinea, Algeria, Angola, Norway, and the Middle East (other sources such as Australia, Peru, Malaysia, Indonesia, Russia and Papua New Guinea are much less likely because of the much larger distances from Puerto Rico). Another future source could be the Continental United States where liquefaction and export projects are under construction in Louisiana (Sabine Pass LNG and Cameron LNG) and Texas (Freeport LNG). However, the volumes from these projects are already committed and sold to companies such as BG, Gas Natural Fenosa, BP, Chubu Electric, Osaka Gas, Toshiba, SK Energy, KOGAS, Gail, Total, Mitsubishi, and Mitsui. Other LNG liquefaction and export projects are in various stages of

development. However, the volumes associated with the projects that are most advanced and likely to be sanctioned in 2015 have also already been committed to buyers. Consequently, PREPA requires the flexibility to be able to source LNG from both the global market and potentially from the Continental US.

There are currently no CNG production facilities of the scale required to satisfy PREPA's volume requirements. There are some projects under development in both the US (containerized CNG) and Trinidad (bulk CNG) but the timeframe for the sanction of either project is highly uncertain, and PREPA would require the flexibility to source CNG from either domestic or foreign sources.

### STUDY METHODOLOGY

The Team conducted a multi-dimensional assessment that is primarily based on environmental and technical assessments of a series of options for LNG or CNG infrastructure solutions.

### POTENTIONAL OPTIONS LIST

The Team identified a total of three potential locations for the LNG or CNG infrastructure based on discussions with PREPA and P3A about potentially available land or land owned by other government agencies and the Team's experience with siting LNG projects.

- Two locations inside San Juan Bay: Pier 15/16 and Army Dock (also referred to Liquids Dock in appendices) are shown as red pins on Map 2 below. Subsequently to the evaluation of these first two location, PREPA requested that a third location adjacent to the San Juan Power Plant on its western boundary (Warehouses Site). This site is also shown as a red pin on Map 2 below.
- One locations outside San Juan Bay: North Offshore is shown as red pins on Map 3 below

Prior to launching this feasibility study, PREPA had identified another potential location outside San Juan Bay in Ensenada Boca Vieja. However, PREPA determined that this location should not be evaluated as part of this feasibility study because it was determined that it would not be suitable for a floating or onshore LNG terminal because of the very shallow water depth, environmental issues (presence of protected corral and manatees habitat) and presence of a grandfathered sewage disposal line that runs through the potential site. For the purpose of illustration, this potential location is shown is a green pin on Map 3 below.

Map 2 – Potential LNG or CNG Infrastructure Locations Inside San Juan Bay



Map 3 – Potential LNG or CNG Infrastructure Locations Outside San Juan Bay



The Team then developed a list of potential infrastructure solutions for each of the locations based on the Team's experience and PREPA's requirements. The list of options is summarized in Table 1 below

Table 1 – List of Potential LNG or CNG Infrastructure Solutions

Option #	Location	Product	Infrastructure Description	Delivery Logistics
1	Pier 15/16	LNG	Regasification barge (floating storage and regasification) moored at Pier 15 or 16	Smaller scale shuttle tanker being loaded from LNG ship via ship-to-ship transfer in the area of Guayanilla Canyon on the protected south shore of Puerto Rico
2	Pier 15/16	LNG	Regasification barge (floating storage and regasification) moored at Pier 15 or 16	Standard scale LNG carrier delivering directly to regasification barge
3	Pier 15/16	LNG	FSRU moored at Pier 15 or 16	Standard scale LNG carrier delivering directly to FSRU
4	Pier 15/16	LNG	FSU and on land vaporization	Smaller scale shuttle tanker being loaded from LNG ship via ship-to-ship transfer in the area of Guayanilla Canyon on protected south side of Puerto Rico
5	Pier 15/16	LNG	On land storage and vaporization	Standard scale LNG carrier delivering directly to on land tanks
6	Army Dock	LNG	Regasification barge (floating storage and regasification) moored at Army Terminal	Smaller scale shuttle tanker being loaded from LNG ship via ship-to-ship transfer in the area of Guayanilla Canyon on protected south side of Puerto Rico
7	Army Dock	LNG	Regasification barge (floating storage and regasification) moored at Army Terminal	Standard scale LNG carrier delivering directly to regasification barge
8	Army Dock	LNG	FSRU moored at Army Terminal	Standard scale LNG carrier delivering directly to FSRU
9	Army Dock	LNG	FSU and on land vaporization	Smaller scale shuttle tanker being loaded from LNG ship via ship-to-ship transfer in the area of Guayanilla Canyon on

				protected south side of Puerto Rico
10	Army Dock	LNG	On land storage and vaporization	Standard scale LNG carrier delivering directly to on land tanks
11	North Offshore	LNG	FSRU moored at offshore buoy	Standard scale LNG carrier delivering directly to FSRU
12	Pier 15/16	CNG	Non-self-propelled vessel with onboard CNG storage and pressure reduction systems	Non-self-propelled vessel with onboard CNG storage and pressure reduction systems to replace berthed vessel when empty
13	Army Dock	CNG	Non-self-propelled vessel with onboard CNG storage and pressure reduction systems	Non-self-propelled vessel with onboard CNG storage and pressure reduction systems to replace berthed vessel when empty
14	Warehouse	LNG	On land storage and vaporization	Standard scale LNG carrier delivering directly to on land tanks

The first draft of this feasibility report evaluated options 1 through 13 in table 1 above. In this report, the conclusion stated that Option 5 above (on land storage and vaporization at Pier 15/16) was the most feasible of the alternatives that were evaluated. After consulting with government authorities, PREPA determined that siting the on land storage and vaporization equipment at the Pier 15/16 would not be feasible because of the presence of artifacts of historical and archeological significance, the presence of which was not made known to the Team until after the issuance of the 1<sup>st</sup> Draft Report. Consequently, PREPA identified a third potential site inside San Juan Bay (Warehouse Site) and requested that the Team add this fourteenth option of an LNG terminal located at the Warehouse Site consisting of on land storage and vaporization being serviced by standard scale LNG carriers. Options consisting of FSU or FSRU configurations were not included in the evaluation of the Warehouse Site because of the conclusions drawn that these types of options were non-preferential because of the uncertainty about the permitting process and uncertainty about the ability to successfully manage the regulatory siting challenges resulting from the large exclusion zones.

One or more pipelines will be required to deliver vaporized LNG or depressurized CNG to both the San Juan and Palo Seco Power Plants from either of the four locations.

• Pier 15/16: a subsea pipeline crossing San Jan Bay (most likely horizontally directionally drilled instead of trenched) from Pier 15/16 to the San Juan Power Plant, AND onshore pipeline from San Juan Power Plant to Palo Seco Power Plant following the routing

- originally contemplated for Via Verde. An alternative could include a buried underwater pipeline from the San Juan Power Plant to Palo Seco Power Plant (refer to Appendix 1 Attachment 5 in the TRC report for a conceptual route for this underwater pipeline).
- Army Dock or Warehouse Site: an onshore pipeline from San Juan Power Plant to Palo Seco Power Plant following the routing originally contemplated for Via Verde. An alternative could include a buried underwater pipeline from the San Juan Power Plant to Palo Seco Power Plant (refer to Appendix 1 Attachment 5 in the TRC report for a conceptual route for this underwater pipeline).
- North Offshore: a subsea pipeline from FSRU to western tip of Ensenada de Boca Vieja, AND a subsea pipeline horizontally drilled to Palo Seco, AND an onshore pipeline from Palo Seco Power Plant to the San Juan Power Plant following the routing originally contemplated for Via Verde.

### ENVIRONMENTAL ASSESSMENT

TRC prepared a map of the environmentally sensitive zones in the study area that identified coral reefs, mangroves, sea grass beds, wetlands, critical wildlife areas, river and streams, karst areas, and aquifers. TRC determined that the environmental issues that are most likely to result in a high consequence impacts are those impacting coral reefs and mangroves. The regulatory requirements of dredge spoil management also represent a critical issue that could affect schedule. Impacts on the other environmentally sensitive areas can presumably be mitigated.

TRC then developed a classification scheme to quantify the severity of potential impacts from the infrastructure solutions identified above. This classification scheme includes the following a:

- High: impacts that are most assuredly going to result in significant project delays (more than 1 year) and/or cost a material amount of money to mitigate.
- Potentially High: impacts that could result in significant project delays (more than 1 year) and/or cost a material amount of money to mitigate.
- Moderate: impacts that have to be addressed, however, according to TRC experts, are impacts that can be mitigate with moderate project delays (less than 1 year) and/or mitigated at reasonable costs.
- Minor: impacts that are easily mitigated.
- Potential Issue Need More Information: impacts where, based on TRC's experiences, could be considered "Moderate" to "High" but where further technical definition is required to properly assess the impact (e.g. choice of vaporization technology).
- None: no impacts are anticipated.

TRC's performed its assessment by leveraging its experts' experience and knowledge about siting and permitting LNG facilities in the US, and incorporated feedback from Galway about specific issues such as pipeline routing. TRC's report should be considered an initial screen of potential fatal flaws that is based on a desktop study. Further and more detailed and targeted assessments would be required to confirm the anticipated environmental impacts. The TRC report is included as Appendix I.

### TECHNICAL ASSESSMENT

CH-IV completed a Feasibility and Options Study that focused on a) identifying and examining a full range of LNG and CNG delivery options, b) considering potential sites, c) quantifying various terminal configurations, site attributes and key differentiators within the context of each option's specific engineering challenges, solutions, and, very importantly, regulatory environment. CH-IV leveraged its extensive experience with LNG projects developed and built in the US as well as input from WH on regulatory matters and Galway on techno-commercial and commercial considerations.

One of the key components' of CH-IV assessment focused on the regulatory requirements that would impact the siting, design and operations of the potential options. Specifically, because of the requirement to be able to source LNG from the global market as well as potential from the continental US, the facility would need to be permitted as an Import LNG Terminal and therefore would be under the jurisdiction of the FERC. The Team viewed this requirement as a net positive because the FERC permitting process has a long history, is well established and predictable and is attended by relatively little uncertainty. Any permitting strategy that would require a new or one-off process would, in the Team's opinion, introduce significant permitting process, schedule and outcome uncertainty, which could be viewed as a fatal flaw in light of PREPA's obligations to meet MATS requirements.

There are a couple of important considerations with regards to the permitting approach that would impact this type of jurisdictional facility.

1) CFR 49 Part 193 applicability and considerations on the determination of the facility's impact on public safety and required mitigation measures.

According to Part 193, the safety standards and mitigation measures defined in the rules would not apply to LNG facilities that are used by the ultimate consumer of LNG or natural gas. Therefore, it is possible that any LNG or natural gas facilities serving PREPA would qualify for a different set of safety standards and mitigation measures that may be less stringent than those imposed under Part 193. However, one of the FERC's duties is to ensure public safety from the potential impact of jurisdictional facilities. Consequently, based on the Team's experience with FERC staff on other projects, it is anticipated that FERC staff would, as they are empowered to do, require that any facilities build to serve PREPA demonstrate that it meets the siting requirements of Part 193 irrespective of any exemptions that may be offered by regulations. Consequently, CH-IV has analyzed siting related issues according to the standards required under Part 193.

2) Application of public impact and siting requirements for floating LNG terminal infrastructure.

There is significant uncertainty about the applicable methodology to determine impacts on the public of vapor dispersion and thermal radiation for LNG terminal that include floating LNG infrastructure. The "traditional" method used (which is being used by Excelerate Energy in the permitting process for the Aguirre Offshore GasPort in Puerto Rico) is based on the USGC regulations that define Zones of Concern that delineate particular areas of specific risks and have been advisory in nature and have not constituted a proscriptive siting constraint. However, there have been recent developments that suggest that the application of proscriptive project-specific Zones of Concern may be required for LNG terminals that include any floating infrastructure (such as FSU or FSRU). Consequently, the Team feels that going forward, it is very likely that projects that include floating LNG infrastructure will be required to calculate and describe Zones of Concern for the floating infrastructure. The Team believes that FERC will then use those Zones of Concern to determine the potential impacts to the public in a similar manner as FERC currently applies for onshore LNG infrastructure. It is possible that alternatives to the "traditional" method to evaluate the impact of those Zones of Concern could be developed with FERC. However, the Team felt that this approach would introduce significant uncertainty about the permitting process, schedule and outcomes and should therefore be considered a fatal flaw in light of PREPA's MATS obligations. Therefore, CH-IV applied the "traditional" methodology to analyze siting related issues for floating LNG infrastructure.

For CNG, there are currently no CNG projects within the US. Therefore, no CNG project has been presented to FERC or USGC as part of a formal permitting process. Therefore, no specific rules, guidelines or precedent have been developed to provide a basis for the calculation of hazard zones for marine based CNG project within US jurisdiction. In the Team's opinion, this in itself presents significant uncertainty about the permitting process, schedule and outcomes for a CNG project and should therefore be considered a fatal flaw in light of PREPA's MATS obligations. However, for demonstration purposes, CH-IV did calculate hazard zones for the two CNG options based on analytical concepts used for LNG scenarios.

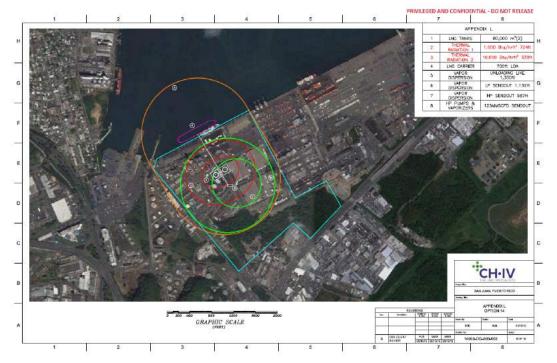
CH-IV calculated Zones of Concern for vapor dispersion and thermal radiation. These Zones of Concerns are shown in appendices A through L in CH-IV's Feasibility and Options Study report and are numbered in the map legends. The regulatory requirements for describing these Zones of Control are described in section 6.2 of CH-IV's Feasibility and Options Study report. Specifically, these include:

<sup>&</sup>lt;sup>1</sup> Methods currently used to describe Zones of Concerns by FERC for jurisdictional onshore LNG facilities

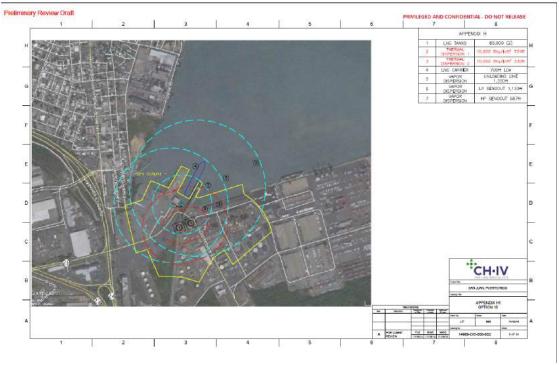
- 49 CFR 193.2057 requires that "Each LNG container and LNG transfer system must have a thermal exclusion zone in accordance with section 2.2.3.2 of NFPA 59A (incorporated by reference)". This requires that provisions need to be made to minimize the possibility of damaging effects of fire reaching beyond a property line that can be built upon and that would result in a distinct hazard. These thermal radiation Zones of Concerns are defined in the report as Zone 1 (37.5 kW/m² equivalent to 10,000 BTU/ft²-hr thermal flux) and Zone 2 (5 kW/m² equivalent to 1,600 BTU/ft²-hr thermal flux).
- 49 CFR 193.2059 requires that "Each LNG container and LNG transfer system must have a [vapor] dispersion exclusion zone in accordance with sections 2.2.3.3 and 2.2.3.4 of NFPA 59A (incorporated by reference)". This requires that provisions need to be made to minimize the possibility of a flammable mixture of vapors from a design LNG spill reaching a property line that can be built upon and that would result in a distinct hazard. These vapor dispersion Zones of Concerns are defined in the report as Zone 3 and are calculated and shown for various spill scenarios (therefore for some of the cases, multiple Zone 3's have been calculated and shown to reflect these different required spill scenarios).

Siting an LNG or CNG facility requires compliance with the Zones of Concerns described above and therefore required that the terminal control all of the property on land that is included within the three Zones of Concern described above. This means that access to the property is restricted and controlled by the terminal and the activities that can take place within the property boundary are limited to the operations of the LNG terminal and, in the case of the Warehouse Site, the operations of PREPA's power plant. Any option that included Zones of Concern that extended materially beyond the proposed property site limits on land and/or would impact the public were deemed to be undesirable. In option 14 (on land LNG storage and vaporization option at Warehouse Site), although some of Zone 3 vapor dispersion zones extend beyond the site boundary limit, as shown in Map 4 below, it does not extend beyond the property limit in a material way and therefore CH-IV concludes that this condition can be managed and mitigated through design and engineering methods and is therefore not a cause for concern during this feasibility assessment stage. This contrasts sharply from all options that include floating elements (FSU or FSRU's) where the Zone 3 extend materially over public areas, or option 10 (on land LNG storage and vaporization option at Army Dock). The material extensions of the Zone 3's beyond the proposed site boundary limits for Option 10 are shown on Map 5 below.

Map 4 – Option 14 (On Land LNG Storage and Vaporization Option at Warehouse Site) Zones of Concerns



 $\mbox{Map}\ 5-\mbox{Option}\ 10$  (On Land LNG Storage and Vaporization Option at Army Dock) Zones of Concerns



The results of CH-IV's assessment are document in its Feasibility and Options Study report and included in Appendix II.

## COMMERCIAL ASSESSMENT

The commercial assessment focuses on how well the infrastructure solution would support PREPA's goal of being to tap into multiple sources of LNG or CNG to assure security of supply and implement a competitive procurement process that would attract multiple potential suppliers to participate in the process. Consequently, any solution that requires custom logistical chain would be viewed as less attractive as a solution that can leverage existing shipping fleets. For example, a solution that requires more frequent deliveries of smaller ships because of lower terminal storage capacity or draught requirements would be less favorable from a commercial perspective than a solution that would support deliveries using standard scale vessels for the industry. The results of this assessment are included in Table 2 in Section 4 of this report.

## 2 – OPTIONS ASSESSMENT SUMMARY

The following table summarizes the assessment of the thirteen options identified by the team. Detailed environmental and technical assessments are included in Appendices I and II respectively. Table 2 summarizes the assessment of the LNG and CNG infrastructure Options and Table 3 summarizes the environmental assessment for the cross bay pipeline to connect Pier 15/16 to the San Juan Power Plant, the on land pipeline between the San Juan and Palo Seco Power Plants and the buried underwater pipeline between the San Juan and Palo Seco Power Plants.

Table 2-LNG and CNG Options Assessment Summary

	Environmental Impact		<b>Technical Assessment</b>		Regulatory	Commercial
Option #	Dredging & Disposal/Bentic Impact	Land Use/ Aesthetics/ Cultural	Zones of Concern Impact on Public	Shipping Frequency	Permitting Process Uncertainty	Logistical Conformity
	Moderate	Minor	Very High	Low	High	Low/Moderate
1	Some dredging required	Additional vessels at pier	Significant vapor dispersion zone encroachment over San Juan	2 per month	Issues with determination of impact of floating LNG elements	Requires custom and dedicated shuttle tanker and extended LNG carrier unloading periods
	Moderate	Minor	Very High	Low	High	Low/Moderate
2	Some dredging required	Additional vessels at pier	Significant vapor dispersion zone encroachment over San Juan	2 per month	Issues with determination of impact of floating LNG elements	Requires custom LNG carrier as existing ships in this size range are too old or dedicated to other trades
3	Potentially High	Moderate	Very High	Low	High	High

	Significant dredging required	Visual impact of FSRU from Convention Center	Significant vapor dispersion zone encroachment over San Juan	1.4 per month	Issues with determination of impact of floating LNG elements	Compatible with many vessels existing LNG fleet
	Moderate	Minor	Very High	Low	High	Low/Moderate
4	Some dredging required	Additional vessels at pier	Significant vapor dispersion zone encroachment over San Juan	2 per month	Issues with determination of impact of floating LNG elements	Requires custom and dedicated shuttle tanker and extended LNG carrier unloading periods
5	Potentially High  Significant dredging required for use of larger ships	Moderate Visual impact of on land LNG storage tanks	Low/None  Zones of concerns are completely contained within site boundaries	Low 1.4 or 2 per month (depending on ship size)	Low  "Standard"  configuration for  FERC process	Low or Low/Moderate  Depending on type of ship used
6	Potentially High  Significant dredging required for use of larger ships	Minor Additional vessels at pier	Very High Significant vapor dispersion zone encroachment over San Juan	Low 2 per month	High  Issues with determination of impact of floating LNG elements	Low/Moderate  Requires custom and dedicated shuttle tanker and extended LNG carrier

						unloading periods
	Potentially High	Minor	Very High	Low	High	Low/Moderate
7	Significant dredging required for use of larger ships	Additional vessels at pier	Significant vapor dispersion zone encroachment over San Juan	2 per month	Issues with determination of impact of floating LNG elements	Requires custom LNG carrier as existing ships in this size range are too old or dedicated to other trades
	Potentially High	Minor	Very High	Low	High	High
8	Significant dredging required	Additional vessels at pier	Significant vapor dispersion zone encroachment over San Juan	1.4 per month	Issues with determination of impact of floating LNG elements	Compatible with many vessels existing LNG fleet
	Potentially High	Minor	Very High	Low	High	Low/Moderate
9	Significant dredging required	Additional vessels at pier	Significant vapor dispersion zone encroachment over San Juan	2 per month	Issues with determination of impact of floating LNG elements	Requires custom and dedicated shuttle tanker and extended LNG carrier unloading

						periods
10	Potentially High  Significant dredging required for use of larger ships	Moderate Visual impact of on land LNG storage tanks	High  Zones of concerns Vapor dispersion zone encroaches on facilities owned by Puma, existing Port tenants adjacent to San Juan Power Plant and some public areas	Low 1.4 or 2 per month (depending on ship size)	Low  "Standard"  configuration for  FERC process	Low or Low/Moderate  Depending on type of ship used
11	Potentially High  Pipeline would have to cross potential corral reef areas	High  Likely visible from registered historic structures within pristine view shed	Very High Significant vapor dispersion zone encroachment over San Juan	None in San Juan Bay  Concerns about severe metocean conditions impeding unloading into FSRU	High  Issues with determination of impact of floating LNG elements because of proximity to San Juan	Low/Moderate  Concerns about severe metocean conditions impeding unloading into FSRU & concerns of associate natural gas supply disruptions

	Moderate	Minor	Medium	High	High	Low
12 <sup>2</sup>	Some dredging required	Additional vessels at pier	Potential Zones of concerns are mostly contained contained within site boundaries	10 per month	Lack of guidelines/permitting process or experience for CNG	No marine CNG projects have been implemented. Would require custom dedicated ships. Concerns about security of supply since no CNG production capacity or CNG ships exist at the moment and none are in advanced stages of development
	Potentially High	Minor	High	High	High	Low
133	Significant dredging required for use of larger	Additional vessels at pier	Potential Zones of concerns for most release scenarios	10 per month	Lack of guidelines/permitting process or	No marine CNG projects have been

<sup>&</sup>lt;sup>2</sup> The environmental assessment for option 12 is the same as option 1 since it is site specific

<sup>&</sup>lt;sup>3</sup> The environmental assessment for option 13 is the same as option 6 since it is site specific

	ships		encroaches on facilities owned by Puma, existing Port tenants adjacent to San Juan Power Plant and some public areas		experience for CNG	implemented. Would require custom dedicated ships. Concerns about security of supply since no CNG production capacity or CNG ships exist at the moment and none are in advanced stages of development
144	Potentially High  Significant dredging required for use of larger ships	Moderate Visual impact of on land LNG storage tanks	Low/None  Zones of concerns 1 & 2 are completely contained within site boundaries, Zones of concerns do not extend materially site boundaries and are manageable/mitigable	Low  1.4 or 2 per month (depending on ship size)	Low  "Standard"  configuration for  FERC process	Low or Low/Moderate  Depending on type of ship used

<sup>&</sup>lt;sup>4</sup> The environmental assessment for option 14 is the same as option 10 since the two locations are very near each other

 $Table \ 3-Environmental \ Assessment \ Summary \ for \ Pipelines$ 

Pipeline	Dredging & Disposal/Benthic Impact	Land Use/Aesthetics/Cultural
Cross Bay from Pier 15/16 to San Juan Power Plant	Minor  It is assumed that the pipeline would be constructed with Horizontal Directional Drilling ("HDD") which will have minor impact on the bentos of the bay during construction and none during operations	None
Onshore Pipeline From San Juan to Palo Seco Plant (or vice versa) Route 1 – Along highway 165	None	High  This pipeline will be very difficult to permit because of the proximity to roads, residences, and the potential impact to environmentally sensitive areas
Onshore Pipeline From San Juan to Palo Seco Plant (or vice versa) Route 2 – Routing proposed for Via Verde	None	Potentially High  This pipeline will be difficult to permit because of the proximity to roads and industrial sources
Buried Underwater Pipeline From San Juan to Palo Seco Plants (or vise versa)	Minor – if HDD installation technically feasible  Moderate/High – if trenching method is required	Moderate  Construction and pullback spaces in harbor highly visible during construction (temporary)

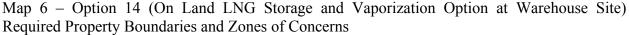
Offshore Pipeline from Offshore FSRU to Palo Seco	Potential High	None
Power Plant	This pipeline will be difficult to permit because of the	
	proximity to roads and industrial sources	

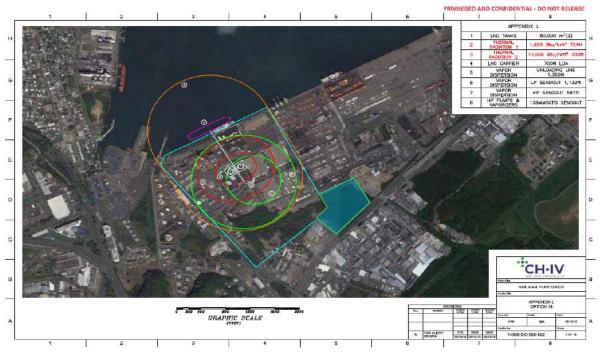
It is worthwhile pointing out that several of the options evaluated will required significant dredging. TRC categorized the environmental impact for those options from dredging has Potentially High because the dredging and the disposal of the dredge spoil will have to be permitted by the US Corps of Engineers ("USACE"). This permitting effort will likely take 1.5 to 4 years. However, based on its experience, TRC expects that the permitting timeline for any dredging projects would be on the lower end of this range and it is TRC's judgement that obtaining a dredging permit from the USACE will not be the critical path permitting issue. However, the dredging requirements could become a Fatal Flaw if the dredge material management exceeds the USACE's existing offshore spoil disposal site capacity and a new Ocean Dredged Material Site ("ODMDS") is required. TRC expects that it would take years to obtain a Marine Protection, Research and Sanctuaries Act ("MPRSA") § 102 approval from the EPA for a new ODMDS. However, initial informal feedback obtained during discussion between PREPA and USACE indicate that USACE does not have any concerns about capacity its existing offshore spoil disposal site.

## 3 – CONCLUSIONS AND RECOMMENDATIONS

The Team's conclusions and recommendations from the multi-disciplinary assessment of potential options to deliver natural gas to the San Juan and Palo Seco Power Plants Technical and Commercial assessments are:

• Despite the dredging requirements, Option 14, which consists of a more traditional on land LNG Import terminal configuration at the Warehouse Site, appears to be the most feasible of the options considered because the preliminary analysis suggests that meeting regulatory siting challenges is manageable (including the non-material slight extension of the vapor dispersion zones beyond the site limits) as long as whole property contained within the blue boundary shown in Map 5 below is used for the exclusive use of the LNG terminal and PREPA's power plant. A relatively small section in the southeastern corner of the proposed site (highlighted in blue) may potentially not be required, but this will have to be verified as part of the second phase of technical evaluation. Therefore, the Team concludes and recommends that Option 14 is the most preferential of the fourteen options considered. Equipment layouts and other siting considerations will need to be optimized in the second phase of the technical evaluation, which scope may need to be expanded to address vapor dispersion mitigation and management.





- Option 5, which consists of a more traditional on land LNG Import terminal configuration at Pier 15/16, initially appeared to be the most feasible of the initial thirteen options considered because the preliminary analysis suggested that meeting regulatory siting challenges were manageable. PREPA learned, after consulting with government authorities, of the presence of artifacts of historical and archeological significance (which was not made known to the Team until after the issuance of the 1<sup>st</sup> Draft Report). Therefore, the Team concludes that this option is now non-preferential because of the siting challenges caused by the presence of artifacts of historical and archeological significance.
- The other options at Pier 15/16 that incorporate floating infrastructure for the terminal (either FSU or FSRU) have been determined to be non-preferential because of the uncertainty about the permitting process and uncertainty about the ability to successfully manage the regulatory siting challenges.
- Similarly, the options evaluated for the Army Dock site that include floating infrastructure have been determined to be non-preferential because of the uncertainty about the permitting process and uncertainty about the ability to successfully manage the regulatory siting challenges.
- The option to site an onshore facility at/near the Army Dock and PREPA's San Juan Power Plant has also been determined to be non-preferential because of PREPA's expectations that securing all the land identified as the site boundaries will be very challenging. But even if the land could be assembled, the site is not sufficiently large nor situated properly for the Team to have confidence that it will be manageable to meet regulatory siting challenges imposed by proximity to the public and third party installations.
- Option 11, Offshore FSRU option, has been determined to be non-preferential for several reasons including:
  - The uncertainty about the permitting process and uncertainty about the ability to successfully manage the regulatory siting challenges;
  - The High Impact environmental assessment associated with the visibility of a FSRU from the registered historic structures in Isla de Cabras National Park and San Felipe del Morro Fort, which currently have a "pristine viewshed". It is the Team's opinion that it is very unlikely the viewshed impact would be approved by the regulatory agency reviewing the EIS;
  - The requirement for the pipeline connecting the FSRU to the Palo Seco Power Plant to cross a corral reef area. Crossing a corral reef area has a Potentially High impact because of the increased turbidity, noise vibration, and possibility of corral/equipment collisions associated with construction of the pipeline could impact the corral reef.
  - The expectation that challenging metocean condition along Puerto Rico's norther coast will significantly hinder the ability to reload the FSRU reliably which would result in poor availability of natural gas to PREPA's power plants.

- The 2 CNG options have been determined to be non-preferential because of the uncertainty about the permitting process and uncertainty about the ability to successfully manage the regulatory siting challenges. It is also uncertain how the frequent monthly deliveries of CNG would impact other port users and, therefore, it is uncertain how much opposition from other port users a CNG solution would face. In addition, since there are no marine CNG project in operations anywhere around the world, relying on such a solution would expose PREPA so significant security of supply risks and minimal bargaining leverage during the procurement process.
- Regardless of which LNG site is chosen, there will have to be a natural gas pipeline that connects the San Juan Power Plant and the Palo Seco Power Plant. TRC has evaluated the environmental and socioeconomic impacts of this pipeline based on the two routes supplied by PREPA. Route 1 follows an onshore route generally along highway 165 (Avenida El Cano) within 50 feet of this major thoroughfare and within 200 feet of residential areas. The new natural gas pipeline will have to be a buried pipeline, as the United States Department of Transportation ("DOT") Pipelines and Hazardous Materials Safety Administration ("PHMSA") requires all new natural gas pipelines to be buried with at least 3 feet of cover. TRC believes there are two issues associated with Route 1: 1) the pipeline will have to cross both populated areas (i.e., PHMSA Class <sup>3</sup>/<sub>4</sub> locations) and potentially sensitive environmental areas (e.g., mangrove swamps), and 2) there will likely be substantial public opposition (this is based on the experience from the Via Verde pipeline permitting effort). TRC considerers this pipeline route to be a high impact issue. Constructability in this tight corridor may also present a moderate impact issue. There is a second route (Route 2) that will be specifically routed to minimize encroachment on highways, roads, and residential areas. This route will be closer to the industrial areas and still has the potential for impacts on wetlands and/or other environmentally sensitive areas.
- Dredging will also be required for all options but the Offshore FSRU Option. Obtaining a dredging and spoil disposal permit will likely take 1.5 to 4 years. However, based on its experience, TRC expects that the permitting timeline for any dredging projects would be on the lower end of this range and it is TRC's judgement that obtaining a dredging permit from the USACE will not be the critical path permitting issue.
- No environmental or social impact issues that have been identified at this stage as Fatal Flaws.
- This evaluation did not focus on the level of public opposition or support that such a project would face. The location in (or very close to) San Juan and the Port of San Juan (which drives a significant level of economic activity for the island) will very likely make any project to deliver natural gas to PREPA's power plants very high visibility and will be subject to significant focus and scrutiny from the public, authorities and stakeholders that could be impacted economically by such projects. Although the Team's assessment is that meeting the siting and permitting requirement for the the recommended solution of

an onshore LNG terminal at the Warehouse Site are manageable, this project is a high footprint endeavor that will in all likelihood garner additional scrutiny because of its localized impact (dredging, large tanks, large vessels delivery LNG). Therefore is the Team's recommendation that P3A and PREPA carefully assess the potential execution risks associated with overcoming likely public opposition.

4 – APPENDICES:	TRC & CH-IV	Reports

## San Juan LNG Phase I

**Fatal Flaw** 

May 2015

Prepared For Galway Group

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## **Executive Summary**

Our primary objective for this project has been to help Galway Group quickly determine if there are fatal flaws in locating an LNG import terminal in San Juan Bay, Puerto Rico. We have conducted an evaluation that considers:

- Biological Resources,
- Water Quality,
- Air Quality, and
- Social Impacts.

TRC evaluated the environmental and social impacts for the LNG facility "cases" developed by CH IV. The cases are shown in Appendix 1 Attachment 1. An additional terminal site (adjacent to the San Juan power plant site and sharing the same berthing cases) and an additional offshore pipeline route from San Juan power plant to Palo Seco power plant were added to these cases. TRC engaged a team of LNG environmental experts to evaluate the environmental/socioeconomic issues for each case to determine 1) if there are any fatal flaws with any case, and 2) identify significant issues.

The final results of the TRC team analysis is presented in Appendix 1 Attachment 2. The conclusions are:

- There are no environmental or social impact issues that will be a fatal flaw.
- Regardless of which LNG site is chosen, there will have to be a natural gas (NG) pipeline that runs between the San Juan power plant and the Palo Seco power plant. TRC has evaluated the environmental and socioeconomic impacts of this pipeline based on the two onshore routes supplied by Puerto Rico electric Power Authority (PREPA) (route was posted to the Sharepoint site on 10/7/2014) and a preliminary offshore route.
  - Cano) within 50 feet of this major thoroughfare and within 200 feet of residential areas. The new NG pipeline will have to be a buried pipeline, as the United States Department of Transportation (DOT) Pipelines and Hazardous Materials Safety Administration (PHMSA) requires all new NG pipelines to be buried with at least 3 feet of cover. TRC believes there are two issues associated with Route 1; 1) the pipeline will have to cross both populated areas (i.e., PHMSA Class 3/4 locations) and potentially sensitive environmental areas (e.g., mangrove swamps), and 2) there will likely be substantial public opposition (this is based

- on the experience from the Via Verde pipeline permitting effort). TRC considerers this pipeline route to be a high impact issue. Constructability in this tight corridor may also present a moderate impact issue.
- There is a second route (Route 2) that will be specifically routed to minimize encroachment on highways, roads and residential areas. This route will be closer to the industrial areas and still has the potential for impacts on wetlands and/or other environmentally sensitive areas.
- An offshore option through San Juan Bay would avoid most of these onshore issues but would present constructability issues required to minimize impacts to shipping channels and aquatic resources (vegetation, corals). Assuming that constructability challenges could be overcome, the shoreline crossing at Palo Seco and the channel crossings (Army Terminal Channel and Turning Basin) would require horizontal directional drill (HDD) installation to avoid sensitive shoreline resources and traffic disruptions, respectively. The remainder of the line would also likely require HDD installation to avoid direct and indirect (turbidity) impacts to vegetation and corals. Visual and traffic impacts during the extended time on station required for drilling operations, pullback, welding, burial, tie-ins, etc. and the workspace required for HDD pullback would present high impact issues.
- There is only one (1) LNG import terminal case that has a high impact. This is the case with the "North Offshore" send out location (Case 11). In this case the visibility of a Floating Storage and Regasification Unit (FSRU) from the registered historic structures in Isia de Cabras National Park and San Felipe del Morro Fort, which currently have a "pristine view shed", would represent a high level impact and it is very unlikely the view shed impact would be approved by the regulatory agency reviewing the Environmental Impact Statement (EIS).
- TRC has identified six (6) cases which would have a moderate impact because of impacts from dredging. These are all cases associated with Pier 15/16. Whenever dredging will be required, TRC has identified a moderate impact. The main issues are that 1) dredging will increase the turbidity of the immediate area and could impact nearby environmentally sensitive areas such as sea grass beds and coral reefs, and 2) the dredging will have to be permitted with the US Army Corp of Engineers (USACE). This process could take form 2 4 years. During the project kickoff meeting in San Juan, Sonia Miranda Vega stated that she talked with the USACE Jackson District and they said it would likely take 4 four years to permit any significant dredging. However, we believe the timeline will be on the lower end of the 2 4 year range. It is our judgment that obtaining a dredging permit from the USACE will not be the critical path permitting issue.
- There is one (1) case (Case 11) which would likely require a pipeline to cross a coral reef area. Crossing a coral reef has a potentially high impact because the increased turbidity,

noise/vibration, and possibility of coral/equipment collisions associated with construction of the pipeline could impact the coral reef.

• All other issues are considered either moderate or low impact.

## 1.1 Study Areas

For this study TRC was asked to identify any environmental or social impacts, resulting from the construction and/or operation of a Liquefied Natural Gas (LNG) receiving facility which could result fatal flaws. Based on conversations at project kickoff meeting (in San Juan on July 12-13, 2014) and subsequent team conference calls, CH IV prepared a "case list" that is used as the basis of TRC's LNG import terminal options. This "case list" is presented as Appendix 1 Attachment 1.

## 1.2 Environmentally Sensitive Areas

TRC prepared a map of the environmentally sensitive zones in the study area. This map is presented in Appendix 1 Attachment 3. TRC identified coral reefs, mangroves, sea grass beds, wetlands, critical wildlife areas, river and streams, karst areas, and aquifers. The cases that are most likely to result in a high consequence impacts are the cases that include actions that would impact coral reefs and mangroves. Impacts on the other environmentally sensitive areas can presumably be mitigated.

## 1.3 Identification of Impacts

## 1.3.1 Methodology

TRC developed a classification scheme for quantify the severity of impacts. Table 1 below shows the ranking scheme. The most severe impacts were identified as "high" impacts. High impacts were defined as those impacts that are most assuredly going to result in in significant project delays (more than 1 year) and/or cost a material amount of money to mitigate. "Potentially high" impacts are defined as those impacts that could result significant project delays and/or cost a material amount of money to mitigate, however the probability of this being an issue is uncertain at this time. "Moderate" impacts are impacts that have to be addressed, however according to TRC experts are impacts that can be mitigated with moderate delays (less than 1 year) and/or mitigated at a reasonable cost. "Minor" impacts are easily mitigated. The classification of "Potential issue need more information" identifies an impact where, based on TRC experience, could be "moderate" to "high" but there are LNG gasification technology issues that have to be more defined before an impact category can be assigned.

Table 1 - Impact Classification

Color	Impact
	High
	Potentially High
	Moderate
	Minor
	None
	Potential Issue, need more information.

### 1.3.2 Resources Evaluated

An Environmental Impact Statement (EIS) for an LNG import terminal has to address impacts on marine wildlife, essential fish habitat (EFH), and benthic species; impacts on threatened or endangered species; impacts on land use and recreation; and air and noise. The TRC evaluation considered all of these resources. Each category and the actions that will adversely impact the resource are discussed below.

## Offshore and In-Harbor Impacts

**Benthic Resources** - the benthic resources are the biogeographic resources at the bottom of the bay and/or sea. This includes, coral reefs, sea grass, and other macroalgae. The main activity from this proposed project that could impact the benthic resources are dredging and pipeline construction in the marine environment.

**Fisheries** – This includes fish and their spawning areas. The activities that could adversely impact the fisheries include construction of a subsurface pipeline and significant water withdraw from the bay.

**Transportation** – As it relates to this project, this includes disruption of marine transportation in the busy San Juan Harbor.

### On-shore Impacts

Water Use/Water Quality – Significant water demand for the LNG regasification process could have an impact on the water supply for the San Juan area, especially it the water is withdrawn from the aquifers in the area. The water quality could be impacted if the water used to regasify the LNG is directly released into the shallow San Juan Bay.

**Wetlands/Wildlife** - Any onshore construction or change of land use has the potential to destroy existing wetlands or disrupt wildlife.

**Visual Impacts** – Significant structures (such as LNG storage tanks or large stationary Floating Storage and Regasification Units - FSRU) could result in degradation of the view shed at historical structures or pristine environments.

Air Quality – There will be emissions to the atmosphere of nitrogen oxides ( $NO_x$ ) and carbon monoxide (CO) from any fuel combustion facilities associated with the regasification facilities. These emissions have the potential to adversely impact the existing air quality resources. These impacts cannot be quantified until there is more information on the magnitude of the emissions and the specific locations of the emission sources.

## 1.3.3 Impacts

A detailed matrix of the proposed impacts are shown in Appendix 1 Attachment 4. A discussion of the activities that result in impacts classified is presented below.

Impacts From Dredging – CH IV has identified 11 cases for the LNG import terminal. In CH IV's case definition (see Appendix 1 Attachment 1) they documented the "controlling draft" for the marine vessels associated with this case. TRC also had available the depths of the various channels and turning basins in San Juan Harbor (see Appendix 1 Attachment 3) as defined by the US Army Corp of Engineers (USACE). If the controlling depth was deeper than the existing channel depths, then TRC took the position that dredging will be required. Further, the existing channel is narrower than typical approach channels at domestic LNG terminals, and widening of the channel would also require dredging. In TRC's review it was identified that all of the cases associated with Pier 15/16 will have to accommodate dredging to some extent. Cases associated with the Liquids Dock (including cases using Site No. 3) would not require dredging. All dredging was considered a "moderate" impact because the dredging and the disposal of the dredging spoils will have to be permitted by the USACE. The permitting effort will take 1.5-4years. TRC's experience is that dredging to improve an existing channel is likely manageable in a 2 year time frame, especially if the USACE can incorporate dredge material management into their existing capacity. It becomes a Fatal Flaw only in the unlikely event it exceeds existing capacity and requires a new Ocean Dredged Material Disposal Site (ODMDS), which would take years to receive a Marine Protection, Research and Sanctuaries Act (MPRSA) §102 approval from EPA.

**Pipeline Between Pier 15/16 and San Juan Power Plant** – It is assumed that the a subsurface pipeline could be constructed with Horizontal Directional Drilling (HDD) across San Juan Bay.

HDD is a technology that will minimize impacts to the benthic environment and the fisheries. However, impacts will not be completely eliminated.

**Pipeline Between San Juan Power Plant and Palo Seco Power Plant** – There are two potential onshore pipeline routes plus a preliminary offshore pipeline route.

Route 1 (see Appendix 1 Attachment 5) is along an existing right of way that parallels highway 165. This pipeline follows an onshore route generally along highway 165 (Avenida El Cano) and is within 50 feet of this major thoroughfare and within 200 feet of residential areas. The new NG pipeline will have to be a buried pipeline, as the United States Department of Transportation (DOT) Pipelines and Hazardous Materials Safety Administration (PHMSA) requires all new NG pipelines to be buried with at least 3 feet of cover. TRC believes there are two issues associated with this pipeline; 1) the pipeline will have to cross both populated areas (i.e., PHMSA Class 3/4 locations) and potentially sensitive environmental areas (e.g., mangrove swamps), and 2) there will likely be substantial public opposition (this is based on the experience from the Via Verde pipeline permitting effort). TRC considerers this pipeline route to be a high impact issues. Constructability in this tight corridor may also present a moderate impact issue.

Route 2 is a route that will be specifically routed to minimize encroachment on highways, roads and residential areas. The new NG pipeline will have to be a buried pipeline, as the DOT PHMSA requires all new NG pipelines to be buried with at least 3 feet of cover. This route will be closer to the industrial areas and still has the potential for impacts on wetlands and/or other environmentally sensitive areas.

An offshore pipeline route (see Appendix 1 Attachment 5) would present significant constructability challenges and may not be feasible from an engineering perspective; however, engineering analysis is beyond the scope of the environmental analysis. Assuming that constructability challenges could be overcome, the shoreline crossing at Palo Seco and the channel crossings (Army Terminal Channel and Turning Basin) would require horizontal directional drill (HDD) installation to avoid sensitive shoreline resources and traffic disruptions, respectively. Open-cut construction techniques, such as trenching, plowing, or jetting the pipeline in would have significant direct and indirect (water quality/sedimentation) impacts on the benthic community, and HDD installation may be required for the entirety of the route. Workspace required for HDD pullback (estimated at one mile) and the extended time on station for drilling operations,

pullback, welding, burial, tie-ins, etc. would present high impact visual and traffic (commercial and recreational) issues, temporarily during construction.

Transportation – TRC believes all cases could result in a "moderate" impact to marine traffic in San Juan bay. Just the fact there will be more barges or ships coming into the already busy harbor will result in some disruption of the existing harbor traffic. Traffic disruption will be compounded by the fact the barges and/or ships will be carrying and unloading LNG. The US Coast Guard has regulations that prevents other ships from getting near the LNG laden vessels while in transit or docked at a terminal. Marine traffic could also be disrupted during the construction of "across bay" subsurface pipelines (i.e., Pier 15/16 to San Juan Power Plant and San Juan power plant to Palo Seco power plant).

Visual Impacts - – Significant structures (such as LNG storage tanks or large stationary Floating Storage and Regasification Units - FSRU) could result in degradation of the view shed at historical structures or pristine environments. The Offshore (North) case would have a FSRU which could impact the visibility from the registered historic structures in Isia de Cabras National Park and San Felipe del Morro Fort, which currently have a "pristine view shed". TRC believes this is a "High" impact classification because it is unlikely the view shed impact would be approved by the regulatory agency reviewing the EIS. TRC believes the structures at Pier 15/16 will be able to be seen from the convention center. However we believe these are "moderate" impacts in that the view shed does not impact historical landmarks or pristine views. Similarly, the structures at the liquids dock will be able to be visible to the general public and are classified as "moderate" impacts in that the view shed does not impact historical landmarks or pristine views.

### 1.4 Conclusions

TRC's review concludes that there will be environmental and/or social impacts from the construction and operation of an LNG import terminal. A summary of the impacts are shown in Appendix 1 Attachment 1. TRC has not identified any fatal flaws resulting from environmental or socioeconomic impacts.

## Appendix 1 Attachment 1 CH IV LNG Cases

## Days Elasticity 3 Sendout Rate: 125

Option Number		Location	Sendout Rate (mmscfd)	Storage Volume (m³)	Days at Design Sendout	Days Elasticity	( anacity	Available Loading Volume at Maximum Elasticity Level (m³)	Remaining Tank Volume (m³)	Loading Rate (m³/hr)	Supply Vessel Capacity	Offload Duration (hrs)	Sandia Zone 3 (ft)	I FI /2	Volume of trolling Dredging aft (ft) Required (yd <sup>3</sup> )
1	Regas Barge with onboard storage, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon. Note this is not a designated lightering zone.	Pier 15/16													
			125 125 125	125,000 80,000 60,000	19.26 12.33 9.24	3 3 3	16.26 9.33 6.24	107,477 62,477 42,477	17,523 17,523 17,523	8,000 6,000 5,000	85,000 50,000 30,000	13 10 8			36.9 32.0 28.7
2	Regas Barge with LNG Carrier landing direct import.	Pier 15/16	125 125	125,000 80,000	19.26 12.33	3	16.26 9.33	107,477 62,477	17,523 17,523	8,000 6,000	145,000 85,000	20 16			40.2 36.9
3	FSRU moored at pier LNG Carrier landing direct import.	Pier 15/16	125	165,000	25.42	3	22.42	147,477	17,523	10,000	145,000	16			40.2
			125	125,000	19.26	3	16.26	107,477	17,523	8,000	85,000	13			36.9
4	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pier 15/16	125	125,000	19.26	3	16.26	107,477	17,523	8,000	85,000	13			36.9
			125 125	80,000	12.33 9.24	3	9.33 6.24	62,477 42,477	17,523 17,523	6,000 5,000	50,000 30,000	10			32.0 28.7
5	Storage and vaporization ashore, LNG provided by LNG Carrier	Pier 15/16													
	1 x 160,000 tank 2 x 80,000 tanks		125	160,000	24.65	3	21.65	142,477	17,523	8,000	85,000	13			36.9
	1 x 120,000 tank 2 x 60,000 tank 1 x 80,000 tank		125 125	120,000 80,000	18.49	3	9.33	102,477 62,477	17,523 17,523	6,000 5,000	50,000 30,000	10			32.0 28.7
<u> </u>	1 x 60,000 tank	Г	125	60,000	9.24	3	6.24	42,477	17,523	5,000	30,000	8			28.7
5	Storage and vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.  1 x 160,000 tank	Pier 15/16	125	160,000	24.65	3	21.65	142,477	17,523	8,000	85,000	13			36.9
	2 x 80,000 tanks 1 x 120,000 tank 2 x 60,000 tank 1 x 80,000 tank 1 x 60,000 tank 3 x 40,000 tank		125 125 125 125 125 125	160,000 120,000 120,000 80,000 60,000 120,000	24.65 18.49 18.49 12.33 9.24 18.49	3 3 3 3 3	21.65 15.49 15.49 9.33 6.24 15.49	142,477 102,477 102,477 62,477 42,477 102,477	17,523 17,523 17,523 17,523 17,523 17,523	8,000 6,000 5,000 5,000 5,000	85,000 50,000 50,000 30,000 30,000 30,000	13 10 10 8 8			36.9 32.0 32.0 28.7 28.7 28.7
6	Regas Barge with onboard storage, LNG provided by Shuttle	Liquids Dock		==-,,			, ====	,		3,332	3,332	- 1			
			125 125 125	125,000 80,000 60,000	19.26 12.33 9.24	3 3 3	16.26 9.33 6.24	107,477 62,477 42,477	17,523 17,523 17,523	8,000 6,000 5,000	85,000 50,000 30,000	13 10 8			36.9 32.0 28.7
7	Regas Barge with LNG Carrier landing direct import.	Liquids Dock	125 125	125,000 80,000	19.26 12.33	3	16.26 9.33	107,477 62,477	17,523 17,523	8,000 6,000	145,000 85,000	20			40.2 36.9
8	FSRU moored at pier LNG Carrier landing direct import.	Liquids Dock	125	165,000	25.42	3	22.42	147,477	17,523	10,000	145,000	16			40.2
			125				16.26	107,477	17,523	8,000	85,000	13			36.9
9	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Liquids Dock	125	125,000	19.26	3	16.26	107,477	17,523	8,000	85,000	13			36.9
			125 125 125	80,000 60,000	12.33 9.24	3	9.33 6.24	62,477 42,477	17,523 17,523 17,523	6,000 5,000	50,000 30,000	10 8			32.0 28.7
	Carrier	Liquids Dock	425	450,000	24.65	2	24.65	442.477	47.500	0.000	or ooo I	40.1			acal
	1 x 160,000 tank 2 x 80,000 tanks 1 x 120,000 tank 2 x 60,000 tank 1 x 80,000 tank 1 x 60,000 tank		125 125 125 125	160,000 120,000 80,000 60,000	18.49 12.33 9.24	3 3 3	21.65 15.49 9.33 6.24	142,477 102,477 62,477 42,477	17,523 17,523 17,523 17,523	5,000 5,000	85,000 50,000 30,000 30,000	13 10 8 8			36.9 32.0 28.7 28.7
	FSRU on weathervaning buoy approximately 3 miles offshore with gas feed line landing in vicinity of west tip of Ensanada de Boca Vieja, HDD approximately 3 miles to Palo Seco	Liquids Dock	125	165,000	25.42	3	22.42	147,477	17,523	8,000	85,000	13			36.9

## Appendix 1 Attachment 2 Critical Issue Summary Matrix

		1	chement 2 Critical	Julian y Iv	1	
Case No.	Sendout Location	Descri	ption	Fatal Flaws		l Issues
Cuse Hor	Sendout Estation	LNG and Regasification	Pipeline(s)		Dredging & Disposal / Benthic Impacts	Land Use / Aesthetics / Cultural
1	Pier 15/16	Regas Barge with onboard storage, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon. Note this is not a designated lightering zone.		None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Minor - additional vessel at piers
2	Pier 15/16	Regas Barge with LNG Carrier landing direct import.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Minor - additional vessel at piers
3	Pier 15/16	FSRU moored at pier LNG Carrier landing direct import.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Moderate - FSRU will be viaible from the Convention Center
4	Pier 15/16	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.		None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Minor - additional vessel at piers
5a	Pier 15/16	Storage and vaporization ashore, LNG provided by LNG Carrier	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Moderate - onshore LNG storage tanks
5b	Pier 15/16	Storage and vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	_	None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Moderate - onshore LNG storage tanks
6	Liquids Dock	Regas Barge with onboard storage, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon. Note this is not a designated lightering zone.		None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Minor - additional vessel
7	Liquids Dock	Regas Barge with LNG Carrier landing direct import.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Minor - additional vessel
8	Liquids Dock	FSRU moored at pier LNG Carrier landing direct import.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Minor - additional vesse
9	Liquids Dock	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	Minor - no significant dredging	Minor - additional vesse

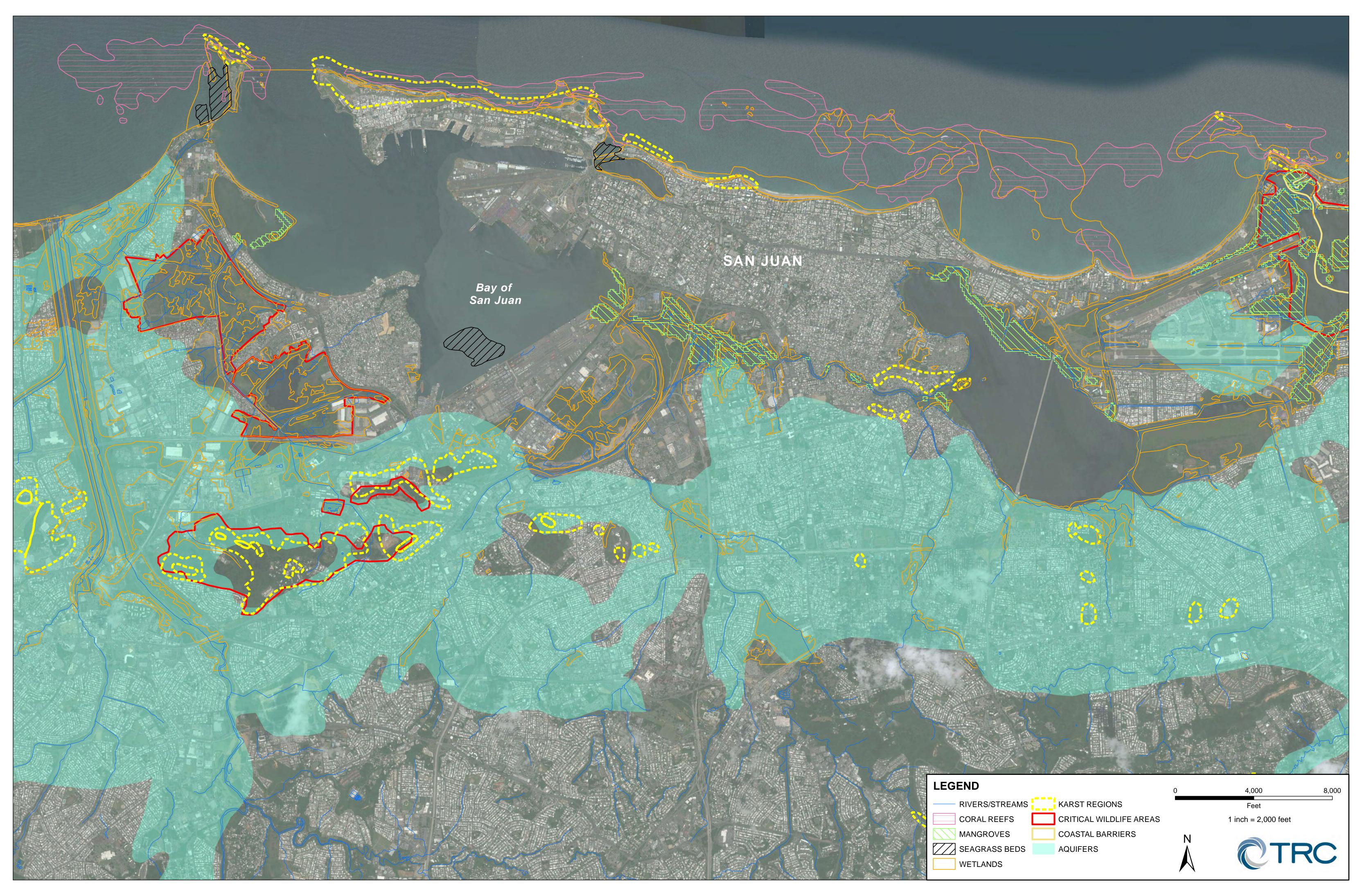
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C N	Canada 11 a st	Descri	iption	F ! F!	Critica	l Issues
Case No.	Sendout Location	LNG and Regasification	Pipeline(s)	Fatal Flaws	Dredging & Disposal / Benthic Impacts	Land Use / Aesthetics / Cultural
10	Liquids Dock	Storage and vaporization ashore, LNG provided by LNG Carrier	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	Moderate - There will be significant dredging but the permitting effort will not be the critical path issue.	Moderate - onshore LNG storage tanks
11	Offshore (North)	miles offshore with gas feed line landing in vicinity of west tip of Ensanada de Boca Vieja, HDD	Pipeline 1 - subsea from FSRU to western tip of Ensanada de Boca Vieja; Pipeline 2 - landing point to Palo Seco; Pipeline 3 - Palo Seco to San Juan <sup>1</sup>	None	Potential - pipeline in potential coral reef area	High: <sup>2</sup> Visible from registered historic structures Within "pristine" viewshed
Cross Bay Pipeline	Pier 15/16		Pipeline from Pier 15/16 to San Juan Power Plant	None	It is assumed that the pipeline could be constructed with Horizontal Directional Drilling (HDD) which will have a minore impact on the benthos of the bay during construction.	None
On Shore Pipeline Route 1	San Juan Power Plant		Pipeline from San Juan Power Plant to Palo Seco along route proposled in Val Verde EIS.	None	None	Potentially High - This pipeline will be difficult to permit because of the proximity to roads and industrial sources.
Onshore Pipeline Route 2	San Juan Power Plant		Pipeline from San Juan Power Plant to Palo Seco along highway 165.	None	None	High - This pipeline will be very difficult to permit because of the proximity to roads, residences, and the potential impact to environmentally sensitive areas.
Under Water Pipeline from FSRU	San Juan Power Plant		Under Water Pipeline from FSRU	None	Potential - pipeline in potential coral reef area	None
Offshore Pipeline from San Juan power plant to Palo Seco power plant	San Juan Power Plant		Pipeline from San Juan power plant to Palo Seco power plant offshore through San Juan Bay.	None	It is assumed that the pipeline could be constructed with Horizontal Directional Drilling (HDD) which will have a minor impact on the benthos of the bay during construction.	Moderate – construction and pullback workspace in harbor highly visible during construction (temporary)

<sup>&</sup>lt;sup>1</sup> The impacts from the pipelines (Pier 15/16 to San Juan Power Plant and San Juan to Palo Seco) are addressed as Cases 12 and 13.

<sup>&</sup>lt;sup>2</sup> Mitigation is to move the facility. Is there a location it can it be moved to a location that would not be a concern?

Color	Impact
	High
	Potentially High
	Moderate
	Minor
	None
	Potential Issue, need more
	information.

# Appendix 1 Attachment 3 Map of Environmentally Sensitive Zones



# Appendix 1 Attachment 4 Detailed Matrix of Proposed Impacts

Appendix 1 Attachment 4

				ı	Offshore	Appendix 1 Attachment 4			
	Sendout	Descrip	otion	Fatal	Impacts		In-Harbor Impacts		
Case No.	Location	LNG and Regasification	Pipeline(s)	Flaws	Benthic	Benthic	Fisheries	Transportation	
1	Pier 15/16	Regas Barge with onboard storage, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon. Note this is not a designated lightering zone.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	None	Moderate - There will be significant dredging. Channel dredging for LNG carriers would increase turbidity and has the potential to impact benthic communities. The permitting effort will not be the critical path issue.	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic	
2	Pier 15/16	Regas Barge with LNG Carrier landing direct import.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	None	Moderate - There will be significant dredging. Channel dredging for LNG carriers would increase turbidity and has the potential to impact benthic communities. The permitting effort will not be the critical path issue.	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic	
3	Pier 15/16	FSRU moored at pier LNG Carrier landing direct import.	Pipeline 1 - Pier 15/16 to San Juan Power Plant, Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	None	Moderate - There will be significant dredging. Channel dredging for LNG carriers would increase turbidity and has the potential to impact benthic communities. The permitting effort will not be the critical path issue.	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic	
4	Pier 15/16	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	None	Moderate - There will be significant dredging. Channel dredging for LNG carriers would increase turbidity and has the potential to impact benthic communities. The permitting effort will not be the critical path issue.	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic	
5a	Pier 15/16	Storage and vaporization ashore, LNG provided by LNG Carrier	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	None	Moderate - There will be significant dredging. Channel dredging for LNG carriers would increase turbidity and has the potential to impact benthic communities. The permitting effort will not be the critical path issue.	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic	
5b	Pier 15/16	Storage and vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	None	None	Moderate - There will be significant dredging. Channel dredging for LNG carriers would increase turbidity and has the potential to impact benthic communities. The permitting effort will not be the critical path issue.	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic	
6	Liquids Dock	Regas Barge with onboard storage, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon. Note this is not a designated lightering zone.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	None	None	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic. Marine vessels at the liquids terminal location will have the largest impact on existing in-harbour traffic.	
7		Regas Barge with LNG Carrier landing direct import.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	None	None	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic. Marine vessels at the liquids terminal location will have the largest impact on existing in-harbour traffic.	

Appendix 1 Attachment 4

						Арреник	1 Attachment 4	
	Sendout	Descrip	otion	Fatal	Offshore Impacts		In-Harbor Impacts	
Case No.	Location	LNG and Regasification	Pipeline(s)	Flaws	Benthic	Benthic	Fisheries	Transportation
8	Liquids Dock	FSRU moored at pier LNG Carrier landing direct import.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	None	None	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic. Marine vessels at the liquids terminal location will have the largest impact on existing in-harbour traffic.
9	Liquids Dock	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	None	None	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic. Marine vessels at the liquids terminal location will have the largest impact on existing in-harbour traffic.
10	Liquids Dock	Storage and vaporization ashore, LNG provided by LNG Carrier	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	None	None	None	Potential entrainment/ impingement impacts on ichthyoplankton during regasification	New vessel traffic could impact existing in-harbor vessel traffic. Marine vessels at the liquids terminal location will have the largest impact on existing in-harbour traffic.
11	Offshore (North)	FSRU on weathervaning buoy approximately 3 miles offshore with gas feed line landing in vicinity of west tip of Ensanada de Boca Vieja, HDD approximately 3 miles to Palo Seco	Pipeline 1 - subsea from FSRU to western tip of Ensanada de Boca Vieja; Pipeline 2 - landing point to Palo Seco; Pipeline 3 - Palo Seco to San Juan <sup>1</sup>	None	Moorings and sendout pipeline (direct and secondary impacts - footprint, sedimentation, and turbidity)	None	None	None
12	Pier 15/16		Pipeline from Pier 15/16 to San Juan Power Plant		None	Minor - Horizontal Directional Drilling (HDD) will have a minor impact.	Minor - Horizontal Directional Drilling (HDD) will have a minor impact.	There could be minor disruptioons to marine traffic during construction
13	San Juan Power Plant		Pipeline from San Juan Power Plant to Palo Seco along route proposled in Val Verde EIS.			None	None	None
14	San Juan Power Plant		Pipeline from San Juan Power Plant to Palo Seco along highway 165.	None	None	None	None	None
15	San Juan Power Plant		Pipeline from San Juan power plant to Palo Seco power plant offshore through San Juan Bay.	None	None	Minor – if HDD installation feasible Moderate/major – if trenching methods proposed	Minor – if HDD installation feasible Moderate – if trenching methods proposed	Moderate disruptions to commercial and recreational marine traffic during construction.

<sup>&</sup>lt;sup>1</sup> The impacts from the pipelines (Pier 15/16 to San Juan Power Plant and San Juan to Palo Seco) are addressed as Cases 12-15.
<sup>2</sup> Mitigation is to move the facility. Is there a location it can it be moved to a location that would not be a concern?

Color	Impact
	High
	Potentially High
	Moderate
	Minor
	None
	Potential Issue, need more
	information.

	Canal	Descrip	otion			On-Shore Impacts	
Case No.	Sendout Location	LNG and Regasification	Pipeline(s)	Water Use / Quality	Wetlands / Wildlife	Land Use/Aesthetics/Cultural	Air Quality
1	Pier 15/16	Regas Barge with onboard storage, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon. Note this is not a designated lightering zone.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Minor - more marine vessels at Pier 15/16	Potential air impacts from combustion sources associated with regasification
2	Pier 15/16	Regas Barge with LNG Carrier landing direct import.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Minor - more vessels at Pier 15/16	Potential air impacts from combustion sources associated with regasification
3	Pier 15/16	FSRU moored at pier LNG Carrier landing direct import.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Moderate - more vessels at Pier 15/16 and permanent FSRU	Potential air impacts from combustion sources associated with regasification
4	Pier 15/16	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Minor - more vessels at Pier 15/16	Potential air impacts from combustion sources associated with regasification
5a	Pier 15/16	Storage and vaporization ashore, LNG provided by LNG Carrier	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Potentially significant - onshore storage tanks	Potential air impacts from combustion sources associated with regasification
5b	Pier 15/16	Storage and vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pipeline 1 - Pier 15/16 to San Juan Power Plant; Pipeline 2 from San Juan to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Potentially significant - onshore storage tanks	Potential air impacts from combustion sources associated with regasification
6	Liquids Dock	Regas Barge with onboard storage, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon. Note this is not a designated lightering zone.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Minor - more vessels at Liquids Dock	Potential air impacts from combustion sources associated with regasification. The negative impact will be largest at the liquids terminal because of the other soruces in the area.
7	Liquids Dock	Regas Barge with LNG Carrier landing direct import.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Minor - more vessels at Liquids Dock	Potential air impacts from combustion sources associated with regasification. The negative impact will be largest at the liquids terminal because of the other soruces in the area.

	Sendout	Descrip	otion			On-Shore Impacts	
Case No.	Location	LNG and Regasification	Pipeline(s)	Water Use / Quality	Wetlands / Wildlife	Land Use/Aesthetics/Cultural	Air Quality
8		FSRU moored at pier LNG Carrier landing direct import.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Moderate - more vessels at Liquids Dock and permanent FSRU	Potential air impacts from combustion sources associated with regasification. The negative impact will be largest at the liquids terminal because of the other soruces in the area.
9	Liquids Dock	FSU with vaporization ashore, LNG provided by Shuttle Tanker using STS in area of Guayanilla Canyon.	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Moderate - more vessels at Liquids Dock and permanent FSU	Potential air impacts from combustion sources associated with regasification. The negative impact will be largest at the liquids terminal because of the other soruces in the area.
10	Liquids Dock	Storage and vaporization ashore, LNG provided by LNG Carrier	Pipeline from San Juan Power Plant to Palo Seco <sup>1</sup>	Potential aquifer impacts from groundwater withdrawal	None	Moderate - onshore storage tanks	Potential air impacts from combustion sources associated with regasification. The negative impact will be largest at the liquids terminal because of the other sources in the area.
11	Offshore (North)	FSRU on weathervaning buoy approximately 3 miles offshore with gas feed line landing in vicinity of west tip of Ensanada de Boca Vieja, HDD approximately 3 miles to Palo Seco	Pipeline 1 - subsea from FSRU to western tip of Ensanada de Boca Vieja; Pipeline 2 - landing point to Palo Seco; Pipeline 3 - Palo Seco to San Juan <sup>1</sup>	None	None	High - FSRU visible from Ensanada de Boca Vieja beaches.	Potential air impacts from combustion sources associated with regasification
12	Pier 15/16		Pipeline from Pier 15/16 to San Juan Power Plant	None	None	None	None
13	San Juan Power Plant		Pipeline from San Juan Power Plant to Palo Seco along route proposled in Val Verde EIS.		Potential impacts to wetlands and wildlife from San Juan to Palo Seco pipeline	Potentially High - This pipeline will be difficult to permit because of the proximity to roads and industrial sources.	
14	San Juan Power Plant		Pipeline from San Juan Power Plant to Palo Seco along highway 165.	None	Potential impacts to wetlands and wildlife from San Juan to Palo Seco pipeline	High - This pipeline will be very difficult to permit because of the proximity to roads, residences, and the potential impact to environmentally sensitive areas.	None
15	San Juan Power Plant		Pipeline from San Juan power plant to Palo Seco power plant offshore through San Juan Bay.	Minor – if HDD installation feasible Moderate – if trenching methods proposed Temporary	None	Moderate – construction and pullback workspace in harbor highly visible during construction (temporary)	None

<sup>1</sup> The impacts from the pipelines (Pier 15/16 to San Juan Power Plant and San Juan to Palo Seco) are addressed as Cases 12-15.
<sup>2</sup> Mitigation is to move the facility. Is there a location it can it be moved to a location that would not be a concern?

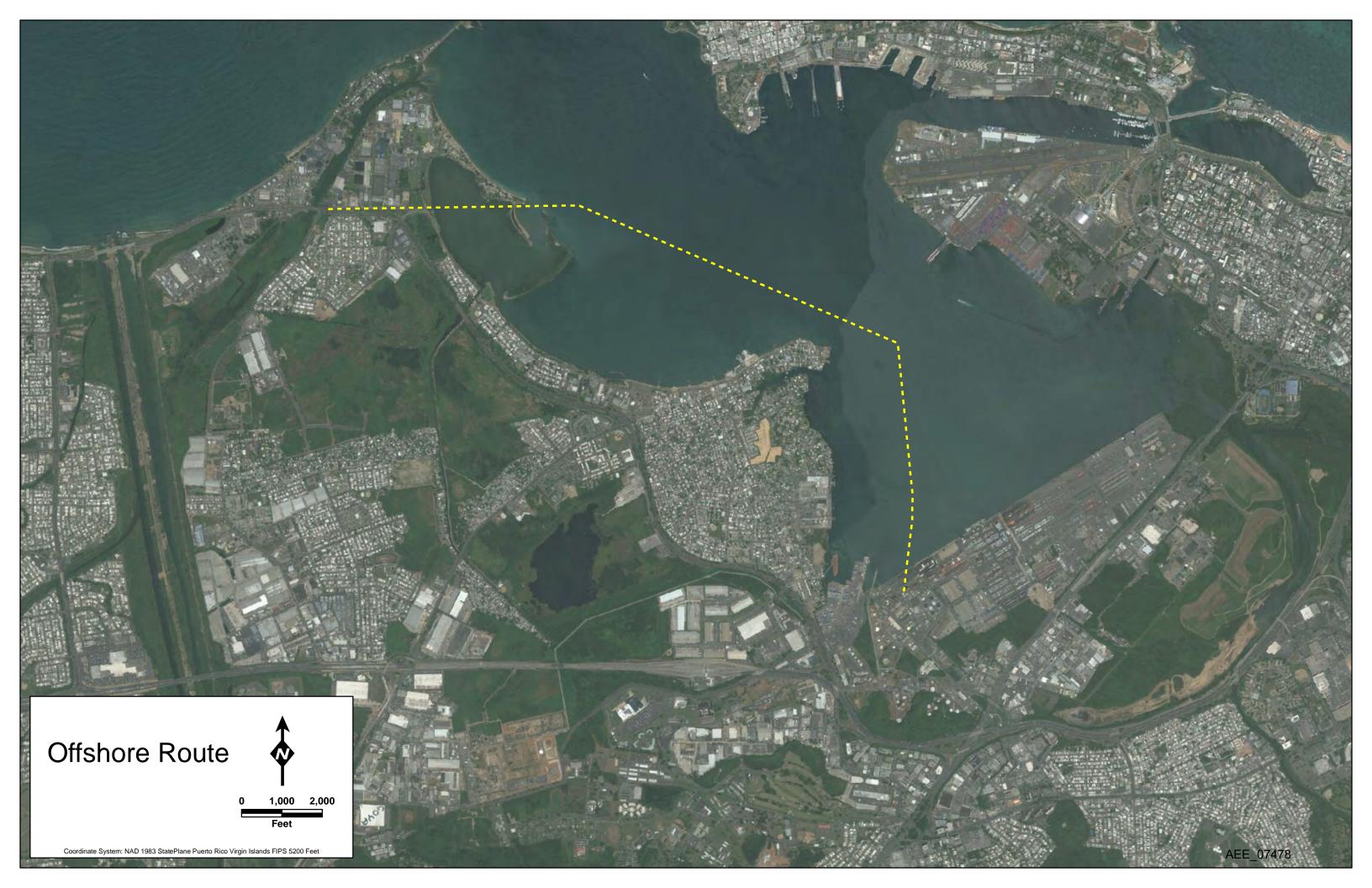
Color	Impact
	High
	Potentially High
	Moderate
	Minor
	None
	Potential Issue, need more information.

## Appendix 1

#### **Attachment 5**

Map of the Proposed Pipeline Routes Between San Juan Power Plant and Palo Seco Power Plant





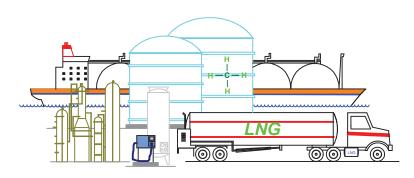
#### SAN JUAN LNG IMPORT TERMINAL

#### **FEASIBILITY AND OPTION STUDY**

Prepared for ~

Galway Group, LLC

Prepared by ~





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#### 1 INTRODUCTION

The Puerto Rico Electric Power Authority (PREPA) is exploring the feasibility of various options to provide alternate fuel delivery to its power generation equipment at its San Juan Power Plant and its Palo Seco Power Plant. PREPA seeks to introduce alternative fuel equivalent to approximately 5,841 m³/day of LNG. Accordingly, PREPA wishes to examine options in landing LNG at a receiving terminal for regasification and transmission to the two existing power plants.

#### 2 SCOPE OF STUDY

This Feasibility and Option Study is targeted to (a) develop and examine a full range of LNG and CNG delivery options, (b) consider available sites, (c) quantify various terminal configurations, site attributes and key differentiators within the context of each option's specific engineering challenges, solutions, associated commercial impacts, and regulatory environment. The Feasibility and Option Study shall provide PREPA with an options analysis leading to, and in support of, final conclusions and recommendations for a terminal configuration and site location.

CH·IV International (CH·IV) has identified several technology options for importing LNG and CNG and has also identified potential locations for each. CH·IV has studied each option and location to determine the technical feasibility of each. The purpose of this report is to:

- Describe the findings of the evaluation performed for each option,
- Identify potential fatal flaws for each option, and
- Describe those options for which no fatal flaws were evident and which should be considered further.

#### 3 LNG TERMINAL DESIGN CONSIDERATIONS

#### 3.1 LNG Receipt and Natural Gas Sendout Requirements

PREPA has estimated that the targeted annual LNG landing volume for the Project is approximately 1 million tonnes annually (1.0 MTPA) which is equivalent to approximately 125 MMSCFD of natural gas sendout. Baseload consumers of the natural gas send out are anticipated to include planned conversions at Palo Seco and the San Juan Power (Combined Cycle and Thermoelectric) facilities and expansion at the Palo Seco facility.



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#### 3.2 LNG Storage Considerations and Requirements

For the design of any LNG facility, the quantity of LNG to be stored either offshore or onshore is generally a function of:

- Terminal natural gas sendout rate and the desired minimum number of days storage at full sendout rate;
- Availability at Terminal berth; and
- LNG Carrier logistics and specifics, including source of LNG, transit time, Carrier
  availability and size (i.e. number and size of LNG Carriers available to supply the
  facility).

The business model base case assumption presented by the Project is an annual delivery of 1,000,000 tonnes of LNG. Assuming a baseload demand of 125 MMSCFD, this Feasibility and Option Study assumes the following capacities:

- FSRU storage capacity of 165,000 m<sup>3</sup> for near-shore solutions,
- FSU storage capacity of ≤125,000 m³ for near-shore solutions,
- Aggregate LNG storage capacity of 160,000 m<sup>3</sup> for on-shore solutions, and
- LNG carrier capacity of  $\leq 145,000 \text{ m}^3$ .
- Other related considerations for LNG Carrier transits, a minimum channel width requirement of 400 feet is assumed.

#### 4 LOCATIONS CONSIDERED

Subsequent to performing site visits and desktop research, CH·IV identified several general areas for potentially siting offshore and/or onshore LNG infrastructure facilities. Each area is described below.

#### 4.1 Option 1: Regasification Barge at Pier 15/16 with Shuttle Delivery

This option comprises a non-self-propelled vessel with onboard regasification capability and  $\leq 125,000$  m<sup>3</sup> storage capacity to be moored dockside in way of Pier 15/16. Cargo delivery would be provided by shuttle tanker through ship – to – ship (STS) transfer in the area of Guayanilla Canyon.

This option provides receipt and storage of LNG aboard the FSRU and vaporization of the LNG to natural gas via on board regasification. The natural gas from the on board regasification process would be sent to an onshore pipeline co-located at the facility and then to a subsea pipeline crossing San Juan Bay to the San Juan power plant.



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From its San Juan power plant riser, the pipeline would bifurcate to provide feed gas for San Juan power plant prime movers and an additional pipeline to be run to provide feed gas for the Palo Seco facility.



Figure 4.1: Pier 15/16 Location

#### 4.2 Option 2: Regasification Barge at Pier 15/16 with LNG Carrier Delivery

Similar to Option 1, this option comprises a non-self-propelled vessel with onboard regasification capability and ≤125,000 m³ storage capacity to be moored dockside in way of Pier 15/16. In this option, cargo delivery would be provided by an LNG Carrier entering San Juan Bay to transfer cargo directly to Regasification Barge through either STS or through plant piping arrangement at marine jetty.

As before, this option provides receipt and storage of LNG aboard the regasification barge and vaporization of the LNG via on board regasification with pipeline as described in Option 1.



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Figure 4.2: Guayanilla Canyon

#### 4.3 Option 3: FSRU at Pier 15/16 with LNG Carrier Delivery

This option comprises a self-propelled Floating Storage and Regasification Unit (FSRU) with onboard regasification capability and ≤165,000 m³ storage capacity to be moored dockside in way of Pier 15/16. In this option, cargo delivery would be provided by an LNG Carrier entering San Juan Bay to transfer cargo directly to FSRU through either STS or through plant piping arrangement at marine jetty.

As before, this option provides receipt and storage of LNG aboard the FSRU and vaporization of the LNG to natural gas via on board regasification with pipeline as described in Option 1.

#### 4.4 Option 4: FSU at Pier 15/16 with Shuttle Delivery

This option comprises a Floating Storage Unit (FSU), either self-propelled or non-self-propelled, with no onboard regasification capability and  $\leq$ 125,000 m³ storage capacity to be moored dockside in way of Pier 15/16. Cargo delivery would be provided by shuttle tanker through STS transfer in the area of Guayanilla Canyon.



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This arrangement provides for the FSU to pump LNG to the co-located shoreside facility for vaporization and send – out through the pipeline arrangement described in the earlier options.

#### 4.5 Option 5: Storage and Vaporization at Pier 15/16

This option comprises a "conventional" shoreside LNG receiving terminal with storage and vaporization to shore and cargo provided through LNG Carrier. LNG storage considered in this case is an aggregate of 160,000 m³ through the use of two 80,000 m³ full containment tanks.

Distribution of gas to the San Juan and Palo Seco power plants is as earlier described.

#### 4.6 Option 6: Regasification Barge at Army Dock with Shuttle Delivery

This option comprises a non-self-propelled vessel with onboard regasification capability and ≤125,000 m³ storage capacity to be moored dockside in way of the Army Dock on the west side of the San Juan Power Plant. Cargo delivery would be provided by shuttle tanker through STS transfer in the area of Guayanilla Canyon.

This option provides receipt and storage of LNG aboard the FSRU and vaporization of the LNG to natural gas via on board regasification. The natural gas from the on board regasification process would be sent to an onshore pipeline co-located at the facility and bifurcated to provide feed gas to the San Juan power plant into a pipeline providing feed gas to Palo Seco.

#### 4.7 Option 7: Regasification Barge at Army Dock with LNG Carrier Delivery

Similar to Option 6, this option comprises a non-self-propelled vessel with onboard regasification capability and ≤125,000 m³ storage capacity to be moored dockside in way of the Army Dock. In this option, cargo delivery would be provided by an LNG Carrier entering San Juan Bay to transfer cargo directly to Regasification Barge through either STS or through plant piping arrangement at marine jetty.

As before, this option provides receipt and storage of LNG aboard the Regasification Barge and vaporization of the LNG via on board regasification with pipeline as described in Option 6.

#### 4.8 Option 8: FSRU at Army Dock with LNG Carrier Delivery

This option comprises a self-propelled FSRU with onboard regasification capability and ≤165,000 m³ storage capacity to be moored dockside in way of the Army Dock. In this option, cargo delivery would be provided by an LNG Carrier entering San Juan



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Bay to transfer cargo directly to FSRU through either STS or through plant piping arrangement at marine jetty.

As before, this option provides receipt and storage of LNG aboard the FSRU and vaporization of the LNG to natural gas via on board regasification with pipeline as described in Option 6.



Figure 4.3: Army Dock

#### 4.9 Option 9: FSU at the Army Dock with Shuttle Delivery

This option comprises an FSU, either self-propelled or non-self-propelled, with no onboard regasification capability and ≤125,000 m³ storage capacity to be moored dockside in way of the Army Dock. Cargo delivery would be provided by shuttle tanker through STS transfer in the area of Guayanilla Canyon.

This arrangement provides for the FSU to pump LNG to the co-located shoreside facility for vaporization and sendout through the pipeline arrangement described in the earlier options for the Army Dock.



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#### 4.10 Option 10: Storage and Vaporization at the Army Dock

This option comprises "conventional" shoreside LNG receiving terminal with storage and vaporization to shore and cargo provided through LNG Carrier. LNG storage considered in this case is an aggregate of 160,000 m<sup>3</sup> through the use of two 80,000 m<sup>3</sup> full containment tanks.

Distribution of gas to the San Juan and Palo Seco power plants is as earlier described in the Army Dock options.

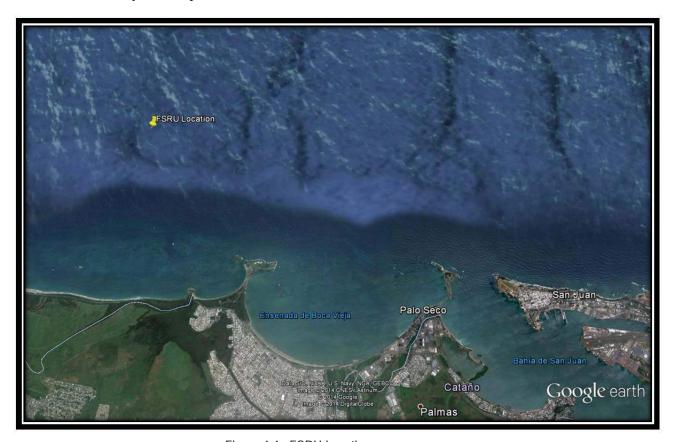


Figure 4.4: FSRU Location

#### 4.11 Option 11: FSRU Moored Offshore

This option comprises an FSRU of ≤165,000 m³ storage capacity moored at approximately 3 miles offshore as depicted in the figure. The moored FSRU would send out natural gas through a riser/PLEM assembly to a sub-seabed pipeline landing in the vicinity of the West tip of Ensenada de Boca Vieja and from there the pipeline would be horizontally directionally drilled to a pipeline riser at the Palo Seco site. At



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the Palo Seco site, the pipeline would bifurcate with one line providing feed gas to the Palo Seco prime movers and the other providing feed gas to a pipeline to run to the San Juan power plant.

#### 4.12 Option 12: CNG Barge Moored at Pier 15/16

This option comprises a non-self-propelled vessel with onboard CNG storage to be moored dockside in way of Pier 15/16. This option requires marine civil works adequate to provide mooring for two vessels simultaneously in order to avoid feed gas interruption. This option provides storage of CNG aboard the vessel and discharge of the CNG to be sent from the vessel to an onshore pipeline co-located at the facility and then to a subsea pipeline crossing San Juan Bay to the San Juan power plant.

From its San Juan power plant riser, the pipeline would bifurcate to provide feed gas for San Juan power plant prime movers and an additional pipeline to be run to provide feed gas for the Palo Seco facility.

#### 4.13 Option 13: CNG Barge Moored at Army Dock

This option comprises a non-self-propelled vessel with onboard CNG storage to be moored dockside in way of the Army Dock. This option requires marine civil works adequate to provide mooring for two vessels simultaneously in order to avoid feed gas interruption. This option provides storage of CNG aboard the vessel and discharge of the CNG to be sent from the vessel to an onshore pipeline co-located at the facility and bifurcated to provide feed gas to the San Juan power plant into a pipeline providing feed gas to Palo Seco.

#### 4.14 Option 14: Storage and Vaporization at the San Juan Power Plant Extended

This option comprises "conventional" shoreside LNG receiving terminal with storage and vaporization to shore and cargo provided through LNG Carrier. LNG storage considered in this case is an aggregate of 160,000 m<sup>3</sup> through the use of two 80,000 m<sup>3</sup> full containment tanks.

Distribution of gas to the San Juan and Palo Seco power plants is as earlier described in the Army Dock options.



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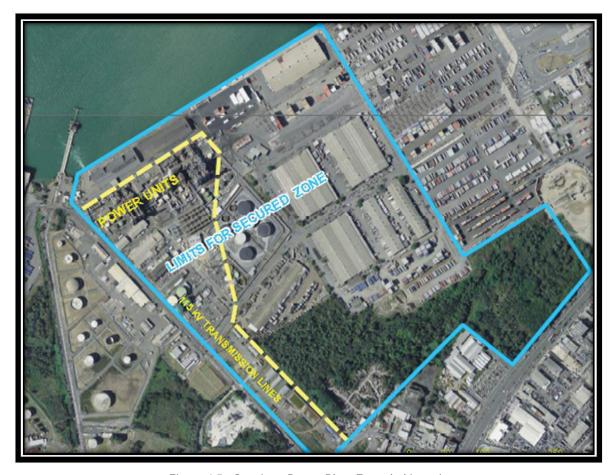


Figure 4.5: San Juan Power Plant Extended Location

#### 5 REGULATORY CONSIDERATIONS

In assessing the feasibility of any project, it is critical to have a thorough working knowledge of the regulatory environment within which the project will be sited, constructed and operated in order to understand any risks associated with the suitability of the project proposed integrating into the regulatory environment.

The product as proposed would require the commercial latitude to receive LNG from non-US ports. As such, the facility would be FERC jurisdictional. This arrangement is viewed as a net positive for the project in that the FERC process has a long history, is well-established and predictable and is attended by relatively little uncertainty. Indeed, this arrangement is preferable as a non-jurisdictional facility would introduce the need to craft a "one-off" state and local government permitting process. With two notable exceptions, issues considered by other cooperating federal agencies typically participating in the FERC process are also predictable; the exceptions merit discussion and are:



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- the application of 49 CFR Part 193 by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA);
- application of public impact/siting requirements (proscriptive versus advisory) for floating terminal infrastructure considered to be "permanently moored craft" under the US Coast Guard's 2009 policy.

#### 5.1 Part 193 Applicability

49 CFR Part 193 includes the following applicability requirements:

#### § 193.2001 Scope of part.

- (a) This part prescribes safety standards for LNG facilities used in the transportation of gas by pipeline that is subject to the pipeline safety laws (49 U.S.C. 60101 et seq.) and Part 192 of this chapter.
- (b) This part does not apply to:
  - (1) LNG facilities used by ultimate consumers of LNG or natural gas.
- (2) LNG facilities used in the course of natural gas treatment or hydrocarbon extraction which do not store LNG.
- (3) In the case of a marine cargo transfer system and associated facilities, any matter other than siting pertaining to the system or facilities between the marine vessel and the last manifold (or in the absence of a manifold, the last valve) located immediately before a storage tank.
  - (4) Any LNG facility located in navigable waters (as defined in Section 3(8) of the Federal Power Act (16 U.S.C. 796(8)).

Of particular interest is §193.2001 (b) (1) in bold text above. It is Project's intent to utilize all landed LNG solely as feed gas for its power generation prime movers. As such, the Project would likely satisfy §193.2001 (b) (1) and not be subject to the requirements of Part 193. This exemption from the requirements of Part 193 is, on its face, significant in that the Project would be under no explicit obligation to demonstrate compliance with the exclusion zone requirements described in §193.2057 and §193.2059 using the methodology and approaches currently required by DOT PHMSA. However, FERC staff routinely evaluates and determines public impacts for facilities of this type under their jurisdiction in accordance with Part 193; therefore, as a practical policy matter, it is anticipated that FERC staff would require, as they are empowered to do, that the Project demonstrate siting in a manner consistent with the requirements of §193.2057 and §193.2059 irrespective of any exemptions offered by



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the regulation. Accordingly, this expectation has been considered in performing this Study.

#### **5.2** Floating Infrastructure Issues

There are several issues involving floating infrastructure that add to regulatory uncertainty and raise questions about potential suitability to meet the Project's needs. One question relates to determination of public impacts of vapor dispersion and thermal radiation. The "traditional" methodology for determining potential areas under risk from an event occurring aboard LNG Carrier has been defined under the Coast Guard's Navigation, Vessel and Inspection Circular (NVIC) 01-11. The (partial) output from the process described therein has been to establish project – specific Zones of Concern that delineate particular areas of specific risk for advisory purposes to the public. The Zones of Concern, within the context of the NVIC, have been advisory and have not constituted a proscriptive siting constraint.

Recent developments, however, suggest that application of project – specific Zones of Concern may be changing for floating infrastructure that comprise part of the terminal. Noting that §193.2001 does not apply to an "LNG facility located in navigable waters", there are limited choices in evaluating public impacts for such facility infrastructure. One choice is the evaluation of impacts provided through NVIC 01-11 and the other option is to propose to the Authority Having Jurisdiction (AHJ) an alternative evaluation method, such as the use of Chapter 15 "Performance (Risk Assessment) Based LNG Plant Siting" of NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG)" 2013 edition.

Whether the potential public impacts are determined through straight application of NVIC 01-11 or the output of a Quantitative Risk Assessment or a hybrid of each, it is felt that the project will be required to describe the Zones of Concern for the floating infrastructure and that those Zones of Concern will be used to determine the potential public impacts to be considered by FERC.

In addition, there are certain recent issues arising out of the US Coast Guard's "Permanently Moored Craft" policy. Information regarding this policy is attached in Appendix J. Although this permanently moored craft policy has been in place since 2009, it is only recently that LNG project development initiatives in the industry give rise to some of the regulatory gaps and issues attendant with the policy. Such issues include the requirement for robust mooring systems capable of handling permanently moored craft loadings in hurricane conditions (for non-self-propelled vessels or self-propelled vessels that are proposed to remain permanently on station), clarification of any Jones Act uncertainties surrounding the use of non-US constructed vessels in Regasification Barge, FSRU or FSU service, scope and application of non-marine codes, standards and regulations (such as those enforced by the Occupational Safety



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and Health Administration) on vessels in Regasification Barge, FSRU or FSU service, and well defining the permitting, plan review and approval process and division of responsibilities between FERC, the US Coast Guard and the selected Class Society.

#### 5.3 Summary

Depending on the infrastructure configuration selected by the Project, there may be several areas of regulatory uncertainty. It may be arguable that the requirements of 49 CFR Part 193 do not apply to the Project given the language of \$193.2001; however, it is felt that the Project will be required as a matter of FERC staff policy to demonstrate a level of analysis equivalent to that under Part 193.

With respect to the floating infrastructure, as a conservative approach and reflecting what is felt to be the ultimate outcome, public impacts associated with floating infrastructure, whether nearshore or offshore, will present the Zones of Concern, as defined in NVIC 01-11.

#### **6 HAZARD EVALUATION BASIS**

Based on the specifics defined in Section 3.1 and 3.2 of this Report and of the discussions in Section 5, CH·IV has defined the following as the basis for calculating site-specific hazards.

#### 6.1 LNG Marine Vessels Hazard Analysis

Due to increased demand for natural gas in the U.S., it was necessary to identify consistent methods and approaches to help ensure protection of public safety and property from a potential large scale LNG spill on water. Therefore, the U.S. Department of Energy (DOE), Office of Fossil Energy, requested that Sandia National Laboratories (Sandia) develop guidance on a risk-based analysis approach to assess and quantify potential threats to an LNG carrier, the potential hazards and consequences of a large spill from an LNG carrier, and review prevention and mitigation strategies that could be implemented to reduce both the potential for and the risks of an LNG spill over water.

In December 2004, Sandia issued a report titled "Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water" (2004 Sandia Report) which provided a methodology for assessing hazards and identified approaches to minimize the consequences of LNG spills from LNG carriers with capacities of 125,000 m³ to 150,000 m³ and defined three Hazard Zones which made up the "Zones of Concern". The Hazard Zones were defined as:

<sup>&</sup>lt;sup>1</sup> "Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water", SAND2004-6258, December 2004.



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- Zone 1: Distance to 37.5 kW/m<sup>2</sup> Thermal Flux
- Zone 2 : Distance to 5 kW/m<sup>2</sup> Thermal Flux
- Zone 3: Distance to Lower Flammability Limit

In May 2008, Sandia issued a report titled "Breach and Safety Analysis of Spills Over Water from Large Liquefied Natural Gas Carriers" (2008 Sandia Report) which analyzed spills from LNG carriers up to 265,000 m<sup>3</sup> and re-assessed emerging accidental and intentional threat scenarios.

The distances to the Hazard Zones calculated in the 2004 and 2008 Sandia Reports were based on a "nominal case" and were not site-specific. Site-specific Hazard Zone distances will change depending on the location of the project (accidental vs. intentional breaches), environmental conditions (temperature, relative humidity, wind speed, etc.), storage tank configurations and storage volumes. The Hazard Zone distances calculated in the 2004 and 2008 Sandia Reports were intended to convey the scale of possible hazard distances for a large spill of LNG over water. Therefore, the 2004 and 2008 Sandia Reports recommended a site-specific analysis be performed to calculate site-specific Zones of Concern.

In December 2011, Sandia issued a report titled "Recommendations on the Prediction of Thermal Hazard Distances from Large Liquefied Natural Gas Pool Fires on Water for Solid Flame Models" (2011 Sandia Report) which provided recommended parameters for solid flame models based on experimental data from "The Phoenix Series Large Scale LNG Pool Fire Experiments" (Phoenix Series) performed by Sandia. The 2011 Sandia Report also updated the hazard distances calculated in the 2004 and 2008 Sandia Reports to include the recommended parameters. The 2011 Sandia Report emphasized that surrounding conditions will change the Hazard Zone distances and therefore again recommended that a site-specific analysis be performed to calculate the site-specific Zones of Concern.

CH·IV has calculated site-specific Zones of Concern for the FSRU, FSU, and LNG Vessel options being considered based on the methodology described in the Sandia Reports.

<sup>&</sup>lt;sup>2</sup> "Breach and Safety Analysis of Spills Over Water from Large Liquefied Natural Gas Carriers", SAND2008-3153, May 2008.

<sup>&</sup>lt;sup>3</sup> "Recommendations on the Prediction of Thermal Hazard Distances from Large Liquefied Natural Gas Pool Fires on Water for Solid Flame Models", SAND2011-3342, December 2011.

<sup>&</sup>lt;sup>4</sup> "The Phoenix Series Large Scale LNG Pool Fire Experiments", SAND2010-8676, December 2010.



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#### 6.2 Onshore Facilities Hazard Analysis

As earlier stated, the basis of this Report considers that the Project will be required to perform siting analysis similar to those described in §193.2057 and §193.2059 of 49 CFR 193 as further described below:

- 49 CFR 193.2057 requires that "Each LNG container and LNG transfer system must have a thermal exclusion zone in accordance with section 2.2.3.2 of NFPA 59A (incorporated by reference)". Section 2.2.3.2 of NFPA 59A (2001 edition) requires that provisions shall be made to minimize the possibility of the damaging effects of fire reaching beyond a property line that can be built upon and that would result in a distinct hazard. This section of NFPA 59A and also 49 CFR 193.2057 require that thermal heat flux distances be determined by using the model described in Gas Research Institute report GRI 0176, "LNGFIRE: A Thermal Radiation Model for LNG Fires".
- 49 CFR 193.2059 requires that "Each LNG container and LNG transfer system must have a [vapor] dispersion exclusion zone in accordance with sections 2.2.3.3 and 2.2.3.4 of NFPA 59A (incorporated by reference)". Section 2.2.3.4 of NFPA 59A (2001 edition) requires that provisions shall be made to minimize the possibility of a flammable mixture of vapors from a design [LNG] spill reaching a property line that can be built upon and that would result in a distinct hazard. This section of NFPA 59A and also 49 CFR 193.2059 require that flammable gas dispersion distances be determined in accordance with the model described in Gas Research Institute report GRI 0242, "LNG Vapor Dispersion Prediction with the DEGADIS Dense Gas Dispersion Model".
- 49 CFR 193.2051, requires that "Each LNG facility designed, constructed, replaced, relocated or significantly altered after March 31, 2000 must be provided with siting requirements in accordance with the requirements of this part and of NFPA 59A (incorporated by reference)". Section 2.1.1.d of NFPA 59A (2001) states that "other factors applicable to the specific site that have a bearing on the safety of plant personnel and the surrounding public shall be considered. The review of such factors shall include an evaluation of potential incidents and safety measures incorporated in the design or operation of the facility".

#### 6.2.1 Thermal Radiation Model

In accordance with 49 CFR 193.2057 and Section 2.2.3.2 of NFPA 59A (2001 edition), the Project used LNGFIREIII to calculate the thermal radiation exclusion zones associated with the LNG Storage Tank impoundment.



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### 6.2.2 Vapor Dispersion Written Interpretation

Until early 2009, the DEGADIS model was the standard used within the LNG industry to calculate vapor dispersion distances to demonstrate that the resulting "exclusion zones" remain within property controlled by the facility owners or areas controlled by a government entity. However, in an effort to develop LNG dispersion model evaluation tools for the NFPA 59A Committee, the Fire Protection Research Foundation (FPRF) funded research on LNG spill source term modeling and, in March, 2009 its findings were included in a report entitled "LNG Source Term Models for Hazard Analysis: A review of the State-of-the-Art and an Approach to Model Assessment". The report presented a methodology for assessing the suitability of LNG source term models used in determining pool spread and vaporization and concluded that the source term model generally used within the industry to provide input to the DEGADIS dispersion model could result in under-prediction of hazard distances in some cases because it does not accurately represent vapor accumulation within impoundments, vapor flashing, and pool spreading. Subsequently, in July, 2010 U.S. DOT PHMSA issued written interpretations acknowledging the FPRF findings and described requirements that vapor dispersion exclusion zone analysis be performed for LNG facilities not yet in existence or under construction to demonstrate compliance with 49 CFR 193 and that the analysis should include vapor dispersion from:

- Jetting and flashing,
- Conveyance of LNG to impoundments; and
- LNG in impoundments.

Although the DEGADIS dispersion model was not a subject of concern for the FPRF, the model is not capable of solving the requirements to analyze the effects of jetting and flashing and the conveyance of LNG spills to impoundments. New models were required to perform this function and therefore, in its written interpretations, U.S. DOT PHMSA stated that applicants should provide an interpretation from PHMSA on the suitability of the specific source term model used to satisfy flammable vapor dispersion requirements.

Also note that for the purposes of this Report, vapor dispersion events surrounding conveyance of LNG to impoundments and LNG in impoundments were not considered as they are expected to be bounded by analysis associated with jet releases.



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## 6.2.3 Vapor Dispersion Model

In late 2010, Model Evaluation Protocols and Model Evaluation Reports for two new vapor dispersion models were submitted to DOT PHMSA for review and approval. On October 7, 2011 U.S. DOT PHMSA issued final approvals allowing the models to be used (within certain conditions) to perform vapor dispersion analysis to demonstrate compliance with exclusion zones. The models currently being used to permit the construction of LNG facilities in the U.S.A are the FLACS (v9.1) model (developed by GexCon) and the PHAST (v6.6 or v6.7) model (developed by DNV).

For the non-marine infrastructure, the vapor dispersion analyses presented in this Report are based on results using the PHAST model.

### 6.3 CNG Marine Vessels Hazard Analysis

There are currently no CNG projects within U.S. territory and no such projects have been presented to FERC or USCG. Therefore, there are no specific rules, guidelines or precedent available that provides a basis for calculating hazard zones (or equivalent) for marine based CNG vessels in the U.S. However, examples of analysis performed for CNG solutions within other jurisdictions are available, along with vessel classification guidelines from ABS and rules from DNV.

While it is understood that there are currently no examples of CNG vessels in U.S territory and therefore no precedent regarding regulatory requirements to permit a CNG facility, the calculation of hazard zones using the same concepts used by Sandia for the determination of intentional and accidental release scenarios will allow for a reasonable comparison to the hazard zones calculated for LNG vessels. For the purposes of this analysis, CH·IV assumed a non-self-propelled vessel with an onboard inventory of a plurality of Composite Reinforced Pressure Vessels (CPRV). Baseline design information for the vessel is as follows:

- Propulsion: non-self-propelled
- CPRV maximum total common header inventory: 56
- CPRV maximum total single hold inventory: 306

CH·IV performed modeling for the following scenarios:

• Release Scenario 1: An intentional release which results in the rupture of the 6 inch header connected to a "gang" of 56 CPRVs;



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- Release Scenario 2: An intentional release which results in the rupture of the 8 inch header connected to a total single hold space inventory of 306 CPRVs;
- Release Scenario 3: An intentional release which results in the rupture
  of a single 1 ¼ inch connection to an individual CRPV which results in
  releasing the contents of all 56 CPRVs connected to a common header;
  and,
- Release Scenario 4: An intentional release which results in a 5 m<sup>2</sup> hole in the side of the CNG vessel. Two CPRVs which are directly behind the 5 m<sup>2</sup> hole are damaged and their contents are released.

In order to calculate potential Hazard Zones associated with the CNG vessels, CH·IV used assumed baseline design information and the PHAST v6.7 software tool to calculate the potential extent of site specific Zones of Concern:

- Zone 1 12,000 Btu/ft<sup>2</sup>-hr. (37 kW/m2).
- Zone 2 1,600 Btu/ft<sup>2</sup>-hr. (5 kW/m2).
- Zone 3 Lower Flammability Limit (LFL).

#### 7 INFRASTRUCTURE-SPECIFIC HAZARD EVALUATIONS

Based on the specifics defined in Section 3.1 and 3.2 of this Report, CH·IV has calculated site-specific hazards associated with each option.

CH·IV has used the following weather data to be used in performing the thermal radiation analysis

Table 7-1: Thermal Radiation Weather Assumptions

Parameter	Value
Ambient Temperature	70°F
Wind Speed	Multiple wind speeds will be analyzed to determine longest thermal radiation distance.
Relative Humidity	50%

CH·IV has used the following weather data to be used in performing the vapor dispersion analysis



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Table 7-2: Vapor Dispersion Weather Assumptions

Parameter	Value
Average Ambient Temperature	85°F
Wind Speed	Multiple wind speeds will be analyzed to determine longest cloud distance.
Relative Humidity	70% over water, 50% over land
Pasquill-Gifford Atmospheric Stability	F

## 7.1 Regasification Barge Hazard Analysis

For the Option 1, 2, 6 and 7 arrangements, the following assumptions were used in the analysis:

- Storage capacity of 125,000 m<sup>3</sup> via five vessel storage tanks at 25,000 m<sup>3</sup> each
- Initial liquid height of 15 meters in each tank
- Intentional release scenario resulting in a 5 m<sup>2</sup> breach of a single cargo tank

Using the methodology and recommended parameters in the Sandia Reports, CH·IV calculated the distances to the "Zones of Concern" for a 125,000 m<sup>3</sup> vessel so configured is as follows:

- Zone 1: Distance to  $37.5 \text{ kW/m}^2$  Thermal Flux = 1,138 feet (347 m)
- Zone 2 : Distance to  $5 \text{ kW/m}^2$  Thermal Flux = 3,337 feet (1,017 m)
- Zone 3: Distance to Lower Flammability Limit = 17,680 feet (5,389 m)

### 7.2 FSRU Hazard Analysis

For the Option 3, 8 and 11 arrangements, the following assumptions were used in the analysis:

- Storage capacity of 165,000 m<sup>3</sup> via five vessel storage tanks at 33,000 m<sup>3</sup> each
- Initial liquid height of 16 meters in each tank
- Intentional release scenario resulting in a 5 m<sup>2</sup> breach of a single cargo tank

Using the methodology and recommended parameters in the Sandia Reports, CH·IV calculated the distances to the "Zones of Concern" for a 165,000 m<sup>3</sup> vessel so configured is as follows:

- Zone 1: Distance to  $37.5 \text{ kW/m}^2$  Thermal Flux = 1,154 feet (352 m)
- Zone 2 : Distance to  $5 \text{ kW/m}^2$  Thermal Flux = 3,376 feet (1,029 m)
- Zone 3: Distance to Lower Flammability Limit = 18,024 feet (5,494 m)



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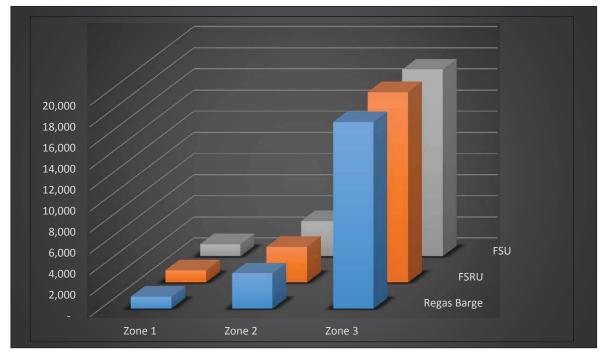


Figure 7.1: ZOC End Points

## 7.3 FSU Hazard Analysis

For the Option 4 and 9 arrangements, the following assumptions were used in the analysis:

- Storage capacity of 125,000 m<sup>3</sup> via five vessel storage tanks at 25,000 m<sup>3</sup> each
- Initial liquid height of 16 meters in each tank
- Intentional release scenario resulting in a 5 m<sup>2</sup> breach of a single cargo tank

Using the methodology and recommended parameters in the Sandia Reports, CH·IV calculated the distances to the "Zones of Concern" for a 125,000 m<sup>3</sup> vessel so configured is as follows:

- Zone 1: Distance to  $37.5 \text{ kW/m}^2$  Thermal Flux = 1,138 feet (347 m)
- Zone 2 : Distance to  $5 \text{ kW/m}^2$  Thermal Flux = 3,337 feet (1,017 m)
- Zone 3: Distance to Lower Flammability Limit = 17,680 feet (5,389 m)

#### 7.4 LNG Storage Tank Hazard Analysis

As earlier discussed, 49 CFR Part 193 and Chapter 2 of NFPA 59A (2001 addition) specify distances to a property line for radiant heat flux. CH·IV has used LNGFIRE3 to calculate the distances to radiant heat fluxes. Although a plurality of LNG storage



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tank options are available, given the circumstances of this project, CH·IV has considered only the full containment option as feasible. This is applicable to Options 5, 10, and 14.

The following assumptions were used in the analysis:

- Aggregate storage capacity of 160,000 m<sup>3</sup>
- Each tank 80,000 m<sup>3</sup>
- Full containment storage tank with outer diameter of 200 feet and height of 115 feet

The results of the analysis are as follows:

- Distance to  $10,000 \text{ BTU/ft}^2\text{-hr} = 330 \text{ feet}$
- Distance to 1,600 BTU/ft<sup>2</sup>-hr = 724 feet

### 7.5 LNG Transfer Piping Vapor Dispersion Analysis

As earlier discussed, this Report presumes the project will be required to demonstrate compliance with 49 CFR Part 193. CH·IV has considered the following process conditions in determining representative dispersion distances:

Unloading line from the LNG Carrier to LNG Storage Tank:

- 28-inch line
- length ≤950 feet,
- 2-inch single accidental release source:
  - ½ LFL dispersion distance is 1,350 feet

Low pressure Sendout Pumps from the LNG Storage Tank to the High Pressure Sendout Pumps:

- 10-inch line
- length  $\leq$ 500 feet,
- 2-inch single accidental release source:
  - ½ LFL dispersion distance is 1,132 feet

High Pressure Sendout Pumps to the Vaporizers:

- 10-inch line
- length  $\leq 200$  feet,
- 1-inch single accidental release source:



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• ½ LFL dispersion distance is 587 feet

This is applicable to Options 5 10, and 14.

### 7.6 CNG Marine Vessel Hazard Analysis

The dynamics of a release of LNG from an LNG carrier compared to a CNG release from a CNG carrier are very different. The integral models described earlier used in the calculation of Hazard Zones for LNG releases for an FSRU or LNG Barge consider an LNG release through a hole which forms a pool on water and either ignites to form a pool fire or disperses. A release of CNG would not form a pool on water and therefore these models used for LNG are not appropriate for modeling a CNG release. Therefore, CH·IV used the PHAST v6.7 software tool to calculate the potential equivalent Zones of Concern for CNG releases. The jet fire model was used in PHAST to calculate the distance to Zones 1 and 2 and the dispersion model was used to calculate the distance to Zone 3. This analysis is applicable to Options 12 and 13

Site specific conditions used in the analysis are as follows:

- Ambient temperature of 70 °F.
- Ambient wind speed(s) up to 4.5 mph.
- Relative humidity of 50%.
- Surface roughness factor of 3e<sup>-3</sup> m for spills on water.

The following modeling assumptions were made:

- The CNG vessel analyzed utilizing a plurality of Composite Reinforced Pressure Vessels (CRPV) to store CNG.
- Each cargo "hold" contains 306 CRPVs and the largest "gang" in each cargo hold contains 56 CRPVs connected to a common header.
- Each individual CPRV is connected with a 1 ¼ inch pipe to its header. A total of 28 CRPVs are connected to a 4 inch header. The 4 inch header from each bank of 28 CRPVs is connected to a 6 inch header to connect the entire "gang" of 56 CRPVs. The 6 inch header is then expanded to an 8 inch header.
- There are no isolation valves between each CRPV in the "gang". Therefore, if there is a rupture of 1 CRPV, all 56 CRPV's connected in the same "gang" will release through that rupture.
- Each CRPV is approximately 80 feet long and 42 inches in diameter with a container volume of 800 ft<sup>3</sup> (22.65 m<sup>3</sup>), has a capacity of 178,000 scf and is designed for 3,400 psi.



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• The release material for all scenarios will be 100% methane and each CRPV can store 9,072 lb. of methane at 3,400 psi and 30°C.

#### 7.6.1 CNG Release Scenario 1

Release Scenario 1 assumes that there is an incident which results in the rupture of the 6-inch header connected to all 56 CPRVs in the gang. This scenario uses conservative assumptions to calculate the worst-case hazard zones associated with the release of all 56 CRPV's in the gang. This scenario assumes that the 6-inch rupture discharges horizontally directly to atmosphere, therefore no obstructions or internal decking are taken into account.

It is assumed that a jet fire occurs for the calculation of the equivalent Zones of Concern 1 and 2. For the calculation of Zone of Concern 3, it is assumed that no ignition source is present and the methane is allowed to disperse un-ignited. For this scenario, the release duration is 308 seconds. The calculated Hazard Zones are as follows:

- Zone 1  $(37.5 \text{ kW/m}^2)$  215 meters (705 feet);
- Zone 2 (5 kW/  $m^2$ ) 391 meters (1,283 feet);
- Zone 3 (LFL) 277 meters (909 feet).

## 7.6.2 CNG Release Scenario 2

Release Scenario 2 assumes that there is an incident which results in the rupture of the 8-inch header connected to all 306 CPRVs in the hold. This scenario uses conservative assumptions to calculate the worst-case hazard zones associated with the release of all 306 CPRV's in the hold. This scenario assumes that the 8-inch rupture discharges horizontally directly to atmosphere, therefore no obstructions or internal decking are taken into account.

It is important to note that information provided by Centrica stated that the CNG vessel will transit with all its shutdown valves closed which would keep each gang in the hold isolated. However, once the CNG vessel has been moored, all shutdown valves will be opened prior to start of offloading. Therefore, this scenario could not occur while the CNG vessel is in transit and could only occur once the CNG vessel is moored.

It is assumed that a jet fire occurs for the calculation of the equivalent Zones of Concern 1 and 2. For the calculation of Zone of Concern 3, it is assumed that no ignition source is present and the methane is allowed to



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disperse un-ignited. For this scenario, the release duration is 947 seconds. The calculated Hazard Zones are as follows:

- Zone 1  $(37.5 \text{ kW/m}^2)$  282 meters (925 feet).
- Zone 2 (5 kW/  $m^2$ ) 509 meters (1,670 feet).
- Zone 3 (LFL) 388 meters (1,273 feet).

#### 7.6.3 CNG Release Scenario 3

Release Scenario 3 assumes that there is an incident which results in the rupture of one of the 1 ¼ inch connections to an individual CRPV which results in releasing the contents of all 56 CPRVs in the gang connected to the same header. This scenario uses conservative assumptions to calculate the worst-case hazard zones associated with this release. This scenario assumes that the 1 ¼ inch rupture discharges horizontally directly to atmosphere, therefore no obstructions or internal decking is taken into account.

It is assumed that a jet fire occurs for the calculation of the equivalent Zones of Concern 1 and 2. For the calculation of Zone of Concern 3, it is assumed that no ignition source is present and the methane is allowed to disperse un-ignited. For this scenario, the release duration is 7,103 seconds. The calculated Hazard Zones are as follows:

- Zone 1  $(37.5 \text{ kW/m}^2) 57 \text{ meters } (187 \text{ feet}).$
- Zone 2  $(5 \text{ kW/m}^2)$  94 meters (308 feet).
- Zone 3 (LFL) 69 meters (226 feet).

#### 7.6.4 CNG Release Scenario 4

Release Scenario 4 assumes that there is an intentional incident which results in a 5  $\text{m}^2$  hole in the side of the CNG vessel. Two CPRVs which are directly behind the 5  $\text{m}^2$  hole are damaged and their contents are released. This scenario assumes an instant failure of two CPRVs and the contents are released inside the cargo hold, allowed to expand, and directly release to atmosphere through the 5  $\text{m}^2$  hole.

For this scenario, it was assumed that the cargo hold has dimensions of 30 meters wide by 30 meters long by 19 meters tall for a total volume of 17,100 m<sup>3</sup> and each CPRV was has a volume of approximately 800 ft<sup>3</sup> with an additional 20% volume accounting for supports, piping, and walkways. Based on these assumptions, each CPRV and its associated supports, piping, and walkways will occupy approximately 27.18 m<sup>3</sup> and



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all 306 CPRV's and their associated supports, piping, and walkways will occupy a total volume of 8,318 m<sup>3</sup>. Therefore, the rupture of two CPRV's inside the cargo hold will allow the gas to depressurize to approximately 17.5 psi before releasing through the 5 m<sup>2</sup> hole.

It is assumed that a jet fire occurs for the calculation of the equivalent Zones of Concern 1 and 2. For the calculation of Zone of Concern 3, it is assumed that no ignition source is present and the methane is allowed to disperse un-ignited. For this scenario, the release duration is 5.65 seconds. The calculated Hazard Zones are as follows:

- Zone 1  $(37.5 \text{ kW/m}^2)$  299 meters (981 feet).
- Zone 2 (5 kW/ $m^2$ ) 536 meters (1,759 feet).
- Zone 3 (LFL) 452 meters (1,490 feet).

#### 8 FEASIBILITY AND OPTION STUDY RESULTS

The feasibility results for each area are described below.

### 8.1 Option 1: Regasification Barge at Pier 15/16 with Shuttle Delivery

## 8.1.1 Terminal Configuration

Option 1 includes a non-self-propelled vessel with onboard regasification capability and  $\leq$ 125,000 m³ storage capacity to be moored dockside in way of Pier 15/16. Cargo delivery would be provided by shuttle tanker through ship – to – ship (STS) transfer in the area of Guayanilla Canyon.

This option provides receipt and storage of LNG aboard the Regasification Barge and vaporization of the LNG to natural gas via onboard regasification. The natural gas from the onboard regasification process would be sent to an onshore pipeline co-located at the facility and then to a subsea pipeline crossing San Juan Bay to the San Juan power plant.

From its San Juan power plant riser, the pipeline would bifurcate to provide feed gas for San Juan power plant prime movers and an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be provided by LNG Shuttle Carriers of appropriate capacity operating on liner service shuttling between an LNG Carrier in the area of Guayanilla Canyon and San Juan Bay.



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#### 8.1.2 Site Evaluation

Site considerations include:

- Regasification Barge, and
- pipeline route including:
  - sub seabed crossing of San Juan Bay landing at San Juan power plant;
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- Regasification Barge,
- Marine Jetty suitable for loadings of a permanently moored vessel during hurricane events,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- Subsea Pipeline from the site crossing San Juan Bay to San Juan power plant, and
- Regasification Barge Support Network.

Although a general area is suggested for the STS transfer of LNG from the LNG delivery carrier to the LNG shuttle carrier, the STS area may be optimized upon a more detailed analysis of metocean conditions in order to find the most favorable location.

This arrangement requires pipeline crossing of San Juan Bay using horizontal directional drilling technique.

The "Zones of Concern" were calculated for the Regasification Barge in Section 7.1 of this Report. Appendix A presents a preliminary layout of key components of Option 1 illustrating the Zones of Concern.

### 8.1.3 Waterway Suitability

This option requires ongoing support from an LNG Shuttle Carrier of approximately 85,000 m<sup>3</sup> capacity. In support of the Regasification Barge, the Shuttle Carrier will be required to navigate the Bar Channel, Anegado Channel, the Graving Dock Channel and the Graving Dock Turning Basin. The Shuttle Carrier is anticipated to require a depth of 36.9 feet; this



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results in a requirement to dredge approximately 529,275 yd<sup>3</sup> from the Graving Dock Channel and Turning Basin.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register when entering or leaving San Juan Bay. Pilots board vessels 3 miles north of Lighted Buoy #2. Tugboats are available up to 6000 hp; this power range is felt appropriate for maneuvering and docking the LNG Shuttle Carrier.

From Coast Pilot 5 (2014), the following is noted:

- Pier 15 (18°26'58"N., 66°05'21"W.): 1,000 feet long; 34 feet alongside; 1,000 ton floating drydock; ship repair facility; also known as Outfitting Pier on the south side operated by Puerto Rico Drydock and Marine Works,
- Pier 16 (18°27'01"N., 66°05'15"W.): marginal wharf, 525 feet long; 34 feet alongside; open storage; general and bulk cargoes, containers; operated by Puerto Rico Ports Authority.

As may be seen from the following figure, the Port of San Juan has a dynamic waterway.<sup>5</sup> This option will require integration of the LNG Shuttle Carrier into the ongoing commercial vessel traffic. However, it needs to be noted that this is not a true differentiator among the remaining options to be discussed. Of the thirteen options presented in this report, twelve require marine transit of the San Juan Bay waterway.

Vessel traffic chart downloaded from: https://www.marinetraffic.com/en/ais/details/ports/1023/Puerto\_Rico\_port:SAN\_JUAN



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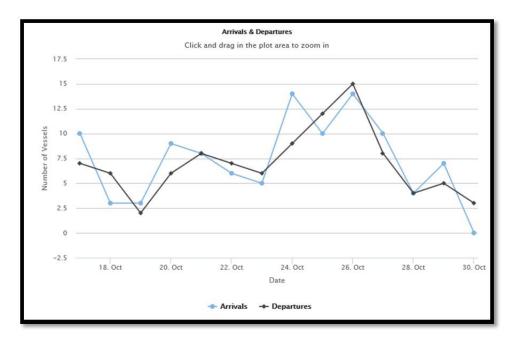


Figure 8.1: Arrivals and Departures – Port of San Juan

Each project subject to the jurisdiction of 33 CFR Part 127 is obligated to conduct a Waterway Suitability Assessment in accordance with the requirements set forth in NVIC 01 – 11. This process, in part, is intended to objectively identify and assess risks associated with the proposed operation facility (with respect to the marine component), offer mitigation measures to bring those risks to an acceptable level, and to do so in a process inclusive of the other waterway stakeholders. This process of identifying risk and mitigation measures incorporating input from the other stakeholders, will be determinative of the eventual suitability of the waterway for LNG vessel traffic.

#### 8.1.4 Discussion

This option presents de minimus dredging requirements given the relatively low displacement of the LNG Shuttle Carriers and requires less tugboat horsepower for maneuvering and turning of the LNG Shuttle Carriers. However, discussed in sections 5.2 and 6.1, the Regasification Barge introduces potentially significant siting issues, permitting issues with the Coast Guard, FERC, OSHA and possibly other agencies.

This option requires LNG Carrier delivery in support of the Regasification Barge approximately every 16 days. This option requires use of a permanently moored craft, which introduces some particular challenges. In addition to the earlier discussion about uncertainty of the permitting path



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and incorporation of general industrial shoreside practices and regulations into a quasi-marine facility, one issue that is less ambiguous is the requirement to provide a mooring system suitable for retaining the Regasification Barge in a 100-year hurricane event. Typically, it is expected that vessels will depart in advance of severe weather and that expectation serves as a nominal design basis for the marine civil works. For this option, there is expected to be a marine civil works arrangement that is significantly more robust than that typically found at an LNG facility; this additional robustness will be required to provide regulatory agency comfort that the permanently more craft will have a suitable mooring in severe weather events.

## 8.2 Option 2: Regasification Barge at Pier 15/16 with LNG Carrier Delivery

#### 8.2.1 Terminal Configuration

Option 2 includes a non-self-propelled vessel with onboard regasification capability and  $\leq$ 125,000 m³ storage capacity to be moored dockside in way of Pier 15/16. Cargo delivery would be provided by conventional LNG Carrier.

This option provides receipt and storage of LNG aboard the FSRU and vaporization of the LNG to natural gas via onboard regasification. The natural gas from the onboard regasification process would be sent to an onshore pipeline co-located at the facility and then to a subsea pipeline crossing San Juan Bay to the San Juan power plant.

From its San Juan power plant riser, the pipeline would bifurcate to provide feed gas for San Juan power plant prime movers and an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be delivered by LNG Carriers of appropriate capacity operating on liner service.

#### 8.2.2 Site Evaluation

Site considerations include:

- Regasification Barge, and
- pipeline route including:
  - sub seabed crossing of San Juan Bay landing at San Juan power plant:
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.



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Principal infrastructure comprises:

- Regasification Barge,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- Subsea Pipeline from the site crossing San Juan Bay to San Juan power plant, and
- Regasification Barge Support Network.

This arrangement requires pipeline crossing of San Juan Bay using horizontal directional drilling technique. The "Zones of Concern" were calculated for the Regasification Barge in Section 7.1 of this Report. Appendix A presents a preliminary layout of key components of Option 2 illustrating the Zones of Concern.

### 8.2.3 Waterway Suitability

This option requires LNG delivery through a conventional LNG Carrier of approximately 85,000 m³ capacity. In support of the Regasification Barge, the LNG Carrier will be required to navigate the Bar Channel, Anegado Channel, the Graving Dock Channel and the Graving Dock Turning Basin. The Shuttle Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 529,275 yd³ from the Graving Dock Channel and Turning Basin.

All other waterway suitability issues remain the same as those discussed for Option 1.

#### 8.2.4 Discussion

This option presents de minimus dredging requirements given the relatively low displacement of the LNG Carriers of this capacity and requires less tugboat horsepower for maneuvering and turning of the LNG Carriers. However, the siting issues discussed regarding Option 1 earlier with respect to the Regasification Barge remain attendant for this option. To restate, this option introduces potentially significant siting issues, permitting issues with the Coast Guard, FERC, OSHA and possibly other agencies.

This option requires LNG Carrier delivery in support of the Regasification Barge approximately every 16 days. As discussed in Option 1, the



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Regasification Barge option requires use of a permanently moored craft, which introduces some particular challenges. In addition to the earlier discussion about uncertainty of the permitting path and incorporation of general industrial shoreside practices and regulations into a quasi-Marine facility, one issue that is less ambiguous is requirement to provide a mooring system suitable for retaining the Regasification Barge in a 100-year hurricane event. Typically, it is expected that vessels will depart in advance of severe weather and that expectation serves as a nominal design basis for the marine civil works. For this option, there is expected to be a marine civil works arrangement that is significantly more robust than that typically found at an LNG facility; this additional robustness will be required to satisfy regulatory agency comfort that the permanently more craft will have a suitable mooring in severe weather events.

## 8.3 Option 3: FSRU at Pier 15/16 with LNG Carrier Delivery

#### 8.3.1 Terminal Configuration

This option comprises a self-propelled or non-self-propelled Floating Storage and Regasification Unit (FSRU) with onboard regasification capability and ≤165,000 m³ storage capacity to be moored dockside in way of Pier 15/16. In this option, cargo delivery would be provided by an LNG Carrier entering San Juan Bay to transfer cargo directly to FSRU through either STS or through plant piping arrangement at marine jetty suitable for simultaneous mooring of the FSRU and the delivery carrier.

The natural gas from the onboard regasification process would be sent to an onshore pipeline co-located at the facility and then to a subsea pipeline crossing San Juan Bay to the San Juan power plant.

From its San Juan power plant riser, the pipeline would bifurcate to provide feed gas for San Juan power plant prime movers and an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be delivered by LNG Carriers of appropriate capacity operating on liner service.

The FSRU may or may not be self-propelled; it is expected this project decision detail would be conducted on an evaluation of the availability and economics of each option.

#### 8.3.2 Site Evaluation

Site considerations include:



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- FSRU, and
- pipeline route including:
  - sub seabed crossing of San Juan Bay landing at San Juan power plant;
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- Regasification Barge,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- Subsea Pipeline from the site crossing San Juan Bay to San Juan power plant, and
- FSRU Support Network.

This arrangement requires pipeline crossing of San Juan Bay using horizontal directional drilling technique.

The "Zones of Concern" were calculated for the FSRU in Section 7.2 of this Report. Appendix B presents a preliminary layout of key components of Option 3 illustrating the Zones of Concern.

#### 8.3.3 Waterway Suitability

This option requires LNG delivery through a conventional LNG Carrier of approximately 145,000 m³ capacity. In support of the FSRU, the LNG Carrier will be required to navigate the Bar Channel, Anegado Channel, the Graving Dock Channel and the Graving Dock Turning Basin. The LNG Carrier is anticipated to require a depth of 40.2 feet; this results in an aggregate dredge volume requirement of approximately 1,056,019 yd.³ from the Bar Channel to, and including, the Graving Dock Turning Basin.

All other waterway suitability issues remain the same as those discussed for Option 1. An incremental difference between the issues earlier discussed is at the LNG Carrier proposed to service the FSRU is larger than that proposed to service the previous options. This likely introduces requirement for tugboats of greater horsepower than is currently available at San Juan Bay.



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Full bridge mission simulation studies would be required in order to determine final tugboat configurations and power ranges required to conduct safe navigation and maneuvering within the operational weather envelopes sought by the project. This effort would be part of the larger Waterway Suitability Assessment task.

#### 8.3.4 Discussion

This option presents a substantial increase in dredging requirements given the larger LNG Carrier capacity to service the FSRU. The dredge volumes considers a 145,000 m³ LNG Carrier, which would be expected to provide LNG delivery approximately every 22 days. In addition, as mentioned, the larger LNG Carriers will almost certainly introduce the need for tugboats of greater horsepower than currently available; it is also almost certain that tractor tugs will be preferential over conventional tugboats.

The FSRU may or may not be self-propelled, depending on project preferences, opportunities and economics. An FSRU with an operational propulsion plant will present capital and operational expenses, however, a non-self-propelled FSRU will introduce the issues and uncertainties discussed earlier regarding the Regasification Barge in terms of the permanently moored craft. As discussed in Option 1, the Regasification Barge option requires use of a permanently moored craft, which introduces some particular challenges.

In addition to the uncertainty surrounding permitting issues with the Coast Guard, FERC, OSHA and possibly other agencies, additional capital expense for the non-self-propelled option would include meeting the requirement to provide a mooring system suitable for retaining the FSRU in a 100-year hurricane event. Typically, it is expected that vessels will depart in advance of severe weather and that expectation serves as a nominal design basis for the marine civil works. For this option, there is expected to be a marine civil works arrangement that is significantly more robust than that typically found at an LNG facility; this additional robustness will be required to satisfy regulatory agency comfort that the permanently more craft will have a suitable mooring in severe weather events.

### 8.4 Option 4: FSU at Pier 15/16 with Shuttle Delivery

#### 8.4.1 Terminal Configuration

This option comprises a Floating Storage Unit (FSU), either self-propelled or non-self-propelled, with no onboard regasification capability and



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≤125,000 m³ storage capacity to be moored dockside in way of Pier 15/16. Cargo delivery would be provided by shuttle tanker through STS transfer in the area of Guayanilla Canyon.

The LNG from the FSU would be sent at low pressure to high-pressure send out pumps located on the facility that would increase the liquid pressure to pipeline pressure and send the LNG to vaporizers located on the facility. Natural gas from the facility regasification process would be sent via a subsea pipeline crossing San Juan Bay to the San Juan power plant.

From its San Juan power plant riser, the pipeline would bifurcate to provide feed gas for San Juan power plant prime movers and an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be delivered by LNG Carriers of appropriate capacity operating on liner service.

The FSU may or may not be self-propelled; it is expected this project decision detail would be conducted on an evaluation of the availability and economics of each option.

#### 8.4.2 Site Evaluation

Site considerations include:

- FSU, and
- pipeline route including:
  - sub seabed crossing of San Juan Bay landing at San Juan power plant;
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- FSU,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- Subsea Pipeline from the site crossing San Juan Bay to San Juan power plant, and
- high-pressure send out pumps on the facility,



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- LNG vaporizers on the facility,
- FSU Support Network.

The "Zones of Concern" were calculated for the FSRU in Section 7.3 of this Report. Appendix B presents a preliminary layout of key components of Option 4 illustrating the Zones of Concern.

### 8.4.3 Waterway Suitability

This option requires ongoing support from an LNG Carrier of approximately 85,000 m³ capacity and requires an LNG delivery approximately every 16 days. In support of the FSU, the LNG Carrier will be required to navigate the Bar Channel, Anegado Channel, the Graving Dock Channel and the Graving Dock Turning Basin. The LNG Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 529,275 yd.³ from the Graving Dock Channel and Turning Basin.

#### 8.4.4 Discussion

Similar to Options 1 and 2, this option presents de minimus dredging requirements given the relatively low displacement of the LNG Carriers of this capacity and requires less tugboat horsepower for maneuvering and turning of the LNG Carriers. However, the siting issues regarding Option 3 discussed earlier with respect to the FSRU remain attendant for this option. To restate, this option may well choose between a self-propelled or non-self-propelled vessel as the FSU. The choice raises potential issues with respect to permitting through various agencies and design basis changes for the marine civil works to satisfy agency expectations of hurricane impacts.

### 8.5 Option 5: Storage and Vaporization at Pier 15/16

#### 8.5.1 Terminal Configuration

This option comprises a shoreside LNG receiving terminal with storage and vaporization ashore and cargo provided through LNG Carrier. LNG storage considered in this case is an aggregate of 160,000 m³ through the use of two 80,000 m³ full containment tanks.

The LNG from the storage tank(s) would be sent by low pressure pumps within each tank to high-pressure send out pumps located external to the tank that would increase the liquid pressure to pipeline pressure and send the LNG to vaporizers located on the facility. Natural gas from the



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regasification process would be sent via a subsea pipeline crossing San Juan Bay to the San Juan power plant.

From its San Juan power plant riser, the pipeline would bifurcate to provide feed gas for San Juan power plant prime movers and an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be delivered by LNG Carriers of appropriate capacity operating on liner service.

#### 8.5.2 Site Evaluation

Site considerations include:

- LNG Receiving and Regasification Terminal,
- pipeline route including:
  - sub seabed crossing of San Juan Bay landing at San Juan power plant;
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- LNG Receiving and Regasification Terminal,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- Subsea Pipeline from the site crossing San Juan Bay to San Juan power plant, and
- high-pressure send out pumps on the facility,
- LNG vaporizers on the facility,
- LNG facility Support Network.

The hazards associated with full containment LNG storage tanks are presented in Section 7.5 of this Report. Due to size limitations at this site, a full containment LNG storage tank was chosen over a single containment LNG storage tank to reduce the thermal radiation exclusion zones. Appendix D presents a preliminary layout of key components of Option 5 illustrating the thermal radiation associated with the LNG storage tanks and vapor dispersion exclusion zones associated with the LNG process piping.



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## 8.5.3 Waterway Suitability

This option requires ongoing support from an LNG Carrier of approximately 85,000 m³ capacity and requires an LNG delivery approximately every 16 days; this frequency can be reduced through the use of larger carriers. For example, the use of 145,000 m³ vessel could reduce the frequency to an LNG delivery approximately every 22 days. However this provides for a minimum facility LNG inventory pending receipt of cargo and additionally introduces the need for larger dredging volumes.

In support of the facility, the LNG Carrier will be required to navigate the Bar Channel, Anegado Channel, the Graving Dock Channel and the Graving Dock Turning Basin. The 85,000 m³ LNG Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 529,275 yd.³ from the Graving Dock Channel and Turning Basin whereas a 145,000 m³ LNG Carrier, anticipated to require a depth of 40.2 feet; this results in an aggregate dredge volume requirement of approximately 1,056,019 yd.³ from the Graving Dock Channel and Turning Basin.

#### 8.5.4 Discussion

This option is quite favorable given a number of considerations. This option represents a "standard industry solution" to the landing, regasification and sendout of natural gas to consumers. As such, efforts surrounding permitting, agency consultations, engineering design and development, financing and underwriting, acquisition of supply commitment, project execution and operations are attended with de minimus uncertainty. In addition, the hazard analysis conducted strongly suggest public impacts associated with siting criteria to be manageable.

The foregoing is firmly based on the assumption that the project can acquire control over the property indicated in section 4.1 and the appropriate appendices.

# 8.6 Option 6: Regasification Barge at Army Dock with Shuttle Delivery

## 8.6.1 Terminal Configuration

Option 6 largely mirrors Option 1 except for location and the subsea pipeline requirement. This option includes a non-self-propelled vessel with onboard regasification capability and ≤125,000 m³ storage capacity to be moored dockside in way of Pier 15/16. Cargo delivery would be



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provided by shuttle tanker through ship - to - ship (STS) transfer in the area of Guayanilla Canyon.

This option provides receipt and storage of LNG aboard the Regasification Barge and vaporization of the LNG to natural gas via onboard regasification. The natural gas from the onboard regasification process would be sent to an onshore pipeline at the San Juan power plant and then to an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be provided by LNG Shuttle Carriers of appropriate capacity operating on liner service shuttling between an LNG Carrier in the area of Guayanilla Canyon and San Juan Bay.

#### 8.6.2 Site Evaluation

Site considerations include:

- · Regasification Barge, and
- pipeline route including:
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- Regasification Barge,
- Marine Jetty suitable for loadings of a permanently moored vessel during hurricane events,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- Regasification Barge Support Network.

Although a general area is suggested for the STS transfer of LNG from the LNG delivery carrier to the LNG shuttle carrier, the STS area may be optimized upon a more detailed analysis of medicine conditions in order to find the most favorable location.

This arrangement requires pipeline crossing of San Juan Bay using horizontal directional drilling technique.

The "Zones of Concern" were calculated for the Regasification Barge in Section 7.1 of this Report. Appendix E presents a preliminary layout of key components of Option 6 illustrating the Zones of Concern.



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### 8.6.3 Waterway Suitability

This option requires ongoing support from an LNG Shuttle Carrier of approximately 85,000 m³ capacity. In support of the Regasification Barge, the Shuttle Carrier will be required to navigate the Bar Channel, Anegado Channel, the Army Terminal Channel and the Army Terminal Turning Basin. The Shuttle Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 226,357 yd.³ from the Army Terminal Channel and Turning Basin.

#### 8.6.4 Discussion

This option presents a substantial dredging requirement and the Regasification Barge introduces potentially significant siting issues, permitting issues with the Coast Guard, FERC, OSHA and possibly other agencies as earlier discussed.

This option requires LNG Carrier delivery in support of the Regasification Barge approximately every 16 days. As also earlier discussed, this option requires use of a permanently moored craft, which introduces some particular challenges. In addition to the earlier discussion about uncertainty of the permitting path and incorporation of general industrial shoreside practices and regulations into a quasi-marine facility, one issue that is less ambiguous is the requirement to provide a mooring system suitable for retaining the Regasification Barge in a 100-year hurricane event. Typically, it is expected that vessels will depart in advance of severe weather and that expectation serves as a nominal design basis for the marine civil works. For this option, there is expected to be a marine civil works arrangement that is significantly more robust than that typically found at an LNG facility; this additional robustness will be required to provide regulatory agency comfort that the permanently more craft will have a suitable mooring in severe weather events.

# 8.7 Option 7: Regasification Barge at Army Dock with LNG Carrier Delivery

#### 8.7.1 Terminal Configuration

Similar to Option 2 excluding location and subsea pipeline, this Option includes a non-self-propelled vessel with onboard regasification capability and ≤125,000 m³ storage capacity to be moored dockside in way of Pier 15/16. Cargo delivery would be provided by conventional LNG Carrier.

This option provides receipt and storage of LNG aboard the Regasification Barge and vaporization of the LNG to natural gas via onboard



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regasification. The natural gas from the onboard regasification process would be sent to an onshore pipeline at the San Juan power plant and then to an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be provided by LNG Carriers of appropriate capacity operating on liner service.

#### 8.7.2 Site Evaluation

Site considerations include:

- · Regasification Barge, and
- pipeline route including:
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- Regasification Barge,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- Regasification Barge Support Network.

The "Zones of Concern" were calculated for the Regasification Barge in Section 7.1 of this Report. Appendix E presents a preliminary layout of key components of Option 7 illustrating the Zones of Concern.

#### 8.7.3 Waterway Suitability

This option requires ongoing support from an LNG Shuttle Carrier of approximately 85,000 m³ capacity. In support of the Regasification Barge, the Shuttle Carrier will be required to navigate the Bar Channel, Anegado Channel, the Army Terminal Channel and the Army Terminal Turning Basin. The Shuttle Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 226,357 yd.³ from the Army Terminal Channel and Turning Basin.

All other waterway suitability issues remain the same as those discussed for Option 6.



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#### 8.7.4 Discussion

This option presents permitting issues as described in Option 6 and a more substantial dredging requirement.

This option requires LNG Carrier delivery in support of the Regasification Barge approximately every 16 days. As discussed in Option 1, the Regasification Barge option requires use of a permanently moored craft, which introduces some particular challenges. In addition to the earlier discussion about uncertainty of the permitting path and incorporation of general industrial shoreside practices and regulations into a quasi-Marine facility, one issue that is less ambiguous is requirement to provide a mooring system suitable for retaining the Regasification Barge in a 100-year hurricane event. Typically, it is expected that vessels will depart in advance of severe weather and that expectation serves as a nominal design basis for the marine civil works. For this option, there is expected to be a marine civil works arrangement that is significantly more robust than that typically found at an LNG facility; this additional robustness will be required to satisfy regulatory agency comfort that the permanently more craft will have a suitable mooring in severe weather events.

## 8.8 Option 8: FSRU at Army Dock with LNG Carrier Delivery

#### 8.8.1 Terminal Configuration

This option comprises a self-propelled or non-self-propelled Floating Storage and Regasification Unit (FSRU) with onboard regasification capability and ≤165,000 m³ storage capacity to be moored dockside in way of the Army Dock. In this option, cargo delivery would be provided by an LNG Carrier entering San Juan Bay to transfer cargo directly to FSRU through either STS or through plant piping arrangement at marine jetty suitable for simultaneous mooring of the FSRU and the delivery carrier.

The natural gas from the onboard regasification process would be sent to an onshore pipeline at the San Juan power plant and then to an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be provided by LNG Carriers of appropriate capacity operating on liner service. The FSRU may or may not be self-propelled; it is expected this project decision detail would be conducted on an evaluation of the availability and economics of each option.



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#### 8.8.2 Site Evaluation

Site considerations include:

- FSRU, and
- pipeline route including:
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- FSRU,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- FSRU Support Network.

The "Zones of Concern" were calculated for the FSRU in Section 7.2 of this Report. Appendix F presents a preliminary layout of key components of Option 8 illustrating the Zones of Concern.

### 8.8.3 Waterway Suitability

This option requires ongoing support from an LNG Carrier of approximately 145,000 m³ capacity. In support of the Regasification Barge, the LNG Carrier will be required to navigate the Bar Channel, Anegado Channel, the Army Terminal Channel and the Army Terminal Turning Basin. The LNG Carrier is anticipated to require a depth of 40.2 feet; this results in a requirement to dredge approximately 394,655 yd.³ from the Army Terminal Channel and Turning Basin.

All other waterway suitability issues remain the same as those discussed for Option 6. As previously mentioned it Option 3, an incremental difference between the issues earlier discussed is at the LNG Carrier proposed to service the FSRU is larger than that proposed to service the previous options. This likely introduces requirement for tugboats of greater horsepower than is currently available at San Juan Bay.

Full bridge mission simulation studies would be required in order to determine final tugboat configurations and power ranges required to conduct safe navigation and maneuvering within the operational weather



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envelopes sought by the project. This effort would be part of the larger Waterway Suitability Assessment task.

#### 8.8.4 Discussion

This option presents a substantial increase in dredging requirements given the larger LNG Carrier capacity to service the FSRU. The dredge volumes considers a 145,000 m³ LNG Carrier, which would be expected to provide LNG delivery approximately every 22 days. In addition, as mentioned earlier, the larger LNG Carriers will almost certainly introduce the need for tugboats of greater horsepower than currently available; it is also almost certain that tractor tugs will be preferential over conventional tugboats.

The FSRU may or may not be self-propelled, depending on project preferences, opportunities and economics. An FSRU with an operational propulsion plant will present capital and operational expenses, however, a non-self-propelled FSRU will introduce the issues and uncertainties discussed earlier regarding the Regasification Barge in terms of the permanently moored craft. As discussed in Option 1, the Regasification Barge option requires use of a permanently moored craft, which introduces some particular challenges.

Again as earlier discussed, in addition to the uncertainty surrounding permitting issues with the Coast Guard, FERC, OSHA and possibly other agencies, additional capital expense for the non-self-propelled option would include meeting the requirement to provide a mooring system suitable for retaining the FSRU in a 100-year hurricane event. Typically, it is expected that vessels will depart in advance of severe weather and that expectation serves as a nominal design basis for the marine civil works. For this option, there is expected to be a marine civil works arrangement that is significantly more robust than that typically found at an LNG facility; this additional robustness will be required to satisfy regulatory agency comfort that the permanently more craft will have a suitable mooring in severe weather events.

## 8.9 Option 9: FSU at Pier Army Dock with Shuttle Delivery

#### 8.9.1 Terminal Configuration

This option comprises a Floating Storage Unit (FSU), either self-propelled or non-self-propelled, with no onboard regasification capability and ≤125,000 m³ storage capacity to be moored dockside in way of the Army



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Dock. Cargo delivery would be provided by shuttle tanker through STS transfer in the area of Guayanilla Canyon.

The LNG from the FSU would be sent at low pressure to high-pressure send out pumps located on the facility that would increase the liquid pressure to pipeline pressure and send the LNG to vaporizers located on the facility. Natural gas from the facility regasification process would be sent to an onshore pipeline at the San Juan power plant and then to an additional pipeline to be run to provide feed gas for the Palo Seco facility. LNG supply would be provided by LNG Shuttle Carriers of appropriate capacity operating on liner service. The FSU may or may not be self-propelled; it is expected this project decision detail would be conducted on an evaluation of the availability and economics of each option.

#### 8.9.2 Site Evaluation

Site considerations include:

- FSU, and
- pipeline route including:
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- FSU,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- high-pressure send out pumps on the facility,
- LNG vaporizers on the facility,
- FSU Support Network.

The "Zones of Concern" were calculated for the FSU in Section 7.3 of this Report. Appendix G presents a preliminary layout of key components of Option 9 illustrating the Zones of Concern.

#### 8.9.3 Waterway Suitability

This option requires ongoing support from an LNG Shuttle Carrier of approximately 85,000 m<sup>3</sup> capacity. In support of the FSU, the LNG



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Shuttle Carrier will be required to navigate the Bar Channel, Anegado Channel, the Army Terminal Channel and the Army Terminal Turning Basin. The Shuttle Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 226,357 yd.<sup>3</sup> from the Army Terminal Channel and Turning Basin.

#### 8.9.4 Discussion

Similar to Options 6 and 7, this option presents a substantial dredging requirement and the FSU introduces potentially significant siting issues, permitting issues with the Coast Guard, FERC, OSHA and possibly other agencies as earlier discussed given decision made regarding self-propelled or non-self-propelled.

This option requires LNG Carrier delivery in support of the FSU approximately every 16 days. As also earlier discussed, this option requires use of a permanently moored craft, which introduces some particular challenges. In addition to the earlier discussion about uncertainty of the permitting path and incorporation of general industrial shoreside practices and regulations into a quasi-marine facility, one issue that is less ambiguous is the requirement to provide a mooring system suitable for retaining the Regasification Barge in a 100-year hurricane event. Typically, it is expected that vessels will depart in advance of severe weather and that expectation serves as a nominal design basis for the marine civil works. For the non-self-propelled option, there is expected to be a marine civil works arrangement that is significantly more robust than that typically found at an LNG facility; this additional robustness will be required to provide regulatory agency comfort that the permanently more craft will have a suitable mooring in severe weather events.

## 8.10 Option 10: Storage and Vaporization at Army Dock

#### 8.10.1 Terminal Configuration

Similar to Option 5 excluding location and subsea pipeline, this option comprises a shoreside LNG receiving terminal with storage and vaporization ashore and cargo provided through LNG Carrier. LNG storage considered in this case is an aggregate of 160,000 m³ through the use of two 80,000 m³ full containment tanks.

The LNG from the storage tank(s) would be sent by low pressure pumps within each tank to high-pressure send out pumps located external to the tank that would increase the liquid pressure to pipeline pressure and send the LNG to vaporizers located on the facility. Sendout gas from the



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vaporization system would be sent to prime movers at San Juan power plant and also to an additional pipeline to be run to provide feed gas for the Palo Seco facility.

LNG supply would be delivered by LNG Carriers of appropriate capacity operating on liner service.

#### 8.10.2 Site Evaluation

Site considerations include:

- LNG Receiving and Regasification Terminal,
- pipeline route including:
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- LNG Receiving and Regasification Terminal,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- high-pressure send out pumps on the facility,
- LNG vaporizers on the facility,
- LNG facility Support Network.
- The hazards associated with full containment LNG storage tanks are presented in Section 7.5 of this Report. Due to size limitations at this site, a full containment LNG storage tank was chosen over a single containment LNG storage tank to reduce the thermal radiation exclusion zones. Appendix H presents a preliminary layout of key components of Option 5 illustrating the thermal radiation associated with the LNG storage tanks and vapor dispersion exclusion zones associated with the LNG process piping.

# 8.10.3 Waterway Suitability

Similar to the discussion in Option 5, this option requires ongoing support from an LNG Carrier of approximately 85,000 m³ capacity and requires an LNG delivery approximately every 16 days; this frequency can be reduced through the use of larger carriers. For example, the use of 145,000 m³ vessel could reduce the frequency to an LNG delivery approximately



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every 22 days. However this provides for a minimum facility LNG inventory pending receipt of cargo and additionally introduces the need for larger dredging volumes.

In support of the facility, the LNG Carrier will be required to navigate the Bar Channel, Anegado Channel, the Army Terminal Channel and the Army Terminal Turning Basin. The 85,000 m<sup>3</sup> LNG Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 226,357 yd.<sup>3</sup> from the Army Terminal Channel and Turning Basin. A 145,000 m<sup>3</sup> LNG Carrier, anticipated to require a depth of 40.2 feet, would result in an aggregate dredge volume requirement of approximately 394,655 yd.<sup>3</sup> from the Army Terminal Channel and Turning Basin.

#### 8.10.4 Discussion

This Option is less favorable than Option 5 given a number of considerations. Although this Option represents a "standard industry solution" to the landing, regasification and sendout of natural gas to consumers as described in the discussion and Option 5, the hazard analysis conducted strongly suggests difficulty in successfully managing public impacts associated with siting criteria.

#### 8.11 Option 11: Offshore FSRU Solution

#### 8.11.1 Terminal Configuration

This option comprises an FSRU of ≤165,000 m³ storage capacity moored at approximately 3 miles offshore northwest of Bahía de Toa. The moored FSRU would send out natural gas through a riser/PLEM assembly to a sub-seabed pipeline landing in the vicinity of the western tip of Ensenada de Boca Vieja and from there the pipeline would be horizontally directionally drilled to a pipeline riser at the Palo Seco site. At the Palo Seco site, the pipeline would bifurcate with one line providing feed gas to the Palo Seco prime movers and the other providing feed gas to a pipeline to run to the San Juan power plant.

#### 8.11.2 Site Evaluation

Site considerations include:

- FSRU
- offshore anchorage,
- pipeline route including:



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- subsea crossing of northwest of Bahía de Toa and Ensenada de Boca Vieja landing at the Palo Seca power plant;
- Overland or buried pipeline from the Palo Seco to the San Juan power plant.

Key site attributes and infrastructure include the following:

- FSRU,
- Turret Mooring Arrangement,
- Pipeline End Manifold,
- Subsea Pipeline to Landfall at Palo Seco power plant,
- Cross-Country Pipeline to san Juan power plant, and
- FSRU Shoreside Support Network.

Although the mooring location is indicated, there is flexibility in its precise location considering the water depth constraint. The precise moorage position would be optimized in consideration of optimum pipeline landfall and routing, fisheries location and practices, commercial vessel traffic patterns and frequency, and logistics supply lines. This optimization would be conducted in consultation with relevant agencies, FSRU operators, supply chain providers and other stakeholders.

Similarly, the shoreside pipeline route from landfall to the Palo Seco power plant would be optimized in consideration of environmental and social impacts, most expeditious routing and constructability with respect to existing infrastructure, topographical and geophysical characteristics. This optimization would be conducted in consultation with relevant stakeholders. It is also assumed that this pipeline crossing to the Palo Seco plant would be an HDD installation to protect from anchor dragging or grounding events and to otherwise minimize in environmental impacts.

The "Zones of Concern" were calculated for the FSRU in Section 7.2 of this Report. Appendix I presents the Option 11 Zones of Concern.

#### 8.11.3 Waterway Suitability

This option presumes moorage of the FSRU offshore Bahía de Toa, approximately 3 nautical miles north of Bahía de Toa in no more than 300 m water depth.

Although this option's distance off the coast suggests pilotage would not be compulsory, it is nevertheless likely that either shippers or the FSRU



Feasibility and Option Study

owners, or more likely all parties, would require tugboat assisted mooring operations as well as "private pilotage", or a Mooring Master, in order to mitigate marine risks typically associated with open ocean close maneuvering and docking evolutions.

Weather

The following information is presented from Coast Pilot 5 (2014)

Puerto Rico is a tropical, hilly island that lies directly in the path of the E trade winds. Bathed by waters whose temperatures seldom drop below 80°F, the coastal climate is mild year round, with a small daily and annual temperature range. The rugged topography does cause a wide variation over short distances in wind, temperature, and rainfall. ODAS weather buoys are at San Juan, Ponce, and Rincon. For more information, visit <a href="www.caricoos.">www.caricoos.</a> org.

- (23) The outstanding feature of the marine weather is the steadiness of the E trade winds. NE through SE winds blow about 80 percent of the time year round. Easterlies are particularly dominant in summer when the Bermuda High has shifted N. From November through April, northeasterlies are the secondary direction, but give way to southeasterlies in spring. The trade-wind regime is occasionally interrupted by cold fronts that have survived a journey from the United States and by easterly waves. As the cold front approaches, winds shift toward the S, and then as the front passes they gradually shift through the SW and NW quadrants back to the NE. The easterly wave passage is characterized by winds out of the ENE ahead of it, followed by an ESE wind.
- (24) Gale-force winds are unlikely but can occur with a strong front, thunderstorm, or tropical cyclone. Summer gales usually blow from the E semicircle, while winter gales are more likely in the NE quadrant. Windspeeds of 17 to 33 knots blow about 30 percent of the time. In summer, the trades tend to strengthen during the day, and average windspeeds are highest during this season. Morning averages of 12 to 13 knots give way to 13- to 15-knot averages during the afternoon.
- (25) Near the coast, a land-sea breeze effect helps exert a diurnal influence on the wind. If the pressure gradients are weak, a land breeze may develop during the night; northeasterly on the S coast



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and southeasterly on the N coast. The sea breeze develops during the morning hours and reinforces the trades on all but the W coast. Along the W coast, it opposes the trades and tends to weaken them.

- (26) Seas in the area usually run less than 8 feet. Waters are roughest off the N and W coasts in winter and midsummer. For example, waves of 8 feet or more are encountered off these coasts 10 to 12 percent of the time in July. High seas are usually associated with strong winds out of the NE through SE blowing over a long fetch of water. Extreme wave heights are generated by hurricanes and can reach 40 feet or more in deep water.
- (27) The tropical cyclone season extends from June through November. The most active period in this region is from August through the first half of October, although "off-season" storms occasionally brush the area. Most tropical cyclones affecting this area develop E of the Lesser Antilles and move toward the W or NW. They usually pass N or S of the island; occasionally they pass directly over it as was the case of hurricane Georges in September 1998. In addition to strong winds and rough seas, these storms can bring torrential rains and flooding to the island. Georges raked the island from E to W causing at least \$2 billion in damages, 12 deaths, destroyed at least 33,000 homes, and caused power and water loss to nearly 80% of the island.
- (28) Another navigational weather hazard in these waters are thunderstorms. While they can occur in winter, they are most likely from May through November. At sea, they are encountered 2 to 7 percent of the time during this period, while shore stations report thunder on an average of 5 to 15 days each month during the summer. In addition to strong gusty winds, heavy rains may briefly reduce visibilities to near zero. However, visibility problems are infrequent in these waters since fog is a rarity.
- (234) Puerto Rico is in the tropical hurricane region of the E Caribbean where the season for these storms begins June 1 and ends November 30. Several hurricanes affect this area every season, usually passing the area to the N. In 1928, the National Weather Service's anemometer blew away after recording an extreme wind speed of 139 knots, the highest value in Puerto Rico to date. A hurricane caused considerable loss of life and great property damage in San Juan in 1932 and in 1956 Hurricane Betsy passed over Puerto Rico. Hurricane winds were felt at San Juan,



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but there was no loss of life reported, and property damage was not great. Hurricane Hugo passed very close to the city in 1989 with 110-knot wind gusts causing significant damage.

#### 8.11.4 Discussion

This option, like many offshore solutions, is attractive for several reasons. The facility is relatively remote in comparison with inner San Juan Bay and its operations will be unseen by most. Terminal operations are for the most part not within the public's view shed. In the event of an LNG release scenario or other operational upset, there may, depending on the nature of the event, be diminished public exposure to the event impacts. That said, there are constraints on the ability to deploy emergency response resources in such a case.

This option additionally presents a practical requirement to establish an enforceable safety and security zone around the FSRU and the subsea pipeline route.

However, this Option is less favorable than some of the shoreside options with respect to potential public impacts as determined through the analysis in Section 7.2 of this Report. That analysis strongly suggests difficulty in successfully managing public impacts associated with siting criteria. Moreover, the discussion of weather conditions presented by Coast Pilot suggests metocean conditions local to that site may be challenging and unfavorably influence terminal availability.

## 8.12 Options 12 & 13: CNG Marine Vessel at Army Dock and Pier 15/16

#### 8.12.1 Terminal Configuration

Each option comprises a non-self-propelled barge approximately 400 feet LOA by 150 foot beam characterized by discrete cargo tanks in the carriage of compressed natural gas stored in a plurality of CPRVs. The vessel would more at Pier 15/16 (Option 12) or the Army Dock (Option 13) and discharge CNG from the vessel onto an onshore pipeline for downstream distribution. A relief vessel of equivalent size and capacity would be simultaneously moored at the facility to provide uninterrupted supply.

#### 8.12.2 Site Evaluation

Site considerations include:

CNG Vessel



Feasibility and Option Study

- pipeline route including (Option 12):
  - sub seabed crossing of San Juan Bay landing at San Juan power plant;
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.
- pipeline route including (Option 13):
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Key site attributes and infrastructure include the following:

- FSRU,
- Turret Mooring Arrangement,
- Pipeline End Manifold,
- Subsea Pipeline to Landfall at Palo Seco power plant,
- Cross-Country Pipeline to san Juan power plant, and
- FSRU Shoreside Support Network.

The "Zones of Concern" were calculated for the CNG Marine Vessel for all four Release Scenarios in Section 7.3 of this Report. Appendix I presents the Options 12 & 13 Zones of Concern.

### 8.13 Option 14: Storage and Vaporization at San Juan Power Plant Extended

#### 8.13.1 Terminal Configuration

Similar to Option 10, this option comprises a shoreside LNG receiving terminal with storage and vaporization ashore and cargo provided through LNG Carrier. LNG storage considered in this case is an aggregate of 160,000 m³ through the use of two 80,000 m³ full containment tanks.

The LNG from the storage tank(s) would be sent by low pressure pumps within each tank to high-pressure send out pumps located external to the tank that would increase the liquid pressure to pipeline pressure and send the LNG to vaporizers located on the facility. Sendout gas from the vaporization system would be sent to prime movers at San Juan power plant and also to an additional pipeline to be run to provide feed gas for the Palo Seco facility.



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LNG supply would be delivered by LNG Carriers of appropriate capacity operating on liner service.

#### 8.13.2 Site Evaluation

Site considerations include:

- LNG Receiving and Regasification Terminal,
- pipeline route including:
  - Overland or buried pipeline from San Juan power plant to the Palo Seco facility.

Principal infrastructure comprises:

- LNG Receiving and Regasification Terminal,
- Marine Jetty,
- Dredged Turning/Maneuvering Basin,
- Cross-Country Pipeline from San Juan power plant to Palo Seco,
- high-pressure send out pumps on the facility,
- LNG vaporizers on the facility,
- LNG facility Support Network.
- The hazards associated with full containment LNG storage tanks are presented in Section 7.5 of this Report. Due to size limitations at this site, a full containment LNG storage tank was chosen over a single containment LNG storage tank to reduce the thermal radiation exclusion zones. Appendix L presents a preliminary layout of key components of Option 14 illustrating the thermal radiation associated with the LNG storage tanks and vapor dispersion exclusion zones associated with the LNG process piping.

### 8.13.3 Waterway Suitability

Similar to the discussion in Option 10, this option requires ongoing support from an LNG Carrier of approximately 85,000 m³ capacity and requires an LNG delivery approximately every 16 days; this frequency can be reduced through the use of larger carriers. For example, the use of 145,000 m³ vessel could reduce the frequency to an LNG delivery approximately every 22 days. However this provides for a minimum facility LNG inventory pending receipt of cargo and additionally introduces the need for larger dredging volumes.



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In support of the facility, the LNG Carrier will be required to navigate the Bar Channel, Anegado Channel, the Army Terminal Channel and the Army Terminal Turning Basin. The 85,000 m³ LNG Carrier is anticipated to require a depth of 36.9 feet; this results in a requirement to dredge approximately 226,357 yd.³ from the Army Terminal Channel and Turning Basin. A 145,000 m³ LNG Carrier, anticipated to require a depth of 40.2 feet, would result in an aggregate dredge volume requirement of approximately 394,655 yd.³ from the Army Terminal Channel and Turning Basin.

#### 8.13.4 Discussion

This Option is more favorable than Option 10. Similar to Option 10, this Option represents a "standard industry solution" to the landing, regasification and sendout of natural gas to consumers and therefore represents a lower risk in the permitting timeline and efforts over hybrid or floating solutions. This Option also provides a better plot of land over Option 10 allowing the siting of the facility and management of exclusion zones to be better managed. The proximity of Option 14 to the San Juan Power Plant allows for reduced challenges in transporting natural gas from the LNG facility to the San Juan Power Plant.

It is understood that there may be some desire for the project site to effectively have LNG operations and "typical" dry bulk/packaged cargo operations effectively co-located, with logistics scheduling being established such that LNG transfer operations and cargo loading/unloading operations occur at the same location but not contemporaneously. This multipurpose arrangement would differ from standard LNG facility operations in the US. It is an arrangement that would require specific and in-depth detailed discussion with the authorities having jurisdiction to fully understand the risks, uncertainties and potential conditions required for such an arrangement.



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### 9 COMMERCIAL EVALUATION

Each of the options considered in this Study presents differing commercial considerations which must be considered. Table 9.1 illustrates the differing critical commercial considerations for each option. A more quantitative discussion will be included in Phase 2.

Table 9.1: Commercial Evaluation

Option	Note	Offshore Mooring System	Marine Jetty	100 Year Storm Marine Jetty	Channel and Basin Dredging	Subsea Pipeline	Full Containment Storage Tank
1	Non-self-propelled			X	X	Х	
2	Non-self-propelled			X	Х	Х	
3	Non-self-propelled Self-propelled		Х	X	X X	X X	
4	Non-self-propelled Self-propelled		Х	X	X X	X X	
5			X		Х	Х	X
6	Non-self-propelled			X	X		
7	Non-self-propelled			X	X		
8	Non-self-propelled Self-propelled		Х	X	X X		
9	Non-self-propelled Self-propelled		Х	X	X		
10			Х		X		Х
11		Х				Х	
12	Non-self-propelled			X	X	Х	
13	Non-self-propelled			X	X		
14			Х		X		X



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### 10 CONCLUSIONS AND RECOMMENDATIONS

#### 10.1 Conclusions

A number of terminal configuration options were considered and a number evidenced potential significant issues with meeting siting requirements equivalent to 49 CFR Part 193 or the application of Zones of Concern as practical siting requirements. All options require either subsea pipeline runs or overland pipeline runs, or a combination of both to provide feed gas distribution to the facilities requiring support.

Similarly, all options with the exception of Option 11 require dredging. For inshore options using FSU or FSRU, options for self-propelled or not self-propelled may be allowed to be considered depending on available vessels, conversion times and other factors. The outcome of this decision will influence the scope and nature of the marine civil works supporting the FSU or FSRU and, similarly, application of typically non-maritime regulatory standards and requirements may come into play. It is arguable that the use of a Regasification Barge, FSRU or FSU potentially introduces uncomfortable uncertainty into the permitting and engineering design process.

#### 10.2 Recommendations

It is recommended that Options 6 through 10 be determined as non-preferential. These options present apparent Part 193 siting challenges that will be difficult to overcome.

It is recommended that Option 11 be determined as non-preferential. This option requires horizontal directional drilling of a subsea pipeline through a likely highly environmentally sensitive area. In addition, Coast Pilot 5 suggests suboptimal availability to the prevailing wind and weather conditions.

It is recommended that Options 1 through 4 be determined as non-preferential. The use of innovative arrangements with these technologies, coupled with the uncertainty surrounding application of general industrial requirements, such as through OSHA, on shipshape floating infrastructure in addition to the potential issues in demonstrating an acceptable level of public impacts with respect to dispersion distances is felt to introduce high uncertainty into the development process.

It is recommended that Options 12 and 13 be determined as non-preferential. The use of CNG in this application requires innovative arrangements with these technologies, which introduces uncertainty in the permitting process. In addition, this arrangement introduces high logistics and marine transit requirements.

It is recommended that Option 5 be determined as secondary preferential conditioned on the assumption that the property as indicated can be acquired. This location and terminal arrangement appears to be consistent with current existing terminal solutions



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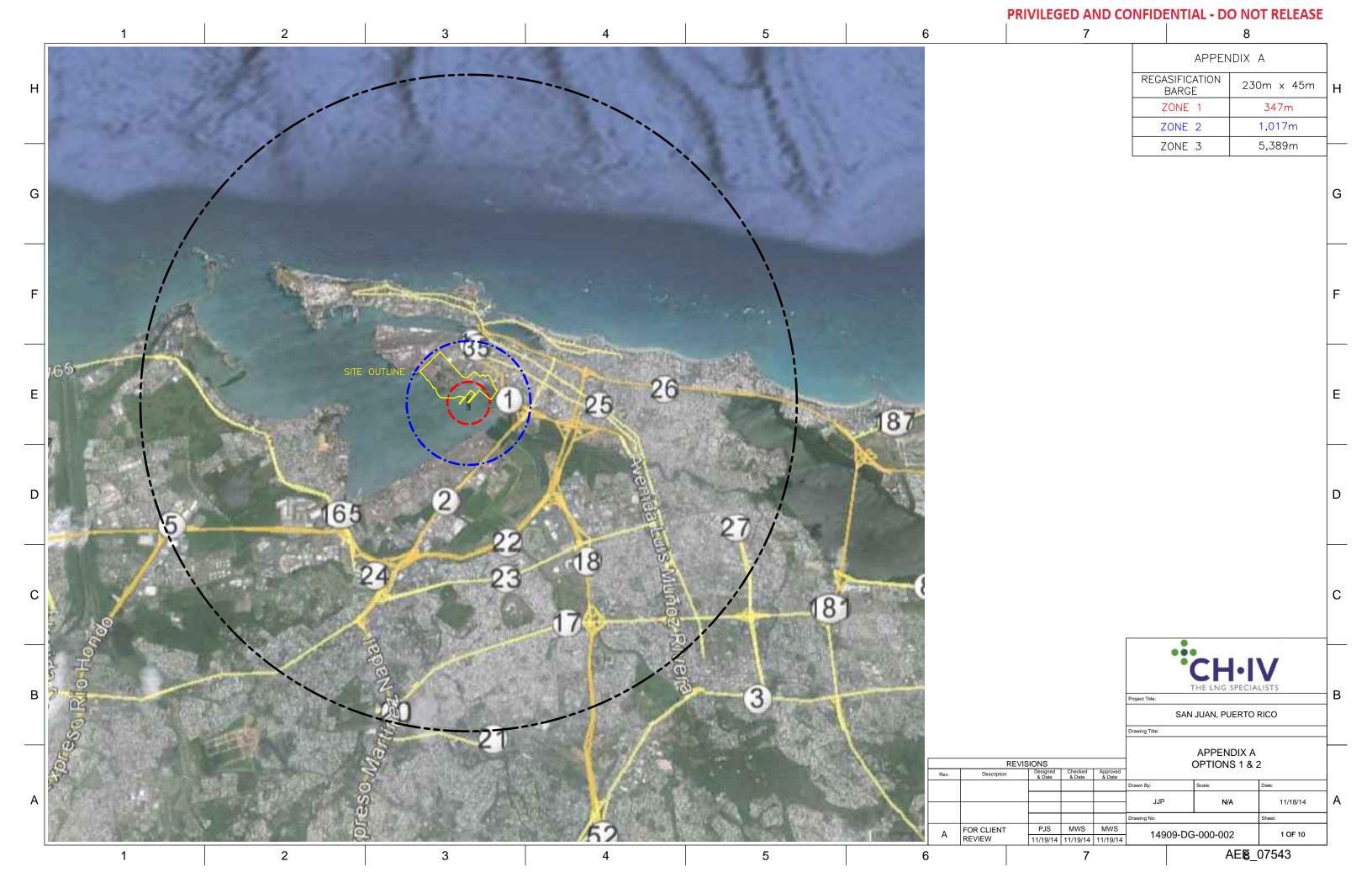
and is one which preliminary hazard analysis suggest presents manageable challenges in meeting regulatory siting requirements.

It is recommended that Option 14 be determined as primary preferential conditioned on the assumption that the property as indicated can be acquired. This location and terminal arrangement clearly appears to be the most consistent with current existing terminal solutions and is one which preliminary hazard analysis suggest presents manageable challenges in meeting regulatory siting requirements. Option 14 has the benefit of being closer to the San Juan Power Plant making the installation of the natural gas sendout line to the San Juan Power Plant less challenging than Option 5.

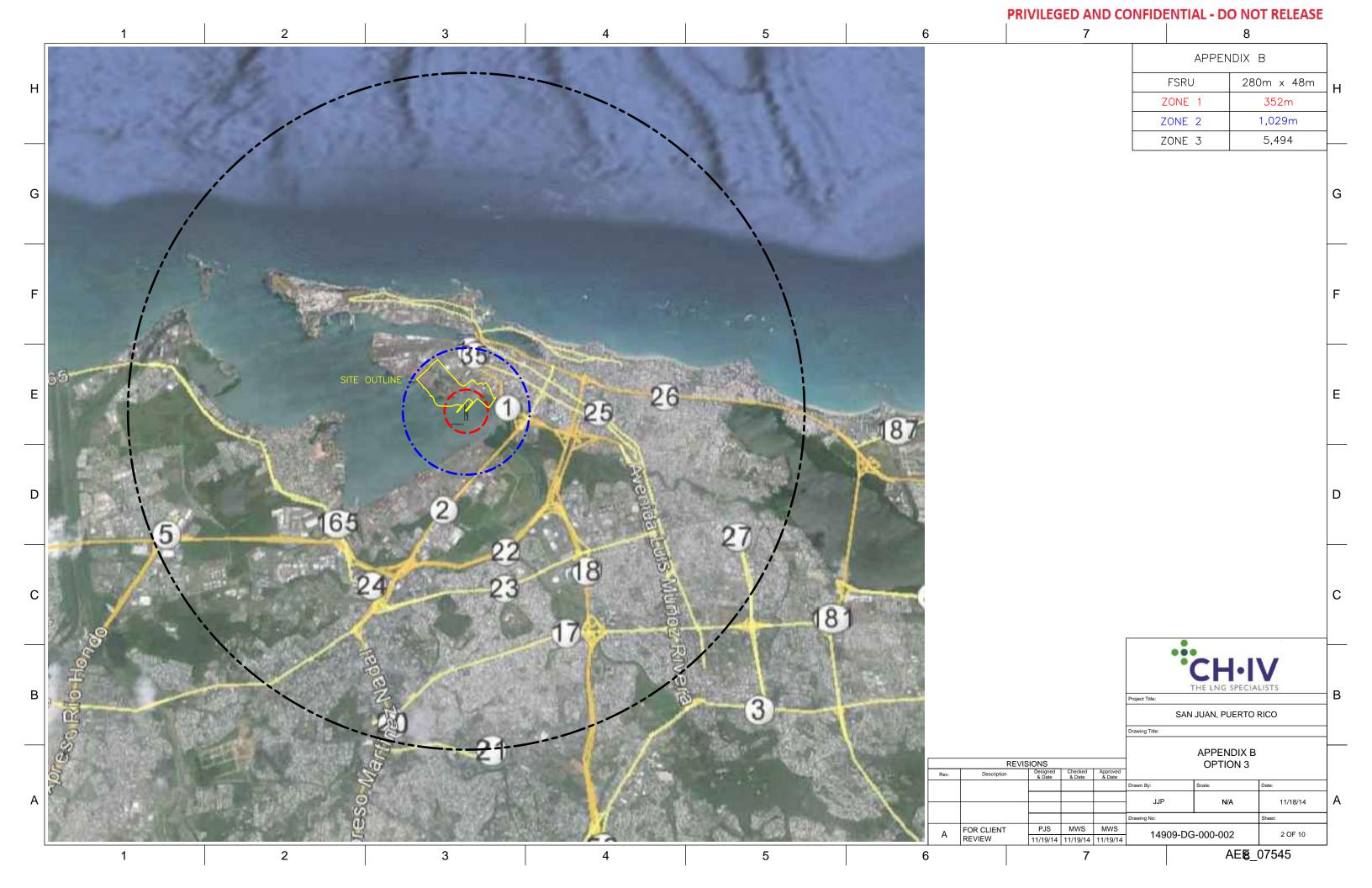


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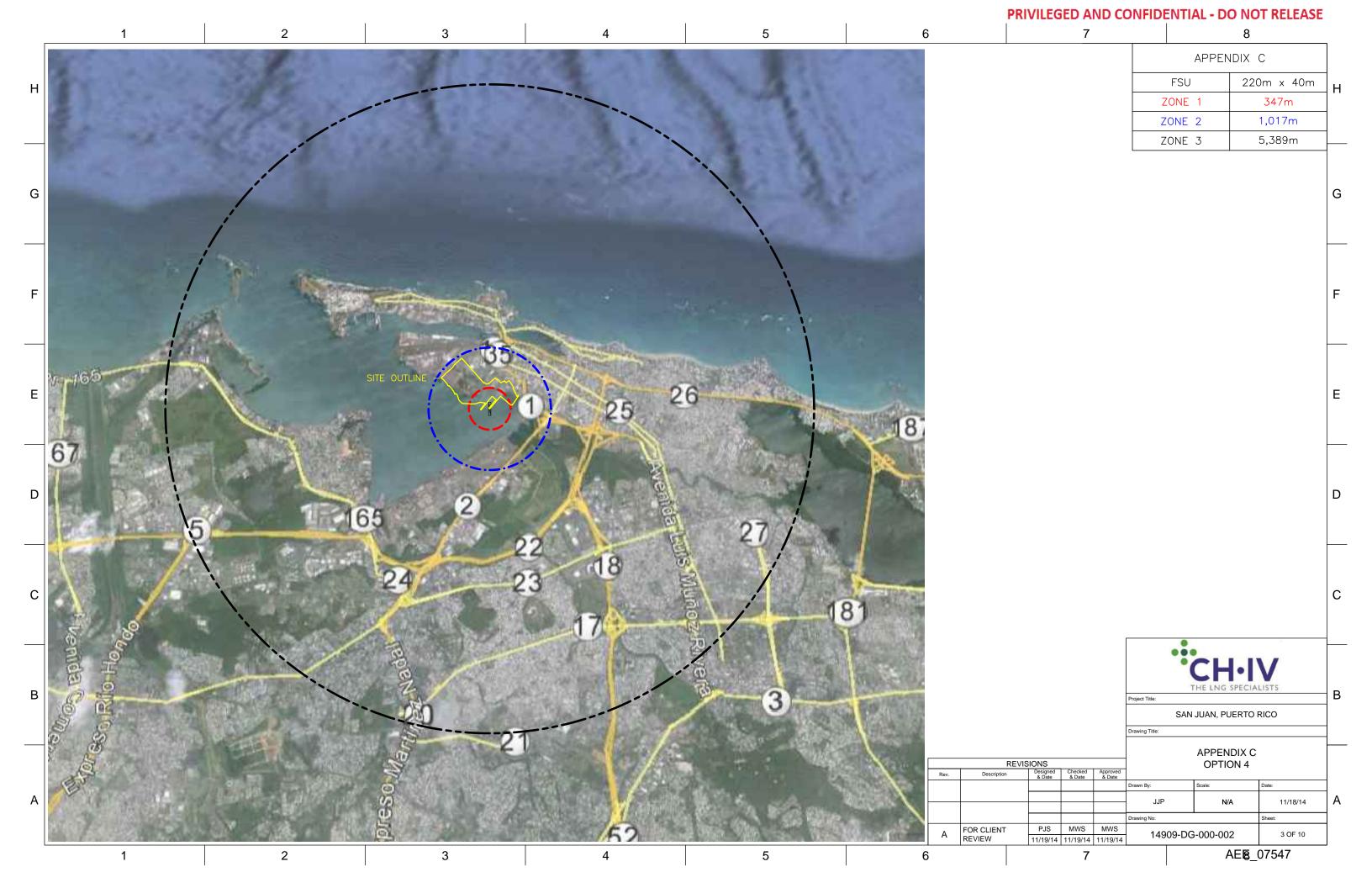
**APPENDIX A: OPTIONS 1 AND 2** 



# **APPENDIX B: OPTION 3**



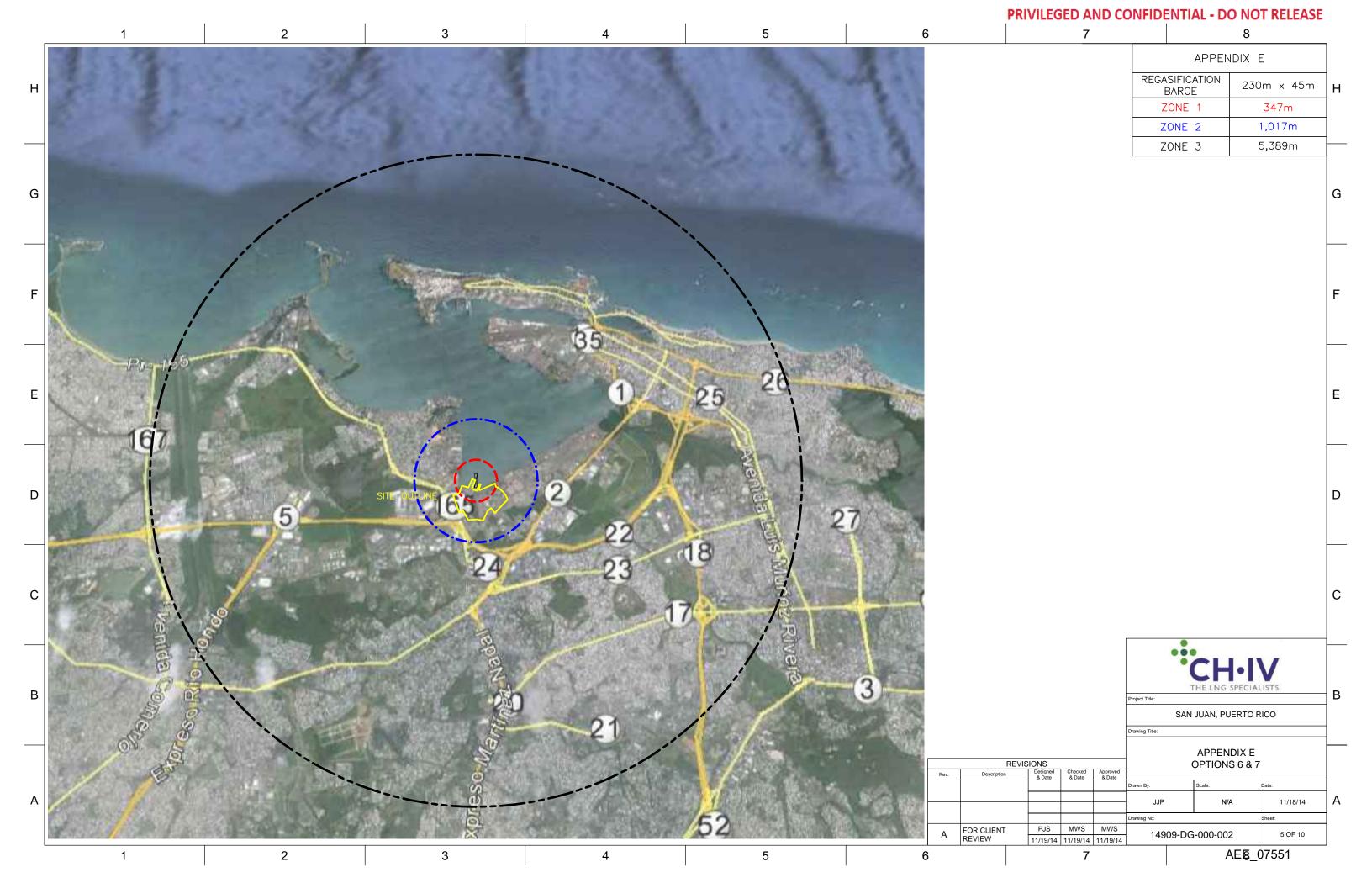
# **APPENDIX C: OPTION 4**



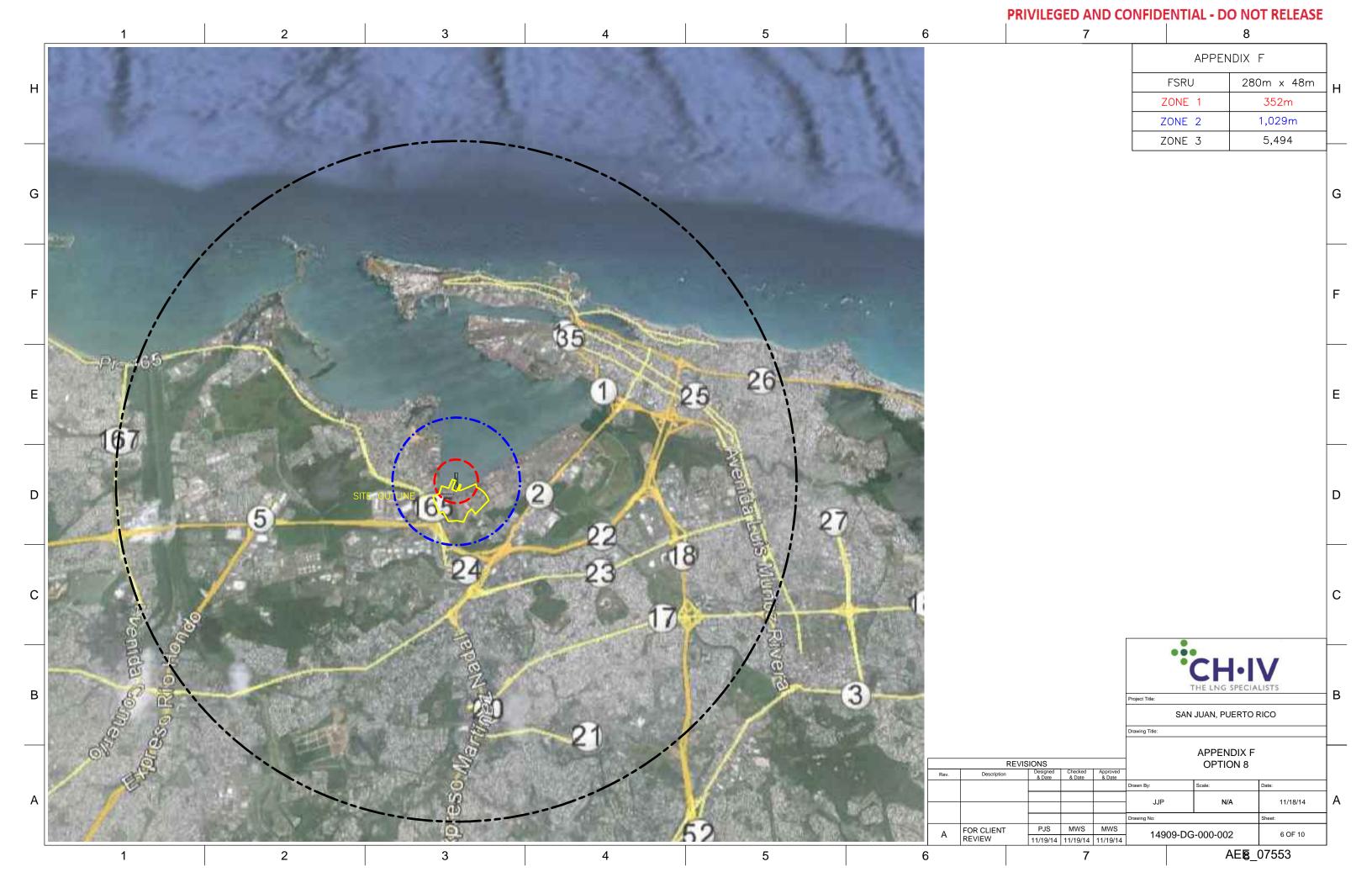
# **APPENDIX D: OPTION 5**

# PRIVILEGED AND CONFIDENTIAL - DO NOT RELEASE 2 5 6 7 APPENDIX D LNG TANKS 80,000 (2) THERMAL 10,000 Btu/hrft<sup>2</sup> 383ft DISPERSION THERMAL 10,000 Btu/hrft<sup>2</sup> 877ft DISPERSION 2 LNG CARRIER 700ft LOA UNLOADING LINE 1,350ft VAPOR DISPERSION VAPOR DISPERSION LP SENDOUT 1,132ft VAPOR DISPERSION HP SENDOUT 587ft Galle-Mir-aflores Ε D В Project Title: SAN JUAN, PUERTO RICO Drawing Title: APPENDIX D OPTION 5 REVISIONS 11/18/14 PJS MWS MWS FOR CLIENT REVIEW 14909-DG-000-002 11/19/14 11/19/14 11/19/14 5 2 AEE\_07549

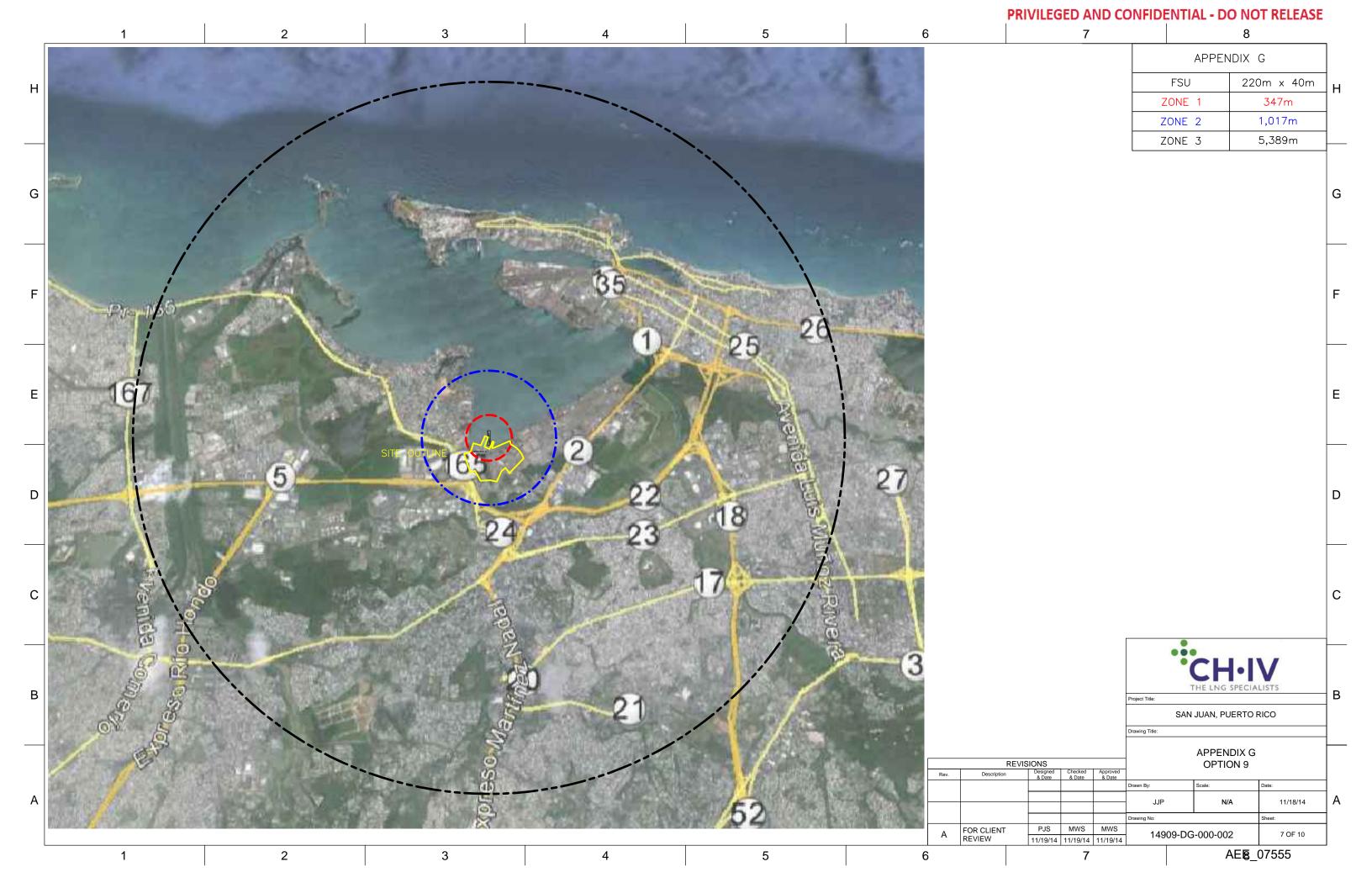
# **APPENDIX E: OPTIONS 6 AND 7**



# **APPENDIX F: OPTION 8**



# **APPENDIX G: OPTION 9**



# **APPENDIX H: OPTION 10**

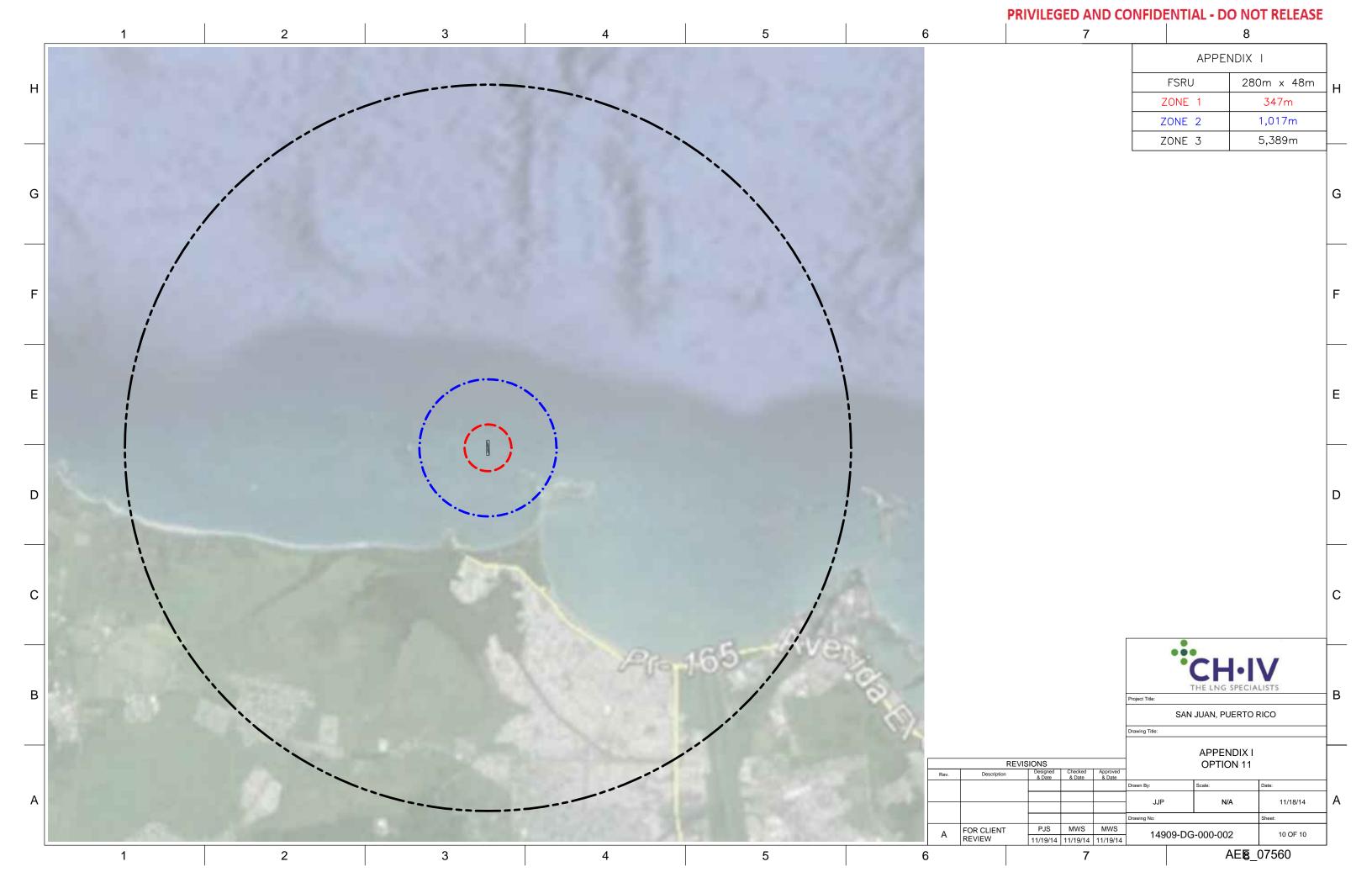


# PRIVILEGED AND CONFIDENTIAL - DO NOT RELEASE 2 3 5 6 7 APPENDIX H LNG TANKS 80,000 (2) THERMAL 10,000 Btu/hrft<sup>2</sup> 724ft DISPERSION 1 THERMAL 3 10,000 Btu/hrft<sup>2</sup> 330ft DISPERSION 2 LNG CARRIER 700ft LOA UNLOADING LINE 1,350ft VAPOR DISPERSION 5 VAPOR DISPERSION LP SENDOUT 1,132ft 6 VAPOR DISPERSION HP SENDOUT 587ft SAN JUAN, PUERTO RICO Drawing Title: APPENDIX H2 REVISIONS OPTION 10 11/18/14 Drawing No: FOR CLIENT REVIEW PJS MWS MWS 14909-DG-000-002 11/19/14 11/19/14 11/19/14 2 3 5 4 AEE\_07558



Feasibility and Option Study

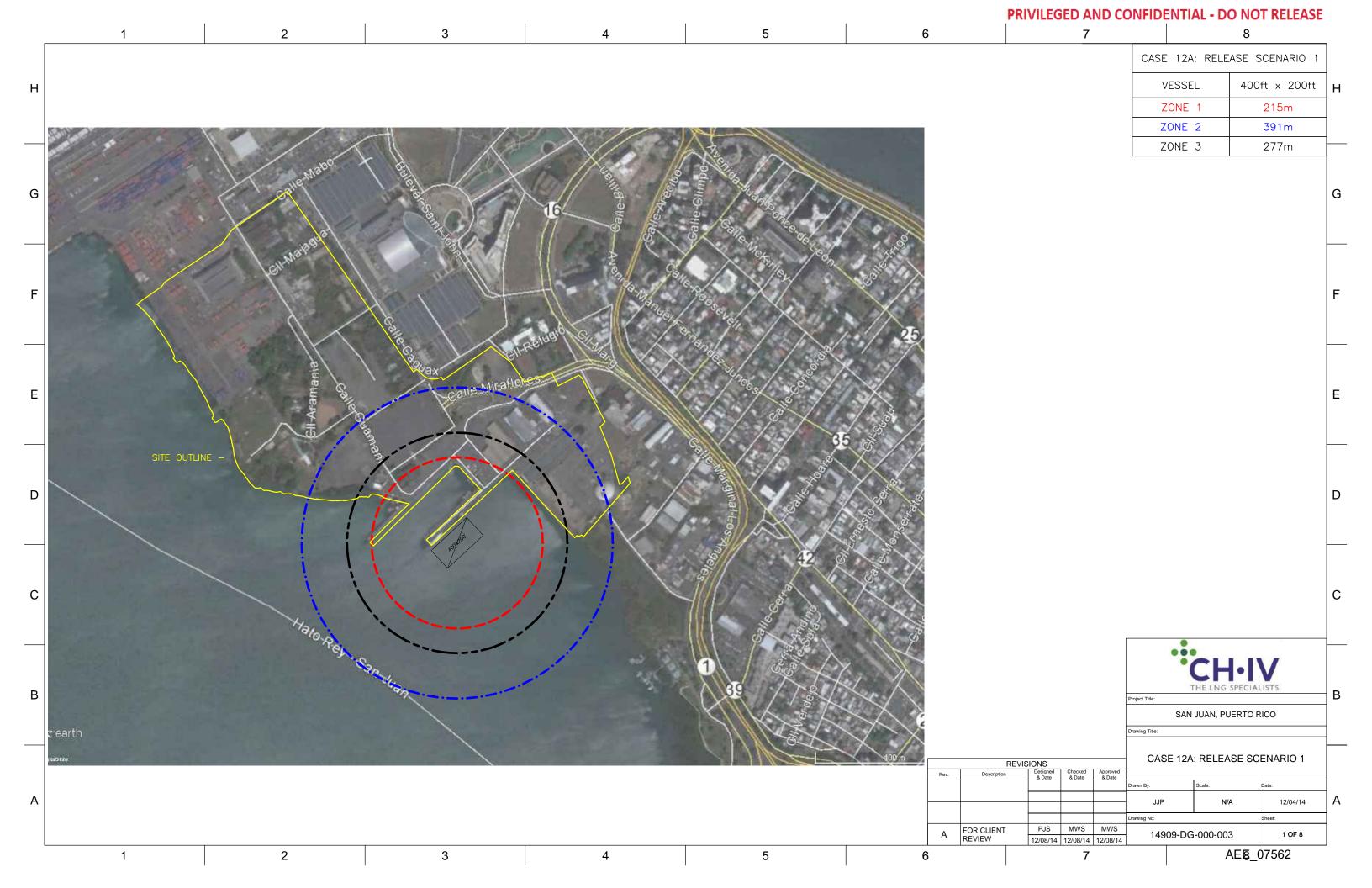
**APPENDIX I: OPTION 11** 

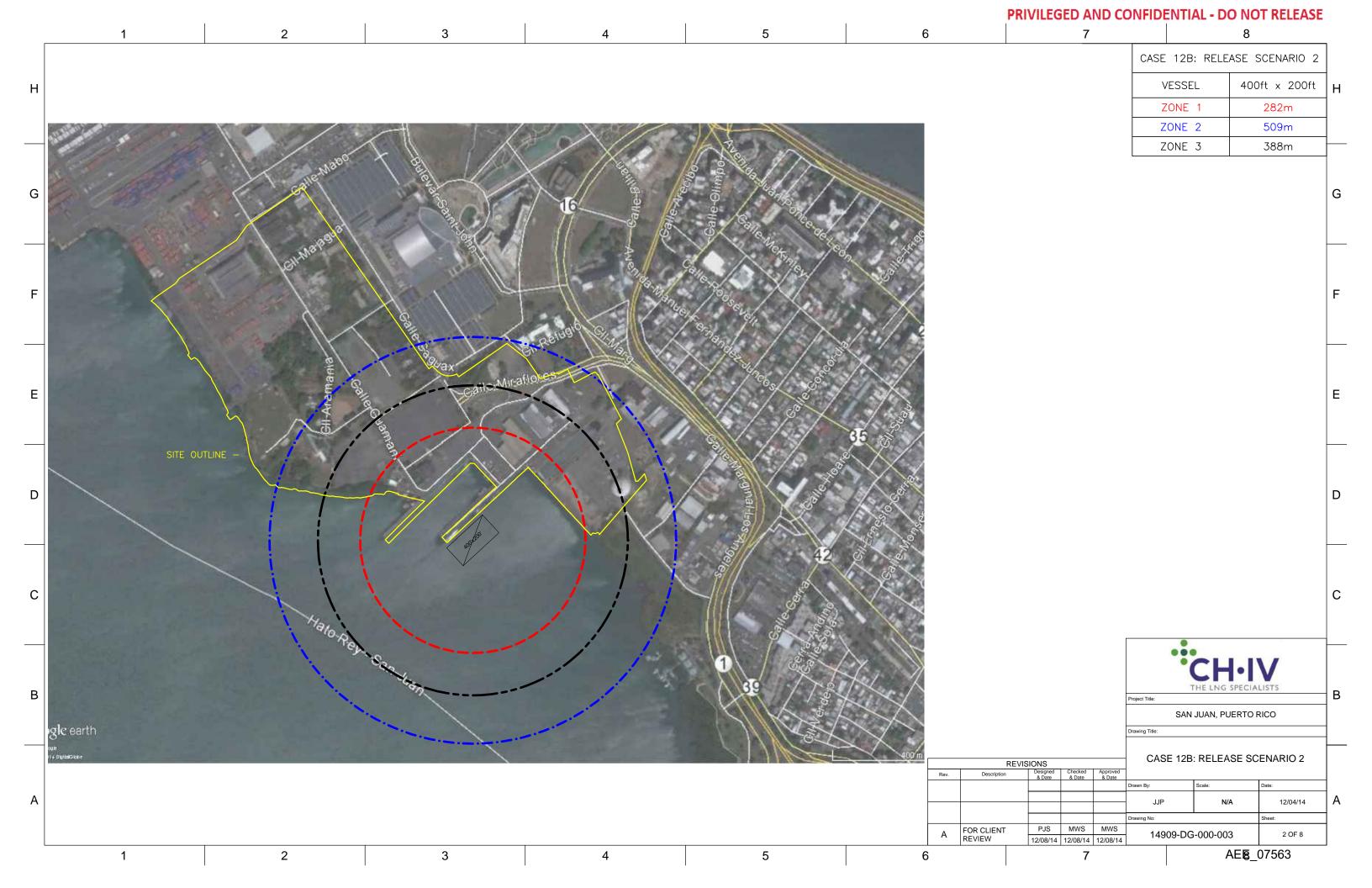


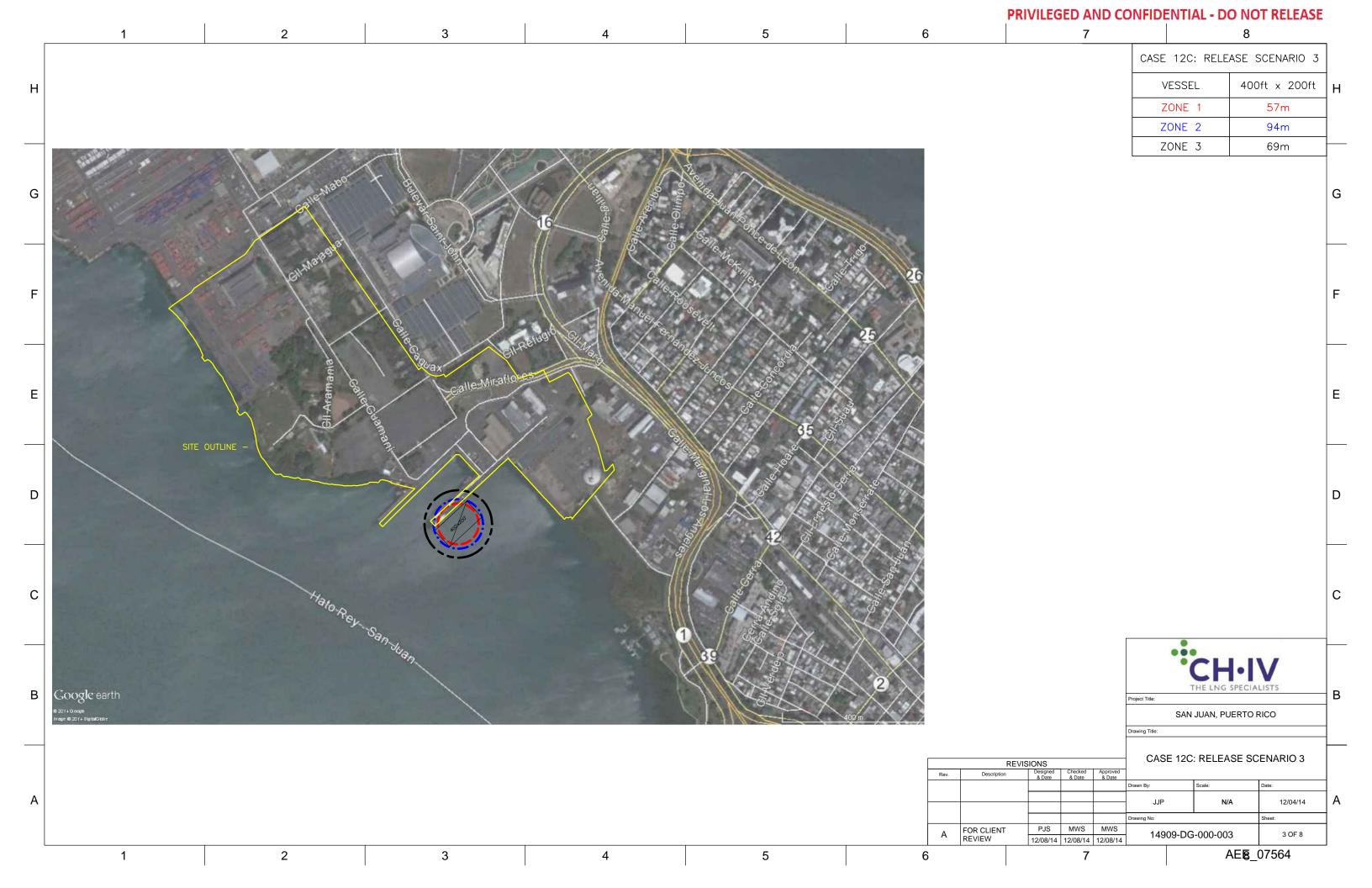


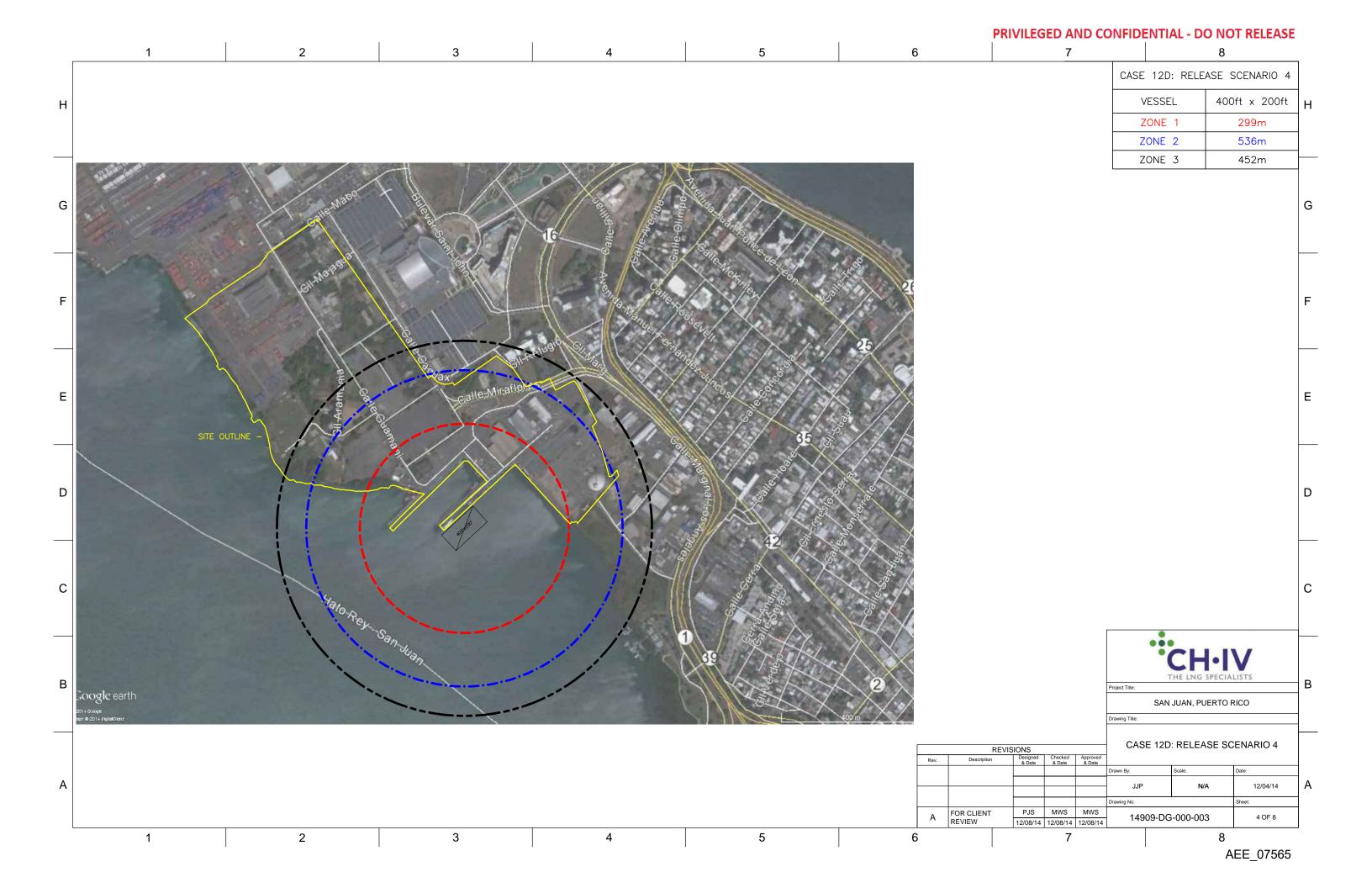
Feasibility and Option Study

**APPENDIX J: OPTION 12** 





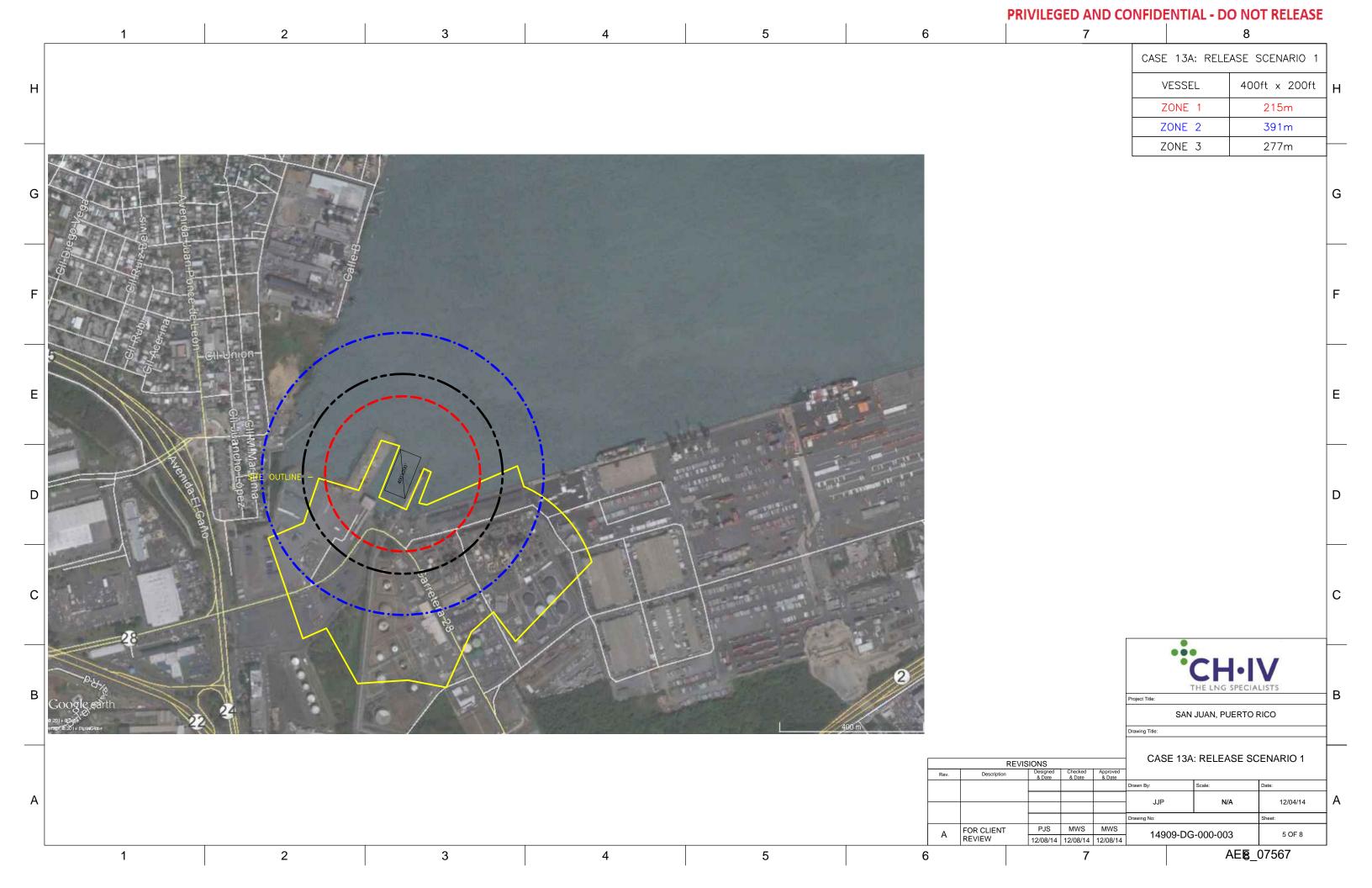


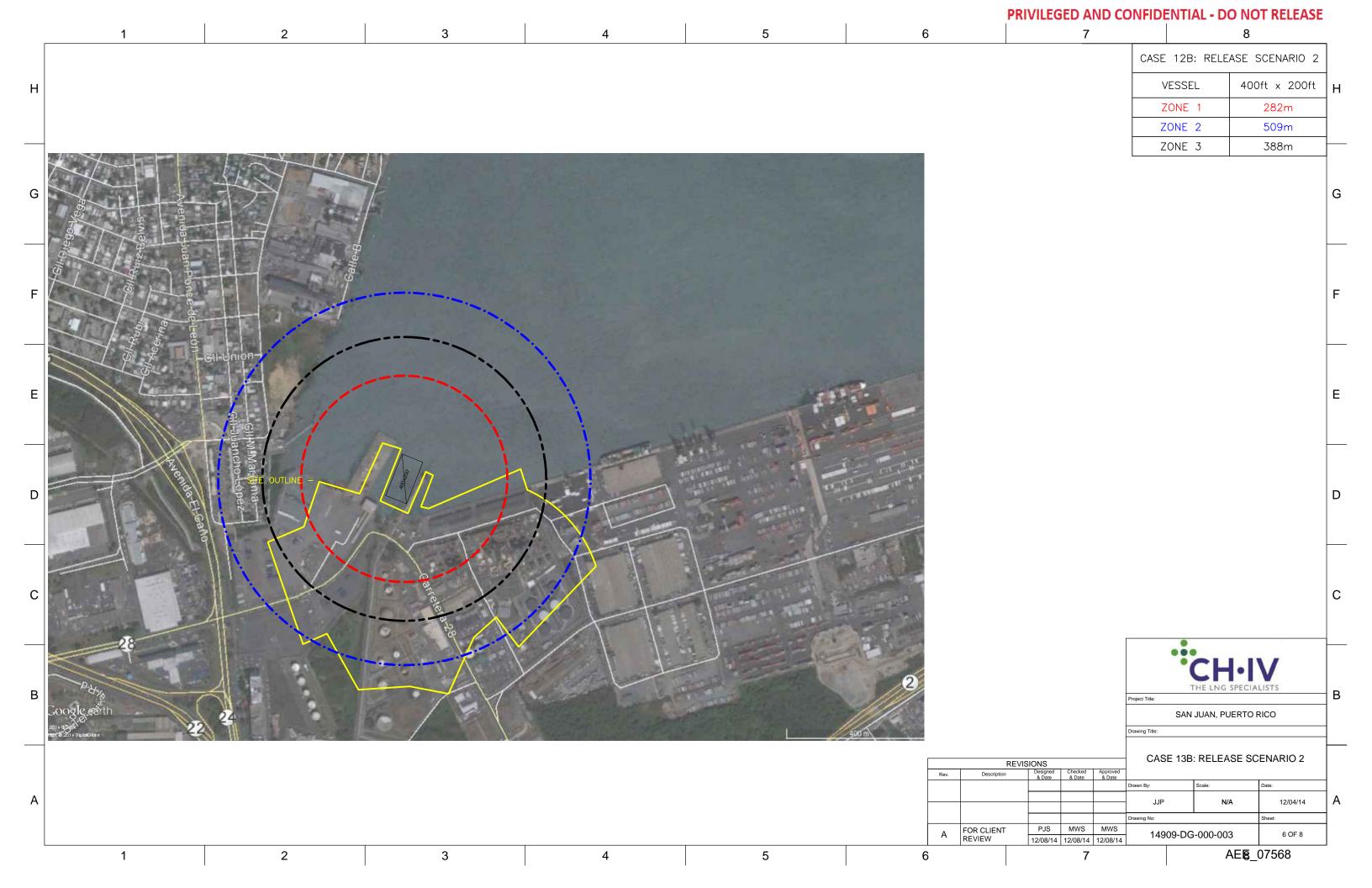




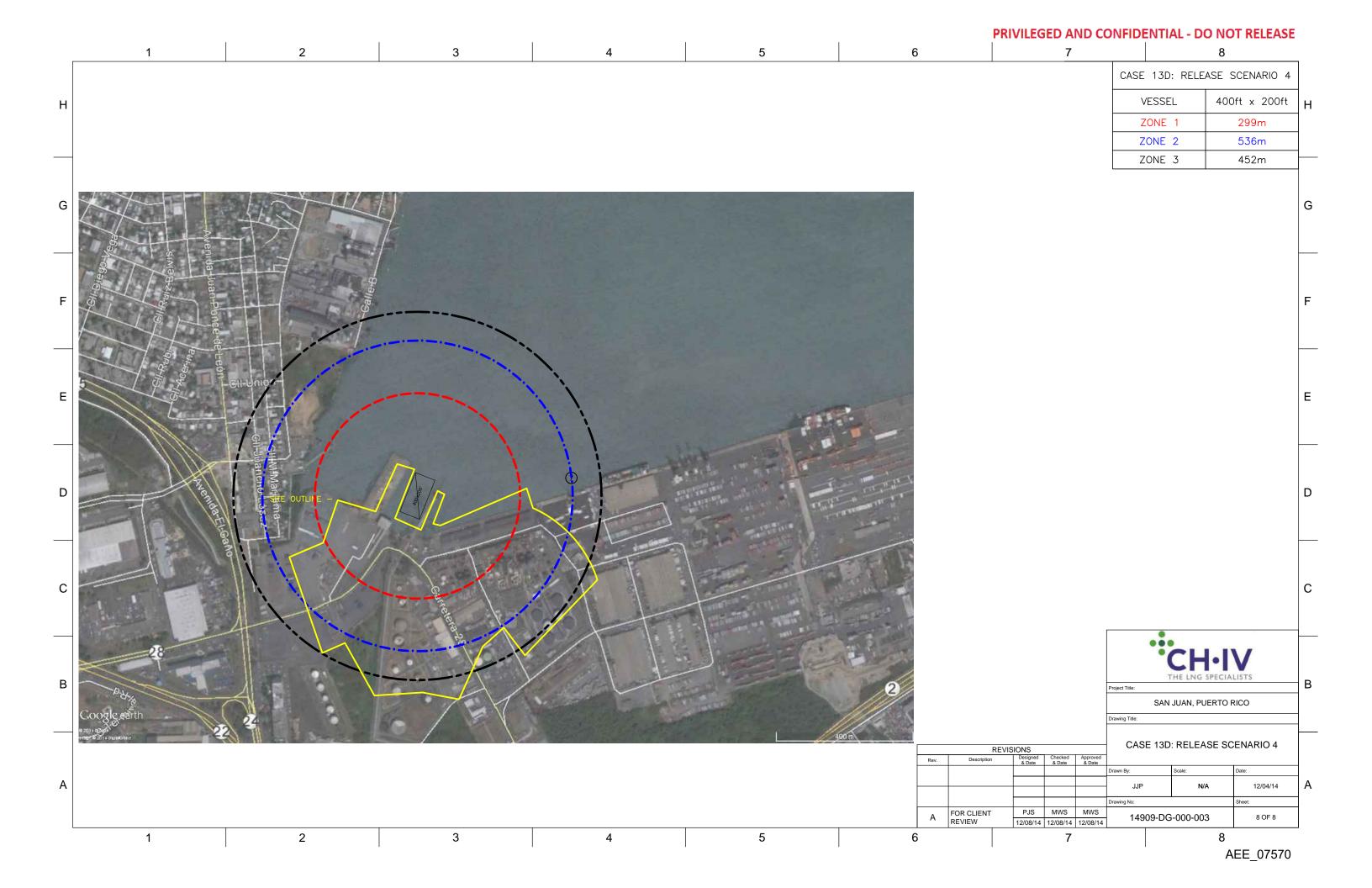
Feasibility and Option Study

**APPENDIX K: OPTION 13** 

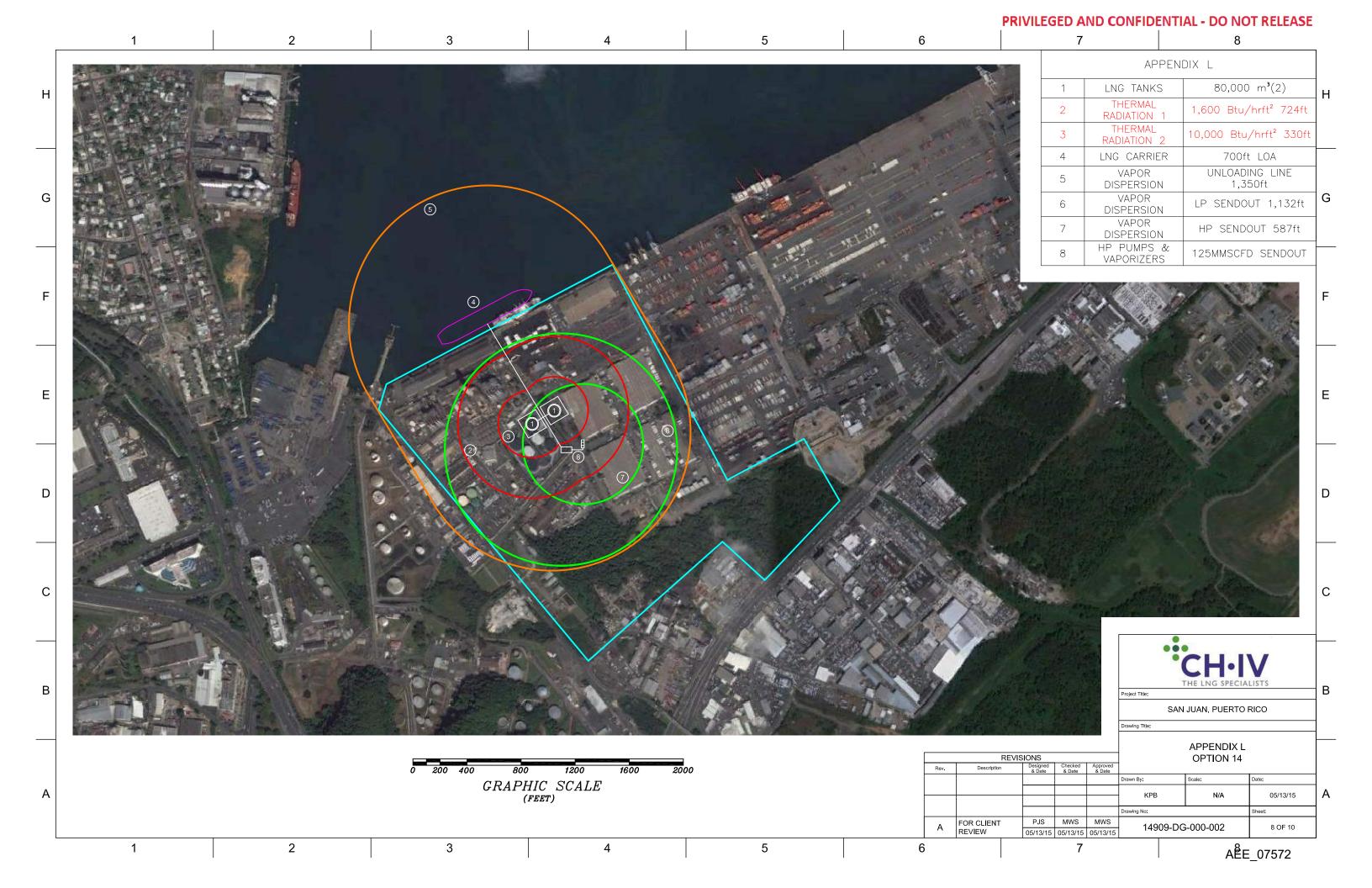








# **APPENDIX L: OPTION 14**



## APPENDIX M: CRAFT ROUTINELY OPERATED DOCKSIDE

## **Craft Routinely Operated Dockside**

In accordance with a recent <u>Supreme Court Decision</u>, the Coast Guard will no longer inspect permanently moored craft or issue Certificates of Inspection to such craft unless a craft demonstrates that it is a vessel, capable of being used as a means of transportation on the water. The <u>Federal Register dated May 11, 2009</u> discusses the implications of the Supreme Court decision and responds to comments received in response to a <u>2004 Federal Register</u> notice that proposed a policy for permanently moored vessel.

The Coast Guard recently determined the number of large passenger vessels (subchapter H) and the number of small passenger vessels (both subchapters K and T) it inspects and the number of inspected passenger barges on May 3, 2012. That information is provided here for information in connection with our C-ROD policy. We did this by sorting the information in our Marine Safety and Information and Law Enforcement System (MISLE) data base as indicated in the header of the document titled: Passenger Vessel Population 3 May 2012.

Since the promulgation of the C-ROD Policy in May 2009, an estimated 21 passenger craft have been deemed permanently moored craft and determined not to meet the definition of vessel as defined in this policy. These craft ceased to be inspected by the Coast Guard and oversight was handed over to the appropriate state authorities.

The Coast Guard also recently estimated the number of permanently moored tank barges operated as floating storage tanks and that do not meet the definition of vessel as defined in the C-ROD policy. These craft are limited to use in the Eighth Coast Guard District located along the Gulf of Mexico coast and the inland river system. The Coast Guard conservatively estimates this number to be 149. This estimate is based upon a survey of Coast Guard field units in the Eighth Coast Guard District conducted between May 4th and 7th 2012. As there are no requirements for operators of these craft to report to the Coast Guard and many are located in remote areas, it is likely the number of such craft is higher than the estimate.

including taxicabs, hotel, and airport shuttles will be inspected before being allowed on campus. Visitors will be asked to show one form of identification (for example, a government-issued photo ID, driver's license, or passport) and to state the purpose of their visit.

Information is also available on the Institute's/Center's home page: http://www.nichd.nih.gov/about/bsd/htm, where an agenda and any additional information for the meeting will be posted when available. (Catalogue of Federal Domestic Assistance Program Nos. 93.864, Population Research; 93.865, Research for Mothers and Children; 93.929, Center for Medical Rehabilitation Research; 93.209, Contraception and Infertility Loan Repayment Program, National Institutes of Health, HHS)

Dated: May 4, 2009.

#### Jennifer Spaeth,

Director, Office of Federal Advisory Committee Policy.

[FR Doc. E9-10801 Filed 5-8-09; 8:45 am]

BILLING CODE 4140-01-P

# DEPARTMENT OF HEALTH AND HUMAN SERVICES

#### **National Institutes of Health**

#### National Institute on Alcohol Abuse and Alcoholism; Notice of Closed Meeting

Pursuant to section 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. App.), notice is hereby given of the following meeting.

The meeting will be closed to the public in accordance with the provisions set forth in sections 552b(c)(4) and 552b(c)(6), Title 5 U.S.C., as amended. The grant applications and the discussions could disclose confidential trade secrets or commercial property such as patentable material, and personal information concerning individuals associated with the grant applications, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Name of Committee: National Institute on Alcohol Abuse and Alcoholism, Special Emphasis Panel, The Effects of Alcohol on Glial Cells (RFA–AA–09–003/004).

Date: July 8–9, 2009.

Time: 8:30 a.m. to 5 p.m.

Agenda: To review and evaluate grant applications.

*Place:* Legacy Hotel, 1775 Rockville Pike, Rockville, MD 20852.

Contact Person: Beata Buzas, PhD, Scientific Review Officer, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, 5635 Fishers Lane, Rm 2081, Rockville, MD 20852. 301–443–0800. bbuzas@mail.nih.gov.

(Catalogue of Federal Domestic Assistance Program Nos. 93.271 Alcohol Research Career Development Awards for Scientists and Clinicians; 93.272, Alcohol National Research Service Awards for Research Training; 93.273, Alcohol Research Programs; 93.891, Alcohol Research Center Grants, National Institutes of Health, HHS)

Dated: May 4, 2009.

#### Jennifer Spaeth,

Director, Office of Federal Advisory Committee Policy.

[FR Doc. E9–10783 Filed 5–8–09; 8:45 am] BILLING CODE 4140–01–M

# DEPARTMENT OF HOMELAND SECURITY

#### **Coast Guard**

[USCG-2004-17674]

#### **Craft Routinely Operated Dockside**

**AGENCY:** Coast Guard, DHS. **ACTION:** Notice of policy.

SUMMARY: The Coast Guard gives notice that, in accord with a recent Supreme Court decision, it will no longer inspect permanently moored craft or issue Certificates of Inspection to such craft unless a craft demonstrates that it is a vessel, capable of being used as a means of transportation on water. This notice discusses the implications of the Supreme Court decision and responds to comments received in response to a 2004 notice that proposed a policy for permanently moored vessels.

DATES: The policy announced in this notice is effective May 11, 2009. Inspection services will continue, with State concurrence, until May 11, 2011, for permanently moored craft that currently possess a Coast Guard-issued Certificate of Inspection, and that have been designed to Coast Guard regulations, and that may not be acceptable for regulation immediately by the State having jurisdiction.

ADDRESSES: Comments and material received from the public, as well as documents mentioned in this preamble as being available in the docket, are part of docket USCG—2004—17674 and are available for inspection or copying at the Docket Management Facility, U.S. Department of Transportation, West Building Ground Floor, Room W12—140, 1200 New Jersey Avenue, SE., Washington, DC 20590—0001, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. You may also find this docket on the Internet at http://www.regulations.gov.

FOR FURTHER INFORMATION CONTACT: For questions on this policy, contact Lieutenant Commander David Webb of the Coast Guard's Office of Vessel Activities (CG–543), telephone 202–

372–1216. For questions on viewing the docket call Renee V. Wright, Program Manager, Docket Operations, telephone 202–366–9826.

#### SUPPLEMENTARY INFORMATION:

#### **Background**

This notice is issued under the authority of 46 U.S.C. 3306, which conveys authority to the Secretary of Homeland Security to implement the vessel inspection provisions of 46 U.S.C. 3301.

On June 21, 2004, the Coast Guard published a notice of proposed policy in the **Federal Register** (69 FR 34385), regarding the inspection of permanently moored vessels (PMVs). We proposed a policy of no longer issuing Certificates of Inspection (COI) to PMVs and no longer inspecting PMVs that currently have a COI, and invited public comments. In response, we received letters from 27 commenters, containing 62 comments.

While we were considering those public comments, the Supreme Court issued its decision in Stewart v. Dutra Construction Company, Inc., 543 U.S. 481, 125 S.Ct. 1118 (2005). That case held that a dredge was a "vessel" under 1 U.S.C. 3. The Court decided that 1 U.S.C. 3 provides the defining criteria for determining what constitutes a vessel, wherever the U.S. Code refers to "vessel" as a jurisdictional criterion. In determining whether a particular craft is also a vessel, the "question remains in all cases whether the watercraft's use 'as a means of transportation on water' is a practical possibility or merely a theoretical one." 543 U.S. at 496.

The Supreme Court's decision ended the prior situation, under which various circuit courts of appeal had applied different tests to determine whether a particular craft constituted a vessel, depending on the statute to be construed and the facts of the case. Under the prior situation, we attempted to apply the different tests so as to provide maximum flexibility in achieving the purpose of the particular statute being administered. After Stewart, however, it is clear that we must apply the single test of whether a craft is used, or is practically capable of being used, as a means of transportation on water. Stewart implies that a "permanently moored vessel" is an oxymoron, since such a craft is neither used nor practically capable of being used as transportation on water, and therefore cannot be considered a vessel. Only a vessel can be inspected by the Coast Guard under the authority of 46 U.S.C. 3301. Thus, in order to conform to Stewart, we have concluded that we will issue Certificates of Inspection to

By Electronic Mail July 26, 2018

Astrid Rodriguez
Puerto Rico Electric Power Authority
San Juan, Puerto Rico

RE: Review of PREPA's RFP#81412: Fuel Supply in the North and Conversion of San Juan Units

5 and 6

No Observations

#### Dear Astrid Rodríguez:

In accordance with the procurement action review procedure for the Office for Contract and Procurement Compliance ("OCPC") (version 6, published July 3, 2018), established by Executive Order 2017-066 (issued Nov. 8, 2017), OCPC completed review of the of the Puerto Rico Electric Power Authority's ("PREPA") RFP#81412: Fuel Supply in the North and Conversion of San Juan Units 5 and 6 (the "Procurement Action"), which PREPA submitted for OCPC review on July 20, 2018 and supplemented July 26, 2018. OCPC reviewed the Procurement Action for compliance with local Puerto Rico contracting requirements.

Based upon its assessment, OCPC provides the attached report with "No Observations" because the review is complete and OCPC has not identified areas of risk.

The enclosed report provides additional information. Note that the report's findings reflect the limits of the information made available to OCPC for review and are conditioned on PREPA taking actions, as specified in the underlying assessment report.

PREPA has advised that it does <u>not</u> intend to seek FEMA reimbursement for this contract. As such, OCPC has not reviewed the contract for compliance with federal law, regulations, policy, or guidance or any other requirements of FEMA's Public Assistance program. Should PREPA change its intent with respect to FEMA reimbursement, it must notify OCPC and resubmit this procurement action for appropriate OCPC review.

This letter and its attachment do not constitute legal advice nor guarantee that the Procurement Action complies with all applicable laws, rules, and regulations. OCPC reserves the right to modify its findings and this letter based on information not available at the time this review is conducted.

Ottmar Chavez
Director
Office for Contract and Procurement Compliance

Encl.

A- Pietrantoni Mendez & Alvarez LLC-prepared Puerto Rico Procurement Proceduce End 7576

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## PUERTO RICO ELECTRIC POWER AUTHORITY OFFICE OF PROCUREMENT AND CONTRACT COMPLIANCE

## **REVIEW ABSTRACT**

REV	IEW ABSTRACT
Title:	RFP#81412: Fuel Supply in the North and Conversion of San Juan Units 5 and 6
Party(ies) contracting with PREPA:	TBD
Date of contract:	TBD
Date contract received:	July 20, 2018; Supplemented on July 26, 2018
Date review completed:	July 26, 2018
Documents received and reviewed:	<ul> <li>Draft of RFP#81412: Fuel Supply in the North and Conversion of San Juan Units 5 and 6</li> <li>Draft – Infrastructure Works Terms and Conditions_RFP Units 5 and 6</li> <li>Board Resolution 4620</li> <li>Justification Memo RFP Fuel and Conversions SJSP 5 and 6</li> <li>Draft Fuel Sale and Purchase Contract</li> <li>Draft Memorandum Evaluation Committee</li> <li>RFI #79 last 3 bullets answers</li> </ul>
Complies with PREPA Procurement Regulations and Procedures:  Details in Exhibit A.	Yes ⊠ No □
Complies with Puerto Rico contracting provisions:  Details in Exhibit B.	Yes ⊠ No □

## PREPA PROCUREMENT PROVISIONS

#	Complies	Requirement	Comments
1.	Y ⊠ N □	Authority of PREPA to execute proposed procedure.	Pursuant to Section 15(1)(a) of Act 83-1941, as amended, known as the Puerto Rico Electric Power Authority Act (the "PREPA Act"), all purchases and agreements for supplies and services made by PREPA, with the exception of professional services agreements, shall be made through a formal bid procedure. Notwithstanding the foregoing, Section 15(2) provides the instances in which a bid process will not be required.
			Board Resolution 4620 approves the procurement by means of an RFP, as allowed under Section 15(2)(f) of the PREPA Act since, in the judgment of the Board, an RFP process shall be carried out for the acquisition of goods, equipment, supplies, or services to promote greater competition, reduce the risk of collusion, and promote the best possible terms and conditions to achieve greater savings and reduce the operating costs and expenses of the Authority.
2.	Y ⊠ N □	Section III.A of the Procedure	RFP shall be completed through PREPA's electronic sourcing platform (PowerAdvocate).  See Section 1.3 of RFP.
3.	Y⊠	Section III.B of the	Suppliers must be registered in PREPA's Supplier's Registry prior to execution of the contract.
	N 🗆	Procedure –	See Section 3.0 of RFP.
4.	Y ⊠ N □	Section III.G of the Procedure	According to Section B of the Rules for Levels of Approval of Documents (Norma Sobre Niveles de Aprobación de Documentos), any agreement exempt from the requirement of a bid process in excess of \$200,000 must be approved by PREPA's governing board. The agreement must be executed by PREPA's Executive Director.
5.	Y ⊠ N □	Section III.I of the Procedure	Section III.I of the Procedure provides that PREPA may require a Performance Bond and, for agreements in excess of \$150,000, a Payment Bond.  Moreover, Section 530.4.1 of PREPA's Administrative Manual provides that a Performance Bond and a Payment Bond shall be required in bid and request for proposal processes. In addition, a Bid Bond shall be required in bid processes.
		X	Section 11.0.
6.	Y 🛭 N 🗆	Section III.K of the Procedure	Section III.K of the Procedure requires all purchases of equipment to include the warranty, special conditions of operation or exceptions in the text of the order or the scope of the agreement.
			Article 19 of Terms and Conditions.
7.	Y ⊠ N □	Section III.O of the Procedure	Section III.O of the Procedure requires all requisitions, material requests or purchase orders to include and active account.
8.	Y ⊠ N □	Minimum period for Delivery of	Section 530.3 of PREPA's Administrative Manual states that all invitations to RFP shall be sent with sufficient time prior to the

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		Invitation to RFP	proposed date of opening, and further provides that five days shall be deemed as sufficient time.
			Section 1.6 of the RFP.
9.	Y ⊠ N □	Section 3 of the Guide	The Executive Director shall appoint an Evaluation Committee with a minimum of three members for each RFP in order to assist with the selection of proponents and the negotiation of the contract terms.
	Section 4.6	of the Guide – C	ontents of the Request for Proposals
10.	Y ⊠ N □	(a)	Description of the project, business model, solution or strategical acquisition that will be developed.
			See Section 2.0 of the RFP.
11.	Y ⊠ N □	(b)	A description and schedule of the proposed timeline for the selection process.
			See Section 1.6 of the RFP.
12.	Y ⊠ N □	(c)	Instructions with respect to the format, PREPA's electronic platform for the filing of proposals or any other technical specifications.
			See Section 1.3 of the RFP.
13.	Y ⊠ N □	(d)	If applicable, an outline of the independent procedure for environmental compliance.
14.	Y ⊠ N □	(e)	A petition by PREPA for proponents to be able to submit, before the proposal, Alternative Technical Concepts or Alternative Financial Concepts.
15.	Y ⊠ N □	(f)	A statement with respect to the type of selection process to be employed by PREPA.
16.	Y ⊠ N □	(g)	The minimum applicable Evaluation Criteria.
17.	Y ⊠ N □	(h)	Any bid bond that may be required by PREPA.
18.	Y ⊠ N □	(i)	If applicable, a statement with respect to any contingent financing or any other conditions, contingences, approvals, authorizations, certifications that would be required for the execution of the agreement.
19.	Y ⊠ N □	(j)	The date and time before which and the place in which proposals must be submitted.
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		See Section 1.3 of the RFP (to be completed at a later stage)
20.	Y 🖂	(k)	The point of contact designated by PREPA or his or her delegate.
	N□		See Section 1.3 of the RFP.
21.	Y 🗵	(m)	A clause regarding confidentiality.
	N□		See Section 7.0 of the RFP.
22.	Y ⊠ N □	(0)	A clause expressly indicating expressly that the RFP may be amended by the publication of addenda.

23. Y N (p) A requirement that all proponents certify that it has complied with the requirements set forth in Section 4.17 of the Rules.  See Section 9.0 of the RFP.	l l			See Section 1.3 of the RFP.
See Section 9.0 of the RFP.	23.		(p)	A requirement that all proponents certify that it has complied with the requirements set forth in Section 4.17 of the Rules
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## PUERTO RICO GOVERNMENT CONTRACTING PROVISIONS

Complies	Required Provision
	Contractor shall be required to submit the following documents or certifications:
CERTIFICA	ATIONS REQUIRED UNDER EXECUTIVE ORDERS OE-1991-24 AND OE-1992-52:
Y 🗵	Treasury Department (Income Tax Debt Certification):
N 🗆	Certification issued by the Treasury Department of Puerto Rico which indicates that Contractor does not owe taxes to the Commonwealth of Puerto Rico; or is paying such taxes by an installment plan in full compliance with its terms. (Form SC 6096)
Y 🗵	Treasury Department (Filing of Income Tax Returns):
N 🗆	An Income Tax Return Filing Certificate, issued by the Treasury Department of Puerto Rico assuring that Contractor has filed his Income Tax Return for the last five (5) tax years. (Form SC 6088)
Y 🗵	Department of Labor and Human Resources:
N □ N/A □	Certificate, issued by the Department of Labor and Human Resources of Puerto Rico, assuring that Contractor has paid to the Department of Labor and Human Resources of Puerto Rico its employees' contributions accruing during the last five (5) years, in accordance with the Puerto Rico Employment Security Act (unemployment, temporary disability or sickness or social security for drivers/chauffeurs); or is paying such contributions by an installment plan in full compliance with its terms.
CERTIFICA	ATIONS REQUIRED UNDER ACT 237-2004 AND TREASURY DEPARTMENT CIRCULAR LETTER
<u>1300-16-16</u>	(Applicable for professional and consulting services.)
Y 🗵	Treasury Department (Merchant's Registration):
N □ N/A □	Copy of Contractor's Merchant's Registration Certificate. (Form SC 2918)
Y 🗵	Treasury Department (Sales and Use Tax Debt Certification):
N □ N/A □	Certification issued by the Treasury Department of Puerto Rico which indicates that Contractor does not owe Puerto Rico Sales and Use Taxes to the Commonwealth of Puerto Rico; or is paying such taxes by an installment plan and is in full compliance with its terms. (Form SC 2927)
Y 🗵	Treasury Department (Filing of Sales and Use Tax Returns):
N □ N/A □	A Puerto Rico Sales and Use Tax Filing Certificate, issued by the Treasury Department of Puerto Rico assuring that Contractor has filed his Puerto Rico Sales and Use Tax for the last sixty (60) contributory periods. (Form SC 2942)
Y 🗵	Municipal Revenues Collection Center (Personal Property Taxes):
N □ N/A □	Certification issued by the Municipal Revenues Collection Center ("MRCC"), assuring that Contractor does not owe any tax accruing during the last five (5) years to such governmental agency with respect to personal property; <i>or</i>
	Negative Debt certification issued by the MRCC with respect to personal property taxes and a sworn statement executed by Contractor indicating that (i) its revenues are derived from the rendering of professional services, (ii) during the last 5 years (or the time in which it has been providing professional services) it has had no taxable business or personal property on the 1 <sup>st</sup> of January of each year, (iii) that for such reasons it has not been required to file personal property tax returns, as required under Article 6.03 of Act 83-1991, as amended and (iv) that for such reason it does not have an electronic tax file in the MRCC's electronic system.
Y ⊠ N □	Municipal Revenues Collection Center (Real Property Taxes):

N/A □	All Concepts Debt Certification issued by the MRCC assuring that Contractor does not owe any taxes to such governmental agency with respect to real and personal property; <i>or</i>
	Negative Debt certification issued by the MRCC with respect to real property taxes.
Y 🗵	Child Support Administration:
N □ N/A □	Certification, issued by the Child Support Administration, assuring that Contractor is in compliance with the withholdings required by law as an employer.
Y 🗵	Department of State (Organization Documents):
N □ N/A □	Certificate of Incorporation, or Certificate of Organization or Certificate of Authorization To Do Business In Puerto Rico issued by the Puerto Rico Department of State.
Y 🗵	Department of State (Good Standing Certificate):
N □ N/A □	Good Standing Certificate issued by the Puerto Rico Department of State.
	If any of the previously required Certifications shows a debt, and Contractor has requested a review or adjustment of this debt, Contractor will certify that it has made such request at the time of the Contract execution. If the requested review or adjustment is denied and such determination is final, Contractor will provide, immediately, to PREPA a proof of payment of this debt; otherwise, Contractor accepts that the owed amount be offset by PREPA and retained at the origin, deducted from the corresponding payments.
	Contractor recognizes that submittal of the aforementioned certifications and documents is an essential condition of this Contract; and even in the case that they are partially incorrect, there will be sufficient cause for PREPA to terminate, cancel or rescind the Contract, and Contractor have to refund all payments received.
	NS REQUIRED UNDER ACT 168-2000, AS AMENDED, KNOWN AS THE LAW FOR THE HENING OF THE FAMILY SUPPORT AND LIVELIHOOD OF ELDERLY PEOPLE:
	e to professional and consulting services.)
Y ⊠ N □ N/A □	The Contractor hereby certifies that if there is any Judicial or Administrative Order demanding payment or any economic support under Act. No. 168-2000, as amended, the same is current and in all aspects in compliance.
PROVISION	NS REQUIRED UNDER ACT 48-2013.
(Applicable	e to professional, consulting, advertising, training and counseling agreements.)
Y⊠	Special Contribution for Professional and Consulting Services:
N □ N/A □	PREPA shall withhold the special contribution of one point five percent (1.5%) of the gross amounts paid under this Agreement.
PROVISION	NS REQUIRED UNDER ANTI-CORRUPTION CODE FOR THE NEW PUERTO RICO (ACT 2-2018):
Y⊠ N□	The Contractor hereby agrees to comply with the provisions of Act No. 2-2018, known as the Anti-Corruption Code for the New Puerto Rico.
Y ⊠ N □	All invoices must include a written certification stating that no officer or employee of PREPA will derive or obtain any benefit or profit of any kind from this Agreement. Invoices that do not include this certification will not be accepted. This certification must read as follows:
	"We certify under penalty of nullity that no public servant of PREPA will derive or obtain any benefit or profit of any kind from the contractual relationship which is the basis of this invoice. If such benefit or profit exists, the required waiver has been obtained prior to entering into the Agreement. The only consideration to be received in exchange for the delivery of goods or for the Services provided is the agreed-upon price that has been negotiated with an authorized

	representative of the PREPA. The total amount shown on this invoice is true and correct. The Services have been rendered, and no payment has been received."
Y 🗵 N 🗆	The Contractor hereby certifies that it does not represent particular interests in cases or matters that imply a conflicts of interest, or of public policy, between the executive agency and the particular interests it represents. (Also required by Act 1-2012 and Act 237-2004 (3 L.P.R.A. 8615(g))).
Y ⊠ N □	Contractor shall furnish a sworn statement to the effect that neither Contractor nor any president, vice president, executive director or any member of a board of officials or board of directors, or any person performing equivalent functions for Contractor has been convicted of or has pled guilty to any of the crimes listed in Article 6.8 of Act 8-2017, as amended, known as the Act for the Administration and Transformation of Human Resources in the Government of Puerto Rico or any of the crimes included in Act 2-2018.
Y ⊠ N □	Contractor hereby certifies that it has not been convicted in Puerto Rico or United States Federal court for under Articles 4.2, 4.3 or 5.7 of Act 1-2012, as amended, known as the Organic Act of the Office of Government Ethics of Puerto Rico, any of the crimes listed in Articles 250 through 266 of Act 146-2012, as amended, known as the Puerto Rico Penal Code, any of the crimes typified in Act 2-2018, as amended, known as the Anti-Corruption Code for a New Puerto Rico or any other felony that involves misuse of public funds or property, including but not limited to the crimes mentioned in Article 6.8 of Act 8-2017, as amended, known as the Act for the Administration and Transformation of Human Resources in the Government of Puerto Rico.
Y⊠ N□	PREPA shall have the right to terminate the agreement in the event Contractor is convicted in Puerto Rico or United States Federal court for under Articles 4.2, 4.3 or 5.7 of Act 1-2012, as amended, known as the Organic Act of the Office of Government Ethics of Puerto Rico, any of the crimes listed in Articles 250 through 266 of Act 146-2012, as amended, known as the Puerto Rico Penal Code, any of the crimes typified in Act 2-2018, as amended, known as the Anti-Corruption Code for a New Puerto Rico or any other felony that involves misuse of public funds or property, including but not limited to the crimes mentioned in Article 6.8 of Act 8-2017, as amended, known as the Act for the Administration and Transformation of Human Resources in the Government of Puerto Rico.
Provision	NS REQUIRED UNDER ACT NO. 18-1975, AS AMENDED:
Y 🗵	Registration of Agreement in the Office of the Puerto Rico Comptroller:
N □ N/A □	Payment for Services object of this Agreement will not be made until this Agreement is properly registered in the Office of the Comptroller of the Government of Puerto Rico.
PROVISION	NS REQUIRED UNDER ACT 237-2004, AS AMENDED.
(Applicab	le to professional and consulting services.)
Y 🗵	<b>Legal Provision under which contract is executed:</b> (3 L.P.R.A. 8615(b))
N □ N/A □	PREPA is authorized to execute this contract pursuant to [ ].
Y⊠	<b>Prohibition with respect to execution by public officers:</b> (3 L.P.R.A. 8615(c))
N □ N/A □	No public officer or employee authorized to contract on behalf of the executive agency for which he/she works may execute a contract between the agency for which he/she works and an entity or business in which he/she or any member of his/her family unit has or has had direct or indirect economic interest during the last four (4) years prior to his/her holding office.
Y 🖂	<b>Prohibition with respect to contracting with officers or employees:</b> (3 L.P.R.A. 8615(d))
N □ N/A □	No executive agency may execute a contract in which any of its officers or employees or any member of their family units has or has had direct or indirect economic interest

	during the last four (4) years prior to their holding office, unless the Governor gives authorization thereto with the previous recommendation of the Secretary of the Treasury and the Secretary of Justice.
Y ⊠ N □	Prohibition with respect to contracts with officers and employees of other Government entities: (3 L.P.R.A. 8615(e))
N/A □	No public officer or employee may be a party to or have any interest in any profits or benefits produced by a contract with any other executive agency or government dependency unless the Governor gives express authorization thereto with previous recommendation from the Secretary of the Treasury and the Secretary of Justice.
Y 🗵	<b>Prohibition with respect to evaluation and approval by public officers:</b> (3 L.P.R.A. 8615(f))
N □ N/A □	No public officer or employee who has the power to approve or authorize contracts shall evaluate, consider, approve or authorize any contract between an executive agency and an entity or business in which he/she or any member of his/her family unit has or has had direct or indirect economic interest during the last four (4) years prior to his/her holding office.
Y 🗵	Prohibition with respect to execution by public officers contracts with former public
N □	officers: (3 L.P.R.A. 8615(h))
N/A □	No executive agency shall execute contracts with or for the benefit of persons who have been public officers or employees of said executive agency until after two (2) years have elapsed from the time said person has ceased working as such.
Y ⊠ N □	Income Tax Withholdings: (3 L.P.R.A. 8615(i))  The Contractor is an independent contractor and as such shall be responsible for the payment of all
N/A □	of its income taxes, its subcontractors and its individual and employers' withholdings under the applicable tax laws of Puerto Rico or the U.S. Internal Revenue Code. PREPA shall withhold or deduct from payments to the Contractor for services rendered any withholdings required by the Puerto Rico Internal Revenue Code and its regulations, including without limitation, the 7% withholding tax for services rendered in Puerto Rico (unless evidence is provided to PREPA of a total or partial waiver having been issued to Contractor by the Puerto Rico Department of Treasury) or as otherwise required by law. PREPA shall forward any such withholdings or deductions to the Secretary of the Treasury of Puerto Rico. PREPA also will notify the Secretary of the Treasury of all payments and reimbursements made to the Contractor.
	The Contractor will request PREPA not to make such withholdings if, to the satisfaction of PREPA, the Contractor timely provides a release from such obligation by the Government of Puerto Rico's Treasury Department.
Y⊠	Funds: (3 L.P.R.A. 8615(j))
N □ N/A □	PREPA certifies that the funds for the payment of Services rendered under this Agreement come from budgetary allocations. All disbursements for such payments shall be made from account [ ].
Y 🗵	<b>Child Support:</b> (3 L.P.R.A. 8615(k))
N □ N/A □	Contractor is not duty bound to pay child support, or if so, that Contractor is up to date or has a payment plan to such effects.
Y 🗵	Termination for Convenience: (3 L.P.R.A. 8615(l))
N □ N/A □	PREPA shall have the right to terminate this Agreement with thirty (30) days prior written notice to the Contractor.

$\mathbf{Y} \boxtimes$	<b>Immediate Termination:</b> (3 L.P.R.A. 8615(m))
N □ N/A □	PREPA shall have the right to terminate this Agreement immediately in the event of negligence, dereliction of duties or noncompliance by the Contractor.
Y 🗵	<b>Dispensation:</b> (3 L.P.R.A. 8615(n))
N □ N/A □	Any and all necessary dispensations have been obtained from any government entity and that said dispensations shall become part of the contracting record.
Y □ N □	No Compensation for Appointments: (3 L.P.R.A. 8615(o)) (only applicable to agreements with individuals)
N/A ⊠	The Contractor acknowledges and accepts that he or she receives no payments or compensation for regular services rendered under a designation from any other public entity, except those authorized by law.
Y⊠	Rules of Professional Ethics: (3 L.P.R.A. 8615(p))
N □ N/A □	The Contractor acknowledges and accepts that it is knowledgeable of the rules of ethics of his/her profession and assumes responsibility for his/her own actions.
Provisio	NS REGARDING WORKMEN'S COMPENSATION.
Y ⊠ N □ N/A □	The Contractor shall provide workmen's compensation insurance as required by Act 45-1935, as amended. Contractor shall also be responsible for compliance with Act 45 by all its subcontractors, agents and invitees, if any, or shall certify that such subcontractors, agents and invitees have obtained said policies on their own behalf. Contractor shall furnish to PREPA a certificate from the Puerto Rico's State Insurance Fund showing that all personnel employed in the work are covered by the workmen's compensation insurance, in accordance with this Agreement.
	NS REQUIRED UNDER JOINT MEMORANDUM 2017-001 OF THE GOVERNOR'S CHIEF OF STAFF
AND THE C	OFFICE OF MANAGEMENT AND BUDGET:
(Applicable	e to contracts for professional or acquired services in excess of \$10,000.)
$\mathbf{Y} \boxtimes$	Interagency Services Clause:
N □ N/A □	Both contracting parties acknowledge and accept that the contracted services may be rendered to any entity of the Executive Branch with which the contracting entity enters into an interagency agreement with or as determined by the office of the Chief of Staff. These services shall be rendered under the same terms and conditions with respect to work hours and compensation, as set forth in this agreement. For purposes of this provision, the term "entity of the Executive Branch" includes all agencies of the Government of Puerto Rico as well as all instrumentalities and public corporations.
Y⊠	Termination Clause Required under Section XI of Joint Memorandum 2017-001 of the
N □	Governor's Chief of Staff and the Office of Management and Budget:
N/A □	The office of the Chief of Staff shall have the authority to terminate this agreement at any time.
	NS REQUIRED UNDER ACT 14-2004:
	e to service contracts.)
Y ⊠ N □ N/A □	Articles extracted, produced, assembled, packaged or distributed in Puerto Rico by enterprises with operations in Puerto Rico, or distributed by agents established in Puerto Rico shall be used when the service is rendered, provided that they are available.

# **32.**

# MARKUP OF TERMS AND CONDITIONS

	AS SELLER
	AND
(2) PUERT	O RICO ELECTRIC POWER AUTHORITY
	AS BUYER
FUEL	SALE AND PURCHASE AGREEMENT

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# <u>ANNEXES</u>

<u>Annex A</u> – Terms and Conditions for Units Conversions and Pipeline Installation Works

THIS A	AGREEMENT is made the	is [●] of, 2018 (the " <b>Effective Date</b> ").
BETW	EEN:	
(1)	a	company (hereinafter called the "Seller"), and

(2) **PUERTO RICO ELECTRIC POWER AUTHORITY** (PREPA), a public corporation and governmental instrumentality of the Commonwealth of Puerto Rico, created by an Act of 2 May 1941, No. 83, as amended, with its principal place of business at P.O. Box 363928, San Juan, Puerto Rico 00936-3928 (hereinafter called the "**Buyer**").

The Seller and the Buyer shall each be a "Party" and, together, the "Parties".

#### WITNESSETH

WHEREAS, PREPA, by virtue of its enabling act (Act 83), has the authority to engage those professional, technical and consulting services necessary and convenient to the activities, programs, and operations of PREPA;

WHEREAS, Pursuant Section 205 (2) (f) of Act No. 83 a competitive bidding shall not be necessary when in the judgment of the Governing Board, a competitive request for proposal (RFP) process for the acquisition of goods, equipment, materials or services must be carried out to encourage greater competition, reduce the risk of collusion and promote the best possible terms and conditions in benefit of greater savings and reduction of costs and operational expenses of PREPA.

## **WHEREAS:**

- (A) Seller will build a micro fuel handling facility ("MFH Facility") to provide fuel service;
- (B) Buyer desires to convert San Juan Units # 5 and # 6 ("San Juan Power Plant") to use Natural Gas (or the proposed fuel) as its primary fuel;
- (C) Seller has agreed to supply Natural Gas (or the proposed fuel) to the San Juan Power Plant through its MFH Facility on the terms herein set forth; and
- (D) the Parties estimate the conversion of the San Juan Power Plant could result in savings of up to \$[•] on an annual basis to Buyer and its ratepayers.

#### NOW, THEREFORE, THE SELLER AND THE BUYER HEREBY AGREE as follows:

## **ARTICLE 14. DEFINITIONS AND INTERPRETATION**

#### 1.1 Definitions

In this Agreement, except where the context otherwise requires, each of the following expressions have the following meaning:

- "Affiliate" means, in relation to a Party, any company, corporation, partnership or other legal entity (in this definition referred to as a "Company"): (a) that is directly or indirectly controlled by such Party; (b) that directly or indirectly controls such Party; or (c) that is directly or indirectly controlled by a Company that also, directly or indirectly, controls such Party. For the purpose of this definition, "Control" means the beneficial ownership, either directly or indirectly, of fifty percent (50%) or more of the voting rights in a Company, or (whether alone or acting in concert with others, and whether by the ownership of share capital, the possession of voting power, contract or otherwise) the right to appoint fifty percent (50%) or more of the board of directors or equivalent management body of such Company.
- "Agreement" means this Agreement and its Annexes, as may be amended, modified, varied or supplemented from time to time.
- "Annual Contract Quantity" or "ACQ" shall have the meaning given to it in Clause 7.4(a)(i).
- "Annual Delivery Programme" or "ADP" shall have the meaning given to it in Clause 7.4(a).
- "Applicable Law" means, in relation to any legal person, property, transaction or event, all applicable provisions of laws, treaties, conventions, statutes, rules, regulations, permits, official directives and orders of, and the terms of all judgments, orders, awards, and decrees issued by, any Competent Authority by which such legal Person is bound or having application to the property, transaction or event in question.
  - "Binding Monthly Schedule" shall have the meaning given to it in Clause 7.4(a)(iii).
- "**Btu**" means a British thermal unit, being that amount of heat that is equal to 1,055.056 Joules or 0.000293071 kWh.
- "Business Day" means a Day, other than a Saturday, Sunday or a public holiday in San Juan (Puerto Rico) or New York (United States).
  - "Buyer" shall have the meaning given to it in the preamble to this Agreement.
  - "Buyer Check Meter" shall have the meaning given to it in Clause 10.2(b).
  - "Capacity Payment" shall have the meaning given to it in Clause 13.1.
- "Change Order" A written agreement between the parties that sets out changes (in price, time, or scope of work) to the Contract.
  - "Claims" shall have the meaning given to it in <u>Clause 11</u>.
- "Commissioning Start Date" means the later of the first day Buyer requires Natural Gas to test or commission the San Juan Power Plant and the first Day that the MFH Facility is able to make Natural Gas available at the Delivery Point.

"Competent Authority" means any local, federal, state, regional, provincial, municipal, national or supra-national governmental agency, authority, department, inspectorate, minister, official, court, tribunal or public or statutory Person (whether autonomous or not) which has jurisdiction in relation to the performance of this Agreement by either Party including, for the avoidance of doubt, any licensing authority and any port authority, in each case acting within its legal authority, but excluding, for the avoidance of doubt, any Party.

"Confidential information" shall have the meaning given to it in Clause 27.1.

"Contract Price" shall mean the sum of the Fuel Contract Price and the Units Conversions and Pipeline Installation Works Cost.

"Contract Quarter" means each calendar quarter (beginning each of January, April, July and October) during the Contract Year, provided that the first Contract Quarter shall begin as of the first Day of the Firm Supply Period and end on the last Day of such calendar quarter and the last Contract Quarter shall end on the last Day of the Firm Supply Period.

"Contract Term" shall have the meaning given to it in Clause 3.1(a).

"Contract Year" means any calendar year during the Firm Supply Period, except for the first Contract Year, which shall commence on the first Day of the Firm Supply Period, and the last Contract Year, which shall end on the last Day of the Firm Supply Period.

"Contracting Officer" - shall mean the Chief Executive Officer of PREPA, acting directly or through his properly authorized representatives as notified in writing to the Seller.

"Corporate Tax" means any and all Taxes based on income, revenues, profits, or net worth and all state and local franchise, license, occupation and similar Taxes required for the maintenance of corporate existence or to maintain good standing that are assessed against a Party.

"Daily Contract Quantity" or "DCQ" shall have the meaning given to it in Clause 6.6.

"**Day**" means a period of twenty four (24) consecutive hours beginning at 00:00 hours local time in Puerto Rico.

"Defaulting Party" shall have the meaning given to it in Clause 19.1(b).

"**Delivery Point**" means the point of interconnection between San Juan Power Plant and the MFH Facility as identified on the schematic attached as Annex \_\_\_. For this Contract the delivery point shall be a flange in the San Juan Power Plant limits.

"Disclosing Party" shall have the meaning given to it in Clause 27.1.

"**Dispute**" shall have the meaning given to it in Clause 25.1(a).

"Effective Date" shall have the meaning given to it in the preamble to this Agreement.

<sup>&</sup>lt;sup>1</sup> NTD: Subject to review of schematic. Parties to discuss optimal line of demarcation for responsibility.

"Environmental Compliance Officer" - PREPA's personnel in charge of project inspections and environmental regulations compliance.

"Expert" means a Person of appropriate industry expertise and experience to whom a Dispute, disagreement or another matter of interpretation is or is to be referred to pursuant to Clause 20.225.2.

"Firm Supply Conditions" shall have the meaning given to it in Clause 3.2.

"Firm Supply Conditions Date" shall have the meaning given to it in Clause 3.4.

"Firm Supply Period" shall have the meaning given to it in Clause 5.3.

"Force Majeure" shall have the meaning given to it in <u>Clause 15.1</u>.

"Fuel Contract Price" shall have the meaning given to it in Clause 12.1.

"Governmental Authority" means the government of the United States of America, any state thereof, the Commonwealth of Puerto Rico, or any local jurisdiction, or any political subdivision of any of the foregoing including, but not limited to courts, administrative bodies, departments, commissions, boards, bureaus, agencies, municipalities or other instrumentalities.

"Heating Value" (also known as High Heating Value (HHV)) means the gross heating value on a dry basis, which is the number of Btu's produced by the complete combustion at constant pressure of the amount of dry gas that would occupy a volume of one Standard Cubic Foot at a constant pressure of 14.73 psia and a temperature of 60° F with combustion air at the same temperature and pressure as the gas, the products of combustion being cooled to the initial temperature of the gas and air and the water formed by combustion condensed to the liquid state.

"Joule" means a unit of energy defined in the International System of Units.

"kWh" shall mean kilowatt per hour.

"LIBOR" means the rate per annum which the British Bankers' Association was offering to prime banks in the London interbank market for deposits in US\$ for a one (1) year period, determined at 11:00 am London Time, as quoted on the date when payment was due. Interest should be calculated on the basis of a 360 Day year, shall accrue daily and be compounded at 3-monthly rests.

"LNG" means Natural Gas in a liquid state at or below its boiling point and at or near atmospheric pressure.

"LNG Delivery Plan" shall have the meaning given to it in Clause 15.1(a).

"Long-Stop Date" shall have the meaning given to it in Clause 3.1(a).

"Maximum Annual Contract Quantity" shall have the meaning given to it in Clause 6.1.

"Maximum DCQ" shall have the meaning given to it in Clause 6.6.

- "Maximum Hourly Rate" shall have the meaning given to it in Clause 6.7(a).
- "Metering Equipment" shall have the meaning given to it in Clause 10.2(a).
- "MFH Facility" shall have the meaning given to it in the Recitals.
- "MMBtu" means 1,000,000 Btu.
- "Mmscf" means one million Standard Cubic Feet.
- "Monthly Invoice" shall have the meaning given to it in Clause 13.213.1.
- "Natural Gas" or "NG" means any saturated hydrocarbon or mixture of saturated hydrocarbons consisting essentially of methane and other combustible and non-combustible gases in a gaseous state.
  - "Ninety Day Schedule" or "NDS" shall have the meaning given to it in Clause 7.4(a)(iii).
- "Off-Spec Natural Gas" is any Natural Gas that does not conform to the Specifications set forth in Clause 4.1.
- "Party" and "Parties" shall have the meaning given to them in the preamble to this Agreement.
- "Person" shall mean an individual, a corporation, a partnership, a limited liability company, an association, a joint stock company, a trust, any unincorporated organization, or any Governmental Authority.
- "Reasonable and Prudent Operator" means a Person seeking in good faith to perform its contractual obligations and comply with Applicable Law, and in so doing, and in the general conduct of its undertaking, exercising that degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced international operator engaged in the same type of undertaking under the same or similar circumstances and conditions.
  - "Receiving Party" shall have the meaning given to it in Clause 22.1.
- "Resident Engineer" shall mean the manager of the field office responsible for, but not limited to, the administrative issues, quality control, and technical aspects of the project. This person shall be a professional engineer register in Puerto Rico and an active member of the Puerto Rico College of Engineers and Land Surveyors. The Resident Engineer shall be present at all times on site in order to the Seller be able to perform any task of the project.
  - "Responsible Party" shall have the meaning given to it in Clause 3.5.
- "Safety Officer"—shall be the person designated by the Seller whose only duty shall be the prevention of accidents and implement, both, the Safety and Health Program and the Site-specific Work Plan. The Safety Officer shall be present at all times on site in order to the Seller be able to perform any task of the project.

"San Juan Power Plant" shall have the meaning given to it in the Recitals.

"Scheduled Maintenance" shall mean the maintenance period scheduled to be performed on the San Juan Power Plant to occur for the durations specified on Annex C during the Firm Supply Period.

"Seller" shall have the meaning given to it in the preamble to this Agreement.

"Seller Shortfall Quantity" shall have the meaning given to it in Clause 9.1.

"Shortfall Payment" shall have the meaning given to it in Clause 9.2.

"**Specifications**" shall have the meaning given to it in <u>Clause 4.1</u>.

"Standard Cubic Foot" or "scf" means Natural Gas at a base temperature of 60° F and at a pressure of 14.73 psia with correction for deviation from Boyle's Law.

"Supply Period" shall have the meaning given to it in Clause 5.1.

"Taxes" shall have the meaning given to it in Clause 14.1.

"TBtu" means 1,000,000,000,000 Btu.

"Termination Event" shall have the meaning given to it in Clause 19.1(b).

["Terms and Conditions of Units Conversions and Pipeline Installation Works" means the requirements, Clauses, and processes for the Units Conversions and Pipeline Installation Works included as Annex A.] $^2$ 

"Third Party" means any legal Person not a Party to this Agreement.

"Transitional Supply Period" shall have the meaning given to it in Clause 5.2.

["Units Conversions and Pipeline Installation Works" means the design, engineering, construction, and installation works performed by the Seller or its affiliates or subcontractors to deliver fuel to San Juan Power Plant Units 5 and 6 from the Delivery Point and their conversions.]

["Units Conversions and Pipeline Installation Works Cost" shall mean the cost of the design, engineering, construction, and installation of LNG pipeline from the delivery point to Units 5 and 6 and the units' conversions.]

"US" means the United States of America.

"US Dollars" or "US\$" means the lawful currency of the United States of America.

"Weekly Programme" shall have the meaning given to it in Clause 7.4(a)(iv).

<sup>&</sup>lt;sup>2</sup> NTD: Term does not appear to be used elsewhere.

#### 1.2 Interpretation

In this Agreement, unless the context requires otherwise:

- (a) References to Clauses and Annexes are to Clauses and Annexes of this Agreement. The Annexes hereto are incorporated herein as an integral part of this Agreement.
- (b) References to a Person include that Person's successors and permitted assigns.
- (c) Headings of Clauses and Annexes are for convenience only and shall not affect the construction or interpretation of this Agreement.
- (d) Where the context requires, words denoting the singular or masculine or neuter only shall include the plural, feminine, body politic or corporate and vice versa.
- (e) References to "include" and "including" shall be construed as "including without limitation."
- (f) The words "agree," "agrees," and "agreed" refer to a written agreement, executed and delivered by the Parties.
- (g) Wherever either Party's consent or agreement is expressed to "not be unreasonably withheld," it is acknowledged that such obligation shall include, but not be limited to, the obligation of the Party not unreasonably to delay giving the relevant consent or agreement, and in the foregoing case as well as wherever either Party undertakes "efforts" or "endeavours" to do something, or refrain from doing something, it is acknowledged that such Party shall not be in breach of its obligations to the other Party to the extent that such Party's actions are limited by such Party's need to comply with its contractual obligations to any Person, provided that such Party has used its reasonable efforts to obtain any necessary waiver(s) of such relevant obligations and that such Party has not assumed such obligations subsequent to entering into this Agreement.
- (h) Any law, statute or statutory provision shall be construed as a reference to the same as it may be amended, modified or re-enacted, from time to time, and shall include any subordinate legislation made from time to time under that provision.
- (i) If at any time during the Supply Period, LIBOR becomes unavailable or inappropriate then the Parties shall meet as soon as possible thereafter and in good faith discuss and attempt to agree in writing upon a suitable alternative replacement. If the Parties are unable to so agree upon a suitable alternative replacement, then either Party may refer the matter to an Expert for determination in accordance with Clause  $\frac{20.2}{25.2}$ .

## **ARTICLE II2.** SALE AND PURCHASE

Seller agrees to sell and make available to Buyer, and Buyer agrees to purchase from Seller, Natural Gas at the Delivery Point in compliance with Clause 4 "Quality" for the San Juan Power Plant. The quantity of Natural Gas to be made available by Seller at the Delivery Point shall be the amount required to operate the San Juan Power Plant primarily on Natural Gas, as scheduled in accordance with Clause 7. The price for such quantities shall be determined in accordance with Clause 12.<sup>3</sup>

## **ARTICLE III3.** DURATION AND CONDITIONS

#### 3.1 Contract Term<sup>4</sup>

- This Agreement shall enter into full force and effect on the Effective Date and shall, subject to the terms hereof, continue in force and effect until and including the later of (i) the fifth (5<sup>th</sup>) anniversary of the first Day of the Supply Period, and (ii) any extension agreed to pursuant to Clause 3.1(b) (the initial Contract Term and the extension above shall hereinafter referred to as the "Contract Term").
- (b) The Parties may extend the Contract Term on such terms and conditions as they may agree to in writing. This contract will be for a base period of Five (5) years with three (3) separate options of five (5) year extensions at Buyer's sole<sup>5</sup> discretion. The Seller shall be responsible for the scope of work and associated capital cost required for LNG gas conversion of PREPA's San Juan Units 5 and 6, as well as modifications to associated turbine controls.

#### 3.2 Each of the following will be "Firm Supply Conditions":

- the Buyer shall have obtained the necessary permits from the relevant (a) Competent Authorities, including the Environmental Air Quality Permit required by the Puerto Rico Environmental Quality Board due to the Natural Gas Specifications; and
- the Seller shall have performed, or caused to be performed, the technical modifications required to enable the Seller to deliver Natural Gas on a fully operational basis to the San Juan Power Plant at the Delivery Point, including the obtaining of the necessary permits for the construction works from the relevant Competent Authorities, with such technical modifications and permits necessary to satisfy its Firm Supply Conditions set out in detail in Annex to this Agreement.
- 3.3 The Parties shall keep each other duly informed of the fulfillment of each of the Firm Supply Conditions. Each Party shall notify the other Party in writing of the date on

<sup>&</sup>lt;sup>3</sup> NTD: Discuss exclusivity of NFE's right to supply natural gas to PREPA in connection with the project.

<sup>&</sup>lt;sup>4</sup> NTD: Discuss structure for firm supply period and commissioning period.

<sup>&</sup>lt;sup>5</sup> NTD: Discuss what notice, if any, of extension periods would be provided and whether the terms would remain the same from the base period to the extension period.

which it anticipates that the respective Firm Supply Condition for which it is responsible will be satisfied no less than thirty (30) Days prior to such anticipated date<sup>6</sup>. As soon as each Firm Supply Condition is satisfied, each Party shall confirm in writing the Firm Supply Conditions fulfilment.

- 3.4 The Firm Supply Period will commence as provided in <u>Clause 5.3</u>. The "**Firm Supply Conditions Date**" shall be the date on which the Firm Supply Conditions have been satisfied or expressly waived in accordance with <u>Clause 3.8</u>, provided that the Firm Supply Conditions Date will not occur until the latest date specified in a notice properly delivered under Clause 3.3.
- 3.5 Each Party shall endeavour in good faith to satisfy or procure the satisfaction of each Firm Supply Condition for which it is responsible (each such Party for the purposes of this <u>Clause 3</u> being the "**Responsible Party**"). Buyer shall be the Responsible Party for the Firm Supply Condition described in <u>Clause 3.2(a)</u> and Seller shall be the Responsible Party for the Firm Supply Condition described in <u>Clause 3.2(b)</u>. <u>Buyer shall, and shall use its reasonable efforts to ensure that other Governmental Authorities shall, (i) approve each Party's Permits that are required in order to satisfy the Firm Supply Conditions in a timely manner and (ii) not interfere with Seller's ability to deliver or Buyer's ability to accept the quantity of Natural Gas contemplated hereby.</u>
- 3.6 Each Party shall furnish the other Party upon request by such other Party with any reasonable assistance in fulfilling each Firm Supply Condition for which that other Party is the Responsible Party.
- 3.7 Upon the satisfaction of any Firm Supply Condition, the Responsible Party shall give prompt written notice thereof to the other Party.
- 3.8 The requirement for the satisfaction of any Firm Supply Condition can only be waived by the written agreement of both Parties.

## **ARTICLE IV4. QUALITY**

- 4.1 The Natural Gas delivered by the Seller to or for the account of the Buyer at the Delivery Point:
  - (a) shall not contain sand, dust, gums, crude oil, impurities or other objectionable substances which may be injurious to pipelines or may interfere with the transmission of the Natural Gas;
  - (b) shall not contain more than three-tenths grains of hydrogen sulfide per hundred standard cubic feet of Natural Gas volume, as measured by methods in accordance with accepted industry practice;

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<sup>&</sup>lt;sup>6</sup> NTD: To be discussed.

- (c) shall not contain more than two grains of total sulfur per hundred standard cubic feet of Natural Gas volume, as measured by methods in accordance with accepted industry practice;
- (d) shall not contain more than 0.25 grains of mercaptan sulfur per hundred standard cubic feet of Natural Gas volume, as measured by methods in accordance with accepted industry practice;
- (e) shall not contain more than two percent (2%) by volume of carbon dioxide, as measured by methods in accordance with acceptable industry practice;
- (f) shall not have a water vapour content in excess of seven pounds per million standard cubic feet of Natural Gas volume, such vapour content to be measured by methods in accordance with accepted industry practice;
- (g) shall be as free of oxygen as it can be kept through the exercise of all reasonable precautions and shall not in any event contain more than zero point four (0.4%) by volume of oxygen, as measured by methods in accordance with acceptable industry practice;
- (h) shall have a Heating Value of not less than 950 Btu per Standard Cubic Foot and not more than 1165 Btu per Standard Cubic Foot. The Heating Value shall be measured by methods in accordance with accepted industry practice, such as, but not limited to, recording calorimeter(s) or Natural Gas chromatograph(s) located at appropriate points; and
- (i) shall be delivered to the Delivery Point at a temperature of more than 40° 0° F and less than 100° 150° F, and at the maximum pressure available when operating the LNG Facilities' vaporizers at a pressure of 650 pounds per square inch gauge. 

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The quality specifications set out in paragraphs (a) to (i) above shall be deemed to be the "Specifications." The standard test methods as described in the Seller's operating procedures applicable at the MFH Facility shall be used to determine compliance with the Specifications.

- 4.2 Failure of Natural Gas to Conform to Specifications
  - (a) Seller shall notify Buyer as soon as reasonably practicable after becoming aware of any existing or anticipated failure of the NG available for delivery to the Delivery Point to conform to the Specifications, giving details of the nature and expected magnitude of the variance, the cause of the non-compliance and the probable duration, including the delivery time of such Off-Spec Natural Gas.
  - (b) If at any time, the NG offered for delivery by the Seller is or is <u>reasonably</u> expected <u>by Seller</u> to be Off-Spec Natural Gas, the Buyer may reject in whole or in

<sup>&</sup>lt;sup>7</sup> NTD: Revisions pursuant to feedback from Mitsubishi and Black and Veatch.

part the delivery of such gas as well as any further deliveries of such Off-Spec Natural Gas.

- (c) If at any time, the Seller is unable to deliver NG conforming to the Specifications but is able to deliver Off-Spec Natural Gas, the Seller may withhold deliveries until such time as it is able to deliver NG conforming to the Specifications; provided however, that in such event the Buyer shall be entitled to request delivery of such Off-Spec Natural Gas (a "Delivery Confirmation Request"), unless such delivery, in the Seller's opinion acting as a Reasonable and Prudent Operator, would have a detrimental effect on the MFH Facility or related facilities upstream of the Delivery Point.
- (d) Unless both (i) Buyer is notified of the full extent to which Off-Spec Natural Gas actually fails to meet the Specifications, and (ii) Buyer waives makes a Delivery Confirmation Request pursuant to Clause 4.2(c) (which shall constitute a waiver in writing of its right to reject such Off-Spec Natural Gas), the Seller shall be liable for all damages incurred by the Buyer as a result of the acceptance delivery of such Off-Spec Natural Gas, including all the reasonable costs and expenses incurred (over and above those normally incurred in accepting conforming Natural Gas) in receiving and treating such Off-Spec Natural Gas by such means as are appropriate; provided, that the Buyer shall exercise commercially reasonable practices to minimize the costs and expenses which may occur.
- (e) If both (i) Buyer is notified of the full extent to which Off-Spec Natural Gas actually fails to meet the Specifications, and (ii) Buyer waives in writing its right to reject such Off-Spec Natural Gas, such Off-Spec Natural Gas shall be deemed to have been delivered in accordance with this Agreement and the Seller shall not be liable for any damages to the Buyer for the acceptance of such Off-Spec Natural Gas; provided, however, that [said NG shall be paid for at eighty-five percent (85%)] 8 of the Fuel Contract Price.
- (f) When NG is not taken by the Buyer due to it being Off-Spec Natural Gas or when Seller withholds NG pursuant to <u>Clause 4.2(c)</u>, the Buyer shall not be obliged to pay for such NG not taken, and such NG not taken shall be deemed not to have been made available and shall be considered a "**Seller's Shortfall Quantity.**"
- (g) The Buyer shall have no right or remedy with respect to the Off-Spec Natural Gas other than those stated or referred to in this <u>Clause 4.2</u>.
- 4.3 Any Dispute between the Parties concerning the measurement and/or testing of NG for the purposes of determining the quality thereof at the Delivery Point, shall be settled in accordance with the provisions of Clause 20.2-25.2 of this Agreement.

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<sup>8</sup> NTD: Discuss whether a pro-rated remedy will be more equitable.

#### **ARTICLE V5. SUPPLY PERIOD**

- 5.1 The supply period for NG shall begin on the Commissioning Start Date and shall continue in force until and including the last Day of the Contract Term (the "Supply Period").
- 5.2 The phase of the Supply Period from, and including, the Commissioning Start Date to, and including, the Firm Supply Conditions Date shall be considered to be a transitional supply period (the "**Transitional Supply Period**").
- 5.3 The phase of the Supply Period from and including the first Day of the first calendar month that commences after the Firm Supply Conditions Date to and including the last Day of the Contract Term shall be the "**Firm Supply Period**."

## **ARTICLE VI6.** NG QUANTITIES

- 6.1 The "Maximum Annual Contract Quantity" for each Contract Year shall be [twenty five (25)] TBTU unless otherwise agreed in writing by the parties.
- 6.2 The Maximum Annual Contract Quantity shall be prorated downward rateably for each Contract Year of less than three hundred and sixty five (365) Days. Without prejudice to the provisions of Clause 6.5 and taking into account the Seller's commercial and technical restrictions and subject to the Parties and Seller obtaining any relevant permits, the Parties may agree, each in its sole and absolute discretion, that prior to the Firm Supply Conditions Date<sup>9</sup> (a) the Seller shall sell and deliver NG to the Buyer at the Delivery Point and (b) the Buyer shall purchase and take delivery of NG from the Seller at the Delivery Point during the Transitional Supply Period.
- 6.3 If such agreement is so reached, in each Party's sole discretion, pursuant to Clause 6.2-<u>all</u> the terms and conditions of this Agreement shall apply *mutatis mutandis* during the Transitional Supply Period and in particular:
  - (a) The Seller shall make available the quantities of NG thus agreed in accordance with <u>Clause 7.1–6.2</u> and Buyer shall pay for such quantities of NG, in each case in accordance with this Agreement, provided that the quantities of NG to be delivered shall be agreed by the Parties and shall not exceed:
    - (i) the maximum amount of NG that the Seller can supply technically, legally and commercially; and
    - (ii) The maximum amount of NG that the Buyer can consume at the San Juan Power Plant.

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<sup>&</sup>lt;sup>9</sup> NTD: Discuss appropriate contractual conditions for nomination and scheduling of LNG supply during the Transitional Supply Period.

- (b) The price applicable to the NG quantities consumed during the Transitional Supply Period shall be the Fuel Contract Price calculated in accordance with Clause 12.1 for the relevant month of consumption.
- 6.4 The Parties shall be in contact on a regular basis to define the quantities to deliver and start the supply as soon as practicable during the Transitional Supply Period.
- 6.5 Unless the Parties reach an agreement in accordance with Clause 6.2, neither Party shall:
  - (a) be obliged to sell, make available, deliver, purchase or take delivery of NG, as appropriate, during the Transitional Supply Period; nor
  - (b) be liable to the other during the Transitional Supply Period for any failure to so sell deliver, purchase or take delivery of NG.
- 6.6 In respect of each Day of every Contract Year, the Daily Contract Quantity ("**DCQ**") shall be the daily nomination for each Day of the Binding Monthly Schedule. The "**Maximum DCQ**" that Buyer may nominate for any Day shall be [93 MMscf] per Day, provided, however, that Seller shall use reasonable efforts to comply with Buyer's request to deliver a quantity on a Day in excess of the applicable Maximum DCQ. 10

#### 6.7 Maximum Hourly Rate

- (a) The Seller shall not be obliged, notwithstanding any other provision of this Agreement, to deliver the DCQ at an hourly rate over [3.875 MMscf] per hour ("Maximum Hourly Rate"); provided, however, that Seller shall use reasonable efforts to comply with the Buyer's requests to exceed such Maximum Hourly Rate to the extent necessary for Buyer's demand, subject to the operation of San Juan Power Plant. 11
- (b) The Buyer shall not be obliged, notwithstanding any other provision of this Agreement, to receive the DCQ at an hourly rate over the Maximum Hourly Rate; provided, however, that the Buyer shall use reasonable efforts to comply with the Seller's exceptional requests to exceed such Maximum Hourly Rate to the extent necessary for the performance of this Agreement.

#### ARTICLE VII7. SCHEDULING<sup>12</sup>

## 7.1 Transitional Supply Period

According to <u>Clause 6.2</u>, the Parties may agree to a binding delivery programme for the Transitional Supply Period.

<sup>&</sup>lt;sup>10</sup> NTD: To discuss Maximum DCQ.

<sup>11</sup> NTD: To discuss Maximum Hourly Rate.

<sup>12</sup> NTD: To discuss supply periods and commissioning periods.

During the Transitional Supply Period, Clauses 7.4(a)(iii), 7.4(a)(iv) and 7.5 shall apply *mutatis mutandis* to the binding NG quantities agreed between the Parties in accordance with Clause 6.3.

7.2 Firm Supply Period - first Contract Year

The first Contract Year shall begin on the first day of the Firm Supply Period and end on December 31.

7.3 Firm Supply Period — except for first Contract Year:

Each Contract Year shall begin on January 1st, of the Contact Year at 00:00 local time and end on December 31st, of the Contract Year at 24:00 local time.

- 7.4 With respect to each Contract Year during the Firm Supply Period, the following provisions shall apply:
  - (a) The Annual Delivery Programme ("ADP"), Ninety-Day Schedule ("NDS") and Weekly Programme for such Contract Years shall be established according to the following conditions:
    - (i) Except for the first Contract Year, on or before 1st June, the Buyer shall nominate the "Annual Contract Quantity" or "ACQ" for the upcoming Contract Year, which ACQ must be between zero (0) MMscf and the Maximum Annual Contract Quantity for such Contract Year. The ACQ shall be final and binding.

In addition to the ACQ, the Buyer shall provide:

- (A) 1-an estimate of its consumption on a quarterly basis; and
- (B) 2.its non-binding estimate of the dates of any Scheduled Maintenance expected to occur during such Contract Year.

Regarding the first Contract Year, an estimation of the ACQ and the information required in this <u>Clause 7.4(a)(i)</u> are attached hereto as Annex C. [Once the Firm Supply Condition Date occurs, the Buyer shall confirm no later than ten (10) Days after such event, the final and binding ACQ for the first Contract Year.]<sup>13</sup>

(ii) Except for the first Contract Year, on or before 1st October of each year thereafter, the Buyer shall provide to the Seller an ADP for the ACQ informed by the Buyer in accordance with Clause 7.4(a)(i), for the following Contract Year on a monthly basis, the sum of the quantities of the months of each calendar quarter ("Quarterly Binding Quantity") being

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<sup>&</sup>lt;sup>13</sup> NTD: Discuss timing of notices.

binding. This ADP shall include the final dates of any Scheduled Maintenance to occur during such Contract Year.

[Regarding the first Contract Year, the Buyer shall provide the Seller an estimated ADP no later than thirty (30) Days after the Effective Date. Once the Firm Supply Condition Date occurs, the Buyer shall confirm no later than ten (10) Day after such event, the final and binding ADP for the first Contract Year.]<sup>14</sup>

- On or before the fifth (5th) Day of month M-1 the Buyer shall (iii) provide to the Seller its NG requirements for the next three (3) months (the "NDS"). On or before the fifteenth (15th) Day of month M-1 and in accordance with Clause 7.4(b), the Seller shall confirm the NDS. The NDS shall be binding for month M (the "Binding Monthly Schedule") and nonbinding for month M+l and M+2. Such NDS shall include the monthly quantities to be delivered in each of the next three months, as well as the daily requirements for month M. Buyer may request additional Natural Gas from Seller for month M after the deadline for submission of the NDS. Upon receipt of such a request, Seller shall inform Buyer within three (3) Days whether Seller can deliver all or a portion of such quantities and the applicable price, and Buyer shall have two (2) Days to accept or decline Seller's offer. If Buyer accepts Seller's offer, such quantities shall become firm. Further, Buyer shall use commercially reasonable efforts to include in each NDS estimated, non-binding daily requirements for months M+l and M+2; and
- (iv) On or before 00.00 hours Puerto Rico Time of each Wednesday of each week, or, if such Day is not a Business Day, on the Business Day immediately preceding such Day, the Buyer shall provide to the Seller a daily estimate of its NG requirements for the coming week, to be provided on a daily basis with hourly detail. This weekly programme ("Weekly Programme") shall be reasonably adjusted to the original NDS for the applicable month.

For the purpose of this Clause each Weekly Programme shall contain consumption details beginning 00:00 hours Sunday until 23:59 hours the following Saturday.

(b) The Parties shall cooperate in the scheduling to ensure that the supply of Natural Gas to the San Juan Power Plant is as regular and as even as practicable (subject to the Buyer's Scheduled Maintenances) in a manner that is consistent with the Seller's projected deliveries and use of LNG, as such projected deliveries or requirements may be adjusted or exist from time to time.

15

<sup>&</sup>lt;sup>14</sup> NTD: Discuss timing of notices.

- (c) The Buyer designates the Operational Manager as specified in <u>Clause 24</u> to make all the notifications required under this <u>Clause 7.4</u>.
- 7.5 If Buyer determines that it no longer requires the quantity of Natural Gas set forth in the Binding Monthly Schedule, Buyer shall promptly provide notice to Seller of the quantities not needed (such notified amount, the "Excess Nomination"). Seller shall use commercially reasonable efforts to sell the Excess Nomination, whether as Natural Gas or as LNG, at a reasonable price. If Seller is able to sell all or a portion of such Excess Nomination, Seller shall credit to Buyer the proceeds of such sale, less Seller's costs to make and perform such sale. If Seller is unable to sell all or a portion of such Excess Nomination, Seller shall retain such quantities and credit Buyer with an amount equal to fifteen (15) percent of the Fuel Contract Price multiplied by the quantity not sold by the Day it would have otherwise been made available.

## **ARTICLE VIII8.** [RESERVED]

#### ARTICLE IX9. SELLER'S SHORTFALL<sup>16</sup>

- 9.1 If, for any reason other than the occurrence of (a) an event of Force Majeure or (b) reasons attributable to the Buyer, the Seller fails to deliver the scheduled quantity for delivery to the Buyer in the Binding Monthly Schedule for the applicable months of any Contract Quarter (the "Seller Shortfall Quantity") the Seller shall be liable to the Buyer in accordance with this Clause 9.
- 9.2 If a Seller Shortfall Quantity occurs, Seller shall pay liquidated damages to the Buyer in the form of an amount (a "Shortfall Payment") equal to (a) the Seller's Shortfall Quantity multiplied by (b) fifteen percent (15%) of the of the applicable Fuel Contract Price.
- 9.3 Any Shortfall Payment shall be due and payable by the Seller to the Buyer in accordance with <u>Clause 139.2</u>.
- 9.4 Seller agrees that Buyer's damages associated with Seller's failure to deliver NG hereunder would be difficult to estimate, and that <u>Clause 9.2</u> represents a reasonable estimate of such damages.

#### **ARTICLE X10.** MEASUREMENT AND TESTING

#### 10.1 Unit of Measurement

The following guidelines shall be followed with regard to the units of measurement to be used by either Party to comply, as appropriate, with the provisions of this Agreement:

<sup>&</sup>lt;sup>15</sup> NTD: Discuss mitigation sale mechanics. It is unclear what the credit described in this section is to be applied against, in the absence of a customary seller cover remedy in these circumstances.

<sup>&</sup>lt;sup>16</sup> NTD: Discuss how to handle scheduled maintenance.

- (a) The unit for the purpose of measuring volume shall be one cubic foot of Natural Gas at a base temperature of sixty degrees (60°) F and at a pressure of 14.73 psia with correction for deviation from Boyle's Law. Computation of volumes, including any deviation from Boyle's Law, shall comply with applicable rules, regulations, and orders promulgated by the appropriate regulatory authorities having jurisdiction. For payment purposes, the volume of Natural Gas delivered hereunder will be determined at the pressure reported by the Metering Equipment or based on fifteen (15) Day average flowing pressure corrected, if necessary, in the event that the Metering Equipment is inoperable or not measuring accurately, as applicable, and will be multiplied by the Btu content per cubic foot to obtain the total Btu contained within such volume of Natural Gas.
- (b) For purposes of measurement and meter calibration, the atmospheric pressure shall be assumed to be 14.73 psia, irrespective of actual elevation or location of the Delivery Point above sea level, or variations in such atmospheric pressure from time to time.
- (c) The static pressure of the Natural Gas passing through the Metering Equipment shall be determined by the use of electronic measurement equipment or by the use of another pressure recording device reasonably acceptable to both Parties. The instantaneous static pressure measurements from the electronic measurement equipment or the arithmetic average of the temperature recorded each Day shall be used in computing Natural Gas volumes.
- (d) If Metering Equipment requiring the use of specific gravity is used, then the specific gravity of the Natural Gas delivered hereunder shall be determined by a method according to accepted industry practice. If a recording gravitometer is used, then the arithmetic average of the specific gravity of the Natural Gas flowing through the meters shall be used in computing Natural Gas volumes. If a spot test method is used, then the specific gravity of the Natural Gas delivered hereunder shall be determined as often as found necessary in practice. Any such test shall determine the specific gravity to be used in computation of volumes values effective the first Day of the following month and shall continue to be used until changed in a like manner by a subsequent test.
- (e) The temperature of the Natural Gas shall be determined by a recording thermometer installed so that it will record the temperature of the Natural Gas flowing through the meters, and such flowing temperature shall be corrected to Fahrenheit.
- (f) Heating Value and energy content will be measured by the Seller as described in "Appendix F Heating Value Calculation of API MPMS, Chapter 14.3." The determination of Natural Gas composition shall be in accordance with the GPA Standard 226 "Analysis for Natural Gas Chromatography" and GPA Standard 2172 "Calculation of Gross Heating Value relative density and compressibility factor for Natural Gas Mixtures from compositional analysis". The composition of the NG shall be continuously measured by on-line chromatographs

installed and maintained (or caused to be installed and maintained) by Seller at Seller's sole expense. The Heating Value of the NG shall be calculated using results from the on-line chromatograph. In the event of failure of the on-line NG chromatograph, chromatograph analysis of samples collected proportional to the flow through the meters shall be Used. All electronic metering shall comply with the API Manual of Petroleum Standards, Chapter 21, Flow Measurement Using Electronic Metering Systems, First Edition, dated September 1993, and any subsequent modification and amendment thereof.

(g) The energy content of all NG delivered hereunder shall be in Btu and shall equal the Standard Cubic Feet of such NG multiplied by the Heating Value of such NG.

## 10.2 Metering Equipment

- (a) Prior to the start of the Supply Period, the Seller will install or cause to be installed, at Seller's expense, a main and a back-up meter and other equipment as necessary to measure the volume of Natural Gas delivered hereunder (the "Metering Equipment"). The Metering Equipment will be installed at the point identified as "Seller Metering Station" on the schematic attached as Annex A. The Metering Equipment shall be designed and installed in accordance with the current recommendations of the American Gas Association. If the Metering Equipment (or component(s) thereof) is out of se ice or registering inaccurately, the volumes of Natural Gas delivered hereunder shall be estimated as follows, in descending order of priority:
  - (i) by using the registration of the Buyer Check Meter;
  - (ii) by correcting the error if the percentage of error is ascertainable by calibration, test, or mathematical calculation; or
  - (iii) by estimating the quantity of delivery by measuring deliveries during prior periods under similar conditions when any meter was registering accurately.
- (b) Buyer has a meter equipment necessary to measure the volume of Natural Gas delivered hereunder (the "Buyer Check Meter"). The Buyer Check Meter is installed at the point identified as "Buyer Metering Station" on the schematic attached as Annex A. The Buyer Check Meter is designed and installed in accordance with the current recommendations of the American Gas Association. In the event that Buyer notifies Seller of a material discrepancy between the quantity of Natural Gas delivered at the Delivery Point by Seller according to the Buyer Check Meter, and the quantity of Natural Gas measured by the Metering Equipment, the Parties will resolve and correct such discrepancy (including with respect to adjustments for prior Natural Gas deliveries).
- (c) For the avoidance of doubt, it is the intent of the Parties that Natural Gas will only be considered delivered when it reaches the Delivery Point, and that any

Natural Gas measured at the Metering Equipment that is not actually delivered to the Delivery Point will not be considered delivered and will not be charged to Buyer. In this regard, Buyer will not be charged for line fill or any losses or fuel used on the pipeline between the Metering Equipment and the Delivery Point. Also, if Seller informs Seller about its intention to consume, due to any operational event, any quantity of Natural Gas stored in the pipeline that was not delivered to Buyer at the Delivery Point and, consequently, that was already measured by the Metering Equipment at the Seller Metering Station, Seller shall notify in writing Buyer of such circumstance. The Parties will resolve any material discrepancies resulting from Seller's consumption of Natural Gas under this Clause in accordance with Clause 10.2(b).

### 10.3 Verification

The following guidelines shall be followed with regard to the verification of the Metering Equipment to be used in accordance with this Agreement:

- (a) At least once each month, and from time to time upon at least two weeks prior written notice by either Party to the other, the Seller shall verify or cause to be verified the accuracy of the Metering Equipment. When as a result of such test the Metering Equipment is found to be out of calibration by no more than one percent (1%) when compared to the manufacturer's specifications for such equipment, no Adjustment shall be made in the amount paid by the Buyer to the Seller.
- (b) If the testing of the Metering Equipment demonstrates that a meter is out of calibration by more than one percent (1%) when compared to the manufacturer's specifications for such equipment, the applicable Metering Equipment reading for the actual period during which out of calibration measurements were made shall be adjusted based on the methods stated in <u>Clause 10.2</u> above.
- (c) If the actual period that such equipment has been out of calibration cannot be determined to the mutual satisfaction of the Seller and the Buyer, the adjustment shall be for a period equal to one-half of the time elapsed since the most recent test. The previous payments made by the Buyer to the Seller for this period shall be subtracted from the amount of payments that are calculated to have been owed under this Agreement. The difference in US Dollars (which may be a positive or negative amount) shall be added to the next Monthly Invoice pursuant to Clause 13.
- (d) The cost of the monthly testing and calibration of the Metering Equipment described in this <u>Clause 10.3</u> shall be the responsibility of the Seller. The cost of any testing and calibration of the Metering Equipment beyond the monthly test permitted in this <u>Clause 10.3</u> shall also be the responsibility of the Seller, unless the request to test any of the Metering Equipment is made by the Buyer and the results of such test requested by the Buyer demonstrate that the Metering Equipment is less than one percent (1%) out of calibration, in which case the cost of such testing and calibration shall be for the Buyer's account.

- (e) Each Party shall comply with any reasonable request of the other concerning the sealing of the Metering Equipment, the presence of a representative of the Buyer when the seals are broken and tests are conducted, and other matters affecting the accuracy, testing and calibration of the Metering Equipment.
- (f) If either the Seller or the Buyer believes that there has been a failure or stoppage of any of the Metering Equipment, it shall immediately notify the other Party.

## 10.4 Availability of readings

At the end of each Month, the Seller shall make available to the Buyer all readings of the metering equipment as referenced in <u>Clause 10.2(a)</u>

#### 10.5 Preservation of Records

The Seller shall preserve or cause to be preserved for a period of at least three (3) years following the expiration of this Agreement all test data, charts, and other similar records regarding the measurement of Natural Gas delivered in accordance with this Agreement.

## **ARTICLE XI<sup>11</sup>.** TRANSFER OF TITLE AND RISK; INDEMNITY

The NG to be sold by the Seller and purchased by the Buyer in accordance with this Agreement shall be delivered to the Buyer at the Delivery Point. Title and risk in NG, including the risk of loss or (without prejudice to <u>Clause 4</u> above) contamination, shall pass from the Seller to the Buyer at the Delivery Point (irrespective of the location of the Metering Equipment). [Seller agrees to indemnify Buyer and save it harmless from all losses, liabilities or claims including reasonable attorney' fees and costs of court ("Claims"), from any and all Persons, arising from or out of claims of title, personal injury (including death) or property damage from said Natural Gas or other charges thereon which attach before title passes to the Buyer. Buyer agrees to indemnify Seller and save it harmless from all Claims, from any and all Persons, arising from or out of claims regarding payment, personal injury (including death) or property damage from said Natural Gas or other charges thereon which attach after title passes to the Buyer. 17

## ARTICLE XII12, FUEL CONTRACT PRICE; CAPACITY PAYMENT

12.1 The Fuel Contract Price applicable to the quantities of NG to be sold, purchased and delivered in any month shall be \$\_\_ per MMBtu ("Fuel Contract Price"). [The capacity payment for capital cost of conversion to LNG of the San Juan Units 5 and 6 will only apply to the Base period and will not apply to any extensions.] 18

<sup>17</sup> NTD: NFE believes that it is necessary to bifurcate the indemnity regimes so that we have (a) one regime that applies to activities on the PREPA site, which is fully aligned with the indemnity regime under the Mitsubishi contracts (i.e. EPC and LTSA) and (b) a separate regime for performance of the Natural Gas supply obligations once the Supply Period commences.

<sup>&</sup>lt;sup>18</sup> NTD: Definition of Capacity Payment to be finalized and use throughout conformed.

## **ARTICLE XIII 13.** INVOICING AND PAYMENT

- 13.1 Every month the Seller shall invoice Buyer for the quantities in the Binding Monthly Schedule for the previous calendar month plus any additional quantities Seller agreed to deliver pursuant to Clause 7.4(a)(iii), and whatsoever other amounts that are owed for those items regulated in accordance with this Agreement and current regulations governing the provision of the services at any given time. PREPA certifies that the funds for the payments of Services rendered under this Agreement come from budgetary allocations. All payments performed under this Agreement will be charged to PREPA's budget account number 1-2321-23215-000-000.
- 13.2 The Seller shall prepare and shall give to the Buyer by not later than the tenth (10th) Day after the end of each calendar month an invoice (the "Monthly Invoice") which shall show in respect of the preceding calendar month the following information:
  - (a) The Fuel Contract Price multiplied by the quantities in the Binding Monthly Schedule for such month;
  - (b) Any additional quantities Seller agreed to deliver pursuant to Clause 7.4(a)(iii) multiplied by the price applicable to such quantities;
  - (c) The amount of the Capacity Payment for such month;
  - (d) (e) Any applicable Taxes due for payment by the Buyer;
  - (e) (d)[The proceeds from the sale of (or credit due, as the case may be, from) any Excess Nomination; and]<sup>20</sup>
  - (f) (e) The net amount payable by the Buyer to the Seller, which shall be (a) plus (b) plus (c) minus (d).
- 13.3 The Buyer shall pay the net amount to the Seller as due in accordance with such Monthly Invoice.
- 13.4 If Seller incurs a liability to the Buyer for failing to deliver NG pursuant to <u>Clause 9</u>, then the Buyer shall send to the Seller (following the end of the applicable month) an invoice and reasonable supporting documentation showing the amount payable by the Seller in accordance with Clause 9.
- 13.5 If any sums are due from one Party to the other Party, except for reasons addressed in <u>Clauses 13.2-13.1</u> and <u>13.4</u>, then the Party to whom such sums are owed shall furnish to the other an invoice describing in reasonable detail the basis for the invoice and providing relevant supporting documentation.

<sup>19</sup> NTD: To discuss payment security.

<sup>&</sup>lt;sup>20</sup> NTD: Please refer to footnote 12.

- 13.6 In respect of any invoice issued pursuant to this <u>Clause 13</u>, the Buyer or the Seller as the case might be shall pay the amount due within thirty (30) Days after receipt of such invoice.
- 13.7 Payment of amounts due to one Party from the other Party shall be made by wire transfer in immediately available funds into the bank account nominated from time to time by the Party to which the funds are owed. Each payment of any amount owing hereunder shall be for the full amount due, without reduction, withholding or offset for any reason (including any exchange charges, bank transfer charges or other fees or Taxes). Until further notice, the bank account for each Party is as follows:

**Seller:** Bank Name: [ENTITY]

Bank Amount #

**Buyer:** Bank Name: [ENTITY]

**Bank Account #** 

Notwithstanding the foregoing, Seller shall request from Buyer wire instructions prior to transferring any funds to Buyer and shall provide Buyer bank confirmation upon completion of each such transfer.

- 13.8 If any Party fails to pay the other Party the full amount of any invoice due by the due date, such Party shall also pay interest thereon to the other Party for the period commencing from and including the due date until and including the Day when payment is made. Interest shall be calculated at the rate of four hundred (400) basis points above the LIBOR percentage rate per annum but no greater than the maximum amount allowable by law.
- 13.9 If a Party disagrees in good faith with any invoice, such Party shall pay the full amount invoiced or so stated by the due date thereof and shall immediately notify the other Party of the reasons for its disagreement. An invoice may be contested by the Party that received it, or modified by the Party that sent it, by written notice delivered to the other Party within a period of one hundred and eighty (180) Days after such receipt or sending, as the case may be. If no such notice is served within such period of one hundred and eighty (180) Days, such invoice shall be deemed correct and accepted by both Parties. Promptly after resolution of any Dispute as to an invoice, the amount of any overpayment or underpayment shall be paid by the Seller or the Buyer, as the case may be, to the other Party, together with interest thereon at the rate provided in <u>Clause 13.9</u> from the date payment was due to the date of payment.

## **ARTICLE XIV14.** DUTIES, TAXES AND CHARGES

Each of the Seller and the Buyer shall be responsible for the payment of all taxes, fees, levies, royalties, duties, penalties, licenses, and other charges imposed by any Governmental Authority ("Taxes") which it incurs and for which it is legally responsible for as a result of complying with this Agreement and which correspond to such Party under all applicable tax

regulations and laws in force at the Effective Date and throughout the Contract Term in each of the jurisdictions relevant to this Agreement connected to the Parties. If a Party it's required to remit or pay Taxes that are the other Party's responsibility hereunder, the Party responsible for such Taxes shall promptly reimburse the other Party for such Taxes. Any Party entitled to an exemption from any such Taxes or charges shall furnish the other Party any necessary documentation thereof.

- 14.1 For the avoidance of doubt and notwithstanding the above:
  - (a) Seller represents and warrants that it is the importer of record for all Natural Gas delivered hereunder, and shall be responsible for entry and entry summary filings as well as the payment of associated duties, Taxes and fees, if any, and all applicable record keeping requirements.
  - (b) Buyer shall pay or cause to be paid all Taxes imposed by any Governmental Authority after the Delivery Point on the sale, use, or purchase of Natural Gas delivered to the Buyer under this Agreement (and on any LNG from which such Natural Gas is derived) and its transportation within the territory of Puerto Rico after the Delivery Point; provided that at all times the Seller shall be responsible for the payment of all and any Corporate Tax payable in Puerto Rico in connection with this Agreement; and
  - (c) Seller shall pay or cause to be paid all Taxes imposed by any Government Authority on or with respect to Natural Gas delivered to the Buyer under this Agreement (and on any LNG from which such Natural Gas is derived) prior to the Delivery Point and all Taxes at the Delivery Point.

## **ARTICLE XV**15. FORCE MAJEURE

15.1 Neither the Seller nor the Buyer shall be liable for any failure to perform or for omission or delay in the performance of any of its obligations under this Agreement, other than the obligation to make payments of money when due, if and to the extent that the affected Party's performance is prevented, delayed or interfered with by an act, event or circumstance, or combinations of events or circumstances, whether of the kind described herein or otherwise, that is not reasonably within its control, such Party having acted as a Reasonable and Prudent Operator and which effects could not be prevented or overcome by the exercise of due diligence ("Force Majeure").

For the avoidance of doubt, provided that the requirements set out in the preceding paragraph are met, events of Force Majeure shall include but not be limited to the following:

(a) Loss of, serious accidental damage to, inaccessibility or incapacity of, or inoperability of the relevant loading terminal or upstream facilities affecting an LNG cargo and source indicated in the LNG Delivery Plan. The "LNG Delivery Plan" shall mean the indicative LNG cargo scheduling program submitted by the Seller to the Buyer, solely for the purposes of this Clause, not later than 30 Days prior to the commencement of each Contract Year and which shall include for each LNG cargo the expected source. The Seller shall inform Buyer of any modifications

to the sources indicated in the LNG Delivery Plan, provided that Seller shall not, at any time nominate any source that is affected by Force Majeure or that is affected by any event that could reasonably lead to a claim of Force Majeure relief under this Agreement.

- (b) Loss of, serious accidental damage to, inaccessibility or incapacity of, or inoperability of an LNG Ship requiring her removal from service;
- (c) Loss of, serious accidental damage to, inaccessibility or incapacity of, or inoperability of the MFH Facility;
- (d) Loss of, serious accidental damage to, inaccessibility or incapacity of, or inoperability of the San Juan Power Plant; provided that if an event of Force Majeure affects just one unit at the San Juan Power Plant, but not both, the affected Party shall only be released from its obligations under this Agreement with regard to the unit affected by the event of Force Majeure; and
- (e) Acts of God, lightning, storm, typhoon, hurricane, tornado, earthquakes, fires, floods, tsunami, earthquake, landslide, soil erosion, subsidence, washout, epidemic, shipwreck, navigational and maritime perils, acts of any Competent Authority or compliance with such acts; explosions, acts of the public enemy, wars (whether declared or undeclared), terrorism or threat thereof, civil war, piracy, civil and military disturbances, strikes, blockades, insurrections, riots, epidemics and quarantine restrictions; strike, lockout or other industrial disturbances involving an enterprise other than a Party, its transporter or its agents or sub-contractors in connection with the Agreement; radioactive contamination or ionising radiation; or breakdown or unavailability of port facilities or port services (including the channel, tugs or pilots).
- 15.2 Notwithstanding the foregoing provisions of <u>Clause 15.1</u>, the following shall not be events of Force Majeure:
  - (a) events arising out of market decline, market failure, industry economic conditions, or general economic conditions;
  - (b) any delay in achieving the Firm Supply Conditions, unless such delay is caused by an event of Force Majeure;
  - (c) the failure to obtain or the withdrawal of any authorization, approval, permit or permission of any Competent Authority, of which the Party claiming Force Majeure was aware, or should have been aware, acting as a Reasonable and Prudent Operator, to the extent such Party could have applied for, obtained, maintained, or attended any such authorization, approval, permit, or permission;

provided, however, that the failure to obtain any authorization, approval, permit or permission of any Competent Authority that is required in order to satisfy the Firm Supply Conditions shall under no circumstances be considered Force Majeure.

- 15.3 In the event of any failure or delay of a Party's performance due to the occurrence of a Force Majeure event, the affected Party shall use reasonable efforts (acting as a Reasonable and Prudent Operator) to resume as soon as possible full performance of its obligations under this Agreement, provided that the settlement of strikes or boycotts, lockouts or other industrial disputes, or obstructive action by organizations or local inhabitants, shall be entirely within the discretion of the Party concerned.
- 15.4 A Party intending to seek relief under this <u>Clause 15</u> shall as soon as reasonably practicable after it becomes aware of the occurrence of a Force Majeure event:
  - (a) notify the other Party of the occurrence of an event that it considers may subsequently lead it to claim Force Majeure relief under this Agreement, describing such event, in as much detail as is then reasonably available, and the obligations, the performance of which has been or could be delayed, hindered or prevented thereby, and the estimated period during which such performance may be suspended or reduced, including (to the extent known or ascertainable) the estimated extent of such suspension or reduction in performance; the obligations which could or have been actually delayed or prevented in performance and the estimated period during which such performance may be suspended or reduced, including (to the extent know or ascertainable) the estimated extent of such suspension or reduction in performance;
  - (b) give a bona-fide good faith estimate of when it shall be able to resume full performance of its obligations; and
  - (c) give the particulars of the programme to be implemented, if any, to resume full performance hereunder subject to any Third Party confidentiality obligations.

Such notices shall thereafter be supplemented and updated at reasonable intervals during the period of such Force Majeure, specifying the actions being taken to remedy the circumstances causing such Force Majeure and the date on which such Force Majeure is expected to terminate.

- 15.5 If any Party claims relief under this <u>Clause 15</u>, it shall allow reasonable access to the other Party, upon such other Party's written request, to examine the scene of such event or circumstance which gave rise to the Force Majeure claim, provided that the Party not claiming relief under this <u>Clause 15</u> shall bear the cost, expense and risk of examining such site.
- 15.6 Where an act, event or circumstance prevents, impedes or delays a Party's performance hereunder, even if such act, event or circumstance primarily affects a Third Party or Third Parties, it shall constitute Force Majeure hereunder as to the Seller or the Buyer, as appropriate, if and to the extent that it is of a kind or character that, if it had happened to a Party, would have come within the definition of Force Majeure under this Clause 15.
- 15.7 Force Majeure takes effect at the moment a Force Majeure event occurs, not upon giving notice. A Party whose performance is excused by Force Majeure shall not be

required, during the period in which the circumstances of the Force Majeure event are continuing, to incur uneconomic cost, make additional investments in new facilities, or bring into production existing or potential reserves not already flowing in support of this Agreement.

- 15.8 If Seller is rendered wholly or partially unable to deliver NG under this Agreement as a result of a Force Majeure event claimed only by the Buyer, Seller shall have the right to enter into binding contracts with Third Parties to sell and deliver LNG that is not reasonably expected to be needed by the Seller to meet its obligations to the Buyer hereunder based on the expected extent and duration of such Force Majeure as notified by the Buyer.
- 15.9 If the Force Majeure event lasts for a period such that the affected Party shall be prevented from or delayed in performing its obligations hereunder for a period of one hundred eighty (180) consecutive Days or more from the date on which the Force Majeure event first occurred, the Party not claiming Force Majeure shall have the right to terminate this Agreement without liability to either Party by giving written notice to the either Party.

## <u>ARTICLE XVI</u>16. REPRESENTATIONS, WARRANTIES, LIABILITIES AND INDEMNITIES

- 16.1 Each Party hereby represents and warrants to the other Party that, as of the Effective Date, to the actual knowledge of its officers and directors:
  - (a) With regard to the Seller it is a corporation or limited liability company duly formed, validly existing and in good standing under the laws of the state and/or country of its incorporation or organization, and is duly qualified to do business in, and is in good standing in, all other jurisdictions where the nature of its business or nature of property owned by it makes such qualification necessary.
  - (b) With regard to the Buyer it is a Puerto Rico public corporation and governmental instrumentality of the Commonwealth of Puerto Rico, duly organized, validly existing and in good standing under the laws of the Commonwealth of Puerto Rico and is duly qualified to do business in, and is in good standing in, all other jurisdictions where the nature of its business or nature of property owned by it makes such qualification necessary.
  - (c) Each Party has all requisite power and authority to conduct its business, to own or lease and operate its properties, and to execute, deliver, and perform its obligations under this Agreement.
  - (d) The execution, delivery and performance by such Party of this Agreement has been duly authorized by all necessary corporate action on the part of such Party and do not (i) require any consent or approval of any Competent Authority, such Party's governing body or any other Person, other than those that have been obtained, or the failure to obtain, of which would not have, or could not reasonably be expected to have, a material adverse effect on each Party's ability to perform its obligations hereunder, (ii) violate any provision of such Party's Articles of

incorporation or by-laws, or other organizational documents, or any Applicable Law in effect, or (iii) result in a breach of or constitute a default under such Party's organizational documents or other material indentures, contracts or agreements to which it is a part or by which it or its properties may be bound.

- (e) This Agreement is a legal, valid, and binding obligation of the Seller and the Buyer enforceable against the Seller and the Buyer, as appropriate, in accordance with its terms.
- 16.2 The Seller warrants that it has good title to or good right to, all NG delivered hereunder and that all NG delivered to the Buyer at the Delivery Point shall be free and clear of all liens, security interests, charges, assessments encumbrances and adverse claims whatsoever. The Seller representation or warranty, written or oral, express or implied that the NG will be fit for a particular purpose, or will be of merchantable quality, and all such representations and warranties are expressly excluded to the fullest extent permitted by law, but nothing in this <u>Clause 16.2</u> affects the requirement that all NG delivered to the Buyer under this Agreement will meet the Specifications of <u>Clause 4</u>.
- 16.3 The Seller represents and warrants that it will take or cause to be taken all necessary actions to start NG deliveries from the first Day of the Firm Supply Period including the design and construction of any facility or its elements situated upstream of the Delivery Point and that to that end it will obtain or cause to be obtained all required approvals, consents or authorization from the relevant Competent Authority.
- 16.4 The Buyer represents and warrants that it will take or cause to be taken all necessary actions to commence taking delivery of NG from the first Day of the Firm Supply Period including the design and construction of any facility or its elements situated downstream of the Delivery Point and that to that end it will obtain or cause to be obtained all required approvals, consents or authorizations from the relevant Competent Authority.
- 16.5 [Except as provided elsewhere in this Agreement, a Party shall not be liable to the other Party under this Agreement, or in tort or otherwise howsoever as a result of any act or omission in the course of or in connection with the carrying out of this Agreement, for or in respect of:
  - (a) any consequential, special or punitive loss or damage suffered or incurred by the other Party or its Affiliates;
  - (b) any loss of income, profits, production or revenue suffered or incurred by the other Party or its Affiliates;
  - (c) any business interruption suffered or incurred, by the other Party or its Affiliates; or

- (d) any claim, demand or action made or brought against that other Party by a Third Party. | 21
- 16.6 The Seller's liability for failure to deliver will be limited to the payment of the amounts detailed in <u>Clause 9</u> (Seller's Shortfall), which shall be the Buyer's sole and exclusive remedies in such event.
- 16.7 [The Seller agrees to make, use, provide, and take all proper, reasonably necessary and sufficient precautions, safeguards, and protection against the occurrence or happenings of injuries, death and/or damages to any person or property during the progress of the work.
- 16.8 The Seller agrees to save and hold harmless and to indemnify BUYER for all expenses and costs of any nature (including attorneys' fees) incurred by BUYER arising out of any claim made by any person for personal injuries, including death or for property damage, caused by the Seller or any of its subcontractors, by act or omission, in the performance or nonperformance of its obligations under the Contract.
- 16.9 The operation of BUYER's equipment by BUYER at its plant site is within the exclusive control of BUYER and BUYER shall indemnify and save harmless the Seller from loss, expense or liability imposed upon the Seller for any injury to a person, including death resulting therefrom or damage to any property resulting from the operation of such equipment by BUYER.
- 16.10 If the Seller is allowed to operate BUYER's equipment at the plant site, the Seller shall indemnify and save harmless BUYER from loss, expense or liability imposed upon BUYER for any injury to a person, including death or damage to any property resulting from the operation of such equipment by the Seller. 22

#### **ARTICLE XVII17.** ASSIGNMENT

- 17.1 Except as provided in <u>Clauses 17.2</u> and <u>17.3</u>, neither Party may assign any of its rights or delegate any of its obligations under this Agreement to a Third Party without the prior written consent of the other Party. Any purported assignment of a Party's rights or obligations hereunder in contravention of this <u>Clause 17</u> shall be null and void and shall have no force or effect.
- 17.2 Notwithstanding the foregoing, either Party shall be entitled to assign, or as appropriate, delegate, all, but not part, of its rights and obligations under this Agreement to an Affiliate by providing notice to the other Party, provided that subsequent to any assignment or delegation made pursuant to this <u>Clause 17.2</u>, the original Party and each subsequent assignee or delegate, having itself assigned or delegated to an Affiliate, shall

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<sup>&</sup>lt;sup>21</sup> NTD: NFE proposes replacing this with a consequential loss waiver that is better aligned with the consequential loss waiver that Mitsubishi requires (see the Mitsubishi LTSA as an example).

<sup>&</sup>lt;sup>22</sup> NTD: NFE believes that it is necessary to bifurcate the indemnity regimes so that we have (a) one regime that applies to activities on the PREPA site, which is fully aligned with the indemnity regime under the Mitsubishi contracts (i.e. EPC and LTSA) and (b) a separate regime for performance of the Natural Gas supply obligations once the Supply Period commences.

be fully liable under this Agreement in the event of non-fulfilment of its obligations under this Agreement by an assignee or delegate.

17.3 Notwithstanding the foregoing provisions of this <u>Clause 17</u>, and without the prior written consent of the Buyer but subject to the Seller's written notification to the Buyer, the Seller may assign (a) its rights to payment under this Agreement to a trust, trustee, bank, paying agent, financial entity or other Person or company for the purposes of any bona fide financing or in order to facilitate the making of any such payment, and (b) any of the Seller's rights under this Agreement to any lender or lender's agent as security for its obligations to any such lender under any such financing.

### **ARTICLE XVIII 18.** SUBCONTRACTORS

The Seller shall not assign nor subcontract its rights and obligations under this Contract, except in the event BUYER gives written authorization for such actions. Provided that no subcontract shall be considered for BUYER's approval, except when the following requirements are met: (1) the Seller delivers BUYER a copy of the subcontract, not less than thirty (30) days prior to the effective date of the proposed subcontract; (2) the subcontract includes, as a condition for its legal validity and enforceability, a provision whereby BUYER has the right to substitute, subrogate or assume Sellers' rights under the subcontract, in the event that BUYER declares the Seller in breach or default of any of the Contract terms and conditions; and (3) the subcontract includes, as a condition for its validity and enforceability, a provision establishing for the subcontractor the obligation to comply unconditionally and entirely with all Sellers' obligations under the Contract (mirror image rule), except for such obligations, terms and conditions which exclusively related with works or services not included under the subcontract.

## **ARTICLE XIX19.** TERMINATION23

- 19.1 This Agreement may be terminated if any of the following circumstances occur:
  - (a) the mutual agreement of the Parties;
  - (b) in the event that a Termination Event on the part of either Party (the "**Defaulting Party**") has occurred, the other Party may at any time after which such Termination Event has occurred or during which such Termination Event is otherwise continuing, terminate this Agreement by giving written notice of termination to the Defaulting Party in accordance with this <u>Clause 18</u>, with such termination to take effect as from and including the date of such notice. In relation to either Party each of the following shall constitute a termination event (a "**Termination Event**"):
    - (i) if any amount payable by that Party under this Agreement has not been paid in full by the due date for the payment of the relevant invoice and the other Party has (after such due date) given notice to the Party requiring

<sup>&</sup>lt;sup>23</sup> NTD: To discuss termination provisions and consequences of early termination for convenience.

payment of such amount and the amount has not been paid in full within ten (10) Business Days after the date of such notice;

- (ii) if that Party is unable to pay, suspends payment of, or agrees to a moratorium (or threatens any of the foregoing with respect to all or a substantial part of its debts, makes a general assignment or any composition or compromise with or for the benefit of its creditors except to the extent otherwise permitted by this Agreement, takes any proceedings with view to a readjustment, rescheduling or deferral of all or a substantial part of its indebtedness (other than in the case of a refinancing); or
- (iii) if any order is made, or a petition is presented and not withdrawn within a period of twenty-one (21) Days, for the winding-up, liquidation, dissolution, custodianship or administration (or any equivalent proceedings) of that Party.
- On and at any time after the occurrence of a Termination Event, any Party not subject to such Termination Event may, while such Termination Event subsists, by giving five (5) Days written notice of its intentions to the Defaulting Party, suspend performance of its obligations under this Agreement. Where the Defaulting Party is the Buyer, any such suspension by the Seller shall not constitute a failure by the Seller to make such quantities of NG available for sale and delivery pursuant to the terms of this Agreement during such period of suspension, and the Buyer shall have no rights in respect of such suspended deliveries during such period of suspension. Where the Defaulting Party is the Seller, any such suspension by the Buyer shall not constitute a failure by the Buyer to take delivery of such quantities of NG pursuant to the terms of this Agreement during such period of suspension, and the Seller shall have no rights in respect of such suspended deliveries during such period of suspension. If such Termination Event is remedied thereafter (including, with respect to any late payments, payment in full of any such outstanding invoice together with interest thereon), prior to the exercise of rights under Clause 18.3, 19.3 the notice of suspension served under this Clause 19.2 shall be deemed to be revoked automatically.
- 19.3 The termination of this Agreement under this <u>Clause 19</u> for any reason shall be without prejudice to the rights and remedies of the terminating Party accrued prior to such termination under this Agreement, including in respect of any antecedent breach (whether or not a repudiatory breach) giving rise to such termination. For the avoidance of doubt, neither Party will be liable to pay any termination payment upon termination of this Agreement other than in respect of liabilities accrued prior to the date of termination.
- 19.4 Buyer shall have the right to terminate this Agreement with thirty (30) days prior written notice to the Seller. Buyer shall have the right to terminate this Agreement immediately in the event of negligence, dereliction of duties or noncompliance by the Seller.

## **ARTICLE XX20.** NOVATION

BUYER and the Seller expressly agree that no amendment or change order which could be made to this Contract, during its term, shall be understood as a contractual novation, unless both parties agree to the contrary, specifically and in writing. The previous provision shall be equally applicable in such other cases where BUYER gives the Seller a time extension for the compliance of any of its obligations under the Contract or where BUYER dispenses the claim or demand of any of its credits or rights under the Contract.

## **ARTICLE XXI21.** LAWS TO BE OBSERVED

[The Seller shall observe and comply with any and all Federal, State and Municipal Laws, by-laws, ordinances, and regulations in any manner affecting the work, the equipment or the materials used in the proposed rehabilitation and/or installation or construction, and those employed on the work or the conduct of the work, and with all such orders and decrees as exist at present or may be enacted prior to the completion of the work by bodies or courts having any jurisdiction or authority over the work. The Seller shall save and hold harmless and to indemnify BUYER and its representative's officers, agents, and servants against any claim or liability arising from or based on the violation of any such law, by-law, ordinance, regulation, order or decree, whether by himself or his employees. [24]

## **ARTICLE XXII22.** CHANGE IN LAW

During the term of this Contract, any change in law, including, but not limited to changes in applicable tax law, which causes an increase in Seller's costs when supplying the products or services to be acquired by BUYER, shall be of Seller's responsibility and BUYER shall not be obliged to make additional payments nor to pay additional sums to the price or canon originally agreed for those products or services.

#### **ARTICLE XXIII23.** APPLICABLE LAW

This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Puerto Rico and, to the extent applicable, the laws of the United States of America, excluding any choice-of-law provisions that would require application of the laws of a different jurisdiction. The United Nations Convention on Contracts for the International Sale of Goods (the Vienna Sales Convention 1980) and the Convention on the Limitation Period in the International Sale of Goods shall not apply to this Agreement or to the performance thereof or to any aspect of any Dispute arising therefrom.

## **ARTICLE XXIV24.** SEPARABILITY

If a court of competent jurisdiction declares any of the Contract provisions as null or invalid, such holding will not affect the validity and effectiveness of the remaining provisions of

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<sup>&</sup>lt;sup>24</sup> NTD: NFE believes that it is necessary to bifurcate the indemnity regimes so that we have (a) one regime that applies to activities on the PREPA site, which is fully aligned with the indemnity regime under the Mitsubishi contracts (i.e. EPC and LTSA) and (b) a separate regime for performance of the Natural Gas supply obligations once the Supply Period commences.

the Contract and the parties agree to comply with their respective obligations under such provisions not included by the judicial declaration.

#### **ARTICLE XXV25.** SETTLEMENT OF DISPUTES

## 25.1 Exclusive Jurisdiction

- (a) Any claim, dispute, disagreement or controversy (each, a "**Dispute**") that arises between the Parties under this Agreement or that is otherwise related to the subject matter of this Agreement, except for those Disputes to be resolved through Expert determination pursuant to <u>Clause</u> 20.2 <u>25.2</u> below, shall be resolved exclusively in the Federal District Court for the District of Puerto Rico.
- (b) In the event of such Dispute, each Party shall continue performing its obligations hereunder except to the extent such obligations have been properly suspended pursuant to the terms hereof. For the avoidance of doubt, the Buyer shall continue paying amounts due under <u>Clause 13</u>.

## 25.2 Expert Determination

Any Dispute that arises between the Parties with respect to (i) the determination of quality under <u>Clause 4</u>, or (ii) <u>Clause 10</u> may be referred by either Party to an Expert for such Expert's determination of such Dispute, disagreement or other matter of interpretation in accordance with the following guidelines:

- (a) The Parties hereby agree that such determination shall be conducted expeditiously by an Expert selected unanimously by the Parties.
- (b) The Expert shall not be deemed to be acting in an arbitral capacity.
- (c) The Party requesting that any matter arising under <u>Clauses 4</u> or <u>10</u> of this Agreement is referred to an Expert shall give the other Party notice of such request. If the Parties are unable to agree on the identity of an Expert within ten (10) Days after receipt of the notice of request for an Expert determination, then, upon the request of any of the Parties, the International Centre for Expertise of the International Chamber of Commerce shall appoint such Expert and shall administer such Expert determination through the ICC's Rules for Expertise.
- (d) The Expert shall be and remain at all times wholly impartial as between the Parties, and, once appointed, the Expert shall have no *ex parte* communications with either of the Parties concerning the Expert determination or the underlying Dispute.
- (e) The Expert procedure shall take place in San Juan, Puerto Rico in English.
- (f) Both Parties agree to cooperate fully in the expeditious conduct of such Expert determination and to provide the Expert with access to all facilities, books,

records, documents, information and personnel necessary to make a fully informed decision in an expeditious manner.

- (g) Before issuing a final decision, the Expert shall issue a draft report and allow the Parties to comment on it.
- (h) The Expert shall endeavour to resolve the Dispute within thirty (30) Days (but no later than sixty (60) Days) after his appointment, taking into account the circumstances requiring an expeditious resolution of the Dispute.
- (i) The Expert's decision shall be final and binding on the Parties.

## 25.3 Qualification of Experts

- (a) No Person, without the prior written agreement of the Parties, shall be appointed as an Expert pursuant to <u>Clause 20.2</u>, <u>25.2</u> if such Person:
  - (i) is (or has been at any time within ten years preceding notice of the Dispute) an employee of a Party or of an Affiliate of a Party;
  - (ii) is (or has been at any time within five years preceding notice of the Dispute) a consultant or contractor of a Party or of an Affiliate of a Party;
  - (iii) holds any significant financial interest in a Party; or
  - (iv) does not have at least ten years' experience advising or working in the North American NG industry with respect to the subject matters subject to the Expert's determination under <u>Clause</u> 20.2.25.2
- (b) The Parties shall, within two months after lithe Effective Date, agree on a list of possible Experts for purposes of Clause 20.2; 25.2 provided, however, that in the event that the Parties are unable to agree on a list of acceptable Experts, then in the event of a Dispute subject to Expert determination pursuant to Clause 20.2, 25.2 the Expert shall be appointed by the international Centre for Expertise of the International Chamber of Commerce in accordance with Clause 20.2, 25.2

## **ARTICLE XXVI26.** NON-WAIVER

Delay or failure to exercise any right, power or remedy accruing to any Party as the result of any breach or default hereunder shall not impair any such right, power or remedy, nor shall it be construed to be a waiver of any such breach or Default.

## **ARTICLE XXVII27.** CONFIDENTIALITY

27.1 The existence and terms of this Agreement and any information directly or indirectly disclosed or furnished, whether orally, in writing or in electronic, digital or any other form, by either Party (or its representatives, employees, directors, officers, agents or Affiliates) (the "**Disclosing Party**") to the other Party (or its representatives, employees,

directors, officers, agents or Affiliates) (the "Receiving Party") in connection with this Agreement (or in connection with the terms and conditions or the negotiation of any other agreement or document related to this Agreement or to is subject matter either between the Parties or otherwise) which is not:

- (a) already known to the Receiving Party; or
- (b) already in the public domain (other than as a the terms of this <u>Clause 27.1</u>),

such information being "Confidential Information," shall, unless otherwise agreed in writing by the Parties, be kept confidential and shall not be sold, traded, published or otherwise disclosed to any Third Party in any manner whatsoever (except as provided in Clause 22.2) 27.2 by the Receiving Party.

- 27.2 The Receiving Party may disclose Confidential Information to the following Persons without the consent of the Disclosing Party:
  - (a) To the Receiving Party's and its Affiliates' directors, agents and employees;
  - (b) to the Receiving Party's lenders and prospective lenders for the sole purpose of obtaining finance based on this Agreement;
  - (c) to the Receiving Party's advisors and consultants, including legal counsel, accountants and other agents of the Receiving Party for purposes connected with this Agreement;
  - (d) to Third Parties on an aggregated basis to the extent such information is delivered to such Third Party for the sole purpose of calculating a published index;
  - (e) to Experts and any court in connection with the resolution of a Dispute; and
  - (f) to co-shareholders and partners in upstream and downstream projects, any operator of the Seller's facilities and any other relevant Third Parties, in all cases limited (i) only to operational information; and (ii) to the extent strictly necessary to implement this Agreement.
  - (g) to any insurer in connection with a policy of insurance required pursuant to this Agreement;
  - (h) to any lender or potential lender and to any employee, representative or advisor of such Person;
  - (i) to those contractor(s) that Seller retains or proposes to retain to perform any of Seller's obligations hereunder; or
  - (j) to any Third Party that is a purchaser or a prospective purchaser of all or any portion of the MFH Facility or a direct or indirect interest therein.

- 27.3 The Receiving Party disclosing Confidential Information pursuant to <u>Clause</u> 22.2 27.2 to a Person identified in <u>Clause</u> 22.2(b) to 22.2(f) shall ensure that such Person undertakes to hold such Confidential Information subject to confidentiality obligations equivalent to those set out in <u>Clause</u> 27.1 (excluding legal counsel). Each Party understands that the Receiving Party, and Persons, listed in <u>Clause</u> 22.2(a), (b) or (c) may now or in the future work on similar projects, and the Parties agree that, without prejudice to the other provisions in this <u>Clause</u> 22.27, such Persons shall not be precluded from working on such other projects because they have reviewed any Confidential Information.
- 27.4 In the event that disclosure is required by any Competent Authority or Applicable Law, the Receiving Party subject to such requirement may disclose the Confidential Information to the extent so required, but shall promptly notify the Disclosing Party of such disclosure prior to so doing, and shall cooperate (consistent with the Receiving Party's legal obligations) with the Disclosing Party's efforts to obtain protective orders or similar restraints with respect to such disclosure at the expense of the Disclosing Party. Notwithstanding the foregoing, Seller acknowledges that the foregoing shall not apply to any requirements applicable to the Buyer to disclose any Confidential information that Buyer is required to disclose as a public entity under Applicable Law.
- 27.5 No press release or public statement concerning the existence, execution of, or other matters directly related to, this Agreement, or the transactions contemplated hereby, shall be issued by the representatives, directors, officers, agents or employees of either Party or its Affiliates unless otherwise agreed by the Parties in writing. In the case of any such press release or public statement, the Parties shall first consult and agree to the specific contents and the manner or timing of presentation or publication thereof. The foregoing shall got apply to any announcement by a Party required in order to comply with any Applicable Law, provided that in this case the relevant Party making such announcement notifies the other Party of the details of such announcement, the relevant Applicable Law to be complied with and, where applicable, the addressee of such announcement.
- 27.6 The Parties shall be entitled to all remedies available at law or in equity to enforce or seek relief in connection with the breach of the confidentiality obligation set out in this <u>Clause 22</u>.

## **ARTICLE XXVIII28.** PATENTS AND COPYRIGHTS

The Seller, at its own expense, shall defend any suit or action brought against Buyer based on a claim that any equipment or part thereof, copyright or uncopyrighted composition, secret process, patented or unpatented invention, Article, or appliance manufactured or used in the performance of this Contract, including their use by Buyer, constitutes an infringement of any patents or copyrights of the United States, if notified promptly in writing by Buyer, and given the authority, information, and assistance for the defense of the same, and the Seller shall pay all damages and costs awarded therein against Buyer. If, in such suit, the equipment or any part thereof, or the composition, secret process, invention, Article or appliance is held to constitute infringement and its use is enjoined, the Seller, at its option and expense, shall either procure for BUYER the right to continue using the same. Also, can replace it with non-fringing equipment,

composition, secret process, invention, Article or appliance, modify it so it becomes non-infringing or remove it and refund the purchase price.

## **ARTICLE XXIX29.** NOTICES

All notices, to be given under this Agreement by one Party to the other shall be in writing, sent to the address and marked to the attention of the Person specified in <u>Clause 24</u> and, unless otherwise agreed, in English or Spanish.

## **ARTICLE XXX30.** CONTINGENT FEES

The Seller guarantees that he has not employed any person to solicit or secure this Contract upon any agreement for a commission percentage, brokerage or contingent fee. Breach of this guarantee shall give Buyer the right to annul the Contract or, at its discretion to deduct from the Contract price or consideration the amount of such commission, percentage, brokerage or contingent fees. This warranty shall not apply to commissions payable by Contractors upon Contract or sales secured or made through bona fide established commercial or selling agencies maintained by the Seller for the purpose of securing business.

## **ARTICLE XXXI31.** ADDRESSES

<b>SELLER</b> :	
Attention: Telephone: Email:	
With Copy to	:
Telephone: Email:	
<u><b>BUYER</b></u> : <sup>425</sup>	Puerto Rico Electric Power Authority Apartado 363928 San Juan, Puerto Rico 00936-3928
Attention:	
Telephone: Facsimile: E-mail:	
With Copies to:	
Telephone: Facsimile:	
	_

<sup>&</sup>lt;sup>125</sup> PREPA to confirm.

E-mail:	
and	
Attention:	
Telephone: Facsimile: E-mail:	

Either Party may change its address details by giving not less than five (5) Days written notice to the other Party.

# <u>ARTICLE XXXII</u>32. <u>I</u>BUSINESS PRACTICES AND FOREIGN CORRUPT PRACTICES ACT

- 32.1 Each Party agrees that in connection with its activities conducted pursuant to this Agreement, neither it nor any of its directors, officers, employees, agents, contractors, or Affiliates shall (a) take any action, or omit to take any action that would violate any Applicable Law applicable to that Party, (b) make, promise to make, or authorize, the making of any payment, gift or transfer of anything of value, directly or indirectly, to any official or employee of any government or instrumentality of any government or to any political party or official thereof or any candidate of any political party for the purpose of influencing the action or inaction of such official, employee, political party or candidate, or (c) otherwise take any action, or omit to take any action that would cause the other Party to be in violation of any Applicable Law related to the business practices of such other Party, including the United States Foreign Corrupt Practices Act, the laws of the European Union and the Spanish anti-bribery and corruption laws.
- 32.2 Each Party agrees and undertakes, on behalf of itself, its directors, officers, employees, agents, contractors or Affiliates, not to pay any fees, commissions or rebates to any employee, officer or agent of the other Party, or its Affiliates or shareholders nor provide or cause to be provided to any of them any gifts or entertainment of significant cost or value in connection with their activities conducted pursuant to this Agreement or in order to influence or induce any actions or inactions in connection with the commercial activities of the Parties under this Agreement.
- 32.3 Without prejudice to <u>Clause 31.5</u>, neither Party shall use any broker, agent, or other intermediary in connection with soliciting, obtaining, negotiating, structuring or performing this Agreement or in connection with the subject matter to which it applies.
- 32.4 Each Party shall indemnify and hold the other Party harmless from and against any and all losses, damages, liabilities, costs, expenses and claims which arise out of, are incident to, or result from any breach by such Party of this <u>Clause</u> 25.32.1<sup>26</sup>

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<sup>&</sup>lt;sup>26</sup> NTD: FCPA provisions to be aligned with those under the Mitsubishi contracts (i.e. EPC and LTSA).

## **ARTICLE XXXIII33.** TRANSFER OF FUNDS

If Seller decides to assign or transfer an amount, due or payable, to which he is entitled for services rendered or goods provided during the term of this Contract, Seller shall notify Buyer of such transfer of funds, in accordance to the provisions of Act 21-2012. Said notice shall clearly indicate the rights granted, including a copy of the contract under which the assignment or transfer of funds is made, the exact amount of funds to be assigned or transferred, and specific identification information regarding the assignee (full name of the person or company), address and any other contact information.

Seller acknowledges and agrees that Buyer may deduct any amount, due or payable under this Contract, that Seller owes; Buyer may retain any said amount if Seller fails to fulfill its obligations and responsibilities under this Contract, or a claim arises for warranty or defects regarding the services rendered or goods provided under this Contract. Seller also acknowledges and agrees that Buyer's payment obligation under any assignment of funds will cease upon payment of the outstanding amounts under this Contract. Buyer shall not be required to make payments or transfer any funds for an amount that exceeds the payment to which Seller is entitled to under this Contract

#### **ARTICLE XXXIV34.** CONFLICT OF INTEREST

The Seller certifies that none of its representatives under this Contract receive payment or compensation of any nature, for services rendered regularly through an appointment to a governmental agency, body, public corporation or municipality of Puerto Rico. The Seller also certifies that he may have consulting services contracts with other governmental agencies or bodies, but such condition does not constitute a conflict of interest for the Seller.

The Seller acknowledges that in executing the services pursuant to Contract it has a duty of complete loyalty towards Buyer which includes not having adverse interests to those of Buyer related to the services. Those adverse interests include representation of clients which have or may have opposed interests to those of Buyer in relation to the services. Also, the Seller shall have the continuous obligation to disclose to Buyer all information and circumstances of its relations with clients and third persons and any interest which could reasonably influence Buyer when executing this Agreement or during its term.

The Parties certifies no officer, employee or agent of Buyer, or of the Government of the Commonwealth of Puerto Rico or Municipal Governments, shall be admitted to any share or part of this Contract or to any benefit that may arise there from, but this provision shall not be construed to extend to this Contract if made with a corporation for its general benefit.

In addition to the restrictions and limitations established under the provisions of Act 1-2012, as amended, retired or former officers or employees of Buyer, whose work was in any way related to the award or management of contracts, shall in no way benefit from any contract with Buyer for a period of two (2) years after leaving employment with or ceasing services to Buyer.

(a) The Seller represents conflicting interests when on behalf of a client he must contend for that which it is his duty to oppose to comply with its obligations with another previous, present or potential client. Also, the Seller represents conflicting interests when his conduct is described as such in the canons of ethic applicable to the Seller and his personnel or in the laws or regulations of the Commonwealth of Puerto Rico.

- (b) In the event that any of the partners, directors or employees of the Seller should incur in the conduct described herein, said conduct shall constitute a violation to the prohibitions provided herein. The Seller shall avoid even the appearance of the existence of conflicting interests.
- (c) The Seller acknowledges that Buyer's Contracting Officer shall have the power to intervene the acts of the Seller and/or its agents, employees, and subcontractors regarding the enforcement of the prohibitions contained herein. In the event that Buyer should discover the existence of adverse interests with the Seller, the Contracting Officer shall inform the Seller, in writing, of Buyer's intention to terminate this Contract within a thirty (30) day period. During said period, the Seller may request a meeting with the Contracting Officer to present his arguments regarding the alleged conflict of interests, which meeting shall be granted by Buyer in every case of alleged conflict of interests. In the event that the Seller does not request such a meeting during the specified thirty (30) day period or the controversy is not satisfactorily settled during the meeting, this Contract shall be cancelled.
- (d) The Seller certifies that, at the time of award of this Contract, it does not have any other contractual relation that can enter in a conflict of interest with this Contract. The Seller also certifies that no public employee has any personal or economical interest in this Contract.

## **ARTICLE XXXV35.** UNFAIR LABOR PRACTICE

In the event that the Seller or any of his subcontractors or agents do not comply with an order issued by the Puerto Rico Labor Relations Board and/or the National Labor Relations Board upon their finding that the Seller or any of his subcontractors or agents have committed an unfair labor practice, no further payments shall be made by Buyer to the Seller after the date of the said order. In addition, the Contract may be terminated by Buyer, in which case Buyer may take possession of the materials, tools, and appliances on the job site and finish the work by whatever method it may deem expedient. Any declaration by the Puerto Rico Labor Relations Board and/or by the National Labor Relation Board that the contractors or agents have not complied with an order issued by the Board relating to any unfair labor practice, shall be binding, final, and conclusive unless such order is reversed or set aside by a Court of competent jurisdiction.

## **ARTICLE XXXVI36.** DISCRIMINATION

The Seller certifies that he is an employer with equal opportunity employment, and does not discriminate by race reason, color, religion, political ideas, sex, nationality, age or mental or physical condition.

## **ARTICLE XXXVII37.** [SAFETY PROVISIONS

- 37.1 The Seller shall comply with all applicable laws, ordinances, rules, regulations and OSHA standards for the safety of personnel, equipment, property and to protect them from damage, injury or loss. He shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities. Compliance with all safety provisions by subcontractors shall be the responsibility of the Seller.
- 37.2 [The Seller shall submit a Site-specific Work Plan including: the scope of work, description of the activities to be done, special safety and health considerations to be addressed before commencement of the project, safety procedures to be applied and used during the project including but not limited to excavations, work zone protection, scaffolding, crane operations and emergency procedures for fire and chemical spill among others.
- 37.3 Before commencement of work, the Seller shall take part in a coordination meeting with Buyer's Safety Officer and Project Manager. During this meeting the areas to be worked on will be toured, the site-specific work plan will be reviewed and the protocols for Safety inspections and work permit system shall be discussed.
- 37.4 The Seller shall designate an employee as their safety officer for the project. The duties of the safety officer could be in addition to his/her normal duties. The safety officer shall be in charge of the prevention of accidents and the implementation of the Site-specific Plan in coordination with Buyer's Safety Officer, Project Manager and Resident Engineer. The Seller safety officer shall have a basic training of 30 hours in Occupational Safety and Health Standards for Construction Industry from an approved OSHA Training Center. Evidence of the training shall be submitted if requested by Buyer.
- 37.5 Welding operations shall comply with the requirements of OSHA, ANSI and NFPA.
- 37.6 All chemical products to be used shall be classified as Approved or Conditionally Approved by Buyer's Hazard Communication Section.
- 37.7 The Seller shall be responsible for maintaining good housekeeping and sanitary conditions in the work, rest, lunch and toilet areas. If the project involves the handling of non-asbestos insulation or other dust generating materials, like gypsum board, steps shall be taken to prevent the release of dust to adjacent areas.
- 37.8 Seller shall have an incident investigation procedure and shall notify to Buyer in writing any incident or accident on Buyer's facility. 27

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<sup>&</sup>lt;sup>27</sup> NTD: These items should be addressed in a different agreement that relates to the work on units 5 and 6 and then their maintenance thereafter.

- 37.9 Seller shall have available and up to date all licenses, trainings, medical surveillance and related certificates for specialized personnel required by OSHA, EQB and DOT according to the scope of work to be performed.
- 37.10 [Each Contractor/Subcontractor shall adhere to a 100% drug /alcohol free work zone. At minimum, pre-project and post-accident testing is required. A positive post-accident test or positive pre-project test will result in worker dismissal from the project. Testing will be performed following closely the NIDA standards.
- 37.11 Services including activities inside buildings occupied by working personnel, that could create a hazard to their safety or health, will be offered after Buyer's working hours. The exception will be if the Seller could take all the necessary precautions to protect Buyer's employees and the public from any possible hazard caused by the work. The Seller will take all steps necessary to assure the area will be free of nuisance odors or vapors before Buyer's personnel is to reoccupy. All these will be done in coordination with the local supervisor of Buyer.]<sup>28</sup>
- 37.12 The Seller shall assure that all wastes generated by Seller as a part of the Work are removed and properly disposed of, in accordance with all applicable laws and regulations[, at the end of every work shift and after the completion of the project].
- 37.13 Seller will obtain and maintain, during the duration of the project, the proper permits from all federal, state and local regulatory authorities with respect to discharge, disposal, use, storage, handling and transportation of hazardous chemicals and substances. For projects including the handling of asbestos, lead, or spilled hazardous substances, the notification to EPA or the EQB will be done by the Seller, but in coordination with the Safety Officer and the Environmental Advisor.
- 37.14 Seller will defend, indemnify and hold harmless, Buyer, its employees, agents or assignees for any and all direct liabilities and expenses arising out of Seller noncompliance with these Clauses, if applicable to Seller and Seller's Work, irrespective of any other terms of this agreement.
- 37.15 Buyer may <u>unilaterally</u> terminate this contract upon Seller's failure to reasonably <u>resolve a failure by Seller to</u> comply with the applicable safety provisions on this Contract upon thirty (30) days of <u>receiving a written notice to Seller.</u>]<sup>29</sup>

## <u>ARTICLE XXXVIII [ENVIRONMENTAL LIABILITIES30</u>

The Seller agrees to indemnify BUYER from all expenses and costs of any nature arising out of any claim due to an environmental violation, caused by his agents, employees, subcontractors or any personal assigned during the performance or non-performance of its obligations under this Contract.

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<sup>&</sup>lt;sup>28</sup> NTD: NFE suggests removal of these provisions for the same reasons as set forth in the previous footnote.

<sup>&</sup>lt;sup>29</sup> NTD: Safety provisions to be aligned with those agreed under the Mitsubishi contracts (i.e. EPC and LTSA).

<sup>&</sup>lt;sup>30</sup> NTD: Environmental Liabilities requirements to be addressed in other agreements.

The Seller shall have available, and near to the working area, the necessary equipment to control and recover any spills that may occur during the performance of the work required by the Contract. This equipment should include all the necessary materials for waste disposal.

All equipment to be used in the work area should be free of oil, transmission fluid or hydraulic fluid leakages. If the equipment develops a leakage during the work process, it should be repaired or replaced immediately. While the leaking equipment is removed or repaired, it is the contractor's responsibility to use and replace the absorbent materials and drip pans.

The Seller shall inform and coordinate with the Environmental Compliance Officer of BUYER's Environmental Protection and Quality Assurance Division (EPQAD) of any work to be done to avoid any environmental violation. In case of any incident, the Seller shall, immediately, notify BUYER's on site Supervisor, who will notify the EPQAD.

Before starting the work, the Seller shall submit the work plan to Buyer's EPQAD for evaluation.

All chemical analysis shall be performed by a Buyer's approved laboratory that is included in Buyer's Material Management Division Supplier Registry as a company that is qualified and evaluated to perform this type of work.

Buyer's personnel will audit the sampling and the disposal of waste material.

The disposal of non-hazardous and hazardous waste material shall be done in a Puerto Rico Environmental Quality Board (PREQB) approved landfill.

The Seller shall comply with 49 CFR 72 Sub. Part H (DOT requirements).

All remedial actions and environmental work will be performed by a company previously approved by Buyer.

All work shall follow the Control Erosion and Sedimentation Plan (CES Plan). The temporary measures needed to control erosion and water pollution shall include, but not be limited to, berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains, and other erosion control devices or methods. These temporary measures shall be installed at the locations where there is a need to control erosion and water pollution during the construction of the project, and as directed by the engineer, and as shown on the drawings. The CES Plan presented in the drawings serves as a minimum for the requirements of erosion control during construction. The Seller has the ultimate responsibility for providing adequate erosion control and water quality throughout the duration of the project. Therefore, if the provided plan is not working sufficiently to protect the project areas, then the Seller shall provide additional measures as required to obtain the required protection.

Chemical products cannot reach any internal or external sewer at the construction site in order to prevent contamination and comply with all federal and local regulations related with the Clean Water Act.

The Seller must obtain and submit to Buyer's EPQAD any other type of permit required for their operation but no limited, such as: fuel or wastewater storage tanks, storage of remain material of excavations or any landfill required for the project, use and storage of chemicals. Furthermore, will take immediate response or mitigate any environmental concern and deficiencies found by Buyer personnel or regulatory agencies. The Seller will be responsible to notify immediately to Buyer for any findings or environmental violations due to inspections by regulatory agencies.

The Seller must provide and maintain environmental protection measures during the commencement, construction and completion of the project, as defined under this contract. Environmental protection measures must be provided by the Seller to correct conditions that may emerge or develop during the construction, as well as, the recondition of all environmental measures or controls employed at the project which does not fulfill their purpose.

The construction process should be performed in such a manner that any adverse environmental impacts, where applicable, are reduced to a minimum and acceptable level in the fulfillment to Buyer's Environmental Compliance Officers.

It is intended that the natural resources within the project boundaries and outside the limits of the permanent work performed, be preserved in their existing condition or be restored to an equivalent or improved condition, upon completion of the work. The Seller shall confine his construction activities to areas defined by the work schedule, plans and specifications.

The Seller along with the engineer will establish, at least on a monthly basis, an orientation program for the residents and business people to clarify details and working schedule of the project, also to attend their needs or complaints.

All equipment to be used in the work area should be in perfect condition and have a good maintenance program. A monthly record of maintenance should be filed by the contractors and submitted to Buyer's EPQAD. If required, the Seller must perform and submit a monitoring study of gas emission or noise reduction on determined areas to comply with regulations. Also, will be responsible to maintain their operation center and project area clean and organized.

The use of liners to cover up carrying trucks is compulsory.

The Seller shall dispose of all waste generated in the project. The waste shall be picked up and placed in containers which area must be emptied on a regular schedule. The construction areas shall be clean and must appear natural upon completion. The use of Buyer's waste disposal equipment by the Seller is not permitted.

All areas must be clean and organized to prevent accidents or violations to regulations.

Safety barriers must be installed at the edges of the project to avoid access from non-authorized individuals at the project site.

The Seller shall coordinate with Buyer for the disposal of all waste generated in connection with the operation and maintenance of the Purchased Equipment according to the all applicable state and federal environmental laws.

Before starting additional work, the Seller shall submit the work plan to Buyer's Environmental Protection Division for evaluation.

Buyer's personnel will audit the sampling and the disposal of waste material.

A company previously approved by Buyer will perform all remedial actions and environmental work (if it is necessary)

All work shall be performed according to the Storm Water Pollution Prevention Plan (SWPPP), which is part of the Special Conditions of the NPDES Permit.

All work performed at the Dock A, B and C should be performed according with best management practices to avoid any impact to NPDES Outfalls 002 and 003 and Intake 001 of the San Juan Power Plant.

All work will be performed in compliance with Consent Decree stipulations Civil Action No. 93-2527 CCC. 131

# ARTICLE XXXIX39. COMPLIANCE WITH THE COMMONWEALTH OF PUERTO RICO CONTRACTING REQUIREMENTS

The Seller will comply with all applicable State Law, Regulations or Executive Orders that regulate the contracting process and requirements of the Commonwealth of Puerto Rico.

- 39.1 Executive Order Num. OE-1991-24 of June 18, 1991 to require certification of compliance with the Internal Revenue Services of the Commonwealth of Puerto Rico: Pursuant to Executive Order Number OE-1991-24 of June 18, 1991, the Seller will certify and guarantee that it has filed all the necessary and required income tax returns to the Government of Puerto Rico for the last five (5) years. The Seller further will certify that it has complied and is current with the payment of any and all income taxes that are, or were due, to the Government of Puerto Rico. The Seller shall provide, to the satisfaction of Buyer, and whenever requested by Buyer during the term of this Contract, the necessary documentation to support its compliance with this Clause. The Seller will be given a specific amount of time to produce said documents. During the term of this Contract, the Seller agrees to pay and/or to remain current with any repayment plan agreed to by the Seller with the Government of Puerto Rico.
- 39.2 Executive Order Num. OE-1992-52 of August 28, 1992 to require certification of compliance with the Department of Labor of the Commonwealth of Puerto Rico. Pursuant to Executive Order Number 1992-52, dated August 28, 1992 amending OE-1991-24, the Seller will certify and warrant that it has made all payments required for unemployment benefits, workmen's compensation and social security for chauffeurs, whichever is applicable, or that in lieu thereof, has subscribed a payment plan in connection with any such unpaid items and is in full compliance with the terms thereof. The Seller accepts and acknowledges its responsibility for requiring and obtaining a similar warranty and

<sup>&</sup>lt;sup>31</sup> NTD: Construction phase environmental provisions to be aligned with those agreed under the Mitsubishi contracts (i.e. EPC and LTSA).

certification from each and every Contractor and Sub Contractor whose service the Con Seller tractor has secured in connection with the services to be rendered under this Contract and shall forward evidence to BUYER as to its compliance with this requirement.

39.3 Government of Puerto Rico Municipal Tax Collection Center: The Seller will certify and guarantee that it does not have any current debt with regards to property taxes that may be registered with the Government of Puerto Rico's Municipal Tax Collection Center (known in Spanish as Centro de Recaudación de Ingresos Municipales ("CRIM"). The Seller further will certify to be current with the payment of any and all property taxes that are or were due to the Government of Puerto Rico. The Seller shall provide, to the satisfaction of Buyer and whenever requested by Buyer during the term of this Contract, Certification issued by the Municipal Revenues Collection Center (MRCC), assuring that Seller does not owe any tax accruing to such governmental agency. To request such Certification, Seller will use the form issued by the MRCC (called "CRIM-Certificados, Radicación, Estado de Cuenta y Todos los Conceptos" in the website). The Seller will deliver upon request any documentation requested by Buyer. During the Term of this Contract, the Seller agrees to pay and/or to remain current with any repayment plan agreed to by the Seller with the Government of Puerto Rico with regards to its property taxes.

The Seller shall provide a Personal Property Tax Filing Certification, issued by the MRCC which indicates that Seller has filed its Personal Property Tax Return for the last five (5) contributory terms or Negative Debt certification issued by the MRCC with respect to real and property taxes and a sworn statement executed by Seller indicating that (i) its revenues are derived from the rendering of professional services, (ii) during the last five (5) years (or the time in which it has been providing professional services) it has had no taxable business or personal property on the 1st of January of each year, (iii) that for such reasons it has not been required to file personal property tax returns, as required under Article 6.03 of Act 83-1991, as amended and (iv) that for such reason it does not have an electronic tax file in the MRCC's electronic system.

- 39.4 The Seller shall furnish a Certification issued by the Treasury Department of Puerto Rico which indicates that Seller does not owe Puerto Rico Sales and Use taxes to the Commonwealth of Puerto Rico; or is paying such taxes by an installment plan and is in full compliance with its terms.
- 39.5 The Seller shall provide a Puerto Rico Sales and Use Tax Filing Certificate, issued by the Treasury Department of Puerto Rico assuring that Seller has filed his Puerto Rico Sales and Use Tax for the last sixty (60) contributory periods.
- 39.6 The Seller shall provide a copy of Contractor's Certificate of Merchant's Registration issued by the Treasury Department of Puerto Rico.
- 39.7 Puerto Rico Child Support Administration (ASUME): The Seller shall present, to the satisfaction of Buyer, the necessary documentation certifying that the Seller nor any of its owners, affiliates of subsidiaries, if applicable, have any debt, outstanding debt, or legal procedures to collect child support payments that may be registered with the Puerto Rico

Child Support Administration (known in Spanish as the Administración Para El Sustento de Menores (ASUME). The Seller will be given a specific amount of time to deliver said documents. 3 L.P.R.A. § 8611 et seq.;

- 39.8 The Seller shall provide a Good Standing Certificate issued by the Department of State of Puerto Rico.
- 39.9 The Seller shall provide a Certification of Incorporation, or Certificate of Authorization to do business in Puerto Rico issued by the Department of State of Puerto Rico.
- 39.10 [Special Contribution for Professional and Consulting Services: As required by Act No. 48-2013, as amended, Buyer will withhold a special contribution of one point five percent (1.5%) of the gross amounts paid under this Contract.]<sup>32</sup>
- 39.11 Social Security and Income Tax Retentions: In compliance with Executive Order 1991 OE- 24; and C.F.R. Part 404 et. Seq., the Seller will be responsible for rendering and paying the Federal Social Security and Income Tax Contributions for any amount owed as a result of the income, from this Contract.
- 39.12 [Income Tax Retention Law: Buyer shall deduct and withhold seven percent (7%) of any and all payments to residents of the Commonwealth of Puerto Rico as required by the Internal Revenue Code of Puerto Rico. In case of US citizens and Non US citizens, which are nonresidents of the Commonwealth of Puerto Rico the Seller will be retained twenty percent (20%) and twenty-nine percent (29%) respectively. Buyer will remit such withholdings to the Government of Puerto Rico's Treasury Department (known in Spanish as Departamento de Hacienda de Puerto Rico). The Seller will request Buyer not to make such withholdings if, to the satisfaction of Buyer, the Seller timely provides a release from such obligation by the Government of Puerto Rico's Treasury Department. 3 L.P.R.A. § 8611 et seq., 2011 L.P.R. 232; 232-2011.]<sup>33</sup>
- 39.13 Compliance with Act No. 1 of Governmental Ethics: The Seller will certify compliance with Act No. 1 of January 3, 2012, as amended, known as the Ethics Act of the Government of Puerto Rico, which stipulates that no employee or executive of Buyer nor any member of his/he immediate family (spouse, dependent children or other members of his/her household or any individual whose financial affairs are under the control of the employee) shall have any direct or indirect pecuniary interest in the services to be rendered under this Contract, except as may be expressly authorized by the Governor of Puerto Rico in consultation with the Secretary of Treasury and the Secretary of Justice of the Government. 3 L.P.R.A. § 8611 et seq.;
- 39.14 Law 168-2000: Law for the Strengthening of the Family Support and Livelihood of Elderly People: The Seller will certify that if there is any Judicial or Administrative

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<sup>&</sup>lt;sup>32</sup> NTD: According to advice from KPMG, this provision does not apply to the transactions contemplated by this agreement.

<sup>&</sup>lt;sup>33</sup> NTD: According to advice from KPMG, this provision does not apply to the transactions contemplated by this agreement.

Order demanding payment or any economic support regarding Act No. 168-2000, as amended, the same is current and in all aspects in compliance. Act No. 168-2000 "Law for the Strengthening of the Family Support and Livelihood of Elderly People" in Spanish: "Ley para el Fortalecimiento del Apoyo Familiar y Sustento de Personas de Edad Avanzada", 3 L.P.R.A. §8611 et seq.

- 39.15 Law Num. 127, May 31, 2004: Contract Registration in the Comptroller's Office of Puerto Rico Act: Payment for services object of this Contract will not be made until this Contract is properly registered in the Office of the Comptroller of the Government of Puerto Rico pursuant to Law Number 18 of October 30, 1975, as amended.
- 39.16 Dispensation: Any and all necessary dispensations have been obtained from any government entity and that said dispensations shall become part of the contracting record.
- 39.17 Articles extracted, produced, assembled, packaged or distributed in Puerto Rico by enterprises with operations in Puerto Rico, or distributed by agents established in Puerto Rico shall be used when the service is rendered, provided that they are available.
- 39.18 Rules of Professional Ethics: The Seller acknowledges and accepts that it is knowledgeable of the rules of ethics of his/her profession and assumes responsibility for his/her own actions.
- 39.19 Prohibition with respect to execution by public officers: (3 L.P.R.A. 8615(c))

No public officer or employee authorized to contract on behalf of the executive agency for which he/she works may execute a contract between the agency for which he/she works and an entity or business in which he/she or any member of his/her family unit has or has had direct or indirect economic interest during the last four (4) years prior to his/her holding office.

39.20 Prohibition with respect to contracting with officers or employees: (3 L.P.R.A. 8615(d))

No executive agency may execute a contract in which any of its officers or employees or any member of their family units has or has had direct or indirect economic interest during the last four (4) years prior to their holding office, unless the Governor gives authorization thereto with the previous recommendation of the Secretary of the Treasury and the Secretary of Justice.

39.21 Prohibition with respect to contracts with officers and employees of other Government entities: (3 L.P.R.A. 8615(e))

No public officer or employee may be a party to or have any interest in any profits or benefits produced by a contract with any other executive agency or government dependency unless the Governor gives express authorization thereto with previous recommendation from the Secretary of the Treasury and the Secretary of Justice.

39.22 Prohibition with respect to evaluation and approval by public officers: (3 L.P.R.A. 8615(f))

No public officer or employee who has the power to approve or authorize contracts shall evaluate, consider, approve or authorize any contract between an executive agency and an entity or business in which he/she or any member of his/her family unit has or has had direct or indirect economic interest during the last four (4) years prior to his/her holding office.

39.23 Prohibition with respect to execution by public officers contracts with former public officers: (3 L.P.R.A. 8615(h))

No executive agency shall execute contracts with or for the benefit of persons who have been public officers or employees of said executive agency until after two (2) years have elapsed from the time said person has ceased working as such.

- 39.24 Both parties acknowledge and agree that the contracted services herein may be provided to another entity of the Executive Branch which enters into an interagency Contract with Buyer or by direct disposition of the Chief of Staff. These services will be performed under the same terms and conditions in terms of hours of work and compensation set forth in this Contract. For the purpose of this Clause, the term "entity of the Executive Branch" includes all agencies of the Government of Puerto Rico, as well as all instrumentalities and public corporations.
- 39.25 The office of the Chief of Staff shall have the authority to terminate this Contract at any time.
- 39.26 The Seller shall provide Workmen's Compensation Insurance as required by the Workmen's Compensation Act 45-1935 of the Commonwealth of Puerto Rico. The Seller shall also be responsible for compliance with said Workmen's Compensation Act by all its subcontractors, agents, and invitees, if any.
- 39.27 Invoices must include a written and signed certification stating that no officer or employee of Buyer, and their respective subsidiaries or affiliates, will personally derive or obtain any benefit or profit of any kind from this Contract, with the acknowledgment that invoices that do not include this certification will not be paid. This certification must read as follows:

"We certify under penalty of nullity that no public servant of Buyer will derive or obtain any benefit or profit of any kind from the contractual relationship which is the basis of this invoice. If such benefit or profit exists, the required waiver has been obtained prior to entering into the Agreement. The only consideration to be received in exchange for the delivery of goods or for the Services provided is the agreed-upon price that has been negotiated with an authorized representative of the Buyer. The total amount shown on this invoice is true and correct. The Services have been rendered, and no payment has been received".

39.28 Anti-Corruption Code for a New Puerto Rico. Seller agrees to comply with the provisions of Act No. 2-2018, as the same may be amended from time to time, which establishes the Anti-Corruption Code for a New Puerto Rico. The Seller hereby certifies that it does not represent particular interests in cases or matters that imply a conflict of interest, or of public policy, between the executive agency and the particular interests it represents.

Seller shall furnish a sworn statement to the effect that neither Seller nor any president, vice president, executive director or any member of a board of officials or board of directors, or any person performing equivalent functions for Seller has been convicted of or has pled guilty to any of the crimes listed in Article 6.8 of Act 8-2017, as amended, known as the Act for the Administration and Transformation of Human Resources in the Government of Puerto Rico or any of the crimes included in Act 2-2018.

Seller hereby certifies that it has not been convicted in Puerto Rico or United States Federal court for under Articles 4.2, 4.3 or 5.7 of Act 1-2012, as amended, known as the Organic Act of the Office of Government Ethics of Puerto Rico, any of the crimes listed in Articles 250 through 266 of Act 146-2012, as amended, known as the Puerto Rico Penal Code, any of the crimes typified in Act 2-2018, as amended, known as the Anti-Corruption Code for a New Puerto Rico or any other felony that involves misuse of public funds or property, including but not limited to the crimes mentioned in Article 6.8 of Act 8-2017, as amended, known as the Act for the Administration and Transformation of Human Resources in the Government of Puerto Rico.

Buyer shall have the right to terminate the agreement in the event Seller is convicted in Puerto Rico or United States Federal court for under Articles 4.2, 4.3 or 5.7 of Act 1-2012, as amended, known as the Organic Act of the Office of Government Ethics of Puerto Rico, any of the crimes listed in Articles 250 through 266 of Act 146-2012, as amended, known as the Puerto Rico Penal Code, any of the crimes typified in Act 2-2018, as amended, known as the Anti-Corruption Code for a New Puerto Rico or any other felony that involves misuse of public funds or property, including but not limited to the crimes mentioned in Article 6.8 of Act 8-2017, as amended, known as the Act for the Administration and Transformation of Human Resources in the Government of Puerto Rico.

If any of the previously required Certifications shows a debt, and Seller has requested a review or adjustment of this debt, Seller will certify that it has made such request at the time of the Contract execution. If the requested review or adjustment is denied and such determination is final, Seller will provide, immediately, to Buyer a proof of payment of this debt; otherwise, Seller accepts that the owed amount be offset by Buyer and retained at the origin, deducted from the corresponding payments.

39.29 Consequences of Non-Compliance: The Seller expressly agrees that the conditions outlined throughout this Section are essential requirements of this Contract. Consequently,

should any one of these representations, warranties or certifications be incorrect, inaccurate or misleading, in whole or in part, there shall be sufficient cause for the Buyer to render this Contract null and void, and the Seller shall reimburse the Buyer all moneys received under this Contract.

## **ARTICLE XL40.** INSURANCE

#### 40.1 INSURANCE AND BONDS:

The Seller shall secure and maintain in full force and effect during the life of this Contract as provided herein, policies of insurance covering all operations engaged in by the Contract as follows:

(a) Commonwealth of Puerto Rico Workmen's Compensation Insurance:

The Seller shall provide Workmen's Compensation Insurance as required by the Workmen's Compensation Act 45-1935 of the Commonwealth of Puerto Rico. Seller shall also be responsible for compliance with said Workmen's Compensation Act by all its subcontractors, agents, and invitees, if any.

The Seller shall furnish a certificate from the Puerto Rico's State Insurance Fund showing that all personnel employed in the work are covered by the Workmen's Compensation Insurance, in accordance with this Contract.

## (b) Employer's Liability Insurance:

The Seller shall provide Employer's Liability Insurance with minimum bodily injury limits of \$1,000,000 for each employee and \$1,000,000 for each accident covering against the liability imposed by Law upon the Seller as result of bodily injury, by accident or disease, including death arising out of and in the course of employment, and outside of and distinct from any claim under the Workmen's Compensation Act of the Commonwealth of Puerto Rico.

## (c) Commercial General Liability Insurance:

The Seller shall provide a Commercial General Liability Insurance with limits of \$2,000,000 per occurrence and \$2,000,000 aggregate.

The Commercial General Liability Insurance or its equivalent must include coverage for bodily injuries and property damages caused during the operation of a watercraft.

#### (d) Excess Liability Insurance:

The Seller shall provide an Excess Liability Insurance in excess of the Commercial General Liability Insurance limits. This Excess Liability

Insurance will have limits of \$10,000,000 per occurrence and \$10,000,000 aggregate.

(e) Commercial Automobile Liability Insurance:

The Seller shall provide a Commercial Automobile Liability Insurance with limits of \$1,000,000 combined single limit covering all owned, non-owned, and hired automobiles.

(f) Pollution Liability Insurance:

The Seller shall provide a Pollution Liability Insurance with limits of \$1,000,000 per claim and \$1,000,000 per aggregate.

## 40.2 Requirements Under the Policies:

The Commercial General Liability or its equivalent and the Commercial Automobile Liability Insurance required under this Contract shall be endorsed to include:

(a) As Additional Insured:

Puerto Rico Electric Power Authority (Buyer) Risk Management Office PO Box 364267 San Juan, PR 00936-4267

- (b) A 30-day cancellation or nonrenewable notice to be sent to the above address.
- (c) An endorsement including this Contract under contractual liability coverage and identifying it by number, date and parties to the contract.
- (d) Waiver of Subrogation in favor of Puerto Rico Electric Power Authority (Buyer).
- (e) Breach of Warranties or Conditions:

"The Breach of any of the Warranties or Conditions in this policy by the Insured shall not prejudice Buyer's rights under this policy."

#### 40.3 Bonds:

As a Contract security, the Seller shall furnish at the time of the execution of the Contract:

(a) A Performance Bond in the amount of 25% of the estimated annual Agreement price, with good and sufficient surety satisfactory to Buyer guaranteeing that the Seller will well and faithfully perform the contract work.

- (b) A Payment Bond<sup>34</sup> in the amount of 25% of the estimated annual Agreement price, with good and sufficient surety satisfactory to Buyer to guarantee the prompt payment of all labor, supervision, equipment and materials required in the performance of the work.
- (c) All bonds shall be issued in the official form of Buyer.

## 40.4 Furnishing of Policies:

All required policies of insurance shall be in a form acceptable to Buyer and shall be issued only by insurance companies authorized to do business in Puerto Rico.

The Seller shall furnish a certificate of insurance in original signed by an authorized representative of the insurer in Puerto Rico, describing the coverage afforded."

## **ARTICLE XLI41.** [RESERVED]

## **ARTICLE XLII42.** GENERAL

- 42.1 If any inconsistency appears between the provisions contained in the body this Agreement and any Annex to this Agreement, then the provisions of the body of this Agreement shall prevail.
- 42.2 If any one or more of the provisions, obligations, or terms herein or part thereof shall be determined by a court of competent jurisdiction to be wholly or partially invalid, void, illegal or unenforceable in any respect by operation of Applicable Law or otherwise, the validity, legality, or enforceability of the remaining provisions, obligations, or terms or part thereof in any other jurisdiction shall not in any way whatsoever be affected or impaired thereby and all provisions of this Agreement shall, if alternative interpretations are applicable, be construed so as to preserve the validity and enforceability hereof to the extent that the essential purposes of this Agreement can be determined and effectuated.
- 42.3 The Parties do not intend any term of this Agreement to be enforceable by any Third Party. The Parties may rescind or vary this Agreement, in whole or in part, without the consent of any Third Party.
- 42.4 Nothing in this Agreement shall be deemed to create a partnership, joint venture or association, establish a principal and agent relationship or any other relationship of a similar nature, including employment, between the Parties or create any joint and several liabilities. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, to act on behalf of, to act as or be an agent or representative of, or to otherwise bind, the other Party.
- 42.5 The Parties acknowledge that this Agreement may have been negotiated and prepared by the Parties with the advice of legal counsel to the extent deemed necessary by

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<sup>&</sup>lt;sup>34</sup> NTD: We would appreciate a discussion on Payment Bond requirements and whether a letter of credit would be acceptable.

each Party. The Parties have agreed to the wording of this Agreement and none of the provisions of this Agreement shall be construed against one Party on the ground that such Party is the author of this Agreement or any part of this Agreement.

42.6 This Agreement contains the entire agreement between the Parties with respect to the subject matter hereof and supersedes all prior proposals, negotiations and communications relative hereto, oral or written, and there are no other understandings or representations between the Parties hereto. This Agreement may not be amended except by an instrument in writing signed by a duly authorized representative of each Party.

[Signature Page Follows]

IN WITNESS WHEREOF the Parties hereto have caused this Agreement to be executed by their respective duly authorized representative as of the day and year first above written.

For and on behalf of	For and on behalf of
SELLER:	BUYER:
	PUERTO RICO ELECTRIC POWER AUTHORITY
Name:	Name:
Title:	Title:

#### PUERTO RICO ELECTRIC POWER AUTHORITY GENERATION DIRECTORATE

## ANNEX A TERMS AND CONDITIONS FOR UNITS CONVERSIONS AND PIPELINE INSTALLATION

IN CONSIDERATION of the mutual covenants hereinafter stated, as first party, the Puerto Rico Electric Power Authority, hereinafter referred to as "PREPA", as second party, (Name of Company), the parties agree themselves, their personal representatives, successors, and assignees, as follows:

#### ARTICLE 1. Scope of Work

The Seller shall furnish all labor, materials, design, supervision, equipment, tools, services, engineering, fabrication, procurement, construction, operator training, tests, taxes, startup, and other necessary services for the conversion of San Juan Units 5 and 6 completion of the Conversion Work in strict accordance with the provisions of this Contract, including the RFP documents, Proposal, and reference drawings, all of which are hereby made a part hereof provided that, on one or before 60 days after the Commissioning Start Date (as per Fuel Sale and Purchase Agreement), as part of its obligations herein stated, the Seller shall deliver to PREPA a true and exact copy of all diagrams, plans, sketches, maps, and other documents used in the performance of contracted works and for which a third party copyright or patent right would not be an impediment for such delivery. The Seller shall be responsible for the scope of work and associated capital cost required for LNG gas conversion of PREPA's San Juan Units 5 and 6, as well as modifications to associated turbine controls, in each case, to the extent specified herein. The Seller shall include be entitled to recover the cost of the scope Conversion Work for PREPA's Units 5 and 6 conversions in the form of a capacity payment Capacity Payment over the initial Base five (5) year term of the Agreement.

The terms and conditions included on this <u>Annex A</u> will apply only to the <u>units' conversions and pipeline installation works Conversion Work</u>. If there is any discrepancy between this document and the Fuel Sale and Purchase Agreement (the Agreement), the latter will prevail. Articles on the Agreement shall also apply to the unit's conversions and pipeline installation works.

#### ARTICLE 2. Definitions

Whenever the words defined in this Article or pronouns used instead are mentioned in this document (Annex A), they shall have the meanings here given. If not defined on this document, then the definition on the Fuel Sale and Purchase Agreement will apply.

2.1 "Act of God" – an Act of God is construed herein to mean an earthquake, hurricane or other cataclysmic phenomenon of nature not ordinarily occurring. Rains, windstorms, floods or other natural phenomenon of normal intensity for the particular locality as determined by the preceding five (5) year monthly average from records of the nearest

<sup>&</sup>lt;sup>35</sup> NTD: Discuss cost recovery in the event of early termination.

- National Oceanic and Atmospheric Administration recording station shall not be construed as an Act of God.
- 2.2 "Buyer" shall have the meaning given in the Fuel Sale and Purchase Agreement.
- 2.3 "Calendar Day" shall mean each and every 24 hour day shown on the calendar, beginning and ending at midnight.
- 2.4"CES Inspector Plan" Monitoring engineer hired to perform monthly inspections and assure compliance with the Approved Erosion and Sedimentation Control Plan for the Project with regulatory agencies.
- 2.4 2.5 "Contracting Officer" shall mean the Chief Executive Officer of PREPA, acting directly or through his properly authorized representatives as notified in writing to the Seller.
- 2.5 Completion Date" date in which units conversions and pipeline installation works has been completed.
- 2.6 2.7 "Contract" shall mean the Fuel Sale and Purchase Agreement.
- 2.7 2.8["Construction Manager" shall mean the professional assigned by the Seller to provide the construction management services on the project. This professional shall be a professional engineer registered in Puerto Rico and an active member of the Puerto Rico College of Engineers and Land Surveyors.]
- 2.8 "Conversion Work" shall mean the supply, installation, commissioning and any Required Testing for pipeline and LNG gas conversion of PREPA's San Juan Units 5 and 6, as well as modifications to associated turbine controls, in each case that are set forth in the Specifications.
- 2.9 "Change Order" A written agreement between the parties that sets out changes (in price, time, or scope of work) to the Contract.
- 2.10 "Critical Path Method (CPM)" A scheduling technique used to plan and control a project which combines all relevant information into a single plan defining the sequence and duration of operations and depict the interrelationship of the work elements to complete the project. The critical path is defined as the longest sequence of activities in a network which establishes the minimum length of the time for accomplishment the last event of the project of Substantial Completion.
- 2.11 "**Delay**" Event that extends (affect) the completion date of the project, by affecting tasks on the critical path. The project schedule shall clearly display that the Seller has used, in full, all the float time available for the work involve with this request (such float belonging exclusively to Seller).
- 2.12 "**Engineer**" shall mean PREPA's Director of Generation, acting directly or through his properly authorized representatives.

- 2.13 "Final Acceptance" shall mean the written approval by PREPA that the entire Phase I Conversion Work (units conversions and pipeline installation) works have has been completed and the final cleaning—up of the site has been performed and all Punch List items have been rectified.
- 2.14 "Hazardous Materials" shall mean any substance that is either defined or regulated as hazardous or toxic by, or as to which liability including for damages or remediation may be imposed under Applicable Law, including (a) any petroleum or petroleum products, radioactive materials, asbestos in any form that is or could become friable, urea formaldehyde foam insulation, transformers or other equipment that contain dielectric fluid containing polychlorinated biphenyls and processes and certain cooling systems that use chlorofluorocarbons; (b) any chemicals, materials or substances which as of the applicable Effective Date are, or hereafter become, defined as or included in the definition of "hazardous substances," "hazardous wastes," "hazardous materials," "extremely hazardous wastes," "restricted hazardous wastes," "toxic substances," "toxic pollutants," or any words of similar import pursuant to Applicable Law; or (c) any other chemical, material, substance or waste, exposure to which is now or hereafter prohibited, limited or regulated by any Governmental Authority, or which may be the subject of liability under any Applicable Law for damages, costs or remediation.
- 2.15 "Inspector Plan" Monitoring engineer hired to perform monthly inspections and assure compliance with the requirements of any construction permits required for the Project with regulatory agencies.
- 2.16 2.14["Letter of Award" (LOA) Letter signed by the Chief Executive Officer to notify the offeror that the proposal is being awarded to him and to require documents prior to contract signing, such as but not limited to; Corporate Resolution, evidence of payment and certificate of the Puerto Rico State Insurance Fund, municipal license taxes, Construction excise taxes, certificate of insurances and endorsements, documents of the Owner Controlled Insurance Program, payment and performance bonds.
- 2.17 **2.15** "Letter of Release" Letter signed by the Seller's contracting officer and notarized stating that the Seller has no debt with, but no limited to, subcontractors, consultants, material and services supplier, Federal and State Agencies, Municipality, manufacturer or Insurance Agency. 37
- 2.18 2.16"Notice to Proceed" a written order sent to the Seller by the Contracting Officer, or his designated representative, notifying the Seller of the date upon which the Seller is given authority to begin the work.
- 2.19 2.17 "Owner" designates the Puerto Rico Electric Power Authority (PREPA).

<sup>&</sup>lt;sup>36</sup> NTD: Letter of Award to align with requirements of contract.

<sup>&</sup>lt;sup>37</sup> NTD: Form of letter to be discussed and agreed.

- 2.18 "Phase I" (Units Conversions and Pipeline Installation) shall mean the supply, installation, commissioning, and tests for pipeline and LNG gas conversion of PREPA's San Juan Units 5 and 6, as well as modifications to associated turbine controls.
- 2.19"Phase II" (Fuel Supply) shall mean the shipping, supply, and operation associated with LNG delivered to the terminal and for natural gas supply from the terminal to San Juan 5 and 6 shall be part of Seller's responsibility. Begins with Commissioning Start Date.
- 2.20 "Punch List" shall mean the list of non-conforming or incomplete work items that are identified by PREPA (acting reasonably) as been required for the Final Acceptance of the work.
- 2.21 "Required Tests" shall mean performance testing of converted units 5 and 6, hydrostatic testing of piping, and any emissions testing that may be required by Applicable Laws or the terms of any permit for the commencement of commercial operation of the converted units 5 and 6.
- 2.22 2.21 "Resident Engineer" shall mean the manager of the field office responsible for, but not limited to, the administrative issues, quality control, and technical aspects of the project. This person shall be a professional engineer register in Puerto Rico and an active member of the Puerto Rico College of Engineers and Land Surveyors. The Resident Engineer shall be present at all times on site in order to the Seller be able to perform any task of the project.
- 2.23 2.22"Safety Officer" shall be the person designated by the Seller whose only duty shall be the prevention of accidents and implement, both, the Safety and Health Program and the Site-specific Work Plan. The Safety Officer shall be present at all times on site in order to the Seller be able to perform any task of the project.
- 2.24 2.23 "Seller" shall have the meaning given in the Fuel Sale and Purchase Agreement.
- <u>2.25</u> <u>2.24</u>"**Special Conditions**" are all special requirements, regulations and/or directions covering conditions peculiar to a particular project.
- 2.26 "Specifications" shall mean [•].38
- 2.27 2.25 "Substantial Completion of Phase I" shall mean the date, certified by PREPA (acting reasonably), when the conversions and modifications to the units have been completed, all tests to Required Testing on the units and pipeline have been performed and demonstrating compliance with the Specifications, written reports have been delivered to PREPA, and after each unit have burned LNG for seven (7) consecutive days. However, the Seller shall finish the items included in the punch list and all other pending task or requirement of the contract documents, as required in the Substantial Completion certificate.

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<sup>&</sup>lt;sup>38</sup> NTD: To refer to an Exhibit, the contents of which to be discussed and agreed.

- 2.28 2.26 "Subcontractor" shall mean any subcontractor, supplier, or vendor of the Seller engaged for the purposes of progressing the work under a subcontract with the Seller and in which the Seller has no equity interest or profit sharing affiliation. Any such entity in which the Seller owns equity or has a profit sharing affiliation shall be considered to be the Seller. Seller shall comply with requirements set forth on Article 18. Subcontractors of the Contract.
- 2.29 "Warranty Period" shall have the meaning given in Article 19.1.
- 2.30 2.27"Working Day" shall mean each day Monday thru Friday and hours from 7:00 AM to 11:30 AM and from 12:30 PM to 4:00 PM.

#### ARTICLE 3. Commencement and Completion of Work

#### 3.1 General

The Seller shall receive a written order, stating the date on which the Seller shall commence to execute the contracted work. Thus, Notice to Proceed date marks the beginning of commencement of work. Mobilization shall be completed within ten (10) days after the Notice to Proceed. Both Parties agree that time is the essence of the Contract.

The demand of the obligations of either party under this Contract will be subject to the filing of the Contract at the Office of the Comptroller of the Commonwealth of Puerto Rico, in compliance with Act of October 30, 1975, No. 18, as amended.

The Seller shall, not later than ten (10) working days, after receipt of the Letter of Award (LOA) signed by the Engineer, furnish all documents required therein.]

#### 3.2 Schedule of Proposed Progress

The Seller, within ten (10) days after receipt of the Notice to Proceed shall file with the Engineer a schedule of proposed progress of the work and the proposed detailed method of carrying on the work including a full statement of equipment and equipment layout for the job. This progress chart and statement of operations shall show the dates of commencement and completion of each item of the work. This schedule shall also include the milestones for the submittals and material ordering, the critical path of the project, and the man-hours per item if said progress chart and/or statement of operations are not satisfactory to the Engineer, they shall be revised by the Seller to provide for the use of adequate and sufficient equipment and force and a method of operations, which will assure the completion of the work within allotted time. This information shall become a part of this Contract after the Engineer has approved it in writing. The schedule shall be actualized monthly by the Seller and submitted to PREPA for approval.

#### ARTICLE 4. Suspension of Work

The Contracting Officer or the Engineer may, at any time, suspend the whole or any portion of the work under this Contract, for the period of time that the Contracting Officer or the Engineer determines appropriate to PREPA, but this right to suspend the work shall not be construed as

denying the Seller actual reasonable, and necessary expenses due to delays,—caused by such suspension (such amounts to be paid as they accrue and in addition to the Capacity Payments) [, it being understood that expenses will not be allowed for such suspension when ordered by the Contracting Officer or the Engineer on account of a Force Majeure event, as defined in Article 14. Force Majeure, herein [39]. The cause of such suspension shall be put in writing by the Contracting Officer, the Engineer or the designate representative within two (2) working days after the suspension or as soon as practicable.

#### ARTICLE 5. Other Work at the Site

PREPA reserves the right to perform other work <u>outside of the scope of the Conversion Work</u> by force account and/or enter into other contracts in connection with this project. The Seller shall afford PREPA and other contractor reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs. If any part of the Seller's work depends for proper execution or results upon the work of PREPA or of any other contractor, the Seller shall inspect and promptly report to PREPA any defects in such work or any conflicts between such work and that of the Seller, PREPA to decide, if necessary, the course to be followed by each party.

Wherever work being done by PREPA's own forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by PREPA to PREPA will secure the completion of the various portions of the work in general harmonyso as not to interfere with the Conversion Work. Whenever, in the opinion of PREPA, the orderly progress of the entire project requires the use by PREPA's own forces or by other contractors, of construction equipment installed and operated by the Seller for his own use, PREPA will arrange with the Seller for such use, at times, and in locations which will not interfere with the work being done under this Contract, and will reimburse Seller (in addition to the Capacity Payments) for any incremental costs incurred by Seller as a result of any such use.

#### ARTICLE 6. Submittals

The Engineer shall be allowed at least ten (10) working days to evaluate and to review of submittals and mark them as disapproved, approved as corrected or approved it becomes necessary. The Seller is responsible to submit digital submittals. All not approved submittals shall be corrected as required and resubmitted for PREPA's evaluation.

Before commencement of any work or task required in this Contract, the Seller shall submit for PREPA's approval, required in Article 37 Safety Provisions of the Contract, the Occupational Safety and Health Program.

#### ARTICLE 7. Specifications and Drawings

PREPA reserves the right to review and approve all drawings, specifications, methods, and data which the Seller generates, from its responsibilities, obligations or liabilities under this Contract. The Seller shall obtain such reviews or approval in writing from PREPA. The Seller shall keep at the working area a copy of the Contract, its supplementary documents, specifications and

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<sup>&</sup>lt;sup>39</sup> NTD: Dependent upon Mitsubishi agreeing to the same.

drawings, and shall, at all times, give the Engineer access thereto. Anything called for in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be of like effect as if called for or shown on both. In case of discrepancy in the specifications and drawings, the matter shall be immediately submitted to the Engineer, without whose decision said discrepancy shall not be adjusted by the Seller, and the Seller shall not proceed with the work so affected until it has received written order from the Engineer.

#### ARTICLE 8. Strict Accordance with Technical Requirements

All construction work called for in the Specifications and/or shown on the drawings to be performed by the Seller shall be performed in strict accordance with the technical requirements of the contract documents.

#### ARTICLE 9. Changes and/or Extra Work

Seller shall be entitled to be reimbursed the actual direct incremental cost to Seller (including amounts paid to its contractors, vendors, consultants and Subcontractors) on account of any of the following events (each, a "Change Event"):

- <u>9.1</u> <u>If PREPA may</u>, at any time, <u>make makes</u> changes or <u>order orders</u> extra work <u>within additional to</u> the Scope of Work contracted, subject to previous written approval of PREPA's Contracting Officer. <u>Changes made by PREPA</u>, <u>which changes</u> may include, but not limited to, changes:
  - (a) 9.1 In the specifications including drawings and design.
  - (b) 9.2 In the method or manner of performance of the work.
  - (c) 9.3 In PREPA's furnished facilities, equipment, materials, services, or site; and/or,
  - (d) 9.4 Acceleration in the performance of the work.  $\frac{40}{}$

9.2

Within ten (10) working days after receipt of PREPA's written order of a change in the work (or such shorter or longer period of time as may be reasonably required as agree by PREPA and the Seller) or the occurrence of a Change Event, Seller shall promptly notify PREPA of the cost, schedule and other impact(s) Seller anticipate as a result of the change Change Event. If PREPA agrees with the Seller's statement as to the impact of the change Change Event, the parties shall proceed promptly to enter into a written change order in connection with such change to equitably adjust Seller's cost (increase or decrease), schedule (lengthen or shorten), or other obligations under Contract in connection with such change Event. If PREPA disagrees with the Seller's statement as to the final impact of the change Change Event, PREPA shall promptly advise Seller in writing of the basis for the disagreement and PREPA and Seller shall negotiate in good faith to resolve any issues in order to, when applicable, enter into a written change order to equitably adjust

<sup>&</sup>lt;sup>40</sup> NTD: NFE would like to discuss alignment of these remedies with Mitsubishi's broader remedies against NFE with respect to PREPA acts and omissions and other circumstances concerning the conversion work.

Seller's cost (increase or decrease), schedule (lengthen or shorten), or other obligations under the Contract in connection with such change. Acceptance of the change order and an adjustment in the Contract price and/or Contract time shall not be unreasonable withheld. Once a written consent has been executed by PREPA's Contracting Officer, Seller shall proceed with the change. Except as herein provided, and with the time frames stated, no order, statement, or conduct of PREPA that does not constitute a Change Event shall be treated as a change under this Section or entitle the Seller to an equitable adjustment hereunder.

If agreement on the prices for the extra work cannot be reached between PREPA and the Seller, PREPA may order in writing the Seller to perform the required work on a force account basis and the Seller shall then execute the order and be paid on a reimbursable basis as its expenses accrue. PREPA may also elect to have such work performed by its own forces or by separate contract.

In order to facilitate review of quotations for extras or credits, all proposals submitted by Seller in connection with a change in the work by PREPA, except those so minor that their propriety can be seen by inspections, shall be accomplished by a complete itemization of the costs including labor, materials, equipment, and subcontracts. When subcontractors perform major cost items, they shall also be itemized.

#### ARTICLE 10. Inspection

#### 10.1 Periodic Inspection

All material and workmanship (if not otherwise designated by the specifications) shall be subject to inspection, examination, and test by PREPA's inspectors, at all reasonable times, during manufacture and/or construction. agreed times. During the Warranty Period, at the time of any such inspection, PREPA shall have the right to reject defective material, equipment or workmanship or require its correction. Rejected workmanship shall be satisfactorily corrected and rejected material and equipment furnished by the Seller shall be satisfactorily replaced with proper material and equipment, without charge to PREPA. The Seller shall promptly remove rejected material from the premises. The Seller shall furnish promptly all reasonable facilities, labor, materials, and equipment necessary for the safe and convenient any inspection and tests that may Required Testing to be performed in such manners as a safe manner that will not to-unnecessarily delay the work.

#### 10.2 Final Inspection of Phase I

Whenever all the materials have been furnished and all work has been performed, including final cleaning—up as contemplated in Article 22. Cleaning Up, all in accordance with the drawings and specifications, the Seller shall notify in writing the Engineer that said work is completed and ready for final inspection. Final inspection shall occur within a ten (10) working days period after the Engineer has received notice from the Seller of the satisfactory completion of the installation of the equipment Substantial Completion. After receipt of notice PREPA will notify Seller of the exact date and time of the final inspection and Seller shall accommodate PREPA's specific time. If all installation work provided for and contemplated by the Contract is found completed in accordance with the specifications, this inspection shall constitute the final inspection and the Completion Date shall be

established as the date of receipt of the notice of the Seller that the work was completed and ready for final inspection. If, however, upon inspection by the Engineer it is found that any work, in whole or in part, is unsatisfactory, the Engineer shall give the Seller the necessary instructions as to replacement of material and performance of work necessary to final completion and acceptance and the Seller shall immediately comply with and execute such instructions. Upon satisfactory replacement and performance of such work, the Seller shall notify the Engineer, and another inspection shall be made which will constitute the final inspection if the said material is found to have been acceptably replaced and the work completed satisfactorily Required Testing demonstrates Substantial Completion. In such event, the date of receipt of this last notice of the Seller will be established as the Completion Date of the work or any separable part thereof under the Contract. The Completion Date, thus established, shall be used in calculating the actual time of performance of the work.

The determination of whether a project is substantially completed is at the discretion of PREPA. A project will normally be considered substantially completed as established in the Article 2.25, Substantial Completion of Phase I, when all the contract work, except for a few very minor details, has been completed, the required final cleaning up has been performed and the project can be fully, legally and safely opened to traffic or used for the intended purpose.

#### 10.3 Substantial Completion Prior to Final Acceptance

When Seller believes that it has achieved Substantial Completion, Seller shall submit a written request to [PREPA] for PREPA to make a determination of whether the project is Substantially Complete. The project will be considered Substantially Complete as established in Article 2.27, Substantial Completion.

Following receipt of a Seller request for determination pursuant to Article 0, PREPA (acting reasonably and in good faith) shall, within [three (3) Days], either issue a certificate confirming that Substantial Completion has occurred or provide written notice to NFE of the Conversion Work that remains to be completed in order for Substantial Completion to occur.

#### ARTICLE 11. Superintendence by the Seller

Before commencement of the work, the Seller shall designate a competent Construction Manager, reasonably satisfactory to the Engineer, with the expertise and resources necessary to provide construction management services. The Seller shall also have a competent Resident Engineer, reasonably satisfactory to the Engineer, on the work site, at all times, during progress of the work, with authority to act for him. The Resident Engineer shall only be assigned to this project. The Construction Manager and Resident Engineer shall represent the Seller on his absence and all directions given to him by the Engineer shall be as binding as if given to the Seller.-]<sup>41</sup> The Seller shall, at all times, enforce strict discipline and good order among his employees and shall not employ on the work any unsuitable or unskilled person in the work assigned to him. In addition,

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<sup>&</sup>lt;sup>41</sup> NTD: Discuss. Given the contracting structure for this project, NFE would like to appoint a Seller's Representative, who would fulfill these roles. PREPA should not directly instruct Mitsubishi.

the Seller shall be fully responsible for the negligent or wrongful acts or omissions of subcontractors or of persons both directly or indirectly employed by the Seller and shall be liable to PREPA and/or any affected third parties for such acts or omissions.

#### ARTICLE 12. Sanitary Facilities

The Seller shall furnish and maintain satisfactory, sanitary facilities for the use of the workmen engaged in the construction, as required by law or regulations.

#### ARTICLE 13. Access to Work

- The Seller shall permit all persons provide reasonable access to all Persons appointed or authorized by PREPA to visit and inspect the work, or any part thereof at all reasonable times, and places during the progress of it.
- 13.2 PREPA shall provide Seller and its contractors, consultants, vendors, and Subcontractors, and each of their respective employees, agents, representatives and other personnel clear access to all areas of the site at all times necessary for the timely completion of the Conversion Work and Seller's other obligations hereunder.

#### ARTICLE 14. Force Majeure

The parties hereto shall be excused from performing hereunder and shall not be liable in damages or otherwise, if and only to the extent that they shall be unable to perform, or are prevented from performing by a Force Majeure event. For purposes of Phase Ithe Conversion Work, Force Majeure means any cause without the fault or negligence, and beyond the reasonable control of, the party claiming the occurrence of a Force Majeure event. Force Majeure may shall include, but not be limited to, the following: any events or circumstances specified as "Force Majeure" events in the Fuel Supply Agreement, Acts of God, industrial disturbances, acts of the public enemy, war, blockages, boycotts, riots, insurrections, epidemics, earthquakes, storms, floods, civil disturbances, lockouts, fires, explosions, interruptions of services due to the acts or failure to act of any governmental authority, and ay failure to obtain Permits for the Conversion Work from the Governmental Authority (but only where the party filed a timely and complete application). provided that these events, or any other claimed as a Force Majeure event, and/or its effects, are beyond the reasonable control and without the fault or negligence of the party claiming the Force Majeure, and that such party, within ten (10) days after the occurrence of the alleged Force Majeure, gives the other party written notice describing the particulars of the occurrence and its estimated duration. The burden of proof as to whether a Force Majeure has occurred shall be on the party claiming the Force Majeure.

#### ARTICLE 15. Independent Contractor

The Seller shall be considered as an independent contractor, for all material purposes under this Contract, and all persons engaged or contracted by the Seller for the performance of its obligations herein, shall be considered <u>either</u> as its employees or agents or those of its subcontractors, and not as employees or agents of PREPA. In consequence, the Seller is not entitled to any fringe benefits, such as, but not limited to vacations, sick leave, and other.

#### ARTICLE 16. Insurance, Bonds, and Indemnities

The Seller shall secure and maintain in full force and effect during the life of this Contract as provided herein, policies of insurance covering all operations engaged in by the Contract as follows:

#### 16.1 Commonwealth of Puerto Rico Workmen's Compensation Insurance:

The Seller shall provide Workmen's Compensation Insurance as required by the Workmen's Compensation Act 45-1935 of the Commonwealth of Puerto Rico. Seller shall also be responsible for compliance with said Workmen's Compensation Act by all its subcontractors, agents, and invitees, if any.

The Seller shall furnish a certificate from the Puerto Rico's State Insurance Fund showing that all personnel employed in the work are covered by the Workmen's Compensation Insurance, in accordance with this Contract.

#### 16.2 Employer's Liability Insurance:

The Seller shall provide Employer's Liability Insurance with minimum bodily injury limits of \$1,000,000 for each employee and \$1,000,000 for each accident covering against the liability imposed by Law upon the Seller as result of bodily injury, by accident or disease, including death arising out of and in the course of employment, and outside of and distinct from any claim under the Workmen's Compensation Act of the Commonwealth of Puerto Rico.

#### 16.3 Commercial General Liability Insurance:

The Seller shall provide a Commercial General Liability Insurance or its equivalent with limits of \$2,000,000 per occurrence and \$2,000,000 aggregate.

#### 16.4 Excess Liability Insurance:

The Seller shall provide an Excess Liability Insurance in excess of the Commercial General Liability Insurance limits. This Excess Liability Insurance will have limits of \$10,000,000 per occurrence and \$10,000,000 aggregate.

#### 16.5 Commercial Automobile Liability Insurance:

The Seller shall provide a Commercial Automobile Liability Insurance with limits of \$1,000,000 combined single limit covering all owned, non-owned, and hired automobiles.

#### 16.6 Pollution Liability Insurance:

The Seller shall provide a Pollution Liability Insurance with limits of \$1,000,000 per claim and \$1,000,000 per aggregate.

#### 16.7 Professional Liability Insurance:

The Seller shall provide a Professional Liability Insurance with limits of \$1,000,000 per claim and \$1,000,000 per aggregate.

#### 16.8 Requirements Under the Policies:

The Commercial General Liability or its equivalent and the Commercial Automobile Liability Insurance required under this Contract shall be endorsed to include:

(a) As Additional Insured:

Puerto Rico Electric Power Authority (PREPA) Risk Management Office PO Box 364267 San Juan, PR 00936-4267

- (b) A 30-day cancellation or nonrenewable notice to be sent to the above address.
- (c) An endorsement including this Contract under contractual liability coverage and identifying it by number, date and parties to the contract.
- (d) Waiver of Subrogation in favor of Puerto Rico Electric Power Authority (PREPA).
- (e) Breach of Warranties or Conditions:

"The Breach of any of the Warranties or Conditions in this policy by the Insured shall not prejudice PREPA's rights under this policy."

#### 16.9 Bonds:

As a Contract security, the Seller shall furnish at the time of the execution of the Contract:

- (a) A Performance Bond in the amount of 100% of the Phase 1 cost (conversions and pipeline installation), with good and sufficient surety satisfactory to PREPA guaranteeing that the Seller will well and faithfully perform the contract work.
- (b) A Payment Bond<sup>42</sup> in the amount of 100% of the Phase 1 cost (conversions and pipeline installation), with good and sufficient surety satisfactory to PREPA to guarantee the prompt payment of all labor, supervision, equipment and materials required in the performance of the work.
- (c) All bonds shall be issued in the official form of PREPA.

#### 16.10 Furnishing of Policies:

<sup>&</sup>lt;sup>42</sup> NTD: We would appreciate a discussion on Payment Bond requirements and whether a letter of credit would be acceptable.

All required policies of insurance shall be in a form acceptable to PREPA and shall be issued only by insurance companies authorized to do business in Puerto Rico.

The Seller shall furnish a certificate of insurance in original signed by an authorized representative of the insurer in Puerto Rico, describing the coverage afforded.

#### ARTICLE 17. Other Contracts

PREPA may award other contracts for additional work, and the Seller shall fully cooperate with such other contractors, in accordance with Article 5. Other Work at the Site, of this Contract, and carefully fit his own work to that provided under other contracts as may be directed by the Contracting Officer. The Seller shall not commit or permit any acts, which interfere with the performance of work by any other contractor.

#### ARTICLE 18. Correction of Work After Final Acceptance

Neither the final certificate for payment nor any provision in the Contract documents shall relieve the Seller of responsibility for faulty materials or workmanship and, unless otherwise specified, he shall remedy any defects due thereto and pay for any damage to other work resulting therefore, which shall appear within a period of two (2) years after final acceptance. PREPA shall give notice of observed defects with reasonable promptness. All questions arising under this Article shall be decided by the Engineer, subject to appeal by the Seller, as provided in Article 25 Settlement of Disputes, of the Contract.

#### ARTICLE 19. Warranty 43

[The Seller shall use commercially reasonable efforts to obtain from each subcontractor or vendor engaged by Seller to perform the Conversion Work ("Subcontractors") warranties of goods, equipment, and materials on the following terms:

The Seller warrants that That all materials, parts, or equipment used, and work performed 19.1 for the units conversions and pipeline installation by, the relevant Subcontractor for the Conversion Work comply in all respect with its the terms and conditions of the Contract; that they are free from any and all latent and patent defects in design, materials, and workmanship; that they are suitable and adequate for the purposes for which they were designed and for such other purposes, if any, as are specified in the Contract, and that the services provided under this Contract will conform with the highest standards of care and practice appropriate to their nature Reasonable and Prudent Operator. The warranty period will begin the date on which PREPA finally accepts the service and/or installation of the contracted product and will continue for a period of two (2) years (the "Warranty <u>Period</u>"). The <u>Seller Subcontractor</u> will, upon written notice by PREPA, fully remedy, free of expense to PREPA, such defects as may develop on said services, materials, parts or equipment, provided that (i) they have been properly stored, installed, and maintained, and operated within the specified parameters (including any such parameters provided by Seller's contractors) and (ii) PREPA notifies the Subcontractor during the Warranty Period.

<sup>&</sup>lt;sup>43</sup> NTD: Changes included to align with standard warranty exclusions.

The Performance Bond <u>furnished by the relevant Subcontractor</u> shall cover and serve as guarantee for this warranty.

- 19.2 For those materials, parts, equipment, which proves defective or deficient during the warranty period Warranty Period, the Seller Subcontractor shall, at his own expense, repair or replace, transport-in, from Seller's Subcontractor's facilities to PREPA's site, and transport-out, from PREPA's site to Seller's Subcontractor's facilities, such materials, parts, and/or equipment. The Performance Bond furnished by the relevant subcontractor shall cover and serve as guarantee for the Seller's Subcontractor's failure, in whole or in part, to properly perform his obligations under this Contract.
- 19.3 For parts and equipment to be procured by Seller from other suppliers, and which will be furnished by Seller to PREPA under this Contract, a written warranty shall be obtained by the Seller from each supplier on the above terms and legally tended to PREPA prior to the commencement of work. Seller shall assign all agreements with Subcontractors to PREPA upon Final Acceptance, at which point Seller shall be released from any future liability with respect to the Conversion Work, whether under this Article 19, or pursuant to any other theory of law, including contract, tort, statute or equity.
- The warranties shall not apply to the extent any defect is proven to be as a result of any of the following occurring after the date on which PREPA finally accepts the service and/or installation of the contracted product: (1) materials, parts, and equipment being repaired or modified by a third party without Subcontractor's or other supplier's authorization, as applicable, or being subjected to modification, misuse, improper maintenance or accident by a third party, (2) materials, parts, and equipment having their serial number or any part thereof altered, defaced or removed by a third party, or (3) materials, parts, and equipment being stored, installed, operated and maintained by a third party not in accordance with manuals, instruction books, or reasonable recommendations provided in writing by Subcontractor or other supplier, as applicable, to PREPA prior to such activity.]

#### ARTICLE 20. Correlation of Documents

The contract documents are complementary and what is required by one shall be as biding as if required by all. The Seller shall keep in the work site a copy of the Contract documents relating to the work and any supplementary documents, specifications and drawings relating thereto and shall give PREPA access thereto during all normal working hours.

In case of discrepancy or in the event of conflict among the different Contract documents such as: Fuel Sale and Purchase Agreement, Units Conversions and Pipeline Installation Terms and Conditions (Annex A), Technical Specifications, Drawings, and the Offeror's Proposal, these shall take precedence in the order given.

The terms and conditions contained in the Contract shall prevail over any conflictive terms and conditions contained in the Seller's Bidding Proposal.

#### ARTICLE 21. Notice

Any required notice to be given hereunder, related to the Units Conversions and Pipeline Installation Works, shall be in writing and will be sufficiently served when delivered in person or properly mailed to the following addresses:

To PREPA: Puerto Rico Electric Power Authority

PO Box 364267

San Juan, Puerto Rico 00936-4267

Attention: Eng. Daniel Hernández Morales

**Acting Generation Director** 

To Seller: (Name of Company)

(Mail Address)

Attention: (Name of Person of Contact)

(Title)

#### ARTICLE 22. Cleaning Up - Up

The Except as provided herein, the Seller shall, from time to time, as directed by the Engineer, remove from PREPA's property and from all public and private property all temporary structures no longer required for Construction, rubbish, and waste materials resulting from his Construction operations.

Upon completion of the work, the Seller shall remove from the vicinity of the work all remaining rubbish, unused materials, and other like material, belonging to him or used under his direction during the installation of the equipment, and in the event of his failure to do so the same may be removed by PREPA at the Contract's expense, and his surety or sureties shall be liable therefore. Notwithstanding the foregoing, under no circumstances shall Seller have any responsibility for any Hazardous Materials or other materials at the site prior to the time when the work begins. Should Seller encounter any such pre-existing materials during the course of the work, it shall identify the same to PREPA and allow PREPA to address and remove the same. At the written request of PREPA and at PREPA's sole expense, Seller may agree to remove and remediate any such Hazardous Materials or other materials to the extent located on the site on behalf of PREPA with the understanding that PREPA will execute any and all documents, submittals or regulatory filings associated with the discovery of these materials, the work or the transportation and disposal of the materials.

#### **ARTICLE 23.** [Use of Completed Portions

PREPA shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding the fact that the time for completion of the entire work may not have expired, but such taking possession and use shall not be deemed an acceptance of the work so taken or used or any part thereof. PREPA may require the Seller to expedite the completion of any part of the work for provisional use by PREPA and the Seller shall comply with such

request. If such order of completion or prior use increases the cost of the work or delays the work, the Seller shall be entitled to such extra compensation or extension of time as agreed by the Parties.]<sup>44</sup>

#### ARTICLE 24. Quality Assurance

The Seller shall submit for evaluation and approval by PREPA a quality control program and establish a quality assurance program, also evaluated and approved by PREPA, to satisfy all applicable regulation and requirements specified in the procurement documents and satisfactory to PREPA. The program shall contain all those measures necessary to assure that all basic technical requisites ask for in the drawings, codes, tests, and inspections for design, fabrication, cleaning, installation, packing, handling, shipping, long term storage, when necessary, and test equipment are fulfilled. PREPA reserves the right to conduct audits and inspections to the facilities, activities, and/or documents when estimated and without previous notification necessary in order to assure that the quality control program is adequate and is being properly implemented.

The Seller shall allow PREPA access to its facilities and documents, so that PREPA, through audits and inspections can verify the quality of the labor, equipment, products, services, and any other related items provided by the Seller. In every case in which the materials or services to be furnished to PREPA are subcontracted partially or totally by the Seller, the Seller shall request the subcontractor to accept and comply with all the requirements of this Quality Assurance Article.

<sup>&</sup>lt;sup>44</sup> NTD: This article does not seem applicable in the context of this agreement, particularly in light of the fuel supply arrangements.

## 33.

# EVIDENCE OF JONES ACT COMPLIANCE



#### U.S. Department of Homeland Security

Washington, DC 20229

U.S. Customs and Border Protection

HQ H294296

April 3, 2018

VES-3-02-OT:RR:BSTC:CCR H294296 ASZ

CATEGORY: Carriers

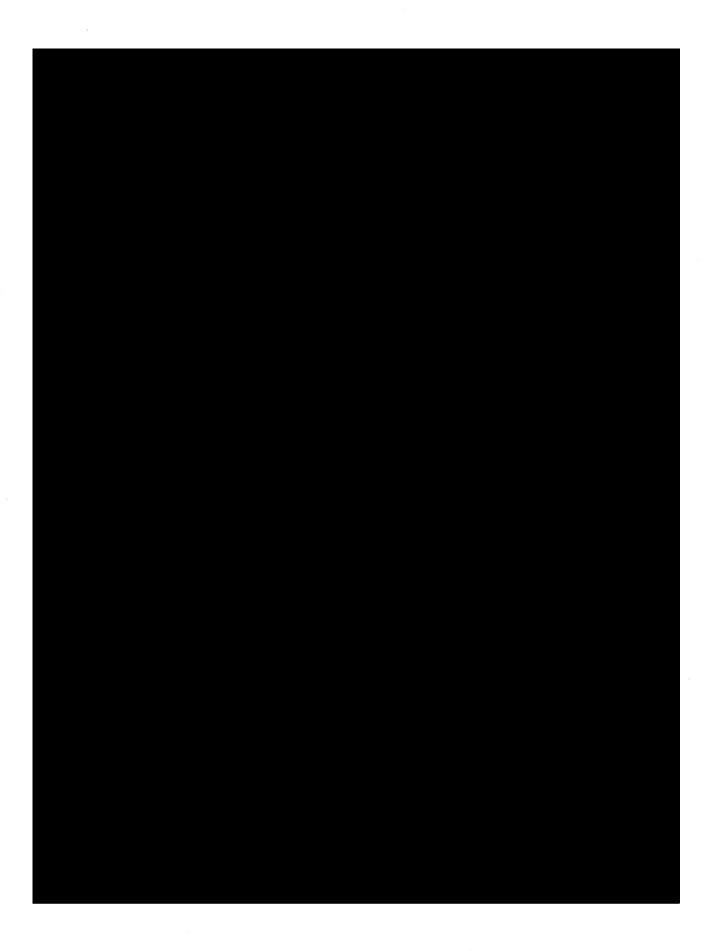
John J. Michael Vinson & Elkins LLP 1001 Fannin Street, Suite 2500 Houston, Texas 77002

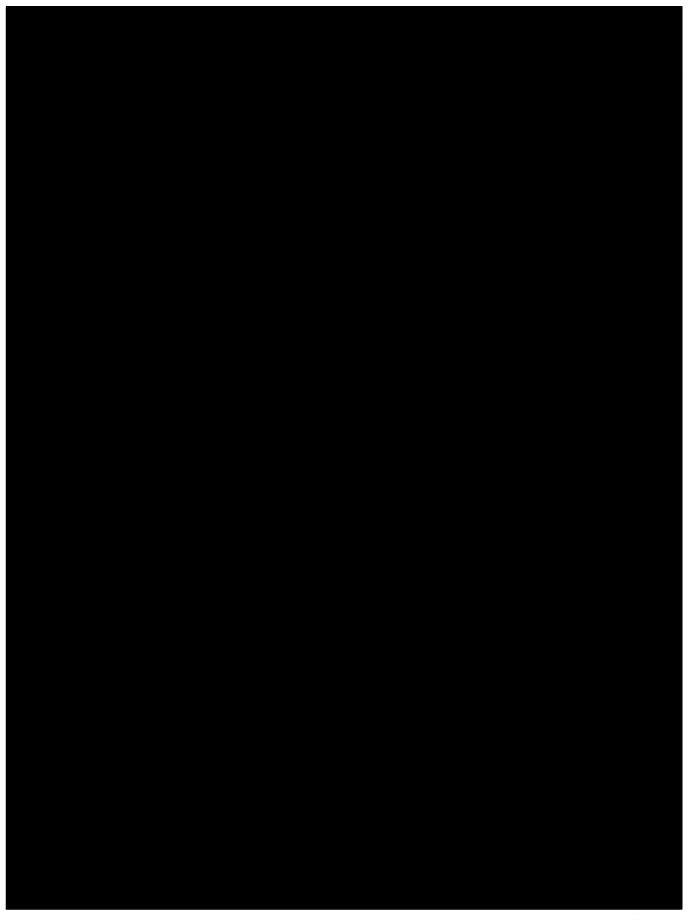
RE: 46 U.S.C. § 55102; Coastwise Transportation; Lightering.

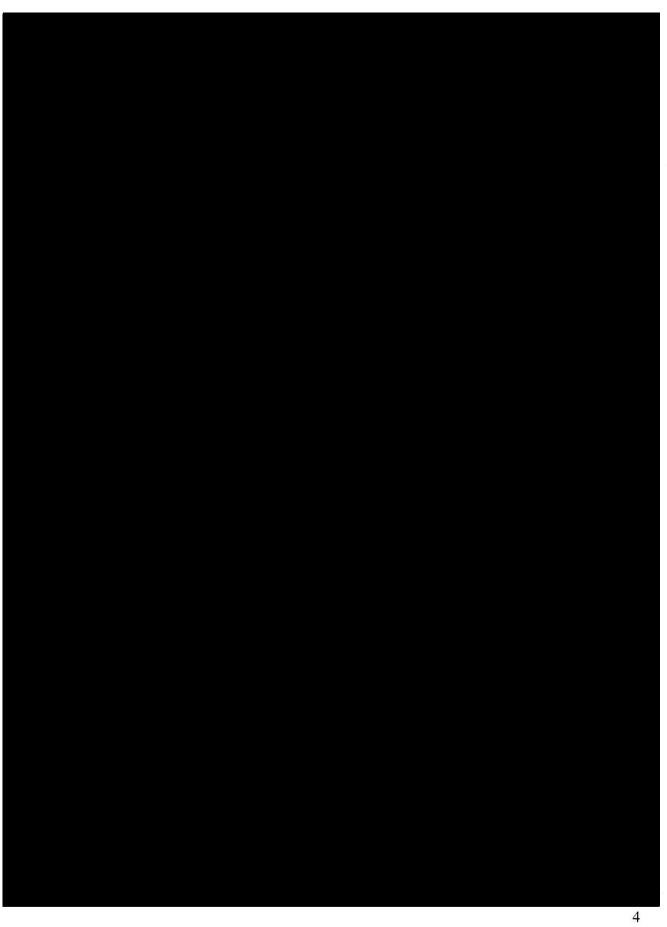
Dear Mr. Michael:

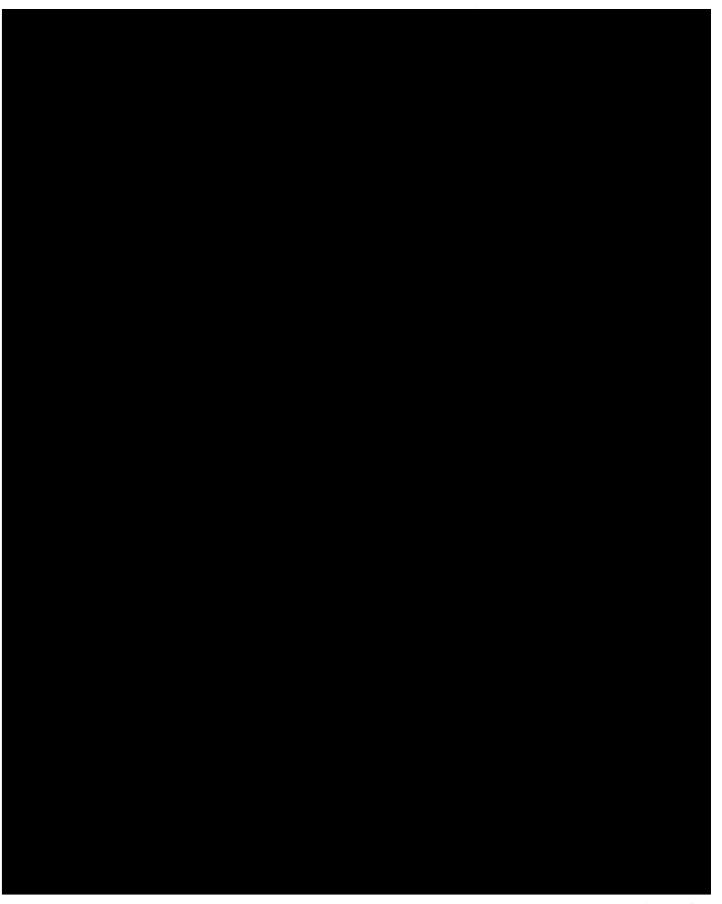
This letter is in response to your correspondence dated March 14, 2018, on behalf of your client New Fortress Energy ("NFE"), in which you inquire about whether your client's use of a non-coastwise-qualified vessel as a floating storage unit constitutes a violation of 46 U.S.C. § 55102. Our decision follows.













#### **HOLDING**

- 1. The proposed use of the FSU and LNGCs in scenario one would not constitute a violation of 46 U.S.C. § 55102.
- 2. The proposed use of the FSU and LNGCs in scenario two would not constitute a violation of 46 U.S.C. § 55102.

- 3. The proposed movement of the FSU in scenario three would not constitute a violation of 46 U.S.C. § 55102.
- 4. The proposed movement of the FSU in scenario four would not constitute a violation of 46 U.S.C. § 55102.
- 5. The proposed movement of the FSU in scenario five would not constitute a violation of 46 U.S.C. § 55102.
- 6. The proposed transportation in scenario six would not constitute a violation of 46 U.S.C. § 55102.
- 7. The proposed transportation in scenario seven would not constitute a violation of 46 U.S.C. § 55102.

Sincerely,

Lisa L. Burley

Chief/Supervisory Attorney-Advisor

Cargo Security, Carriers and Restricted Merchandise Branch

Office of International Trade, Regulations and Rulings

U.S. Customs and Border Protection

### 34.

# PUERTO RICO PORTS AUTHORITY LETTER OF SUPPORT



August 31, 2018

Puerto Rico Electric Power Authority PO Box 364267 San Juan, PR 00936-4267

Re: Letter of Endorsement for NFEnergía LLC and its affiliates related to RFP 81412, Fuel Supply in the North and Conversion of San Juan Units 5 and 6

To whom it may concern at the Puerto Rico Electric Power Authority:

The Puerto Rico Ports Authority ("PRPA") is the owner of Wharfs A and B in the Puerto Nuevo Port in the Municipality of San Juan ("Wharves A and B"). NFEnergía LLC executed a 20-year lease agreement with PRPA (No. AP-17-18-(4)-089) for Wharves A and B on May 3, 2018. The lease authorizes NFEnergia LLC to use Wharves A and B to provide customers with natural gas (among other things), and approves improvements related to a micro fuel handling facility that NFEnergia LLC is developing.

During its tenure as a tenant of PRPA, NFEnergia LLC has successfully applied for and received approval of an environmental assessment for the development of the micro fuel handling facility. In addition, NFEnergia LLC has applied for and received permits required for abatement of lead and asbestos in and the demolition of two warehouses which were located on Wharves A & B in preparation for such development. Furthermore, NFEnergía LLC has consistently paid its rent on time and has proven to be a responsible tenant.

PRPA hereby supports NFEnergía LLC, Soluciones de Energia Limpia PR LLC and any of their affiliates in their proposal for the Fuel Supply to and Conversion of San Juan Units 5 and 6 (the "Project"). The PRPA will approve all reasonable improvements to Wharves A and B in furtherance of the Project in a timely manner and also support any application or authorizations, permits or licenses of any type necessary to develop, construct or operate the Project.

Ordially

Anthony O. Maceira Zayas, Esq.

Executive Director

Puerto Rico Ports Authority



# 44. NON-CONFLICT OF INTEREST



#### SWORN STATEMENT NON CONFLICT OF INTERESTS (Annual Renewal)

Co	mes now, NF Energia LLC  a Lumited liability company's Name)  (Company's Name)  (Company's Name)
	(company a runny)
org	anized, existing and authorized to do business under the laws of the Commonwealth of Puerto Rico, with
So	(Employer or personal) (Representative's Name)
of l	egal age,
	st solemn oath declares the following:
1.	That my name and other personal circumstances are the aforementioned.
2.	That I hold the position of Authorized Signatory in the aforementioned company.
3.	That NFENERSTA LLC has presented or is going to present a (Company's Name)
	The state of the S
	Supply in the North and Conversion of San Juan Units 5 and 6 (REP 814)
4.	NFEnergia LLC directors and officials have the intention (Company's Name)
	of participating in an invitation to bid. They state that there is no conflict of interests by reason of family
	relations, commercial or economic relations, or any other reason between them and PREPA, their officials,
	employees and agents.
5.	A certification signed by the Secretary is included indicating the name and address of the directors and
	officials of the corporation.
6.	This sworn statement is submitted in order to certify that the company, its directors and officials are not in
	the position to have a conflict of interests of any type in the event the invitation to bid is awarded to this
	corporation.
7.	This sworn statement is also submitted for the purpose of certifying and guaranteeing that
	NF Energia CCC has rendered income tax during the last five (5) (Company's Name)
	years, does not owe taxes and has paid unemployment, disability taxes and social security insurance for
	drivers (whichever is applicable), to the Commonwealth of Puerto Rico, or that
	has entered into a payment plan, with whose terms and (Company's Name)
	conditions it is complying. It is expressly recognized that this is an essential condition of any contract
	that NFENCYSTA LLC executes with PREPA, and if the preceding
	(Company's Name) certification is not correct in whole or in part, that will be sufficient cause for the contracting party
	(PREPA) to cancel the same and the contracted party NFENEVATA LLC
	(Company's Name)
	whose representative is the signer of this sworn statement, shall be obligated to reimburse to the
	contracting party (PREPA) the total amount of money received under the contract. This disposition will be
	extensive to all subcontractors of NFENEY STA LLC considering as such, (Company's Name)

	as well, the professionals or technicians who are used by NFENERGIA LLC (Company's Name)
	Comply with their contractual obligations with the contracting party (PREPA). It shall be the responsibility of NFE New Standard to provide the certifications to their subcontractors for such (Company's Name)
	purposes.
3.	This swom statement is submitted for the PREPA's consideration, during the time period from to the PREPA of any change of status that could affect our statement on conflict of interest.
9.	That he/she subscribes this statement in compliance with Act No. 458 of December 29, 2000, as amended.
N Ric	WITNESS WHEREOF, I affirm and sign the herein document in
Dı pe	Deponent's Signature  The property of Signature  Deponent's Signature  Deponent's Signature  The signature of the subscribed to before me by the signature of t
	( The St. Marie



**45.** 

## DEPARTIMENT OF ENERGY NATURAL GAS IMPORT APPROVAL

# UNITED STATES OF AMERICA DEPARTMENT OF ENERGY OFFICE OF FOSSIL ENERGY

NFENERGIA LLC	) ) )	FE DOCKET NO. 18-29-LNG

ORDER GRANTING BLANKET AUTHORIZATION TO IMPORT LIQUEFIED NATURAL GAS FROM VARIOUS INTERNATIONAL SOURCES BY VESSEL

DOE/FE ORDER NO. 4167

MARCH 26, 2018

#### I. <u>DESCRIPTION OF REQUEST</u>

On March 9, 2018, NFEnergia LLC (NFEnergia) filed an application with the Office of Fossil Energy (FE) of the Department of Energy (DOE), under section 3 of the Natural Gas Act (NGA), for blanket authorization to import liquefied natural gas (LNG) from various international sources by vessel, up to a total volume equivalent to 80 billion cubic feet (Bcf) of natural gas. The applicant requests the authorization be granted for a two-year term beginning on the date that DOE/FE issues an order granting the requested authorization. NFEnergia is a Puerto Rico limited liability company with its principal place of business in San Juan, Puerto Rico.

#### II. FINDING

The application has been evaluated to determine if the proposed import and/or export arrangement meets the public interest requirement of section 3 of the NGA, as amended by section 201 of the Energy Policy Act of 1992 (Pub. L. 102-486). Under section 3(c), the import and export of natural gas, including LNG, from and to a nation with which there is in effect a free trade agreement requiring national treatment for trade in natural gas and the import of LNG from other international sources are deemed to be consistent with the public interest, and applications for such imports or exports must be granted without modification or delay. The authorization sought by NFEnergia to import LNG from various international sources by vessel meets the section 3(c) criterion and, therefore, is consistent with the public interest. This Order authorizes transactions with terms of no longer than two years.

-

<sup>&</sup>lt;sup>1</sup> The authority to regulate the imports and exports of natural gas, including liquefied natural gas, under section 3 of the NGA (15 U.S.C. § 717b) has been delegated to the Assistant Secretary for FE in Redelegation Order No. 00-006.02 issued on November 17, 2014.

#### **ORDER**

Pursuant to section 3 of the NGA, it is ordered that:

A. NFEnergia is authorized to import LNG from various international sources by vessel, up to a total volume equivalent to 80 Bcf of natural gas, pursuant to transactions that have terms of no longer than two years. This authorization shall be effective for a two-year term beginning on March 26, 2018, and extending through March 25, 2020.

B. This LNG may be imported at any LNG receiving facility in the United States and its territories.

C. LNG imports that require increased security measures from the United States Coast Guard (USCG) and/or other branches of the Department of Homeland Security in place now or added in the future shall comply with those measures on a shipment by shipment basis to the satisfaction of the USCG. Such measures may include periodic boarding or examination of the vessel by the USCG at the load port, while the vessel is underway, at any time during the voyage, and before and during discharge of the cargo while at the discharge port, as well as other enhanced security measures.

D. Monthly Reports: With respect to the imports of LNG authorized by this Order, NFEnergia shall file with the Office of Regulation and International Engagement, within 30 days following the last day of each calendar month, a report indicating whether imports of LNG have been made. Monthly reports must be filed whether or not initial deliveries have begun. If no imports have been made, a report of "no activity" for that month must be filed.

If imports of LNG by vessel have occurred, the report must give the following details of each LNG cargo: (1) the name of the U.S. receiving terminal; (2) the name of the LNG tanker; (3) the date of arrival at the U.S. receiving terminal; (4) the country of origin; (5) the name of the supplier/seller; (6) the volume in Mcf; (7) the landed price per MMBtu at the point of import; (8)

4

the duration of the supply agreement (indicate spot purchases); (9) the name(s) of the purchaser(s); and (10) the geographic market served (list State(s), U.S. Census Region(s), or general U.S. geographic area(s)).

(Approved by the Office of Management and Budget under OMB Control No. 1901-0294)

E. The first monthly report required by this Order is due not later than April 30, 2018, and should cover the reporting period from March 26, 2018 through March 31, 2018.

F. All monthly report filings shall be made to U.S. Department of Energy (FE-34), Division of Natural Gas Regulation, Office of Regulation and International Engagement, Office of Fossil Energy, P.O. Box 44375, Washington, D.C. 20026-4375, Attention: Natural Gas Reports. Alternatively, reports may be e-mailed to <a href="mailto:ngreports@hq.doe.gov">ngreports@hq.doe.gov</a>, or may be faxed to Natural Gas Reports at (202) 586-6050.

Issued in Washington, D.C., on March 26, 2018.

Robert J. Smith
Deputy Assistant Secretary for Oil and Natural Gas (Acting)



# GOVERNMENT OF PUERTO RICO

Puerto Rico Electric Power Authority

# ATTENDANCE SHEET

RFP 81412 FUEL SUPPLY IN THE NORTH, UNITS CONVERSIONS AND PIPELINE INSTALLATION AUGUST 10, 2018 - 9.00 AM SITE VISIT

	Angnai	706001 10, 2010 - 9.00AM	
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1 au Harmon	Resolution	FEP	doe zeul h@filsinger evangy.cit
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## GOVERNMENT OF PUERTO RICO

Puerto Rico Electric Power Authority

# ATTENDANCE SHEET KICK-OFF MEETING

RFP 81412 FUEL SUPPLY IN THE NORTH, UNITS CONVERSIONS AND PIPELINE INSTALLATION AUGUST 9, 2018 – 9:00am

	Augus	st 9, 2018 – 9:00am	
NAME	SIGNATURE	COMPANY OR DEPARTMENT	EMAIL
WISE HUERRAS BARGON	Huotas	EL Do 2000 Tech Siny SE	edgar @ eldoradotechnicae.com
MARILYN Ocasio	ning	Puna Enerzy	manyn. ocasio Doumaeuergy
OHICK FERRY	chil	AVR O)	charles ferm @ Alperer
Libby Owen	7000	APR Energy	libby owen coprenergy com
JULIO J. CINTRON		Crowley	julio cintrono crowley com
JOAQUILI MEUGLICOT	MA	GAS HATURAL FELLOSA - LIATURG	, sme-gniot@gasnutural tenusa.com
le Gars	2FC	NFErence	Lesaus eneufatherselvery, com
TODO NEWLAD	2620	Black & Veston	newlandle Gbr.com
LENGE ELKOSRY	Chang Ellhry	ARCTAS	JMELKOURY & YAHOOICOM
ANTONIO TORKES	Lurus Johns M.	ALCTRS	tony torres 23660 gmail. com
Lionel Marengo	J. Marenzo	Fosineered Part & Jervices	Imarengo C epspr. com
Rofael Arsuecc		PUMS Energy	rapel ersuage & punconergy con
TECTOR A. VIVA	Han	TROPIES DE AR	hvino @ tropigaspr.com
Rodolfo Quinones		Tropigas de PR	u' '
Humberto Berrios	for the	Ic U	Uhberrios Co trofigus fr. com
ORMAN CO SOFT		GENERDE ELECTRIE	ORIANDO SOTO GEROOM
Emmanyel Ortiz	James 1	General Electric	emmanuelortiz@ge.com
Jose M. Rullan	SHO	Eces Normal Fenosa - Naturgy	rullan p gasnaturalfen sa com
Miquel A. Breuciulo	lugal 3	NAWRGY	matieucinto autorgy.com
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ATTENDANCE SHEET
KICK-OFF MEETING
RFP 81412 FUEL SUPPLY IN THE NORTH, UNITS CONVERSIONS AND PIPELINE INSTALLATION
AUGUST 9, 2018 – 9:00AM

NAME	SIGNATURE	COMPANY OR DEPARTMENT	EMAIL
MATT LEE	May	FEP	MATTLE Filsing senergy. Com paul hat so, nevery. 45 Sterek Of, Isinger every. con
Paul Harmon	tealfle	FEP	paul hat is nevery to
Stere Kopen, + 2	Solf	FEP	Stevek Of, Isingor evergy, con
Monel SelVelle	A 1/1.	PREPA	miquel-delvolle @prepa-com
nablia martirez	) led	PREPA	natalia martinez@prepa.com
Delist. Zambrana	Delis & Zambrana	grepa Procurement	delis. zambranao prepa.com
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## GOVERNMENT OF PUERTO RICO

#### Puerto Rico Electric Power Authority

June 20, 2018

Walter M. Higgins

Chief Executive Officer

William Ríos Mera Generation Director

Fuel Supply in the North and Conversion of San Juan Units 5 and 6, RFP 81412

PREPA is seeking to reduce the cost of generation and improve compliance with environmental requirements for the generating units. Recent atmospheric events demonstrated the need to have reliable and economic generation in the north of the Island. PREPA is looking for alternatives to strengthen the load supply in the San Juan area.

The San Juan Combined Cycle Units 5 and 6 are the most efficient system of our generation fleet but the generation costs are high because of the use of distillate #2 (diesel). With a total capacity of 440 MW, these units have the capability to be converted to dual fuel, having LNG as the primary fuel and diesel secondary.

The purpose of this RFP is to make an agreement with a company that will be responsible for the engineering, design, procurement, and construction of the necessary infrastructure for the San Juan Combined Cycle dual fuel conversion. This project will not require initial capital expenditure from PREPA until the units have been commissioned and ready to generate with LNG or any other selected fuel. Conversion cost is going to be paid and blended through a five year fuel supply contract, also included in the RFP scope of supply. The fuel supply contract considers three extension options of five years each and has no take-or-pay clause or any type of penalty for fuel charges for PREPA. The Contractor shall be responsible for the lease of the spaces needed to provide the alternate fuel and to obtain all local and federal permits needed to fulfill the project within the contract scope of supply.

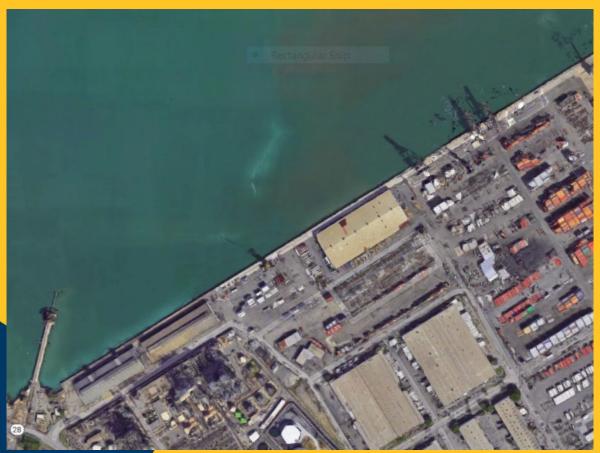


Walter M. Higgins Page 2 June 20, 2018

The use of liquefied natural gas (LNG) will lower generation and maintenance costs and reduces contaminants to the environment. All of the above mentioned benefits are expected to have an impact in the increase of usage over other generation units. The capacity factor historically has been in between 60% to 70%. With the LNG retrofit, the capacity factor may increase in between 80% to 85%, is about 25,000,000 MMBTU of natural gas per year. Based on that volume, diesel and LNG at \$16 and \$10 per MMBTU, respectively, the expected annual savings is estimated to be \$150 million.

The cost estimate for the dual fuel conversion and natural gas piping from the supply side is close to \$20 million. The Return of Investment (ROI) can be achieved in a year.

If you need additional information, please contact Eng. Jaime A. Umpierre Montalvo, Engineering and Technical Services Division Head, at 6541 or 5210.





## **CONCEPT**

- Modify SJSP units 5 & 6 to allow them operate on an alternative fuel, such as natural gas, and retain the ability to burn diesel fuel.
- Representing a response to increased diesel fuel prices.
- Dual fuel capability is maintained to enable flexibility in case of fuel shortages.



## **EXAMPLE ECONOMIC IMPACT**

- Diesel fuel is currently at approximately \$16 per MMBTU\*.
- Natural gas is approximately at \$8.50 per MMBTU
- Savings of approximately \$195 million dollars per year.\*\*
- Potential decrease in maintenance cycles due to new fuel use, approximately \$1 to 5 million in maintenance costs.
  - \* Million British Thermal Units
  - \*\* Considering a net heat plant rate of 7,500 BTU/kWh



## **SCOPE**

- Operation of units 5 & 6 at 85% capacity factor.
- Expected fuel volume consumption of 25 TBtu/Year
- Net plant capacity of 400 MW.
- Conversion costs estimated at \$10 to 30 million dollars.
- Reduction of CO2 production.
- Enables future retrofit for air inlet cooling.



## **CONTRACT TERMS**

- Base period of 5 years.
- With 3 additional options of 5 year extensions.
- Renewal options at PREPA's sole discretion.
- No capital expenditure by PREPA.
- Cost of conversion to dual fuel Units 5 and 6 recovered through a capacity payment during 5-year Base period.



# RFP FUEL SUPPLY CONTRACT AND POTENTIAL CONVERSION OF UNITS 5 AND 6 SAN JUAN POWER PLANT



JE-252370
Walter Higgins, Chief Executive Officer

July 9, 2018

Governing Board

Walter M. Higgins
Chief Executive Officer

Request for Proposal (RFP) Fuel Supply Contract and Potential Conversion of Units 5 and 6 - San Juan Power Plant

#### Background

San Juan Power Plant, Units 5 and 6 (SJ 5&6), are relatively modern combined cycle facilities that were originally designed to burn diesel fuel only. At the time of plant development and construction of the units, diesel fuel was the only fuel available to burn in the units thus no equipment was installed for burning alternative fuels. Advancements in fuel transportation, as well as advancement in upstream drilling technology, have dramatically changed the energy markets since the construction of SJ 5&6. Several fuels, chiefly Liquified Natural Gas (LNG), have become more than cost competitive when compared to diesel fuel. PREPA is considering alternative fuels for use in SJ 5&6 that may represent cheaper, cleaner alternatives to the current diesel supply agreement. Therefore, PREPA proposes a request for proposal (RFP) process for a new fuel supply agreement.

## **Cost Analysis**

While LNG is not seen as the only alternative, we have used it below as an example, in our cost analysis.

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Request for Proposal (RFP) Fuel Supply Contract and Potential Conversion of Unit 5 and 6 - San Juan Power Plant Page 2

The current price of diesel fuel delivered to the San Juan Power Plant is approximately \$16 per MMBTU. Natural gas is currently being delivered to the Costa Sur plant on the south side of the island at rates of approximately \$10 per MMBTU. The assumption is that natural gas can be obtained in the north for similar pricing. This represents a range of potential savings of 39%. Based on the assumptions below, the total fuel savings are approximately \$150 million per year when consuming approximately 25,000,000 MMBTU of fuel.

The average net plant heat rate for the San Juan Units 5 and 6 is 7,500 BTU/kWh.

The combined cycle units will operate at an annual average capacity factor of 87%.

Net plant capacity of the two units combined is 440 MW.

Additional savings would be realized though decreased maintenance cycles resulting from a switch to a gaseous fuel. A specific calculation has not been completed but this is expected to save an additional \$1 to \$5 million per year.

When considering all of these costs along with the expectation that the overall average heat rates can also be improved when burning a gaseous fuel, the expected annual savings could reach as high as \$150 million per year.

## Conversion of San Juan 5 and 6 to Dual Fuel Units

In order for SJ 5&6 to burn a gaseous fuel, a conversion must be completed. The expected cost of this conversion ranges between \$10 and \$30 million. Following this conversion, the primary fuel for those units would be the chosen gaseous while maintaining the ability to burn diesel fuel in emergency or other fuel curtailment scenarios.

#### **Contract Structure**

The financial proposal being offered as a part of this RFP is unique. The proposal is structured so that the successful proponent of this RFP will pay for the conversion of SJ 5&6 and subsequently recoup that cost over the first 5-year period of the fuel contract (three options for 5-year extensions will be offered). Due to the financial situation of PREPA, this is viewed as an advantageous strategy as no capital is required upfront on PREPA's part, and the cost of the conversion will be covered by the winning bidder.

Ultimately, this RFP will save PREPA, and the people of Puerto Rico, up to \$150 million annually while simultaneously resulting in cleaner, lower-priced electricity which in turn would result in lower rates for the citizens of Puerto Rico.

Request for Proposal (RFP) Fuel Supply Contract and Potential Conversion of Unit 5 and 6 - San Juan Power Plant Page 3

### **Process Choice**

We understand that the RFP process is the most advantageous process to procure a new fuel supply contract and potential conversion of San Juan Power Plant, Unit 5 and 6, due to the atypical and unique concept of this request. This process will allow PREPA the flexibility to negotiate prices and options not only in the price of fuel but the additional facets of the potential contract to obtain the most advantageous solution for the people of Puerto Rico.

After considering the foregoing, we ask the Governing Board to consider the draft resolution included with this memorandum to approve the RFP process in place of a formal bid process.

Annexes



## GOVERMENT OF PUERTO RICO

### Puerto Rico Electric Power Authority

June 19, 2018

Walter M. Higgins

Chief Executive Officer

Astrid I. Rodríguez Cro General Counsel ANGURAN CHEOUTINO

Request for Proposals Process (RFP-81412) for the Fuel Supply in the North of Puerto Rico and Conversion of San Juan Power Plant Units 5 and 6.

San Juan Power Plant (SJPP) has the newest units of generation in the North of Puerto Rico, but not the most economical since they are currently only burning distillate #2 (diesel). With a total capacity of 440 MW, SJPP Units 5 and 6 have the capability to be converted to dual fuel to burn different types of fuel along with diesel, including liquefied natural gas (LNG), which can be more economical than diesel, lower maintenance costs, and could reduce the emissions to the environment. All the abovementioned benefits are expected to have an impact in the increase of usage of these units. In recent years, the capacity factor of these units has been between 60% and 70%. With the units' conversion modification to an alternate gaseous fuel, the capacity factor may increase to 80% to 85% and a fuel requirement around 25,000,000 MMBTU per year.

Engineer William Ríos Mera, Generation Director, in memorandum dated June 20, 2018 states that PREPA is seeking to reduce the cost of generation to its clients and improve compliance with environmental requirements for the generating units. Also, recent events demonstrated, including hurricanes Irma and María, PREPA needs to have reliable and economic generation in the north of the Island and have to look for alternatives to strengthen the fleet in the San Juan area.

According to the information provided by Generation directorate PREPA's current price of diesel is approximately \$16 per MMBTU, and is expected that if we can start burning an alternate gas fuel like LNG, PREPA could be paying around \$10 per MMBTU like PREPA is paying in Costa Sur, which may translate in savings of about 39% in fuel expenses. Annual fuel savings around \$150 million may be expected.

Walter M. Higgins
Request for Proposals Process for
Fuel Supply in the North of Puerto Rico ...
Page 2

Engineer Ríos Mera recommended a request for proposal process to make an agreement with a company that can perform the design and conversion of units 5 and 6 to dual fuel, build the necessary infrastructure to transfer fuel to them, and supply fuel to both units. PREPA will not make any investment on the project until the units are commissioned and Units 5 and 6 are burning LNG or any other selected fuel. The contractor shall complete all works, and when the fuel supply starts, PREPA will make the payment for capital cost along with the fuel consumption. This agreement will have a 5-year term and the capital cost payments will be distributed over the whole contract duration. The 5-year contract will also have three extension options of five years each.

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The enabling act of PREPA, Act of May 2, 1941, No. 83 as amended, in section 15 (22 LPRA Sec. 205) Construction and Purchase Contracts; Regulations for Bidders Presentation; Exemption, establishes:

- All purchases and contracts of supplies or services, except professional services, made by PREPA, including contracts for the construction of works thereof, shall be made by calling for bids with sufficiently time in advance before the date the bids are open so that PREPA can guarantee proper knowledge and appearance of competitive bidders. Upon, comparing proposals and making adjudications, consideration shall be given to such factors, in addition to whether the bidder has complied with the specifications, as the ability of the bidder to carry out construction work of the nature involved in the contract under consideration; the relative quality and adaptability of the materials, goods, equipment or services; the financial responsibility of the bidder and his expertise, experience, reputation of business integrity and ability to render repair and conservation services; and the deadline for the delivery or performance offered. PREPA may approve regulations for the presentation of bids.
- 2 The bid requirement will not be necessary:
  - (f) When in the judgment of the Governing Board, a competitive request for proposal (RFP) process for the acquisition of goods, equipment, materials or services must be carried out to encourage greater competition,

Walter M. Higgins Request for Proposals Process for Fuel Supply in the North of Puerto Rico ... Page 3

> reduce the risk of collusion and promote the best possible terms and conditions in benefit of greater savings and reduction of costs and operational expenses of PREPA.

According to PREPA's Rules Regarding Levels of Approval for Document (Norma Sobre Niveles de Aprobación de Documentos de la Autoridad de Energía Eléctrica) it authorizes the Executive Director to sign all contracts exempted from the bid process in accordance with the enabling act of PREPA (Act 83 of the May 2, 1941, as amended) up to \$2,000,000. In addition, it will approve those that exceed this amount with the authorization of the Governing Board.

Administrative Bulletin No. OE-2017-066 delegated to the Fiscal Agency and Financial Advisory Authority (FAFAA), through the officer it designates for such purpose, act as Receiver of PREPA's procurement division and of any other division or office whose duties affect PREPA's procurement processes for goods and services to supervise and reform the processes for the purchase of goods and services by PREPA. To facilitate such receivership, Administrative Bulletin No. OE-2017-066 established the Office for Contract and Procurement Compliance (OCPC), and which shall evaluate and approve all procurement and purchases of goods and services by PREPA in excess of \$500,000. On June 11, 2018, the pertinent documents were send to OCPC, for their approval. In addition on June 14, 2018, the Directorate of Legal Affairs submitted the authorization request for this process for the corresponding approval of the Office of Management and Budget (OMB). Therefore, the RFP cannot be published until the respective authorization of OCPC and OMB.

After evaluating the information and documents provided by the Generation Directorate and assuming as true and correct the aspects mentioned in his memorandum, the Legal Affairs Directorate recommends the RFP process to be used to acquire the services for fuel supply in the North and the possible conversion of San Juan Units 5 and 6, to encourage greater competition, reduce the risk of collusion and promote the best possible terms and conditions in benefit of greater savings and reduction of costs and operational expenses of PREPA. Also, due to the atypical and unique concept of this project, the RFP process will allow PREPA the flexibility to negotiate prices and options not only in the price of fuel but the additional facets of the potential contract to obtain the most advantageous solution for the people of Puerto Rico.

This recommendation is subject to the prior approval of OCPC, OMB and PREPA's Governing Board.

Annexes

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## GOVERNMENT OF PUERTO RICO

Puerto Rico Electric Power Authority

June 20, 2018

Walter M. Higgins

Chief Executive Officer

William Ríos Mera Generation Director

Fuel Supply in the North and Conversion of San Juan Units 5 and 6, RFP 81412

PREPA is seeking to reduce the cost of generation and improve compliance with environmental requirements for the generating units. Recent atmospheric events demonstrated the need to have reliable and economic generation in the north of the Island. PREPA is looking for alternatives to strengthen the load supply in the San Juan area.

The San Juan Combined Cycle Units 5 and 6 are the most efficient system of our generation fleet but the generation costs are high because of the use of distillate #2 (diesel). With a total capacity of 440 MW, these units have the capability to be converted to dual fuel, having LNG as the primary fuel and diesel secondary.

The purpose of this RFP is to make an agreement with a company that will be responsible for the engineering, design, procurement, and construction of the necessary infrastructure for the San Juan Combined Cycle dual fuel conversion. This project will not require initial capital expenditure from PREPA until the units have been commissioned and ready to generate with LNG or any other selected fuel. Conversion cost is going to be paid and blended through a five year fuel supply contract, also included in the RFP scope of supply. The fuel supply contract considers three extension options of five years each and has no take-or-pay clause or any type of penalty for fuel charges for PREPA. The Contractor shall be responsible for the lease of the spaces needed to provide the alternate fuel and to obtain all local and federal permits needed to fulfill the project within the contract scope of supply.



Walter M. Higgins Page 2 June 20, 2018

The use of liquefied natural gas (LNG) will lower generation and maintenance costs and reduces contaminants to the environment. All of the above mentioned benefits are expected to have an impact in the increase of usage over other generation units. The capacity factor historically has been in between 60% to 70%. With the LNG retrofit, the capacity factor may increase in between 80% to 85%, is about 25,000,000 MMBTU of natural gas per year. Based on that volume, diesel and LNG at \$16 and \$10 per MMBTU, respectively, the expected annual savings is estimated to be \$150 million.

The cost estimate for the dual fuel conversion and natural gas piping from the supply side is close to \$20 million. The Return of Investment (ROI) can be achieved in a year.

If you need additional information, please contact Eng. Jaime A. Umpierre Montalvo, Engineering and Technical Services Division Head, at 6541 or 5210.

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Approving a Request for Proposal (RFP) for a New Fuel Contract and Potential Conversion of San Juan Units 5 and 6 thereof RFP 81412

WHEREAS:

The Puerto Rico Electric Power Authority (PREPA) is a public corporation and an instrumentality of the Government of Puerto Rico created by Act of May 2, 1941, No. 83 as amended (Act No. 83). PREPA was created to provide electrical energy in a reliable way contributing to the general welfare and sustainable future of the people of Puerto Rico, maximizing benefits and minimizing social, environmental and economic impacts. In addition, provides a service based on affordable, fair, reasonable and non-discriminatory cost that is consonant with environmental protection, non-profit, focused on citizen participation and its clients.

WHEREAS:

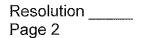
Act No. 83, supra authorizes PREPA, in the management of its purposes, to grant contracts and formalize all the instruments that are necessary or convenient in the exercise of any of its powers.

WHEREAS:

Section 15 (1) (a) of Act No. 83 states that all purchases made and contracts for supplies and services, except professional services entered into by PREPA, including its capital construction contracts, shall be made by a bid process.

WHEREAS:

San Juan Power Plant Units 5 and 6 (SJ 5&6) are relatively modern combined cycle facilities that were originally designed to burn diesel fuel only. At the time of plant development and construction of the units, diesel fuel was the only fuel available to burn in the units thus no equipment was installed for burning any other type of fuel.



WHEREAS: Diesel fuel no longer represents the most economic fuel source for SJ 5 & 6.

WHEREAS: Advancements in fuel transportation, as well as advancement in upstream drilling technology, have made several fuels more than cost competitive when compared to diesel fuel.

WHEREAS: The current price of diesel fuel to Puerto Rico is approximately \$16 per MMBTU. Natural gas is currently being delivered to the Costa Sur plant on the south side of the island at rates of around \$10 per MMBTU.

WHEREAS: The expectation is that gaseous fuel can be obtained in the North side of the island at similar pricing. This represents a potential 39% savings in fuel. Based on a number of justifiable assumptions, the total fuel savings could reach \$150 million per year.

WHEREAS: Additional savings may be obtained through decreased maintenance cycles resulting from a switch to a gaseous fuel. This is expected to save an additional \$1 to \$5 million per year.

WHEREAS: When considering all of these costs along with the expectation that the overall average heat rates can also be improved when burning gaseous fuel, the expected annual savings are over \$150 million per year.

WHEREAS: The expected cost of this conversion is \$10 – \$30 millions. Following this conversion, the primary fuel for those units would be natural gas, while maintaining the ability to burn diesel fuel in emergency or other fuel curtailment scenarios.

WHEREAS: According to the proposal the proponent awarded with this project will pay for the conversion of SJ 5&6 and recover that cost over the first 5-

Resolution \_\_\_\_\_ Page 3

year period of the fuel contract. This is an advantageous and beneficial strategy as no capital is required upfront on PREPA's part.

WHEREAS:

The use of gaseous fuels represents a significant improvement in terms of less environmental emissions from power generation. Ultimately, this project will save PREPA, and the people of Puerto Rico, approximately \$150 million annually while simultaneously resulting in cleaner, lower-priced electricity.

WHEREAS:

Act No. 83 provides in section 15, subsection (2) (e) and 2 (dd) that the requirement of formal bid process will not be necessary in those cases in which specialized services are involved, and when, in the judgment of the Governing Board, a competitive request for proposal (RFP) process for the acquisition of goods, equipment, materials or services must be carried out to encourage greater competition and promote the best possible terms and conditions for the benefit of greater savings and reduction of costs and operational expenses of PREPA.

WHEREAS:

According to the information provided by the Chief Executive Officer and the Generation Director, the RFP process is the most advantageous process to procure a new fuel supply contract and potential conversion of San Juan Plant Units 5 & 6 due to the atypical and unique concept of this project. This process will allow PREPA the flexibility to negotiate prices and options not only in the price of fuel but the additional facets of the potential contract to obtain the most advantageous solution for the people of Puerto Rico.

WHEREAS:

In a memorandum of June 19, 2018, the Director of Legal Affairs, after the corresponding evaluation, recommends the use of the RFP process for the acquisition of services in this case.

Resolution	
Page 4	

THEREFORE: The Governing Board, after considering the recommendations of the Chief Executive Officer and the Generation Director, as well as the provisions of the organic statute of PREPA, decides to:

- 1. Approve a Request for Proposal process for the acquisitions of a new fuel contract for San Juan Units 5 and 6.
- 2. The Chief Executive Officer will inform the Governing Board the result of the RFP process before executing any contract.

Approved	in	San	Juan,	Puerto	Rico,	on	this		day	of	July,	two	thousand
eighteen.								,					



Commander United States Coast Guard Sector San Juan 5 Calle La Puntilla San Juan, PR 00901-1819 Phone: (787) 729-2300

16610 P 405-18 September 26, 2018

NFEnergia, LLC Attn: Capt. Mark Lane 111 W. 19<sup>th</sup> Street, 8<sup>th</sup> Floor New York, NY 10011

Dear Captain Lane:

This Letter of Recommendation (LOR) is issued pursuant to 33 C.F.R. § 127.009 and in response to the Letter of Intent submitted by your company on December 12, 2017, proposing to transport Liquefied Natural Gas (LNG) by ship to Wharves A and B in Puerto Nuevo, Puerto Rico. This LOR conveys the Coast Guard's recommendation that the waterways approaching and entering San Juan Harbor to Wharves A and B in Puerto Nuevo, Puerto Rico be considered suitable for LNG marine traffic. In addition to meeting the requirements of 33 C.F.R. § 127.009, this letter also fulfills the Coast Guard's commitment to provide information to your agency.

My recommendation on the suitability of these waterways is provided to assist your company in the proposal, planning, and execution of the concept of operations for your facility. Because certain sections of the LOR Analysis contain security related data that is "Security Sensitive Information" (SSI), two versions are enclosed. The first contains SSI. The second has all SSI redacted and is marked as such, indicating that it is releasable to the general public. This letter and redacted version of the accompanying analysis may be provided to other agencies as needed.

My staff will continue to monitor the progress of this project and will maintain communications with the project managers from your company and its partners. We are committed to ensure that all safety and security measures necessary to safeguard the public health and welfare, critical marine infrastructure and the marine environment are fully implemented and maintained.

If you have questions regarding this letter of recommendation, my point of contact is Lieutenant Commander Jose Rosario, who can be reached at (787) 289-2378 or <a href="mailto:Jose.M.Rosario@uscg.mil">Jose.M.Rosario@uscg.mil</a>.

Sincerely,

E.P. King

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Captain, U. S. Coast Guard

Captain of the Port

Enclosures: (1) Letter of Recommendation Analysis (Redacted)

(2) Letter of Recommendation Analysis (SSI)

Copy:

Commander Coast Guard District 7 (dp)

Commander Atlantic Area (ap)