Preliminary Assessment
for Maintenance Dredging

DRAFT

Searsport Harbor Federal Navigation Project
Searsport, Maine

U.S. ARMY

US Army Corps of Engineers®
New England District

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), New England District (NAE), is planning to perform maintenance dredging of the Federal Navigation Project (FNP) in Searsport Harbor (Searsport, Maine), located in the Penobscot Bay. Searsport Harbor is in the town of Searsport, in Waldo County and is about 27 miles south of Bangor and 91 miles northeast of Portland, Maine. Searsport is located mid-way along the coast of Maine on Penobscot Bay. The deep draft port terminal at Searsport Harbor is known as Mack Point.

The existing Searsport FNP, authorized by Congress in 1962, includes a channel that is 35 feet deep (mean lower low water) and 500 feet wide. The channel extends from deep water in Penobscot Bay to the terminal berths at Mack Point, for a total length of 3,500 feet, and widens to 1,500 feet off the terminals to provide a turning basin. The existing FNP was completed in 1964 and has not required maintenance until now. A portion of the upper end of the channel was deauthorized by WRDA 1999 to enable pier and berth expansion. The piers servicing the Mack Point terminal include the State of Maine's public general purpose cargo pier (two berths) and the Sprague Energy liquid bulk pier (two berths) used by Sprague Energy and Irving Oil Company. Figure 1-1 shows the location of the existing Searsport Harbor FNP.

This Preliminary Assessment (PA) report evaluates alternatives for dredged material disposal in support of maintenance dredging of the existing authorized Searsport Harbor FNP (the Project) for a 20+ year timeline as required by USACE Planning policy[1]. If it is determined that there is limited or no capacity for dredged material disposal, a detailed Dredged Material Management Plan (DMMP) study would be required to provide the necessary long-term material placement information and recommend prioritization in the NAE and the North Atlantic Division (NAD) USACE budgetary process. As this report will show, the Federal Base Plan can be established to accommodate more than 20 years of maintenance without a full DMMP study. Shoaling rates show that several decades will pass before another maintenance event must be executed. Section 2.2 includes more details on the shoaling rate.

[1] USACE Engineering Manual 1110-2-5025, Section 2.6.4

Figure 1-1: Searsport Harbor FNP Location

There is no known plan for Maine Department of Transportation (MaineDOT) and/or Sprague Energy to concurrently perform maintenance dredging of the two access pier berths at the Searsport Terminal at Mack Point, therefore, there is no need for additional material removal to be considered, beyond what is needed to maintain the FNP to bring the project to its authorized depth. Should that plan change, this action will be documented separately through the USACE regulatory and Section 408 process, and the applicant will identify, separate from this assessment, a proper disposal area.

Searsport Harbor is used primarily for the receipt of petroleum products, salt, and the export of lumber, paper, metals, and potatoes. Oil and gasoline are the dominant imports at the port, generally making up 60 percent of the total tonnages. Of the bulk and break-bulk commodities, the most common imports are road salt, wood pulp, clay, chemicals, and gypsum (per conversations with Searsport Harbormaster, May 2022). Commercial activity at Searsport Terminal currently contributes more than $50 million in direct economic benefit to the mid-coast region annually and has the potential – with maintenance and/or improvement of the existing Searsport Harbor FNP – to contribute to the economic prosperity of the broader northern New England region through increased shipping of goods to and from the region (Ramboll Environ, 2017).

The purpose of this report is to present the federal base plan for maintenance dredging of the Searsport Harbor Federal Navigation Project FNP. The base plan includes the creation of two Confined Aquatic Disposal (CAD) cells, (CAD Cell A and CAD Cell B) that would be constructed adjacent to the FNP for placement of unsuitable material. The CAD cell plan is the least costly and most environmentally acceptable alternative for maintenance dredging material disposal. The establishment of this alternative as the base plan limits the cost of dredging and disposal and will ensure navigable conditions will persist into the future for an estimated 50-60 years. The USACE determined that this detailed preliminary assessment report, accompanying Environmental Assessment, and cost certification of the federal base plan would serve as the decision document for the Project Partnership Agreement to be executed with the Non-Federal Sponsor (NFS) prior to design and construction.

1.1 Project Authorization

1962 Authorization - River & Harbor Act of October 23, 1962.

This Act authorized the Searsport Harbor Navigation Project. The Act referenced the Chief of Engineers Report (House Document Number 500, 87th Congress, 2d Session, Aug 1, 1962) plan of improvement. The plan of improvement was a channel –35 feet mean lower low water (MLLW) near the Mack Point piers, with dimensions 500 feet wide and a linear distance of 3,500 feet and included a 1,500-foot-wide turning basin in front of the piers.

1999 Deauthorization - Water Resources Development Act of August 17, 1999.

1.0) Section 365(a)(8) of the Act deauthorized a triangular area across the northern limit of the Searsport FNP to accommodate expansion of the public terminal at Mack Point. Figure 1-2 shows the deauthorized triangular area of the Searsport FNP, shown in red.

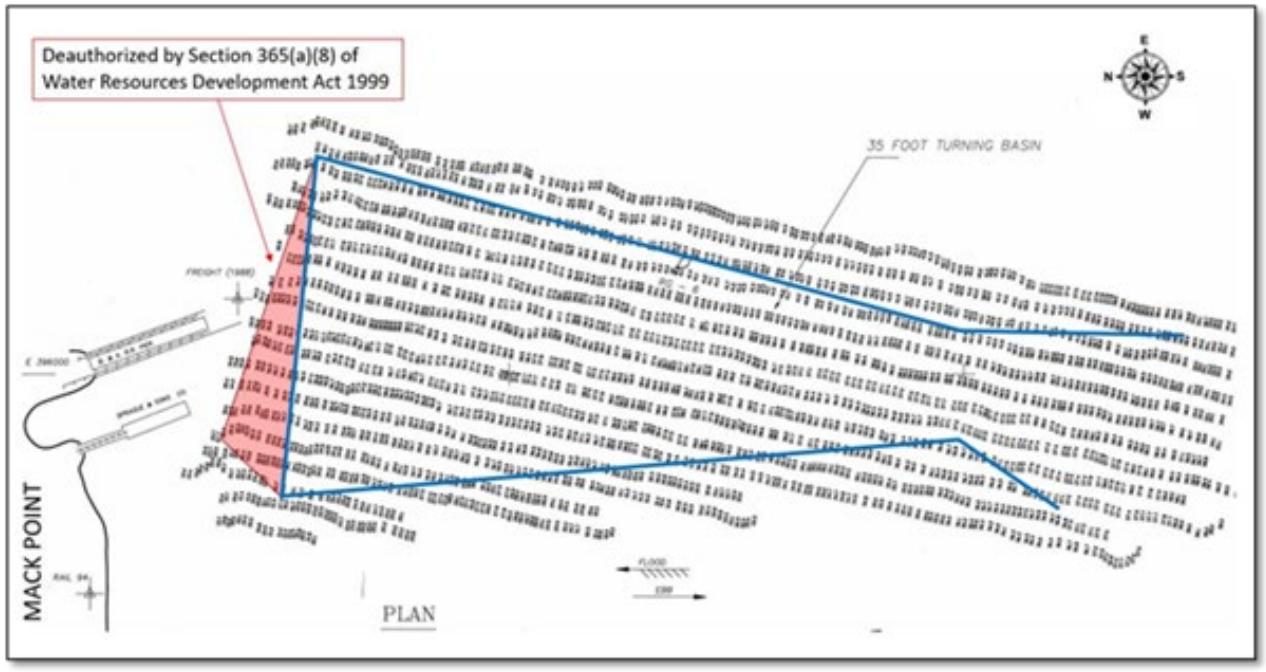

Figure 1-2: Searsport Harbor FNP Deauthorized Area

1.2 Project Construction and Maintenance History

The Searsport Harbor improvement project was constructed from August to October 1964 when approximately 487,500 cubic yards (CY) of silty sand material was removed by mechanical dredge and placed at the Steele's Ledge Disposal site using bottom dump scows, approximately 3 miles southwest of the project location. The upcoming project will be the first maintenance event since the initial improvement dredging, nearly 58 years ago. Since construction, the Searsport FNP has continued to shoal, preventing its unencumbered use by the large shipping vessels calling on the port. In 2014 the Maine Port Authority in conjunction with Sprague Energy LLC dredged the public terminal east berth to 40 feet below MLLW. The current project preliminary assessment focuses only on the Operation & Maintenance (O&M) material within the Searsport Harbor FNP and turning basin, that must be removed to return the project to its authorized depths of 35 feet below MLLW.

1.3 Scope of Assessment

This assessment summarizes the investigation of alternatives for maintaining the Searsport Harbor FNP, including identification of alternative methods of disposal of the dredged material. The assessment borrows extensively from prior studies undertaken by USACE or the NFS in the development of the deep draft port. It incorporates targeted analysis to bolster a collective understanding of individual studies to extract the most viable dredged material placement alternatives for comparison.

The steps in the study included defining the existing navigational needs for access to the harbor, dredging volumes, sediment quality, available disposal options, site investigations for disposal alternatives, and preparation of initial project designs. Public officials have been contacted to provide information and seek input in the study process. Based on these efforts along with identification and assessment of various methods of construction, disposal alternatives were developed and screened.

This report provides for the following:

- Hydrographic surveys to define available depths and volume of material to be dredged
- Sediment sampling and testing results to determine the physical and chemical character of the dredged material
- Identifying the range of disposal options available for material of that type
- Other environmental investigations and coordination with Federal and state agencies to determine resources present and potential for environmental effects
- Subsurface investigations to determine the feasibility of in-water disposal options
- Determination of the requirements for transport and placement alternatives
- Screening alternatives for practicability and cost
- Evaluation and comparison of the engineering, economic, environmental, and social impacts of the alternative disposal methods; and
- Recommendations for a Federal Base Plan for disposal of dredged materials from this project over a 20-year horizon that is implementable.

1.4 Pertinent Studies

2004: Reconnaissance Report, General Investigation 905(b) Analysis, August 31, 2004.

This study examined deepening the existing project from -35 feet to -40 feet MLLW, with some widening of the channel and basin to accommodate larger bulk and petroleum carriers. The report was approved by the USACE North Atlantic Division on September 24, 2004. The recommendation in the report was that there was favorable economic justification for continuing with a feasibility study. This project was never constructed due to scientific uncertainty regarding the placement of material (maintenance and improvement volume) at the preferred placement site in Penobscot Bay, commonly referred to as the "Pockmarks" (Kelley, et al., 1994) (Scanlon & Knebel, 1989).

2015: Searsport Harbor Navigation Improvement Feasibility Study Draft Report

The purpose of the 2015 study was to examine whether navigation improvements to the existing Federal navigation project at Searsport Harbor were warranted and in the Federal interest. The draft report presented a feasibility study analysis and recommendation. A draft Environmental Assessment (EA) and technical reports were also provided with the study draft report. The data, documents, and technical reports from the draft report have been referenced for information used in this Preliminary Assessment.

1.5 Study Participants and Coordination

The preparation of this report required the cooperation of Federal and State agencies, elected officials of State and local governments, the city harbormaster, city department of public works, local commercial fishermen, other harbor users, and interested individuals. Appendix A contains a record of public involvement, agency coordination, and project correspondence. Coordination will be carried out with the following agencies and Tribes:

Federal
U.S. Environmental Protection Agency (Region 1)
NOAA Fisheries (National Marine Fisheries Service)
U.S. Fish and Wildlife Service
U.S. Coast Guard

State of Maine
Maine Department of Environmental Protection
Maine Office of Coastal Zone Management
Maine Division of Marine Resources
Maine Geological Survey
Maine Historic Preservation Commission
Maine Port Authority

Federally Recognized Tribes
Penobscot Nation
Passamaquoddy Tribe
Mi'kmaq Nation
Houlton Band of Maliseet Indians
Wampanoag Tribe of Gay Head (Aquinnah)

Local
Town of Searsport
Penobscot Bay Pilots
Sprague Energy
Local Commercial Fishing Interests
Searsport Historical Society

1.6 Non-Federal Sponsor

While the town of Searsport is the NFS for the Searsport Harbor Federal Navigation Project, as laid out in the project's local commitment agreement (LCA) that was executed to initially construct the FNP, MaineDOT is the project's NFS for the current CAD Cell construction portion of the O&M dredging event. MaineDOT, through its agency, the Maine Port Authority,

represents the State's interests in the port of Searsport at Mack Point. MaineDOT has previously provided funding to USACE as the NFS of the 2015 Searsport Harbor Improvement Project Feasibility Study. See Appendix A for letters from MaineDOT requesting maintenance dredging of the Searsport FNP, in addition to a letter of support for the federal base plan described in this PA.

2.0 EXISTING CONDITIONS

This section of the assessment discusses the existing conditions of the project area and the necessity for maintenance dredging. The navigable reaches of Searsport Harbor are found on U.S. NOAA Coast Chart #13309, Penobscot River (1:40,000) and US Geological Survey 1:24,000 scale Searsport quad Searsport, Maine. Figure 2-1 shows the location of the Searsport Harbor FNP, Mack Point, and the locations of known shipwrecks and obstructions in proximity to the Searsport Harbor FNP. One shipwreck in the project vicinity (the Cullen No. 18), which has a Maine Historic Archaeological Sites Inventory number ME 385-004, is also shown on Figure 2-1.

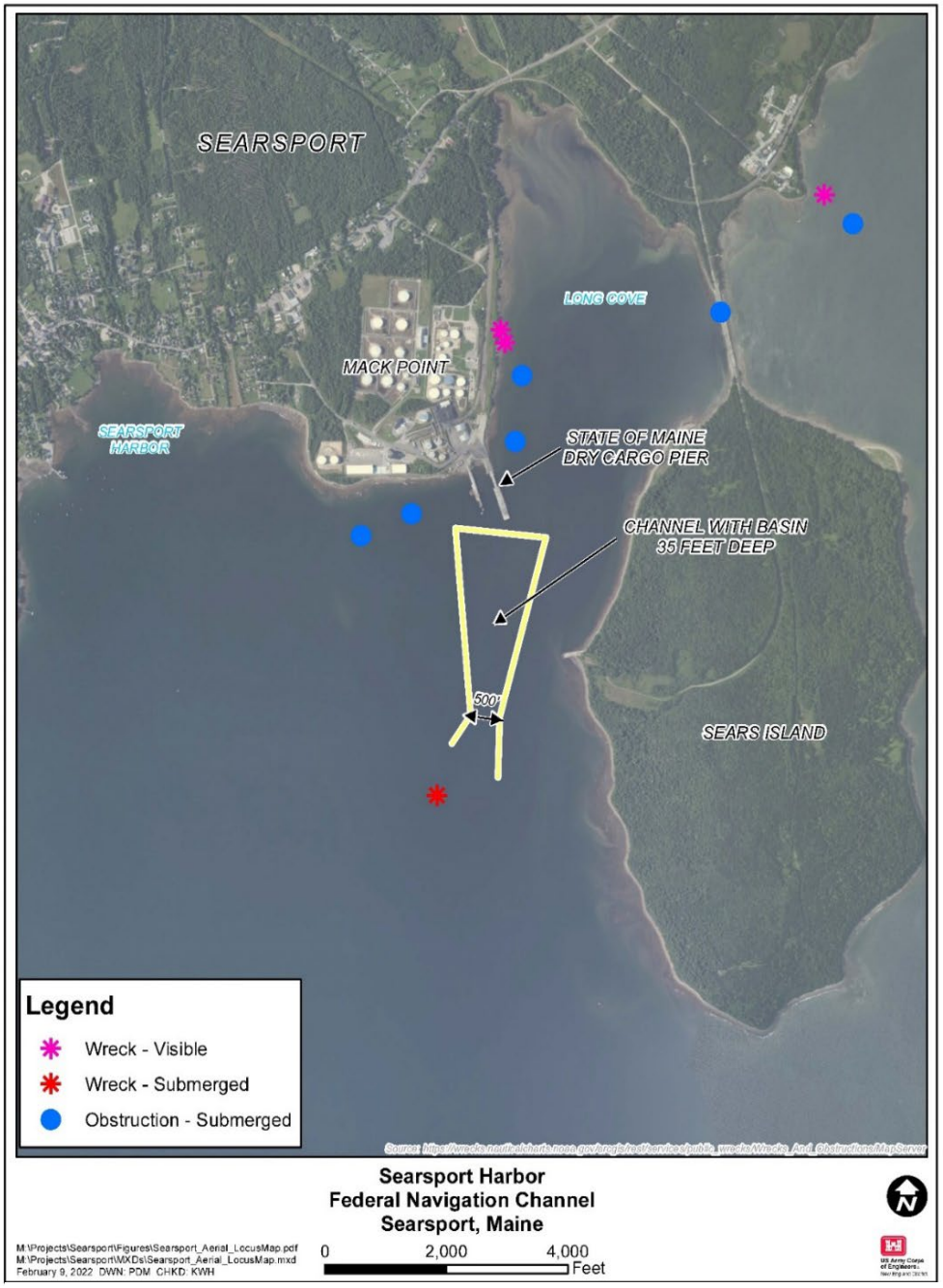

Figure 2-1: Searsport Harbor FNP at Mack Point

2.1 Current Navigation Conditions

The northwest corner of the Searsport FNP channel turning basin has shoaled to depths of less than approximately -32 feet MLLW. Smaller shoals less than the authorized depth are also found in the northeastern area of the project off of the State Pier. Maintenance dredging is

needed to restore the channel to the authorized -35 feet MLLW depth. The shoal depth of -32 feet MLLW is an inadequate depth for approximately 21% of vessels calling on the port (Anon., 2016-2019). The tide range of ~10 feet (mean high water to mean low water), combined with berths dredged significantly deeper than the channel, allow larger vessels to use the port than would normally be possible. Larger vessels are able to enter the harbor at mid to high tide, unload their cargo, and lay over at low tide at the deepened berths. Currently larger vessels experience tidal delays, as they wait until mid-tide or higher to enter or exit the harbor. This results in transportation inefficiencies and shippers are less likely to take advantage of the lower per ton transportation cost of the deeper draft vessels. Figure 2-2 shows the current shoal material footprint from a January 2021 existing conditions survey. The current area of shoaling above -35 feet MLLW within the Searsport FNP and turning basin requiring maintenance, is shown in orange. The focus of the maintenance dredging will be in the orange shaded areas (above -35 feet MLLW). A more detailed plan that shows the shoaled areas and depths in the FNP is also provided in Appendix F.

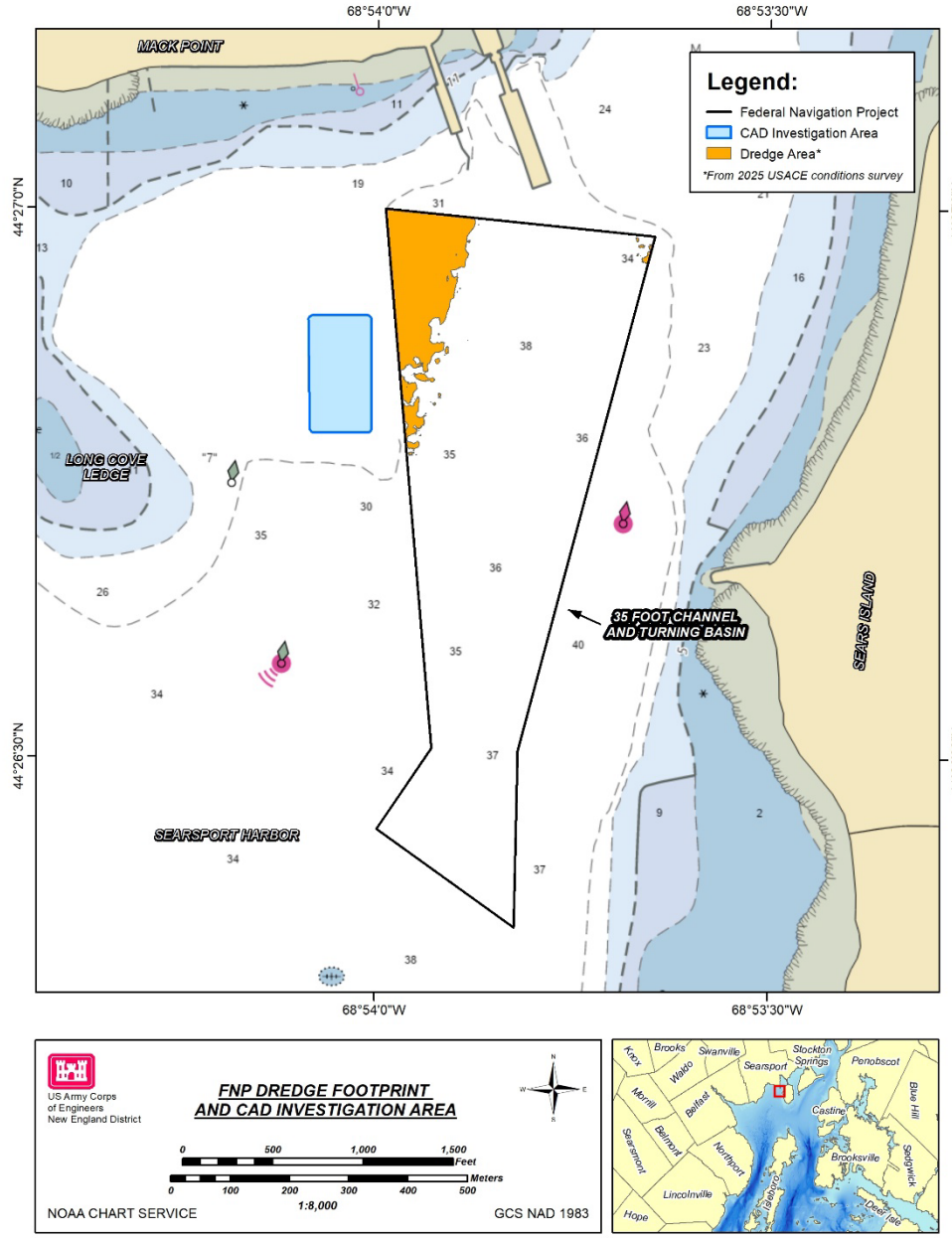

Figure 2-2: Shoal Material Above -35ft MLLW

2.2 Shoaling Rates and Dredging History

The initial improvement dredging occurred in the summer to fall of 1964. Since that time the conditions of the project have been surveyed 14 times, beginning in 1997 using single beam sonar and the most recent full coverage multibeam survey was conducted in March 2025. This event will be the first maintenance event in the project's 60+ year history. Table 2-1 shows the shoal volume progression from 1964 through 2025, from the initial improvement

dredging to the current state of the project based on condition surveys of the Searsport FNP (where volumes were calculated).

Table 2-1: Searsport Harbor FNP Recent Survey History from 2005 through 2025 on the Current Tidal Epoch (1983-2001).

Activity	Year	Survey Datum (NOAA Tidal Datum Epoch)	Volume Removed or Estimated for Removal (CY)	Average Shoaling Rate Per Year between Condition Surveys (CY/Year)	Average Shoaling Rate Per Year 2005-2025 (CY/Year)
Improvement Dredging of 35-ft Channel & Turning Basin	1964	MLW (1941-1959)	487,500 (Removed)	-	-
Conditions Survey	2005	MLLW (1983-2001)	21,800	-	-
Conditions Survey[1]	2015	MLLW (1983-2001)	29,115	732	-
Conditions Survey[1]	2021	MLLW (1983-2001)	31,274	360	-
Conditions Survey[1]	2025	MLLW (1983-2001)	39,101	1,957	865

[1] Estimated using two feet over depth below existing required material

Using this series of volumes collected over a period over the history of the project provides an average estimate of 865 CY per year of shoaling within the Searsport Harbor FNP between 2005-2025. Between 1964, when the initial dredging event occurred to create the FNP, and 2021 when planning for the first O&M dredging project began, 57 years elapsed before O&M dredging became necessary. After completion of this first maintenance event, assuming no other changes occur to the FNP in the future, the project is not expected due for another maintenance event until approximately the 2080-2085 dredge cycles.

2.3 Maintenance Dredging Material Source and Quality

The surficial geologic materials along the coast in the vicinity of Mack Point are identified as glaciomarine deposits as part of a stratigraphic sequence of sand and gravel locally overlain by clay, silt, and sand deposited on the sea floor as part of the Presumpscot Formation, which was deposited during the last glacial retreat (Thompson, et al., 2014). The bedrock within the vicinity of the project has been mapped as the Penobscot Formation, a rusty-weathering, black or gray, iron-sulfide-rich schist and regionally metamorphosed beds of pelite (a fined-grained sedimentary rock predominantly composed of clay and mud particles). Bedrock within the vicinity of the project site is structurally bound to the north by the Sennebec Pond fault and by

the Penobscot Bay fault zone located south of the project area. The fault zone is expected to be comprised of a series of closely spaced faults, as opposed to a single fault plane (Tucker & Stewart, 1999). In 2017 USACE collected sediment core samples from six locations within the proposed maintenance dredging footprint to evaluate the material. This material was determined to be Holocene organic silt and does appear to be part of the Presumpscot Formation. The 2017 vibracore sampling locations are shown in Figure 2-3.

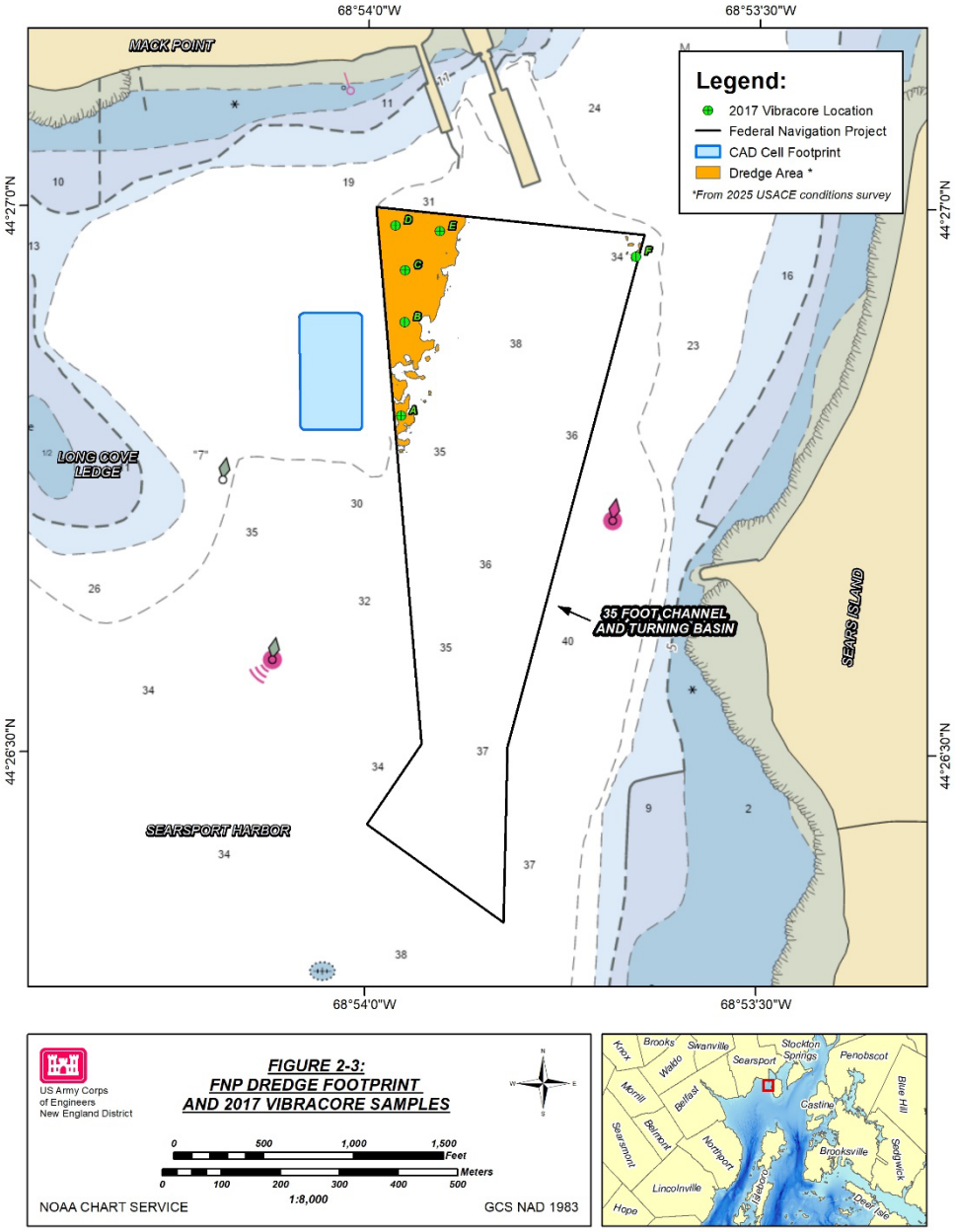

Figure 2-3: Searsport Harbor FNP 2017 Vibracore Sample Locations

The 2017 sediment testing and classification results are presented in more detail in the Environmental Assessment (EA) presented in Appendix B.

Table 2-2: 2017 Physical Testing Results from Searsport Harbor FNP Sediment Samples

	Station A	Station B	Station C	Station D	Station E	Station F
% Total Gravel	0.7	0.3	1.6	0.6	0.1 (U)	0.1 (U)
% Coarse Sand	2.5	1.3	7.5	1.6	0.7	1.2
% Medium Sand	4	3.2	3	1.3	1.5	3.1
% Fine Sand	7.8	3.1	3.3	1.9	2.6	5.2
% Fines (silt/clay)	85	92.1	84.6	94.6	95.2	90.5
% Total Organic Carbon	1.67	1.94	2.88	2.28	0.175	1.54

The material to be dredged from the Searsport Harbor FNP is predominantly clay silt with small fractions of sand. Table 2-2 identifies the high levels of silt/clay content present in the 2017 samples that were collected. The silty nature of the material precludes its use for many beneficial use options such as beach nourishment, dune creation, and road foundations. The sediment material classification and gradation analysis results are also consistent with a stratigraphic profile having a mantle of organic silt deposits characteristic of recent shoaling overlying surficial geologic deposits of the Presumpscot Formation. It may be assumed that underlying this sediment profile, is glacial till overlying bedrock, which is consistent with the geophysical survey conducted by Ocean Surveys, Inc. (Ocean Surveys Inc., 2007) for the channel area. More recent geotechnical borings done in 2024 confirm the subsurface geology in the CAD cell area as well. In addition, large boulders and ledge pinnacles may be encountered during dredging of the FNP based upon the glaciogenic origin of the underlying sediment deposits. A suspected bedrock pinnacle was investigated in 2007 near boring B-4.

Sediment grab samples were also collected from two reference sites (dredged material disposal locations): the historic Steele's Ledge Disposal Site (SLDS) and the Rockland Disposal Site (RDS). SLDS was used for the initial improvement of the project. The RDS was also evaluated based on previously existing data from the site. The purpose of the sampling was to gather physical and chemical information for analyzing environmental impacts from open water disposal. Material to be dredged from the Searsport Harbor FNP was found to be unsuitable for unconfined open water placement at the identified open water sites. A more detailed analysis and explanation of the suitability determination results can be found in Appendix C Suitability Determinations. The U.S. Environmental Protection Agency's (EPA) suitability determination concurrence letter is included in Appendix C as well.

2.4 Maintenance Dredging Material Chemistry

Analysis of the 2017 sediment samples collected from the Searsport Harbor FNP maintenance dredging footprint is presented below in Tables 2-3 and Table 2-4. More detailed dredged material chemistry information and test results from the 2017 sampling locations are summarized in the EA (Appendix B). Previous sediment evaluations from 2008 and 2015, as well as the 2017 bulk sediment chemistry analysis discussed below, can be found in the Suitability Determination (Appendix C).

Additional testing results from 2017, including pesticides, Polycyclic Aromatic Hydrocarbons (PAHs), and polychlorinated biphenyl (PCBs) can be found in the EA. The concentration of some pesticides in the sediment samples was greater than the ERL. Polycyclic Aromatic PAHs were detected at concentrations less than the ERL with the exception of fluorene at station D which was just above the ERL. PCBs were not detected above the method reporting limits in any sample.

Table 2-3: 2017 Sediment Samples from Searsport Harbor FNP Metal Concentrations

Metals	Units	Station A	Station B	Station C	Station D	Station E	Station F
Arsenic, Total	*mg/kg*	14.6	16.7	17.5	15.5	15	15.3
Cadmium, Total	*mg/kg*	0.128	0.313	0.251	0.229	0.054(U)	0.174
Chromium, Total	*mg/kg*	38	35.4	42.5	41.8	32	36.2
Copper, Total	*mg/kg*	12.7	14.4	17.6	19.4	17.1	17.5
Lead, Total	*mg/kg*	12.8	14.2	21.5	27.2	12.9	19.8
Mercury, Total	*mg/kg*	0.028(U)	0.032	0.268	0.326	0.016(U)	0.183
Nickel, Total	*mg/kg*	31.6	28.9	30	31.4	36.9	29.2
Zinc, Total	*mg/kg*	68.6	62.1	74.4	76.9	60.9	64.7

Table 2-4: Mercury Concentrations from 2017 Sediment Samples at Discrete Interval Levels (mg/kg)

Depth Interval in Feet	Station A	Station B	Station C	Station D	Station E	Station F
0-1	0.025(U)	0.138	0.227	0.369	0.034	0.258
1-2	0.029(U)	0.028(U)	0.344	0.457	0.018(U)	0.019(U)
2-3	0.021(U)	0.023(U)	0.498	0.573	0.019(U)	0.018(U)
3-4	-	0.023(U)	0.026(U)	0.034	-	-
4-5	-	-	-	0.022(U)	-	-

2.5 Open Water Placement Standards

Open-water placement of dredged material requires meeting specific standards to minimize environmental impacts and ensure compliance with regulations. These standards include material testing, placement location restrictions, and monitoring requirements. Dredged material must be assessed for contamination and suitability for open-water placement, and placement areas are often designated and restricted to protect sensitive habitats and historical sites.

Mercury was detected above the reporting limit, but below the effects range low (ERL), in the station B composite sample but was not detected above the method reporting limit in any of the one-foot subsamples from that station (Table 2-4). At stations C, D, and F, mercury was detected above the ERL, but below the effects range median (ERM), in the composite samples and the subsamples collected within three feet of the sediment surface. The peak mercury concentration was in the 2-3 foot interval at stations C and D and in the 0-1 foot interval at station F. Mercury concentrations in these subsamples exceeded the Penobscot River mercury study target cleanup level in the 2-3 foot interval from station C and as well as the 1-2 and 2-3 foot intervals from station D. Mercury was either not detected or was detected at concentrations below the ERL in the deeper subsamples collected from more than three feet below the sediment surface at these stations. All other metals were either not detected or were detected at concentrations less than the ERL. The mercury test results confirm that the maintenance material is unsuitable for unconfined placement at an open water disposal site.

3.0 FORMULATION OF ALTERNATIVES

Maintenance of the Searsport Harbor FNP has been determined warranted based on an analysis of project use and navigation conditions as presented in section 2.0. The focus of this PA is the evaluation of alternatives for dredging and disposal of dredged materials from the maintenance dredging of the Searsport Harbor FNP with the objective to establish the federal base plan for dredged material disposal over a 20-year planning horizon. This analysis involves identification, screening, and evaluation of disposal alternatives for materials determined to be unsuitable for unconfined open water placement from the FNP and from any materials that may be generated as a result of a placement alternative. NFS objectives and the views of Federal, State, Tribal, and local agencies and the public are essential considerations in the evaluation of alternative plans.

3.1 Dredging Alternatives Considered

Alternatives considered include the No Action Alternative or the Without Project Condition, maintain the FNP at less than the authorized depth, and to maintain the FNP at the authorized depth.

3.1.1 No Action Alternative/Without Project Condition

Under the no action alternative, the Searsport Harbor FNP would not be dredged. This alternative would allow existing conditions in the FNP to continue to deteriorate resulting in further restricted access of vessels to Searsport Harbor and continued hazardous navigation conditions, especially for the largest ships with the deepest drafts. This adverse condition may result in an increased frequency of groundings and will necessitate worsening tidal delays for vessels using the port. Such conditions can increase the likelihood of vessel accidents which lead to costly repair bills and potential environmental harm by increasing the potential for oil spills or the release of other hazardous materials into the harbor. Due to the safety concerns, the no action alternative was rejected.

3.1.2 Maintaining the FNP at Less Than Authorized Dimensions

Maintaining the FNP at a depth shallower than the authorized depth of -35 MLLW, was considered as an alternative. However, by not restoring the full dimensions of the FNP, vessels currently using the project would still be required to transit on times of tide causing negative economic effects and potential safety concerns. The alternative for maintaining the FNP at dimensions more shallow than authorized was not carried forward for further consideration.

3.1.3 Maintain the FNP at the Authorized Dimensions

This alternative provides the greatest public benefits, results in no significant, long-term adverse impacts on the environment, and satisfies USACE's Congressionally mandated authority for maintenance of the FNP sufficient for project users. This alternative removes the areas of shoaling identified for maintenance dredging and restores the authorized depths and dimensions of the FNP. This is the selected alternative plan.

3.2 Dredging Method Alternatives

Dredging method alternatives considered include both mechanical dredging and hydraulic dredging.

3.2.1 Mechanical Bucket Dredging

Mechanical bucket dredging involves the use of a barge-mounted crane, backhoe or cable-arm with a bucket to dig the material from the sea floor. Typical dredging buckets come in various sizes from five cubic yards to fifty cubic yards, or more. A mechanical dredge is well suited to work in tight quarters such as small harbors and in and around berthing areas and slips. The dredged material is usually placed by bucket into scows for transport to a preferred placement site by tug. A mechanical bucket dredge is a viable alternative dredge method for this project due to the nature of the material (sediments composed of mainly fine sands and silt) to be removed. The handling method that will be performed is to place the material in a scow and to place the dredged material within a confined aquatic disposal (CAD) cell adjacent to the Searsport FNP. This dredge method is acceptable for use within Searsport Harbor. It is, therefore, the selected dredging method alternative to complete the Searsport FNP maintenance dredging.

3.2.2 Hydraulic Dredging – Cutterhead and Pipeline

A hydraulic pipeline dredge consists of a cutterhead on the end of an arm connected to a pump, which loosens the bottom sediments and entrains them in a water slurry that is pumped up from the bottom. The material is then discharged away from the channel (side cast) or is pumped via a pipeline to a dewatering area or disposal site. A hydraulic dredge is generally used for material that will be disposed of in an upland area or on a nearby beach, or for pumping any type of unconsolidated material into a confined (diked) disposal/dewatering area. There are no feasible hydraulic dredge placement locations identified near the Searsport FNP, so hydraulic dredging was screened out from further consideration.

3.3 Formulation of Dredged Material Disposal Options

The evaluation of alternatives for disposal of dredged material is based on a standard set of criteria. Each of the disposal alternatives must:

- be complete so that it provides and accounts for necessary investments or other actions to ensure the realization of the planned objective of providing disposal facilities
- be effective in alleviating the specified problems, and realizing the specified opportunities for project maintenance
- be efficient, demonstrating a cost-effective means of alleviating the specified problems and realizing the specified opportunities for project maintenance
- be acceptable by state and local regulatory entities and the public
- be compatible with existing laws, regulations, and public policies

Each alternative is considered based on its effective contribution to the objective of providing a cost-effective means of disposing of dredged material from the FNP, and the selection of a

specific plan is based on technical, economic, and environmental criteria that allows for a fair and objective appraisal of the effects and feasibility of alternative solutions.

Technical criteria require that the plan have the dimensions necessary to accommodate the volume of dredged material from the FNP to be disposed over the 20-year planning horizon. All plans must contribute to navigational efficiency and be complete within themselves.

Economic criteria require that the Federal Standard or "Base Plan" for disposal of the dredged material be the least costly environmentally acceptable means of maintaining the project.

Environmental criteria require that the Base Plan or any other selected plan address the environmental quality of the project area. This includes the identification of effects to the natural environment and social resources. It also includes the assessment of effects that may arise during the construction of the proposed disposal facility and any activities attracted to the area after plan implementation.

An array of dredge material placement alternatives was derived using past USACE analysis or compiled from other known projects within Searsport Harbor. Proposed dredging volumes are described in Table 3-1. In an effort to minimize the impacts to natural resources in the area of the project and optimize the government's investment, only the area of required removal to achieve the project's authorized dimensions, plus over depth underlying only the shoal areas, was considered for removal during this maintenance event. A total maximum amount of 39,101 CY of material is proposed to be removed within the Searsport FNP to the authorized 35-foot MLLW depth. The total required volume is 16,333 CY, and the proposed two foot payable over depth volume, or "dredging tolerance" as defined in EM 110-2-1613 page 6-30, is approximately 22,769 CY.

Table 3-1: Searsport Harbor Maintenance Dredging Volumes

-35 Foot (MLLW) Channel	Volume (CY)	Area (SF)
Required	16,333	307,375
2ft Over Depth	22,769	*No additional area
Total	**39,101**	**307,375**

3.4 Constraints on Formulation of Disposal Alternatives

Constraints on formulation are the parameters (natural, fiscal, institutional, etc.) that limit the implementation of a proposed plan to allow for cost-effective dredged material disposal alternatives in support of the commercial and recreational navigation needs for maintenance of the Searsport Harbor FNP.

- The major or primary constraint at Searsport Harbor is the physical and chemical nature of the dredged material. The maintenance material has been determined unsuitable for

unconfined open-water or ocean disposal at any of the area's existing sites. Any disposal alternative must provide for long-term containment of the dredged material or some level of processing that would make the material usable.

- Geotechnical borings within the proposed CAD cell area adjacent to the FNP were completed in 2024 by GEI and were used to determine depth available to bedrock (See Appendix D). Additional borings are not anticipated to be required during pre-construction engineering and design (PED) phase to confirm feasibility to construct a subaqueous disposal facility. Sites further from shore may allow a greater dredge cut depth but may also be too deep to cost-effectively site a cell for a small dredging project.
- Upland placement alternative considerations would require basic sequestration of material for protection of human health and the environment.
- The town of Searsport's resources are limited, given the low population and limited fiscal resources available to the municipality. Recommendations will need to take the Town's fiscal resource limits into account and incorporate the State of Maine or other non-federal partner to facilitate the project.

3.5 Identification of Dredged Material Disposal Options

Available options for dredged material disposal or beneficial use depends largely on the nature of the material. For instance, material that is largely sand could be used beneficially for beach nourishment. Coarser materials may be suitable for shellfish habitat substrate. Clean mixed sandy/silty materials might be suitable for saltmarsh creation or as thin layer placement material to help marshes keep up with sea level rise. Cobble, boulders, and rock may be used to create reefs to enhance fisheries habitat for species like lobster and cod that prefer hard bottom substrate. Other mixed materials can be used to expand intertidal flats for shellfish propagation.

There are limited options for disposal of dredged material from the Searsport Harbor FNP on land or the coast; they include either beneficial uses or disposal at a landfill. Discussions with Maine Department of Environmental Protection (Maine DEP) Bureau of Remediation and Waste Management, Division of Solid Waste Management revealed that in Maine, dredged material is handled as special waste requiring specific solid waste management permitting. Material that cannot be permitted as beneficial use under the States solid waste permit must go to licensed special waste landfills. As part of the upland and beneficial use disposal alternatives analysis, an upland placement site at Mack Point was considered, along with a previously used town of Searsport gravel pit, and a landfill were all considered for potential placement locations.

3.5.1 Open Water Placement in Federal Waters

Open water placement involves transport of the dredged material, typically by scow or hopper dredge, to an approved ocean or open water placement site. This method requires significant sampling and testing of the dredged materials and comparison of the test results with those from control sediments and disposal site reference areas. Ocean disposal sites are located seaward of

the territorial sea baseline where the Marine Protection Research and Sanctuaries Act (MPRSA) provides the regulatory framework. Ocean disposal sites are either permanently designated by the EPA under Section 102 of MPRSA or are selected by the USACE (with concurrence from EPA) under Section 103 of MPRSA. Open water disposal sites are located in areas inshore of the territorial sea baseline in areas regulated by the USACE, EPA, and the state under the Clean Water Act (CWA).

There are two regional ocean dredged material disposal sites located in Maine waters. The Portland Disposal Site (PDS), located directly east of Cape Elizabeth, and the Isles of Shoals North Disposal Site (IOSNDS), located just east of Kittery, Maine. Both sites are subject to Section 103 of the MPRSA. These sites have been investigated to determine if they would meet the Federal standard for open water dredged material disposal. The PDS and IOSNDS sites have been dropped from consideration as potential disposal locations for the suitable material from the Searsport FNP due to the chemical composition of the Searsport Harbor maintenance material and the long-haul distance that would be required (100+ miles) for material placement. As a result, other alternative open water disposal sites closer to the Searsport Harbor FNP, including the Rockland Disposal Site (RDS), were considered for placement of suitable material. Figure 3-1 identifies their locations.

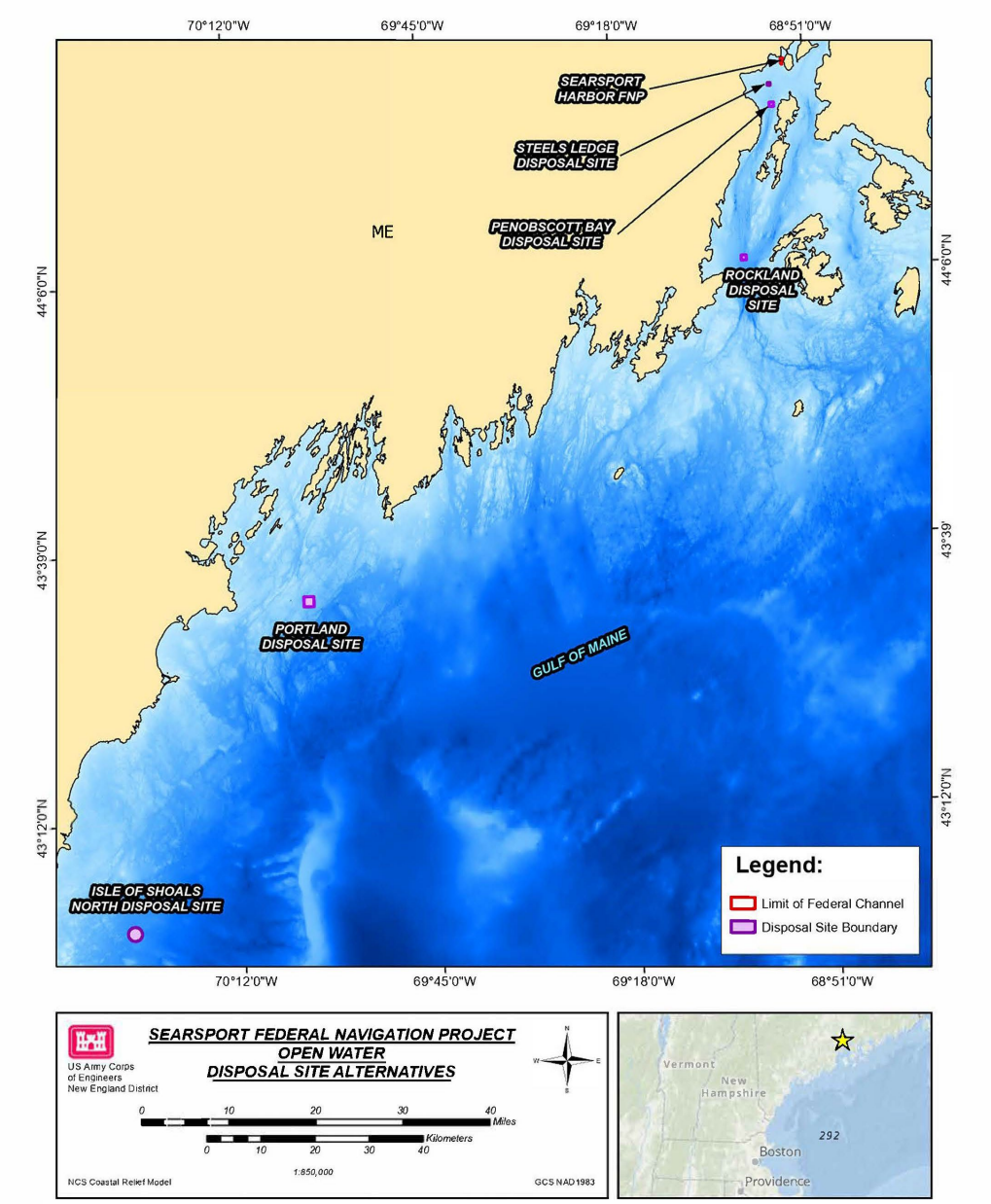

Figure 3-1: Potential Open Water Disposal Sites

3.5.2 Open Water Placement in State of Maine Waters

The primary open water disposal site considered for use to receive dredged suitable material from the associated with the Searsport Harbor FNP maintenance project, is the RDS. RDS is located in lower Penobscot Bay, offshore from Owls Head, and is an active disposal site for dredged material, and subject to Section 404 of the CWA. It is a viable alternative for the placement of suitable dredged material. Only dredged material that meets the CWA guidelines is suitable for disposal at this site. This disposal site had been used for several decades prior to USACE identifying the site as a disposal site under CWA guidelines. RDS has been periodically

monitored for approximately 30 years under the Disposal Area Monitoring System (DAMOS) Program. The chemical composition results of the O&M shoal material at Searsport Harbor preclude use of unconfined open water placement for the FNP O&M dredged material. Therefore, this site was removed from consideration as a standard placement alternative. However, it was determined that the RDS is suitable for the placement of the suitable material taken from a CAD cell that will be constructed adjacent to the FNP. Further analysis of the CAD cell proposal can be found in Section 3.7.

Alternative disposal sites (subject to CWA guidelines, i.e. inshore of the Territorial Sea Baseline, located at the mouth of the Penobscot Bay) that were considered for open water disposal of maintenance material from the Searsport Harbor FNP, is the Steele's Ledge Disposal Site (located approximately 6 miles southwest of the Searsport Harbor FNP). The Steele's Ledge disposal site alternative was last used for the improvement dredging of the original Searsport FNP construction project in 1964. This area was also used for the Belfast Harbor dredging prior to the establishment of the FNP dredging in the late 1800's/early 1900's, but it is also located within a U.S. Coast guard designated oil transfer area (SAIC, 2000). Although it is a previously used disposal site, it is located near a significant commercial fishing area, so it was screened out for use as a disposal location.

3.5.3 Upland Placement Alternative at Mack Point

This beneficial use alternative plan considered would have utilized geotextile tubes to contain dredged material and keep it located within the northwest corner of the Sprague Energy facility located on Mack Point. Dredged material from the FNP would be placed into temporary holding scows by a mechanical dredge, mixed into a slurry that would be treated with coagulant polymer flocculants to aid in particulate filtration, then pumped into the geotextile tubes. However, placing contaminated material in an upland site, not designed to handle these materials, presented long-term risks. Specifically, the Government's potential liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq. for future environmental impacts at the site. CERCLA imposes liability on persons responsible for releases of hazardous substances. To determine liability for remedial actions at a site, the EPA will look for evidence of wastes found at a site and match that with parties that may have contributed wastes at the site. CERCLA Section 107, 42 U.S.C. 9607 states that current owners and operators, past owners, and operators at the time the pollution occurred, arrangers and transporters shall be liable for all costs of removal or remedial actions and other necessary costs of response. CERCLA is a strict liability statute and therefore liability may be imposed regardless of the intent. If the disposal site located at Mack Point requires future remediation, it is possible that the Government would be considered a potentially responsible party and may have liability for costs related to investigation and cleanup of the site. Disposal of dredged material in an upland location also requires compliance with state regulatory requirements. There are no agreements in place nor any proposed between the state of Maine and

Sprague Energy, that we are aware of, which address who is responsible for long-term maintenance and monitoring of the Mack Point site. For these reasons, the upland disposal of dredged material at Mack Point was no longer considered a viable alternative and was screened out from further consideration.

3.5.4 Dredged Material Used as Construction Material or Cap at Mack Point.

The use of the dredged material as a capping or construction material at Mack Point is a beneficial use alternative that was not carried forward for further consideration. This type of beneficial use was applied in 2002 with dredged material from the State Pier deepening project. Material was first dredged and placed on a barge to allow some settling and dewatering. The material from the barge was then placed into dump trucks at the pier, then transported and dumped at a pad site at the Mack Point facility where it was mixed with cement kiln dust. After mixing with cement kiln dust the material was loaded onto trucks and transported to another Sprague Energy facility located in Bucksport, where it was used to restore an old tank farm. Upland disposal of material using this Mack Point option would involve triple handling of the dredged material, compared to in-water placement. This method for upland placement or disposal option of dredged material was not considered any further due to the lack of identified locations that could accept the material.

The dredge material from the FNP was not identified as suitable material to be used as unprocessed fill or for use in other soil products because of elevated levels of mercury and arsenic.

3.6 Additional Placement Plans Investigated but Not Carried Forward

Additional upland disposal sites and beach nourishment sites were investigated for placing the dredged O&M material from the Searsport Harbor FNP and material. Due to sediment characteristics, proximity to residential areas, and general efficiency and concerns, these additional upland placement options were not carried forward for consideration for this project.

Other upland placement alternatives and methodologies were considered for the Searsport Harbor FNP dredged maintenance material.

3.6.1 Searsport Gravel Pit

As part of the previous analysis undertaken by MaineDOT (Ramboll Environ, 2017) a town-owned gravel pit was identified within the city of Searsport, Maine. Located off Route 1 at the end of Sandy Ridge Lane the gravel pit is approximately 3 miles west of the city center and approximately 5 miles from Mack Point Terminal. The gravel pit is no longer active and has been partially reclaimed by the city of Searsport by disposal of materials from various locations over the last several years per conversations with city officials (Communications with Town Administrator, 2021). (Ramboll Environ, 2017).

In this alternative, the dredged shoal material would be removed with a mechanical bucket dredge, placed in scows and brought to the Mack Point terminal pier for offloading. The dredged material would then be dewatered before it is loaded into lined trucks and shipped to the inactive gravel pit where it would be used to level the site to pre-excavation conditions. However, due to the nature of the material as identified in Section 2.4, the close proximity of residential property on Sandy Ridge Lane, this placement location alternative was removed from further consideration.

3.6.2 Juniper Ridge Landfill

The other upland disposal placement option considered was the Juniper Ridge landfill. Juniper Ridge is a landfill in Old Town, Maine that has been considered as a possible upland site for placement of dredged material that is free of contamination or contains limited levels of contamination. Juniper Ridge landfill is approximately 50 miles north of Searsport.

Costs to dispose of dredged material at the landfill would include dewatering at Mack Point, sediment testing, truck transport, and tipping fees. Like the other upland placement alternatives, this option would require the material to be dredged, brought shoreside at Mack Point where it would be dewatered to a point to pass a standard paint filter test, loaded into trucks and hauled to the facility where it would be spread as cover or placed within a lined cell. As a current requirement of acceptance at Juniper Ridge, the dredged material would require chemical testing against a prescribed set of contaminant levels every 250 tons of material for an initial amount of dredge material quantity. After a specific number of tests proved the consistency of dredge material chemical characterization the number of testing requirements could be reduced. This placement location alternative was removed from further consideration because it was not considered feasible to receive the large volume of material to be dredged during the maintenance of Searsport Harbor. In addition, concerns regarding available space at the landfill to receive this large amount of dredged material contributed to this alternative from being screened out from further consideration. Figure 3-2 shows the location of the upland disposal sites that were considered for this project.

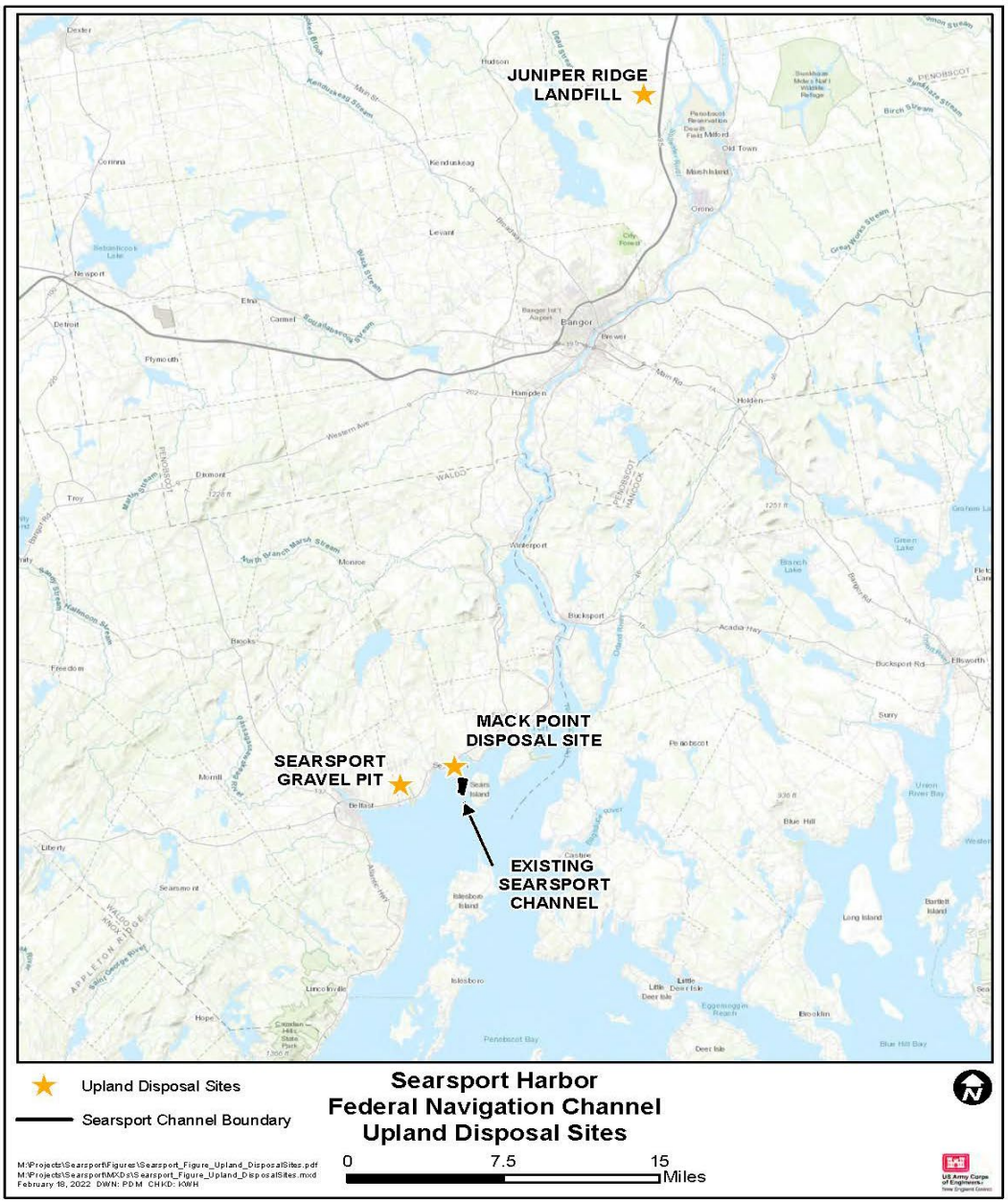

Figure 3-2: Potential Upland Disposal Site Locations

3.6.3 Beach Nourishment

Beach nourishment can consist of either direct placement of clean sandy material on a receiving beach, or placement of material in nearshore feeder bars within the beach's littoral system where it can be transported by natural processes onto the beach. While beneficial use of sand in such a manner prefers material with a grain size similar to or coarser than the receiving beach, the use

of material with a finer grain size is not precluded as even that material will provide some benefit to the beach. Dredged sediment from the Searsport Harbor FNP has a composition of clay silt with sand, which is not adequate for beach nourishment. This option for disposal of dredged material was not carried forward for further consideration.

3.6.4 Habitat Creation or Restoration

The material from both the FNP was eliminated from consideration for habitat creation/enhancement or saltmarsh creation or augmentation. Because of elevated levels of mercury in the FNP, the dredged material from the FNP is not suitable for habitat creation/restoration.

3.7 Confined Aquatic Disposal (CAD) Cell Adjacent to FNP

A CAD cell is a disposal cell constructed beneath the bottom of a harbor to accommodate dredged material unsuitable for beneficial use or open water/ocean placement. CAD cells are sized to accommodate the volume of material requiring containment and capped with suitable material. CAD cells constructed beneath or adjacent to a channel or other dredged project feature must take into account the dredged projects design depth, allowable over depth, a safety factor to prevent future loss of cap material, the potential erosion of the cap material, and the potential of future increases in channel design depth. No additional capacity has been requested by non-federal entities at this time. The cost of constructing FNP capacity at CAD cells and other containment facilities is cost-shared with a NFS at a rate depending on the FNP's design depth as specified in the WRDA of 1986 as amended. For FNPs with design depths greater than 20 feet but not more than 50 feet, like the 35-foot Searsport Harbor project, the required non-Federal cost share is 25 percent up-front plus another 10 percent after construction is completed for a total of 35 percent.

Due to the unsuitable nature of the dredged shoal material in the Searsport Harbor FNP being placed in the open water disposal locations, a CAD cell alternative disposal plan is proposed. Section 6.1.1 describes the sequencing and details of the CAD cell proposal. The location of the proposed CAD cell area (which includes a proposed starter CAD cell) is west of the existing federal navigation channel, shown in Figure 3-3 below. A starter CAD cell (CAD Cell A) is required to hold the unsuitable material taken from the FNP and top three feet of the larger CAD Cell B. It should be noted that a shipwreck was found near the west channel slope, approximately 1,100 feet northwest of red nun buoy No.4. The wreck is a sunken barge located in -49 to -40 feet of water and its size is approximately 30 x 160 feet; however, the proposed CAD cell is approximately 3,000 feet north of this cultural resource. The location of the shipwreck can also be seen in the previous Figure 2-1. Tables 3-2 and 3-3 identify the coordinates for the center points of the proposed starter and primary CAD cells. For more detailed design plans of CAD Cells A & B, see Engineering Design Appendix F.

Table 3-2: Searsport Harbor Proposed Starter CAD Cell (A) Coordinates

Starter Confined Aquatic Disposal Cell, Coordinates (NAD 83 Maine State Planes, East Zone, US Foot)		
ID	**Northing**	**Easting**
Center	285307.2	879671.29

Table 3-3: Searsport Harbor Proposed CAD Cell (B) Coordinates

Confined Aquatic Disposal Cell, Coordinates (NAD 83 Maine State Planes, East Zone, US Foot)		
ID	**Northing**	**Easting**
Center	285008.75	879601.53

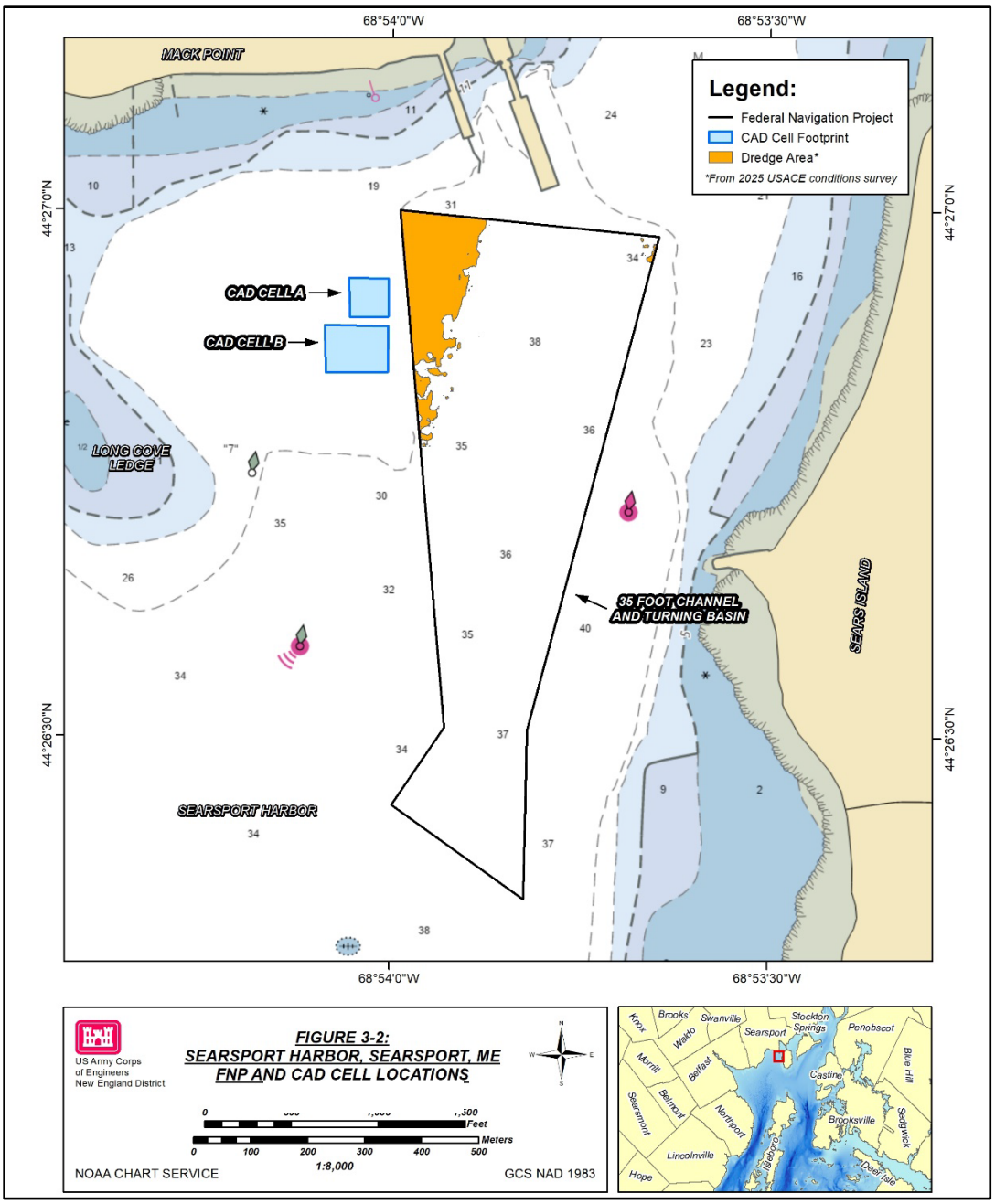

Figure 3-3: Location of Proposed Searsport FNP Starter CAD Cell A & CAD Cell B

3.8 CAD Cell Investigations and Development

Preliminary sampling to characterize the material in the vicinity of the proposed CAD cells A & B occurred in 2021, when USACE collected sediment cores from six locations within a general investigation area identified through interpretation of 2006 sub-bottom profiler data. An

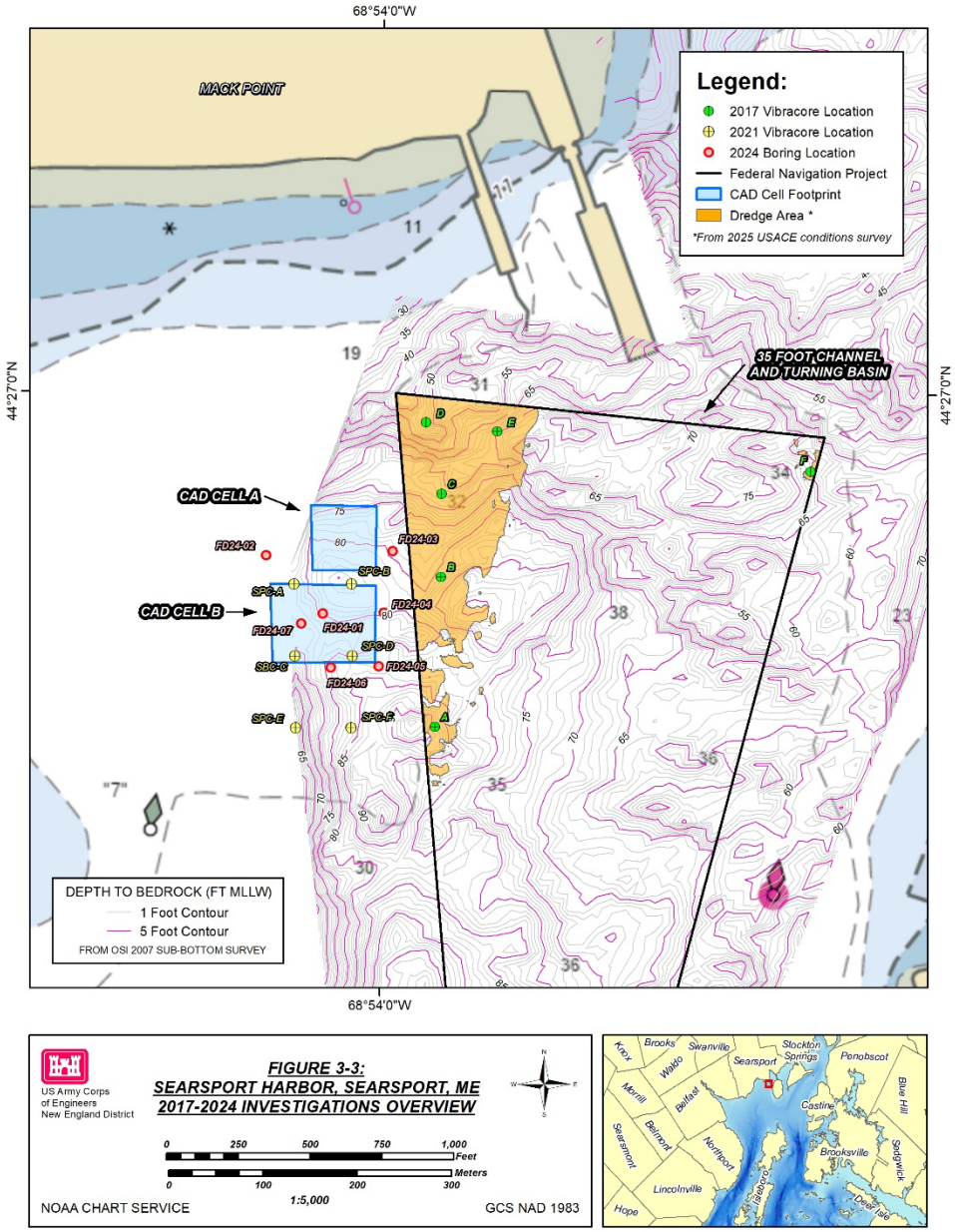

Figure 3-4: CAD Cell Investigation Area Sample Locations

additional seven locations were sampled in 2024. Figure 3-4 shows where the 2021 and 2024 sampling locations were located within the CAD cell investigation area, and depth to bedrock.

The 2006 sub-bottom investigation details and results are summarized in a separate technical report (Ocean Surveys Inc., 2007). The 2021 sediment cores were collected to a maximum depth of eight feet below the water-sediment interface and analyzed for physical and chemical parameters to document the presence and depth of any unsuitable overlying material or dredging obstructions in the proposed CAD cell footprint. See Appendix C,

Supplemental Suitability Determination for the Construction of a CAD Cell 2021 sediment core sampling results.

Data from the 2021 USACE cores were used in conjunction with the historic sub-bottom data to refine the investigation area footprint and develop a plan for more extensive subsurface investigation through an additional seven geotechnical borings (Nos. FD24-01 through FD24-07) within the proposed CAD cell area. The location coordinates of these seven geotechnical boring locations in the CAD cell investigation area, summary of the boring locations, depths, and sediment characteristics, are summarized in Table 3-4 and are also shown in Figure 3-4. The investigation of the CAD Cell area and analysis of the cores taken from the areas shown in Figure 3-4, are documented in the 2024 geotechnical report from GEI Consultants presented in Appendix D.

The GEI report also summarizes the surficial soils in the area, which generally consist of Presumpscot Formation and Till. The Presumpscot Formation is a glaciomarine silt, clay and sand deposit (Maine's "Blue Clay") with shelly horizons. The Presumpscot Formation overlies an irregular surface of Till in a complex manner. The Till is described as a loose to very compact, poorly sorted, massive to weakly stratified mixture of sand, silt and gravel-size rock debris deposited by glacial ice. Till in the Searsport quadrangle reaches a thickness of 85 feet or more. Depth to bedrock in the area of the CAD cell ranges from -67 to -92 feet MLLW. The eight borings in the CAD cell area were drilled to elevations -75 to -77 MLLW. No refusal was encountered at the selected locations. For more details about the sediment characteristics, see the GEI report (Appendix D).

An approximately 9-to-25-foot-thick layer of bay sediment was encountered at the mudline in all borings, with an average thickness of about 14 feet. The bay sediment consisted of very soft to soft, black to gray, organic silt (OL, OH) and organic clay (OL, OH) with organic fibers and wood fragments. A layer of glacial marine sediment, associated with the Presumpscot Formation, was encountered below the bay sediment in all borings. All borings except FD24-02 and FD24-07 were terminated in this layer. The thickness of the stratum ranged from approximately 23 to 38 feet. This layer consisted generally of lean clay with occasional traces of shell, sand, and gravel. Glacial till was encountered below the glacial marine sediment in FD24-02 and FD24-07. The glacial till ranged from approximately 1.5 to 7.5 feet thick, though none of the borings located the bottom of this layer. Water depths in the CAD cell area range from approximately 20 to 35 feet. See the detailed summary of the GEI investigation of the proposed CAD cell can be seen in the Appendix D.

Table 3-4: Searsport Harbor 2024 CAD Cell Borings Investigation Summary

Boring	Northing	Easting	As-Drilled Mudline (ft)	Borings Final Elevation (ft MLLW)	Details (Units are Depth Below Mudline (ft))
FD24-01	285019	879596	-26.1	-76.1	12 to14 ft (organic silt); 18 to 20 ft (clay); 44 to 46 ft (clay)
FD24-02	285221	879399	-22.9	-76.9	10 to 12ft (organic silt); 18 to 20 ft (clay); 30 to 32 ft (clay); 46 to 48ft (sandy clay with gravel)
FD24-03	285235	879839	-26.1	-76.1	4 to 6ft (organic silt); 14 to 16 ft (clay); 34 to 36 ft (clay); 48 to 50 ft (sandy clay with sand)
FD24-04	285021	879809	-27.3	-75.3	2 to 4ft (organic silt); 12 to 14 ft (sandy silt); 20 to 22 ft (clay); 28 to 30 ft (silty sand)
FD24-05	285021	879791	-26.7	-76.7	10 to 12ft (organic silt); 32 to 34 ft (clay); 42 to 44 ft (clay)
FD24-06	284832	879625	-28.4	-76.4	10 to 12ft (organic silt); 14 to 16 ft (sandy clay); 20 to 22 ft (organic silt); 28 to 30 (clay)
FD24-07	284984	879522	-24.8	-76.8	4 to 6ft (organic silt); 16 to 18 ft (clay); 34 to 36 ft (clay); 50 to 52 (sandy clay)

3.8.1 CAD Cell Material Chemistry

A 2022 USACE Suitability Determination addendum (Appendix C) analyzed the six samples collected from the CAD cell investigation area adjacent to the FNP in 2021. USACE concluded that the surficial three feet of sediment located within the CAD cell area is unsuitable for unconfined open water disposal, but that the material below the surficial three feet is suitable for disposal at the RDS open water disposal site. This determination was made based on the weight of evidence from the 2021 CAD cell samples and depth of the peak mercury concentrations

found in the 2017 mercury analysis that was done in the adjacent FNP. Table 3-5 summarizes the total mercury levels found in the 2021 CAD cell samples. The 2022 Suitability Determination (Appendix C) provides more detail on these results, and the other chemistry parameters tested. The material below the surficial three feet in the CAD cell area is suitable for open water placement. Analysis of a beneficial use alternative using the suitable CAD cell material is provided in Section 6.1.2.

Table 3-5: Total Mercury Concentrations from CAD Cell Investigation Area (mg/kg)

Depth Interval in Feet	Station A	Station B	Station C	Station D
0-1.0	0.046	-	-	0.337
0-1.5	-	0.292	-	-
1.0 – 8.0	0.029	-	-	-
1.0 – 4.4	-	-	-	0.041
1.5 – 7.5	-	0.035	-	-
0 – 2.0	-	-	0.34	-
2.0 – 7.6	-	-	0.08	-

3.8.2 Confined Aquatic Disposal (CAD) Cell Location Second Alternative Location

A second in-harbor CAD cell location was also considered but not carried forward. This CAD cell was sited within the FNP in deep water. This secondary location was initially looked at due to concerns from Maine DOT that the first location adjacent to the FNP may impact future plans for development of Mack Point Terminal. As of January 2025, Maine DOT has expressed concurrence and prefers the initial CAD cell area location adjacent to the FNP. Sediment analysis and borings to characterize the sub-bottom profile of this potential second CAD cell location are also included in the 2024 GEI report (Appendix D).

3.9 Disposal Alternative Screening

As described above in Section 2.4, it was determined that the physical and chemical nature of the materials to be dredged from the Searsport Harbor FNP make them unsuitable for most beneficial uses, especially beach nourishment or for habitat restoration. There are no projects in the area that could use re-handled and processed dredged material for other uses such as structural fill or soil products. Construction of the CAD cells for containment of the dredged material could be accomplished and estimates for that method have been developed and compared to determine practicability.

A summary table that accounts for all of the considered alternatives and why they were screened out, or retained, from future consideration, is shown in Table 3-6.

Table 3-6: Summary Table of Alternatives Considered

Alternative Name	Carried Forward for Further Consideration	Screening Analysis
No Action	No	Shoaling depths within the navigation channel are limiting shipping capacity and potential. Maintenance is required
Beneficial Use / Beach Nourishment	No	Sediment characteristics within the navigation channel are not suitable for beach nourishment
Searsport Gravel Pit	No	Sediment characteristics within the navigation channel and the location of residential properties and ground water wells near to the gravel pit, preclude this option from future consideration
Juniper Ridge Landfill	No	Concerns regarding available space at the landfill for this large amount of dredged material preclude this option from future consideration
Mack Point Upland Disposal Site	No	This alternative was concluded to not be feasible due to legal concerns regarding the use of contaminated material.
CAD Cells	Yes	Federal Base plan and only practicable alternative.

4.0 ENVIRONMENTAL IMPACTS

Maintenance dredging in the FNP would result in temporary impacts to the environment. The dredging would occur between the months of November and April to help reduce any potential impacts to specific species such as winter flounder. The proposed Federal action has been reviewed under the authorities NEPA and all applicable Federal environmental laws, regulations, Executive Orders and Executive Memorandums. The Environmental Assessment (EA) (Appendix B) adequately evaluates the anticipated impacts of this project and concludes that they are not significant. Based on the Finding of No Significant Impact (FONSI), the USACE concludes that the proposed dredging and disposal in connection with the maintenance of the FNP for the Searsport Harbor, and the disposal of dredged material in a CAD cell constructed in Searsport Harbor, will not be major Federal actions significantly affecting the quality of the human environment. An environmental impact statement is not needed in order to proceed with this project. This section summarizes the expected environmental effects from dredging and disposal of the dredged material. These effects were considered and reduced to the extent practicable and are summarized in more detail in the EA. Summaries of these environmental impacts are described below.

4.1 General Environmental Effects of Dredging

Temporary impacts to the benthic communities in the Searsport Harbor FNP were considered for this maintenance dredging project. The temporary impacts include short-term loss of benthos within the direct footprint of the dredging areas and CAD cell area and short term and localized increases in turbidity in areas adjacent to the dredging.

Surveys of the benthic communities in the Searsport Harbor FNP show low diversity and abundance numbers. Community structure in the subtidal habitat following dredging is expected to return to similar conditions following construction of the project. As the benthic community throughout the existing FNP is a mix of opportunistic early-successional stage benthic communities and mid-successional stage benthic communities, a return to a similar community following dredging is expected within approximately 1-3 years (Newell, et al., 2011).

Turbidity impacts to benthos are dependent on the concentration and the duration of the suspended sediments (Wilber & Clarke, 2001); (Suedel, et al., 2015). Motile benthic organisms (e.g., lobster and crab) can generally avoid unsuitable conditions in the field and, under most dredging scenarios, encounter localized suspended sediment plumes for exposure durations of minutes to hours. Although adult bivalve mollusks are silt-tolerant organisms (Sherk, et al., 1974), they can be affected by high suspended sediment concentrations. Hard clams (Pratt & Campbell, 1956) and oysters (Wilber & Clarke, 2001), exposed to fine silty-clay sediments have exhibited reduced growth and survival, respectively. Suspended sediment concentrations required to elicit these responses and mortality are extremely high, meaning these responses are beyond the upper limits of concentrations reported for most estuarine and marine systems under natural conditions, as well as typical concentrations associated with dredging operations. Therefore, the temporary increases in turbidity associated with the proposed project are not

anticipated to significantly adversely impact the benthic communities adjacent to the dredge areas.

4.2 Dredged Material Suitability

The material from the Searsport Harbor FNP and the surficial three feet of sediments within the proposed CAD cell area are not suitable for unconfined open water placement. USACE made this determination based on the weight of evidence from the 2021 CAD cell sediment samples and depth of the peak mercury concentrations measured in the 2014 mercury analysis subsamples from the adjacent FNP. This material, along with the maintenance material from the Searsport Harbor FNP, can be effectively isolated according to 40 CFR 230.72 through disposal and containment in the proposed CAD cells or upland in a containment facility.

Based on the weight of evidence including the conceptual site model, the results of previous investigations, bulk sediment chemistry data, and subsequent water column modeling, the subsurface material from the proposed CAD cell area is considered suitable for unconfined open water placement at RDS according to the testing and evaluation requirements set forth in Section 404 of the CWA. The underlying subsurface material from the CAD cell area meets the exclusionary criteria under 40 CFR 230.60 and is also acceptable for open water placement at RDS without additional testing. The geotechnical borings and analyses described in Appendix D of this report document the composition and physical properties of the underlying parent material.

Section 2.3 above details the quality of the sediment proposed to be dredged.

4.3 Endangered Species Impacts

USACE has made the determination that the proposed project may affect, but is not likely adversely affect, ESA-listed threatened or endangered species in the Searsport Harbor FNP and CAD cells area. The project involves subtidal dredging of estuarine sediments. The northern long-eared bat, red knot, and roseate tern may experience some insignificant disturbances from equipment should they be present at the time of construction. However, given that the project will occur between November 8 and April 8 of the year the project is funded and that there is no roosting habitat in the direct footprint of the project for any of these species, it is unlikely that these species would be present during project activities. Coordination with the USFWS and the NMFS is in progress.

4.4 Essential Fish Habitat

The National Marine Fisheries Service (NMFS) has designated specific areas as Essential Fish Habitat (EFH) in accordance with the Magnuson-Stevens Fishery Conservation Act, as amended by the Sustainable Fisheries Act of 1996. The Sustainable Fisheries Act includes requirements for evaluating fish habitat loss and protection of fisheries identified as essential fisheries. “Essential Fish Habitat” are those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (50 CFR Part 600).

The proposed project occurs in designated EFH habitat areas managed by the New England Fishery Management Council. The EA (Appendix B) lists life history profiles for the 22 EFH designated species. The species in Penobscot Bay are: Atlantic sea scallop, Atlantic wolfish, haddock, winter flounder, little skate, ocean pout, Atlantic herring, Atlantic cod, pollock, red hake, silver hake, windowpane flounder, winter skate, American plaice, smooth skate, white hake, thorny skate, Atlantic mackerel, Atlantic salmon, bluefin tuna, bluefish, and Atlantic butterfish. The proposed project is anticipated to affect EFH within the footprint of the dredge area, CAD cell areas, and RDS. Many of the dredging related impacts (i.e., increases in turbidity, changes in fish movement behavior, benthic community changes) are common temporary occurrences in embayments like Searsport Harbor. The proposed project involves a longer duration of these temporary impacts. The effects would only occur in the area of dredging activity and material placement locations, which would not be taking place at all locations at the same time. A construction window of November 8 through April 8 will be utilized to minimize impacts to marine resources at the dredging and placement sites. Individually or cumulatively, the impacts are not anticipated to significantly adversely affect managed species or most species EFHs.

4.5 Summary of Expected Disposal Impacts

Placing material at any of the upland sites considered or within the CAD cell area in Searsport Harbor is not expected to have significant long-term environmental effects. No significant shellfish or lobster resources are located in any of the disposal sites. Direct impacts to fish resources at the CAD cell area are expected to be minimal. Any fish in the vicinity of the placement site would be either expected to avoid the areas of disturbance, be smothered by the material, or be exposed to elevated turbidity for brief periods. Elevated suspended sediment levels should be short-term and localized to the placement site area. Benthic organisms buried at the disposal site will temporarily eliminate a forage area for fish. Recolonization by benthic species from adjacent areas and new recruitment is expected to occur in a relatively short period of time. The proposed dredging and placement of the sediment will occur during the period of November 8th through April 8th, avoiding the time of year restriction for marine fisheries. This window minimizes the presence of aquatic resources in the project area and takes advantage of the lower levels of natural, environmental stresses placed on species that may reside in the work areas.

4.6 Cultural Resource Effects

The FNP study area and CAD cell locations are in a resource-rich, protected coastal setting on the northwestern shore of the head of Penobscot Bay. Penobscot Bay is the drowned southern end of the Penobscot River valley, which was inundated during past periods of sea level change and coastal subsistence. Together, the river and embayment form Maine's largest estuary and would have been a particularly attractive area for settlement during the pre-contact period.

The current project consists of maintenance dredging within the existing FNP dimensions; and the Cullen No. 18 shipwreck site will not be impacted by dredging activities as it is located outside of the FNP boundaries. Archaeological surveys conducted in the FNP and portions of the CAD cells

in 2007 and 2008 did not document any historic or cultural resources. Since these surveys did not capture the entire proposed CAD cell sites, the USACE will conduct an additional archaeological investigation during Pre-Construction Engineering and Design of the Preferred Alternative. Disposal of material at the RDS, a previously utilized disposal site, will not impact historic properties.

Recognizing the region's extremely long history of maritime activity and that most vessel casualties went unrecorded, as well as the relatively protected nature of the project study area, the FNP project study area, including the CAD cell locations has a moderate archaeological sensitivity for containing sunken Contact/post-Contact period vessels and/or coastal structures.

Because effects on historic properties cannot be fully determined prior to approval of the Recommended Plan, the USACE is developing a Programmatic Agreement (PA) pursuant to 36 CFR 800.14(b)(1)(ii) to comply with Section 106 of the NHPA. Disposal of material at the RDS, a previously utilized disposal site, will not affect historic properties.

The USACE is consulting with the ME SHPO, Houlton Band of Maliseet Indians, Mi'kmaq Nation, Passamaquoddy Tribe, Penobscot Nation, the Wampanoag Tribe of Gay Head (Aquinnah) and the Searsport Historical Society. The proposed navigation maintenance project at the FNP is expected to have no effect on historic properties as defined by Section 106 of the NHPA, as amended, and the implementing regulations of 36 CFR 800. No further action is required. The federally recognized Tribes and ME SHPO are expected to concur with this determination.

4.7 Summary of the NEPA Evaluation – Finding of No Significant Impact (FONSI)

A NEPA evaluation (see the EA and FONSI) was prepared for the proposed action. Based on the findings, the District Engineer has determined that the environmental effects, as presented in the EA, for the maintenance dredging of Searsport Harbor is not a major Federal action significantly affecting the quality of the human environment. The FONSI will be finalized when signed by the District Engineer upon approval of the Preliminary Assessment Report and EA by the North Atlantic Division Commander.

5.0 CHANNEL UTILIZATION

The Searsport Harbor FNP serves a variety of commercial vessel operations. Between the years 2016 and 2020, shipments of sulfur, oil, gasoline, petroleum pitch and asphalt, and other chemical products were the principal commodities moving through the Searsport Harbor FNP, as reported by the USACE Waterborne Commerce Statistics Center.

5.1 Navigation Use of the Project

Channel utilization analysis of the Searsport Harbor FNP between 2016-2020 demonstrates significant utilization of the FNP by commercial shipping vessels and container ships that draft up to 40 feet. In order to access the pier at Mack Point, vessels requiring 40-foot depths currently use the tide and the turning basin, which is dredged to 40 feet, to utilize the channel past its authorized depth of -35 feet MLLW. The economics of waterborne freight transportation show that shippers can achieve economies of scale by loading existing vessels more efficiently and with more freight, which can deliver more products with fewer vessel trips. Dredging to the full authorized depth of -35 feet MLLW would allow for less restricted access based on the current fleet of vessels and would maintain the channel's highest amount of utilization possible to transport goods from Mack Point. Figure 5-1 shows the commodity tonnage moved through Searsport Harbor from 2016-2020, by vessel draft in feet. See Appendix E for a more in-depth analysis of the channel utilization that shows that the maintenance dredging is economically warranted.

Figure Source: USACE Channel Portfolio Tool, data only available through 2020

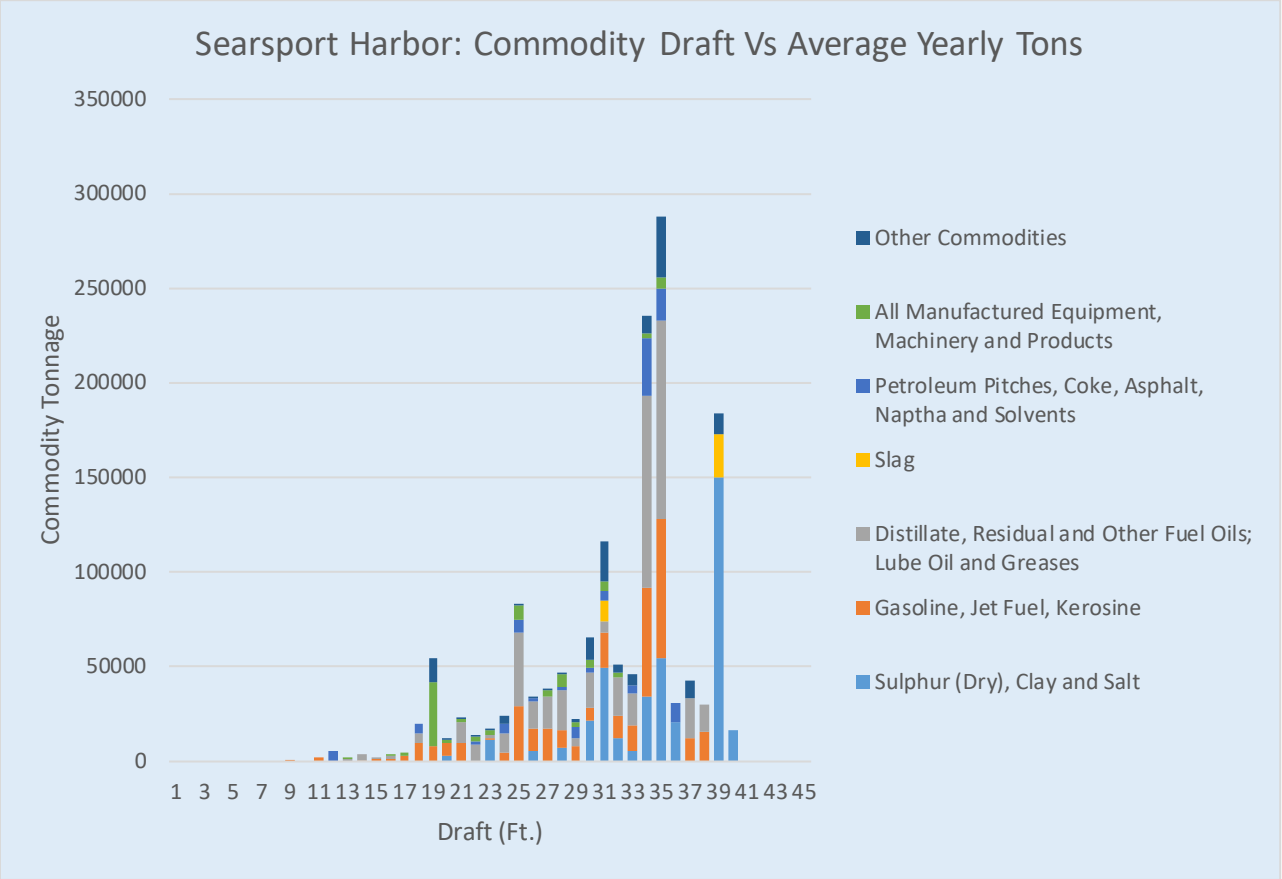

Figure 5-1: Searsport Harbor, All Reaches, Commodity Tonnage by Draft, 2016-2020

6.0 COMPARISON AND EVALUATION OF DETAILED PLANS

Comparisons of the CAD cell area material, upland placement and open water placement alternatives are summarized to show how the plans are different and why they were either screened out or selected for further consideration. Evaluation of their environmental effects, designs, construction requirements, real estate requirements, concerns with cost efficiency, and any long-term implications were considered.

6.1 General Comparison

The EA/FONSI concluded that the alternative placement plan retained for more detailed evaluation (i.e., the CAD cell area adjacent to the FNP) has no significant negative impact to the environment. Dredging will be completed by mechanical dredge and scow disposal for both the FNP O&M dredging and CAD cell creation.

6.1.1 CAD Cell Adjacent to FNP Plan

The CAD cell alternative plan addresses the dredged sediment chemistry and potential contaminant levels in the O&M material. The O&M material was determined to be suitable for placement in a CAD cell, with no increased risk of contaminating the water column. The design for the CAD cells was developed using data from previous geophysical investigation reports compiled during the Searsport Harbor Navigation Improvement Feasibility Study, along with information pulled from the original design documents for the construction of the Searsport Federal Navigation Project (1964). The area studied to determine CAD cell location placement was based upon the results of a USACE sub-bottom profiler survey conducted in 2007 and USACE sediment sampling and analysis conducted in 2021 of the proposed CAD cell location. The top layers of the FNP and the CAD cell area contain elevated levels of heavy metals, such as mercury, and is classified as unsuitable material. Dredging the proposed CAD cell area and FNP, would occur in three phases shown below. Three feet of capacity is proposed to be left at the top of the CAD cells to fill in naturally with suitable material, which does not require a cap or placement of additional dredged suitable material on top of the CAD cells:

Phase 1: CAD Cell A Construction (Starter CAD Cell)

1. Dredge 5,123 CY of three feet unsuitable overburden of CAD Cell A and hold in scow located in Searsport Harbor. Material will be held until CAD Cell A construction is complete (while dredging the remainder of CAD Cell A volume that is suitable for open water disposal).
    a. NOTE – This first three feet of the CAD Cell A footprint area is unsuitable for open water disposal
    b. NOTE – Starter CAD Cell will be used to reduce amount of unsuitable material needed to be held temporarily in scow(s).
2. Dredge the remaining 17,081 CY from CAD Cell A of clean material and dispose in open water at the RDS, 20 nautical miles sail one way.

a. NOTE – This remaining material in CAD Cell A is suitable for open water disposal
b. NOTE – Max dredge depth will be –62ft MLLW with 1:3 slopes.

3. CAD Cell A construction complete.
4. Place 5,123 CY of unsuitable material held in a scow into CAD Cell A.

Phase 2: CAD Cell B Construction (Primary/Larger CAD Cell)

1. Dredge 10,213 CY of three feet unsuitable overburden of CAD Cell B and place into CAD Cell A.
   a. NOTE – CAD Cell B will be south of CAD Cell A, approximately 40 feet of distance will between the two slope crests.
   b. NOTE – This will be the last material placed into CAD Cell A, approximately three feet of capacity will be left at the top of CAD Cell A for a natural cap to form.
2. Dredge the remaining 44,516 CY of clean material and dispose in open water at the Rockland Disposal Site, 20 nautical miles sail one way.
   a. NOTE – Max dredge depth will be -72ft MLLW with 1:3 slopes (north to south), and 1:4 slopes (east to west).
3. CAD Cell B construction complete.

Phase 3: Dredge FNP material

1. Dredge **39,101 CY (16,333 CY required and 22,769 CY overdepth + two feet)** of shoaled unsuitable material in the FNP and place in CAD Cell B. CAD Cell B is approximately 200-700 feet west of the FNP (see figures 3-2 & 3-3). Required depth in the FNP is -35 feet MLLW, with two feet of overdepth.
   a. NOTE – Max dredge depth will be -37 feet MLLW.
   b. NOTE – This will be the last material placed into CAD Cell B, approximately three feet of capacity will be left at the top of CAD Cell A for a natural cap to form.

Section 7.1 describes the details of the proposed CAD cell design and additional considerations for this project.

6.1.2 CAD Cell Dredged Material Upland Placement or Beneficial Reuse Alternatives

The potential upland disposal plans for dredge material from the CAD cell area was screened out from further consideration due to similar concerns regarding construction efficiency, real estate constraints, or other human safety reasons that were studied when planning to dispose of the dredge material from the FNP. Sections 3.5 and 3.6 summarize in more detail why these alternative upland disposal plans were screened out. The upper three feet of material taken from the CAD cell area, located adjacent to the FNP, is unsuitable material for both upland placement and open water disposal. The material below that upper three feet, however, is suitable for open

water placement, as described in Section 3.8.1. No beneficial reuse sites with specific needs or plans for which the material was ready for receipt and use were identified in the area.

6.1.2.1 Habitat Creation or Restoration (CAD cell area beneficial use)

The unsuitable dredged material was eliminated from consideration for habitat creation/enhancement or saltmarsh creation or augmentation because of elevated levels of mercury in the top three feet of sediments within the proposed CAD cell area. The suitable material from the CAD cell area is also composed of silty clay, which was also determined to not be suitable for marsh restoration.

6.1.2.2 Cape Jellison Area (CAD cell area beneficial use)

The NAE team also met with MaineDOT, Maine DMR, and Maine DEP to discuss the idea of identifying areas within the Bay that would potentially benefit from a layer of suitable material that would be removed for the CAD cells USACE explored the possibility of using some or all of the 60,000 CY of suitable material as capping material for the Cape Jellison portion of the Penobscot Bay area closed to lobster fishing (Appendix B). This alternative plan was to place the suitable material over mercury contaminated sediments of the Cape Jellison area to minimize the contaminated sediments exposure to the waters above. Benefits would include reducing contaminated sediment exposure to tidal waters and reducing the distance of the needed haul route to a traditional disposal site like RDS. Though the idea has merit, planning for this placement would require at least an additional year of testing requiring significant schedule delays, placement site identification, planning for construction methodology and a great level of coordination with the Penobscot River Estuary Remediation trustees, Maine State DEP, Maine State DMR, and the public. Furthermore, there currently is a lack of surficial sediment chemistry of the area, lack of water quality chemistry, and the possibility legal liability of interfering with an ongoing remediation project being undertaken by the Greenfield Penobscot Estuary Remediation Trust in the Penobscot River and upper Penobscot Bay. This site was eliminated from further consideration for this project, but NAE will continue to discuss this BU alternative as an option for other FNP sites within the area that may require maintenance dredging in the future.

7.0 ENGINEERING DESIGN

Details and considerations for the CAD cell alternative design are described below. Design plans for the CAD cells can be found in the Engineering Designs Appendix (Appendix F).

7.1 CAD Cell Engineering Design

For the CAD cell design, slope stability analysis was conducted. For CAD Cell B a slope of 1V:4H was determined for the East and West slopes while a slope of 1V:3H was determined for the North and South slopes. For CAD Cell A, a slope of 1V:3H was determined for all sides. Based on previous guidance and experience with other CAD cell designs within the New England area, the designer assumed 3-feet of open capacity at the top for a natural cap to form above the unsuitable material placed in the CAD cell. Proposed slopes were determined through a slope stability analysis using the 2024 geotechnical borings data collected by GEI (Appendix D). Additional information on the side slope analysis is provided in the Engineering Design Appendix F. CAD Cells A & B would be located in water depths of about -25 feet MLLW. CAD Cell A would have top dimensions of approximately 228 feet x 221 feet. CAD Cell B would have top dimensions of approximately 367 feet x 267 feet. Figure 7-1 shows a typical cross section of CAD Cell B, and Figure 7-2 shows the typical cross section of CAD Cell A. See more detailed design drawings and all of the dimensions of CAD Cells A & B in Appendix F.

To contain the maximum amount of approximately 39,101 CY of dredged material (unsuitable for open water placement) removed from the Searsport FNP, the CAD Cells A & B would need to be dredged to contain the minimum required total capacity of approximately 79,233 CY. Table 7-1 breaks down the required CAD Cell A required minimum holding capacity. Table 7-2 identifies how the excess holding capacity was calculated for CAD Cell A. Table 7-3 breaks down the required CAD Cell B required minimum holding capacity. Table 7-4 identifies how the excess holding capacity was calculated for CAD Cell B. The remaining material, located below the top three feet of surficial material in the CAD cell locations, has been determined to be suitable for placement at the RDS site. As identified in the Suitability Determination (Appendix C), the subsurface material in the CAD cells does not have high levels of contaminants.

Table 7-1: Searsport Harbor Proposed CAD Cell A Required Dredging Volumes

CAD Cell A Capacity Required	Volume (CY)
3-Foot Unsuitable Material to Start CAD Cell A	5,123
Bulking Factor (15%)	768
Total Available Capacity in CAD Cell A	22,972
3-Foot-Deep Capacity for Natural Cap	5,123

Table 7-2: Searsport Harbor Proposed CAD Cell A Design Dimensions

CAD Cell A Design	Details
Approximate Top of CAD Cell Dimensions (feet)	229x221
CAD Cell Depth (feet) MLLW	-62
Side Slope	1V:3H
Total Available CAD Cell A Capacity (CY)	+22,972

Table 7-3:Searsport Harbor Proposed CAD Cell B Required Dredging Volumes

CAD Cell B Capacity Required	Volume (CY)
3-Foot Unsuitable Material to Start CAD Cell B	10,213
Required Capacity for Unsuitable FNP Dredged Material	39,101
Bulking Factor (15%)	5,865
Total Available Capacity in CAD Cell B	56,261
3-Foot-Deep Capacity for Natural Cap	10,213

Table 7-4: Searsport Harbor Proposed CAD Cell B Design Dimensions

CAD Cell B Design	Details
Approximate Top of CAD Cell Dimensions North to South (feet)	367x268
CAD Cell Depth (feet) MLLW	-72
Side Slopes	1V:3H & 1V:4H
Total Available CAD Cell B Capacity (CY)	+56,261

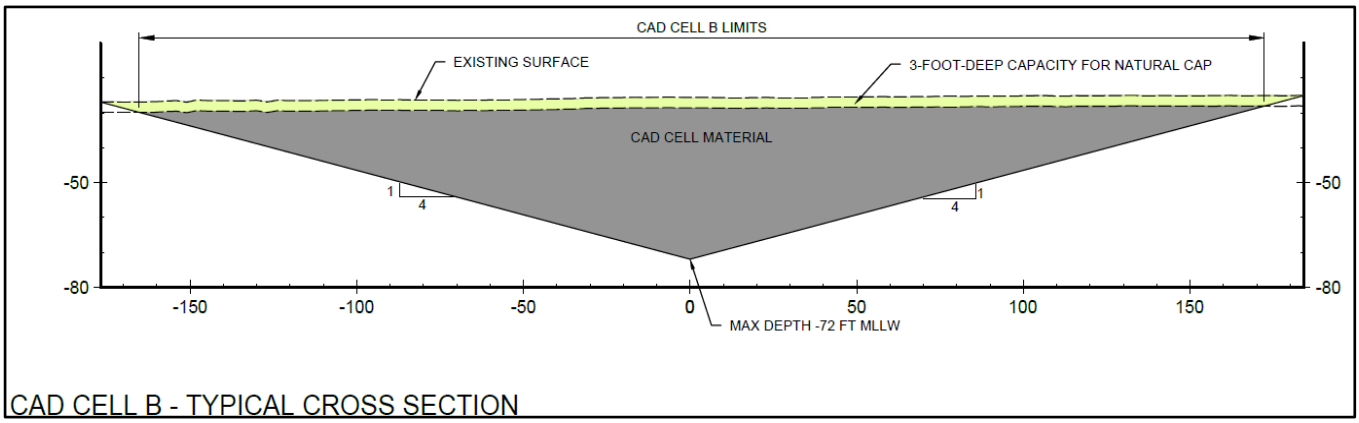

Figure 7-1: Searsport Harbor Primary CAD Cell B Dimensions

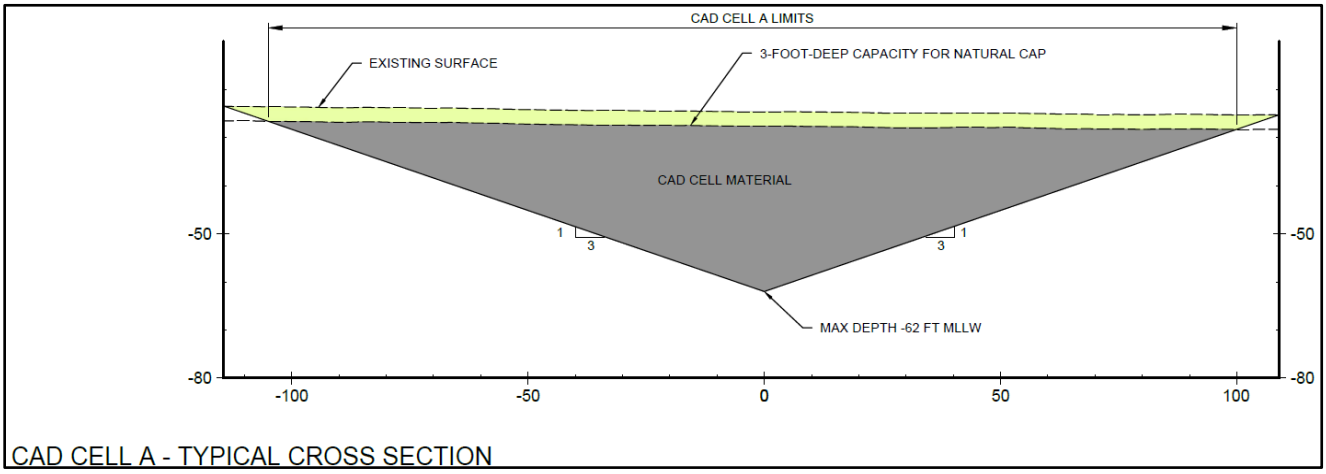

Figure 7-2: Searsport Harbor Starter CAD Cell A Dimensions

8.0 REAL ESTATE

NFSs are responsible for acquiring all lands, easements, or rights-of way for dredged material placement sites that USACE determines to be required for development of new project features such as CAD cells, and for future project operation and maintenance. The USACE does anticipate the need for any real estate acquisitions to complete the O&M dredging, creation of the CAD cells, and disposal of the dredged material from the Searsport FNP.

9.0 COST ESTIMATE FOR DREDGING AND DREDGED MATERIAL DISPOSAL

A cost estimate was developed for maintenance of the Searsport Harbor FNP using the CAD cell alternative, and a preliminary estimate was developed for upland disposal of the FNP dredged material. The Cost Engineering Report for the FNP maintenance dredging and construction of the CAD cells is provided in Appendix G. The cost estimate developed for the upland disposal alternative at Mack Point was an important factor used to screen this alternative from further consideration. Cost estimates include construction contract costs, contingencies, costs for final engineering design, NEPA compliance and regulatory approvals, construction management, administration and inspections, and post construction monitoring. Additional risks considered include weather and the severity of the winter limitations on dredging activities, fuel costs, and their associated effects on the construction estimate. estimate. A Cost and Schedule Risk Analysis (CSRA) was completed by the PDT to determine all of the potential risks to the project and develop appropriate contingencies for estimating the government estimates of each alternative (Appendix G). Table 7-5 summarizes the costs to dredge the Searsport Harbor FNP, dredge the adjacent CAD cell area, and transport of suitable material for disposal at RDS.

Table 9-1: Cost Estimates for FNP Dredging with CAD Cell Disposal of Unsuitable Material

Price Level 01 Jan 2028	Cost ($)
Mobilization/Demobilization	$2,939,000
Dredging of FNP	$379,000
Dredging of CAD Cell (includes transport to RDS)	$1,034,000
Planning, Engineering & Design	$640,000
Construction Management	$546,000
Total Project Cost Estimate*	**$5,538,000**
*Includes Project Contingency	$1,277,000

9.1.1 FNP & CAD Cell Cost Assumptions

Cost estimate assumes:

- Approximately 39,101 CY of fine grain sand and silty shoal material to be dredged from the Searsport FNP channel and anchorages. Material is to be disposed of in CAD Cell B.
- Before the CAD Cell B can be created, a smaller cell (starter CAD Cell A) must be created first to hold the top three feet of soil that is considered unsuitable or contaminated from CAD Cell B. The top layer of sediments from the starter CAD Cell A will be held in a large scow at least 6,000 CY in size until the lower suitable material can be completely dredged out and disposed of at RDS. CAD Cell A will hold the entire remaining unsuitable top three feet of sediment from the larger CAD Cell B (10,213 CY).
- After CAD Cell A suitable material has been placed at RDS, and CAD Cell B unsuitable material is placed in CAD Cell A, then dredging of the Searsport FNP will commence and the material from the FNP will be placed in CAD Cell B.
- All suitable uncontaminated dredged material below the three-foot surface layers, taken from both CAD Cells A and B, will be disposed of at the RDS.

Assumed Construction Methodology:

- Conventional mechanical dredging.

Construction Schedule (Anticipated):

- Total construction estimated to be 4 weeks in duration. The project is expected to enter design in FY27 and construction in early FY28.

Acquisition Strategy/Type:

- Assumed IFB.

Major Assumptions/Exclusions/Notes:

- This estimate is a baseline estimate used for planning purpose of a selected plan. Assumptions used in the CEDEP spreadsheets. Operations assumed 1 dredge using a 10 CY bucket, 1 Ocean Tug and two 6,000 CY capacity scows with additional push boats, support/work barges and attendant equipment.

Cost Data Sources:

- All dredge unit cost information was created in CEDEP mechanical dredging Excel sheets 2023 ver 0.
- Dredge unit prices and mob/demob prices were entered into MII.

Contractor Make-Up:

- Marine heavy dredging contractor.

Contractor Mark-Up:

- PRIME – JOOH 3.82%, HOOH 8%, Profit 10%, Bond & Insurance 2.0%

Other Indirect Costs:

- Escalation of 2023 CEDEP to Q4FY25 – 17.07% (based on CWCCIS)
- No sales tax.

10.0 THE RECOMMENDED PLAN

Identification of the selected dredge material disposal plan from the original array of potential alternative plans is based on USACE planning guidance that specifies that the alternative that reasonably maximizes net economic benefits consistent with protecting the Nation's environment, is to be the selected plan.

10.1 The Federal Base Plan for Dredged Material Disposal

The Federal Base Plan is the disposal option that is consistent with the Federal Standard, defined in USACE regulations as the least costly dredged material disposal or placement alternative identified by USACE that is consistent with sound engineering practices and meets all federal environmental requirements. It is also USACE policy to fully consider all aspects of the dredging and placement operations while maximizing benefits to the public. Beneficial use options for the dredged material should be given full and equal consideration with other alternatives. Beneficial use project costs exceeding the cost of the Federal Standard option, become either a shared federal and non-federal responsibility, or entirely a non- federal responsibility, depending on the type of beneficial use. Beneficial use options are not possible for the unsuitable material present in the top layer of sediment in the FNP, and no viable beneficial use was identified for any of the suitable material located below the top layer of unsuitable material.

The recommended plan is also the Federal Base Plan. The environmental impacts discussion summarized in this report and additional information provided in the EA demonstrates that the alternative can be implemented in a manner that is consistent with protecting human health and the Nations environment. The cost analysis demonstrates that the dredge plan that includes the use of CAD cells located adjacent to the FNP and the RDS disposal site is the plan that maximizes the net economic benefits in a least costly manner. The proposed Federal Base Plan, consistent with the Federal Standard, is the CAD cell disposal plan. Table 8-1 summarizes the screening of alternatives carried through and assessments of their completeness, effectiveness, efficiency, and acceptability.

Table 10-1: Results of Initial Screening of Alternative Plans Carried Forward

Alternative	Completeness	Effective	Efficient	Acceptable
Upland disposal of unsuitable FNP dredged materials	Provides complete maintenance of the FNP and disposal of unsuitable dredged materials	Provides needed disposal for unsuitable dredged material from FNP, but real estate and human health constraints limit the ability to dispose of the material effectively	Meets completeness objective to maintain the FNP and to dispose of unsuitable material, but not cost efficient	Not found to be acceptable due to concerns regarding efficiency during construction and potential liability for placement contaminated material
Disposal of unsuitable FNP dredged materials in CAD cells in Searsport Harbor	Provides complete maintenance of FNP and disposal of unsuitable dredged materials	Provides needed maintenance for FNP. Effectively disposes of all unsuitable FNP material	Meets objectives for maintenance of the FNP and disposal of all dredged material at lower cost	Maintenance dredging of the FNP and disposal of suitable and unsuitable material is acceptable

10.2 Implementation Responsibilities and Details

10.2.1 Federal Base Plan Cost Apportionment

Costs shown in Table 8-2 are the project's baseline First Cost, based on FY26 dollars. The Cost Engineering Report for the FNP maintenance dredging and construction of the CAD cells is provided in Appendix G.

Table 10-2: Project First Costs (FY26) for the Recommended Plan

Project First Costs (FY26, Q1)	Subtotal ($)	Contingency (%)	Contingency ($)	Total Cost ($)
Total Mob/Demob	$ 2,063,000	35%	$ 727,000	$ 2,790,000
Dredging CAD Cells	$ 726,000	35%	$ 256,000	$ 982,000
Dredging FNP	$ 266,000	35%	$ 94,000	$ 360,000
PED*	$ 551,000	12%	$ 66,000	$ 617,000
Total Construction Management	$ 443,000	16%	$ 71,000	$ 514,000
Total	**$ 4,049,000**	**30%**	**$ 1,213,000**	**$ 5,263,000**

*Pre-Construction Engineering & Design

Table 8-3 shows the estimated fully funded level escalated to the mid-point of construction in FY28. Fully funded costs are provided for the project sponsor to understand what cost and budget will be required to construct the Federal-base plan project using CAD cells. The total project cost range using the information available for this PA is estimated to be $5-$10 million. A post-construction additional 10% non-Federal contribution (approximately $592,000) is also shown in Table 8-3.

Table 10-3: Total Project Costs (FY28) for the Recommended Plan

Project Total Costs (FY28, Q1)	Subtotal ($)	Escalation (%)	Escalation ($)	Total Cost ($)
Total Mob/Demob	$ 2,790,000	5.3%	$ 149,000	$ 2,940,000
Dredging CAD Cells	$ 982,000	5.3%	$ 52,000	$ 1,034,000
Dredging FNP	$ 360,000	5.3%	$ 19,000	$ 379,000
PED*	$ 617,000	3.6%	$ 22,000	$ 640,000
Construction Management	$ 514,000	6.3%	$ 32,000	$ 546,000
Total	**$ 5,262,000**	**5.2%**	**$ 275,000**	**$ 5,538,000**
Post-Construction 10% Non-Federal $ Additional Contribution	-	-	-	$ 554,000

*Pre-Construction Engineering & Design

Table 8.4 summarizes the estimated fully funded cost of the project comparing the Federal vs. non-Federal costs. The Federal base-plan cost to dredge the Searsport FNP is 100% paid with Federal dollars. The costs for the CAD cell construction are cost shared 75% Federal dollars/ 25% Non-Federal dollars. The cost share breakdown (75% Federal / 25% Non-Federal) to dredge Searsport FNP and the CAD cells, will be more fully determined during the Design & Implementation Phase.

Table 10-4: Federal vs. Non-Federal Cost Share for the Recommended Plan

Fully Funded Costs FY28 - Q2 Final Costs	Construction Cost ($)	Construction Cost ($)
Federal / Non-Federal Share	CAD Cell	FNP
Mob / Demob	$ 2,151,000	$ 788,000
CAD Cell Construction	$ 1,034,000	$ -
FNP Maintenance Dredging	$ -	$ 379,000
PED*	$ 468,000	$ 171,000
SIOH**	$ 400,000	$ 146,000
Total $	**$ 4,053,000**	**$ 1,485,000**
Federal $ 75%	$ 3,040,000	$ 1,885,000
Non-Federal $ 25%	$ 1,013,000	$ -
Total Project Cost	**$ 5,538,000**	

*Pre-Construction Engineering & Design

**Supervision, Inspection & Overhead

10.2.2 Other Federal Responsibilities

The Federal government will be responsible for preparation of plans and specifications, contract advertisement and award, and supervision and inspection of the work. The Federal government will be responsible for project compliance with Federal environmental laws and regulations, including the National Environmental Compliance Act (NEPA), consistency with the Coastal Zone Management Act (CZM), the Clean Water Act (CWA), Magnuson-Stevens Fishery Conservation Act, and the National Historic Preservation Act et al. Federal responsibility includes only the maintenance dredging of the designated Federal channels, with disposal of the dredged material, and does not include any berthing facilities, shoreline protection, or site work at upland disposal areas.

10.2.3 Other Non-Federal Responsibilities

The following is a list of some of the items of local cooperation required for projects authorized for maintenance dredging. The NFS must provide assurance that they intend to meet these items prior to project authorization. The Project Partnership Agreement details these and other requirements of the Government and the Sponsor for implementation and future maintenance of the project.

In accordance with Article II, paragraph B of the "Model Agreement for Providing Additional Dredged Material Capacity For Specifically Authorized Commercial Navigation Harbor Projects (April 23, 2020)", it is expected that the NFS will be responsible for providing twenty-

five (25) percent of construction costs assigned to a channel depth in excess of 20 feet but not greater than 50 feet.

In accordance with Article III, of the aforementioned agreement, the NFS shall provide the real property interests, if required, acquire or compel the removal of obstructions, and perform or ensure the performance of relocations required for construction, operation, and maintenance of the DMPFs.

Finally, in accordance with Article VI.D. C. of the aforementioned agreement, the NFS shall pay an additional 10 percent of construction costs (hereinafter the "additional 10 percent payment"), less any credit afforded by the Government for the real property interests and relocations, over a period not to exceed 30 years.

11.0 RECOMMENDATION

In accordance with ER 1105-2-100 Appendix E, this Preliminary Assessments establishes that a more detailed DMMP study is not required based on the indicators described herein, which include volume and frequency of traffic and vessel dimensions. USACE has established the Base Plan and confirms that continued maintenance is warranted. The federal Base Plan can be established to accommodate more than 20 years of maintenance without a full DMMP study. Shoaling rates show that several decades will pass before another maintenance event must be executed.

The USACE recommends continued maintenance of the Searsport Harbor FNP, including the construction of two CAD cells adjacent to the Searsport FNP for placement of that portion of the dredged material determined unsuitable for open-water placement. Construction of the CAD cells will be cost shared with the NFS in accordance with the Recommended Plan identified in this Preliminary Assessment, with such further modifications thereto as in the discretion of the Chief of Engineers may be advisable.

The recommendations contained in this report reflect the information available at this time and current USACE Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are authorized for implementation funding.

_____ _____

Date

Justin R. Pabis, PE
Colonel, Corps of Engineers
District Engineer

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12.0 REFERENCES

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