CENAE-R
Application Number: NAE-2010-02347

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for Above-Numbered Permit Application

This document constitutes the Environmental Assessment, 404(b)(1) Guidelines Evaluation, Public Interest Review, and Statement of Findings for the following:

1. Application information

APPLICANT: DCP Searsport, LLC

APPLICATION/ORM NUMBER: NAE-2010-02347

WATERWAY & LOCATION: Unnamed Tributary to Long Cove and its adjacent freshwater wetlands; Mack Point; Searsport, Maine

LATITUDE & LONGITUDE: Latitude North: 44.4641184°
Longitude West: -68.9004178°

PROPOSED WORK (project purpose and need as stated by applicant): The primary purpose of the proposed DCP Terminal is to establish and operate a liquid propane ("LPG") marine import and distribution facility to serve the Maine LPG market. Propane has become an increasingly important component of Maine's energy mix. The applicant's estimates indicate that approximately 115 million gallons of LPG are used annually in the state for industrial, commercial, and residential heating needs. More than 26,000 Maine households heat with propane, most of which are in rural areas where natural gas is not available. The applicant expects use of propane to grow in the state in response to environmental requirements that demand increasingly lower emissions of air pollutants, and due to the volatility expected in the price and supply of heating oil. The heating oil market currently supplies approximately 75% of Maine's home heating needs, the highest in the nation.

DCP currently relies heavily on the importation of propane from western Canada via rail to storage and distribution terminals in Hermon and Auburn, Maine. The applicant asserts that over the past several years there has been a steady decline in Canadian natural gas production and, since propane is a by-product of the natural gas recovery process, less production of propane in Canada. Natural gas/propane production in Canada is reportedly forecasted to continue to decline. At the same time, there has also been increasing cost and competition for rail transportation from western Canada. Propane deliveries in Maine had to be rationed in 2007 due to a Canadian railroad strike, an interruption in pipeline imports into New York State, and a cold winter and severe weather at sea. Lower production of Canadian propane together with vulnerable rail availability has resulted in serious challenges for bringing a dependable supply of propane into Maine.

Given these challenges and DCP's experience with the waterborne import market, the applicant asserts that locating a marine import terminal and bulk storage facility in mid-coast Maine will ensure consistent and reliable access to an adequate supply of an important, growing component of a clean energy mix in Maine, and which may also help to address the current heavy reliance on oil.

Construction of the DCP Terminal will entail the installation of one LPG bulk storage tank; an LPG transfer pipeline and vapor return line from the bulk storage tank to the existing Sprague Energy pier; a mobile manifold to allow LPG transfer from delivery vessels to the transfer pipeline; a truck loading station; and a future rail car loading station. The facility will also include the installation of ancillary equipment such as ethyl-mercaptan storage tanks (ethyl-mercaptan is an odorant added to LPG), an LPG fuel tank, three propane-fired heaters, a propane flare, a diesel-fueled emergency generator, a diesel-fueled fire water pump and fire water storage tank. The purpose of the propane flare is to provide a controlled means of burning off excess propane vapor from within the tank in the rare event that normal refrigeration and vapor recapture processes fail, e.g. a prolonged power failure or reduction in the availability of commercial power (such as a brown out). Administration, compressor and motor control center buildings, five electric compressors, an electric cooler, and four electric loading pumps will also be required.

Construction and operation of the DCP terminal will result in unavoidable impacts to 1.97 acres of forested and scrub-shrub freshwater wetlands. Within the wetland area affected, approximately 365 feet of stream channel will be rerouted into a culvert passing beneath the truck loading area, and the next approximately 670 feet of the stream channel will be rerouted into a new, stabilized channel along the site perimeter in order to construct other essential project elements.

Mack Point at Searsport offers the attributes that support the development of a propane import and distribution terminal and which make the proposed location a practicable alternative. The Dry Cargo Pier at the Mack Point Terminal has approximately 40 feet of water depth at low water, it is a new pier of sufficient size to safely accommodate the LPG vessels, and is constructed in accordance with the latest codes. Searsport has a long maritime history that includes shipbuilding and cargo handling, and Mack Point has been an established port for bulk cargo vessels for many years. Searsport town planning has already designated the DCP terminal site for future industrial/commercial growth. Sprague Energy is an experienced terminal operator, and the Mack Point Terminal already engages in services similar to those proposed for the DCP terminal. Bulk storage tanks owned and operated by the Irving Oil Corporation and Sprague Energy are already located at Mack Point. Waterways serving Mack Point are well suited to LPG vessel traffic. Penobscot Bay is wide and deep, with plenty of room to maneuver and no blind turns; tides and currents place relatively few limits on ship movements; ship meeting and crossing situations will be limited and can be avoided; the ship transit route does not cross or pass any critical infrastructure such as bridges; there are multiple navigation routes into and out of the port; the port is not congested and does not have the amount of commercial, deep draft traffic that occurs at busier ports such as Portland; the terminal is well protected from the elements; and population densities along the route are relatively smaller than along other waterways, and routes do not come close to any large urban area. The site is centrally located in Maine and

to the applicant's present market, and has existing, immediately adjacent access to both highway and rail transportation routes. Impacts to waters of the U.S. are minimal, with less than two acres of total wetland impacts.

The applicant has stated that the engineering design and layout of all aspects of the proposed Searsport LPG Terminal, including minimum separation distances between on-site components, setbacks from the DCP property line and from off-site structures and roadways, as applicable, is and will be completed in full accordance with all safety, security, design and operational codes and regulations.

Applicant's Proposed Measures for Avoidance and Minimization: The applicant conducted an extensive analysis of alternatives to include alternative sites other than Mack Point, alternative locations on Mack Point, reducing the size of the proposed terminal, and variations in the terminal and transfer pipeline layout to reduce impacts to aquatic resources to the extent practicable. Finally, he has considered the no build alternative.

Due to the physical constraints of the site (roads, rail lines, property lines, etc), the distribution of wetlands across the site, and the security, clearing and containment requirements of the facility, avoiding all impact to aquatic resources, is not possible. The applicant has centered the facility to provide the maximum buffer possible to abutting properties, the Route 1 corridor, and the shoreline adjacent to Long Cove. In doing so, several areas of wetlands and discharge outlets to Long Cove have been avoided. He also purchased additional land to provide greater siting flexibility. Further avoidance and minimization does not appear practicable. A rerouting of the original pipeline route took it away from the immediate shoreline, eliminated its wetland impact (0.07 acres), and confined it largely to a common utility corridor within an existing nearby tank farm complex.

In order to avoid or minimize secondary impacts to aquatic resources, the applicant will implement strict erosion control measures during construction; he will limit site clearing to only that necessary to meet security and safety requirements; he will implement stormwater management measures, resulting in no change in post-construction runoff into Long Cove; he will retain natural vegetated buffers around the site to the maximum extent practicable, particularly along the shoreline of Long Cove; he will implement spill prevention and containment measures; and he has designed the facility to provide for full containment of any breach in tank integrity.

Applicant's Proposed Compensatory Mitigation: In accordance with federal and state recommendations, the applicant has agreed to compensate for the project's unavoidable wetland impacts by funding $305,835.00 toward Maine's Natural Resources Conservation Fund (In Lieu Fee Program). Although this funding figure also accounts for the footprint of impact to the intermittent stream on site, the applicant has agreed to supplemental mitigation specifically to address stream impacts. The intermittent stream on site originates at Route 1 and passes through the site to eventually discharge into Long Cove via a culvert under the rail line. The stream's flow and principal functions will be accommodated through a combination of culvert, natural channel, and constructed channel. In addition and at the suggestion of the Corps and the US Fish & Wildlife Service ("USFWS"), the applicant will

implement a stream restoration/enhancement project off site. Within the same drainage area, an existing improperly installed and undersized culvert on Long Cove Brook will be removed and replaced with a natural bottom arch culvert, thereby restoring passage to aquatic organisms and overall habitat connectivity.

PROJECT PURPOSE DETERMINED BY CORPS:

Basic Project Purpose[1]: The basic project purpose is to increase the stability and reliability of liquid propane supplies to serve the Maine LPG market.

Overall Project Purpose[2]: The overall project purpose is to construct and operate an LPG marine import, storage, and distribution facility in order to increase the stability and reliability of liquid propane supplies to serve the Maine LPG market.

Water Dependency Determination: A water-dependent project is a project which will "require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose" (40 C.F.R. § 230.10(a)(3)). The tank and propane off loading facility meets the basic project purpose of increasing the stability and reliability of liquid propane supplies to serve the Maine LPG market. Discharges of fill material into waterways and wetlands for the project are associated with site clearing, filling, and grading necessary to install the proposed tank and associated infrastructure. This project is not water dependent; the facility does not have to be sited within a water of the United States in order to meet the basic project purpose.

SITE DESCRIPTION (Refer to Figure 2, Page 20): The proposed development is located off Route 1 and Station Avenue on Mack Point, at the northern end of Searsport, Maine. Searsport is located in Waldo County, about 27 miles south of Bangor and 91 miles northeast of Portland. Mack Point has been extensively developed for various commercial uses since the early 1900's and currently has the largest deep draft commercial cargo port in Maine north of Portland. Commercial facilities currently include a dry cargo pier and an oil terminal pier, upland tank farms, coal and salt storage facilities, areas for other bulk cargo, and a rail terminal for cargo. The piers at Mack Point accommodate vessel shipments of petroleum products, aggregates, forest products and bulk cargos. Sprague Energy and Irving Oil are the current operators of the petroleum terminals and tank farm facilities at Mack Point. Historic upland development on Mack Point has resulted in extensive clearing and disturbance by grading, ditching or filling. The undeveloped portions of the Mack Point consist of successional forests (mixed hard and softwood) fragmented by roads, rail lines and development, and mowed meadows or emergent wetlands. Railroad tracks extend along the southern and eastern shores of the point and the shoreline consists of mostly unprotected banks grading down to gravel, cobble, sand and mudflat. The sub-tidal substrate is composed of mostly soft sediments with relatively low populations of infauna. Local efforts

[1] The basic project purpose is the fundamental or irreducible reason for the project that is used by the Corps to determine if the proposed action is water dependent for purposes of the Section 404(b) Guidelines.

[2] The overall project purpose is a more detailed, comprehensive and project specific statement of the project's purpose that takes into account the needs of the public and the applicant. The overall project purpose is used by the Corps in evaluating practicable alternatives in accordance with the Section 404(b) Guidelines and, in some instances like here, in developing a reasonable range of alternatives considered under NEPA.

have been ongoing for years to enhance populations of soft shell clams in the cove and portions of the cove are now open to harvesting. Available resource mapping indicates the presence of scattered areas of eelgrass within and outside of Long Cove.

The DCP site is currently undeveloped and situated between Route 1, Station Avenue, and the existing Montreal, Maine and Atlantic Railroad ("MMAR") spur that terminates at Mack Point. The DCP storage and distribution terminal would be located on an approximately 23.6 acre parcel of land (the upper parcel) at Mack Point. Approximately 19.8 acres of this land area is zoned for industrial use by the Town of Searsport, with the remaining approximately 3.8 acres zoned for commercial use. The site is located approximately 1,000 feet north of the Sprague Energy and Irving Oil terminal and tank farm facilities. The site is generally bounded by Route 1 and commercial and residential development along Route 1 to the northwest; residential land, small forested patches, and the railroad to the north, northeast, and southeast; Long Cove to the southeast; and small forested patches and residences along Station Avenue to the south and southwest. The parcel is mostly wooded, comprised of early successional hardwood saplings and more mature secondary growth components. The secondary growth areas are comprised of a mix of conifers and hardwoods. Several shallow to deep drainage swales, containing freshwater wetlands and a stream component, run across the site in a general northwest to southeast orientation. The stream is intermittent and originates at a culvert at Route 1, passing through the site to eventually discharge into Long Cove via an elevated culvert under the rail line. Forested and scrub-shrub freshwater wetland pockets are also present. The topography and overall site drainage slopes downward from Route 1 towards Long Cove to the southeast.

An approximately 5,100-foot long, generally 50-foot wide, corridor for the LPG transfer pipeline would extend from the upper parcel, cross under Station Avenue onto land owned by Sprague (Sprague Way Lane), and continue through the Sprague tank farm facility generally following an existing pipeline corridor to the pier. The pipeline would be located underground from the upper parcel until it reaches the existing Sprague fence, then be installed predominantly aboveground to the pier. This corridor footprint encompasses approximately 5.7 acres of land. Approximately 800 linear feet of the corridor would be within existing roads. The remainder is predominantly developed land within the existing Sprague facility. The entire corridor consists of previously disturbed soils and fill and no wetlands.

The applicant owns two parcels, contiguous to the tank site, which will not be developed as part of this proposal. The first is a 20.1-acre parcel between the railroad spur and Long Cove, consisting of approximately 6 acres of forested upland and approximately 14 acres of intertidal wetlands and mudflat. The area above high tide contains similar drainages and associated bands of freshwater wetland, one of which originates on the tank site. The second is a 3.5-acre parcel of forested land south of the proposed terminal, with frontage on Station Avenue. Forested freshwater wetlands and uplands are also present on this parcel. These two parcels will function as natural buffer areas.

2. Authority.

☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403).
☒ Section 404 of the Clean Water Act (33 U.S.C. §1344).
☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C.1413).

3. Scope of Analysis.

a. National Environmental Policy Act ("NEPA").

1.) Factors to be considered in determining scope of analysis for NEPA: Determine whether or not the regulated activity comprises "merely a link" in a corridor type project; whether there are aspects of the upland facility in the immediate vicinity of the regulated activity which affect the location and configuration of the regulated activity; the extent to which the entire project will be within the Corps jurisdiction; and the extent of cumulative federal control and responsibility.

2.) Determined scope. The project is not a link in a corridor type project. Jurisdictional activities take place at the tank site and the existing terminal pier and although the pipeline corridor affects only uplands, it forms a key functional link in the project development and operation. Similarly, the tank site is a mosaic of upland and wetland and a number of areas of wetland are being impacted throughout the site. The tank facility's design and impact is driven by a number of site constraints to include property line setbacks, visual buffers, roads, and rail lines. Therefore, this analysis will encompass the entire development, including the tank site, all associated infrastructure, and the pipeline corridor out to the pier.

b. National Historic Preservation Act ("NHPA") "Permit Area".

1.) Factors to be considered in determining permit area for NHPA: Determine whether activities outside waters of the United States are included based on the following (see 33 CFR 325 Appendix C): 1) The activity would or would not occur *but for* the authorization of the work or structures within the waters of the United States; 2) Whether the activity is integrally related to the work or structures to be authorized within waters of the United States (or, conversely, the work or structures to be authorized must be essential to the completeness of the overall project or program); and 3) Whether the activity is directly associated (first order impact) with the work or structures to be authorized.

2.) Determined scope: The applicant proposed a one-mile Area of Potential Effect ("APE") for determining potential adverse effects on historic architectural resources with respect to compliance with the requirements of Section 106 of the NHPA. The APE for archaeological resources is limited to the terminal site. The Deputy State Historic Preservation Officer, on behalf of the Maine Historic Preservation Commission ("MHPC") and the Corps concurred with the APE.

c. Endangered Species Act ("ESA") "Action Area".

1.) Action area means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.

2.) Determined scope: The Action Area in this case is the property to be owned or controlled by DCP on Mack Point, plus the waters of Penobscot Bay.

4. Public Involvement.

a. A Corps permit application was received on May 20, 2011. In light of the project's minimal impact to aquatic resources, it was initially considered eligible for the Maine General Permit. On January 24, 2012, the Corps decided to exert discretionary authority and to require an Individual Permit review. This authority is invoked on a case-by-case basis whenever the Corps determines that the potential consequences of the proposal warrant a higher level of review based on concerns for the aquatic environment or for other relevant factors of the public interest. A Corps Public Notice was issued on January 31, 2012. The comment period ended on February 29, 2011.

b. **Comments and issues raised.** Prior to and in response to our Public Notice, the Corps received 211 letters or emails in opposition to the project, 22 of which contained public hearing requests, and 135 letters or emails in support of the project. The Corps notes that 33 of the comments received in opposition and 115 of those received in favor to the project were form letters. It should also be noted that the total comments received in opposition to the project include repeat comments from several of the same individuals (pre and during Public Notice) and multiple comments from the several of the same individuals (during Public Notice). The Corps did not attempt to differentiate duplicative or multiple comments.

Those in favor expressed the following comments:

1.) Jobs. The development will create much needed construction and operations jobs. Operation of the facility will also result in secondary economic benefit to the community and the region.

2.) Gas supply. The project will result in a more reliable and stable propane supply for Maine consumers.

3.) Fuel source. Propane constitutes a cleaner alternative to traditional heating oil and is an important element of Maine's energy mix.

4.) Mack Point. It is appropriate to site such a facility at Mack Point, already an industrialized site.

5.) Traffic. The increase in traffic from the project will be inconsequential.

6.) Water. The applicant will facilitate improvements to the municipal water system that will benefit the entire community (The Searsport Water District).

7.) Natural Areas. There are no rare botanical features that will be disturbed by the project (Maine Dept. of Conservation, Natural Areas Program).

Those opposed raised issues and concerns that are broadly captured as follows:

1.) Wetlands. The project will permanently impact aquatic resources on site including wetlands that serve important functions and values. The proposed compensatory mitigation is insufficient to address the project's wetland impact. There was also some question whether the scope of wetland impact was accurately described.

2.) Wildlife. There is important wildlife habitat that will be adversely affected by clearing and development of the site.

3.) Tidal resources. The project could adversely affect intertidal and sub-tidal resources within Long Cove including lobsters, shellfish beds, and eelgrass. The project could have further reaching effects to marine resources and fishing in Penobscot Bay.

4.) Historic properties. There could be archeological or historic sites on site that will be adversely affected by the development. There are historic properties within the community that are threatened by increased truck traffic or a catastrophe.

5.) Safety. The presence of a tank of this size, just off Route 1 poses a safety risk, particularly in the event of a catastrophic fire or explosion. Increased truck traffic in the area could threaten public safety. Local emergency responders are ill equipped to handle an emergency of any magnitude.

6.) Pollution. The operation of the facility will result in air, water, noise, and light pollution. This is particularly relevant to the proposed emergency flare.

7.) Aesthetics. The size and height of the tank and appurtenant facilities will adversely affect the views from Route 1, Sears Island, and nearby communities. There will be insufficient buffers to the site. Is there a long-term plan for decommissioning and removal of the tank?

8.) Economics. The limited number of jobs created by the facility will not mitigate for the anticipated loss of tourist dollars and economic impact to the community and surrounding region. Increased truck traffic could adversely affect local businesses. A request was made for an economic study of the impact of the project.

9.) Geotechnical. There is a geologic fault in the area that could present a safety hazard to the proposed tank.

10.) Sears Island. The passive recreational use of Sears Island could be adversely affected by further industrialization of Mack Point. There were multiple references to the construction of the Sears Island Causeway by the Corps and its impact to marine resources.

11.) Traffic. The project could result in an excessive increase in truck traffic in the region with associated degradation of existing roads and quality of life. Rail traffic could also increase.

12.) Security. The presence of the proposed tank could attract terrorists. An attack on the tank could cause catastrophic fire or explosion. This factor, plus exacerbating our

dependency on foreign supplies of fossil fuels, may adversely affect National Security. There was an objection to imports of propane from countries like Afghanistan.

13.) Navigation/Recreation. Recreational and commercial boaters currently using Searsport Harbor and surrounding waters could be adversely affected by LPG vessels at anchor and their associated security zones.

14.) Property values. The presence of the tank and associated operations in the community could result in a lowering of property values.

15.) Need. There is insufficient demand for propane in Maine and ample supply such that the project is not necessary.

16.) Industrialization. The tank facility adds to the overall industrialization of Mack Point and could lead to future industrialization in the area.

17.) General Environmental Impact. An Environmental Impact Statement and full NEPA review should be performed by the Corps.

18.) Scope of Environmental Review. The Corps should consider the entire facility, not just the fill of wetlands, in its NEPA review.

19.) Compliance. There was some reference to the environmental and safety compliance track record of the applicant and the industry in general elsewhere in the country.

c. **Additional issues identified by the Corps.** Pursuant to Section 10 of the Rivers and Harbors Act, the Corps considered the project's potential navigational impact, despite the fact that the only work subject to Section 10 jurisdiction is the attachment of the off loading pipeline to the existing cargo pier. Our review includes consideration of the Searsport Federal Navigation Project ("FNP"). Refer to Section 7.k.

d. **Issues/comments forwarded to the applicant and applicant's response.** All public comments received were forwarded to the applicant. Including a request made before determining that an individual permit would be required, the Corps has made multiple requests for additional information in response to the public comments. The applicant has provided detailed responses that are contained in the administrative record.

e. **Has a request for a public hearing been made?** Yes. As noted, a total of 22 public hearing requests were received in response to the Public Notice.

Requests for a public hearing shall be granted, pursuant to 33 CFR 327.4 (b), "unless the district engineer determines that the issues raised are insubstantial or there is otherwise no valid interest to be served by a hearing". Courts reviewing the regulations governing public hearings have observed that hearings are conducted on an "as needed" basis by the Corps. To the extent that the Corps determines that it has the information necessary to reach a decision and that there is "no valid interest to be served by a hearing," the Corps has the discretion not to hold one. Courts have also observed that an important factor in determining the necessity for a public hearing is the extent

to which there have already been opportunities and other forums for the public to participate and raise their concerns.

Issues raised regarding the proposed activity were clearly stated in response to the Corps Public Notice, and these issues are 1) readily addressed through existing or obtainable information; 2) have been or will be more appropriately addressed by other federal agencies; and/or 3) have been or will be more appropriately addressed at the state and municipal level.

In addition, the public has had ample opportunity to express their interest in the project. The Corps administrative record contains not only the public's response to our January 31, 2012 Public Notice, but also extensive comments made during the period when the Corps was considering the project's eligibility under the Maine General Permit. It is unlikely that heretofore unknown issues will be identified in a public hearing. To date, the applicant has held two local public information meetings, one of which was required by the Maine DEP; he has attended local Planning Board meetings to provide project updates and these were open to the public and available on line; he has participated in three public meetings/hearings required by the Town of Searsport concerning tank height; he has provided information through the media including news articles and interviews and a full page informational ad in the paper; he has gone door to door in the community to distribute information and answer questions; he has met with local officials, business owners, concerned citizens, and state officials; he has opened a local office that is open to public inquiries; and finally, he conducted yet another public information meeting on January 26, 2012. The Corps attended the January 26, 2012 meeting and has on file any available records of the previous meetings. The format of the most recent meeting, like many of those in the past, provided for a description of the project elements, responses to public questions, and public testimony. Far more information has been conveyed to the public through these various forums than would ever be presented in a Corps public hearing, and the issues raised by members of the public in these forums reflect the same concerns and issues raised in the written comments received in response to the Corps Public Notice.

In accordance with 33 CFR 327, the Corps determined that it was not necessary to conduct a public hearing because through the Corps public comment process, we have sufficient information to adequately evaluate the issues relating to the proposed activity. All requesting parties have been notified.

f. **The following comments are not discussed further in this document as they are outside the scope of Corps review for the current project.**

1.) DCP citations for environmental or safety violations. The Corps is not aware of any citations issued to DCP for unauthorized placement of fill in waters of the United States or work in navigable waters. Compliance with other federal, state, or local regulations is not within the authority of the Corps to consider in its review.

2.) Sears Island Causeway. Copies of an early form letter included reference to the Corps constructing the Sears Island causeway and associated impacts it may have had on marine resources in the area. The causeway was not constructed by the Corps; it was constructed by the Maine Dept. of Transportation in the late 1980s. Moreover, the impacts of the proposed facility will be to freshwater wetlands, not marine resources, therefore there is no relationship between the

current proposal and impacts from the Sears Island causeway, and therefore are not discussed further.

3.) Sources of propane. One commenter objected to importing gas from countries like Afghanistan. The applicant has noted that propane will generally originate from the North Sea, but regardless, the Corps has no jurisdiction over international trade. The Corps will also not consider the concerns about energy dependence as such issues of national energy policy are beyond the scope of this project's NEPA review.

4.) Maine Energy Market. When private enterprise makes application for a Corps permit, Corps regulations direct that it will generally be assumed that appropriate economic evaluations have been completed, the proposal is economically viable, and it is needed in the marketplace (33 CFR 320.4(q)). That presumption is supported here by the 2007 propane shortage and the need for diversified delivery sources for the State of Maine.

g. **Consideration and evaluation of Public Notice comments.** The public concerns/comments referenced in Section 4.b are addressed below or as noted, in Section 7, Public Interest Review.

1.) Wetlands.

i.) Function & value. The applicant's functional assessment of the site's wetlands conforms to the format recommended by the Corps. The principle valuable functions include wildlife habitat, floodflow alteration, groundwater discharge, sediment/toxicant retention, shoreline stabilization, and nutrient retention. However, these functions are limited by the size of the site, the proximity of nearby development (roads, rail, residences, and commercial facilities), the relatively small size and wide distribution of the wetlands, and the opportunity to provide the function. The Corps has determined that the functional assessment is accurate. The federal resource agencies and Maine DEP concur.

ii.) Compensation. On April 10, 2008, the Corps and US EPA published regulations governing compensatory mitigation for activities authorized by permits issued by the Department of the Army. These regulations favor use of mitigation banks and in-lieu-fee ("ILF") to provide compensatory mitigation for unavoidable impacts to wetlands. There are no mitigation banks in Maine that are available to the public. Maine has an approved ILF program with a demonstrated record of success. The proposed ILF contribution complies with the requirements of the Maine DEP and the Corps. In response to recommendations from the USFWS, the applicant has supplemented the ILF contribution with a specific plan to restore flow and habitat connectivity at a poorly installed culvert crossing on Long Cove Brook, within the same watershed as the impact site. This specifically addresses impacts to the intermittent, lower value stream on site. The Corps has determined that the two elements of the proposed mitigation are acceptable and fully compliant with New England District guidance. The federal resource agencies concur.

iii.) Delineation. The applicant has satisfactorily addressed the concerns expressed about the location and amount of jurisdictional wetlands and streams present on the project site. The wetlands on site were delineated using the federal 3-parameter approach mandated by the 1987 Corps of Engineers Wetland Delineation Manual and its Regional Supplement. A site

inspection by Corps, the DEP, and federal resource agency personnel confirmed the accuracy of the delineation. The Corps of Engineers has determined that the wetland line accurately defines the limits of wetlands subject to Federal jurisdiction in conformance with the 1987 Corps of Engineers Wetland Delineation Manual and its Regional Supplement.

2.) Wildlife. Refer to Section 7.g.

3.) Tidal resources. Refer to Section 7.g.

4.) Historic properties. Refer to Section 7.f.

5.) Safety. Refer to Section 7.q.

6.) Pollution. Refer to Sections 7.d. (air, noise, odor, and light) and 7.o. (water).

7.) Aesthetics. Refer to Section 7.c.

8.) Economics. The requested economic impact study has been provided to the Corps and the Town of Searsport (where it is available to the public). The economic impact of the project is discussed in Section 7.b.

9.) Geotechnical. The Searsport area is subject to regular but infrequent, low energy earthquake activity. Nevertheless, DCP has designed its facilities to withstand the earthquake events that can occur here. The seismic design criteria used will be in accordance with the criteria listed in the American Society of Civil Engineers Minimum Design Loads for Buildings and other Structures (ASCE 7-05) published in 2005, since that is currently the standard included in the Maine Building Code. However ASCE 7-10 is the most current edition of this standard so both were used by the geotechnical engineer for the evaluation of the site specific soil liquefaction potential. The bulk storage tank seismic design is in compliance with American Petroleum Institute API 620 11th Edition, including Appendix L in conjunction with ASCE 7-05. In a letter to the Corps dated March 2, 2012, the Maine State Geologist commented on the seismic hazard in the project area. In summary, he stated, *"Small, non-damaging earthquakes have occurred and will continue to occur in the Searsport area. While there is potential for a damaging earthquake to occur anywhere in Maine, the potential is very small. Well designed and constructed structures should endure the probable intensity of seismic activity in the Searsport area with negligible damage."* Both USCG regulations (33 CFR 127 Subpart C) and US EPA regulations (40 CFR 68 Subpart C) require engineering practices to address seismic conditions at an LPG facility. In its April 9, 2012 Letter of Recommendation, the USCG confirmed that the existing terminal pier has been certified to meet or exceed seismic design and construction requirements.

10.) Sears Island. The western shore of Sears Island is approximately 1 mile away from the tank site and 2,200' away from the existing terminal pier. As described in other sections of this document (e.g., tidal waters, water quality, vegetated shallows, fish and wildlife, air quality, aesthetics, recreation, etc.) little impact to Sears Island is expected. Existing passive recreational use will continue; existing resources around the island will not be directly or indirectly impacted; and although the view may change with the addition of the LPG tank, the effect will be minor in comparison to the existing industrialized view shed of Mack Point that already exists. Refer to

Section 6.f relative to the Sears Island Causeway comments.

11.) Traffic. The applicant projects a maximum of 50-60 LPG trucks per day will operate in and out of the site during peak heating season, when tourist and other traffic on Route 1 is at its lowest. When tourist traffic is at its highest, up to 12-15 trucks per day are expected. These increased volumes are conservative, recognizing that at least a portion of the new trucks will displace LPG trucks that currently operate in the area from the applicant's Hermon, Maine distribution site. Traffic data compiled by the Maine Dept. of Transportation ("Maine DOT") estimates the annual average daily traffic volume on Route 1 near the terminal site in 2010 at approximately 10,500 vehicles per day, over 800 of which were commercial truck traffic with more than two axles. The increase of approximately 50 trucks per day utilizing this portion of Route 1 during the winter will represent less than five one-thousands of the total daily traffic and approximately six percent of the daily truck traffic. Propane vehicles will follow the same general traffic patterns as existing truck and other traffic in the area, including propane vehicles. Employee vehicles (12-15) are an inconsequential addition to the traffic mix. The applicant does not propose to increase the size of his existing truck fleet. The effect of the additional truck traffic from the project is expected to be minimal (this includes noise and air quality effects – Refer to Section 7.d. 1 & 2). Maine DOT approved the project on June 9, 2011 and has provided follow up email comments to confirm that the access point on Route 1 meets their safe access standards; that the LPG trucks will have no more impact on the roadway than existing truck traffic; and that congestion levels are unlikely to be impacted. The Corps recognizes the Maine DOT's expertise and authority in this matter.

In response to the concern about increased rail traffic, the applicant confirmed that future distribution of propane by rail from Searsport will represent a potential increase in rail traffic entering and leaving Mack Point, but will not require an increase in rail infrastructure other than DCP's rail siding on Mack Point. Approximately 2,500 rail cars move in and out of Mack Point per year (up to 10-15 at a time). DCP projects that a maximum of 600 additional rail cars per year will accommodate their distribution (up to 4 at a time; 8 in a day). The amount of existing rail traffic at Mack Point exceeds by a considerable margin that which would be added by DCP. The existing rail line exits Mack Point adjacent to Route 1 but never actually crosses Route 1 until reaching Sandy Point, approximately 6 miles to the northeast. The line turns away from Route 1 at Mack Point and continues to run close to the shore, intersecting only secondary roads or unimproved access roads at well established crossing points. No adverse impact to existing rail traffic or vehicular traffic is expected from the minor increased use by DCP. It is unlikely that anyone delayed by a train at a crossing will detect a difference in the number or type of rail cars or the length of the delay.

12.) Security. In addition to navigation safety, the Coast Guard also focused on maritime security during their comprehensive evaluation of the intended transit route and Mack Point cargo transfer area. As indicated in his Letter of Recommendation ("LOR") dated April 9, 2012, the USCG Captain of the Port, Sector Northern New England recommended to the Corps that the Penobscot Bay Waterway be considered suitable for LPG marine traffic in the type and frequency associated with the proposed DCP terminal. The Corps concurs with the USCG assessment and recognizes them as a subject matter expert in maritime security issues. The USCG LOR is appended to this environmental assessment.

i.) LPG vessels in transit. In making the above determination, the Coast Guard considered information and data contained in the applicant's Letter of Intent ("LOI") and Waterway Suitability Assessment ("WSA"), and related input from regional stakeholders. The WSA is an applicant-prepared risk-based assessment, intended to document and address all safety and security concerns related to the marine transportation of LPG as per the requirements of 33 CFR Part 127. Additionally, the Coast Guard applied select portions of policy guidance contained in Navigation and Vessel Inspection Circular ("NVIC") 01-2011[3]. Although NVIC 01-2011 is intended for proposed Liquefied Natural Gas ("LNG") facilities, it also contains process information, guidance, and risk assessment methodologies that the Captain of the Port deemed equally applicable to liquefied hazardous gas ('LHG"), such as LPG.

As outlined in Coast Guard regulations, the WSA covered the entire transit route, from sea to the proposed terminal site, and encompassed factors such as the hydrodynamics of the waterway (tides, currents, etc), density of deep-draft vessel traffic, recreational boating, commercial fishing, aids to navigation, shoreline residential demographics, climatic weather (winds, fog, snow squalls, etc), identification of environmentally sensitive areas and critical industrial infrastructure, detection of hazards to navigation (shoaling, ledges, etc), and the availability of response assets along the transit route. Regional stakeholder input was provided by an LPG Working Group consisting of representatives from the Penobscot Bay Pilots, the Maine Port Authority, Town of Searsport officials (fire and police departments and harbormaster), the Maine Marine Patrol and Department of Marine Resources, the Maine State Ferry Service, the Maine Windjammer Association, abutting waterfront business owners and residents, commercial fishermen, lobstermen's associations, the marine towing industry, county emergency management officials, the Maine DEP, local interest groups, the Corps, and recreational boaters.

The Coast Guard evaluated all aspects of the transit route to and from the proposed import terminal and storage facility. The Recommended Vessel Routes[4] depicted on Figure 1, Page 15 are long established and are actively and safely transited by deep draft ships of approximately the same dimensional size and draft as the proposed LPG carriers. Tank ships and tug-barge combinations routinely traversing these waters carry a variety of liquid cargoes to include home heating oil and other petroleum products, while freight ships transport dry bulk commodities that include coal, road salt, gypsum, and coke. In 2010, over 175 commercial deep draft vessels transited the bay, 136 of which called on the two terminal piers located at Mack Point. The Coast Guard determined that the existing infrastructure and hydrographic characteristics of the waterway suitably support the current volume of tankers and bulk ships plying the waterway enroute to Mack Point and beyond, and that an additional six to eight LPG vessels per year would not alter the waterway's capacity. That said, they also acknowledged that the introduction of LPG carriers to the waterway represents a higher level of risk, necessitating the consideration of additional safeguards and risk reduction strategies and mitigation measures. USCG's recommended safety and security risk mitigation measures include:

- The development of a Transit Management Plan ("TMP") in consultation with the Coast Guard, Penobscot Bay Pilots, Maine Port Authority, area stakeholders, and

[3] NVIC 01-2011 may be accessed on line at http://www.uscg.mil/hq/cg5/nvic/pdf/2011/NVIC%2001-2011%20Final.pdf

[4] National Oceanic and Atmospheric Administration; *United States Coast Pilot 1*; 2009.

other agencies that clearly outlines the roles, responsibilities, and specific procedures for the LPG carrier, the LPG terminal, and all federal, state, and local stakeholders

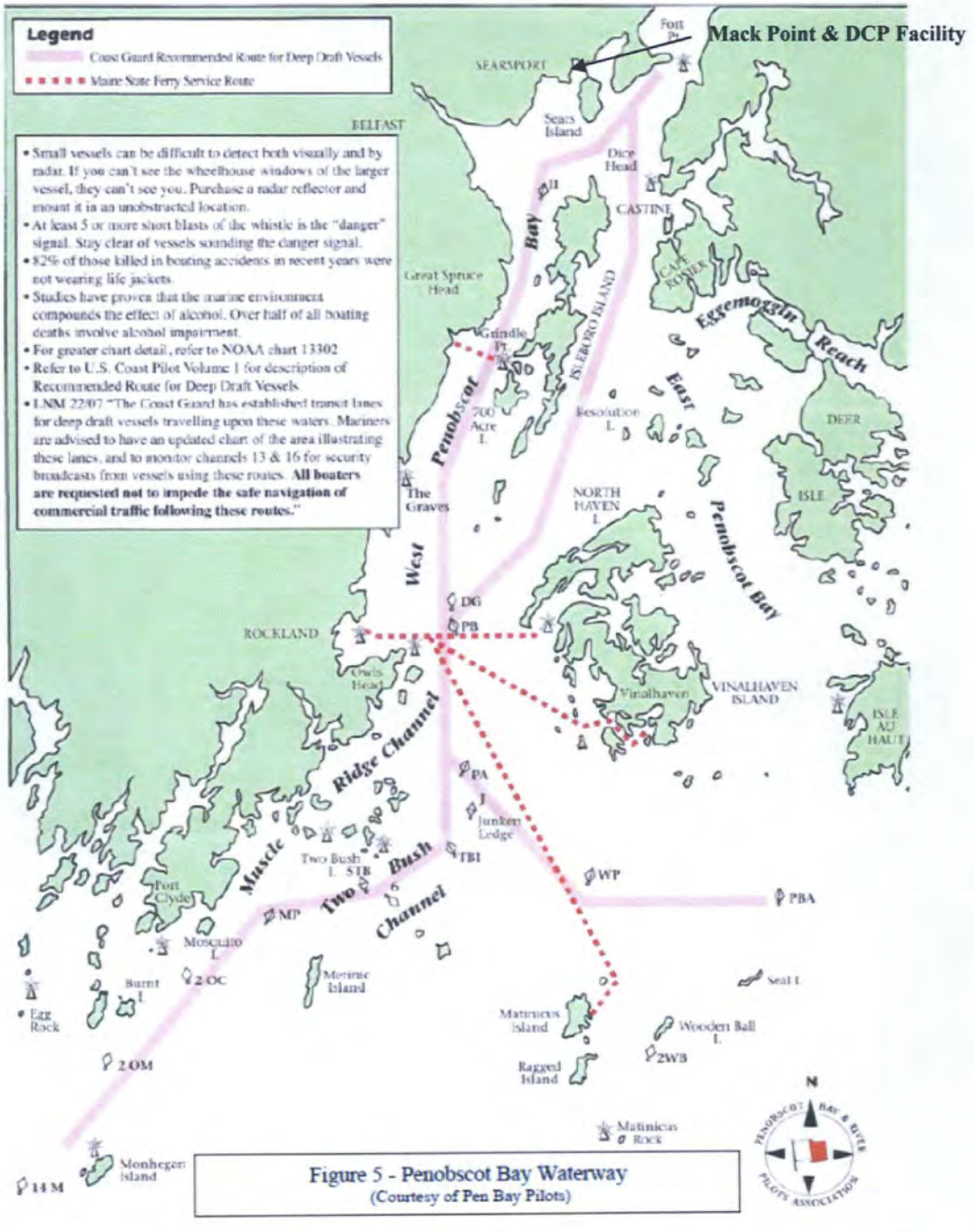

Figure 5 - Penobscot Bay Waterway
(Courtesy of Pen Bay Pilots)

Figure 1 (Penobscot Bay Transit Routes – Source USCG LOR; April 9, 2012)

with responsibilities related to the proposed project and/or whose jurisdiction may reasonably be expected to be impacted by a potential navigation safety accident or terrorist attack. The TMP should be comprehensive and address at a minimum, tug operations, and safe operating parameters and environmental constraints.

- The development and implementation of navigation safety upgrades and enhancements such as improved communications interoperability, placement of data buoys, and installation of private aids to navigation.

- The implementation of full mission bridge simulator training for those pilots providing services to LPG carriers to include expanded training with the intended tug fleet.

- The preparation of an Operations Manual, as required by 33 CFR § 127.305, an Emergency Manual, as required by 33 CFR § 127.307, and a Facility Security Plan as required by 33 CFR § 105.120.

- The implementation of periodic threat assessments, at the discretion of the Coast Guard, in order to ensure that in-place security measures are adequate and appropriate.

- The submission to the Coast Guard, prior to terminal operations, the intended LPG carrier(s)' nation of registry; the nationality or citizenship of the serving officers on board the intended LPG carriers; and the nationality or citizenship of the crew members serving on board the intended LPG carriers.

- The implementation of an annual review of the WSA with any updates provided to the Coast Guard.

- The implementation of an education program directed at personnel residing or working along the transit route that outlines the steps the applicant and local emergency response organizations may take and what the public can do to contribute to their own safety if an LPG release should occur.

- The implementation of an education program intended for the general public that encourages increased vigilance and outlines the steps to follow to report suspicious behavior concerning maritime activities along or near the transit route.

The Coast Guard notes that the above measures are *recommended* tools intended to enhance maritime safety and security and manage competing waterway priorities; they are not intended as specific conditions of their LOR to the Corps. The Corps notes that most of these measures are beyond this agency's ability to enforce, particularly in light of the limited jurisdiction we have in this matter. We have, however, conditioned our permit to require the applicant to develop a comprehensive transit management plan in consultation with the Coast Guard. In a letter dated April 18, 2012, the applicant expressed a clear commitment to fully implement all of the above mentioned measures, and the USCG will participate in these efforts. Notwithstanding the

applicant's cooperation, the USCG has independent and organic authority to impose these measures on a case-by-case basis or through rulemaking where determined to be necessary. In fact, the Coast Guard notes in their LOR that pursuant to their authority under the Ports and Waterways Safety Act of 1972 (33 U.S.C § 1221 et.seq.) and other authorities, they will continue to assess the waterway and port area to determine those safety and security measures necessary to safeguard vessel traffic, the public's health and welfare, regional infrastructure, and the marine environment. To the extent that the recommendations set forth in the LOR are not implemented appropriately, or there are additional measures determined to be needed based on changed circumstances, the USCG retains ample authority to address such concerns.

The WSA includes both a safety risk assessment and a security risk assessment. Safety risks associated with an *accidental* release of LPG from a carrier are included in the discussion of Safety in Section 7.q. of this document. The security risk assessment evaluated the risks of an *intentional* release of LPG consequent to internal subversive acts like sabotage, and/or terrorist-related attacks using improvised incendiary or explosive devices, underwater mines, divers, planes, etc, which would cause and/or result in substantial release of LPG from transiting or moored carriers. The WSA documented the security risk assessment consistent with the Security Vulnerability Assessment methodology as recommended by the American Petroleum Institute and the National Petrochemical & Refiners Association, using the guidance set forth in NVIC 01-2011, and took into consideration historical data and informational exchanges with area stakeholders. The assessment explored threat, vulnerability, and consequence. The probability of an incident was evaluated in terms of threat and vulnerability, where threat was considered as the likelihood of an attack, and vulnerability as being the likelihood that such an attack could succeed. The WSA concluded that the threat of intentional interference is relatively low based on past and existing deep-draft vessel activity, the relative remoteness of the area, the substantial width and relative depth of the transit route, comparative absence of national iconic and/or critical infrastructure, and low population densities. The Coast Guard concurs with this assessment and has made findings relative to targets, general threat analysis, security vulnerability assessment, and attack modes. Information in support of their findings is designated as Sensitive Security Information ('SSI") and as such, controlled under the provisions of 49 CFR Parts 15 and 1520.

As indicated in the WSA, the implementation of safety and/or security zones around transiting or moored LNG and LPG carriers is a control mechanism employed by the Coast Guard whenever a need dictates their use. While safety and security zones certainly serve important functions, they have also been a source of local concern. A common misconception among fishermen and other boating interests was that security zones would completely close all navigation whenever LPG vessels were transiting, in effect drastically curtailing navigation and fishing. In his LOR, the Captain of the Port differentiated between 'safety zones' and 'security zones'. A Safety Zone[5] is a water area, shore area, or combination of both to which, for safety and/or environmental protection purposes, access is limited to persons, vehicles, or objects specifically authorized by the Captain of the Port or USCG District Commander. Security Zones[6] are designated areas of land, water, or combination of land and water, established for such time as necessary to prevent damage or injury to any vessel or waterfront facility; to safeguard ports, harbors, or waters of the United States; or to secure the obligations of the United States. Security zones are primarily used for

[5] Coast Guard regulations applicable to safety and security zones are promulgated in 33 CFR Part 165.
[6] Security Zones are also established under Coast Guard authority pursuant to 50 U.S.C §191 and 33 CFR 6.04-6.

national security interests rather than strictly for safety considerations; however, due to the heightened security posture consequent to 9/11, combinations of safety and security zones are often employed when the need dictates. The Coast Guard notes that there is no federal mandate that specifies that a safety and/or security zone must be established; rather, it is risk and circumstance specific. The Coast Guard has not recommended the establishment of either security or safety zones at this time, but based on the additional analysis and consultation that the LOR has directed, if, after further study, the Captain of the Port decides to employ and enforce moving safety/security zones around LPG carriers as they transit to/from the proposed terminal site, specific boundary limits will be applied. Should such zones be established, the Coast Guard believes there should be ample room for boaters to still freely navigate the waterway along the outer periphery of the channel, and ahead/astern of the carriers. If established, the zone(s) will likely move with the vessel, with an average time for the zone to pass any given point corresponding to approximately 18 minutes, assuming a transit speed of 10 knots. While the zones could cause slight delays and/or interferences or inconveniences, proper voyage planning and attention to advance 'Broadcast Notices to Mariners' should help alleviate potential impositions to other boating interests.

ii.) LPG Terminal. Generally speaking, the tank facility has a lower threat risk than the LPG carriers, threat in this case equating to vulnerability. Tangible security measures planned for the facility complex include but are not limited to perimeter fencing, security barriers, video surveillance, lighting, gated and controlled access, and personnel on site 24/7. Maritime security of the proposed terminal falls under the Maritime Transportation Safety Act of 2002 ("MTSA"), a comprehensive framework for the security of vessels, ports, and facilities located on or adjacent to U.S. waters. MTSA is implemented by the Coast Guard under the Department of Homeland Security ("DHS"). Under Coast Guard regulations, specifically 33 CFR Subchapter H, covered facilities are required to prepare and implement security measures for deterring transportation security incidents to the maximum extent practicable, and to operate in accordance with a threat-scalable facility security plan ("FSP") approved by the Coast Guard. This plan will address the security risks identified in a MTSA facility security assessment.

The DCP facility must also comply with the MTSA Transportation Worker Identification Credentials ("TWIC") program administered by the Transportation Security Administration ("TSA") and enforced by the Coast Guard. Under the TWIC program, individuals who require unescorted access to secure areas of the facility must obtain and present a TWIC card before access is granted. Workers applying for a TWIC must provide certain personal information and fingerprints to TSA so that TSA can conduct a security threat assessment, which includes an FBI investigation fingerprint-based criminal history records check

In addition to MTSA, the facility will develop and implement a security plan in accordance with the Department of Transportation Hazardous Materials Transportation Security Requirements. The plan will include an assessment of possible transportation risks and appropriate measures to address the assessed risks including personnel security, measures to ensure that unauthorized persons do not gain access to hazardous materials, and enroute security.

Lastly, DCP must comply with applicable security requirements contained in TSA's Rail Transportation Security Rule. This rule requires shippers, receivers, and carriers of hazardous materials to implement chain of custody requirements, create a rail security coordinator, be

equipped to report the position of hazardous materials, and report significant security concerns to TSA.

13.) Navigation/Recreation. Refer to Sections 7.k & m.

14.) Property values. The applicant has provided information about the various factors that may affect property values in addition to industrial development. These include the physical condition, functionality, location, availability, and surroundings of a building or parcel of land, and the local economy and zoning. Future property values cannot be predicted because all of these factors play a role such that positive influences in one or more factor could negate or have more of an effect on those that may be negative influences. It is difficult to predict how property values will be affected by the presence and operation of the LPG facility. Land owners that take exception to the presence of the facility because of perceived safety or quality of life concerns may choose to sell their property. Other landowners may choose to stay. The market will determine resale value if anyone chooses to sell. Searsport, as a coastal community, generally has higher property values than inland communities, this despite the long standing presence of the Mack Point and Kidder Point industrial complexes. The presence of such commercial operations in a community can affect the local property tax base, thereby reducing tax rates for the property owners, which can make such communities attractive to potential buyers. There are examples throughout the State of Maine where residential and small business owners have either moved into areas adjacent to industrial sites, such as paper mills, sewer treatment plants, quarries, power plants, landfills, a former nuclear power plant, and petroleum facilities, or learned to co-exist. The applicant has cited examples of people purchasing homes immediately adjacent to their existing facilities after they were built. Here, with the proposed LPG facility being cited adjacent to existing similar industrial facilities, it is unlikely that there will be substantial effects on real estate property values in Searsport or the region.

The applicant has reported that in response to questions raised by area residents, the Searsport Planning Board has approved an amendment to the local Site Plan Review Ordinance which added a performance standard to the local review process specifically addressing property values. DCP supported this property value amendment and has stated it will address any specific concerns about local property values in the context of the local permit application review process. As enacted, the ordinance provides that the DCP project cannot have an "unreasonable adverse effect" on property values. The ordinance also provides that in evaluating whether there is an "unreasonable" impact, the Planning Board must take into account the "economic, social and environmental costs and benefits" of the project. Further, the ordinance places the burden on the property owner to show that the project will unreasonably impact property values. With regard to process, a property owner would need to provide either their own testimony (by "clear and convincing evidence") or an appraisal that showed the anticipated reduction in property value that is attributable to the project. The ordinance expressly permits the applicant to rebut this testimony or appraisal with other evidence. The ordinance does not expressly contemplate any payments to property owners, but instead the Planning Board could deny a permit for the project upon finding an unreasonable adverse effect (as it would need to do if DCP failed to meet any of the other applicable performance standards). The Corps recognizes the town's authority to address this issue.

15.) Need. Refer to Section 6.f.

16.) Industrialization. Mack Point has been extensively developed for various commercial uses since the early 1900's and currently has the largest deep draft commercial cargo port in Maine north of Portland (Refer to Figure 2, below). Commercial facilities currently include a dry cargo pier and an oil terminal pier, upland tank farms, coal and salt storage facilities, areas for other bulk cargo, and a rail terminal for cargo. The piers at Mack Point accommodate vessel shipments of petroleum products, aggregates, forest products and bulk cargos. Sprague Energy and Irving Oil are the current operators of the petroleum terminals and tank farm facilities at Mack Point. Industrial/commercial build out of Mack Point conforms to local zoning and comprehensive planning. For years federal and state resource agencies, environmental groups, and many area citizens favored build out of Mack Point over the Maine DOT's proposal to develop a port facility on Sears Island. Toward that end, a 45 plus member steering committee of various interest groups published a Consensus Agreement in 2007 that gave preference to the build out of Mack Point. The Corps finds that the proposal meets the intent of past and present focus on Mack Point as an industrial growth site.

Figure 2 (Mack Point Facility; Source - Maine Port Authority)

17.) General Environmental Impact. In response to recommendations that the Corps conduct an Environmental Impact Statement ("EIS"), the Corps references Section 11.c. of this document.

18.) Scope of Environmental Review. In response to the recommendation that the Corps should consider the entire facility in its NEPA review, not just the filling of wetlands, the Corps concurs and references Section 3.a. of this document. This document's analysis will encompass the entire development, including the tank site, all associated infrastructure, and the pipeline corridor out to the pier.

19.) Compliance. Refer to Section 6.f.

5. Alternatives Analysis.

a. Comparison of off-site locations. DCP has indicated that a major goal for the project is to utilize an existing deepwater cargo pier to avoid the environmental impacts and costs that would accompany the development of a new deepwater pier. In addition, the waterway should be currently in use for similar bulk cargo shipping, and present minimal or no safety or security issues with regard to its suitability for LPG cargo vessels. The pier and its approach must have a minimum water depth of 35 feet at low tide, be of sufficient size and construction to handle vessels up to approximately 800 feet long and 38,000 metric tons, and be compliant with current security and seismic standards administered by the U.S. Coast Guard. The terminal site needs good access to major highways and to rail service to allow DCP to serve customers in Maine, with a mid-coast Maine location preferred. Additionally, to be consistent with local development goals, DCP asserts the site should be suitably zoned for industrial development and, preferably, existing land use in the area should be consistent and compatible with DCP's proposed terminal.

Maine has three existing seaports that are well suited to handle the requirements of international cargo vessels: Searsport, Portland and Eastport. Additional cargo ports are located at Brewer, Bucksport and Rockland. DCP evaluated these existing cargo port locations as discussed below.

1.) Portland. Portland Harbor has several existing piers on the South Portland side and the Intermodal Cargo Pier in Portland, all with sufficient water depths at all tides that could accommodate LPG cargo vessels. However, there is very little undeveloped land in South Portland that is available to accommodate a tank facility and none on the Portland side. Any available parcels on the South Portland side are not served by rail. There is no nearby access to rail on the Portland side. Portland Harbor is Maine's busiest commercial harbor, and also receives extensive recreational use, all within a confined channel. Shipping traffic headed for the inner harbor piers is further confined by the obstruction to navigation presented by the Casco Bay Bridge (a drawbridge). Portland Harbor is centrally located between the cities of Portland and South Portland, with combined populations of approximately 89,500 people and a larger metropolitan area containing approximately 230,000 people. Densely populated areas occur immediately adjacent to or near the piers, all of which escalates safety/security/navigation concerns. In order to access the highway system, LPG distribution trucks would have to utilize congested city streets.

No available or practicable locations in Portland were identified that could accommodate an LPG tank and terminal facility with adequate access to both highways and rail. In addition, Portland presents greater potential public interest issues in the form of safety and security concerns based on the magnitude of commercial and recreational uses within confined waterways and population densities along waterways, and potentially greater traffic impacts as a result of existing roadway congestion.

2.) Eastport. The Port of Eastport has two main piers: the Estes Head Terminal and the downtown pier. There are no obstructions to navigation in the region and it is located in a low density population area. Only the Estes Head Cargo Terminal can accommodate an ocean going LPG vessel. The downtown pier, constructed as a breakwater by the Corps and eventually de-authorized and turned over to the town, is structurally unsuitable to accommodate large cargo vessels. The Industrial-zoned portion of Estes Head covers an area of approximately 25 acres and currently contains a large warehouse that presents a substantial constraint to the land area required to site the footprint of the DCP tank. Although access to the highway system from Estes Head is good, there is no rail access. Rail lines were long ago removed from the region and their corridors have become highly used recreational trails. Eastport is located in extreme eastern Maine, far from the major propane markets in Maine's metropolitan areas for vessels transporting LPG.

Eastport doesn't meet the project purpose because only one terminal can accommodate ocean going LPG vessels, and the land area of that terminal is not of sufficient size for the construction of an LPG tank facility. In addition, Eastport is not logistically or economically practicable because of its distance from major propane markets and the lack of rail service. The extreme tidal fluctuations and strong currents in the Bay of Fundy, while not prohibitive to safe navigation, present some additional risk.

3.) Bucksport. The only marine cargo terminal in Bucksport is the Webber Dock on the Penobscot River. It can accommodate vessels up to 700 feet in length. Draft is limited to 35 feet at high tide (brackish water allowance). Due to the tidal cycle and current effects, all vessels calling on Bucksport usually dock within one hour of high or low water slack. A USCG draft limitation of 28 feet is in effect for vessels berthing at low water. Obstructions for transit to Bucksport include two bridges (located below Bucksport) with a vertical clearance of 135 feet. Due to this vertical obstruction, vessels over 10,000 tons are restricted to daylight transits only.

Bucksport is not a practicable alternative because it cannot accommodate LPG vessels which range up to 800 feet in length, and does not provide a minimum water depth of 35 feet at low tide within the berth. In addition, bridges of *en route* waterways limit arrivals and departures to daylight transits, which would further limit the practicability of locating an LPG terminal in Bucksport.

4.) Brewer and Rockland. Brewer's commercial traffic consists of small coastal passenger vessels during the summer and fall seasons, and barges used by Cianbro Corporation to ship its refinery modules built in Brewer to the refinery in Texas. Rockland is a mixed use fishing, seafood processing, recreational boating, and service center. It is also the terminus for ferry service to North Haven, Vinalhaven, and Matinicus islands. There is no existing pier at either location that could accommodate a LPG vessel. The draft limitation is 14 feet, and a vertical obstruction by the Veterans Memorial Bridge (Brewer) is at 74 feet.

Brewer and Rockland are not practicable alternatives because they cannot accommodate LPG vessels which range up to 800 feet in length, and do not provide a minimum water depth of 35 feet at low tide. Rockland Harbor is also very congested with insufficient maneuvering room for these large vessels. There are no existing terminal piers and to construct one, with any associated dredging, would be economically impracticable.

5.) Sears Island. Sears Island, also located in Searsport and proposed for years by the Maine Dept. of Transportation ("Maine DOT") as a site for a new port facility, was considered briefly by the applicant but was rejected quickly as being economically and logistically impracticable, more environmentally damaging, and contrary to the public interest. After years of environmental review and court challenges, Maine DOT initiated construction of a new port facility on Sears Island in the mid to late 1980s. A causeway and access road to the island was built, dredging was completed, some site work was begun, and filling for a pier was begun. Work was stopped and plans for a facility were abandoned in the face of further legal challenges, economic challenges, and pressure from environmental groups. Sears Island is now largely preserved in perpetuity and used for passive recreation. Although Maine DOT has retained its development rights to a potential future port facility on a portion of the island, for DCP to use the site they would need to negotiate a purchase or long-term lease from DOT, construct a new terminal pier, perhaps conduct new and/or maintenance dredging, construct a tank facility, and perhaps eventually bring rail to the site. This is not economically practicable. Development of a portion of the former port site would likely impact wetlands and vernal pools of far greater value than the wetlands on the Mack Point site. Finally, development of the DCP project at Sears Island would run contrary to the current passive recreational use of the island and a 2007 Consensus Agreement that directs port development growth to Mack Point and away from Sears Island. This Consensus Agreement was developed by a 45-plus member Steering Committee representing a variety of interests.

6.) No other alternative locations besides Mack Point were identified that could potentially meet the primary requirements that the proposed facility utilize an existing, appropriately sized and constructed cargo pier with adequate water depths and sufficient, available, industrially-zoned land with highway and rail access. Construction of a new deepwater cargo pier capable of accommodating LPG vessels is economically impracticable and likely more environmentally damaging than utilizing an existing pier. Maine DOT estimates the 2002 reconstruction of the Mack Point cargo pier cost $16 million. Most of this was voter approved state bond money. Costs today would be substantially higher, particularly for a private company. A subset of the overall cost to DOT was the cost of maintenance and improvement dredging *of a previously dredged berth.* No access dredging was required because of the presence of a Corps maintained federal channel. Establishing a new channel and berth for a site where there is not already deepwater access would substantially increase the scope and impact of any alternative. For example, the Corps has just been awarded funding to perform maintenance dredging of Portland Harbor. Portland Harbor supports an authorized federal channel that is 35' deep and tapers down from 1000' wide at its entrance to 300' wide at its terminus. Maintenance dredging of this *established and previously dredged* channel has been funded for $13 million. Costs for a new channel would likely be substantially much higher. It is unrealistic to think that a private company could fund this level of dredging and port development as part of an economically viable LPG facility, particularly since propane is but one relatively small share of Maine's energy mix (compared to other states with higher propane use). Furthermore, improvement dredging projects,

like what would be necessary at Rockland, Brewer, Bucksport, or some new site, are strongly discouraged by the Maine DMR and Maine DEP because of their higher environmental impact.

The applicant was questioned whether smaller sized LPG vessels might open up a broader range of off-site locations to consider. VLGC, which stands for very large gas carrier, is the acronym for the size ship used by LPG suppliers and is the standard vessel servicing the applicant's Rhode Island and Virginia marine terminals. It is also the same size vessel servicing the Sea-3 LPG facility at Portsmouth, NH although those vessels are restricted slightly due to the bridge opening on the Sarah Long bridge over the Piscataqua River. This vessel is chosen by the supplier of the propane and it is the smallest tanker available for long range transatlantic crossings. The vessel dimensions are normally in the 575' long by 175' wide range and require approximately 33-36 feet of water under keel at mean low water to operate. Smaller ships are unable to safely cross the Atlantic and are therefore not practicable. The applicant's alternatives analysis repeatedly refers to vessels of up to 800' in length which is not uncommon. Even at the more typical 575' length, the alternative port locations are not practicable and no other previously unconsidered sites were identified.

b. **On-site configurations.** DCP evaluated four categories of alternatives to the proposed on-site configuration: the use of alternative or additional locations for the terminal on Mack Point, reducing the size of the tank facility, alternatives to the proposed tank facility layout, and alternative routes for the transfer pipeline.

1.) Alternative Locations on Mack Point. The DCP application indicates approximately 20 acres of land are required for permanent development and operation of the proposed terminal facility, excluding any surrounding land area to serve as visual or other buffers to adjacent land uses. In a booklet entitled: *Port of Searsport, Maine USA: Access to Global Opportunity,* published by the Maine Port Authority, 70 acres are identified on Mack Point for future development (refer also to Figure 2, Page 20). Excluding the area to be developed by DCP, only 16 acres of available undeveloped land remain within the 70 acres identified on Mack Point on land to the south of Station Avenue. An additional six acres remains undeveloped, but is located within the Sprague Energy fence line. The 16 acres of undeveloped land also contain wetlands. The aquatic resource impacts on the 16 acre parcel would likely be equivalent to if not greater than the aquatic resource impacts from construction on the applicant's preferred location, because on the 16 acre parcel the wetlands are not confined to narrow drainages. Furthermore, construction of a terminal on the 16 acre parcel is precluded by an active railroad spur that dissects the property and which serves both Irving Oil and Sprague Energy. Relocation of the rail spur owned by the MMAR is not logistically practicable. Another potential constraint to development is an overhead utility line from Station Avenue leading to the Irving Oil terminal. Finally, the 16 acre parcel does not provide sufficient area to construct and operate the proposed facility while meeting required safety, security, and containment requirements.

The applicant has also identified an approximately 15-acre parcel of land on the north side of Trundy Road that is zoned by the Town of Searsport for industrial use, but was not included in the area identified for future development by the Port Authority. No information is available regarding the presence of wetlands on this parcel; however, the applicant indicates that it, also, is too small for the proposed facility.

The existing tank farms on Mack Point were considered for siting options. The tanks at the Sprague and Irving facilities could not be retrofitted to store cryogenic propane. The steel is not designed for the cold internal temperatures, nor do the existing foundations meet the required engineering standards that would be necessary for a cryogenic storage tank.

Neither Sprague nor Irving is willing to diminish their business by tearing down part of their existing facilities, which they are using, to accommodate a new cryogenic tank when there is adequate vacant land in the Mack Point Industrial Zone. Sprague is selling the applicant the land to build the proposed facility on. Due to their business interests they are unwilling to sell/lease the other parcel of vacant land even if it were large enough to accommodate the applicant's needs, which it is not.

Constructing the DCP terminal at another location at Mack Point is not an available or practicable alternative because current landowners are unwilling or unable to sell property and other undeveloped parcels at Mack Point provide insufficient space for the terminal.

2.) Reducing the Size of the Proposed Terminal. The applicant states that the economic viability of the project is dependent on its ability to accept the full cargo (approximately 33,000 metric tons or approximately 410,000 barrels) of liquid propane carried by today's marine cargo vessels equipped to transport LPG at approximately -40 °F. As a result, the terminal's bulk storage capacity must meet or exceed this volume with additional room for safe, efficient storage tank operation. A smaller tank is not considered logistically or economically practicable. The "typical" capacity of the current fleet of transatlantic LPG transport vessels is approximately 16 million gallons. The 22.7 million gallon tank allows the applicant to maintain approximately 6 million gallons in the tank and safely unload the "typical" size ship. Ideally, the applicant would want even more room in the tank to accommodate a full delivery but 6 million gallons provides about a two week reserve supply in the event that extreme weather (a greater concern for deliveries to Searsport in the winter months when demand will be greatest) or other factors delay a delivery ship.

A smaller tank would necessitate reducing the available reserve supply. Based on the applicant's experience with delivery ship logistics, this represents a risky proposition, one which would require scheduling more frequent partial deliveries. Such deliveries would result in product at a much more costly rate because the applicant has the same fixed costs for the vessel with less saleable product to offset those costs. There are only so many LPG ships available and the applicant must compete with others for deliveries throughout the world. More frequent partial deliveries would create serious scheduling issues thereby reducing the reliability of supply and defeating the purpose of the project. Finally, the only way that is economically and operationally practicable to bring in multiple smaller loads would be to off load part of the product at Searsport and the remainder at another facility operated by DCP or others. There are times when this will work, but it is the exception not the rule, and typically only happens when the demand exceeds what was predicted during the previous spring's orders or when some emergency shortage exists (e.g. a severe winter heating season). The tank has been sized to make efficient use of the deliveries from the class of ships that transport LPG, and failure to do so will potentially drive up the cost of product for the consumer, or risk shortfalls during the critical winter months. The applicant also considered two smaller tanks on the site instead of one large tank. Two smaller tanks of comparable capacity that would meet applicable codes and specifications would increase the impact to aquatic resources and virtually eliminate all buffers to the facility. This is considered more

environmentally damaging and contrary to the public interest.

Most other parameters affecting the land area required for the facility result from the amount of bulk storage required; namely, the size of the containment area that is required, the setback requirements to property lines, and separation distances between various components at the facility (e.g., between combustion sources and propane storage vessels). In addition, other facility safety/security requirements must be met, such as the location of fencing and its setback from property lines, as well as providing adequate parking area and turning radii for transport trucks so they are not parked along the sides of public roads while waiting to be loaded.

The applicant states that extensive evaluation of design options and constraints was necessary to fit the terminal on the amount of contiguous land available at Mack Point. This is supported by drawings provided by the applicant demonstrating the relatively tight configuration of the terminal within the project boundaries. Reducing the storage capacity of the proposed tank will make the project economically infeasible as a marine import facility for LPG.

3.) Alternative Tank Facility Layouts. The proposed layout of the terminal was the result of evaluation of many alternative design options within the land area constraints at Mack Point. The applicant has sufficiently demonstrated to the Corps that there are no alternative layouts on the site that would result in a reduction of impacts to jurisdictional waters. Furthermore, in response to public comments requesting an evaluation of two smaller bulk storage tanks rather than the proposed single tank, the applicant has demonstrated that a two tank layout would require more land than is available on the site, and that the additional costs associated with constructing and operating two separate tanks would be economically impracticable. The proposed terminal layout reflects the applicant's efforts to minimize impacts:

i.) Location of the entrance drive on Station Avenue allows for the avoidance of anticipated impacts, such as filling wetlands and culverting 210 feet of stream.

ii.) Location of the exit drive on Route 1 results in lower wetland impacts than locating both the facility entrance and exit on Station Avenue, and also provides some additional visual screening by retaining more of the trees located at the corner of the property;

iii.) Separation of the entrance and exit drives between Station Avenue and Route 1 allows for sufficient land area at the facility entrance drive to ensure that trucks waiting to be filled will not have a tendency to wait on the shoulder of Route 1, which may have been the case if the plant entrance were located alongside the exit as originally planned;

iv.) Separation of the entrance and exit drives between Station Avenue and Route 1 provides additional land area to allow other terminal components to be moved and thereby increase setbacks from parcel boundaries, thereby improving overall facility safety and security and providing larger buffer areas between project components and adjacent property uses; and

v.) Separation of the entrance and exit drives between Station Avenue and Route 1 provides improved traffic circulation.

Reducing the footprint of the terminal or the use of alternative layouts for terminal components is not practicable given the conflict between available land area and operational, safety and security requirements.

4.) Alternative Transfer Pipeline Routes. Four potential routes were evaluated for the pipeline that will transfer the LPG from ships docked at the existing Sprague pier to the bulk storage tank at the proposed DCP terminal. The first alternative would locate the pipeline just offshore until adjacent to DCP property. The "offshore route" would result in direct impacts to tidal waters and wetlands. The applicant also considered running the pipeline between the MMAR railroad spur and the shore (along the east side of the existing tracks, the "MMAR route"); however, the MMAR would not agree to this.

Potential pipeline routes further from the shore would cross Sprague Energy's existing operations and, depending on the alignment, the Irving terminal as well. A third pipeline route was proposed as the applicant's preferred route in the application (the "application route") and would cross through both Sprague and Irving's existing facilities. The application route would directly impact approximately 1,675 square feet (approximately 0.04 acre) of forested wetland as a result of construction and operation of the pipeline, and an additional approximately 1,115 square feet (approximately 0.03 acre) of emergent wetland due to required vegetation maintenance adjacent to a short portion of the pipeline. However, based on further discussions with Sprague, a fourth potential route was identified, the "inland route," which is preferable to Sprague and which reduces wetland impacts. DCP has agreed to adopt the inland route, which will avoid the 0.07 acre of wetland impact that would have occurred as a result of use of the route proposed in the application.

The offshore route is more environmentally damaging due to the impacts to tidal waters. The MMAR route is not available. The originally proposed application route through both the Sprague and Irving facilities is not preferred by Sprague and results in greater environmental impacts than the inland route. It would also have greater impact in the shoreland zone.

d. No action alternative. The no-action alternative would avoid the direct and indirect environmental impacts that will be associated with the proposed project, but would not achieve the project purpose. The reliable, stable and cost competitive supply and diversity of fuel options with the attendant air quality and economic benefits described by the applicant would not be realized. Maine's existing propane market would remain at risk to less than a fully reliable propane supply and distribution.

e. Least environmentally damaging practicable alternative ("LEDPA"). Corps guidance (Regulatory Guidance Letter 93-2) states that "the amount of information needed to make [a determination that a project represents the LEDPA] is commensurate with the severity of the environmental impact (as determined by the functions of the aquatic resource and the nature of the proposed activity) and the scope/cost of the project." Based on the limited impacts to aquatic resources that will result from the project, the Corps has determined that the array of potential alternatives considered in support of the DCP application is sufficiently commensurate with aquatic resource impacts. The Corps has concluded, and the federal resource agencies do not disagree, that the proposed location and layout of the terminal along with the inland transfer pipeline route and use of the existing pier represent the LEDPA to accomplish the project's overall purpose.

6. Evaluation of the 404(b)(1) Guidelines (see 40 CFR 230.11 and Subparts C-F). Consider short-term and long-term effects of proposed discharge on physical, chemical, and biological components of the aquatic environment in light of the following:

a. Physical Substrate Determinations [40 CFR 230.11(a)]:

1.) Substrate impacts [Subpart C, Sec. 230.20]. The substrate on the project site consists of soils dominated by glacio-marine and glacio-lacustrine deposits with silty textured surface horizons, and silt loam to silty clay loam subsoils. Bedrock was not encountered during the on-site soil investigations. Human-altered soils were identified in previously disturbed and developed areas such as the existing railroad corridor and Mack Point terminal. Soil survey information is contained in the administrative record. Areas of permanent fill will replace existing topsoil and subsoil with high quality, construction-grade materials.

b. Water Circulation, Fluctuation, and Salinity Determinations [40 CFR 230.11(b)]:

1.) Water column impacts [Subpart C, Sec. 230.22]. Temporary, minor turbidity may occur in waterways and wetlands during construction. This effect is expected to rapidly diminish as portions of the site are permanently stabilized and construction is completed.

2.) Alteration of current patterns and water circulation [Subpart C, Sec. 230.22]. Minor changes in current runoff patterns within the site will result from construction and implementation of the approved stormwater management system, however the prevailing northwest to southwest flow and existing discharge points and runoff volume into Long Cove will remain unchanged.

3.) Alteration of normal water fluctuations/hydroperiod [Subpart C, Sec. 230.24]. See Section 6.b.2).

4.) Salinity gradients [Subpart C, Sec 230.25]. This is not applicable to the on-site work. Long Cove receives untreated runoff from the site presently, including runoff from Route 1. The project has been designed to result in no change in post-construction runoff quantity but quality may improve slightly since it will now be treated.

c. Suspended particulate/turbidity determination [40 CFR 230.11(c)]: Refer to Section 6.b.1).

d. Contaminant Determination [40 CFR 230.11(d)]: No introduction of new contaminants, relocation, or increase in existing contaminant discharge is expected. Only clean, construction-grade fill, concrete materials (*e.g.*, for foundations, pads and culvert headwalls) or existing soils will be used as on-site fill. There will be no on-site disposal of spoil or construction debris. The risk of contaminant discharge during construction will be minimized with the implementation of the applicant's Construction Spill Plan.

The project is not expected to result in new contaminant discharges to Long Cove. LPG carriers will, like other vessels calling at the terminal, be required to comply with all applicable laws, regulations, and requirements restricting the discharge of pollutants and regulating other

aspects of vessel operations, including those administered by the US Coast Guard ("USCG") and the US EPA Vessel General Permit. With respect to LPG offloading operations, the operations will be designed and managed to ensure no discharge into waters of the United States of LPG or other contaminants. Product transfer is controlled by a system of remotely-operated shutdown valves as well as an emergency shutdown system that can be activated either automatically or manually.

The only anticipated post-construction discharge off the site will be treated stormwater. This poses no more threat to aquatic resources in Long Cove than the current site runoff and may actually be a slight improvement. The containment berm for the bulk LPG tank is designed to contain 100 percent of the full capacity of the tank in the unlikely event of loss of tank integrity. DCP will develop and implement a facility-wide Spill Prevention Plan for Operations that includes spill prevention, control and cleanup measures to minimize the risk of contaminant release.

e. Aquatic Ecosystem and Organism Determinations [40 CFR 230.11(e)]:

1.) Effect on threatened/endangered species and their habitat [Subpart D, Sec. 230.30]. See Section 8.a.; Other Laws, Policies & Effects; Endangered Species Act.

2.) Effect on Fish, Crustaceans, Mollusks and other aquatic organisms in the food web [Subpart D, Sec. 230.31]. The small stream and other wetland drainages that flow from the site are isolated from tidal areas by existing hanging culverts under the MMAR spur. As a result, these freshwater resources do not provide fish habitat. The tidal and deep waters of Penobscot Bay are important commercial and recreational fisheries. However, construction of the project will not result in any impacts to tidal waters. The effects from transit by the four to eight ships per year bringing LPG to the existing piers at the Mack Point Terminal will be comparable to any of the approximately 130 to 160 vessels per year that currently utilize the existing facility and does not represent an appreciable increase in existing marine cargo vessel traffic.

The portion of Long Cove that is adjacent to the project site contains a large area of mudflats, most of which have recently been re-opened to shellfish harvesting by the Maine DMR. The proposed construction and operation of the terminal will not affect the quality, size or use of these mudflats. The applicant has no authority to restrict access to these flats, only the Maine DMR can.

3.) Effect on other wildlife (mammals, birds, reptiles and amphibians) [Subpart D, Sec. 230.32]. The project is expected to have no more than minimal impact to wildlife resources. See Section 7.g; Public Interest Review.

f. Potential Impacts on Special Aquatic Sites (Subpart E):

1.) **Sanctuaries and refuges.** Not applicable. There are no federal or state sanctuaries or refuges present in the project area.

2.) **Wetlands.** Wetlands on or adjacent to the DCP site include estuarine inter-tidal wetlands adjacent to Long Cove, palustrine forested wetlands with an associated stream segment, and palustrine scrub-shrub wetlands. Pipeline installation on the existing Sprague pier will take place above the mean high water line; thus no impact will occur to tidal wetlands. Construction and

operation of the on-shore terminal will result in approximately 1.97 acres of unavoidable direct and indirect impacts to freshwater wetlands and an associated stream segment. Approximately 1.96 acres of forested wetland will be permanently impacted by fill or clearing and ongoing vegetation maintenance. Secondary wetland impacts will result from selective tree clearing of approximately 0.01 acre of forested wetland to improve the sight distance for trucks leaving the facility on U.S. Route 1. Approximately 365 feet of stream channel will be routed into approximately 330 feet of culvert passing beneath the truck loading area. The next approximately 670 feet of the stream channel will be routed into a new, stabilized channel for a distance of approximately 650 feet along the site perimeter in order to avoid the containment dike, emergency flare and other essential project elements.

The affected wetland resources have limited functions and values due to the underlying soils, location on a steep gradient, proximity of surrounding existing development, relative small size and lack of connectivity to adjacent resources, wide distribution across the site, and limited use by the public. What values exist for sediment/toxicant/nutrient removal/retention and floodflow alteration will be fully offset by construction and operation of the engineered stormwater management system. Habitat functions will be addressed through compensatory mitigation. Refer to Section 9; Compensation and Other Mitigation Actions.

3. **Mudflats.** See Section 6.e.2).

4.) **Vegetated Shallows.** Available resource mapping indicates eelgrass (*Zostera marina*) in scattered areas within and outside Long Cove. As noted in Sections 6.b. through e., above, there will be no effect on vegetated shallows from construction or operation of the project.

5.) **Coral reefs.** Not applicable. There are no coral reefs present in the project area.

6.) **Riffle and pool complexes.** Not applicable. There are no riffle and pool complexes present on the project site.

g. Human Use Characteristics (Subpart F).

1.) **Effects on municipal and private water supplies.** When completed, the proposed project is anticipated to use 1,000 gallons of water per day. Water will be supplied by the Searsport Water District. The applicant submitted a letter from the District, dated April 7, 2011, indicating that it will be capable of servicing this project. The Corps has received positive comments to that effect from the Searsport Water District.

2.) **Recreational and commercial fisheries impacts.** See Section 6.e.2).

3.) **Effects on water related recreation.** Penobscot Bay is used extensively for recreational activities such as boating and fishing. A visual simulation of the developed site provided by the applicant indicates the proposed facilities are at least partially screened by trees that will remain and is consistent with the current development on Mack Point. Mack Point's industrial and commercial development and the associated large vessel shipping traffic have been highly visible to recreationalists on the water for many years during which recreational use of the Bay has flourished. The four to eight LPG vessels per year that will supply the terminal will use the same

transit routes used by the much greater volume of existing shipping that currently docks at Mack Point, and represents a minimal increase in shipping activity. Recreational use of Searsport Harbor will not be adversely affected. Refer to Sections 7.k and m; Public Interest Review.

4.) **Aesthetic impacts.** See Section 6.g.3), above, and Section 7.c; Public Interest Factors Review; Aesthetics.

5.) **Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.** Not applicable. None of these resources is present within the project area. The closest local resource of this nature is Mosman Park, a municipal park near downtown Searsport approximately 1/3-mile from the project site. Moose Point State Park is the nearest state resource, located approximately three miles from the site. Development of the project will not restrict access to or use of these resources. The potential effect from the visual impact of the terminal on the use or enjoyment of these parks, as well as a number of historic structures in the project vicinity, is addressed in the applicant's visual assessment. No undue adverse effects were found. The Corps, Maine DEP and MHPC concur with these findings (see Section 7 c; Public Interest Review, Aesthetics).

h. Disposal Site Determination [40 CFR 230.11(f)]: Not applicable. No dredging is required.

i. Determination of cumulative effects on aquatic ecosystem [40 CFR 230.11(g)]: See Section 8.d., Cumulative and Secondary Impacts.

j. Determination of secondary effects on aquatic ecosystem [40 CFR 230.11(h)]: See Section 8.d., Cumulative and Secondary Impacts.

k. Restrictions on discharges (230.10).

1.) Are there available, practicable alternatives to the proposed discharge that would have less adverse impact on the aquatic ecosystem, and that do not have other significant adverse environmental consequences? No. See Section 5; Alternatives Analysis.

If the project is in a special aquatic site and is not water dependent, has the applicant clearly demonstrated that there are no practicable alternative sites available? Yes. While the project is water dependent in that it must be located near a suitable pier for receiving international LPG cargo vessels, it does not require access to a special aquatic site. The discharge of fill material into a stream and wetlands in order to construct and operate the propane storage and distribution facilities is not water dependent. As noted above however, the applicant has demonstrated there are no available practicable alternatives.

2.) Will the discharge:

i.) Violate applicable State water quality standards or Section 307 prohibitions or effluent standards? No. State 401 Water Quality certification ("WQC") was issued October 24, 2011.

ii.) Jeopardize the continued existence of federally listed threatened or endangered species or affects their critical habitat? No. See Section 8.a., Other Laws, Policies & Effects; Endangered Species Act.

iii.) Violate the requirements of a federally designated marine sanctuary? No. There is no federally designated marine sanctuary in the project area.

3.) Will the activity cause or contribute to significant degradation of waters of the United States, including adverse effects on human health; life stages of aquatic organisms' ecosystem diversity, productivity and stability; and recreation, esthetic, and economic values? No. State WQC issued October 24, 2011. See also Sections 6.a. through d., e.2), g.3) and k.2) i), and Sections 7.b. and c.

4.) Have appropriate and practicable steps been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem? Yes. See Section 9; Compensation and Other Mitigation Actions.

7. Public interest review factors (33 CFR 320.4(a)(1)).

a. Conservation: The project will not result in the conservation of additional land and it will not result in the use of lands conserved for other purposes. Much of nearby Sears Island has been conserved by the Maine DOT under an Umbrella Mitigation Banking Instrument. Development of the DCP site does not affect the intent of that action.

b. Economics: Direct and indirect economic benefits are expected from construction and operation of the project. The applicant estimates that construction of the project will require approximately 100 construction and trades workers over an 18-month construction period and 12-15 full time employees during operation, in addition to the services of other local workers and businesses to provide building maintenance services and supplies, office supplies, snow plowing, meals, temporary lodging, etc. The annual operating budget for the Searsport terminal is expected to be approximately $3.8 million, much of which will be spent for wages and purchases in Maine.

The applicant retained Charles F. Colgan, PhD, of the University of Southern Maine to conduct an analysis of the economic impact expected from construction and operation of the facility. Dr. Colgan's analysis is contained in the administrative record and concludes, in part: "*As a result of the construction of the project, it is estimated that an average of $5.5 million in additional wages per year will be paid in the Waldo County area .... During the operating period, an additional $1.54 million in wages will be paid per year.*"

Construction of the terminal is expected to cost approximately $50 million. Again, from Dr. Colgan's report: "*Construction of such projects requires labor and supplies both from within the region where the project takes place and outside the region. The economic impact depends upon the proportion of inputs from within the region, which I have estimated at half the total cost ($25 million).*"

Although acknowledging that the valuation process has not yet taken place, Dr. Colgan has also estimated, using construction costs as a proxy for fair market value, the potential impact of the

facility on property taxes. Adjustments to the school funding formula and the county assessment were also taken into account. Once constructed, the Town of Searsport potentially could see a net reduction in the mill rate from 19.7 to less than 17.5, an 11-12% reduction in the property tax rate. Alternatively, if the Town chose to keep the old rate of 19.7, it would be able to increase annual expenditures by over $500,000.

The State of Maine will benefit from the increased income taxes resulting from the additional wages anticipated during construction and operation. Lastly, the project will bring substantial economic benefits to the entire state by providing a reliable supply of propane as a clean, cost-competitive energy option.

Concerns that tourism in Searsport or the region will be adversely affected by the project are speculative at best. Searsport is both a destination and through point for tourist traffic along Route 1. The LPG facility will be busiest in the winter, when coastal tourism is generally low. Tourism has developed to its current levels simultaneous with the growth of industrial and commercial activity at Mack Point and at the chemical plant on Kidder Point, north of Sears Island. Route 1 is the major transportation corridor through this region and tourism has developed alongside commercial truck traffic. Unless Searsport makes a conscious effort to advertise the presence of the LPG tank (or any of the other tanks on Mack Point), it is questionable whether the through tourists will even notice or be affected. Consider "The Old Port," Portland, Maine's premiere tourist destination. The Old Port is a district known for its cobblestone streets, 19th century brick buildings, fishing piers, boutiques, restaurants and bars. It has grown in popularity despite the long-standing and highly visible petroleum terminals and tank farms directly across the harbor. Portland Harbor is one of the largest importers of petroleum products on the east coast. Portland and Casco Bay are among the most visited places in Maine and while it is to be expected that a certain amount of industrial land will be visible in urban areas, the shoreline and views from the Bay are a major element in the attraction of Portland. The growth of tourism and recreation in the Portland area in the face of highly visible energy facilities indicates, along with the location of the proposed LPG tank in Searsport at some distance from Searsport Village, that there should be minimal detectable impact on tourism activities in the town.

Portsmouth, NH has a similar historic commercial district with a thriving tourist industry located just downstream from petroleum and LPG facilities. Those facilities are surrounded by malls and shopping centers, the Spaulding Turnpike, the Pease International Tradeport, and residential developments. They also are situated directly across from Kittery and Eliot, Maine and numerous river front residents. LPG and petroleum vessels transit the Piscataqua River, right past all of these communities on their way to upstream terminals, often within 300' of the New Hampshire shoreline. The LPG vessels transiting the Piscataqua are very similar in size to those that will off load at Searsport. LPG vessel traffic and the presence of the Sea-3 facility in Portsmouth has apparently had little effect on the tourist industry in that area. Consider also, Dragon Products, a cement manufacturer at Thomaston, Maine. Dragon Products operates a major cement plant immediately next to Route 1 at the Thomaston/Rockland town line. The highly visible and starkly industrial plant and associated quarries occupy approximately 300 acres of land on both sides of and immediately next to Route 1. This industrial complex, operational for at least 60 years, has not precluded the development of tourism along Route 1 or in the greater Rockland area. Finally, consider Tampa, Florida. In 2000, a comparably sized LPG tank was built in Tampa, a city with a thriving tourism industry. In the years since the LPG facility was built, Tampa has seen a

steady growth in the number of tourist visits and dollars spent. Based on these other cities' experiences, it is not expected that tourism in Searsport or the region will be negatively impacted simply by the presence of the LPG facility.

The Town of Searsport's official web site notes that for over a century Searsport has been a town dependent on and noted for its port and dependence on shipping. Its location on Penobscot Bay has been a major influence in its development. During its early history, its major industry was shipbuilding and cargo handling. The chemical industry played a major role in the local economy during World War II. Petroleum product shipping and handling supplemented the chemical industry during the Korean conflict, while today fuel, lumber, paper and chemicals continue to depart and arrive from the seaport. Large industrial facilities such as the Sprague and Irving Terminals and the GAC Chemical plant have been in operation in Searsport for decades. Yet tourism in this part of coastal Maine has thrived as it has elsewhere along the coast. The addition of the DCP facility is not expected to substantially change that.

c. Aesthetics: The existing visual quality of the area within the DCP terminal viewshed has two major elements: (1) the ongoing industrial, commercial and recreational marine activities on Penobscot Bay, most notably the heavy shipping traffic utilizing the two existing piers at the Mack Point Terminal, and (2) the existing commercial development and related tourism traffic mixed with residential development along this portion of Route 1. The truck traffic and land-based activities at the Sprague and Irving facilities, an Irving Oil gas station and convenience store, as well as restaurants, motels and other commercial establishments dominate the immediate area around the proposed site. The existing Sprague and Irving terminals contain approximately two dozen storage tanks that are up to approximately 150 feet in diameter and 40-50 feet tall. These existing land uses and activities have been present in this area for many years.

i.) Tank size/height. One comment letter noted a discrepancy in the application materials and plans relative to tank height. The applicant acknowledges the error and has corrected the plans. The tank height used in the photo simulation and visual analysis actually depicted an early design in which the base elevation of the tank was 6' higher than it is presently. Redesign was able to lower the base elevation, thereby slightly reducing the visual impact. The Corps acknowledges that though similar in general appearance, the LPG tank will be up to three times taller and approximately 50' larger in diameter than the Sprague and Irving tanks within the nearby tank farm. Part of this is a function of design and part is simply an elevation difference on the site. However, the tank's size/capacity (22.7 million gallons) is very similar to comparable facilities in Tampa, FL (22.7 million gallons), Chesapeake, VA (20 million gallons), and Providence, RI (18 million gallons).

The tank size is further addressed in Section 5; Alternatives Analysis. A smaller tank is not considered logistically or economically practicable, nor is two smaller tanks on the same site. In March, in preparation for the following heating season, DCP relies on expertise and experience to schedule the timing of ship deliveries for when the tank will have sufficient capacity to take a full ship load, but not so low that there is a danger of running out of propane. The "typical" capacity of the current fleet of transatlantic LPG transport vessels is approximately 16 million gallons. The 22.7 million gallon tank allows the applicant to maintain approximately 6 million gallons of reserve in the tank and still safely unload the "typical" size ship. Ideally, the applicant would want even more room in the tank to accommodate a full delivery but 6 million gallons provides about a two

week reserve supply in the event that extreme weather (a greater concern for deliveries to Searsport in the winter months when demand will be greatest) or other factors delay a delivery ship. A smaller tank would necessitate reducing the available reserve supply. Based on the applicant's experience with delivery ship logistics, this represents a risky proposition, which would require scheduling more frequent partial deliveries. Such deliveries would result in product at a much more costly rate, and could also result in shortages if deliveries are delayed. The tank has been sized to make efficient use of the deliveries from the class of ships that transport LPG, and failure to do so will potentially drive up the cost of product for the consumer, or risk shortfalls during the critical winter months. The applicant also briefly considered two smaller tanks on the site instead of one large tank. Two smaller tanks of comparable capacity would increase the impact to aquatic resources and virtually eliminate all buffers to the facility. This is considered more environmentally damaging and contrary to the public interest.

ii.) Views. The Corps acknowledges that the LPG tank will be at least partially visible from select vantage points along Route 1, from Long Cove and Sears Island, and from Penobscot Bay. From the cove and Sears Island it will be at least partially screened compared to the completely unscreened view of the Irving and Sprague tank farms, the Mack Point piers, and the shoreside rail line. At any given time this view includes queued rail cars along much of the entire shore and large cargo vessels at berth. Put into that perspective, the new tank's cumulative visual impact is not substantial. The view of Mack Point's existing industrial/commercial complex from Penobscot Bay, including nearby islands, has been unchanged for years. Anyone close to the Mack Point shore could notice the addition of the LPG tank to the landscape. Anyone in the outer bay or on the islands (Islesboro is 5 miles away; North Haven is 18 miles away) are unlikely to easily detect a change except possibly at night. Lighting impacts will be minimized to the extent practicable and will be minor compared to the existing lighting at the Mack Point complex (Refer to Section 7.d.).

DCP will own undeveloped forested land that will provide complete or partial visual screening from locations covering over 180 degrees around the terminal facility. In addition, the applicant has used existing and final topography as well as adjustments to the facility design, including lowering the elevation of the base of the bulk storage tank, to minimize the project's visual impact to the extent practicable. The effect of these measures to minimize visual impact is demonstrated in visual simulations provided to the Corps. These simulations and the associated analysis focus on the tallest structures that will be built, i.e. the tank, the fire water tank, the flare, and the buildings, and depict the expected view of the developed site from nearby, representative scenic resources. Many of the nearby scenic resources are historic architectural structures listed on or potentially eligible for listing on the National Register. The view of the proposed facility from these regulated locations varies from nearly totally obstructed to partially screened.

After review of the applicant's visual assessment, Maine DEP made the following finding: *"... the development, analyzed in the context of the existing and surrounding visual qualities and visual impact on scenic and aesthetic local resources is found to be acceptable without changes or compensation. Based on the project's location, design, and viewshed analysis, the Department finds that the proposed project will not have an unreasonable adverse effect on the scenic character of the surrounding area."* The Corps acknowledges the Maine DEP's authority to evaluate visual impacts. Their evaluation appears appropriate in this case. The Corps also notes that the Maine Historic Preservation Commission concluded in a letter dated August 8, 2011 that there will be no

historic properties [architectural or archaeological] adversely affected by the proposed undertaking pursuant to Section 106 of the Historic Preservation Act. The Corps generally considers a historic property to be one of the most sensitive "receptors" to visual impacts. Since the Commission determined that even the visual impact of the project would not affect historic resources, this indicates that the visual impact is not substantial. The Corps agrees with these agencies' conclusions.

Subsequent to the public comment period, project opponents provided the Corps with their own visual assessment. The assessment was made by a Maine landscape architect who has performed similar assessments for a number of large development projects in the state including wind farms, utility corridors, power plants, and transportation projects. Only two photo simulations were provided and they mirror two views included in the applicant's analysis, albeit with more of the tank visible. The assessment and photos do not represent substantially different visual impact. The Corps has already acknowledged that the LPG tank will be at least partially visible from select vantage points along Route 1, from Long Cove and Sears Island, and from Penobscot Bay.

iii.) Buffers. Taking into account siting constraints, containment requirements, and site security, the applicant is retaining the maximum amount of natural buffer possible. The applicant intends to place a deed restriction on the parcel east of the rail line and adjacent to Long Cove to protect this natural buffer from future development. Unlike some facilities, e.g. airports, there are no requirements for maintaining secondary clear zones beyond the facility's fence line. Natural vegetation including trees will continue to grow and thicken, diminishing visibility of the facility over time. The Corps acknowledges however, that the upper portion of the tank will remain visible from some viewpoints regardless. Fencing, tree planting, or other mitigation measures will do nothing to address this.

The Corps asked the applicant to address an alternative tank color to minimize potential visual impact. A light grey color will more than double the absorption of solar radiation over a white tank, which would (1) in the event of a power outage or process upset, result in the need to send more boil-off vapors to the flare and thereby potentially increase the size, height, emissions and brightness of the flare; (2) result in more loss of operational efficiency/saleable product; and (3) during routine operations, it would increase the electrical demand for the additional refrigeration/compression needed to re-liquefy the boil-off vapors and return them to the tank. In addition, light grey doesn't necessarily reduce its visibility under all sky conditions. An even darker tank, e.g. forest green, would increase these effects.

iv.) Decommissioning. At the Town Hall Meeting conducted by DCP in Searsport on January 26, 2012, DCP confirmed it has a company policy in place to remediate any of the sites it owns should it be permanently closed. The Corps will not condition its permit to require future remediation, this is more appropriately addressed by the municipal authority.

d. General environmental concerns: Negative impacts of the overall project are relatively minor and are outweighed by the positive impacts on the local, regional, and state economy. More specific potential impacts to the public interest are noted elsewhere in the section. Four additional considerations, reflected in concerns expressed by the public, are addressed below:

1.) Noise. The Maine DEP regulates noise under Chapter 375 of its regulations

implementing Site Law. Based on analyses performed by the applicant, Maine DEP concluded in part: "*The Department finds that the applicant has demonstrated that the sound is not likely to exceed the modeled level, and the project will meet the noise standards. To ensure that the 60 dBA hourly sound level limit is met during all conditions, the applicant must conduct noise monitoring.*" Should monitoring indicate that DEP standards are not being met, DCP must submit for Maine DEP review and approval, within 60 days of the determination of non-compliance, a revised operation protocol or other plan and implementation schedule that demonstrates how the project will be brought into compliance. Once approved the compliance plan must be implemented in accordance with the approved schedule.

The Corps recognizes DEP authority in this matter but has further considered potential noise impacts. The applicant acknowledges that generators and the flare were not evaluated in the noise analyses submitted to the DEP because they are considered to be emergency equipment and are not representative of routine operations. The flare will operate at a low pressure and is not expected to be audible off site. The generators will be equipped with mufflers and will be located within buildings to reduce noise. Truck traffic will experience a minor increase (refer to Section 4.g.11). Any increase in noise from trucks is expected to be minimal compared to the noise from existing volumes of truck and car traffic in the project area. Furthermore, any minor increase in truck traffic will largely occur in the winter months, when fewer people are outside, fewer people are in the area in general, and windows are closed, thereby reducing noise effects.

State regulations exempt noise from construction as long as those activities are limited to the hours of 7AM to 7PM or daylight hours, whichever is longer. Construction activities outside those time periods (i.e., nighttime) are regulated. DCP has committed to meet the nighttime construction noise standards, should nighttime construction be required. Noise levels in the immediate area are expected to increase during construction and may be noticeable to nearby residents, commercial businesses and the general public transiting the area. Construction noise will be temporary, limited in accordance with Maine DEP requirements, and will cease upon completion of construction. The Corps has determined that the DEP's review appears appropriate in this case; that the applicant's minimization measures also appear reasonable and appropriate; and that the potential noise impacts of the project are not substantial.

2.) Air Quality. The US EPA regulates air emissions pursuant to the Clean Air Act. In Maine that authority has been delegated to the Maine DEP. DCP developed an air quality analysis for the DEP that included emissions from all elements of the project including the flare and truck/rail loading (including decoupling). An air emission license was issued by the Maine DEP on October 27, 2012. The impacts on air quality associated with the regulated activity described in this EA/SOF have been considered and will not exceed de minimis levels of direct emissions of a criteria pollutant or its precursor, and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps continuing program responsibilities, and generally cannot be practicably controlled by the Corps. In issuing its air emission license however, the DEP determined that the emissions from the facility would receive best practical treatment; would not violate emission standards; and would not violate applicable ambient air quality standards in connection with emissions from other sources.

The air emission license is based on a maximum of 500 hours of flare operation per calendar year, but the applicant considers this a worst case scenario based on his experience at his other

facilities. Operations are designed to minimize flaring so it is expected that the flare will operate much less than the maximum permitted. Flaring is only used when normal refrigeration and vapor recovery systems and processes fail, e.g. during an extended maintenance period, a prolonged power failure, or reduction in the availability of commercial power (such as a brownout). Compared to normal vapor recovery, flaring provides for no recovery and therefore represents a financial loss to the applicant.

Temporary minor increases in air emissions may occur during construction of the project resulting from ambient dust and diesel exhaust from heavy equipment. The applicant will employ best management practices ("BMPs") to control dust when operating construction equipment, and will comply with all applicable state and federal regulations regarding the operation and fuels used in construction equipment. As a result, the effects on air quality during construction will be minor and temporary, and will cease upon completion of construction. Minor increases in truck traffic and the number of vessels visiting the Mack Point terminal may result in additional air emissions. The increased ship and truck traffic (and possibly rail in the future) will occur primarily in the winter months, when their minor increase in air emissions will not add to the cumulative effect of summertime high ozone, heavy tourist traffic, and generally poorer summer air quality. The Corps has determined that the DEP's review on behalf of US EPA appears appropriate in this case; that the applicant's minimization measures also appear reasonable and appropriate; and that the potential air quality impacts of the project are not substantial.

3.) Light. The applicant acknowledges that their visual impact study submitted to the Maine DEP did not include nighttime operations. The facility will require outdoor lighting for both personnel safety and facility security. The applicant has provided the Corps with a lighting plan which demonstrates how the dispersion of light is expected to be limited to confined areas. The lighting plan is intended to depict a worst case scenario, when all lights are on. All exterior lighting is designed to minimize potential adverse impact on neighboring properties and will be directed inward and toward the ground or terminal operational areas. The lighting plan does depict a series of lights that progress to the top of the tank. As such, they are potentially the most visible from off site. These lights are located on the southwest side of the tank, facing Station Road, but still potentially visible from the south and west. These lights illuminate a stairway that provides maintenance access to the top of the tank. Except for the rare case where night time maintenance or other access to the top of the tank will be necessary and lighting is required for worker safety, these lights will remain unlit. The Corps also notes that DCP has obtained a letter from the Federal Aviation Administration indicating that night time air hazard lighting will not be necessary. The Corps has determined that lighting at this location will represent a change but not a drastic one in view of the surrounding commercial and industrial operations. The minimization measures appear reasonable. Lighting will also be addressed through the Town of Searsport's review process.

With regards to the flare, the applicant acknowledges that on rare occasions, an extended period of flaring may be necessary due to extended maintenance or prolonged power failure. As a precaution, the applicant advises the local fire department, but expects minimal impact to the surrounding area. Based on their experience, the flare does not emit enough heat or noise to be noticeable off site. The applicant acknowledges that the flare, when operational, could be visible from some locations, e.g. Sears Island, but it is located downslope from the tank and is substantially lower than the height of the tank. The visual impact of the operational flare has been minimized to the maximum extent practicable and this impact is expected to be infrequent. The height of the

DCP flare is expected to be 75' tall, with a typical flame height of 5-10'. In contrast, a refinery flare system is designed to accommodate all sources of venting from an entire facility. Vent pressures at those facilities range from 16 psi to several hundred or even 1,000 psi (compared to 1 psi at the DCP facility) and volumes of vent gases are substantially higher. Flare height at a typical refinery could be up to 150' taller than the DCP flare; the noise would be substantially greater (because of the higher release pressure); and the flame would be 50' high or higher.

4.) Odor. This document describes the various project elements associated with the proposed facility. Ancillary equipment includes storage tanks for ethyl-mercaptan. Ethyl-mercaptan is an odorant that is added to propane and butane in the processing and refining process to provide a detectable odor as a safety precaution prior to sale to the end user in order to provide a detectable odor, otherwise the gases are odorless. Ethyl-mercaptan has a strongly disagreeable odor that humans can detect in minute concentrations. The threshold for human detection is as low as one part in 2.8 billion parts of air. It is such an effective odorant that it has been added to propane and natural gas for decades and nearly all propane in the U.S. is odorized with it. At the DCP Terminal, odorant will be added directly to propane being loaded onto trucks or rail cars via a closed system to reduce the risk of incidental, even minor leaks. Major leaks of Ethyl-mercaptan are uncommon in the industry and will be fully addressed in Risk Management Plan ("RMP") submitted to the US EPA.

e. Wetlands: Construction and operation of the on-shore terminal will result in approximately 1.97 acres of unavoidable direct and indirect impacts to freshwater wetlands and an associated stream segment. Approximately 1.96 acres of forested wetland will be permanently impacted by fill or clearing and ongoing vegetation maintenance. Secondary wetland impacts will result from selective tree clearing of approximately 0.01 acre of forested wetland to improve the sight distance for trucks leaving the facility on U.S. Route 1. Approximately 365 feet of stream channel will be routed into approximately 330 feet of culvert passing beneath the truck loading area. The next approximately 670 feet of the stream channel will be routed into a new, stabilized channel for a distance of approximately 650 feet along the site perimeter in order to avoid the containment dike, emergency flare and other essential project elements.

The affected wetland resources have limited functions and values due to the underlying soils, location on a steep gradient, proximity of nearby development, relatively small size and lack of connectivity to adjacent resources, wide distribution across the site, and limited use by the public. What values exist for sediment/toxicant/nutrient removal/retention and floodflow alteration will be fully offset by construction and operation of the engineered stormwater management system, and by compensatory mitigation. Refer to Section 9; Compensation and Other Mitigation Actions.

The cumulative impact to wetlands on Mack Point and in the general area is discussed in Section 8. d.; Cumulative and Secondary Impacts.

f. Historic properties: The MHPC and Maine's Indian tribes were provided with a copy of the application by the applicant and were sent a copy of the Public Notice from the Corps. On August 8, 2011, the MHPC determined that the project would have no effect on properties of historic, archeological, or architectural significance pursuant to Section 106 of the Historic Preservation Act as amended. On March 22, 2011, the Tribal Historic Preservation Office

("THPO") of the Passamaquoddy Tribe stated that there will be no impact on tribal cultural concerns from the project. On April 20, 2011 the THPO of the Penobscot Tribe concurred. No other comments were received directly from the tribes nor have they expressed concern in telephone conversations. This concludes Corps responsibility under Sec 106 of the NHPA.

The minor increase in truck traffic, compared to the volume of existing truck traffic, is expected to have little, if any, additional secondary effect on Searsport's historic properties. The Corps notes that Maine DOT is currently studying Route 1 improvements along a 1.83 mile beginning at Station Road and extending south. The improvements include reconstruction and modernization, drainage improvements, sidewalk rehabilitation and reconstruction, accommodations for bicycles and on-street parking, intersection improvements, pedestrian crosswalks, elimination or reduction of driveway openings, overhead utility relocations, and ancillary streetscape amenities to improve safety and traffic flow, minimize future maintenance costs, and enhance the Searsport section of the Route 1 corridor. These actions are part of a downtown revitalization that will benefit all properties, including historic, recognizing that Route 1 still remains part of the National Highway System and Maine's Heavy Haul Truck Network.

g. Fish and wildlife values: The applicant contacted federal and state resource agencies responsible for the protection and management of fisheries and wildlife. The purpose of these consultations was to obtain information on the occurrence of rare, threatened or endangered species and related habitat and other wildlife concerns to be considered and evaluated for permitting, constructing, and operating the DCP terminal. In addition, an interagency site visit was conducted on April 13, 2011. Representatives from the Corps, USFWS, NMFS, and Maine DEP attended along with representatives from DCP. Lastly, the applicant conducted comprehensive natural resource field surveys over the entire site.

1.) Fish. The small stream and other wetland drainages that flow from the site are isolated from tidal areas by existing hanging culverts under the rail spur. As a result, these freshwater resources do not provide fishery habitat. The tidal and deep waters of Penobscot Bay are important commercial and recreational fisheries. However, construction of the project will not result in any impacts to tidal waters. The project is not expected to result in new contaminant discharges to Long Cove. The only water discharge during terminal operation will be treated stormwater. The containment berm for the bulk LPG tank is designed to contain 100 percent of the full capacity of the tank in the unlikely event of loss of tank integrity. DCP will develop and implement a facility-wide Spill Prevention Plan for Operations that includes spill prevention, control and cleanup measures to minimize the risk of contaminant release. The effects from transit by the four to eight ships per year bringing LPG to the existing piers at the Mack Point Terminal will be comparable to any of the approximately 130 to 160 vessels per year that currently utilize the existing facility, and do not represent an appreciable increase in existing marine cargo vessel traffic or an increase in threat to the Bay's marine resources.

The portion of Long Cove that is adjacent to the project site contains a large area of mudflats, most of which have recently been re-opened to shellfish harvesting by the Maine DMR. The proposed construction and operation of the terminal will not affect the quality, size or use of these mudflats. The applicant has no authority to restrict access to these flats, only the Maine DMR can. The administrative record contains comments from Maine DMR indicating that there does not appear to be any potential adverse impacts to marine resources from the project. The applicant has

no authority to restrict access to these flats, only the Maine DMR can. Maine DMR and the NMFS have no objections to permit issuance.

2.) Wildlife. Wildlife habitat at the DCP Terminal site is strongly influenced and limited by conditions surrounding the site. The site is located on the north side of the existing Mack Point Terminal, which includes the Sprague Energy and Irving Oil facilities. U.S. Route 1, heavily used by local, commercial and tourist traffic, borders the site on the north and west along with residential and commercial development. Residential and commercially-zoned lots are located to the south along Station Avenue, which is currently used for truck access to the Irving facility. The easterly side of the site is bordered by the rail spur, which provides regular, direct rail use for cargo shipments to and from the Mack Point Terminal. Although wooded conditions dominate the site and its small wetlands, the site is not readily linked to other habitat of equal or better quality, and is instead closely surrounded by intensive and persistent commercial and industrial activity. The site does provide some habitat for small mammals, deer, and a variety of birds. However, the overall habitat value is limited due to its relatively small size; the fragmentation and barriers present; and the proximity of human development and disturbance. The development will relegate wildlife use to the buffer areas or displace it off site.

No bald eagle essential habitats are known to occur in the project vicinity. The applicant conducted field surveys to identify potential vernal pools within the site. No vernal pools were identified. No vernal pools were observed during the interagency site visit. The Maine DIFW states no other state-regulated Significant Wildlife Habitat occurs on the site; although the shallow-water fringe along the shoreline from the existing piers to the mudlflats at the upper end of Long Cove is identified as Tidal Waterfowl and Wading Bird Habitat, a state regulated Significant Wildlife Habitat. Maine DIFW indicates that, based on their understanding of the project, there would be no direct impacts to waterfowl and wading bird habitat as long as stormwater management best management practices are employed as required by the Maine DEP. USFWS and Maine DIFW have no objections to permit issuance.

h. Flood hazards: The only portion of the proposed project that will be located within the 100-year floodplain, as defined by the Federal Emergency Management Agency, is approximately 950 feet of the transfer pipeline corridor, approximately 565 feet of which will be attached to the pier. The transfer pipeline will not have any measurable effect on the existing flood zone elevation or alter existing flood flows. Should it be required, the applicant will obtain a Flood Hazard Development Permit from the Town of Searsport.

i. Floodplain values: The applicant prepared a stormwater management plan for the developed site, which was reviewed and approved by the Maine DEP in accordance with state regulations. Implementation of the stormwater management plan will ensure that the project will not cause or increase flooding or flood hazards, and will compensate for any flood flow alteration ability of the wetlands or stream segment that will be affected.

j. Land use: Nearly the entire development will be located on land currently zoned and/or in use for industrial development. The only exception is the approximately 4-acre parcel of undeveloped, commercially zoned land at the corner of Station Avenue and U.S. Route 1 that will contain the facility administration building and entrance road. Further development of Mack Point for marine-borne cargo and related infrastructure, such as the proposed terminal, has been a goal of

the state for many years and has been locally favored over other locations, e.g. Sears Island, as memorialized in the 2007 Sears Island Consensus Agreement. The proposed development conforms to local zoning and the local comprehensive plan.

Other land use in the area includes a mix of commercial and residential development, all located on commercially-zoned land. These uses are expected to continue throughout construction and upon completion of the project.

k. Navigation: The Corps considered the project's potential navigational impact, despite the fact that the only work subject to Section 10 jurisdiction is the attachment of the off loading pipeline to the existing cargo pier. Our review includes consideration of the Searsport Federal Navigation Project ("FNP"). The Corps has concluded that the project will not adversely impact general navigation. Specific to the use of Searsport Harbor by recreational and commercial boaters, the Corps has determined that this use will not be adversely impacted. The Searsport Harbormaster concurs. The President of the Penobscot Bay & River Pilots Association concurs. The Coast Guard concurs. Ample opportunity for unobstructed passage in and out of Searsport Harbor will be available, even accounting for any future security/safety zone requirements from the Coast Guard.

As noted in Section 4.g.12) of this document, on April 9, 2012, the USCG Captain of the Port recommended to the Corps that the Penobscot Bay be considered suitable for LPG marine traffic. The Captain of the Port focused on the navigation safety and maritime security aspects of LPG vessel transits along the entire affected waterway (Refer to Figure 1, Page 15) and included an assessment of the risks posed by these transits and possible risk mitigation measures. USCG sponsored a stakeholders' meeting on October 19, 2011 which the Corps attended. It was clear from presentations made by USCG and the Penobscot Bay Pilots that the minor increase in shipping traffic (6-8 vessels/year) will not appreciably alter commercial shipping activity or navigation along well established transit routes in Penobscot Bay and approaches (up to 175 deep draft vessels/year in 2010). Established transit routes will not change as a result of this project and because of the high number of petroleum vessels already transiting the region, the pilots and marine operators already operate at the highest level of safety. The LPG project won't change this. To the degree that lobstermen fish along the existing transit lanes, this does not have to change. Similarly, existing recreational traffic, schooner trips, island ferries, and commuters who boat to/from Penobscot Bay islands are not expected to be appreciably affected. It is important to note for these users in particular, most LPG shipments will occur in the off-season winter months, when boat traffic is reduced. Should LPG vessels have to be temporarily anchored, anchoring would occur in established and long-used temporary anchorage areas so minimal new impact is expected.

Based on the testimony of the USCG and the pilots, the long established deep draft commercial use of the transit routes and the Mack Point terminals, the similarity of LPG vessels to the size of vessels and types of cargo already accommodated in the region, and the relatively few number of LPG vessels that will visit the area per year, the Corps does not believe existing navigational use will be more than minimally impacted. The LPG vessels will complement existing petroleum, dry cargo, and containerized cargo vessels that already frequent the Mack Point terminals. The installation of the gas pipeline on the existing terminal pier, although still a Section 10 regulated activity, will not impact navigation. The Corps has maintained the FNP at this location since 1963 to provide an approach channel and turning basin for the berths at Mack Point. The FNP is currently being studied for possible improvement. Neither the existing nor potentially

expanded FNP will be adversely affected by LPG traffic. It should be noted that the Corps has been evaluating maintenance and improvement of the Searsport FNP since a resolution was passed in 2000 by the House Committee on Transportation and Infrastructure, long before the DCP proposal was received.

l. Shore erosion and accretion: Construction of the transfer pipeline from the pier to the bulk storage tank will not require any disturbance below the high water mark. The existing shoreline along Mack Point consists mostly of unprotected banks grading down to gravel, cobble, sand, and mudflat. The shoreline shows no indications of erosion or accretion.

As described previously, construction of the onshore terminal facility will require rerouting a portion of an existing stream that runs through the central portion of the site. Approximately 365 feet of stream channel will be routed into a culvert, and the next approximately 670 feet of the channel will be routed into a new, stabilized channel. Culverting and relocating of the stream will be completed very early in the project construction schedule to contain and move this flowing water source out of the way of ongoing construction and subsequent operations. The culvert and new stream channel will be installed and final stabilization measures put in place prior to disturbing the existing channel. Stabilization of the ends of the culvert will utilize a combination of concrete headwalls and rip rap. There will be no increase in runoff volumes to the stream. The new stream channel, which has been designed to carry expected high flow volumes and to prevent erosive flows, will be stabilized with rip rap. As a result, water will be allowed to flow at a controlled rate directly into its new, stabilized pathway with a minimum amount of unavoidable turbidity occurring only at the time of the tie-in. The ground surface adjacent to the new stream channel will be re-vegetated.

All other construction disturbance will be conducted using the erosion and sedimentation control BMPs described previously, followed by final stabilization of exposed soils by riprap, or re-vegetation. Any resulting turbidity is expected to be short-term and minimal.

m. Recreation: The four-acre corner lot which will contain the administration building and entrance road has an existing snowmobile trail that is part of the interconnected trail system ("ITS"), trail number 82. This portion of the corner lot will not be altered during construction and DCP has stated it is not planning on closing the trail where it crosses its property. The larger portion of the project site is currently owned by Sprague Energy and is not available for public recreation. Recreational use of Long Cove is expected to continue; the applicant has no plans for development east of the rail line, adjacent to Long Cove. Passive recreational use of Sears Island on the opposite shore of Long Cove is expected to continue.

Penobscot Bay is used extensively for recreational activities such as boating and fishing. A visual simulation of the developed site provided by the applicant indicates the proposed facilities are partially screened by trees that will remain and is consistent with the current development on Mack Point. Mack Point's industrial and commercial development and the associated large vessel shipping traffic have been highly visible to recreationalists on the water for many years during which recreational use of the Bay has flourished. The four to eight LPG vessels per year that will supply the terminal will use the same transit routes used by the much greater volume of existing shipping that currently docks at Mack Point, and represents a minimal increase in shipping activity.

n. Water supply and conservation: The project is not expected to adversely affect surface waters or groundwater supplies. Risks to these resources during construction will be minimized with the implementation of the applicant's Construction Spill Plan. Longer-term risks to these resources during operation will be minimized with the implementation of the Spill Prevention Plan for Operations. Municipal water will be used to provide the water needed for operation of the facility.

o. Water quality: There will be no discharge of process water to Long Cove or Penobscot Bay from operations at the LPG terminal. The only water discharge during terminal operation will be treated stormwater. The applicant has prepared a Stormwater Management Plan, which was reviewed and approved by Maine DEP under Chapter 500 of state regulations. A detailed description of the stormwater management system has also been provided to the Corps. Runoff from the terminal will be collected and treated on-site using underdrained gravel filters and discharged through the existing culverts under the railroad tracks that currently convey the runoff from the site.

LPG offloading and transfer operations will be designed and managed in accordance with International Gas Code requirements such as remotely controlled emergency shutdown valves on the ship for stopping liquid and vapor transfers between the ship and shore, and remotely-operated shutdown valves at each cargo hose connection used in transfers. The emergency shutdown control system will be capable of being activated by a single control in either of two locations on the ship and will be activated by fusible links that will respond in the event of a fire in other locations, including tank domes and loading stations.

No new contaminant discharges to Love Cove are expected to result from LPG vessels during offloading or transit through Penobscot Bay. LPG carriers will, like other vessels calling at the terminal, be required to comply with all applicable laws, regulations and requirements restricting the discharge of pollutants and regulating other aspects of vessel operations. LPG carriers are required to comply with federal and international standards governing LPG shipping, including all applicable rules, regulations, and requirements of the Coast Guard. In addition, the USEPA regulates discharges incidental to the normal operation of commercial vessels, such as the vessels calling at the Mack Point Terminal, under the Vessel General Permit ("VGP") to ensure compliance with the Clean Water Act.

Temporary, minor impacts to surface water quality may occur during clearing, grading, and construction. To minimize these impacts, the applicant will implement its Erosion Control Plan, which is consistent with the Maine DEP's March 2003, "*Maine Erosion and Sediment Control Best Management Practices.*"

A Water Quality Certification was issued by the Maine DEP on October 24, 2011.

p. Energy needs: The project will have a positive effect on energy needs since it will ensure a safe, cost-effective, sufficient and reliable supply of LPG is available to meet the existing and possibly growing demand for clean-burning propane in Maine.

Approximately 26,000 homes in Maine rely on propane for heating. Propane is also used increasingly in Maine for industrial and commercial heating due to oil price volatility and emission

restrictions. Approximately 70 percent of the propane consumed in Maine comes into the state via rail, predominately from Canada. Canadian propane production has been declining for several years. A serious shortage of propane occurred in Maine in 2007 because of a Canadian railroad strike, temporary interruption of service on a major natural gas liquids supply pipeline, and a cold winter, requiring intervention by Maine's Governor to request that DCP seek alternate sources of propane to avoid shutting down industrial/commercial operations so that as much propane as possible could be made available for home heating. This exemplifies the fragile infrastructure that exists and which could occur again, especially in view of the increasing demand for this fuel. The DCP marine import terminal will provide substantially more storage and diversity of supply to address this problem.

q. Safety: Perhaps the key issue in the review of this project and this public interest review is consideration of how the proposed LPG facility will affect public safety in the community. The following items 1 – 6 relate specifically to the tank facility; item 7 refers to the safety risk assessment performed by the Coast Guard.

1.) General. DCP is clearly committed to designing and operating the Searsport facility to meet or exceed all applicable safety requirements. This is evident in public testimony, local outreach efforts, and their application submittals. The terminal has been designed as a low temperature/low pressure facility which is considered the safest available design option for storing propane. DCP has a robust employee training program that includes maintaining a staff of process safety and employee/public health experts, providing a comprehensive new employee training program with annual safety refresher training, and implementing numerous systems to ensure workers are totally familiar with the potential risks from the storage and handling of propane and the required procedures and safety-auditing mechanisms put in place to mitigate those risks. They will also be subject to all federal, state, and local safety regulations.

The Searsport terminal will be operated as a Process Safety Management ("PSM") facility, in accordance with Occupational Safety & Health Administration ("OSHA") guidelines which include 14 elements to ensure operational safety. DCP's PSM Program requires that every valve, fitting, alarm, and safety feature, be evaluated by a team of employees for potential hazards. Before startup of the facility a review of hazards by a separate team is conducted to ensure all outstanding action items identified in the initial hazards review have been addressed. While in operation DCP requires that a third review be conducted, prior to making any change to the original system design, in order to evaluate the impact of that change to safety. Safety systems are designed with redundancy in mind to ensure protection of the people and the process should a safety system fail. Facility operators are present 24/7; they are fully trained to respond to emergency events; and are backed up with a total product control system that will notify the operator of any kind of alarm due to a sensor detecting an abnormal reading. This could include but is not limited to gas detection, fire detection, or increased temperature detection. The automated control system is capable of automatic system shutdowns, emergency response (e.g. fire suppression), and calls to key personnel and local emergency responders regardless of operator action.

DCP will have in place a Risk Management Plan ("RMP") that must be provided to the US EPA prior to startup. The RMP is a detailed assessment of the potential impacts to the surrounding community from a worst case and an alternate case upset event. The operator identifies the possible things that could go wrong, develops plans and strategies to reduce the likelihood of an occurrence,

and/or reduce the severity of the impact from these events. DCP has also expressed its commitment to help train and support the local emergency responders, and has demonstrated this commitment by providing communications received from the responders and organizations in communities where it is currently operating. The RMP is developed in a coordinated manner with the Town of Searsport.

DCP reportedly operates in 18 states and owns or operates 61 processing plants, 10 fractionaters, and approximately 60,000 miles of gas pipeline. With regard to propane, the applicant operates an underground storage facility in Michigan, LPG terminals in Rhode Island and Virginia, and eight rail or truck terminals in the northeast. Almost all of these facilities are subject to both PSM and RMP regulations. DCP maintains that there has never been a serious incident at any of the propane facilities that they own. DCP has RMPs in place for all of its facilities, including its sites in Hermon and Auburn, Maine.

2.) Boiling Liquid Expanding Vapor Explosion ("BLEVE"). A core theme in the public concerns for safety is the perception that the LPG tank could catastrophically catch fire or explode. A BLEVE is repeatedly referenced by those opposed to the project. Opponents maintain that a BLEVE or a catastrophic fire threatens abutting residents and business owners, the Route 1 corridor, and much of Searsport. Fear of such an event is exacerbated by the proximity of the Mack Point tank farms and the chemical plant on Kidder Point, and the potential that they could increase the severity of such an event.

The applicant has repeatedly emphasized that because the LPG tank is not under pressure and is stored in a liquid state by maintaining the temperature between -44° and -42°F, that an explosion is virtually impossible. The same low pressure and lack of oxygen within the tank prevents a hypothetical terrorist attack from initiating a BLEVE. A BLEVE occurs when a vessel containing a *pressurized* liquid above its boiling point ruptures. For a BLEVE to occur, the container has to be under pressure, the pressure has to exceed the strength of the container, and the container has to be weakened in some way (e.g. impact, corrosion, fire, etc).

At the Searsport facility, the propane will be stored in a liquid state at essentially atmospheric pressure by maintaining the above referenced temperature. These temperatures are maintained by mechanical refrigeration and a enclosed insulation integral to the LPG tank. Boil off vapors will be collected and returned to the tank using refrigeration units. The storage tank will have an emergency control valve to route vapors to an emergency flare to protect against over pressurization. The tank will also be equipped with process safety valves that vent to atmosphere to prevent catastrophic tank failure if flaring is insufficient to maintain the tank pressure at a safe level.

In the event of a power outage, temperature and pressure in the tank are safely maintained through flaring and the pressure safety valves to prevent a BLEVE. A backup generator will be on hand to reduce the risk during power outages. In response to one comment, DCP has been assured by Central Maine Power Company that adequate power is available to operate DCP facilities at all times of year without risk to the availability of power for the grid (DCP causing a brown out). In the event of a prolonged power outage, e.g. from a severe ice storm, or a reduction in the availability of power such as a brownout, the flare, generators, and insulated tank will continue to function to maintain pressure and temperature in the tank. There is no increased hazard to public safety. DCP maintains a strong tank integrity and maintenance program and since propane is non-

corrosive, that threat is eliminated as well. Finally, there will be a fire suppression system that will be capable of preventing the spread of fire. DCP maintains stringent policies for trucks entering the facility. These policies are outlined in the administrative record. Security and operational safety standards within the facility are industry based and cover the entire installation from pipeline to tank to truck distribution.

Public safety concerns focused on the potential for a BLEVE at the LPG storage tank. This concern is addressed above. In addition to the primary storage tank however, the applicant will also maintain a 90,000 gallon tank on site which will be *pressurized.* The function of this tank is to store a small volume of propane which is used to fuel the heaters that are used to warm LPG from the large tank so that it can be pumped directly to trucks or in the future, rail cars. This differs from and is inherently safer than other facilities where such secondary tanks serve as interim *pressurized* storage vessels prior to off loading propane onto trucks/rail. The small tank generally maintains approximately 9,000 gallons of propane (only 10% of its volume), the exception being if it is used to temporarily off load a truck or rail car that in some way is found deficient. This would be a rare and short-term condition. As a *pressurized* tank, there is more of a risk of a BLEVE than there is in the *unpressurized* and refrigerated primary storage tank. However, this risk is greatly reduced by the low gas volumes that will be maintained in the tank, pressure safety valves, and the aforementioned safety and security protocols and fire suppression system. Propane storage tanks up to this size are common at large commercial and industrial sites throughout Maine according to the US EPA. They have been managed safely for years in accordance with federal, state, and municipal guidance and regulations.

3.) LPG compared to Liquefied Natural Gas ("LNG"). Comments received from attorneys representing a local opposition group included technical comments from a professor emeritus at the Massachusetts Institute of Technology, Dr. James Fay. Dr. Fay opined on the uncontrolled release of large quantities of LPG, its combustibility, and the threat to public safety from fire, thermal radiation, and dangerous pressure waves. Comparisons were made between LPG, oil, and LNG spills. It was the professor's opinion that LPG is more hazardous than LNG, and yet is subject to fewer and less stringent requirements.

DCP and its contractors have significant experience in the design, construction and operation of LPG facilities, and do not agree with the conclusions made by Dr. Fay. DCP asked two technical experts to review and comment on Dr. Fay's report. Theodore Lemoff served for 25 years with the NFPA and held the position of Principal Gases Engineer. Since 1932, the NFPA has been charged with developing propane standards that have been adopted worldwide by most countries. Dr. Phani Raj has several decades of experience with the establishment and administration of safety standards applicable to LPG, LNG and other gases, and was awarded the NFPA's Committee Service Award for Distinguished Service in the Development of NFPA Codes and Standards. DCP's rebutting comments and statements from both of these experts are contained in the administrative record.

The Corps has fully considered Dr. Fay's comments as well as the rebuttal comments from the applicant's experts. A core theme of his comments is that review standards for LNG terminals are more stringent and therefore should be applied to the review of LPG terminals, particularly since in his view the two products have comparable radiant energy and threat to public safety in the event of a fire. The Corps acknowledges that LPG and LNG facilities are subject to different

regulations. LNG facilities are often regulated by the Federal Energy Regulatory Commission ("FERC"); LPG facilities are not. LPG facilities are subject to safety standards established in NFPA 58; LNG facilities are subject to the standards of NFPA 59A. However, both sets of standards are similar in that their goal is to ensure that accidental releases of stored, transferred, or otherwise handled product do not occur. NFPA 58 was specifically developed by technical experts that work and operate with LPG. These experts look at the physical, chemical and thermal properties of LPG; they look at any past incidents involving LPG facilities; and they incorporate any new technologies. The standard is developed based on their knowledge of this information, and includes appropriate safe guards such as automatic and manual shutdowns, fire suppression systems, and containment dikes[7]. The standard also requires written procedures as well as employee training on those procedures for the safe operation of the facility. Regardless, the applicant has little choice in the matter; he is obliged to follow the standards that are applicable to the LPG industry. It is not up to the Corps to determine the industry standards or regulatory requirements (Congress has largely chosen to leave this to states for LPG). The fact remains that the NFPA is the leading organization that develops standards and codes covering subjects ranging from electrical fire safety, to building fire protection, to fire protection for flammable materials. The standards and codes are the highest practical and are developed through consensus by technical committees and are continually reviewed and revised. In the area of propane fire safety, NFPA publishes NFPA 58, Liquefied Petroleum Gas Code, an American National Standard. NFPA 58 has been adopted in all 50 states and is used worldwide. It represents the "gold standard" of safety rules for the storage and handling of propane in the U.S. A list of applicable standards is included in the administrative record and they are extensive.

In response to Dr. Fay's comments on the threat to public safety from uncontrolled release of large quantities of LPG, Dr. Raj points out that there has never been a release of LPG from a refrigerated storage facility like what is proposed, anywhere in the world. Adherence to stringent design and safety standards and codes, rigorous employee training, implementation of long-standing industry best management practices and standard operating procedures all play a key role in achieving this record. There is no reason to believe that DCP will not operate its facility in the same manner. Every propane storage facility is required to have an emergency system that, when activated, immediately stops the flow of propane. They are also required to prepare fire safety plans, emergency action, response and plant security plans. The Searsport Terminal will be built to the highest standards and its operators highly trained in both normal and emergency procedures.

Dr. Fay also compares the hazards of a release of LNG to that of LPG. The hazards due to a pool fire are dependent on two primary factors - the size of the pool (surface area) and the fire characteristics. Both LNG and LPG tanks are required to have secondary containment that is sized to hold 100 percent of the entire contents of the tank. In the event of a release, the material would be captured within the secondary containment, thereby minimizing the size of the pooled liquid. In

[7] Dr. Fay's comments only acknowledge a few of the many safety requirements of NFPA 58. Among other requirements, NFPA 58 provides design standards and requirements for the metals used in storage tanks, remotely operated shutdown valves to address piping system failure, features to address fugitive emissions from storage tanks, tank design requirements to address seismic and wind effects, requirements for the tank foundation, redundant systems to prevent overfilling, pressure relief valves for all potential operating conditions including fire exposure, operational upset or control failure, equipment failure, operational failure, flash vaporization, loss of refrigeration, and rapid atmospheric pressure change. By ignoring these other requirements of NFPA 58, Dr. Fay understates the efficacy of this standard.

addition, NFPA 58, along with other standards, requires shutdown valves, overfill protection and pressure relief valves to prevent or minimize the amount of material that is released. The proposed DCP tank will be built to meet or exceed these requirements. The fire characteristics will vary between LPG and LNG and will be dependent on the fire base diameter, emissive power of fire, height of the fire, wind speed, burning rate of the fire and atmospheric absorption including relative humidity and amount of soot. These factors, along with data collected from field tests that indicate that the radiant heat output value for LPG is two times smaller than for a comparable size LNG fire.

Dr. Fay included several graphics in his comments, intended to depict a thermal radiation hazard zone[8] and an overpressure zone[9] surrounding the tank site from an accidental release of LPG and either a fire or an explosion respectively. He maintains that since the radii of these zones of effect extend well beyond the boundary of the project site, they represent a potential threat to public safety within the Searsport community. As noted previously, LPG at the proposed facility would be stored refrigerated in its liquid form, which is not flammable, and would remain in this state inside the low pressure storage tank until it is prepared for transportation from the site.[10] If released outside the controlled storage conditions however, as the temperature of the liquid rises, it would vaporize and become a flammable gas. If there is no ignition source, the gas will not burn but will instead dissipate into the atmosphere. The extent of impacts from a fire fueled by accidentally released LPG will depend upon, among other factors, the amount that has been released and atmospheric conditions. If the gas is dissipated by winds before reaching an ignition source, it will not be present in dense enough a "cloud" to fuel a fire, but if a "cloud" of gas is too dense at the ignition source, it will not contain sufficient oxygen for a fire to burn. In fact, propane can only burn when it is within a range of two to ten percent of an air-propane mix, propane in amounts greater or less than that range will not burn. If a fire does occur, there are numerous variables that determine how it will burn and the distance at which impacts will occur. For purposes of the current NEPA review, however, it is important to recognize the role of US EPA's Risk Management Program (40 CFR Part 68). For a facility of this type, US EPA's Program 3 requirements will apply. Under these provisions, LPG facilities are required to perform hazard assessments that include US EPA defined "worst-case scenarios" for releases, assessments that take into account off-site impacts. The applicant must develop accidental release prevention programs, emergency response programs, and process hazard analyses, all of which provide US EPA oversight over the safe design and operation of such facilities. This includes the transfer of LPG from ships, the storage of LPG in its refrigerated, liquid form, and the movement of LPG from the storage tank and preparation for transportation by rail or truck. If the applicant cannot satisfy US EPA's requirements, it will not be able to receive shipments of LPG. Thus, US EPA's Risk Management Program addresses potential impacts of accidental releases, and the analysis and review that will occur pursuant to that program will serve to ensure there will not be a significant safety impact to the community from a fire caused by accidental release.

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[8] It is not clear what assumptions Dr. Fay has made in his analysis of radiant hazard distance, but it would appear that he did not take into account several characteristics of refrigerated, non-pressurized LPG that would limit the size of fire, most importantly the fact that the extremely cold temperature of LPG would freeze the ground of the sump containing the spilled liquid, thereby reducing the evaporative rate to the gaseous (flammable) form of propane and consequently limiting the size of the fire.

[9] Again, it is not clear what assumptions Dr. Fay has made in his analysis of LPG vapor explosions, but it is apparent that he is not taking into account the fact that this facility stores LPG in a refrigerated (as opposed to pressurized) condition. This distinction is critically important, as the risk of explosion is far greater in a pressurized system, and this is reflected in USEPA's regulations governing "worst-case" release scenario analysis.

[10] When transported by train or truck, propane will be stored in a pressurized state.

The overpressure zone radius described by Dr. Fay appears to be based on guidance in US EPA's Risk Management Program, but that guidance is for propane facilities storing LPG in a *pressurized* condition. As previously noted, the DCP facility propane will be stored in an *unpressurized* liquid condition at -44°F. In the unlikely event of an uncontrolled spill, not all of the liquid released will vaporize instantly or form a large vapor cloud. The threat posed by a potential vapor cloud explosion is diminished substantially. Similar to above, US EPA's regulations require an applicant to assume a worst case-release scenario for a vapor cloud explosion, but as a refrigerated storage facility this risk is far lower than with a pressurized storage facility. It is important to remember that the Corps is not the entity charged with reviewing the design, construction, or operation of LPG facilities. These roles fall to US EPA, USCG, Maine DEP, Dept. of Homeland Security, local building inspectors, and local and state fire and emergency agencies, and the Corps relies on the expertise and professionalism of these other governmental entities in considering these matters as part of its review.

4.) Emergency Preparedness. DCP has made it clear that they are committed to the security and safety of the facility and have strong programs and protocols in place in which they work with local emergency responders. This includes education, training opportunities for local responders, and collaboration on local emergency response and evacuation plans. DCP has already met with fire, ambulance, and police departments and will continue to do so. In a letter to the Corps dated March 3, 2012, the Director of the Searsport Emergency Management Office stated that Searsport has a National Incident Management System ("NIMS") compliant Emergency Operations Plan capable of managing events that require more resources than can be provided by their local emergency responders and mutual aid partners. NIMS, a Dept. of Homeland Security initiative, provides federal, state, tribal, and local governments, among others, a template to work together to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents regardless of cause, size, location, or complexity. Searsport's plan is coordinated with the emergency response plans of their other major industrial facilities. It is also linked to the Waldo County Plan, and through the county, to the State of Maine Emergency Response Plans. Through these interoperable processes, the director indicated that Searsport can respond to any conceivable emergency that might occur in Searsport, including the proposed DCP facility. In comments to the Corps dated January 11, 2011, the Searsport Police and Fire Departments and Ambulance Service echoed the Emergency Management Director's position.

5.) Risk Management. The applicant must develop a RMP to address US EPA requirements pursuant to 40 CFR Part 68 (Chemical Accident Prevention Provisions). The RMP must be developed and approved by EPA prior to the time DCP receives its first delivery of propane and must be resubmitted to EPA every five years. The applicant indicates that he has an extensive risk management program that looks at issues such as exposure rates to regulated chemicals (e.g. propane and the odorant), worst case scenarios (e.g. fire or explosions), area receptors, and emergency response. The plan must consider effects inside and outside the fenceline of the facility. The administrative record contains a synopsis of EPA's guidance as well as representative data from a RMP for the applicant's Chesapeake, VA facility. Similar representative data is available on line for facilities throughout the country.

How is risk of a BLEVE or other catastrophic event managed/mitigated? As noted above, the key factors to consider in this case are that the tank is cryogenic (refrigerated); it is insulated; it

is not pressurized; multiple pressure relief measures will be in place to avoid a pressure build up within the tank; a fire suppression system will be in place; emergency response procedures will be in place; backup power will be provided; safety protocols backed by industry standards and federal/state/local regulations will be implemented for all elements of the facility; and security standards backed by industry and federal standards will be implemented. Although the smaller auxiliary tank on site is not refrigerated and is pressurized and therefore poses more of a potential risk of a BLEVE than the unpressurized and refrigerated primary storage tank, this risk is greatly reduced by the low gas volumes that will be maintained in the tank, pressure safety valves, and the aforementioned safety and security protocols and fire suppression system.

6.) Corps Determination. The Corps has reviewed the extensive information provided by the applicant on this issue. The facility provides for primary containment (tank with integral insulation), secondary containment (a properly sized containment berm), multiple safeguard systems, and compliance with multi-layered regulations and industry standards. The Corps notes that the applicant has entered into an agreement with the Searsport Water District to upgrade a major water line in order to serve the facility's day-to-day and emergency fire protection needs. The upgraded line will not only supply fire water for DCP, it will benefit the entire community by providing a more reliable source of fire water for the Irving and Sprague facilities as well as the town in that area. The Corps has independently consulted with US EPA and the National Fire Protection Association ("NFPA") regarding their regulations and safety/review standards in view of the safety concerns expressed by the public.

NFPA is recognized as one of the oldest and most authoritative fire and hazard safety organizations in the world. NFPA establishes consensus codes and standards, conducts research, and provides training and education. In 1938, NFPA developed the Liquefied Petroleum Gas Code or NFPA 58 which is still in use today. NFPA 58 is the American National Standard for propane storage and handling and in fact, is used worldwide. NFPA 58 has been adopted by all 50 states, as the basis for state propane safety regulations. NFPA 58 is updated regularly and the Corps has reviewed the current version of NFPA 58 which is available on line. The senior engineer at NFPA confirmed that a BLEVE of the primary storage tank is not a realistic scenario at a facility of this nature for the reasons noted above. She also confirmed that a BLEVE or other incident caused by some kind of attack is equally unrealistic. Risk of a BLEVE of the small auxiliary tank is greatly reduced by the low gas volumes that will be maintained in the tank, pressure safety valves, and the aforementioned safety and security protocols and fire suppression system. As previously noted, propane storage tanks up to this size are common at large commercial and industrial sites throughout Maine according to the US EPA. They have been managed safely for years in accordance with federal, state, and municipal guidance and regulations.is

The Corps has reviewed the comments submitted by the Searsport Emergency Management Director as well as the Fire and Police Departments and Ambulance Service that clearly demonstrate a level of preparedness capable of addressing an emergency at the facility. The Corps notes that other federal, state, and local approval processes are in place to further address the issues of risk and public safety to include those of US EPA, Maine DOT, the US Dept. of Transportation, Dept. of Homeland Security, Occupational Safety & Health Administration ("OSHA"), USCG, and the Town of Searsport. The administrative record contains a complete list of all applicable codes and standards that the proposed facility must meet and it is extensive. The Corps recognizes the expertise and responsibility of each of these agencies to administer their regulations governing the

design, construction and operation of the facility. The Corps has no reason to believe the facility will not be operated safely and in accordance with all regulatory requirements.

7.) USCG Determination. As noted in Section 4.g.12) of this document, on April 9, 2012, the USCG Captain of the Port, Sector Northern New England recommended to the Corps that the Penobscot Bay Waterway be considered suitable for LPG marine traffic. In making this determination, the Coast Guard considered information and data contained in the applicant's Letter of Intent ("LOI") and Waterway Suitability Assessment ("WSA"), and related correspondence and input from regional stakeholders. The WSA is an applicant-prepared risk-based assessment, designed to document and address all safety and security concerns related to the marine transportation of LPG as outlined in 33 CFR Part 127 and relevant parts of policy guidance contained in Navigation and Vessel Inspection Circular ("NVIC") 01-2011.

The safety risk assessment portion of the WSA evaluated the risks of an *accidental* release of LPG from a carrier, where events may be triggered by incidents such as collisions, groundings, or machinery failures, etc. The assessment was performed consistent with the Coast Guard's Risk-based Decision Guidelines (USCG 2004) and NVIC 01-2011 and like the security risk assessment, took into consideration historical data and informational exchanges with area stakeholders. For purposes of the assessment, the applicant's operations were divided into three phases – the vessel's coastal approach to the port area, transit of Penobscot Bay and docking at the Mack Point facility, and cargo discharge operations while pierside. An inventory of scenarios was developed and analyzed to determine the likelihood of occurrence and severity of risk and in turn, ascertain scalable prevention, mitigation, and response strategies necessary to counter the risks and support the proposed operation. Also included in the assessment was a "Change Analysis Study" that compared the risk parameters associated with the current port status quo against added risks consequent to the introduction of LPG carriers and the tank facility into the region; and a Safety Risk Quantitative Analysis to determine the probability of certain risks relative to threat, failure of preventative or mitigating measures, and consequences (costs and fatalities). The latter analysis indicated that the probability or likelihood of an unintentional release of LPG due to grounding, allusion, collision, or during off loading is low (less than one per 10,000 port visits); the probability of failure of preventative or mitigating measures is low; and the probability of significant loss of life and/or property beyond the confines of the vessel is low. Other consequences considered included asphyxiation, cryogenic burns and structural damage, vapor cloud explosion, rapid phase transitions (rapid heating of LPG resulting in overpressure releases), and BLEVE. For all of these consequences, the Coast Guard determined that probability was low; that effects would be localized to the immediate vicinity of the vessel; or that mitigation measures were available to minimize risk.

The LOR notes that an important consideration in assessing the suitability of the proposed transit route and approaches is establishing the size of hazard zones or Zones of Concern associated with the release of LPG from a moving or moored LPG carrier. Scientific reports by the Sandia National Laboratories[11] (for LNG) and D.W. Johnson and J.B. Cornwell[12] (for LNG, LPG, and gasoline) were referenced in order to define and determine zones of thermal radiation (for purposes of the WSA) that would be expected from an LPG fire (zones 1, 2 and 3). In summary, within all

[11] Sandia National Laboratories; *Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water*; Technical Report SAND2004-6258

[12] Johnson, D.W and Cornwell, J.B., "Modeling the Release, Spreading and Burning of LNG, LPG, and Gasoline on Water"; *Journal of Hazardous Materials*; 2006

three zones the level of risk of injury or property damage reduces as the distance from the source increases and thermal radiation decreases. An overlay of potential hazard zones associated with the movement of an LPG carrier along the intended transit route is included in the appended LOR Analysis. The Coast Guard notes that the superimposed Zones of Concern identify where zone boundaries could potentially intersect with populated areas, critical infrastructure, and areas with heavy concentrations of marine traffic, thereby highlighting areas where USCG promulgated risk-management strategies should be considered. Zones of Concern associated with an intentional breach/spill event were used to depict worst case scenarios vice the smaller zones associated with an accidental breach/spill. Corresponding risk mitigation measures are discussed in Section 4.g.12) of this document. It should be noted that the safety and security analyses, conducted in support of the LOR process do not extend beyond the waterfront marine transfer area, as defined in 33 C.F.R. 127.005.

The WSA concluded that the threat of accidental releases of LPG and/or threats of intentional interference is relatively low based on past and existing deep-draft vessel activity, the relative remoteness of the area, the substantial width and relative depth of the transit route, comparative absence of national iconic and/or critical infrastructure, and low population densities. The Coast Guard concurs with this assessment but notes that the potential still exists, albeit proportionately less for the Penobscot Bay are, for property damage and personal injury consequent to a release of LPG. Accordingly, the Captain of the Port, under authority of the Ports and Waterways Safety Act or other authorities, may require the implementation of certain safeguards and risk reduction measures aside and apart from those referenced in his LOR to the Corps. For a discussion of safety/security zones and other safeguards intended to minimize risk posed by LPG transits, refer to Section 4.g.12) of this document. The Coast Guard does note in their LOR that the LPG marine industry is well established and holds an excellent 30-year safety record. The specially designed ships used in the trade are built to the highest of regulatory standards and are operated only by specially trained, highly proficient captains and crews with competencies linked to internationally required standards. The Coast Guard acknowledged that there are risks of accidental spills from any deep draft ship; however, through continual risk identification and the implementation of robust risk mitigation measures and strategies in collaboration with regional port partners, stakeholders, and members of the Area Maritime Security Committee, these risks can be minimized without unduly compromising safety and security. The Corps acknowledges the Coast Guard's authority and subject matter expertise in making their determination and recommendation.

r. Food and fiber production: Not applicable. The project will have no effect on food and fiber production.

s. Mineral needs: Construction of the project will necessitate the use of various local mineral (fill) resources. The project will have a positive economic effect on the suppliers of those resources, but will not result in a substantial depletion of any mineral resources.

t. Considerations of property ownership: DCP has purchased or has purchase and sale agreements for sufficient land and obtained all other necessary property rights through its agreement with Sprague Energy to construct and operate the facility. Landowners adjacent to the site will experience clearing and construction related disturbance during construction. These effects will be limited to the hours between 7AM and 7PM or daylight hours, whichever is longer. Once construction is complete these impacts will cease. Some nearby landowners may experience

alterations of views resulting from changes in vegetation or lighting on the property site. They may also notice noise generated from facility operations included within the existing background noise. Noise and visual impacts will be controlled to ensure compliance with Maine DEP standards. These impacts have been mitigated to the extent practicable.

8. Other Laws, Policies and Effects.

a. Endangered Species Act ("ESA"). In a letter dated October 28, 2010, the USFWS informed the applicant that the only listed species known to occur in the project area is Atlantic salmon, a federally-endangered species under the joint jurisdiction of the USFWS and NMFS. USFWS also stated the proposed project site does not, however, occur in a watershed that has been designated as critical habitat for Atlantic salmon by NMFS. In a letter dated November 16, 2010, the NMFS provided the same determination for salmon and noted that shortnose sturgeon are known to occur in the Penobscot River. The NMFS letter also identified the Atlantic sturgeon as a species that had been proposed for listing as federally-threatened in the Gulf of Maine, with the species having been documented in the Penobscot River. NMFS has since listed the Gulf of Maine distinct population segment of Atlantic sturgeon as threatened, pursuant to Section 4 of the ESA.

In their comments during the Corps Maine General Permit review for this project, NMFS determined that the project will have no effect on federally listed endangered species. The USFWS concurred. The land-based terminal and pipeline components of the project will not affect salmon or sturgeon. The stream on the project site is not used by either species; the existing, hanging culverts under the MMAR tracks prevent upstream migration by fish species and the stream does not provide critical habitat. Furthermore, the increase of approximately six ships per year bringing LPG to the existing pier at the Mack Point Terminal is minimal when compared to the approximately 130 to 160 vessels per year that currently utilize the existing facility. There are procedures and policies in place to minimize potential impacts to endangered marine mammals, e.g. Northern Right Whale, from commercial shipping traffic as it operates within established transit routes.

b. Essential Fish Habitat ("EFH"). The Corps has consulted with the NMFS regarding the effects of the project on EFH designated under the Magnuson-Stevens Fishery Conservation and Management Act. The NMFS did not provide EFH recommendations. For the reasons described in Section 8.a, above, the project will not have an adverse impact on EFH.

c. Historic Properties. The applicant conducted a review of MHPC records to determine if historic properties that are listed on the National Register of Historic Places ("NRHP") are located within a one-mile APE from the proposed terminal. An architectural field survey of other structures greater than 50 years old was then conducted to determine if any of those properties are potentially eligible for listing on the NRHP. Four NRHP-listed properties and two other previously-surveyed properties that are contributing resources to Searsport's East Main Street Historic District were identified. In addition, 11 other properties within the APE were determined to be potentially eligible for listing on the NRHP. An Architectural Survey Report was prepared to address potential impacts to historic structures within the project's APE and was submitted to the MHPC for its review and concurrence. The only potential impacts found from the proposed project were minor visual impacts to three structures considered by the applicant to be potentially-eligible for listing.

The MHPC and Maine's Indian tribes were provided with a copy of the application by the applicant and were sent a copy of the public notice from the Corps. On August 8, 2011, the MHPC determined that the project would have no effect on properties listed or eligible for listing on the NRHP. On March 22, 2011, the THPO of the Passamaquoddy Tribe stated that there will be no impact on tribal cultural concerns from the project. On April 20, 2011 the THPO of the Penobscot Tribe concurred. No other comments were received directly from the tribes nor have they expressed concern in telephone conversations. This concludes Corps responsibility under Sec 106 of the National Historic Preservation Act.

d. Cumulative & Secondary Impacts.

1.) Secondary and Indirect Impacts. Under CEQ regulations, indirect effects are those effects "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable" 40 C.F.R. § 1508.8. Under the Section 404(b)(1) Guidelines, secondary effects are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material. 40 C.F.R. § 230.11(h).

i.) On Site. No effects of the authorized discharges of fill material are expected to occur on the site beyond the specific location of the fill, with the possible exception of very minor and temporary sedimentation or turbidity type impacts within the wetlands and stream at the time of construction.

With respect to other activities on the site, DCP does not foresee the need to expand the proposed LPG facility or construct any new facilities of its own beyond the currently proposed footprint. There is not enough room for an additional cryogenic tank that would be required for any expansion. The only foreseeable impacts that may occur are included in this analysis. In particular, the impacts from a future rail siding adjacent to the existing MMAR spur for filling rail cars for distribution in Maine are included in the impacts described previously.

ii.) Off Site. No effects of the authorized discharges of fill material are expected to occur downstream of the site (i.e. in Long Cove), with the possible exception of very minor and temporary sedimentation or turbidity type impacts as described above. These minor, temporary impacts are not expected to adversely affect resources within Long Cove.

With respect to other activities associated with the terminal, DCP does not expect alterations to the layout or function of the terminal based on fluctuations in LPG demand. The demand for propane in Maine has reportedly been increasing over the past several years, and that trend is expected to continue given the environmental benefits of burning propane versus oil or wood to generate heat, and the ongoing volatility of the price of oil.

DCP is currently a regional supplier of propane in the northeast. The applicant has no plans to expand their statewide truck fleet and their existing facilities at Auburn and Hermon cannot be expanded. One commenter expressed the concern that the Searsport tank could become a supply depot for a much broader market. The practicability of transporting propane from Searsport to locations outside of Maine is limited by (1) the cost and DOT regulations associated with transport by truck; (2) the limited existing railroad infrastructure, which is not expected to increase; and (3)

the locations outside Maine of other DCP facilities or DCP competitors which may be able to provide the product at a lower price than would be the case for distribution from Searsport. The applicant has no plans to regularly supply markets outside Maine. Transporting product from Searsport to other states could occur in response to emergency shortages, similar to the prior import of LPG into the state at the request of the Governor and to Maine's benefit in 2007. This would be a unique circumstance however. Rail and truck transport of propane to Canada from Searsport are not planned or envisioned.

Existing distribution routes by both truck and rail will change as a result of the project. The distribution of trucking routes will change with the source point; i.e., some of the LPG trucks that are currently filled elsewhere will be filled at the terminal's truck load-out station and then transport their product to various distribution points in Maine. Many such trucks currently travel through Searsport from locations in Hermon and Auburn, but will now load in Searsport and travel to the smaller, existing storage and distribution terminals. DCP is not aware of any current rail traffic carrying propane through Searsport; therefore, distribution by rail from Searsport will also represent a change in rail distribution.

As noted, DCP's truck fleet is not expected to increase in size; and, in fact, may decrease to the extent it is displaced by future distribution by rail. This would be an environmental benefit. In general, truck traffic in and out of Mack Point will increase, but, given the current amount of truck and other traffic through Mack Point and Searsport, the Maine DOT does not consider the projected increase to be meaningful and does not believe it will result in additional congestion or damage to local roads. The existing terminals on Mack Point operate 24 hours a day, seven days per week, as will DCP. The majority of the DCP traffic will occur during the winter months when traffic volumes are lowest on Route 1. As is the case with the amount of overall truck traffic currently calling at Mack Point, the amount of new nighttime traffic at DCP is expected to be a fraction of the total current traffic.

Distribution of propane by rail from Searsport will represent a potential increase in rail traffic entering and leaving Mack Point, but will not require an increase in rail infrastructure other than DCP's rail siding on Mack Point. However, the amount of existing rail traffic at Mack Point exceeds by a considerable margin that which would be added by DCP.

Finally, the amount of vessel traffic that will call at Mack Point to deliver LPG, four to six vessels per year, will represent a small fraction (approximately 5 percent) of the commercial vessel traffic that already calls at Mack Point. The vessels will be subject to regulation under applicable laws and requirements designed to protect the marine environment, as described above.

iii.) Coastal Islands. Several letters were received from residents or individuals representing the interests of Islesboro and North Haven. At its closest point, Islesboro is located approximately four miles southeast of Mack Point. North Haven is approximately five miles further southeast and approximately 18 miles away from Mack Point at its closest point. However, both islands are situated adjacent to established transit lanes in Penobscot Bay (Refer to Figure 1, Page 15), Islesboro with a lane on both sides of the island; North Haven with a lane along the west side of the island.

It is possible that even four miles away, Islesboro residents along the western shore of the island may be able to identify the new tank adjacent to the existing tanks and other industrial activity at Mack Point. It is equally possible that a discerning eye could notice a change in the night time lighting pattern on Mack Point. However, as previously noted in Section 7 c & d of this document the visual impact of the new tank facility, by day or night, from that distance is unlikely to be substantial compared to the existing industrial development and use on Mack Point. North Haven residents are unlikely to be able to discern a difference at 18+ miles away. The more likely visual effect for both islands will be the addition of LPG carriers to the mix of commercial deep draft vessels that currently ply Penobscot Bay and the established transit lanes. As previously noted however, LPG carriers are expected to be similar in size to many of the vessels currently transiting the bay and the addition of four to eight LPG vessels per year is comparatively very minimal. Navigation to/from and around the islands has been addressed and is expected to be minimally affected by the proposed LPG facility. Fishing and recreational boating opportunities are expected to remain largely unchanged. Safety and security risks as LPG carriers transit past the islands have been addressed and are considered low. Coastal shorefront property values are not likely to be affected by the LPG facility, particularly if the only change affecting the islands is a very minor increase in vessel traffic a few times a year during winter months. Finally, it is unlikely that tourism on the islands will be adversely affected. LPG carriers will be present primarily during winter months when tourists and many seasonal coastal property owners have left for the season.

2.) Cumulative Impacts. The CEQ regulations define "cumulative impact" as "the impact on the environment which results from incremental impact of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency (federal or non-federal) or person undertakes such other actions" 40 C.F.R. § 1508.7. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Id. The Section 404(b)(1) Guidelines define cumulative impacts as the changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual discharges of dredged or fill material. 40 C.F.R. § 230.11(g).

i.) Geographical scope of analysis. The geographic scope of the cumulative impacts analysis is the Long Cove Brook watershed plus the entirety of Mack Point (the "Cumulative Effects Watershed" or "Watershed"). The geographic scope is based on the location of the project site on Mack Point, the on-site aquatic resources that will be affected, and the fact that these affected resources flow into the tidal areas on the western side of Long Cove which is the receiving waters for Long Cove Brook. The Watershed is approximately 4 miles long north-south and 1.4 miles wide east-west and covers a total area of 4.58 square miles (2,900 acres). Long Cove Brook essentially flows down the center of the Watershed and discharges into the west side of Long Cove.

ii.) Mack Point impacts. The direct, indirect and secondary effects of the proposed action on the aquatic resources are described in Sections 6.f.2), and 8.d.1), above.

The Corps Omobil Regulatory Module database ("ORM") indicates that eight permit actions have been taken on Mack Point since 1992. Three of these were dredge projects; two involved the installation or repair of mooring dolphins; one involved the installation of a water line; and two involved wetland fill. Both fill projects were affiliated with the Sprague/Maine DOT cargo terminal facility and total 1.11 acres. Combined with the impacts proposed by DCP, the total

cumulative wetland impact on Mack Point will be 3.08 acres. The previous wetland impacts were fully compensated with on site wetland restoration/creation.

Approximately 260 acres on Mack Point have been zoned for industrial development, which currently contain the Sprague Energy and Irving Oil Terminals (the "Mack Point Terminal") and is served by the MMAR. This Industrial Zone encompasses approximately nine percent of the Watershed. DCP indicates that approximately 79 percent of the portion of Mack Point that could be used for industrial development is either currently developed or otherwise unavailable for such development. Of the 21 percent that remains potentially available for industrial development, the DCP project will utilize approximately 9 percent, leaving 12 percent potentially available for future industrial use. Available resource information, including previous NEPA documents, indicates that the remaining undeveloped parcels on Mack Point are a mix of wooded and open areas containing both uplands and wetlands. Full build out of Mack Point has been encouraged for years in the form of local zoning and planning, efforts by Maine DOT and the Maine Port Authority, recommendations from environmental groups, and the recommendations found in the 2007 Sears Island Consensus Agreement. Some of this future build out, like the DCP proposal, is likely to require Corps permits. The Corps will continue to evaluate any future development proposals cumulatively against the impacts of this project and other work that has occurred at Mack Point.

iii.) Federal actions in the Watershed. The Corps is considering maintenance and improvement dredging of the Searsport Harbor FNP (Refer to Figure 3, Page 59). A Congressional Resolution passed in 2000 at the request of Maine DOT called for a study of Searsport Harbor with a view towards deepening the existing 35-deep channel in support of existing port activities at the state and private terminal facilities at Mack Point. The Corps performed a reconnaissance study in 2004 and executed a cost sharing agreement with Maine DOT in 2005. Work on the more comprehensive study began in 2006 and a draft feasibility report including project costs, economic benefits and environmental assessment is expected in 2012. The project includes maintenance and improvement dredging of the existing channel to -40' mean low water as shown on Figure 2. An estimated 930,000 cubic yards of sand, gravel, glacial till, and clay would be removed. Implementation of the project would require Congressional authorization and state cost sharing. It would be 2014 at the earliest before the Corps would perform any dredging, assuming Congressional authorization and funding and state permits can be obtained.

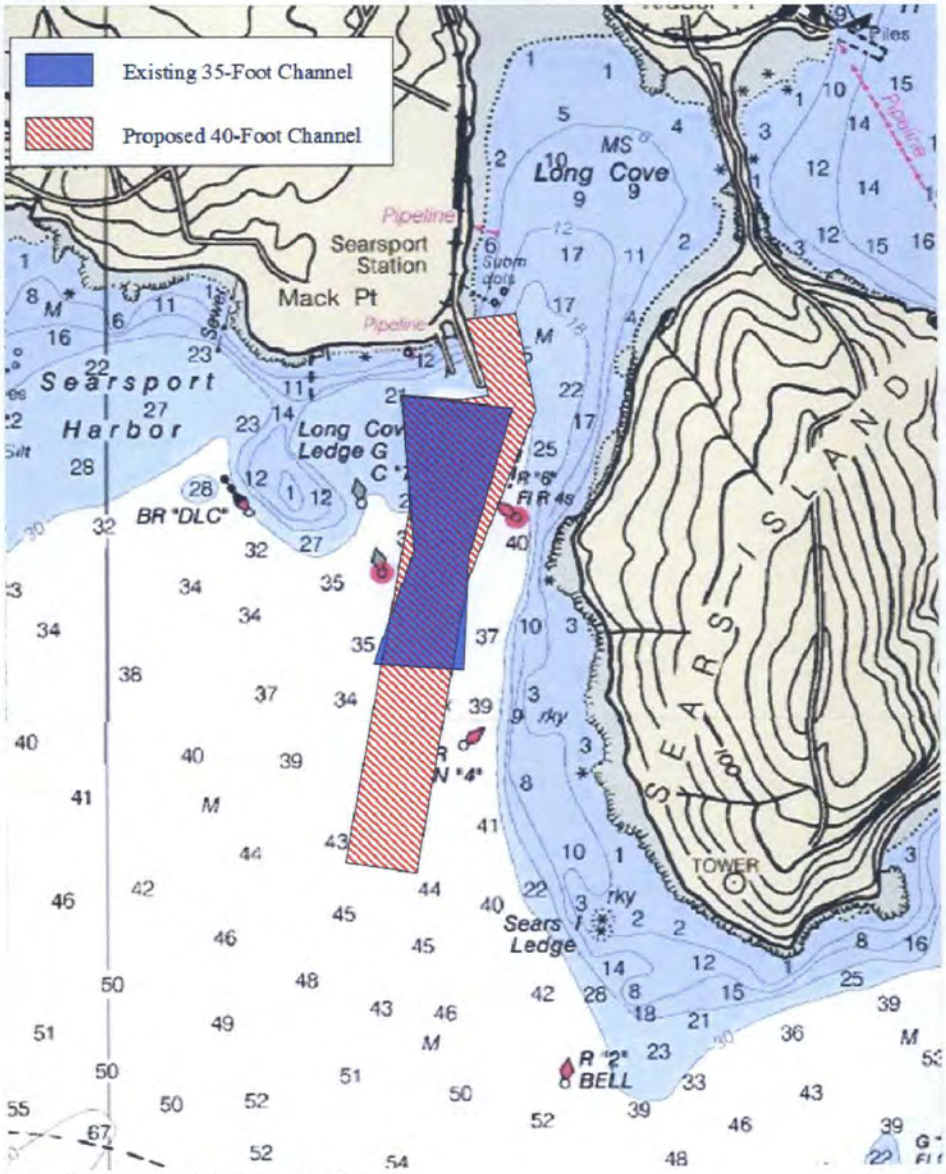


Figure 3; Searsport Harbor FNP

The Corps ORM database was further consulted for other Corps permit actions in the general project area. A precise watershed based search was not possible. Random search radii of 1.5 miles, 5 miles, 10 miles and 15 miles from the DCP site were selected. The 1.5-mile radius encompasses downtown Searsport and at least the west side of Sears Island. The 5-mile radius encompasses Belfast and Islesboro, where some public comment originated. The 10-mile radius encompasses more of Islesboro as well as Lincolnville, were public comment also originated. The 15-mile radius extends almost out to the island of North Haven. The table below summarizes the number of Corps permit actions on record for each radius.

Radius from DCP	1.5-miles	5-miles	10-miles	15-miles
Total Corps Permit Actions	20	136	346	405

Final action dates range from the mid-1980s to present. Most of the above Corps permit actions have been for piers, moorings, floats, aquaculture projects, and similar structures along area waterways and for minor transportation related or commercial and residential fills. The majority of these projects were of small to moderate scale that are scattered around the communities with no relationship to the proposed project. Virtually all of these actions had minimal individual impact to aquatic resources and were eligible for nationwide or general permits. The Corps has determined that the cumulative effect of these projects to aquatic resources has been minimal due to their small individual size, their widely distributed locations, the length of time between actions, and case-by-case avoidance and minimization measures. Future development proposals in this region will continue to be evaluated on a case-by-case basis by the Corps and our interagency review team in order to assess their individual and cumulative impact relative to the proposed project and any mitigation requirements.

iv.) Other Potential Impacts in Watershed. Approximately 87 percent of the land in the Watershed northward of Route 1 (or 75 percent of the entire Watershed) is undeveloped forest land that is zoned by the Town of Searsport as either Residential or Rural Agricultural. Several transmission lines, telephone line or pipeline corridors cross this area. Although not quantified, since the linear nature of these transportation corridors is generally across the incised drainage courses/wetlands rather than parallel to them, the orientation of these corridors has inherently minimized historic impacts to aquatic resources within the Watershed. Housing unit density is sparser here than throughout other parts of Town.

Long Cove Brook, the primary stream traversing the length of the Watershed, receives flow north of Route 1 from several unnamed second order intermittent and perennial tributaries. These tributaries are most abundant on the east side of the Watershed where drainage originates from forested wetlands surrounded by undeveloped upland forests. Approximately 7.7 miles of streams are shown within the Watershed on the USGS 7.5 minute quadrangle base map used to show the extent of the Watershed. Since second and lesser order streams and brooks are often not identified on USGS topographic mapping, it can be assumed that there are substantially more than 7.7 miles of streams within the Watershed. For example, the on-site stream that will be affected is not shown on USGS mapping.

One indicator of the potential presence of wetlands within an area is the presence of hydric soils. In Maine, based on soils mapping by the USDA Natural Resources Conservation Service (NRCS), approximately 32 percent of the state's land area is mapped as hydric soils (Widoff, 1988). Similarly, field delineation experience has shown that, on average, approximately 30 percent of the land area in Maine is wetland. The applicant has provided information that shows, approximately 600 acres of land are mapped as hydric soils within the Watershed, which comprises approximately 21 percent of the Watershed. This relatively lower percentage of hydric soils could be explained by the incised topography of the area, which results in relatively steep banks and relatively fewer opportunities for wetlands to form. Accordingly, the 600 acres of hydric soils provides a reasonable approximation of the acreage of wetlands within the watershed. Due to the relative lack of development and extensive wooded conditions throughout most of the Watershed, existing wetland and waterway impacts appear to be largely confined to the immediate Route 1 corridor.

Existing limited land uses in the remainder of the watershed are expected to continue. On-going forestry and agricultural activities have the potential to contribute to sedimentation in area

streams unless BMPs are implemented. These activities are for the most part exempt from Corps permit requirements. Slow growth in residential development may occur, leading to potential stream or wetland crossings or other wetland fills. Properly designed and installed stream and wetland crossings can minimize potential short-term, long-term, and cumulative impact to stream biota and habitat connectivity. Continued maintenance of utility corridors is likely but this usually is limited to vegetative management within previously cut over areas with little additional impact to aquatic resources so long as BMPs like stream buffers are followed. The Corps notes that in 2010, 456 acres of mixed upland and wetland forest within the Watershed were deeded over to the Coastal Mountains Land Trust by Central Maine Power Company as partial mitigation for their MPRP project (Corps File No. NAE-2008-03017). Although this is the land trust's only Searsport holding, the trust's other holdings total 9,129 acres and extend from Rockport to Prospect. It is common for single holdings, like the one in the Watershed, to act as an anchor for future acquisitions. Expanding the conservation lands within the Watershed will help minimize potential secondary and cumulative impact to aquatic resources.

v.) Other Actions, Non-federal. DCP provided data obtained from the 2010 and 2011 Searsport Town Reports that indicate that that less than six Planning Board or Code Enforcement Officer permit actions are, on average, processed annually within the Watershed. This average reflects a relatively low level of development within the Watershed. While this analysis does not directly indicate the number of activities which resulted in impacts subject to Corps jurisdiction, it provides a further indication that current and future activities that may impact freshwater wetlands and streams in the Watershed can be expected to be minimal. This expectation is supported by information received by the applicant from Maine DEP that indicates that no Maine DEP permits issued within this same two-year period resulted in impacts to resources of concern in the Watershed. As noted in Section 7.f. of this document, Maine DOT is studying transportation improvements along a 1.83 mile section of Route 1 through downtown Searsport. These improvements are likely to have minimal impact to aquatic resources and may include culvert replacements/rehabilitations, drainage improvements, and small areas of wetland fill.

vi.) Corps Determination. The Corps has determined that the cumulative impact of the past and future federal and non-federal impacts plus the small impacts associated with the DCP project do not constitute an unacceptable loss of resource functions and values.

vii.) NEPA reviews. As previously noted, a number of NEPA documents have been prepared in the past for work in the general project area. They are largely focused on the cumulative impact of port development which is a scale of project substantially larger than the DCP project. However, they are a reference that has been available to the Corps in the review of the DCP proposal.

e. State Water Quality Certification under Section 401 of the Clean Water Act. The State water quality certification was issued on October 24, 2011, along with Maine DEP's Site Law and NRPA permits.

f. Coastal Zone Management consistency/permit. As mentioned above, the Maine DEP Site Law and NRPA permits were issued on October 24, 2011. The Maine Air Emission License was issued on October 27, 2011. In accordance with the Maine Coastal Program, acquisition of all

required permits from the Maine DEP constitutes compliance with the Coastal Zone Management Act.

g. Other authorizations. As noted, the Maine Air Emission License was issued on October 27, 2011. The Maine DOT issued a Driveway/Entrance Permit for the terminal exit road on Route 1 on June 9, 2011. DCP must still obtain a building permit from the town; an approval from OSHA; a Risk Management Plan approval from the US EPA; and certification from the Maine DOT and U.S. DOT. DCP cannot apply for the permits required from the Town of Searsport until all Maine DEP and Corps permits are received.

h. Significant Issues of Overriding National Importance. None.

9. Compensation and other mitigation actions.

a. **Compensatory Mitigation**

1.) Is compensatory mitigation required? Yes

2.) Is the impact in the service area of an approved mitigation bank? Yes but it is a statewide bank operated by Maine DOT for their own use. Much of Sears Island has been "deposited" into this statewide bank. The bank is not available for private use.

i.) Does the mitigation bank have appropriate number and resource type of credits available? NA

3.) Is the impact in the service area of an approved in-lieu fee ("ILF") program? Yes

i.) Does the ILF program have appropriate number and resource type of credits available? Yes. Maine's ILF program is in its third year of operation. Numerous projects in bio-physical regions throughout the state have been awarded ILF funds.

4.) Check the selected compensatory mitigation option(s):
_____ mitigation bank credits
__X__ in-lieu fee program credits
__X__ permittee-responsible mitigation under a watershed approach
_____ permittee-responsible mitigation, on-site and in-kind
_____ permittee-responsible mitigation, off-site and out-of-kind

5.) If a selected compensatory mitigation option deviates from the order of the options presented in §332.3(b)(2)-(6), explain why the selected compensatory mitigation option is environmentally preferable. Address the criteria provided in §332.3(a)(1) (i.e., the likelihood for ecological success and sustainability, the location of the compensation site relative to the impact site and their significance within the watershed, and the costs of the compensatory mitigation project):

The proposed mitigation followed the required sequence of avoidance, minimization, and mitigation. The applicant conducted a comprehensive alternatives analysis of numerous alternative

sites other than Mack Point, alternative locations on Mack Point, reducing the size of the proposed terminal, and variations in the terminal and transfer pipeline layout to reduce impacts to the extent practicable. Measures that resulted in the reduction of potential wetland impacts included utilization of an existing pier that requires no alterations other than the attachment of the pipeline that will transfer liquid propane from the ships to the bulk storage tank. No new construction or disturbance below the high tide line will occur. No new dredging of the existing channel is required. These measures resulted in the total avoidance of new impacts to the marine environment. No other location in Maine has been identified that would also meet the siting criteria for use of industrially-zoned land that is currently affected by similar uses and is also served by major highway and railroad connections.

Additionally, the iterative process for determining the proposed transfer pipeline alignment avoided any impacts to tidal resources and eventually resulted in an alignment that has no freshwater wetland impacts due only to the pipeline itself. DCP purchased additional land that allows for the elimination of direct impacts to approximately 210 feet of stream and associated wetlands, and reconfigured the facility entrance and exit drives in a manner that minimizes wetland impacts on the corner lot. Multiple attempts to reconfigure other facility components, including the size and number of tanks used for LPG bulk storage, did not result in further reduction of impacts given the conflicting parameters of available land; economic viability; and operational, safety and security requirements. As a result, impacts to these freshwater resources are unavoidable.

The proposed compensatory mitigation has been developed in accordance with current Corps and Maine DEP guidance that favor the use of in-lieu fee above other options. The Maine In-Lieu Fee Compensation Program was established in 2008 through an agreement signed by the Corps, Maine DEP and the Maine Chapter of The Nature Conservancy. The in-lieu fee amount of $305,835 complies with DEP and Corps ILF guidance and addresses the direct and indirect freshwater wetland impacts of the project.

The portions of the affected on-site stream segment that will be relocated and/or placed in a culvert have been designed to avoid erosive flows, erosion and sedimentation of downstream resources. The additional culvert replacement project will provide off-site, in kind mitigation for a stream also located in the Long Cove watershed that has far more potential to provide desirable functions and values, most importantly habitat for freshwater and anadromous fish species, than the affected stream that is much shorter with much lower flows and has a hanging culvert that prevents upstream migration of fish. The new culvert will also resolve an existing erosion problem caused when high stream flows overtop the existing culvert and road, as evidenced by direct observation by the applicant of this high flow condition and the resultant erosion of the road bed. The existing culvert is too small, poorly installed and partially plugged.

The Corps and federal resource agencies concur that the applicant has satisfied section 230.10(b) of the 404(b)(1) Guidelines and that all appropriate and practicable steps have been taken to minimize the adverse environmental impacts.

6.) Other Mitigative Actions. BMPs will be implemented to minimize impacts on aquatic resources during construction. These include: minimization of the extent and duration of soil disturbance, implementation of temporary erosion control measures and final stabilization of exposed soils remaining after construction using rock or vegetation, as detailed in the Erosion

Control Plan. The applicant will also implement the Stormwater Management Plan that will ensure the site remains stable after construction and will capture and treat runoff prior to its discharge to Long Cove. These plans were provided in the applicant's state and federal application materials and reflect the applicant's overall goal of avoiding and minimizing environmental impacts.

10. General evaluation criteria under the public interest review. We considered the following within this document:

a. The relative extent of the public and private need for the proposed structure or work. The overall project purpose is to construct and operate an LPG marine import, storage, and distribution facility in order to increase the stability and reliability of liquid propane supplies to serve the Maine LPG market. The project benefits the local and state economy as well as the applicant but there is benefit as a whole to Maine's existing and future propane customers.

b. Are there unresolved conflicts as to resource use? If so, are there reasonable and practicable alternative locations and/or methods to accomplish the objectives of the proposed action? Refer to Section 5; Alternatives Analysis.

c. The extent and permanence of the beneficial and/or detrimental effects, which the proposed work is likely to have on the public, and private uses to which the area is suited: Refer to Section 7; Public Interest Review.

11. Determinations.

a. Section 176(c) of the Clean Air Act General Conformity Rule Review: The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed *de minimis* levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

b. **Relevant Presidential Executive Orders ("EO").**

1.) EO 13175, Consultation with Indian Tribes, Alaska Natives, and Native Hawaiians. This action has no substantial direct effect on Maine's Indian tribes.

2.) EO 11988, Floodplain Management. The effects of the proposed activity on floodplains were considered in part 7. No impact is foreseen.

3.) EO 12898, Environmental Justice. In accordance with Title III of the Civil Right Act of 1964 and Executive Order 12898, it has been determined that the project would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin nor would it have a disproportionate effect on minority or low-income communities.

4.) EO 13112, Invasive Species. The evaluation above included invasive species

concerns in the analysis of impacts at the project site and associated compensatory mitigation projects. Through special conditions, the permittee will be required to control the introduction and spread of exotic species.

5.) EO 13212 and 13302, Energy Supply and Availability. The review was expedited and/or other actions were taken to the extent permitted by law and regulation to accelerate completion of this energy-related project while maintaining safety, public health, and environmental protections.

c. Finding of No Significant Impact ("FONSI"). I find that based on the evaluation of environmental effects discussed in this document, the decision on this application is not a major federal action significantly affecting the quality of the human environment. Under the Council on Environmental Quality ("CEQ") NEPA regulations, "NEPA significance" is a concept dependent upon context and intensity (40 C.F.R. § 1508.27). When considering a site-specific action like the proposed propane storage and off loading facility, significance is measured by the impacts felt at a local scale, as opposed to a regional or nationwide context. The CEQ regulations identify a number of factors to measure the intensity of impact. These factors are discussed below, and none are implicated here to warrant a finding of NEPA significance. A review of these NEPA "intensity" factors reveals that the proposed action would not result in a significant impact—neither beneficial nor detrimental--to the human environment. Hence, an environmental impact statement is not required.

1.) Impacts on public health or safety: Safety has been one of the central issues of concern raised by members of the public, and a subject that has received extensive attention in the Corps review of the project. Based on the nature of LPG and the low pressure, refrigerated design of the storage tank and the numerous design and operational safety requirements, it is almost impossible to conceive that a catastrophic explosion, or BLEVE, could occur from the LPG storage tank at the facility. As to fires occurring from accidental releases of LPG, the various design, operational, and risk management requirements from the various state and federal agencies will ensure minimal risk of impacts to the Searsport community. Local emergency officials have indicated confidence in their ability to deal with safety concerns in the event of accidents requiring emergency response. There are not expected to be impacts to public health or safety from operation of the proposed facility.

2.) Unique characteristics: The proposed project conforms to the existing uses and facilities at Mack Point as well as local zoning - this is an industrial project adjacent to an existing waterfront industrial facility. The impacts to waters of the United States are discussed above, and do not constitute a significant impact. There are no designated parklands, wild and scenic rivers, or prime farmlands impacted. The permit has been conditioned to further minimize the project's short-term, long-term, and cumulative impacts, and there are no unique characteristics that will be impacted by the proposed facility.

3.) Controversy: The concept of "controversy" in NEPA significance analysis is not simply whether there is opposition to the proposal, but whether there is a substantial technical or scientific dispute over the degree of the effects on the human environment. Here, there are no objections from federal or state resource agencies regarding the Corps assessment of the environmental impacts of the project. Similarly, none of the federal and state agencies tasked with

reviewing the design, operation, and risk management requirements of the proposed facility indicated any objection regarding the safety of the proposal, nor have the state and local emergency response agencies objected. To the extent there have been concerns raised about a catastrophic "BLEVE" event, agencies and entities with experience and expertise have indicated that this is not a credible concern for a facility of this design, and no one with technical expertise has suggested the contrary. One individual, Dr. James Fay, raised concerns regarding the analysis of potential fires from accidental release, suggesting a review methodology similar to how USEPA's Risk Management Program will require "worst-case" release analysis, thus, the analysis he has suggested will take place in that context. As to the economic impacts of the facility, the Corps is not aware of any analysis of the facts of this project by individuals with technical expertise that has reached a conclusion that there are likely to be significant economic impacts. The most that has been stated have been questions of the possibility of such impacts, while numerous examples from other locations are cited to show that such impacts are unlikely. As such, this project does not represent a NEPA "controversy."

4.) Uncertain impacts: The impacts of the proposed project are not uncertain. The wetland fill activities and minor rerouting of a stream are no different than many past projects that have occurred and have been reviewed and monitored by the Corps in New England. As to the impacts from the operation of the facility, the operation of an industrial fuel transfer facility and its attendant impacts (vehicle traffic, noise, etc.) are readily understood from many such similar facilities, including at Mack Point, already in existence. Likewise, the impacts of an LPG facility of this size and scale are not unknown; there are similar facilities in operation across the country. The applicant and others have prepared visual impact assessments that show what the facility will look like in the Searsport environment. There is very little uncertainty surrounding the impacts of this facility.

5.) Precedent for future actions: The decision here is based upon the facts of the proposed project, and does not set precedent for future Corps permit decisions, which, like this decision, will be based upon their own merits and their own facts.

6.) Cumulative significance: As discussed above, to the extent that other actions are expected to be related to project as proposed, these actions will provide little measurable cumulative impact, certainly not to the level of NEPA significance.

7.) Historic resources: The SHPO and THPOs have agreed with the Corps's conclusion that there will not be adverse impacts upon properties listed or eligible for listing on the National Register of Historic Places. There are no archaeological resources expected to be impacted by construction of the facility.

8.) Endangered species: The Corps concluded, and USFWS and NMFS agreed, that the project is unlikely to affect species or critical habitat of species listed under the Endangered Species Act.

9.) Potential violation of state or federal law: This action, if permitted by the Corps, would not violate federal law, and as evidenced by the issuance of state permits and water quality certification, does not violate state law.

d. Compliance with 404(b)(1) guidelines.

Having completed the evaluation in paragraph 6, I have determined that the proposed discharge __X__ complies/_____ does not comply with the 404(b)(1) guidelines.

e. Public Interest Determination: I have considered all factors relevant to this proposal including cumulative effects. Potential factors included conservation, economics, esthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people. After weighing favorable and unfavorable effects as discussed in this document, I find that this project is not contrary to the public interest and that a Department of the Army permit should be issued.

f. Special Conditions and Rationale for Inclusion.

1.) All conditions included in the Section 401 State Water Quality Certification are referenced by condition in the Corps permit.

2.) The following special conditions will be included in the permit to ensure the project is not contrary to the public interest [33 CFR 320.4(r)], to ensure the project complies with the Section 404(b)(1) Guidelines [40 CFR 230.10(d)], to meet requirements for compensatory mitigation for losses of aquatic resources [33 CFR 320.4(r)(2)], and/or at the permittee's request [33 CFR 325.4(b)]:

1. The permittee shall ensure that a copy of this permit is at the work site (and the project office) authorized by this permit whenever work is being performed, and that all personnel with operational control of the site ensure that all appropriate personnel performing work are fully aware of its terms and conditions. The entire permit shall be made a part of any and all contracts and sub-contracts for work that affects areas of Corps jurisdiction at the site of the work authorized by this permit. This shall be achieved by including the entire permit in the specifications for work. The term "entire permit" means this permit (including its drawings, plans, appendices and other attachments) and also includes permit modifications.

If the permit is issued after the construction specifications, but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions contained within the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps jurisdiction.

2. This authorization requires you to 1) notify us before beginning work so we may inspect the project, and 2) submit a Compliance Certification Form. You must complete and return the enclosed Work Start Notification Form(s) to this office at least two weeks before the anticipated starting date. You must complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work and any required mitigation (but not mitigation monitoring, which requires separate submittals).

3. Adequate sedimentation and erosion control devices, such as geo-textile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

4. The permittee shall implement all terms and conditions contained in water quality certifications from the Maine Dept. of Environmental Protection. Copies of all required submittals shall also be provided to the Corps.
5. No temporary fill (e.g., access roads, cofferdams) may be placed in waters or wetlands unless specifically authorized by this permit. If temporary fill is used, it shall be disposed of at an upland site and suitably contained to prevent its subsequent erosion into a water of the U.S., and the area shall be restored to its original contours (but not higher) and character upon completion of the project. During use, such temporary fill must be stabilized to prevent erosion or, in the case fill placed in flowing water (rivers or streams), clean washed stone should be used.

6. Except where stated otherwise, reports, drawings, correspondence and any other submittals required by this permit shall be marked with the words "Permit No. NAE-2010-02347" and shall be submitted via: a) MAIL: PATS Branch - Regulatory Division, Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751, or b) FAX: (978) 318-8303. Documents which are not marked and addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit.

7. Mitigation shall consist of payment of $305,835.00 to the Natural Resource Mitigation Fund. The completed ILF Project Data Worksheet which must be mailed with a cashier's check or bank draft, made out to "Treasurer, State of Maine", with the permit number noted on the check. The check and worksheet should be mailed to: ME DEP, Attn: ILF Program Administrator, State House Station 17, Augusta, ME 04333. **No project construction may begin until the permittee provides the Corps with a copy of the check, with the permit number noted on the check.** The ILF amount is only valid for a period of one year from the date on the authorization letter. After that time, the project would need to be reevaluated and a new amount determined.

8. To meet state requirements for compensatory mitigation for stream impacts, the permittee shall replace an existing deteriorated and restrictive concrete culvert on Long Cove Brook, beneath Old County Road, at Searsport, Maine. The existing undersized and hanging culvert will be replaced with a natural bottom arch, approximately 10' wide and 3.5' high as shown on the attached plans entitled "DCP Searsport, LLC" in two sheets dated "2/29/2012". Final plans and a construction schedule confirming that the replacement culvert meets or exceeds the Category 1 specifications of the Department of the Army Maine General Permit General listed on page 12-14 (condition 22) shall be provided to the Corps prior to any construction at the development site (reference http://www.nae.usace.army.mil/Regulatory/SGP/ME_GP.pdf).

9. Your responsibility to complete the required compensatory mitigation as set forth in Special Condition 8 will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the Corps of Engineers. The term "mitigation success" means success as defined in the mitigation plan this permit requires you to implement.

10. Invasive Species Control.

a. The introduction, spread, or the increased risk of invasion of non-native invasive plant or animal species on the project site, into new or disturbed areas, or areas adjacent to the project site caused by the site work is prohibited and shall be managed in accordance with the attached Invasive Species Control Plan (ISCP) titled, "Invasive Plant Species Control Plan" and dated "March 9, 2012". Small patches must be eliminated during the entire monitoring period; large patches must be aggressively treated in accordance with the submitted ISCP and the treatment documented. A summary of the invasive species control and supporting photographic documentation shall be completed and submitted to the NAE Regulatory Division no later than December 15 of each year being monitored. Failure to perform the monitoring and submit the report constitutes permit non-compliance. A self-certification form will be completed, signed as the transmittal coversheet for each annual summary, and shall indicate the permit number and the reporting year (i.e first year, second year).

b. Prior to being on the construction site, the contractor shall thoroughly inspect and remove seeds, plant material, soil, mud, insects, and other invertebrates on all equipment, including construction mats, to be used on the project site to prohibit introduction of invasive organisms. At a minimum, the following shall be inspected and cleaned on terrestrial vehicles where applicable:

- ***Rubber Tired Vehicles*** - Crevices in upper surface and panels, tires, rims, and fender wells, spare tire mounting area, bumpers, front and rear quarter panels, around and behind grills, bottom of radiator vent

openings, brake mechanisms, transmission, stabilizer bar, shock absorbers, front and rear axles, beds, suspension units, exhaust systems, light casings, and mirrors.

- ***Tracked Land Vehicles*** - Crevices in upper surface and panels, top of axles and tensioners, support rollers, between rubber or gridded areas, beneath fenders, hatches, under casings, and grills.

- ***Interiors of All Vehicles*** - Beneath seats, beneath floor mats, upholstery, beneath foot pedals, inside folds of gear shift cover.

11. In consultation with the US Coast Guard, Sector Northern New England, the permittee shall develop a Transit Management Plan ("TMP") that clearly outlines the roles, responsibilities, and specific procedures for the LPG carrier, the LPG terminal, and all federal, state, and local stakeholders with responsibilities related to the proposed project and/or whose jurisdiction may reasonably be expected to be impacted by a potential navigation safety accident or terrorist attack. The TMP should be comprehensive and address at a minimum, tug operations, and safe operating parameters and environmental constraints. A copy of the TMP and verification of its approval by the Coast Guard's shall be submitted to Corps prior to gas delivery. The TMP should be submitted to: US Army Corps of Engineers, Maine Project Office, 675 Western Avenue #3, Manchester, Maine 04351.

PREPARED BY:

Jay L. Clement Date: 5/3/12
Jay L. Clement
Senior Project Manager

REVIEWED BY:

Date 5/3/12
Frank J. Del Giudice
Chief, Permits & Enforcement Branch

Date 5/3/12
Jennifer L. McCarthy
Chief, Regulatory Division

APPROVED BY:

Date 3 May 12
Charles P. Samaris
COL, EN
Commanding

U.S. Department of Homeland Security

United States Coast Guard

Commander
United States Coast Guard
Sector Northern New England

259 High Street
Portland, ME 04106
Staff Symbol: Command
Phone: (207) 767-0320
Fax: (207) 767-0308

16611

APR 9 2012

Mr. Jay Clement
Senior Project Officer
Maine Project Office
U.S. Army Corps of Engineers
675 Western Avenue #3
Manchester, ME 04351

Dear Mr. Clement,

This Letter of Recommendation (LOR) is issued pursuant to 33 CFR 127.009 in response to the Letter of Intent (LOI) submitted by KSEAS, LLC on behalf of DCP Searsport, LLC on January 17, 2011, proposing to transport liquefied petroleum gas (LPG) by ship to the DCP Searsport Marine Terminal proposed for construction and operation at the Mack Point Intermodal Cargo Terminal, in Searsport, Maine. It conveys the Coast Guard's recommendation on the suitability of the Penobscot Bay Waterway for LPG marine traffic as it relates to safety and security.

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

On December 30, 2011, I completed a review of the WSA for the DCP Searsport Marine Terminal submitted by KSEAS, LLC on June 7, 2011. This review was conducted following guidance (in part) contained in U.S. Coast Guard Navigation and Vessel Inspection Circular (NVIC) 01-2011, *Guidance related to Waterfront Liquefied Natural Gas (LNG Facilities)* dated January 24, 2011. Although NVIC 01-2011 is intended as guidance related to the review and assessment of proposed liquefied natural gas (LNG) facilities, the document also contains guidance of a general nature and risk assessment methodologies that I deemed equally applicable to this LPG proposal. The material was found beneficial to the applicant during the developmental stages of the WSA and equally useful during the Coast Guard's validation process of the same.

My review focused on the navigation safety and maritime security aspects of LPG vessel transits along the affected waterway. My analysis included an assessment of the risks posed by these transits and possible risk mitigation measures that could be imposed, if a permit is ultimately issued by your agency. During the review, I consulted a variety of stakeholders, including members from the Penobscot /Frenchmen Bay Regional Sub-Committee of the Area Maritime Security (AMS) Committee, State and local officials, and relevant members of regional law enforcement and response agencies.

This recommendation is provided to assist you in your determination of whether the proposed facility should be permitted. The enclosed LOR Analysis contains a detailed summary of the WSA review process that has guided this recommendation as well as a number of port management strategies and risk mitigation measures that would improve the safety and security of the waterway for LPG marine traffic. These port management plans and risk mitigation measures are recommended tools intended to enhance maritime safety and security and manage competing waterway priorities; they should not be construed as specific *conditions* of my LOR.

Please note that under my authority and responsibility as Captain of the Port (COTP) and Federal Maritime Security Coordinator (FMSC) I am obligated to analyze, and mitigate as necessary, all matters affecting navigational safety and maritime security associated with all ports and navigable waterways within my area of responsibility, including the Penobscot Bay waterway. I will continue to assess this waterway and port area to determine those safety and security measures necessary to safeguard vessel traffic, the public's health and welfare, regional infrastructure and marine environment. I may, from time to time, issue orders to control vessel movements and protect the waterway and marine environment, pursuant to my authority under the Ports and Waterways Safety Act (PWSA) of 1972 (33 U.S.C.§1221 et. seq.), among other authorities. These orders may well be separate and apart from the Waterway Suitability Assessment and/or Letter of Recommendation processes specified in 33 CFR Part 127.

If you have any questions, my point of contact is Mr. Alan Moore. He may be reached at the address listed above, or phone (207) 767-0338, or e-mail: Alan.H.Moore2@uscg.mil.

Sincerely,

C. L. ROBERGE
Captain, U.S. Coast Guard
Captain of the Port
Sector Northern New England

Encl: Letter of Recommendation (LOR) Analysis

Copy: Commander, Coast Guard District One (p)
Commander, Atlantic Area (p)
Commandant (CG-5), (CG-522), (CG-544), (CG-741)
DC Midstream Partners, LP
Maine State Department of Environmental Protection

REDACTED VERSION

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

TABLE OF CONTENTS

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

1. INTRODUCTION

This analysis supplements my Letter of Recommendation (LOR) dated April 9, 2012, which conveys my recommendation on the suitability of West Penobscot Bay, East Penobscot Bay, and its approaches from the Gulf of Maine (hereinafter collectively termed the Penobscot Bay Waterway) for liquefied petroleum gas (LPG) marine traffic associated with the DCP Searsport Marine Terminal, LLC (DCP Terminal or applicant). It documents the processes followed in analyzing the DCP Terminal's Waterway Suitability Assessment (WSA) completed on June 7, 2011, and the Coast Guard's assessment of the suitability of the waterway for LPG marine traffic identified above. For the purposes of this analysis, the following assumptions were made:

a. The applicant is fully capable of, and would fully implement, any and all risk mitigation measures identified in their WSA and measures referenced in this LOR Analysis.

b. The conditions of the port area identified in the WSA fully and accurately describe the actual conditions of the port area at the time of the WSA submission.

c. The conditions of the port area have not changed substantially during the analysis process.

d. The applicant will fully meet all regulatory requirements including the development and submission of a Facility Security Plan (FSP), Emergency Manual and Operations Manual.

2. BACKGROUND

The data and information regarding the proposed LPG import terminal and storage facility detailed in this Letter of Recommendation Analysis (LORA) were derived from DCP Terminal's Letter of Intent (LOI), WSA, and related correspondence provided directly to the Captain of the Port (COTP) Sector Northern New England (SNNE) from regional stakeholders. The WSA is an applicant-prepared risk-based assessment, designed to document and address all safety and security concerns related to the marine transportation of LPG for a U.S. port or waterway. The scope of the DCP Terminal WSA was based on U.S. Code of Federal Regulations (CFR) Part 127, and U.S. Coast Guard (Coast Guard) policy guidance (in part) contained in Navigation and Vessel Inspection Circular (NVIC or Circular) 01-2011, *Guidance Related to Waterfront Liquefied Natural Gas (LNG) Facilities*, dated January 24, 2011. Although NVIC 01-2011 is intended as guidance related to the review and assessment of proposed LNG facilities and their associated waterways, the document also contains guidance of a general nature that the COTP determined to be equally applicable to the DCP Terminal LPG proposal.

Portions of the NVIC were very beneficial to the applicant during the developmental stages of the WSA and equally useful during the COTP's review and validation of the document. The DCP Midstream WSA considered the entire approach to the proposed

terminal, with particular attention focused on all safety and security aspects of the waterway within 15.5 miles of the proposed terminal location, as outlined in 33 CFR 127.007 and 127.009. Included in this evaluation were the hydrodynamics of the waterway (tides, currents etc.), density of deep-draft vessel traffic, recreational boating, commercial fishing, aids to navigation (ATON), shoreline residential demographics, climatic weather (winds, fog, snow squalls, etc.), identification of environmentally sensitive areas and critical industrial infrastructure, detection of hazards to navigation (shoaling, ledges etc.), and the available response capabilities along the transit route.

The lead federal agency responsible for the permitting of this onshore import terminal and storage facility is the U.S. Army Corps of Engineers (ACOE). Information contained in the DCP Midstream's LOI and WSA enables the COTP to provide specific input, via his Letter of Recommendation (LOR), to the ACOE as to the suitability of the waterway to support LPG marine traffic associated with the DCP Midstream LPG project. It should be noted that the LOR is based upon the Coast Guard's expertise in navigation safety and maritime security and neither the LOR nor this LORA impose conditions on the ACOE permit.

Certain sections of the LORA contain security-related data that has been determined "Sensitive Security Information" (SSI). Therefore, two versions of the LORA have been developed and provided to the ACOE; the original containing SSI and a copy with all SSI removed and marked as a "redacted" version of the original. This provides the ACOE with the maritime-related information it needs for its decision-making process while also allowing the ACOE to have a redacted copy that is releasable to the general public.

Regional stakeholders contributed to the information contained in this LOR Analysis through a LPG working group formed under the auspices of the Pen Bay/Frenchman Bay Regional Area Maritime Security (AMS) Sub-Committee. An initial planning meeting convened on September 30, 2011 at the Sprague Energy Mack Point Terminal, followed by *ad hoc* subgroup meetings/discussions based on individual topics/areas of expertise. A balanced group of representatives were invited to participate, including:

- Pen Bay Pilots;
- Maine Port Authority;
- Town of Searsport officials, fire and police departments, and harbor master;
- Maine Marine Patrol and the Maine Dept of Marine Resources;
- Maine State Ferry Service;
- Maine Windjammer Association;
- Abutting commercial waterfront facilities and residential property owners;
- Local commercial fishermen;
- Down East Lobstermen's Assoc and the ME Lobstermen's Assoc;
- Towing industry representatives;
- Penobscot Marine Museum;
- Waldo County Emergency Mgmt Agency,

- Maine Dept of Environmental Protection;
- Coast Watch;
- Army Corps of Engineers; and
- Recreational boaters.

None of the participants were asked to "vote" or otherwise indicate whether the DCP Searsport LPG proposal should be approved. Rather, participants were relied upon to provide valid input based on their expertise and regional familiarity in order to conduct a thorough review of potential risks to navigational safety and port security associated with the proposed project, develop and recommend operational parameters significant to the transit, and assist in the identification of potential mitigation measures, if needed.

Members of the LPG working group were provided electronic copies of the WSA; they then reviewed and commented on subject areas commensurate with their vocation, expertise, or regional familiarity. After the initial review, specified issues, concerns, and/or risks relating to the proposed project were reviewed by individual members and *ad hoc*, informal groups, for further consideration and recommended resolution. The subcommittees presented an inventory of perceived risks, and then followed up with corresponding mitigating measures, using the Safety and Security Risk Assessment Methodology contained in the WSA as a cross-check and guide. These efforts aided in the planning of plausible operational parameters and a conceptual framework for a transit management plan. It was collectively agreed that the majority of these measures, once incorporated into the TMP, would reduce the risk of safety/security related casualties and incidents involving the marine transportation of LPG and contribute to the safe navigation of all vessel traffic along the waterway.

3. RESOLUTION PRECIS

The following sections summarize the myriad specifics considered and reasoning behind the COTP's determination. This summary is not all inclusive; background information and amplifying data are contained in the applicant's WSA, to include vessel traffic studies, casualty analysis, port characterization appraisals, and risk-based safety/security assessments, among others.

The COTP has confirmed that the hydrographic characteristics of the waterway as described in the WSA currently sustain deep draft vessel movement confirming that the transit and maneuvers are comparatively feasible for the design range of LPG carriers anticipated. However, there exist certain risk management measures and response capabilities that contribute to a safe and secure port-area climate that the COTP recommends are incorporated into a Transit Management Plan and/or further considered by the ACOE during their permitting process. Identified safety/security risk mitigation measures, resource shortfalls, and/or implementation strategies from the WSA are discussed in the following paragraphs, where applicable. Specific recommendations proposed by DCP Midstream (as per their WSA) are denoted as "WSA Recommendation #1, 2, 3 ...etc." For ease of reference, the numbering scheme used in the WSA is

maintained throughout this LOR Analysis. COTP comments pertinent to a particular WSA Recommendation, and/or the identification of additional risk management measures recommended by the COTP, are also provided where relevant.

4. PROJECT OVERVIEW

DCP Midstream Partners, LP, a privately operated subsidiary owned by Spectra Energy Corporation and ConocoPhillips Company, is proposing to construct and operate an LPG import terminal and storage facility at the north end of Penobscot Bay just west of Sears Island. The approximate 70-acre site would be collocated with two existing petroleum storage and distribution facilities operated by Sprague Energy Corporation and Irving Oil Corporation, respectively, and a dry cargo, general purpose facility, operated by the Maine Port Authority. Altogether, the complex is referred to as the Mack Point Intermodal Cargo Terminal (Mack Point Terminal), and is physically situated with Route 1 to the north, Trundy Avenue to the west, and Station Avenue to the east, within the town limits of Searsport, Waldo County, Maine, as shown in Figure 1.

Sprague Energy Corporation owns and maintains a dock that handles liquid cargo and can accommodate vessels up to 700 feet in length, 106 feet beam and maximum draft of 35 feet. The Maine Port Authority owns and maintains a dock that handles dry cargo and can accommodate vessels up to 800 feet in length, 120 feet beam and a maximum draft of 39 feet. The DCP terminal intends to utilize the easterly side of the Maine Port Authority dry cargo pier for the mooring and offloading of arriving LPG carriers.

The applicant intends to have the capability to receive and store 540,000 barrels (approximately 22.7 million gallons) of liquid propane in one 138-foot tall, 202-foot diameter, single-containment, tank to be constructed about mid-center of the divided, irregularly shaped property on the westerly side of the existing railroad spur. The DCP Terminal would receive LPG from arriving LPG carriers via a predominately above-ground, one-mile pipeline to be constructed and connecting the dry cargo berth to the storage tank. The propane will be stored in a liquid state at approximately atmospheric pressure by maintaining the refrigerated temperature at minus 42 to minus 44 degrees Fahrenheit. During routine storage and operation, process safety valves located throughout the system will route vapors for re-liquefaction and re-collection back into the storage tank. In the exceptional event of potential over pressurization, the storage tank is equipped with an emergency control valve/system that will route vapors to an emergency flare. The DCP Terminal will not be connected to any in-state and/or interstate distribution pipeline. Rather, the LPG will be heated to near ambient temperature by three propane-fired heaters to pressurize the product, and then transferred into tanker trucks at three new loading racks and shipped over the road to destination points. Expansion plans for a rail car loading station having the capability of loading four rail cars at a time also exists, to be constructed and operated in the future. The proposed facility also includes:

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

- Four pressurized 1,000-gallon ethyl-mercaptan storage tanks to odorize the propane;
- A 150 kilowatt diesel-driven emergency generator station;
- A 175 horsepower diesel-driven emergency fire pump and 450,000-gallon firewater storage tank with ancillary valves and piping;
- An emergency propane flare system;
- Five electric compressors, an air-fin cooler, and four electric loading pumps;
- Propane-fired heaters to gasify the LPG for distribution; and
- An administrative building to house office space, communications and monitoring equipment, and dispatch center to manage truck and future rail loading operations.

The facility is planned for 24-hour operation, with business demands being highest during the peak heating season.

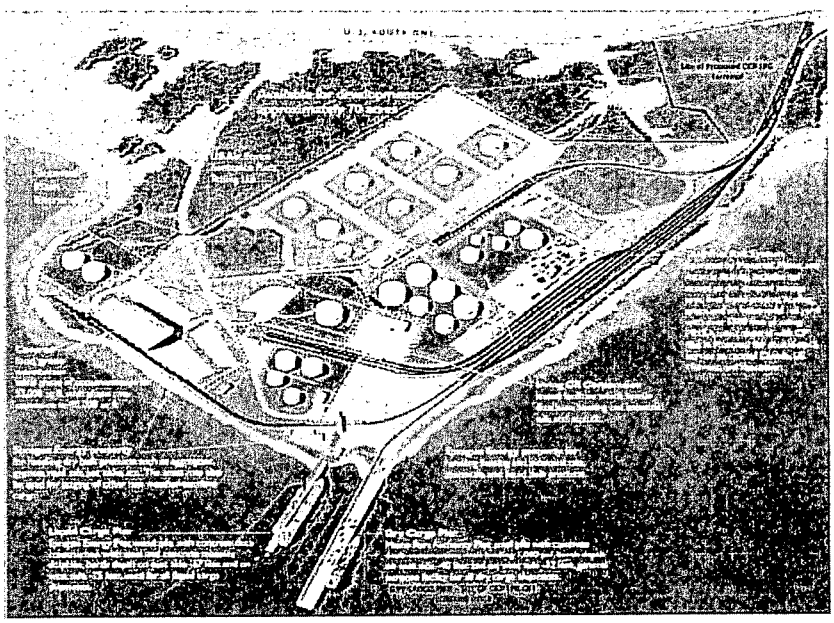


Figure 1 - Mack Point Intermodal Cargo Terminal
(Courtesy of KSEAS, LLC)

A portable, marine unloading arm and manifold (commonly referred to as a chicsan unloading arm and/or system) will be used to connect the LPG discharge piping on the ship to the fixed, 16-inch shoreside, insulated, unloading pipe. An insulated 10-inch vapor return line will transfer excess vapors displaced from the storage tank during the fill process back to the vessel for cooling and reintroduction into the ship's cargo system.

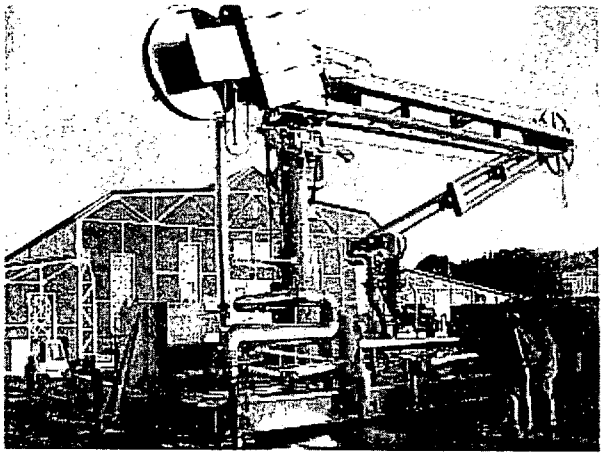


Figure 2 - Typical Portable Unloading Arm
(Courtesy of KSEAS, LLC)

When no LPG carriers are pier side, the portable unloading manifold will be moved and stored elsewhere near the dock apron so that the dock can accommodate the arrival and unloading of conventional dry cargo vessels.

The maximum throughput of the DCP Terminal is based on receiving about six LPG carriers per year, with each vessel carrying approximately 33,000 metric tons (410,000 barrels) of LPG. It is anticipated that each LPG carrier will be at the dock for approximately 36-48 hours total, which includes docking and undocking evolutions. Directly to the west of the dry cargo pier is the Sprague/Irving dock, which is used to receive such petroleum products as asphalt, kerosene, and gasoline, as well as clay-slurry and caustic soda from berthed tank ships and tug-barge combinations. The existing ship traffic at the two piers averages approximately 136 per year, with 166 arrivals being the highest. The peak season for arrivals is in the fall and winter, with tankers typically taking between 24 and 36 hours to offload their cargoes at the *wet* cargo berth.

5. MARINE TRANSPORTATION OF LIQUEFIED PETROLEUM GAS (LPG)

Liquefied petroleum gas (LPG), is a byproduct of raw oil refining and/or natural gas separation and consists of propane, butane, or a mixture of the two. LPG is a subset of a larger grouping, termed liquefied hazardous gases (LHG), which includes butane, propane, butadiene, propylene, vinyl chloride monomer and anhydrous ammonia. In general, deep draft or ocean-going "gas carriers" are categorized by the hazard potential of the cargo or cargoes they carry and are divided into (1) those that carry LHG cargoes

and (2) those that carry LNG. As per the International Maritime Organization (IMO) Gas Carrier Code, they are further broken down into three types: IG, IIG, or IIIG, depending on vessel size, cargo tank design/placement, and level of protective measures intended to prevent the escape of cargo. Type IG is used for chlorine, ethylene oxide, methyl bromide, and sulfur dioxide cargoes; type IIG is used for LHG or LNG and applies to vessels over 150 meters (492 feet) in length, and type IIIG is intended for cargoes of nitrogen and refrigerant gases. LPG carriers calling on the DCP Terminal will predominately be type IIG ships, built with independent cargo tanks, usually of prismatic shape, that are completely self-supporting, *i.e.*, they do not form part of the vessel's hull. Cargoes carried in this type of cargo tank arrangement are fully refrigerated, and maintained at or near atmospheric pressure.

For added safety and efficiency, modern LPG carriers of the above design have a secondary containment system, known as a "secondary barrier", surrounding each tank that is capable of containing the entire contents of the cargo tank. This is accomplished by building a second "skin" around the cargo tank itself, or building the hull out of special steels to accomplish the same. In either case, the space between the primary barrier and secondary barrier is filled with inert gas, which will not support combustion.

For additional safety and efficiency, these ships are built with double bottoms and ballast tanks (completely segregated from the cargo system) and a complete centerline longitudinal bulkhead to improve stability. Figure 3, below, provides a typical design layout for the type of ship that would service the DCP Terminal. This type of fully-refrigerated carrier has up to six cargo tanks and can carry up to 100,000 cubic meters of LPG.

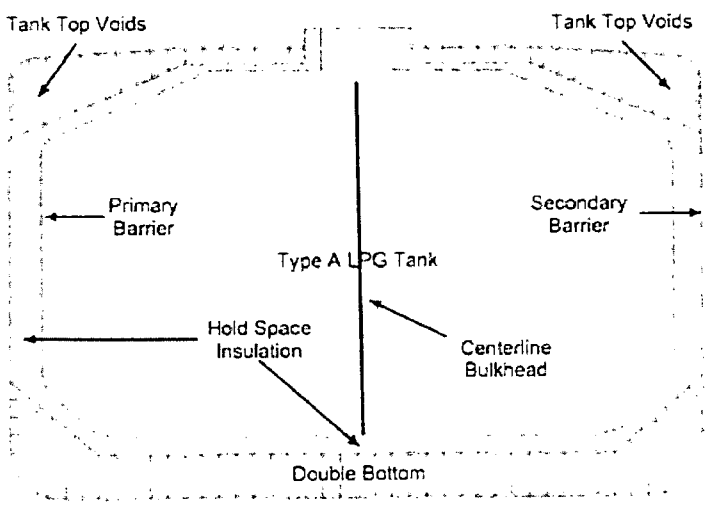


Figure 3, Cross section of a fully refrigerated LPG carrier depicting the containment and ballast design. (Courtesy of KSEAS, LLC)

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

For comparison, below is a photo of the HASSI MESSAUD 2. The vessel is 672 feet long, has a draft of 39.7 feet, and cargo capacity of 58,000 cubic meters. This is typical of the LPG carriers servicing the Sea-3 LPG Terminal in Newington, NH, and is of the type, design, and size of the carrier anticipated for the DCP Terminal.

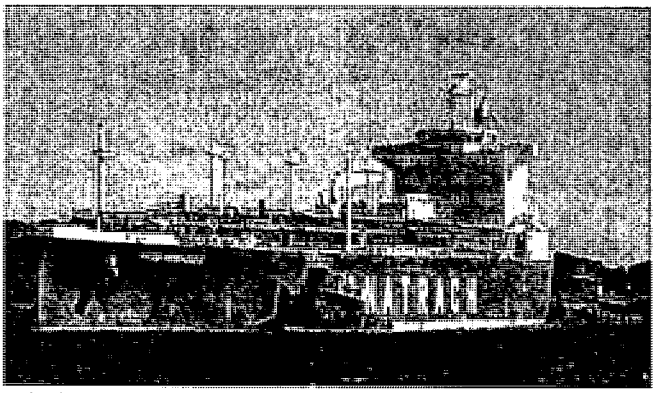


Figure 4, Typical LPG carrier anticipated for the DCP Terminal (Courtesy of KSEAS, LLC)

While the marine transportation of liquefied gases incurs its own special hazards, some of the features are less hazardous than those of the heavier petroleum cargoes.

Hazards peculiar to the carriage of LHG cargoes include:

- Cold from leaks and spillages can affect the strength and ductility of a vessel's structural steel. Likewise, skin contact with the liquids or escaping gases can produce frostbite and inhalation of the cold vapor can permanently damage certain organs, such as the lungs.
- Rupture of a pressure system containing LPG could release a massive evolution of vapor, termed a vapor cloud.

LHG transportation hazards that are reduced, as compared with "normal" petroleum tanker operations, include:

- Loading or ballasting does not eject gases to the atmosphere in the vicinity of decks and superstructures. Gas freeing is rarely performed and does not usually produce gas on deck.
- Liquefied gas compartments are never within flammable limits throughout the cargo cycle. Within a cargo tank the vapor space above the liquid cargo is virtually 100% rich with cargo vapor and thus far above the upper flammable limit. Static electricity and other in-tank ignition sources are, therefore, no hazard.
- There is no requirement for tank cleaning; therefore, the hazards associated with that operation are eliminated.
- Gas carriers are fitted with fixed water spray systems for added fire protection. The spray nozzles cover cargo tank domes, above-deck cargo tank areas, manifolds, and

provide a curtain of spray over the front of accommodation spaces, cargo control rooms, etc.

6. WATERWAY TRANSIT CONSIDERATIONS

Transit Route

The intended transit route for the deep-draft LPG carriers, from sea to project site, includes the Gulf of Maine, East Penobscot Bay, West Penobscot Bay, and approaches (hereinafter collectively termed the Penobscot Bay Waterway). All aspects of the transit route to and from the proposed import terminal and storage facility were evaluated, including tides and currents, prevailing weather, density and character of marine traffic, deep draft vessel management, recreational boating and commercial fishing, navigational aids (buoys, markers etc.), regional waterway events, surrounding community/port impacts, and relevant environmental/iconic considerations. Applicable navigation charts are National Oceanic and Atmospheric Administration (NOAA) #'s 13302, 13303, 13305, and 13309. Figure 5 provides an overview of the Penobscot Bay Waterway; the recommended deep-draft vessel routes are highlighted in pink, and ferry crossings are dotted red. LPG carriers arriving from overseas would normally enter the Penobscot Bay Waterway from the east at the "PBA" buoy. It would then proceed on a westerly course to the "WP" buoy, where it would pick up a U.S., state-licensed pilot[1], turn northward, and continue on past Junken Ledge to the first apex of the recommended transit lanes, which is in the vicinity of the "PA" buoy. Turning north, the vessel would continue on until reaching the second transit lane apex, the point at which the two traffic lanes split and encircle Seven Hundred Acre and Islesboro Islands. Unless traffic and/or conditions dictate otherwise, the *routine* deep-draft route continues northward, along West Penobscot Bay, keeping Islesboro Island to the starboard. Once abreast Islesboro Island buoy II, a mid-channel red and white aid lighted with Morse signal Alpha, the vessel would turn westerly, leave the transit lane, and proceed to the Mack Point Terminal.

Should the LPG carrier be arriving from another port along the eastern seaboard, it would most likely enter the system from the west. In the vicinity of Monhegan Island the carrier would pick up the U.S. pilot, proceed easterly through Two Bush Channel, and then turn north in the vicinity of the "TBI" buoy. Once past this point the same route as aforementioned is followed, commencing at the first apex of the transit lanes to the terminal. The "outbound" transit lane, which is along the easterly side of Islesboro Island, is primarily used by vessels and tug-barge combinations transiting to and from the ports of Brewer, Bucksport and Castine, or is used to avoid meeting or overtaking situations in the westerly transit lane.

[1] Pilotage is compulsory for foreign vessels and U.S. vessels under register in the foreign trade.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

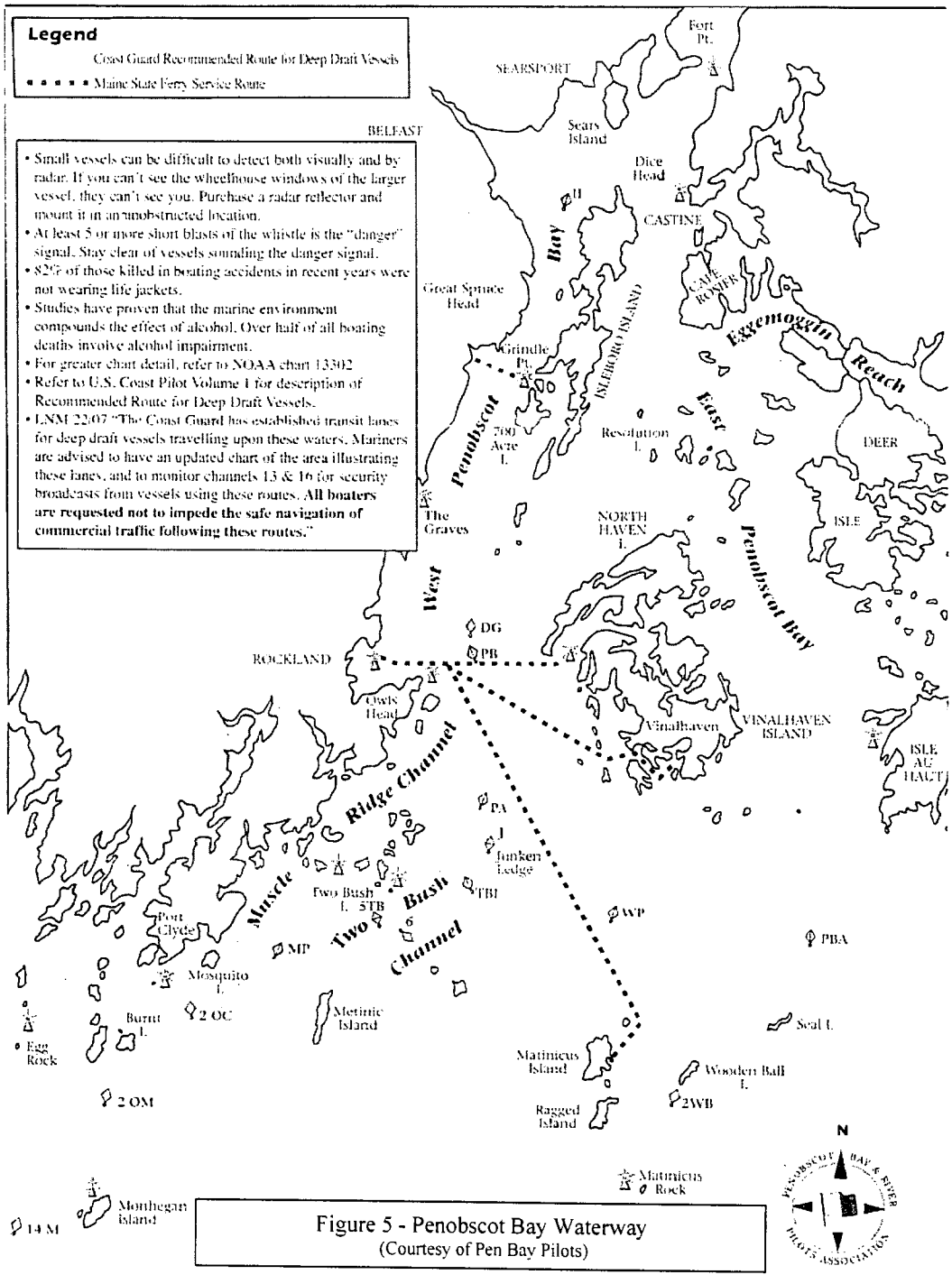


Figure 5 - Penobscot Bay Waterway
(Courtesy of Pen Bay Pilots)

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

Deep Draft Traffic

The Penobscot Bay Waterway is a mixed use marine thoroughfare of regional significance. Year-round recreational, deep-draft commercial, tug and barge combinations, ferry vessels, and fishing boats all share this waterway going to, and from, port communities along its entirety. The waterway has historically been, and continues to be, a relatively vibrant shipping channel for commercial vessels plying the ports of Rockland, Searsport, Belfast, and Castine, as well as Bucksport and Bangor/Brewer, which are located further up river from the proposed DCP site. Altogether, these ports collectively received approximately175 commercial vessels in 2010 (this number varies from year to year). Of those, 136 called on the two piers at the intermodal complex, with 93 being product carriers, 19 chemical carriers, and 24 bulk carriers. Arriving cargoes ranged from petroleum products to potatoes, and other dry bulk commodities. As previously mentioned, if and when the DCP facility goes into operation, the annual arrivals will increase by approximately six LPG carriers. Of those six, only one would be at the facility at any one time; only one would transit the waterway at any one time; and no two LPG carriers would be in a passing and/or meeting situation within the affected waterway. The actual number of LPG ship transits would be determined by market demand and supply, together with terminal operating and storage capacities.

Hydrographic Characteristics

Penobscot Bay and approach is a relatively deep and wide body of water dotted with a number of islands, shoals, and ledges, calling for extreme caution when navigating. At low tide there is a considerable expanse of exposed sand and mud intermixed with a substantially rocky shoreline containing shoals and land points that abruptly jut out into the waterway. The Bay is about 20 miles wide from Isle au Haut on the east to Whitehead Island on the west, and approximately 30 miles long from its entrance to the mouth of the Penobscot River. The sea approaches to Penobscot Bay are well marked by light houses on Monhegan Island and Matinicus Rock, and the Bay entrance is marked by Saddleback

Figure 6 - Far easterly side of Penobscot Bay

Ledge Light on the east and Two Bush Island Lights on the west. From sea, deep draft vessels can enter one of two *recommended* ½ mile wide transit lanes depending on their last port of call or origin. If traveling up the coast of Maine they enter Two Bush Channel off the coast of Port Clyde, passing just north of Monhegan Island Light. If arriving from overseas, vessels enter the system from the Gulf of Maine, northeast of Matinicus Island. The distance from either pilot boarding area to Mack Point is approximately 48 miles, and takes about 4 ½ hours when traveling at about 10-12 knots during favorable weather and tide conditions.

The COTP, in conjunction with the ME/NH Port Safety Forum, developed minimum under keel clearances (UKC) for vessel traffic operating in Penobscot Bay. As delineated in the *U.S. Coast Pilot*, the recommended UKC criterion is three feet in outer Penobscot Bay when south of Turtle Head Island; two feet within the Bay when north of Turtle Head Island; and one foot at all dock and mooring locations. Depths along the transit route range from 400 feet at its deepest to approximately 54 feet at its lowest and can be navigated throughout the tidal range. Maintenance dredging within the recommended channels is not required, however, once leaving the westerly transit lane in approach to the Mack Point turning basin the water depth decreases to approximately 35feet due to isolated shoaling. As a result, most all deep-draft vessels either wait in the anchorage for favorable tidal conditions before transiting directly to the terminal dock, or vessel masters, in coordination with the pilots, routinely time their transits to arrive at the turning basin at high tide in order to avoid the necessity of anchoring.

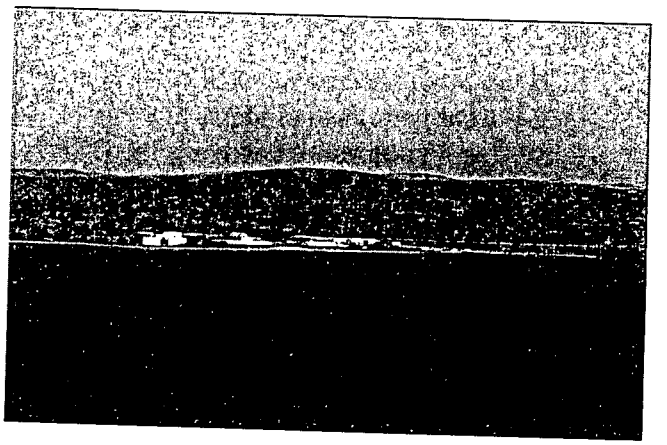


Figure 7 – Approach to Mack Point

COTP SNNE has concluded that the anchoring of LPG vessels within Penobscot Bay while waiting for traffic, a berth, or the tide presents an unnecessary risk to the vessel itself, recreational boaters, commercial fishermen, and surrounding shoreline communities. Moreover, the potential need for continual enforcement of safety and/or security zones, if established, around an anchored LPG vessel could consume vital SAR and law enforcement assets. Therefore, with the exception of temporary boarding areas established by and for Coast Guard authorized resources, the COTP will limit the anchoring or holding of LPG vessels within Penobscot Bay to emergency situations only,

such as major mechanical malfunctions and reduced visibility consequent to non-forecasted, abrupt weather changes (fog, squalls, etc.). Accordingly, the pilots, in coordination with the vessel masters and the terminal manager, will need to time their transits so as to maintain adequate UKC and avoid unplanned holding and/or anchoring.

Islesboro Island and a chain of small and large islands split the non-compulsory thoroughfares, with deep draft traffic generally traversing the western side of the island (West Penobscot Bay) and tug & barge combinations plying the eastern side (East Penobscot Bay).

Figure 8 - Islesboro Island to the Northeast

These routes are intended to provide safe, established routes for deep drafts while at the same time limiting the potential for loss of fishing gear, interference with commercial lobstering, and impact to summertime recreational craft and ferry traffic. The narrowest portion of the route is about 1 1/8 miles wide and occurs between Great Spruce Head on the mainland, and Gooseberry Point on Islesboro Island. There are no man-made obstructions such as bridges, dams or locks; the channels are well buoyed, dangers well marked, and approaches clear.

Deep draft ships of approximately the same dimensional size and draft as the proposed LPG carriers have been productively transiting the existing waterway and mooring at the Mack Point terminal for a number of years. Current vessel management practices, traffic routes, safety procedures, and navigational aids (ATON) have contributed to a successful and safely managed waterway and port area. The current infrastructure and hydrographic characteristics of the waterway easily support the current volume of tankers and bulk ships plying the waterway enroute to Searsport and beyond. An additional six to eight deep draft arrivals over a year's time would not alter this capacity. That said, the introduction of LPG carriers to the Penobscot Bay Waterway presents a higher level of risk necessitating risk reduction strategies and mitigation measures to counter the increase in risk. Although a number of operational parameters and safety measures already exist, modifications will certainly be necessary and additional safeguards employed to account for and offset the potential safety and security hazards associated with the marine transportation of LPG. Recommended safety and security mitigation measures are addressed in more detail in subsequent sections of this analysis.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

Vessel Traffic Management

There is no formal Vessel Traffic System (VTS) for Penobscot Bay and its approaches; however, as aforementioned, recommended vessel routes (traffic lanes) have been established for these waters. Pilotage is compulsory for all foreign-flagged and U.S. deep-draft vessels under register in the foreign trade when transiting Penobscot Bay, and therefore fall under the operational control of the Penobscot Bay & River Pilots Association. Using radio communications via VHF-FM channels 13 and 16 and the Automatic Identification System (AIS), vessel arrivals and departures are coordinated between the pilot pickup area (vicinity of buoy 14 M off the coast of Monhegan Island or the PBA buoy north of Seal Island) for all port destinations within the Bay and Penobscot River with the intent of avoiding vessel head-to-head, close encounter, or overtaking situations. It should be noted that the existing communications network (and associated interoperability) has operated well and to date provided the level of safety and security required for the port area. Radar navigation within the Bay is good, owing to the bold coastline and many offshore islands, which present dependable radar targets. To maintain safe maneuvering capability and reduce the potential for collision the respective pilots, or tug captains in the case of tug and barge units, relay their course positioning via radio contact using VHF channels 16 and 13 at established way points along the transit route.

Based on tried and proven performance, the pilots utilize personal "Portable Pilot System" technology by Raven Industries' (Starlink) which possesses Differential Global Positioning System (dGPS), AIS, and electronic chart interface to provide accurate and functional position data for all transits being made to, and from, all ports within the Penobscot Bay waterway, including the Penobscot River. The pilots assert that this capability, which has proven accuracy to within one meter, when combined with a shipboard Electronic Chart Display and Information System (ECDIS) and Automatic Radar Plotting Aid (ARPA) provide the highest degree of electronic navigation support currently available. The COTP fully concurs with the pilots' sound judgment in employing all navigational means available to aid in the transit of all deep-draft vessels for the safety of all water way users and abutting shore-side communities along the intended route.

Transit Management Plan (TMP)

Although not required by specific regulation, the development and implementation of a well-conceived TMP has proven to be an invaluable and effective tool often employed at other ports that receive LHG or LNG vessels. As indicated in WSA Recommendation #9, the DCP terminal recommends that a TMP be developed and implemented to further maintain safe maneuvering capability and reduce the potential for collision. This recommendation was further endorsed by the LPG workgroup, who also proposed that a subgroup of regional stakeholders assist in the endeavor. The COTP concurs with the

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

WSA and workgroup proposal, further recommending that the TMP follow the guidance and template contained in NVIC 01-2011. At a minimum, the document should:

- Describe the interagency procedures that will be put into place prior to the LPG transit;
- Clarify the roles and responsibilities of each agency and industry component in the event of a marine casualty or transportation security incident (TSI);
- Describe any and all operational parameters and safety/security measures to be employed, i.e., weather-related or hydrographic constraints, visibility restrictions, number and operating characteristics of tugs and escort vessels, routine and emergency communications procedures, and routine traffic/operational measures.

Related to the above, a number of climate and/or hydrographic operating parameters were also recommended in the WSA; these included:

- Sea height at the pilot station should not exceed 10 ft;
- Sustained winds should not exceed 30 knots during channel transits, and gusting winds should not exceed 25 knots during docking;
- Clear visibility for maneuvering and docking at Mack point should be a minimum of ¼ mile, with no restriction to nighttime transits whether inbound or outbound throughout the waterway; and
- Transits of LPG vessels should be timed to arrive at Mack Point during periods of slack water, especially during infrequent spring freshets (caused by sudden ice thaws upriver) at the discretion of the attending pilot in consultation with the vessel master.

The COTP agrees that operational limitations may become necessary for the safety and security of the LPG carrier itself as well as the surrounding maritime communities, but does not necessarily agree with all parameters as stated in the WSA. Nonetheless, to minimize the potential for delays while at the same time affording an acceptable level of risk, the COTP encourages the DCP Terminal to consult with the pilots and other stakeholders, specifically a selected subgroup of the LPG Working Group, to determine and submit specific criteria for his review/approval, for future incorporation into the TMP as outlined above.

As previously mentioned, vessel positioning is strictly dependent on VHF radio contact between the cognizant vessel masters and pilots. Current practice is to employ informal, one-way traffic patterns for deep-draft transits whenever possible, consistent with navigation rules and regulations. Pilots routinely utilize the west Penobscot Bay channel for upbound transits to avoid downbound tug and barge combinations and other deep-draft traffic, which usually use the East Penobscot Bay channel. In the case of the DCP Terminal, inbound loaded or partially loaded LPG carriers would turn in a northwesterly direction, leaving the recommended transit lane, in order to arrive at Mack Point, south of where the two traffic routes remerge into one. Along the same lines, in the lower approaches of Penobscot Bay there is only a relatively short distance where the two

separation schemes actually merge into a single fairway before splitting to the east or west, again reducing the chances of meeting or crossing situations.

As indicated in the WSA, DCP Midstream asserts that only one LPG carrier will be within the "system" i.e., either moored at the dock or transiting to/from the dock, at any one time, thus eliminating the prospect of two LPG vessels being involved in a meeting or overtaking situation. The COTP agrees with this traffic management strategy and emphasizes that this limitation, especially at the onset of LPG vessel transits, would be strictly enforced.

Notwithstanding, the WSA also inferred that non-LPG two-way traffic might also be present during the transit of an LPG carrier in order to minimize any potential for delays involving vessels and/or tug & barge combinations transiting to or from other ports within the Bay and upriver. The COTP does not fully concur with this premise. Without a "formalized" traffic management system in place or way to continuously monitor multiple ocean-going vessel movements, a sizeable commercial fishing fleet, and large numbers of recreational craft, the addition of an LPG carrier to the mix raises the risks substantially, especially in the channel areas where the traffic lanes merge into one. Therefore, it is imperative that LPG carriers not encounter other ocean-going vessels in a meeting, crossing, or overtaking situation while transiting to, or from, the Mack Point Terminal. So, to enhance safety, whenever other deep-drafts or tug and barge combinations are transiting the waterway their route should follow the alternate channel from that taken by the LPG carrier around Islesboro Island, or be in waters where there is sufficient maneuvering space; and they should be appropriately timed so as not to encroach on a carrier's transit through the merged, single traffic lanes. The COTP agrees with the DCP Terminal and Pen Bay pilots that transit management specifics, such as these, need to be clearly prescribed in the aforementioned TMP and may well be revisited in the future when and after identified risk mitigation measures are implemented and practical experience with LPG carriers is gained. Along the same lines, the local pilots have recommended, and the COTP agrees, that they be included in future waterways studies, such as an Penobscot Bay Ports and Waterways Safety Assessment (PAWSA) for the port area and/or Waterways Analysis and Management System (WAMS) review in order to (1) ensure existing and/or projected procedures for the safe transit of deep draft vessels in and out of port are accurately considered and (2) provide recommendations as to the adequacy and stationing of ATON buoys and markers, respectively. To reiterate: the pilots, in conjunction with other waterway users, will be intimately involved with the development and implementation of the Transit Management Plan for the safety and security of all stakeholders.

Simulated Maneuvering Trials and Associated Training

Full-bridge mission simulation training/testing is employed world-wide to train and/or hone the ship handling skills of mariners, pilots, and tug captains in a number of proficiencies from rules of the road and emergency maneuvering to bridge team and bridge resource management. This computer-based technology is used to simulate a

range or class of vessels (e.g., tankers, container ships, integrated tug and barges, etc.) operating under specified or generic conditions (waterway/channel characteristics and prevailing or forecasted weather), in certain locations (port, bay, river and/or harbor, etc.) in varying, reality-based scenarios (while transiting, docking/undocking, and/or under emergency, restricted conditions due to mechanical malfunctions, etc.). Simulation testing is also used as a "proof of concept" to determine whether or not a particular port and/or waterway can feasibly support a new proposal or expanded operation without compromising real-life safety. Such is the case with the DCP Terminal proposal; maneuvering studies would assist in:

- Determining the feasibility of navigating the intended size and class of fully loaded LPG carriers from the pilot station to the proposed terminal site at various stages of tides and currents;
- Ascertaining the number, size, HP, and bollard pull of tugs needed for escorting and assisting with docking maneuvers, and their ability to control the carrier's movements under varying conditions of emergency operations such as engine/rudder and equipment failure;
- Quantifying risks associated with the inbound and outbound transits, and determining appropriate risk-mitigation factors;
- Determining the limiting hydrodynamic and environmental factors for inbound and outbound transits;
- Evaluating arrival, turning, and departure maneuvers in the vicinity of the terminal berth;
- Ascertaining the adequacy of existing aids to navigation and identifying potential upgrades/changes that would contribute to an increased margin of safety; and
- Providing the pilot(s) with invaluable "hands-on" training and realistic exposure maneuvering this unique class of vessel in varying traffic conditions commensurate with the season and location, e.g., recreational boaters, ferries and commercial fishing vessels.

One outcome of the LPG Work Group, and further corroborated by the Pen Bay Pilots, is the recommendation that simulation testing/training be contracted by DCP Midstream as a means of validating the conclusions and recommendations of the WSA, enhancing the pilots' level of safety, determining the capabilities of the existing tug fleet, and gaining appreciation for the handling/maneuvering characteristics of the intended LPG carriers. Also mentioned, the State of Maine purportedly expended a considerable amount of funds having the port of Searsport and the associated tug fleet "modeled" in support of an unrelated project. This data, along with models of LPG and LNG vessels that routinely ply Newington, NH, and Boston, MA, is maintained at a New England simulation facility and is ostensibly available for future use. As per the aforementioned recommendation, the ME Port Authority and pilots' association believe it would be prudent to take advantage of these existing assets and have recommended that DCP Midstream contract for simulation training early in 2012, well in advance of any LPG vessel arrival, with further, follow-on training conducted as warranted.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

While the Coast Guard does not endorse any one facility, the COTP fully concurs on the value of "hands on" simulator training and encourages DCP Midstream to consider the merits of the above recommendation. Case in point: WSA Recommendations #1 and 2, *Escort Tugs* and *Mooring, Docking and Standby Tugs* respectively, provide specific recommendations surrounding the number of escort tugs needed for the transit, where they would be employed, adequacy of available horsepower and bollard pull, maneuverability, and numbers needed for routine docking/undocking and exigent "breakaways". Empirical data, based on historical vessel traffic and current practices corroborated by the pilots and terminal managers formed the basis of this recommendation. However, through the use of a simulator integrated training and testing for the area pilots and respective tug captains, taking into account the size and type of LPG carriers intended, as well as the number, horsepower, and bollard pull of the projected tugs, would build on the necessary skill sets and ground truth a number of WSA postulations, such as the aforementioned recommendations, without potential sacrifice to the marine environment. Notwithstanding, it should be noted there is no Coast Guard regulation that actually requires simulator testing/training nor should it be perceived as a requirement or form of condition specific to the LOR.

Vessel Traffic Study and Transit Considerations

The DCP Terminal WSA included a rudimentary traffic coordination study, conducted to determine the extent to which LPG vessel traffic would potentially impact scheduled arrivals/departures of vessels currently serving the Mack Point Intermodal terminal (Sprague Energy and Irving Oil facilities). The study also factored in vessels and tug-barge traffic plying the remaining ports within the Penobscot Bay and Penobscot River waterway.

For the purposes of this study the LPG vessel traffic pattern was based on the anticipated number of carrier arrivals to the DCP Terminal per year, while the traffic pattern for all other vessels was based on historical statistics. Climatic information and data was based on weather conditions prevalent for the region and season and the regionally conceived, existing transiting practices for traffic control involving vessel movements being monitored by the pilots under oversight by the Coast Guard. Although the WSA purports a one-way vessel traffic scheme around Islesboro Island the pilots offered that, in actuality, many of the tug-barge combinations do not always utilize the services of a separate pilot and therefore do not always follow this "informal" practice. Operating parameters, procedures and associated risks germane to the Piscataqua River/Newington transit were used as a template and applied to the study, where feasible.

Penobscot Bay serves a substantial number of commercial lobstering vessels, especially in the lower reaches, a state ferry system, and relatively high volumes of recreational craft during the seasonal months. Because of the extreme fluctuation in numbers, these craft were not factored into this particular study; actual vessel count was relegated to deep-drafts only. The WSA reasoned that there would be minimal impact to recreational vessels in that the bulk of LPG carrier transits would occur "off-season" (tepid to cold

months), and the majority of lobstermen traditionally set traps in specific, territorial grounds, most of which do not impact the 0.4 mile-wide traffic lanes. That is not to say that local stakeholders' concerns and interests were not considered; to the contrary, the LPG work group was open to ferry management, recreational boat owners and fishing/lobstermen alike, and each had the opportunity to comment on and/or verify the WSA as it relates to their specific interests.

The risk-based, traffic coordination study focused on conceivable marine traffic scenarios involving multiple combinations of inbound and outbound LPG and non-LPG vessel movements, to and from the port-area and upriver terminals, in an effort to determine the level of control that would be needed to efficiently and effectively manage all deep-draft commercial traffic, without sacrificing safety.

Recognizing that the majority of deep-draft vessel movements to Mack Point are predicated on the tide, the study also explored such interrogatories as: Can a vessel inbound to the Irving or Sprague facility precede an LPG carrier and dock at the Sprague or Irving on the same tide? If a product carrier were to follow the LPG carrier, could both moor in the same tide or would one of the vessels have to anchor and await the next tide? Would an inbound vessel be allowed to proceed to the "wet dock" while an LPG carrier was offloading at the "dry berth"? Can an LPG carrier enter the approach to West Penobscot Channel while a tug and barge combination is outbound, but still in the Penobscot River? These scenario-based questions, and others, also formed the basis of the Safety and Risk Analysis contained in Part 5 of the WSA. While the WSA analysis "proved" some of the scenarios plausible, a number of "assumptions" were made by the DCP Terminal that will need further corroboration by the TMP stakeholder work group and ultimately, COTP concurrence. These suppositions (with corresponding comments) included:

- Allowing night time transits of the LPG carrier. The pilots contend that (1) there would be less recreational craft and fishing vessels to impede navigation; (2) today's navigational technology lends itself to safe, nighttime transits; (3) significant delays could occur if nighttime/early morning transits were not allowed due to limited daylight hours in the winter coupled with the need to berth at high tide – two limitations that create an extremely tight operating window; and (4) historical data shows that the pilots have consistently piloted deep draft vessels along the same transit route intended by the LPG carriers and safely maneuvered them to the Mack Point terminal during nighttime hours and periods of reduced visibility without incident.

  Likewise, the WSA suggests that either day or night transits can be managed safely; however, initially transits may need to occur during daylight hours only to allow for a progressive increase of confidence in handling LPG carriers.

  The COTP notionally agrees with the above premise and will give further consideration to the nighttime transit issue. Notwithstanding, this matter may

well be resolved when DCP Midstream conducts simulator trials. Further testing should ascertain the suitability of the current ATON system to support non-daylight/restricted visibility operations, thereby further reducing the safety risk factor. Akin to the day/night transit issue is whether or not "empty" LPG vessels will have any transit restrictions or necessitate additional safeguards in that, for efficiency, a small percentage of cargo is normally maintained in an LPG carrier's cargo tanks, termed *heel,* in order to keep the tanks and associated piping in a refrigerated/liquefied state and ready for the next loading. The COTP has made the determination that while the vessels are not, technically, in an inert or gas-free condition, the overall risk factor has significantly diminished; accordingly, potential risk mitigation measures to include escorts, safety/security zone applications, and nighttime restrictions for outbound transits are certainly subject to modification.

- Permitting deep draft petroleum (gasoline, home heating oil etc.) tankers to transit to the "wet cargo" berth and offload cargo while an LPG carrier is offloading at the "dry cargo pier". In that only about 500 ft separates the two piers there was expressed concern by members of the stakeholder work group that: (1) increased wave action consequent to the close-by maneuvering and docking of a loaded tanker, further aggravated by the attending tugs, could potentially cause an offloading LPG carrier to surge on its moorings and exceed the limits of the unloading arm emergency disconnect coupling (Powered Emergency Release Coupling (PERC)); (2) a mechanical malfunction, such as sudden loss of steering and/or propulsion, could potentially result in the tanker alliding with a berthed LPG carrier during cargo offload; and (3) if a release were to take place as a result of a high-energy allision a fire could conceivably erupt on either or both vessels and the cumulative radiation effects (thermal flux) of the burning cargoes may prove disastrous to the surrounding , residential area.

  The COTP acknowledges these concerns and for the reasons outlined above will limit deep draft vessel movement in the immediate vicinity of the wet cargo berth during LPG cargo offloading operations. This type of scenario points out the need for well-defined traffic management (e.g., a Transit Management Plan). Inbound deep-draft vessel transits are predicated on definitive tide conditions, favorable weather and visibility, and in the case of an LPG carrier, one-way traffic limitations. Add to that the simultaneous, multiuse character of the two piers by Sprague, Irving, and the Maine Port Authority and the actual transit opportunities diminish exponentially – a recipe for possible delays and unintended waterway congestion. This enforces the significance of having transit/mooring protocols and emergency response planning/procedures in place prior to the arrival and docking of any LPG vessel traffic. Towards that end the COTP concurs with the WSA recommendation that a combined resource management, terminal operations, and emergency procedures plan be developed, or the same incorporated into a Transit Management Plan, by the three entities (in collaboration with select members of the working group, the local pilots, and

emergency management resources) and submitted for COTP review and endorsement.

- The structural condition of the pier and current mooring arrangements will adequately support LPG vessels of the size and draft intended. A concern was raised regarding the structural condition of the dry cargo pier at Mack Point. As per the WSA, a survey of the dry cargo dock has been conducted by Fay, Spofford and Thorndike, LLC and the pier has been certified to meet or exceed seismic design and construction requirements, as per 33 CFR 127.1103, of Title 49, Part 41. Considerations not specifically addressed by the WSA, but applicable to the aforementioned resource, operations, and emergency procedures plan, (or TMP if developed), include (1) the assessment of mooring (tie-up) capabilities of the existing dry cargo berth and its ability to accept LPG carriers of the size, draft, and breadth being considered, especially in the event of extreme tides, currents, and winds; (2) the overall condition and adequacy of the existing fendering system on the west side of the berth; (3) ability to affix adequate aft-leading stern lines; and (4) the potential installation of a tidal current gauge or like device to facilitate docking/undocking evolutions consequent to freshet-related conditions. Therefore, in consideration of these concerns a thorough review of the intended mooring appurtenances should be undertaken and consensus arrived at, in consultation with the pilots and terminal manager, prior to the arrival of any LPG carriers.

- Mandatory setting and enforcing of Limited Access Areas (LAA) i.e., safety and security zones: Several commercial lobstermen and recreational boaters expressed significant concern about the Coast Guard establishing safety and/or security zones. Their apprehension was based on the erroneous assumption that should safety and/or security zones be established, the entire Penobscot Bay waterway would be completely closed to all navigation whenever LPG vessels were transiting, in effect curtailing their ability to freely navigate and/or fish. In view of this apparent confusion and misconception concerning *safety* and *security zones* and the respective enforcement action of each, the following overview was developed by the COTP to assist the LPG work group and other stakeholders in the formulation of tenable operating parameters.

"Historically, safety and/or security zones have been a control mechanism employed by COTP's to ensure the safe and secure navigation of vessels transiting U.S. waters carrying bulk products such as liquefied hazardous gasses (LHG), which includes LPG and liquefied natural gas (LNG). Safety zones serve important dual purposes. A level of safety is provided to the transiting vessel by minimizing waterway congestion, and a layer of protection is afforded to the surrounding port community through the reduction in casualty risk. By definition, a safety zone[2] is a water area, shore area, or combination

[2] Regulations applicable to safety and security zones are promulgated in 33 Code of Federal Regulations (CFR) Part 165.

of both to which, for safety and/or environmental protection purposes, access is limited to persons, vehicles, or objects specifically authorized by the COTP or U.S. Coast Guard District Commander. No person may enter a safety zone, remain in a safety zone, or allow any vehicle, vessel, or object to remain in a safety zone, unless authorized by the COTP or District Commander or his/her designated representative. And, each person in a safety zone, who has notice of a lawful order or direction, must obey that order or direction, under penalty of law. A safety zone may be described by fixed limits, or it may be a specified zone around a vessel in motion. Safety zones may be established as temporary measures, such as in response to an emergency situation, or they may be established for indefinite periods, such as along the waterfront and shore area of a high-risk waterfront terminal or facility.

Security zones are another control mechanism available to the COTP. Security zones[3] are designated areas of land, water, or combination of land and water, established for such time as necessary to prevent damage or injury to any vessel or waterfront facility; to safeguard ports, harbors, or waters of the United States; or to secure the obligations of the United States. Security zones are primarily used for national security interests rather than strictly for safety considerations; however, due to the heightened security posture consequent to 9/11, combinations of safety and security zones are often employed when the need dictates.

COTP's receive their statutory authority to safeguard the nation's ports, waterways and facilities from a variety of sources, including the Ports and Waterways Safety Act (PWSA) of 1972, *i.e.*, 33 U.S.C.§1221 *e. seq.* and the implementing regulations at 33 CFR , Subchapter P. These authorities provide, among other things, that further vessel traffic controls may be imposed by the COTP when deemed necessary, such as during periods of reduced visibility or adverse weather, or when in congested waterways or other hazardous conditions. These controls include specifying times of vessel movements; establishing traffic schemes; limiting vessel size, draft, or speed; and the establishment of explicit operating parameters for a specific area. While only the Coast Guard has authority to determine who may enter a zone, and under what conditions, the COTP may delegate that authority to lawfully designated on-scene representatives, who are usually Coast Guard personnel. In Maine and New Hampshire, however, under current memorandums of understanding (MOU) with each respective state, the Maine and New Hampshire Marine Patrols also augment and enforce U.S. Coast Guard safety/security zones.

Notwithstanding internal Coast Guard policy, there is no federal mandate that specifies that a safety and/or security zone must be established; rather, it is risk and circumstance specific. Risk-based decision making is used to determine to what extent operational restrictions and/or safety management parameters need to be employed, taking many factors into consideration including, but not limited to, the current or anticipated event, Maritime Security (MARSEC) level, and response capability needed to mitigate a safety incident or security threat.

[3] Security zones are also established under the authority of 50 U.S.C.§191 and 33 CFR 6.04-6.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

Across the country Captains of the Port monitor the marine transportation of LPG on a regular basis. Some transit routes and terminal sites are located near large metropolitan cities, while others are in far more remote locations. The type and quantity of risk management measures needed to protect critical infrastructures and population densities varies greatly at both ends of the scale; in other words, one size does not fit all. The establishment of limited access areas, such as safety and security zones, is just one tool among many available to the COTP in the interests of safety and security. Accordingly, if and when the COTP decides to employ and enforce moving safety/security zones around LPG carriers as they transit to/from the proposed DCP Terminal specific boundary limits will be applied. In the event that zones *are* established for the Penobscot Bay waterway, there should be ample room for boaters to still freely navigate the waterway along the outer periphery of the channel, and ahead and astern of the carriers. If established, the zone(s) will likely move with the vessel, with the average time for the zone to pass any given point corresponding to approximately eighteen minutes, assuming a carrier speed of 10 knots. While the zones could cause slight delays and/or interferences, proper voyage planning and attention to advance "Broadcast Notices to Mariners" should help alleviate potential impositions to other boaters.

The normal establishment and enforcement of controlled access areas, e.g., safety and security zones, are not arbitrary measures. They are established through the Federal rulemaking process and must be published in the Federal Register. Rulemaking of a non-emergency nature, as in the case of long term LPG siting proposals, requires the opportunity for public comment. This process provides "constructive legal notice" to the general public and the maritime community as to the rulemaking's existence and legal enforceability, and provides an opportunity to comment on the proposal and shape the rule appropriate to local, extenuating circumstances peculiar to a geographic area.

In WSA Recommendation #6, *Moving Safety/Security Zone*, the DCP Terminal recommends that the Coast Guard initially establish safety/security zones that have the following size limits when LPG carriers are in transit: 2000 yards ahead, 1000 yards astern, and 1000 yards abeam of the moving vessel. The WSA also recommends that the COTP consider implementing smaller sized zones after completing a satisfactory trial period in view of the expansive channel characteristics, lack of blind turns, intended traffic management plan and anticipated reduction in recreational and fishing traffic during winter deliveries. Although the COTP concurs with the *intent* behind this recommendation, in consideration of those factors aforementioned no final determination as to the specifics of moving safety and/or security zones has been made.

WSA Recommendation #7, *Facility Safety/Security Zone,* recommended that the COTP establish a fixed, 500 yard radius security zone around a LPG vessel while it is berthed at the Mack Point "dry pier". Within this recommendation the DCP Terminal assumed that oil/product tankers would routinely dock and offload cargo at the neighboring "wet pier", which is about 500 feet south, and parallel to, the "dry pier." To accommodate simultaneous tanker/carrier operations and not infringe on security zone requirements the recommendation went on to propose that the waterside portion of the zone not be

continually enforced by a specifically designated law enforcement asset unless Maritime Security Levels (MARSEC) and/or intelligence dictated otherwise. Rather, it was recommended that shore-side security be shuttled by commercial tug to intercept any approaching craft as deemed necessary.

As aforementioned, safety and security zones are established on the initiative of an authorized Coast Guard official; there is no federal regulation that mandates that a zone be employed. Conversely, the actual establishment of either zone (limited access area) is considered a rulemaking, which necessitates adequate and prior notification of the lawful order and intended enforcement of the same by a Coast Guard authorized official. Therefore, if the COTP establishes either a safety or security zone around an LPG vessel, whether in transit or moored at the DCP Terminal, it becomes an enforceable regulation and no person or vessel will be allowed to enter or remain within the zone without the expressed permission of the COTP. Security zone specifics, such as boundary size and enforcement strategy proposed in WSA Recommendation #7, have not been decided. Once determined, zone parameters and other operational and security safeguards will be factored into the transit management plan (TMP) and/or facility security plan (FSP), as appropriate.

7. PORT LEVEL CONSIDERATIONS

Maritime Commerce

The DCP terminal WSA considered the land and waters within and abutting Penobscot Bay originating in the mouth of the Bay and continuing along the intended transit route to the Mack Point Terminal. Additionally, the WSA factored in community demographics involving the ports of Rockland Harbor, Rockport Harbor, Searsport Harbor (to include Stockton Harbor), Bar Harbor, Bucksport and Bangor in an effort to address stakeholder concerns and possible risk factors associated with the marine transportation of LPG and the potential impacts to and from commercial, recreational, and fishing vessel activities that occur in those areas. A summary of the findings include:

- The Bay plays host to a significant and diverse range of motor, sail, and manually-propelled boaters, from canoes and kayakers to yachts and commercial lobstermen.
- There is a very large commercial fishing industry within the region, including one of the most prolific lobster fisheries on the North Atlantic Coast. In fact, the area is home to over 63% of the state's commercial fishing fleet.
- Over 200 commercial deep draft vessels that include tug and barge combinations, freighters and tankers and passenger vessels annually transit the area.
- There are two designated vessel-to-vessel oil transfer anchorage areas; one about 1.8 miles northwest of Islesboro island, and one approximately 2 miles due north of the island.
- There is a significant amount of ferry traffic servicing island communities throughout the Bay. The Maine State Ferry Service shuttles passengers and

vehicles from its terminals on Rockland, Bass Harbor, and Lincolnville to the islands of Vinalhaven, North Haven, Matinicus, Swans Island, Frenchboro and Islesboro. All ferries operate on set schedules, some occurring daily and others biweekly or at longer intervals, depending on the season.

- The amount of recreational boating traffic increases considerably during the summer months, especially during Schooner/Windjammer Days, The North Atlantic Blues Festival, and the ME Lobster Festival.
- Stockton Harbor and Castine serves Maine Maritime Academy for mooring and training purposes.
- Sears Island, located about ½ miles southwest of Mack Point, is one of the largest uninhabited islands on the entire east coast. Located in the northern top of Penobscot Bay, it is connected to the mainland via a causeway, and is renowned for its unspoiled, natural beauty, miles of hiking trails, and spectacular views of rugged coastline, old farmlands, and estuarine bays.
- Bar Harbor handles about 100 cruise ship port calls per year; however, traffic interference should not be an issue in that any meeting and/or passing situations would occur well offshore of the Bay.
- The waterway is relatively wide throughout its length and much of the island population along the route is seasonal. If a casualty occurred involving an underway LPG carrier and resulted in a breach and release of cargo Rockland, from a population density factor, would be of the highest consequence, followed by Camden and Rockport respectively. Searsport could be affected if an incident occurred while the vessel was approaching the dock or while offloading. Population densities (persons per square mile) for those cities/towns located along the intended vessel route are considered "low" e.g., less than 1,000, per the criteria set forth in NVIC 01-2011. In fact, according to Census data, the town of Searsport itself, projected site for the project, is home to only about 265 people per square mile.

Environmental and Regional Impact

An accidental spill or release of LPG consequent to a marine casualty could pose potential hazards to the public, waterway, and surrounding environment. The nature and severity of the spill, climatic and sea conditions, and whether or not oil pollutants were also spilled are all factors that must be taken into consideration in order to mount a rapid and effective response.

The National Environmental Policy Act (NEPA) requires Federal agencies to ensure any and all potential impacts, whether social, economic, or environmental consequent to projects licensed or permitted by the Federal Government, have been carefully considered and evaluated. Compliance with NEPA and other environmental planning laws surrounding the DCP Terminal rest with the ACOE as the permitting agency.

Equally essential to the NEPA assessment is the individual state permitting/application review process. Project applicants must demonstrate compliance with applicable federal

and state laws and regulations regarding environmental protection to receive the necessary approvals needed to construct their respective project. Detailed information and data concerning environmentally sensitive areas, endangered species, wildlife refuges, estuaries, aquaculture, and general areas of environmental significance, which could be impacted in one way or another by the DCP Terminal project, are taken into consideration. To reiterate, this environmental impact analysis, as it relates to the issuance of an LOR, falls under the purview of the Army Corps of Engineers, not the Coast Guard. The Coast Guard's only role in the siting or permitting process is to serve as a subject matter expert to the ACOE regarding waterway safety and security and provide the ACOE with a recommendation as to the suitability of the waterway to support LPG marine traffic in connection with the proposed project.

The ME Department of Inland Fisheries & Wildlife (MDIFW) reviewed the proposed project and determined that there were no records of any *Essential* or *Significant Wildlife Habitats*, or other wildlife habitats of special concern associated with the actual site. Although MDIFW identified no fisheries impacts, LPG workgroup members expressed concern for the prolific numbers of juvenile salmon that congregate and feed in the Bay's upper estuary after entering salt water from the fresh water rivers, and their migratory movement to the Gulf of Maine in search of schooled herring. Of additional concern to shellfish harvesters was whether or not an expanse of tidal flats, located on the easterly side of the railroad tracks along the outer periphery of the 43 acre tract, would be negatively impacted. According to the DCP Terminal, the tidal flats are not part of the terminal's operations and would be left undisturbed, with no plans to deny access to the public unless it fell within the boundaries of a safety and/or security zone established by the Coast Guard.

As previously indicated, safety and/or security zone parameters have not been determined. However, the COTP believes it would be safe to assume that in the event that a fixed security zone around a moored LPG carrier were established, the boundaries would most likely be consistent with security zones in force at alternative LPG sites within this zone and accordingly, would not significantly impact the public's ability to access this particular area.

The waterway between the sea and the DCP terminal does not support a level of industrial complex and/or critical infrastructure as defined in NVIC 01-2011 or the Area Maritime Security (AMS) Plan. There are no highway or railway bridges, or tunnels along the vessel's route to and from the terminal, nor are there any military-related bases or load-out ports, or nuclear facilities. There does exist an industrial based, chemical manufacturing and distributing company on the northerly end of the Sears Island causeway, at Kidder Point, which is approximately one mile northeast (by water) of Mack Point. This facility, which produces a wide variety of chemicals to support growth in the pharmaceutical, food and beverage, agriculture, pulp and paper, water and wastewater industries, is slightly "upriver" of the proposed DCP Terminal so would not be along an LPG carrier's path; however it is, nevertheless, on the exterior perimeter of

hazard zone two, as defined by Sandia Laboratories (see Section 9 for more details regarding Zones of Concern).

Cultural/Economic Impact

The port area has a long history of maritime commerce, shipbuilding, and fishing, and supports many diverse uses of the waterway. Tourism supplements the commercial fishing/lobstering, pulp and paper and agricultural-related industries, with much of the tourist pull centered on boating, canoeing/kayaking, recreational fishing, and camping around the pristine bay. Local cities, towns and municipalities along the shoreline and on both sides of Route 1, the major coastal artery, depend on tourist-related businesses to increase local capital and bolster employment opportunities.

Cities and towns along the bay are rich in maritime history. During the 19th century the port area had countless shipyards, building hundreds of three, four and five-masted schooners. In fact, in the mid-1870's over 10% of all U.S. sea-going merchant marine captains lived within the immediate area. These shipbuilders and deep-water captains became wealthy, building opulent mansions and houses along the waterfront, many of which still stand today. A lot of these homes are now elegantly restored bed and breakfasts and/or quaint seasonal resorts, appealing to the huge numbers of tourists and visitors who frequent the region year after year. According to some residents and local businesses who oppose the DCP Project, this appeal may be short-lived if the Bay becomes more "industrialized", and have argued that the perceived risks of an LPG accident, especially in connection with the size and location of the storage tank and estimated volume of tanker trucks needed to distribute the product, far outweigh any conceivable, economic advantage. Additionally, some consider the potential increase in deep-draft vessel traffic to pose an unacceptable risk; a release of fuel oil, lube oil, or cargo as a result of an accidental grounding, collision, or intentional act of terrorism could result in irreparable ecological harm to the environment and present an even greater health hazard to the surrounding population and visiting tourists. As well, a number of lobstermen and recreational boaters have expressed concern that the LPG carriers and associated ancillary craft may interfere with their summer boating activities and/or result in an increased fouling of lobster gear and traps.

The COTP appreciates the above-stated concerns and considered each throughout the WSA review and validation process. While this project does represent a slight increase in deep-draft vessel traffic, it is not anticipated that an additional 6-8 vessel arrivals, occurring primarily during the fall and wintertime over the course of a year, would substantially inconvenience recreational boaters or disrupt commercial fishing activities in that the LPG carriers would be transiting the same established shipping lanes already being used by other deep draft tankers and freighters that ply the port area.

It should be borne in mind that the LPG marine industry is well established and holds an excellent 30-year safety record. The ships are built to the highest of regulatory standards and are operated only by specially trained, highly proficient captains and crews with

competencies linked to the internationally required "Standards of Training, Certification and Watchkeeping" (STCW). There are risks of accidental spills from any deep-draft ship; however, through continual risk identification and the implementation of robust risk-mitigation measures and strategies in collaboration with regional port partners, stakeholders, and members of the Area Maritime Security Committee, these risks can be minimized to an acceptable level without unduly compromising safety and security.

WSA Conclusion #4, which states "Continual risk identification and risk management processes should be conducted in cooperation with appropriate stakeholders" reinforces the DCP Terminal's intentions in that regard, and has the concurrence of the COTP.

8. OPERATIONAL CONSIDERATIONS

Shore-side Emergency Response

Generally speaking, law enforcement, public safety, and emergency response capabilities within the immediate region are in keeping with the rural nature of the area – minimally staffed, minimally equipped and trained, and limited in their ability to expand due to relatively small tax bases. This is of obvious concern to the region's first responders; a fire of any magnitude would be catastrophic to the immediate area.

COTP comment: It's logical for one to expect that, in general, shore-based fire departments, emergency response units, and emergency management organizations located in close proximity to an LPG facility would also have the appropriate training and equipment necessary to launch an initial response capability to an LPG fire and/or related medical emergency. Unfortunately, in keeping with the rural nature of the area that capability does not currently exist in the Penobscot Bay region; a major concern and subject of several received queries. Notwithstanding, some within the LPG workgroup, who had also served on similar working groups in connection with neighboring Down East liquefied natural gas (LNG) proposals, were also under the misconception that the applicant would be required, by federal mandate, to supplement existing response services in way of a cost-sharing program. This is understandable. In all LNG project evaluations where the Federal Energy Regulatory Commission (FERC) is the lead federal jurisdictional agency and ultimately authorizes the siting of the LNG terminal, the Commission Order will dictate that emergency response needs and related planning strategies must be addressed as per Section 311(d) of the Energy Policy Act of 2005, and the Natural Gas Act, 15 U.S.C § 717b-1. In addition, the Energy Policy Act of 2005 and ultimately, the FERC Commission, require a cost sharing plan within the Emergency Response Plan (ERP), again applicable to LNG, that identifies the funding mechanism for all project-specific security and safety/emergency management costs that would be borne by state and local agencies to include:

- Direct reimbursement (overtime for police and fire, *etc.*)
- Capital costs associated with emergency management equipment (patrol boats, firefighting equipment, *etc.*); and

- Annual costs associated with specialized training for fire departments, mutual aid, *etc.*

However, the above provisions apply to LNG facilities located onshore or within state waters only, and do **not** map over to liquefied petroleum gas (LPG) facilities in those same locations, even though the hazard characteristics of the two commodities, when directly compared, are not remarkably different. (See the discussion under Application of Hazard Zones later in this analysis.)

Accordingly, the need for shoreside emergency plan development, resource identification, response training, and a public education program on emergency response management were acknowledged in the safety and security risk assessment portions of the WSA as *Identified Response Gaps*. Risk reduction measures such as these will need to be further considered by the Army Corps of Engineers (ACOE), the lead federal agency with siting authority for this project, in joint collaboration with the State of Maine in that the actual site determination, while associated with the WSA, predominately falls under their respective purviews.

Additionally, although not specific to the Coast Guard's WSA and/or LOR process, a number of questions surfaced during work group efforts surrounding the proposed LPG storage area, to be located well inland of the designated waterfront facility. It should be noted that Environmental Protection Agency (EPA) regulations require all facilities that process or store flammable or toxic materials in quantities greater than specified thresholds to register with the EPA and have in place an extensive Risk Management Program (RMP). The RMP, based on a worst-case potential release, is submitted to local, state, and federal authorities and made available to the public to enhance local emergency planning processes. Details of the RMP are available in EPA publication #550-B-00-001 entitled *Risk Management Program Guidance for Propane Storage Facilities (40 CFR Part 68).* The RMP, which is subject to periodic audits, must be provided to EPA for review and comment at least 45 days prior to the start-up of the facility and must be resubmitted every five years thereafter.

Marine Firefighting Capabilities

Fire is one of the most dangerous emergency conditions onboard a ship, leading to disastrous results including loss of property and life. LPG, like LNG, burns at extremely high temperatures, and once started, propane and methane fires are difficult to extinguish. Therefore, LPG carrier onboard firefighting capabilities must be in compliance with rigorous requirements established by the International Gas Carrier (IGC) Code under the International Convention for the Safety of Life at Sea (SOLAS) 1974. In that firefighting resources aboard a vessel are physically limited, prevention is significantly important. For this reason, an international safety system, known as the Fire Safety System Code (FSS Code), was promulgated under SOLAS and became mandatory by Marine Safety Committee (MSC) resolution 99 (73). The FSS Code provides specific standards of engineering for fire safety systems onboard these vessels, to include fixed gas, foam,

water pressure and spray extinguishing systems, personal protection equipment, and detection and alarm systems, just to name a few.

Due to the nature of LHG and LNG cargoes, and the potential for severe consequence subsequent to a major casualty, most new LHG and LNG escort and assist tug boats are equipped with firefighting equipment that meet the International Association of Classification Societies (IACS) "FiFi 1" notation; *i.e.,* vessels are equipped with at least two monitors that, in total, have a discharge rate of 2400 m^3/hr, and are able to spray water to a height of 45 meters and to a minimum distance of 120 meters and capable of conducting sustained firefighting operations for at least 24 hours. In addition to the water stream requirements, at all levels of FiFi categories (1, 2, and 3) the vessels must have a deluge system, comprised of piping and associated sprinkler heads and nozzles along the deck and pilot house, which will provide a protective curtain of water and protect the tug/response vessel and crew from the effects of radiant heat. This would allow the tug to escape the scene of a fire in order to reach an area of refuge, or it might enable the tug to enter an area of high heat to affect a rescue. The National Fire Protection Academy, as outlined in its publication NFPA 1915 – *Standard on Marine Fire-Fighting Vessels,* also requires similar criteria for towing vessels in order that they maintain Class 1 certification. While there is no federal requirement that specifies that tugs in the service of escorting or assisting LHG vessels meet the FiFi 1 notation; it has widely become the industry standard.

Tug service for the Penobscot Bay port area is provided by the Penobscot Bay Tractor Tug Company. The three tugs intended to assist the transit and mooring of LPG carriers are the:

- 3,500 HP FOURNIER TRACTOR, which is powered by two EMD diesel engines married to Ulstein "z-drives", has a 40 short-ton bollard pull, and equipped with a firefighting system capable of supplying 3,500 gallons per minute (GPM);
- 4,000 HP twin-propeller CAPTAIN BILL, which has a 42 short-ton bollard pull and firefighting system rated at 300 GPM; and
- Single-propeller, 2,000 HP Fairbanks-Morse powered FORT POINT, which has a 27 short-ton bollard pull and end equipped with a firefighting system capable of supplying 3,500 GPM.

Currently, none of the listed tugs are equipped with firefighting capabilities that meet the criteria specified for a FiFi 1 notation; however, the Penobscot Bay Tractor Tug Company, in consultation with the DCP Terminal, has examined the feasibility of retrofitting the FOURNIER TRACTOR with the necessary drives, pumps, and associated piping etc. in order to produce water stream capacities and capabilities equivalent to the FiFi 1 notation and fully intends to upgrade the tug accordingly when and if the DCP Terminal receives final siting approval from the ACOE.

The COTP concurs on the need and significance of adequate firefighting capabilities for the port area and appreciates the tug company and DCP's proactive approach towards

consequence management. Enhanced firefighting capabilities will not only serve the LPG proposal, it will increase the margin of safety for all deep draft freighters and petroleum tankers servicing the port area.

Application of Hazard Zones

Effective June 25, 2010, the Coast Guard revised its requirements for facilities handling LNG and LHG cargoes. Under previous regulations, the mandatory requirement for a WSA was based on FERC regulations and applied only to LNG; contrastingly, under the new rulemaking a WSA is now required by Coast Guard regulations, and applies to LHG cargoes as well. However, in that the Coast Guard has not promulgated guidance in the form of a Navigation and Vessel Inspection Circular (NVIC) specific to LHG, NVIC # 01-2011 entitled, *Guidance Related to Waterfront Liquefied Natural Gas (LNG) Facilities* was used as a guideline in developing the DCP Terminal WSA, and Enclosure 2 to the NVIC, *Overview – Process and Procedures Associated with Waterfront LNG Facilities*, provided the procedural template for the WSA.

LNG and LHG facilities and the cargoes they handle are similar in nature; as well, the vessels that transport these cargoes pose similar risks to the waterway environment and the immediate areas surrounding the marine transfer area. In view of this, COTP SNNE recommended that KSEAS, LLC apply and evaluate the vessel transit route against a "hazard zone" type criterion applicable to LPG, akin to the Zones of Concern established for LNG as concluded by proven algorithms and modeling by the Sandia National Laboratories and contained in their Report SAND2004-6258 (Sandia Report), entitled *Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water.*

Subsequent review of a similar report entitled "Modeling the Release, Spreading and Burning of LNG, LPG and Gasoline on Water", by D.W. Johnson and J.B. Cornwell, 2006, for the *Journal of Hazardous Materials*, correlated the fundamental equations and principles of Sandia and demonstrated the fact that the models can be used for LPG with the same level of confidence as for LNG. To further substantiate these findings, KSEAS, LLC investigated modeling used by the Chemical Process Industry in *Guidelines for Chemical Process Quantitative Risk Analysis, 2nd Edition, AIChE.* Using the Pool Fire Models for thermal flux and inputting the conditions used in the Johnson and Cornwell Study, it was determined that the calculated distances for LPG do, in fact, fall within the same limits and parameters as that calculated by Sandia laboratories for the Zones of Concern for LNG.

In view of the above, the DCP Terminal applied the hazard zone criteria contained in the Sandia National Laboratories Report to both (safety and security) assessment methodologies contained in the WSA. Additionally, following the guidance of NVIC 01-2011, the distance parameters commensurate with an "intentional" release were used to define the potential areas of impact, termed "Zones of Concern", for both assessments. Figure 9, obtained from the Johnson and Cornwell Study, provides a graphical

comparison of projected thermal flux levels and associated distances for LNG, LPG, and gasoline, consequent to a 1-meter hole. As indicated in their analysis and shown on the graph, the heat flux per distance and volume of release is nearly the same for all three products, further substantiating that for equal volumes of these flammable materials, the impacts from an expanding burning pool are nearly identical.

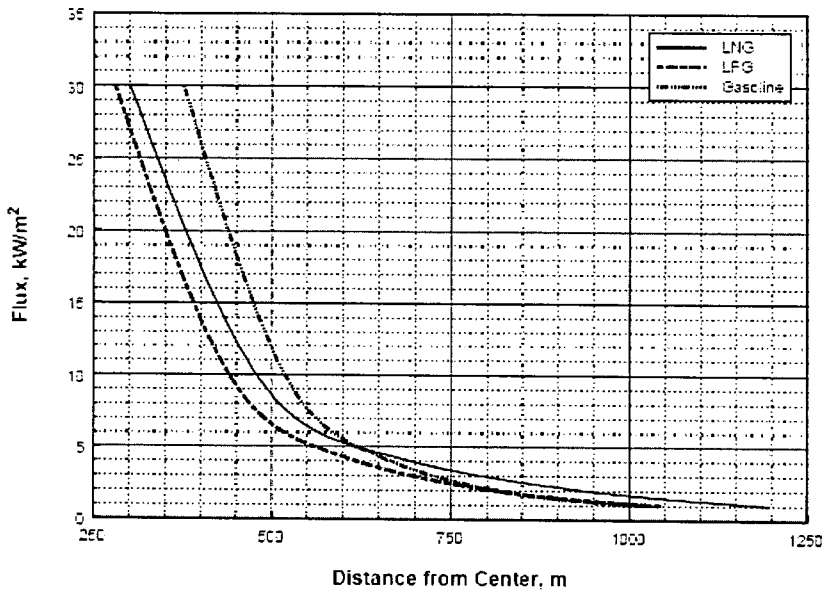


Figure 9 - Radiant Flux vs. Distance (consequent to a 1-meter diameter breach)
(Courtesy of "Modeling the Release, Spreading and Burning of LNG, LPG and Gasoline on Water", by D.W. Johnson and J.B. Cornwell, 2006, for the *Journal of Hazardous Materials*)

Thermal Radiation Analysis

An important consideration in assessing the suitability of the proposed transit route and approaches to support LPG marine traffic, is establishing the size of hazard zones, or Zones of Concern, associated with a large release of LPG. The criterion used to define the outer limits of Zone 1 and 2 is incident flux, i.e., thermal radiation that would be expected from an intense LPG vapor fire over a specified time period.

Zone	Criteria (10 minute exposure time)	Consequence
Zone 1	37.5 kW/m^{2*}	High potential for major injuries and/or significant structural damage consequent to a pool fire and vapor cloud hazard
Zone 2	5 kW/m^2	Potential for injuries and limited property damage consequent to a pool fire and vapor cloud hazard
Zone 3	Lower flammability limit (5%)	Reduced potential for injury or damage if appropriately clothed or protected consequent to vapor cloud hazard only; no pool fire

Figure 10 - Hazard Zone Criterion
(Source: Extrapolated from Sandia Report data Note: *Kilowatts per square meter)

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

As shown in Figure 10, thermal radiation consequent to a pool fire and vapor cloud within Zone 1 can cause serious injury and/or significant damage to property structures. As indicated in Figure 11, Zone 1 is considered to extend about 500 meters (0.3 miles) from a breached LPG tanker. By definition, these are areas in which LPG shipments occur in relatively narrow harbors or channels, or ships pass under major bridges or over tunnels, or come within 500 meters of major infrastructure such as military installations, commercial/business centers, or national icons. Definitive risk mitigation measures should address vapor cloud dispersion and fire hazards, with the most rigorous protective and preventive deterrent measures being considered. These measures may include such safeguards as vessel safety zones, waterway traffic management, and establishment of vessel positive control measures. Coordination amongst port stakeholders is essential and relevant response measures carefully weighed and resources made available, where appropriate.

Within Zone 2 the thermal radiation, again consequent to a pool fire and vapor cloud, can cause limited injury and/or some property damage. As shown in Figure 11, Zone 2 is considered to extend outward from 500 meters (0.3 miles) to 1,600 meters (1 mile) from the intentional breach. This zone would include areas of broader channel widths, larger open harbors, or areas over 500 meters from major critical infrastructure elements. Risk mitigation strategies should address vapor cloud dispersion and fire hazards. Risk management strategies should include incident management and response procedures that ensure areas of refuge are available (enclosed buildings, shelters etc.,), the development of emergency warning procedures, and the availability of educational programs to ensure communities are aware of needed precautionary measures.

COTP Note: Section 7.3 of the WSA contains a cross-check of security measures recommended by NVIC 01-2011 against security measures recommended by the DCP Terminal. A summary of the findings was provided in WSA Table 64. Of significance, one of the WSA recommendations concluded that "Warning signals for the community are not warranted. The impact of the Zones of Concern on Searsport should be further studied with the intent of evaluating whether warning signals would be necessary. Given the predominant winds, any gas leak would be carried away from Searsport during an emergency at the terminal." The COTP disagrees with this finding. Weather along the Maine coast is anything but predictable; it is always changing. While the prevailing wind during the summer is usually from the southwest, there are many days when it shifts and comes from the east, bringing fog, drizzle, and generally gray weather. After a front has passed the wind typically shifts again, arriving from the northwest in strong gusts before tapering off after several hours and shifting back to the southwest. The region also experiences "Nor'easters", so named for the hurricane-force winds that blow in from the northeast. There are also many places along the Maine coast where the hills and mountains are so close to the coast that downdrafts, unrelated to the general weather pattern, are created – as is the case for the shoreline along Penobscot Bay just north of Camden. So, there cannot be a strong presumption that an accidental release of LPG at the terminal would not impact Searsport due to prevailing winds. Regardless of the prevailing winds, it should be noted that 33 CFR 127.1207 specifically requires that each

marine transfer area for LHG cargoes must have a rotating or flashing amber light visible for at least one mile, supplemented with a siren that is audible for at least one mile, for the safety of surrounding communities.

Commencing with Zone 3 there is no longer a pool fire threat; only a vapor cloud hazard remains. As a result, the potential for personal injury and property attributable to thermal radiation significantly decreases. The outer limit of Zone 3 ranges from approximately 1-mile for an accidental release of LPG, to about 2.2 miles for an intentional release, and is determined based on the lower flammability limit of the LPG vapor, i.e., the lowest concentration of fuel (by volume) mixed with air that remains flammable. Accordingly, to ensure people know what to do in the unlikely event of the release of a vapor cloud without ignition risk mitigation measures should address the vapor cloud dispersion hazard and incorporate incident management and emergency response measures that ensure areas of refuge are identified and community education programs made available.

In summary and as shown in Figure 10, within all three zones the level of risk of injury or property damage reduces as the distance from the source increases and the thermal radiation decreases. The most significant impact to public safety and property exists within approximately 500 meters of an LPG spill/release due to the extreme thermal radiation hazards from fire, with much lower public health and safety impacts at distances approaching 1600 meters and beyond.

The intensity and linear size of hazard zones calculated in the Sandia Report for accidental and intentional spills/releases of LPG were determined only after extensive modeling and testing. However, the potential for an LPG cargo tank breach, the dynamics and dispersion rates, and the resultant hazards of such a spill are only generally understood and, as such, are only postulated estimates at best. The combination of LPG vessel double hull design and current safety management practices throughout the marine transportation industry have reduced LPG accidents to a point where there is little historical or empirical information from which to draw definitive conclusions. This lack of information forces assumptions to be made when the size, dispersion rate, and thermal hazards of a spill are calculated. Therefore, it should be understood that a level of variability exists with the many current models and techniques being used to provide adequate guidance on the hazards of an LPG spill. Some of the variables that affect the modeling techniques, assumptions, and simplifications include: the size, mass, speed, and loaded condition of the carrier; size, mass, collision velocities, and angle of impact if collided with another vessel; depth of penetration and whether or not the inner hull and primary tank boundary was compromised; size and number of breaches; whether or not there were multiple, cascading tank failures; climatic conditions (wind velocity and sea state); and location of the breach in reference to the waterline.

	Zone 1 (37.5 kW/m^2)		Zone 2 (5 kW/m^2)		Zone 3 (Lower Flammability Limit)	
Intentional Breaches	500 m	546 yds	1600 m	1750 yds	3500 m	2.2 miles
Accidental Breaches	250 m	273 yds	700 m	765 yds	1700 m	1.06 miles

Figure 11 - Hazard Zone Size
(Ref: Sandia Report)

As previously indicated and shown in Figure 11, calculated hazard zone sizes vary, depending on whether the event was accidental, or intentionally caused. Based on 2004 Sandia Laboratories LNG modeling studies, accidental events occurring near-shore resulted in smaller breach sizes and were found to be much easier to mitigate through operational improvements than spills caused by intentional events. Similarly, the Johnson and Cornwell Study indicated that accidental LPG cargo tank damage scenarios (e.g., groundings, collisions or allisions) exist that could potentially cause an effective breach area of 0.5 to 1.5 m^2; but due to existing LPG carrier hull design and equipment requirements, together with the implementation of navigational safety measures, the risk from such accidents is generally low. In contrast, several credible intentional LPG cargo tank damage scenarios exist that would initiate a breach of between 2 m^2 to approximately 12 m^2, with a probable nominal size of 5 to 7 m^2, resulting in a higher rate and volume of spill, corresponding to larger diameter Zones of Concern. In the majority of the scenarios identified, an ignition source is probable and a LPG fire at, or near, the source is very likely to occur. In the unlikely event that a fire doesn't erupt, damage scenarios indicate that vapor cloud dispersion with delayed ignition could occur, followed by a fire some considerable distance from the source. For the purposes of the WSA risk assessment methodologies, the DCP Terminal applied the zone sizes associated with an intentional release (worst-case scenario) to anticipate the expected consequences of a large release of LPG from a carrier onto the water and into the surrounding atmosphere.

Hazard Zones by Route Segments

Figure 12 provides a graphic overlay of potential hazard zones associated with the movement of an LPG carrier along the intended transit route, commencing at the pilot boarding area (buoy PBA) and concluding at Mack Point. The DCP Terminal used the zone sizes associated with an intentional release to describe the expected consequences of a large release of LPG from a carrier onto the water and into the surrounding atmosphere. The superimposed Zones of Concern identify where zone boundaries could potentially intersect with populated areas, critical infrastructure, and areas with heavy concentrations of marine traffic, thereby highlighting areas where risk-management strategies should be considered. The red line depicts the LPG carrier's anticipated course or track line, from which the Zones of Concern are calculated.

Figure 12 - Zones of Concern
(Courtesy of Google Earth Images and KSEAS, LLC)

An LPG carrier "drifting" from the plotted route within the channel would, therefore, shift the Zones of Concern proportionately, where greater public safety and environmental effects could be experienced, if a worst case accidental or intentional release scenario were realized. The circles plotted along the track line denote the outer boundaries of the Zones of Concern, with red representing Zone 1, orange Zone 2, and

yellow Zone 3. For ease of reference the WSA further divided the transit route into segments, based on established way points provided by the pilots and shown in Figures 13 through 16. An enlarged view of the Mack Point Terminal, superimposed with the corresponding Zones of Concern, can be seen in Figure 17.

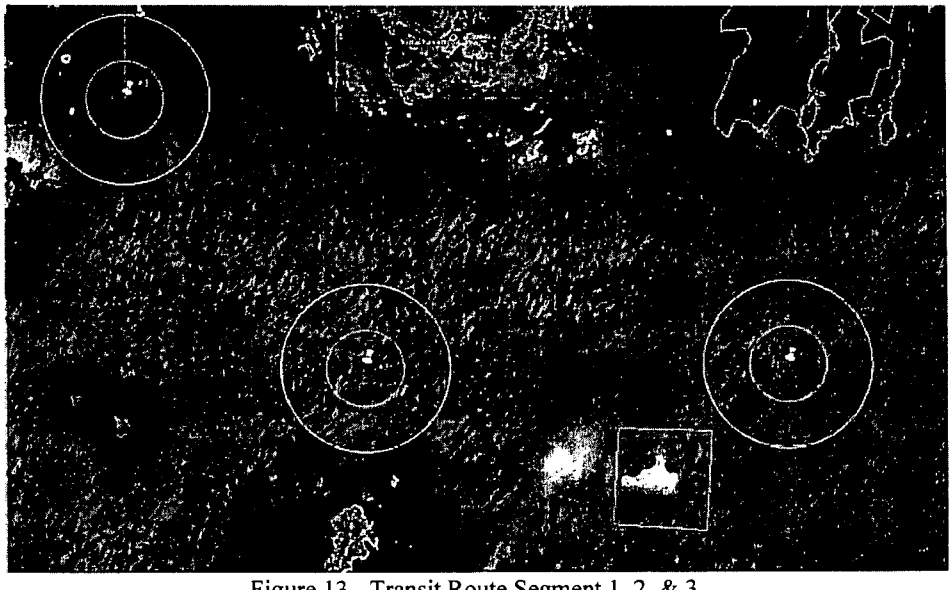


Figure 13 - Transit Route Segment 1, 2, & 3.

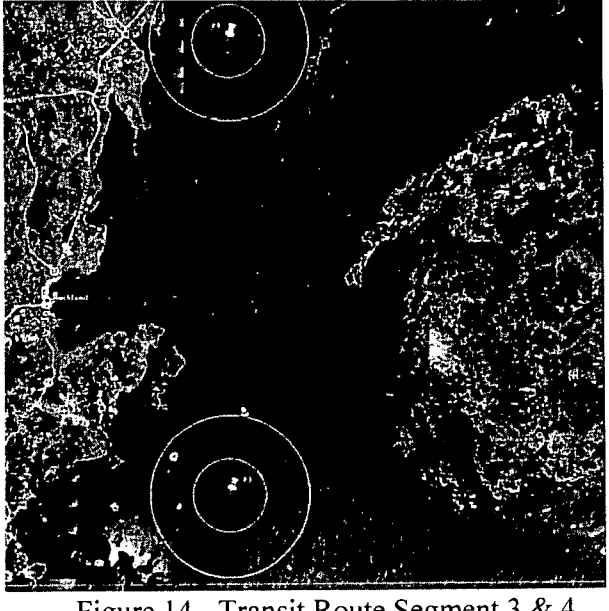
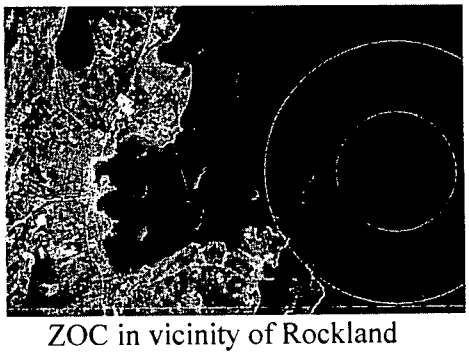


Figure 14 - Transit Route Segment 3 & 4



ZOC in vicinity of Rockland

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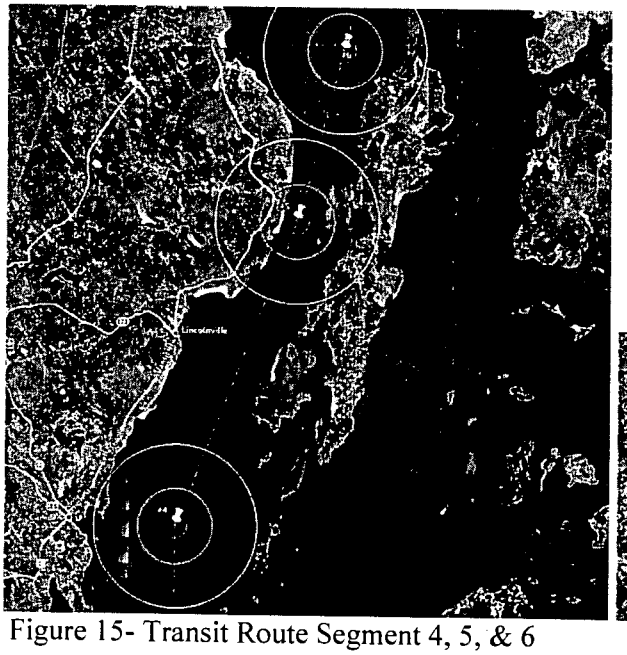
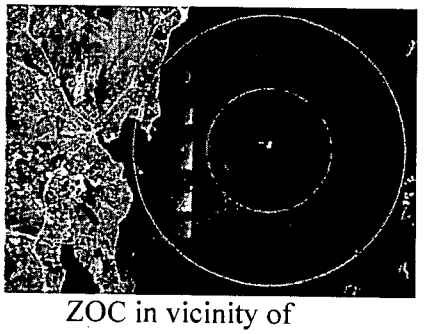


Figure 15- Transit Route Segment 4, 5, & 6



ZOC in vicinity of Rockport and Camden

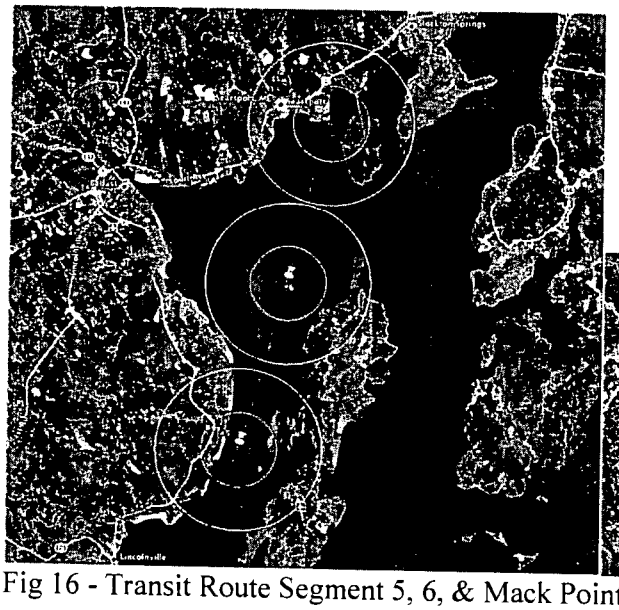
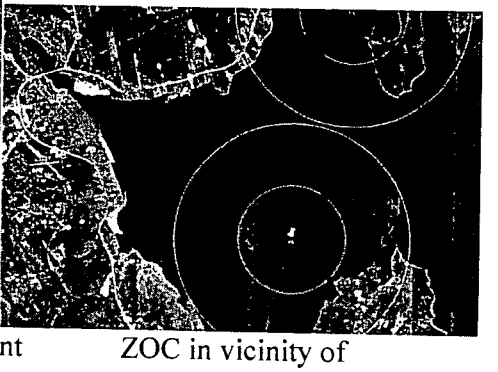


Fig 16 - Transit Route Segment 5, 6, & Mack Point



ZOC in vicinity of Belfast

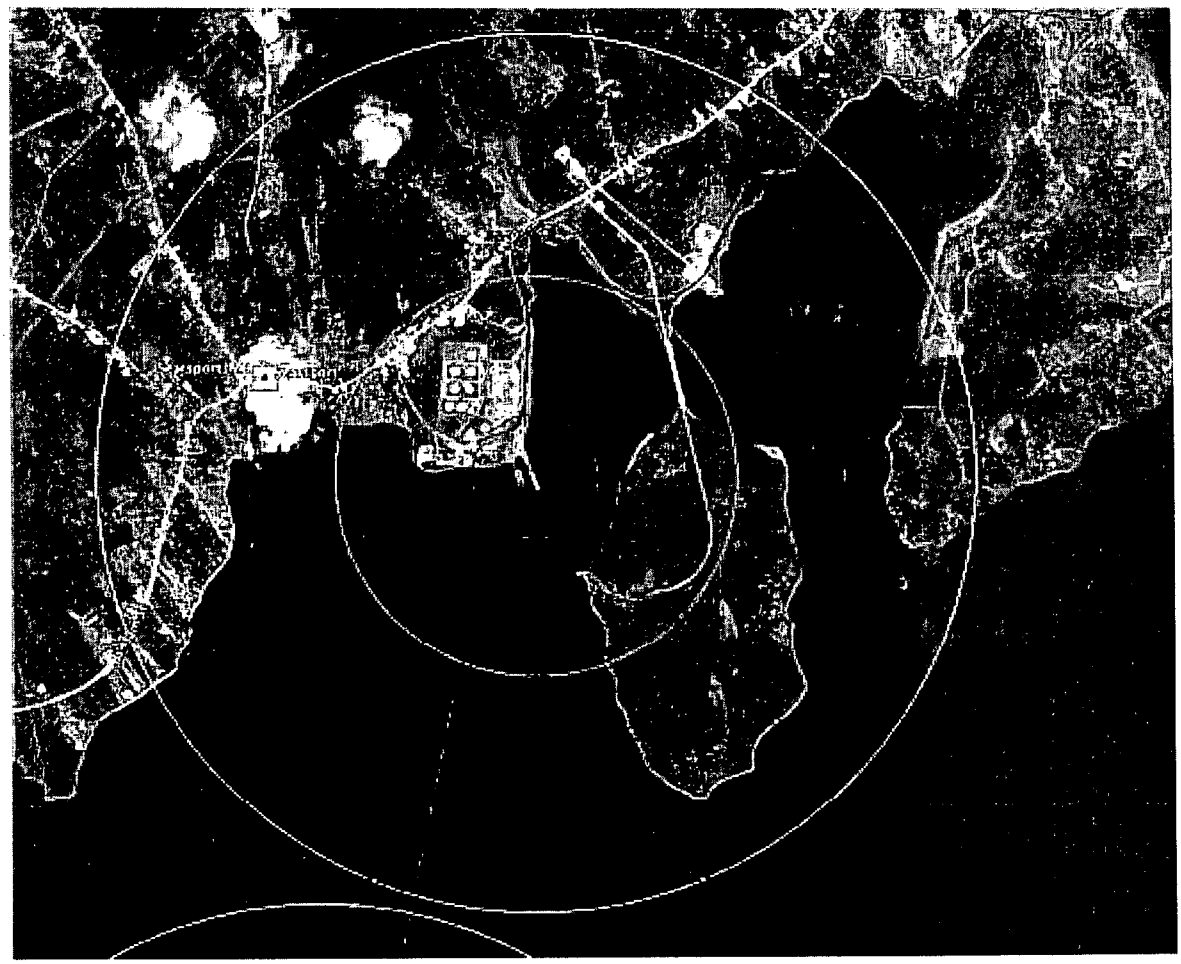


Figure 17 - Mack Point Terminal and Searsport area

LPG burns at extremely high temperatures; once started, a propane gas fire is difficult to extinguish. As indicated in the Sandia Report, scientists determined that should a large LNG spill on water be ignited, it could burn at 3,000 degrees F for 30 minutes to an hour, throwing off extreme, potentially damaging heat for the first four-tenths of a mile from the vessel. Beyond that range, the degree of heat flux decreases appreciably depending on surrounding climatic conditions (wave height, wind speed, etc.) and geographical impediments such as man-made buildings or structures, and natural obstructions such as tree lines and hills. The same holds true for propane, and as earlier mentioned, gasoline. For comparison sake, the auto ignition temperatures and peak flame temperatures for the three products, in degrees Fahrenheit, are:

	Propane (LPG)	Methane (LNG)	Gasoline
auto ignition temp	1,004	842	428
peak flame temp	3,614	3,254	3,591

Population Densities

One of the criteria used to judge the potential impact of a LPG release is the population threatened. The three levels of population density, as defined in NVIC 01-2011 are:

- High population areas - residential areas with a population density of 9,000 persons or more per square mile;
- Medium population areas - residential areas with 1,000 to 9,000 persons per square mile; and
- Low population areas - residential areas with less than 1,000 persons per square mile.

As per the requirement of 33 CFR 127.007(f), the WSA considered all population centers along the transit route that are located within 15.5 miles of the DCP Terminal, and also included the towns of Stockton Springs and Penobscot, just northeast of the Mack Point Terminal.

As shown in the transit route segments, the hazard zones for an intentional (terrorist-related) incident reach at least a portion of the populated areas. Applying the above population density criteria, the transit route passes through only low population areas, i.e., less than 1,000 persons per square mile. Based on 2000 Census data and as shown in Figure 18, the most densely populated area was Rockland, with a density of 589.2 persons per square mile, followed by Camden at 187.3. At the other end of the spectrum was Penobscot, at 31.7, and not surprisingly due to size and offshore location, the islands of Matinicus and Isle Au Haut, with population densities of 31.8 and 6.2, respectively. Clearly, the demographics of the Penobscot Bay port area do not meet the NVIC-based criterion specific to *high,* or even *medium,* population densities along the vessel's transit route or at the proposed facility site. This statement is not intended to demean the significance and/or importance of the surrounding communities, environment, or the populace living, working or using the waterway; rather, it simply concludes that the risk of LPG movement through the waterway has been evaluated against pre-determined criteria in order to establish and prioritize levels of impact, and as a means of determining risk mitigation strategies.

Fig. 18 - Population Densities for Communities Along the LPG Transit Route (High to Low)

Municipalities Along Transit Route	Population Density Classification	Population Density (people/sq mi)
Rockland	Low	589.2
Camden	Low	287.3
Belfast	Low	187.5
Castine	Low	172.2
Rockport	Low	147.8
Bucksport	Low	92.5
Searsport	Low	92.4
Stockton Springs	Low	75.6
Lincolnville	Low	54.6
Vinalhaven Island	Low	48.8
Islesboro Island	Low	42.3
Penobscot	Low	33.7

Zone Impacts

In view of the relative remoteness of the waterway and comparatively low concentration of key assets, critical infrastructure, and population densities as defined by NVIC 01-2011, the following generalities, denoted by zone consequence, are provided to illustrate the potential impacts of an intentional release of LPG, vice graphically depicting them by route segments:

Zone 1

- Zone 1, the measure with the most severe impact, does not affect any high population areas or public or government centers such as schools, hospitals or transportation infrastructure along the intended track line. Recreational and fishing vessels may fall within Zone 1, depending on their course. The Maine State Ferry crossings connecting the mainland with the islands of Islesboro, Vinalhaven, and Matinicus could also be within Zone 1 as an LPG carrier passes. Transit of recreational, fishing, and ferry vessels through a Zone 1 can be avoided by timing and course changes, if operational conditions permit.

- When an LPG carrier is moored at Mack Point southeasterly portions of the Sprague and Irving terminals would fall within Zone 1.

Zone 2

- As with Zone 1, recreational, fishing, and ferry vessels could fall within Zone 2, depending on their respective course directions and time of operation.

- During LPG vessel transits within segment 5, coastal portions of Northport and Keller Point, Islesboro Island fall within Zone 2.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

- When an LPG carrier is moored at Mack Point the entire Sprague and Irving facilities would fall within this zone. In addition, a significant number of Searsport streets, as well as U.S. Route 1, residential homes and businesses would be within this zone.

Zone 3

- Commercial deep-draft vessels and/or tug and barges transiting the west side of Islesboro Island and bound for ports in the Penobscot River, such as Bucksport, could potentially cross the outer boundary of Zone 3 as they pass Sears Island.

- Coastal portions of Rockport and Camden may be on the outer fringes of Zone 3, depending on the location of an LPG carrier within the channel during its transit.

- When an LPG carrier is moored at Mack Point the majority of Searsport, outer fringes of Stockton Springs, Sears Island, and southwestern tip of Cape Jellerson all lay within the zone.

- A significant portion of U.S. Route 1 in Northport, between Spruces Head and Kellys Cove, lies within Zone 3 during the transit of an LPG carrier.

- Although not classified as "critical infrastructure", U.S. Route 1 is the region's major artery and carries over 90% of all vehicular traffic headed up the Maine coast. Whenever an LPG carrier is berthed at Mack Point, approximately five miles of this road would be contained in Zone 3, and about two miles would be in Zone 2.

In general:

- Although no major military post or camp is situated along the waterway, Coast Guard Station Rockland, a Search and Rescue (SAR) and Law Enforcement (LE) installation, is located in Rockland Harbor, outside of the zone boundaries, about 4 nautical miles west of the intended transit track line.
- There are no other major transportation centers located along the vessel's route or in the direct vicinity of Mack Point.
- There are no known or designated iconic structures in the immediate area and/or along the vessel transit route into and out of the proposed site. The natural features of the coast are the area's most iconic attribute.
- With the exception of the Knox County Regional Airport and Belfast Municipal Airport, each of which are located about five miles from the intended track line, there are no other major airports within the region. There does exist, however, a number of airfields. The only one that would be potentially impacted is Islesboro Field, where the extremity of the runway falls ¼ mile within the outer boundary of Zone 3 during the transit of an LPG carrier.
- There are five hospitals/medical centers within the Searsport region; none fall within the Zones of Concern associated with either, a passing or moored LPG carrier.

- According to the WSA, an analysis of the data collected on school locations showed that there were no areas where public schools were located within three nautical miles of an LPG carrier's track line and two public schools located within the Searsport proper inside Zone 3 boundaries when a carrier is moored at Mack Point. Once again, the WSA asserted that "prevailing winds" would eliminate any vapor cloud threat to the school(s). As aforementioned, the COTP does not fully concur with this supposition; wind direction changes with seasons and weather conditions.
- The region is populated with a number of wilderness parks; however, within the context of the defined criteria, none approach the *high* or *medium* population density factor, and none are wholly contained within a Zone of Concern.

9. RISK ASSESSMENT AND MANAGEMENT STRATEGIES

Assessment Methodology

The **safety** risk assessment portion of the WSA evaluated the risks of an *accidental* release of LPG from a carrier, where events may be triggered by incidents such as collisions, groundings, or machinery failures, etc. Potential problems that could lead to an accidental release were considered and the likelihood and consequences of these events further evaluated. The **security** risk assessment, on the other hand, evaluated the risks of an *intentional* release of LPG consequent to internal subversive acts like sabotage, and/or terrorist-related attacks using improvised incendiary or explosive devices, underwater mines etc., which could cause and/or result in a significant release of LPG from a transiting or moored carrier. Successful mitigation measures generally fall into one of two categories: prevention and consequence management. Whereas prevention seeks to avoid an accident, consequence management seeks to reduce the negative impacts should an accident or incident occur.

KSEAS, LLC performed and documented the risk assessments for the DCP Terminal consistent with the U.S. Coast Guard's Risk-based Decision (RBDM) Guidelines (USCG, 2004). These guidelines defined a process in which (1) risk questions were proposed, (2) an analysis was structured to answer those questions, and (3) the appropriate risk techniques (including data analysis when available) were employed. The specific transit-related questions that the assessments were structured to answer included:

- What incidents could occur that would threaten the public or environment?
- What safeguards exist to mitigate or prevent those kinds of events?
- Given those safeguards, what are the likelihood and consequence (i.e., the risk) of such events?
- What additional measures could be considered to reduce the identified risks?

Also, a number of assumptions, common to both risk assessments, was made and applied. These included:

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

- The COTP's jurisdictional authority under 33 CFR Part 127, as defined in 33 CFR 127.005, is that part of a waterfront facility located between the vessel, or where the vessel moors, and the first shutoff valve on the pipeline immediately inland of the terminal manifold or loading arm[4]. In accordance with these regulations, the scope of the WSA and safety and security analyses focused on the marine environment, transit and docking of the LPG carrier, and offloading operations and not on potential events pertaining to storage tanks, pipelines and ancillary equipment located inland of the pier.

- The DCP Terminal and associated LPG carriers that serve them will comply with all applicable international treaty requirements and federal laws and regulations regarding the implementation of safety measure, security plans, and other specifically mandated requirements.

- Only a single LPG carrier will be transiting to and from the DCP Terminal at any one time; i.e., there will be no opposing LPG traffic.

- Conjectural events consequent to equipment failures (such as loss of propulsion, steerage, etc.,) and/or human error (such as incorrect helm positioning, inaccurate course plotting etc.,) were applied factors.

- There will be no routine bunkering operations conducted at the terminal or anywhere along the transit route involving LPG carriers.
- The Coast Guard will (1) conduct Port State Control boardings and security screenings as dictated per current policy; and (2) facilitate the development of a transit management plan (TMP) for LPG carriers transiting to and from the LPG terminal. The TMP will outline operational and security requirements, and define safe operating windows for all vessel movements.

The WSA safety and security analyses took into consideration historical data and informational exchanges with area stakeholders. Safety and security measures currently in place that help mitigate the risks associated with the marine transportation of LPG were identified and quantified. Where available resources and capabilities were not adequate to offset or mitigate the identified risk, a gap was identified, recorded, and alternate mitigation strategies subsequently explored.

Specific questions that the safety and security[5] assessments were structured to answer included:

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[4] 33 CFR 127.007(f)(2), 127.009(d), and 127.009(e).

[5] The **security assessment** evaluated the risks of intentional releases of LPG and explored threat, vulnerability, and consequence. The probability of an incident was evaluated in terms of threat and vulnerability, where threat was considered as the likelihood of an attack and vulnerability being the likelihood that such an attack could succeed. In that this assessment contains information classified as "Sensitive Security Information", it is contained in Section 10, which serves as a *Supplement* to this Letter of Recommendation Analysis, and will not be available for public disclosure.

- What potential incidents involving an LPG carrier transiting through Penobscot Bay to Mack point would threaten members of the public, commerce, or the environment?
- Are there existing safeguards to prevent or mitigate the kinds of events identified?
- What is the likelihood and consequence of such events?
- What additional safety or security measures are needed to reduce the identified risks?

The DCP Terminal conducted its **safety** risk assessment following RBDM Guidelines, and analyzed its **security** risks utilizing the Security Vulnerability Assessment (SVA) methodology as recommended by the American Petroleum Institute (API) and National Petrochemical & Refiners Association (NPRA). Additionally, both assessments used and applied Sandia Laboratories-based thermal hazard criteria associated with worst-case releases (intentional) to calculate and plot the three hazard zones, termed "Zones of Concern" (ZOC). The ZOCs, which are concentric, circular rings transposed over a target, graphically depict those areas along the transit which may be directly subject to the consequences of an LPG release, and depending on the radial distance from the center, the expected severity of the hazard consequence.

In addition to illustrating the hazard zone(s) boundary limits the WSA analyses, following guidance contained in NVIC 01-2011, applied a comprehensive inventory of strategic scenarios and corresponding, well-conceived risk reduction strategies to mitigate the effects of a LPG release on people and property located within the calculated zones. These scenarios took into consideration a number of assumptions and anticipated safety/security parameters on which the eventual mitigation strategies were based, to include waterway dynamics, carrier size, capacity and frequency, potentiality for vessel groundings, collisions and allisions, hazards consequential to spill/releases, potential vulnerabilities, security risks, existing safeguards, and the plausibility of terrorist-related attacks and activities, among others.

The DCP Terminal's risk-based assessment methodology suggests that the likelihood of accidental releases and/or threats of intentional interference are relatively low. This assessment was based on past and existing deep-draft vessel activity, the relative remoteness of the area, the substantial width and relative depth of the transit route, comparative absence of national iconic and/or critical infrastructure, and population densities that are in sharp contrast to larger, industrialized and strategically located in urban port areas. Nonetheless, the potential for severe consequences as a result of a release of LPG does exist, albeit proportionately less for the Penobscot Bay port area. In consideration of the risk factors acknowledged in the DCP Terminal WSA, substantiated in part with the findings of the LPG working group, it's clearly apparent that it will be necessary to implement mitigation measures to effectively manage the identified navigation, safety, security and environmental risks associated with the project. Accordingly, the COTP, under authority of the Ports and Waterways Safety Act and/or the Maritime Transportation Security Act of 2002, may require the implementation of

certain safeguards and risk reduction measures, some of which are referenced in this Analysis, aside and apart from the Letter of Recommendation process.

Safety Risk Assessment (SRA) and Associated Scenarios

Consistent with the guidelines contained in NVIC 01-2011, the DCP Terminal applied the Coast Guard's *Risk-Based Decision-Making Guidelines* to develop a comprehensive assessment strategy that adequately analyzes the safety risks that arise with the potential introduction of LPG operations into the Penobscot Bay port area. For the SRA the operation was divided into three phases. The first phase involved the vessel's approach to the port area and made the assumption that the carrier traveled up the Maine coast after offloading a partial load at another U.S. port. The second phase covered the vessel's transit of Penobscot Bay and docking at the Mack Point terminal, and the third phase covered the vessel's cargo discharge operation and examined potential dockside emergencies.

An inventory of scenarios was developed and analyzed to determine the likelihood of occurrence and severity of risk. Based on the overall potential impact, resource needs were considered to identify and recommend scalable prevention, mitigation, and response strategies necessary to counter the risks and support the proposed operation. The safety-related risk-based scenarios focused on likelihood while the security scenarios focused on vulnerability.

In order to fully analyze the safety components of the transit route along the track line operational details, course and distance calculations, applicable cautionary measures, and advisory notes specific to segments of the route were provided, from a pilot or master's perspective, to ascertain the adequacy of existing safeguards and/or determine the need for additional mitigation measures.

WSA Tables 31 through 34 documents the qualitative analysis of the safety-related scenarios applied to each phase. For each "what-if" scenario, the corresponding tables provided:

- A description of the scenario examined (*Event*, e.g., collision, allision, propulsion or steering failure, etc.);
- The causes that would result in a scenario occurring *(Causes*, e.g., severe weather, mechanical failure, human error, poor communications, etc.);
- A qualitative description of the scenario consequences (*Consequences*, e.g., collision with other vessel, fire, injury, LPG release, oil pollution, delays, allision with dock, etc.);
- A list of the existing safeguards that either help prevent the scenario or facilitates response activities (*Existing Safeguards*, e.g., carrier construction/design, federal regulations and inspections, system tests, navigation rules, pilot experience, communications, vessel radar, AIS, traffic control, etc.); and

- Additional items that should be implemented or evaluated (*Prevention Recommendations*, e.g., tug escort, transit management plan, improved ATON, etc.).

Change Analysis Study and Safety Risk Quantitative Analysis

In addition to the above scenario-based analyses, the SRA also included:

1. A Change Analysis Study that compared the risk parameters associated with the current port status quo against added risks consequent to the introduction of LPG carriers and the DCP Terminal into the Penobscot Bay waterway with results provided as Risk Control Prevention and Action measures, provided in WSA Table 35; and

2. A Safety Risk Quantitative Analysis (SRQA) was conducted, applying the formula *Risk=Function [Pt(threat occurring), Ps (system failure/threat), Consequences (C)]*; in which:

Pt= the probability of an accidental or intentional threat;

Ps= the probability that the preventive or mitigating measures fail; and

C= usually expressed in fatalities or costs.

In the SRQA, historical data based on actual incidents and related studies concerning vessels carrying liquefied hazardous gases was factored into the equation to determine the probability of certain risks associated with the transportation of LPG in ships. It was found that:

- The probability or likelihood that an *unintentional release* of LPG may occur due to a grounding, allision, collision, or during a cargo loading or offloading operation, is relatively low, *i.e.*, the probability of an incident is less than 1 per 10,000 port visits.
- The probability *that preventive or mitigating measures will fail* is also low. (This is only a probable assumption in that there was no data found to support the probability that improvements will fail in organizational or regulatory arenas).
- The probability of *significant loss of life and/or property* beyond the confines of the vessel is low. Sandia Laboratories relate consequences to thermal flux, based on the assumption that a serious accident or casualty resulting in a breach of the hull and loss of cargo will almost always result in the release and abrupt ignition of vaporizing liquid immediately around the vessel, vice an unlit vapor cloud affecting populations or infrastructure distanced from the source.
- Other *consequences* that were considered in the assessment and their ramifications included:

  a) Asphyxiation – Oxygen deficiency during vaporization of an LPG spill is possible and should be taken into consideration for the safety of the crew and first responders; however, this would be mostly concentrated in the actual "plume", and in all probability would not be as significant an issue as

flammability limits and fire concerns. Asphyxia occurs when the blood cannot take a sufficient supply of oxygen to the brain. A person affected may experience headache, dizziness and inability to concentrate, followed by loss of consciousness. In sufficient concentrations any vapor may cause asphyxiation, whether toxic or not. Asphyxiation can be avoided by the use of vapor and oxygen detection equipment and appropriate breathing apparatus as necessary.

b) Cryogenic burns and structural damage – Cooled liquid at -44 degrees F could impact persons in the immediate vicinity, such as the vessel's crew and first responders, and in addition degrade the structural condition of the hull in areas in contact with the leaking cargo. This situation would most likely be limited to the immediate vicinity of the vessel and not have any long-distance effects.

c) Vapor cloud explosion – There are two types of combustion modes that might produce damaging pressure and structural failure in the event of a release; these are deflagration and detonation. Deflagration is a term describing *subsonic* combustion that usually propagates through thermal conductivity, i.e., hot burning material heats the next layer of cold material and ignites it. Ignition of a vapor cloud will cause the vapor to burn back to the spill source, resulting in a low-pressure "fireball"; which by its nature generates low pressures, thus having a low potential for pressure damage. Most fires, ranging from flames to explosions, involve deflagration.

Detonation, on the other hand, occurs as a result of a *supersonic* blast front; i.e., a powerful shock wave immediately followed by a flame. When a cloud of turbulent fuel-air mixture becomes rapidly confined and encounters an ignition source, a rapid acceleration in burn rate will occur which may produce a detonation, or over pressurization. A detonation usually causes structural damage and could rupture nearby cargo tanks, greatly exacerbating the situation. To reduce the chances of detonation, all void spaces between the inner and outer hulls of an LPG carrier are maintained in an inert condition. i.e., the spaces will not support combustion in the rare event of a leak.

d) Rapid Phase Transitions (RPT) – When a cryogenic liquid, such as LPG, is suddenly heated via direct contact with a warmer liquid surface, such as water, energetic boiling of the LPG can occur, resulting in localized overpressure releases. The impacts of this phenomenon will be localized near the spill source and should not cause extensive structural damage any distance from the stricken vessel.

e) BLEVE – The boiling liquid expanding vapor explosion (BLEVE) is a phenomenon associated with the sudden and catastrophic failure of the pressurized containment of flammable liquids in the presence of a surrounding fire. A BLEVE can be caused by an external fire near and/or impinging on an

intact tank boundary causing heating of the contents and a severe pressure build-up. This is especially true in the case of a tank being heated on one side when there is an insufficient level of liquid on the other side to absorb the transferred heat. The intense heat increases the internal pressure and, particularly at that part of the tank not wetted by liquid product, the tank's structure is weakened to the point of failure and a rupture occurs. The sudden release of the tank's contents to atmosphere and the immediate ignition of the resultant rapidly expanding vapor cloud produce destructive overpressures and heat radiation. The resulting LPG cloud could result in a fireball and possible fuel-air explosion (BLEVE). Depending on the amount of release and fuel available, the effects could be catastrophic to those in the immediate vicinity, and even extend outward some distance from the source. Such incidents have occurred involving a damaged rail tank car or truck tank due to intense heat from a surrounding fire. There have been no instances of this kind, nor are they likely to occur, on liquefied gas tankers where, per the International Gas Code, all LPG cargo tanks are fitted with appropriately sized pressure relief valves to prevent unanticipated pressures causing tank failures consequent to surrounding fires. In addition to the pressure relief valves being sized to cope with a surrounding fire, the tanks are strategically located within the hull design to reduce the chances of a breach in the event of a collision or allision, and the entire exterior tank envelope is equipped with cooling water spray.

Collision Modeling

The SRA also described collision modeling studies previously conducted by Sandia Laboratories, independent consultant/testing firms, and classification societies such as Lloyds Register, and Det Norske Veritas. These studies examined the effects of critical speed and angle of impact to determine the probability and extent of cargo release in the event an accident involving two LPG carriers, an LPG vessel and a product tanker, and an LPG carrier and dry cargo freighter. In addition, scenarios that included groundings, allisions, and lesser impacts with smaller craft, such as fishing vessels, were considered. The general findings and conclusions of these studies were factored into the SRA scenarios in order to better determine threat and risk factors, and qualify the undesirable consequences of an event. Of the safety scenarios considered, the highest consequences to public safety, the environment, and financial impact would be as a result of an underway 90 degree (T-bone) collision between an LPG carrier and deep-draft gasoline tanker in the direct vicinity of Mack Point. The next two highest consequences would be consequent to a LPG carrier alliding with the Mack Point terminal pier resulting in a vapor cloud release, and a LPG vessel colliding with loaded passenger ferry, respectively.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

Existing Safeguards and Proposed Mitigation Measures

To counter or reduce risks and consequences, the SRA identified a number of existing navigational system safeguards, specialized/enhanced crew training and competencies, quality control systems, and enhanced measures specific to the area and/or to LPG carrier operations. The assessment also considered preventative and mitigating strategies routinely employed at operating LPG facilities located elsewhere and determined that:

1. There are international protocols, design standards, and operational measures currently in place that promote the safe marine transportation of LPG. These include:

- Enhanced crew competency linked to the internationally required "Standards of Training, Certification and Watchkeeping" (STCW);
- Integrated Bridge Resource and Management training;
- Employment of Automatic Identification System (AIS);
- Higher classification society standards regarding carrier design, construction, and Flag State Control and;
- USCG Port State Control safety-related boardings and testing of operational and cargo systems.

2. The WSA also suggested additional industry best practices that may further reduce risks associated with the marine transportation of LPG. These include:

- Implementation of formalized traffic management to avoid meeting and/or overtaking situations involving LPG carriers and other vessel traffic along the transit route;
- Employment of Coast Guard safety and security zones;
- Development of community programs promoting safety/security awareness;
- Identification of safe refuges for locales graphically contained within the Zones of Concern;
- Evaluation and upgrading of available waterside firefighting capabilities;
- Development of emergency break-away plans, *e.g.*, emergency ship disconnect and rapid departure procedures in the event of fire or exigent conditions at the DCP Terminal;
- Development of a transit management plan to further clarify federal, state and local agency roles, delineate LPG carrier safe operating parameters, and address key safety and security concerns together with corresponding mitigation measures;
- Identification of regional response capabilities;

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

- Establishment of general marine and LPG-specific firefighting and incident management training for shore side firefighters and emergency management personnel; and
- Conduct of simulator training to ascertain assist/escort tug parameters (number, HP, and bollard pull), adequacy of existing ATON and capability of same to support nighttime LPG transits, and LPG carrier familiarization for pilots and tug captains involving routine and emergency maneuvering situations.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

10. SENSITIVE SECURITY SUPPLEMENT

Note: The **security** assessment conducted by the DCP terminal evaluated the risks of *intentional* releases of LPG and explored threat, vulnerability, and consequence. In that this section contains security-related data that has been determined "Sensitive Security Information" (SSI) controlled under the provisions of 49 CFR parts 15 and 1520, portions of it have been redacted to prevent unauthorized release.

Background (Redacted)
Targets (Redacted)
General Threat Analysis (Redacted)
Security Vulnerability Assessment (Redacted)
Attack Modes (Redacted)

Consequence Management and Resource Evaluation

U.S. Coast Guard - Local Coast Guard assets in the Penobscot Bay port area are responsible for conducting pollution prevention and response, vessel inspections, port state control, International Ship and Port Facility Security (ISPS) and Maritime Transportation Security Act (MTSA) compliance exams and vessel boardings on behalf of the Sector Northern New England COTP. Current resources available to conduct these activities include three cutters in Rockland (65' and 140' icebreakers as well as a 175' buoy tender), a marine safety detachment (MSD) in Belfast, and a small boat station in Rockland (two 47' motor life boats and a 25' safe boat). In consideration of the hydrographic characteristics of the waterway, vessel traffic analyses, and port characterization appraisals the Coast Guard has adequate resources to effectively manage those risks associated with the marine transportation of LPG in the Penobscot Bay port area. This determination is based on Coast Guard policy and internal procedures currently in place within the Sector Northern New England COTP zone, and predicated on the DCP Terminal's projected four to eight (maximum) inbound LPG carrier transits per year.

- State, county, and local resources - The proposed location of the DCP Terminal has a number of safety and security benefits associated with its relative remoteness, especially with respect to threat and consequence when compared to other facilities handling LHG cargos that currently exist in more urban areas that have significantly higher population densities and associated critical infrastructure. While this fact may serve to lessen the LPG terminal and servicing vessels' attractiveness as a target, the remote location also creates major challenges in the projection of an adequate law enforcement presence and emergency response capability. Likewise, the majority of local public and private emergency response services that are immediately available within the port area are predicated on accidents, fires, and emergency calls routinely encountered in rural, under-populated areas. In the event of a large-scale crisis or catastrophe, the acquisition of enhanced response capabilities, such as bomb squads, hazardous materials response,

marine firefighting/salvage operations, and major medical assistance, etc., would require significant coordination through regional federal, state, and county agencies.

At present, port area police departments are ably staffed and equipped to respond to emergency situations and events commensurate with their geographic sizes and populations, but anything beyond that would demand additional manpower, training and equipment. In keeping with the rural nature of the area, incidents that arise outside of the city limits require the State Police and surrounding county Sheriff's Departments to respond, in accordance with current resource sharing agreements.

A number of state agencies, to include the Maine State Police (MSP), Department of Marine Resources (DMR), and Emergency Management Agency either participated directly in the LPG work group process and/or provided significant insight and comment as to asset availability and associated resource shortfalls from a regional law enforcement and response perspective. Resources permitting, the state agencies pledged their support to further transit security and emergency response planning. That notwithstanding, personnel and equipment are relatively limited; a response requiring large or long term assets would quickly exhaust their capabilities and unquestionably require additional personnel and equipment be brought in from alternate troop locales, possibly resulting in long delays.

The Maine Marine Patrol (MMP), within DMR, is a viable tactical asset and possesses the skill sets and expertise necessary to participate with other federal, state, and local agencies in a response to a maritime security threat, such as those outlined in the WSA security vulnerability assessment scenarios. Under a memorandum of understanding (MOU) the MMP augments Coast Guard assets during vessel escorts and safety/security zone enforcement when staffing and boat resources permit.

11. EMERGENCY RESPONSE PLANNING

If the DCP Terminal is approved, federal, state, and local agencies with responsibilities related to the proposed project, or whose jurisdiction may reasonably be expected to be impacted by a potential navigation safety accident or terrorist attack, should engage in the development of the recommended Transit Management Plan, and required Emergency Manual. The Coast Guard will help facilitate this process by continuing to involve the services of local officials, stakeholders, members of the LPG working group, and the Penobscot River Oil Pollution Abatement Committee (PROPAC) towards the formation of mutually beneficial risk management strategies and emergency response measures for plan development, where relevant.

As per 33 CFR 127.1307, the *Emergency Manual* must contain:

- A physical description of the LHG and, its physical hazards.
- LPG release response procedures.
- Emergency shutdown procedures.
- Operating description of the firefighting system.
- Description of the emergency lighting and power systems.

- Contact info of all regional federal, state, and local law enforcement, medical facilities, fire departments and other emergency response organizations.
- Location info of personnel shelters, if so equipped.
- First aid procedures and locations.
- Emergency procedures for mooring and unmooring LPG carriers.

LPG terminal owners and operators are also required to submit an *Operations Manual* to the Coast Guard COTP for review and approval, as per 33 CFR 127.019. The *Operations Manual* must contain:

- A description of the cargo transfer area (to include the mooring area), all transfer connections, and schematics of all piping and electrical systems.
- The duties of personnel assigned to transfer operations.
- The maximum allowable working pressure of the cargo transfer system.
- Operating procedures covering cargo transfer, from startup to shutdown.
- 24/7 contact info for supervisors, watch standers, and security personnel, etc.
- A description of the security system being employed and procedures for security violations.
- Training and communications systems procedures.

12. RECOMMENDED RISK MITIGATION MEASURES

Based on the DCP Terminal WSA, LPG workgroup effort, and comprehensive assessment conducted of the Penobscot Bay waterway, COTP SNNE has determined that continued application and/or further consideration, with probable inclusion into a transit management plan, as appropriate, should be given to the following safeguards and risk mitigation measures. These measures take into account WSA Sections 7.2 and 7.3, *Recommendations*, and WSA Table 64, a comparative cross-check of security measures contained in Enclosure 7 to NVIC 01-2011, respectively, stakeholder input, and demonstrated safety and security procedures currently employed in support of LPG vessel transits and operations in the Piscataqua River waterway.

1. The DCP Terminal should develop a Transit Management Plan (TMP), in consultation with the USCG, Penobscot Bay Pilots, Maine Port Authority, area stakeholders, and other cognizant agencies that clearly outlines the roles, responsibilities, and specific procedures for the LPG carrier, the LPG terminal, and all federal, state and local stakeholders with responsibilities related to the proposed project and/or whose jurisdiction may reasonably be expected to be impacted by a potential navigation safety accident or terrorist attack. The TMP should address transit issues and prescribe definitive operating parameters to include:

- Minimum number and performance capabilities of assist tugs and escort vessels needed to escort LPG carriers throughout their transit and during docking and undocking evolutions. The assist tugs should be of sufficient number and

capability (shaft horsepower and bollard pull) to enable them to assume complete navigational control of a LPG carrier should it encounter propulsion and/or steerage problems. It should be noted that additional requirements for escort tugs may be identified during the emergency response and transit management planning processes. In addition, a standby tug of sufficient HP capability will be required to stand by and be able to immediately get underway at all times during cargo offloading operations and at all times that the LPG carrier's tanks are not gas free. The location of the standby tug should be such that total response time would not exceed 10 minutes.

- Safe operating parameters and environmental constraints, to include but not limited to: visibility, wind, sea state, currents, and tides. At a minimum, these parameters should consider the following:

a. Inbound, loaded or partially loaded LPG carriers should only transit the waterway during daylight hours, with daylight being interpreted, in practical terms, as being able to clearly see the horizon, shoreline and receiving berths clearly under conditions of natural light.

b. A minimum of two miles of clear visibility should be required for the movement of LPG vessels. In marginal weather conditions visibility can vary significantly along the route; the decision as to whether sufficient visibility exists, and is likely to continue to exist for the full transit, is a judgment call that will need to be made jointly between the attending pilot(s) in consultation with, and the concurrence of, the COTP.

c. Thirty knots should be the maximum sustained true wind speed, as measured on the LPG carrier, at which an inbound or outbound transit should be allowed to commence, and 25 knots gusting, during docking/undocking evolutions. As with visibility, significant variation in wind conditions can exist along the route, and the decision as to whether wind conditions permit a safe transit will be made by the attending pilot(s) in consultation with, and concurrence by, the COTP.

d. One-way traffic patterns for deep-draft transits should be required whenever LPG carriers are moving to avoid meeting or overtaking situations.

e. LPG vessels should not be allowed to anchor, or hold, within an anchorage or the waterway while waiting for a berth or favorable tide conditions to support adequate under keel clearances. With the exception of temporary Coast Guard boarding areas, the anchoring or holding of LPG vessels within the "system" should be limited to confirmed emergency situations only, such as major mechanical malfunctions and/or reduced visibility situations following non-forecasted, abrupt weather changes (fog, squalls, etc.) and/or as directed by, and in consultation with, the COTP. Non-LPG vessels may anchor or hold at the attending pilot's discretion.

f. To reduce the chances of an allision and effects of a wave surge deep draft traffic intended for the Mack Point wet cargo pier will be limited whenever a LPG vessel is berthed at the dry cargo pier and offloading cargo.

g. A two-mile separation distance should be maintained between loaded LPG vessels

and deep-draft vessels proceeding to the terminal, at the pilot's discretion, to preclude the possibility of incurring overtaking situations.

h. The implementation of combined, safety and security zones around a moving LPG carrier will be at the discretion of the COTP. In consideration of historical deep draft traffic and recreational and fishing vessel activity, the ability to separate movements of upbound and downbound traffic in the narrowest parts of the transit route around Islesboro Island, the lack of any bridges, underwater tunnels, blind turns, or major infrastructure the application of zone parameters commensurate with those employed in the Piscataqua River for comparable LPG operations appear practical; i.e., 2,000 yards ahead, 1000 yards astern, and 1000 yards abeam of the LPG carrier. Likewise, the establishment of a 500 yard fixed security zone around a LPG carrier while it is docked and offloading cargo may be prudent.

2. The development and implementation of navigation safety upgrades and enhancements such as communications interoperability, placement and use of data buoys, and use of private aids to navigation should be incorporated into the TMP.

3. The DCP Terminal should plan and successfully conduct full mission bridge simulator training for those pilots providing services to LPG carriers. The training should take into account the full spectrum of vessel design and length, cargo carrying capacity, method of propulsion, steering and rudder configuration, thruster arrangements, and maneuvering characteristics for those carriers being considered for charter. In addition, expanded simulator training incorporating the number and design of tug boats having the minimum performance and operating criteria should be conducted.

4. The DCP Terminal must prepare and submit an Operations Manual, as required by 33 C.F.R. § 127.305, an Emergency Manual, as required by 33 C.F.R. § 127.307, and a Facility Security Plan as required by 33 C.F.R. § 105.120 to the COTP Sector Northern New England for review and approval. The Operations and Emergency Manuals must be submitted at least 30 days before any transfer of LHG can take place, and the Facility Security Plan must be submitted at least 60 days before the facility begins operations. Comprehensive and coordinated response planning should consider:

a. In-transit and dockside emergency procedures in the event of fire, mechanical malfunction, allision, grounding, and/or need of safe anchorage or refuge.

b. The potential environmental impact of an LPG release and the identification and acquisition of joint resource needs to respond to the potential release.

c. A contingency response plan specific to LPG and focusing on a layered response approach.

d. Coordinated marine firefighting training and emergency response, with an emphasis on containing and extinguishing LPG fires.

e. An incident management training and collaborative exercise program.

5. Currently there are no known credible threats specific to the proposed facility; nonetheless, the threat environment is subject to change over time, especially in view of the protracted time table necessary to facilitate construction. If the project receives final

approval periodic threat assessments should be conducted by the DCP Terminal, at the discretion of the COTP, in order to ensure that in-place security measures are adequate and appropriate to meet circumstances specific to that timeframe.

6. Prior to terminal operations the DCP Terminal must provide the COTP with the following information: 1) Intended LPG carrier(s)' nation of registry; 2) The nationality or citizenship of the officers serving on board the intended LPG carriers; and 3) The nationality or citizenship of the crew members serving on board the intended LPG carriers.

7. Until the facility goes into operation, the DCP Terminal must conduct an annual review of their WSA and provide the COTP with an update that accurately reflects all changes (actual and planned), to include changes of planned LPG carrier size or load frequency, port characterization modifications, facility-related design alternations, and conditions potentially affecting cumulative considerations. The annual review cycle should coincide with the anniversary date of the LOR.

8. The DCP Terminal should consider providing an education program directed at personnel residing or working along the transit route that outlines the steps the DCP Terminal operators and local emergency response organizations may take and what the public can do to contribute to their own safety if an LPG release should occur.

9. In concert with the Coast Guard and Area Maritime Committee, the DCP Terminal should consider developing and executing an educational program intended for the general public that encourages increased vigilance and outlines the steps to follow to report suspicious behavior concerning maritime activities along, or near the LPG carrier's transit route.

13. CONCLUSIONS

The hydrographic characteristics of the Penobscot Bay waterway suitably support deep-draft marine traffic. On average, approximately 135 tank vessels, ranging from 18,000 to 65,000 deadweight ton (DWT) capacity, and two dozen 75,000 DWT cargo carriers successfully transit to and from the Mack Point Intermodal Cargo Terminal annually. Based on a review and validation of the information contained in the DCP Terminal WSA as per 33 CFR 127.007 and 33 CFR 127.009 respectively, and evaluation of the waterway in consultation with a variety of port stakeholders, the COTP has determined that the same transit route, which takes in the Gulf of Maine, Two Bush Channel, Muscle Ridge Channel, West Penobscot Bay, and East Penobscot Bay, is equally suitable for the type and frequency of marine traffic associated with this proposed project.

The Coast Guard's evaluation focused on the navigation safety and maritime security aspects of LPG vessel transits along the intended waterway and included analyses of safety and security risk methodologies and corresponding risk mitigation measures.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

These port management plans and risk mitigation measures are *recommended* tools intended to enhance maritime safety and security and effectively manage waterway priorities and are not intended as specific conditions of the LOR.

Resource requirements and associated operational procedures are based on existing USCG authorities and policies. These policies take into account a changing threat environment and the potential for unknown threats. If the conditions of the waterway change and/or situational awareness dictates the need, the COTP may reconsider this determination. Pursuant to his authority under the Ports and Waterways Safety Act of 1972 (33 U.S.C.§1221 et.seq.), among other authorities, the COTP will continue to assess the Penobscot Bay waterway to determine and implement controls and safeguards as necessary for the protection of the public's health and welfare, regional infrastructure and marine environment. Any orders to this effect may well be separate and apart from this LOR process.

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

14. LIST OF ACRONYMS

ABS	American Bureau of Shipping
ACOE	U.S. Army Corps of Engineers
AIS	Automatic Identification System
AMSC	Area Maritime Security Committee
ANOA	Advance Notice of Arrival
API	American Petroleum Institute
ASD	Azimuth Stern Drive (Propulsion)
ATON	Aid to Navigation
BLEVE	Boiling Liquid Expanding Vapor Explosion
BMP	Bureau of Marine Patrol
CDC	Certain Dangerous Cargoes
CFR	Code of Federal Regulations
CG	U.S. Coast Guard
COTP	Captain of the Port
CSP	Cost Sharing Plan
DCP	DCP Midstream Partners, LP or DCP Searsport Terminal, LLC
DGPS	Differential Global Positioning System
DHS	Department of Homeland Security
DOT	Department of Transportation
DWT	Deadweight Ton
EIS	Environmental Impact Statement
ERP	Emergency Response Plan
FERC	Federal Energy Regulatory Commission
FiFi 1	Fire Fighting – Class 1
FSP	Facility Security Plan
GPS	Global Positioning System
IACS	International Association of Classification Societies
IGC Code	International Gas Carrier Code
IMO	International Maritime Organization
ISPS	International Ship & Port Facility Security Code
LE	Law Enforcement
LHG	Liquefied Hazardous Gas
LNG	Liquefied Natural Gas
LOI	Letter of Intent
LOR	Letter of Recommendation
LORA	Letter of Recommendation Analysis
LPG	Liquefied Petroleum Gas
LRIT	Long Range Identification and Tracking
m	Meter (measurement of length)
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
MARSEC	Maritime Security
MEMA	Maine Emergency Management Agency

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR NORTHERN NEW ENGLAND ON APRIL 9, 2012

MIFC	Maritime Intelligence Fusion Center
MMP	Maine Marine Patrol
MPA	Maine Port Authority
MSI	Marine Safety International
MTSA	Maritime Transportation Security Act
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
nm	Nautical mile (one nautical mile is equal to 6,000 feet)
NPRA	National Petrochemical & Refiners Association
NVIC	Navigation and Vessel Inspection Circular
OPA	Oil Pollution Act of 1990
PERC	Power Emergency Release Coupling
PHMSA	Pipeline and Hazardous Materials Safety Administration
PORTS	Physical Oceanographic Real-Time System
PWSA	Ports and Waterways Safety Act
RBDM	Risk-Based Decision-Making
PSC	Port State Control
SANS	Sys Admin, Audit, Network, Security
SAR	Search and Rescue
SIGTTO	Society of International Gas Tanker and Terminal Operators
SNNE	Sector Northern New England
SOLAS	Safety of Life at Sea
SRA	Safety Risk Assessment
SSI	Sensitive Security Information
STCW	Standards of Training, Certification, and Watch Keeping
SVA	Security Vulnerability Assessment
UFL	Upper Flammability Limit
USACOE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
VHF-FM	Very High Frequency-Frequency Modulated
VTS	Vessel Traffic Service
WAMS	Waterways Analysis and Management System
WSA	Waterway Suitability Assessment
ZOC	Zone of Concern