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December 27, 2019

Paul A. Harren, Project Manager
General Dynamics, Electric Boat Corporation
75 Eastern Point Road
Groton, CT 06340

Re: F-2019-0672
U.S. Army Corps of Engineers/New England District Permit Application NAE-2017-02739 - General Dynamics, Electric Boat Corporation – proposed dredging and blasting at facility with subsequent disposal of 890,000cy of dredged material at the "Eastern Long Island Sound Disposal Site (ELDS)." Thames River, Long Island Sound, Town of Groton, New London County, Connecticut.
Objection to Consistency Certification

Dear Mr. Harren:

The New York State Department of State (DOS) has completed its evaluation of the Federal Consistency Assessment Form and certification submitted by General Dynamics, Electric Boat Corporation (Electric Boat or applicant) in which you certified that the disposal of 890,000 cubic yards (cy) of dredged material at the Eastern Long Island Sound Disposal Site (ELDS) complies with, and will be conducted in a manner consistent with, New York State's approved Long Island Sound Coastal Management Program (LIS CMP) and Town of Southold Local Waterfront Revitalization Program (LWRP).[1] Pursuant to the Coastal Zone Management Act (CZMA), and its regulations at 15 CFR § 930.63, DOS objects to your consistency certification on the basis that disposal of dredged material at ELDS is not consistent with LIS CMP Policies 5, 6, 8, 10 and 11 and the Town of Southold LWRP Policies 5, 6, 8, 10 and 11.

DOS is constrained to issue this objection, with alternatives, because Electric Boat included ELDS as its only preferred alternative in its consistency certification to DOS. Electric Boat originally included two preferred alternatives, ELDS and the Central Long Island Sound Disposal Site (CLDS), for open water disposal to other reviewing state and federal agencies, as identified in its May 2018 Permit Application to the Connecticut Department of Energy and Environmental Protection (CTDEEP) & the U.S. Army Corps of Engineers (Corps).[2]

[1] Electric Boat has completed a "South Yard Facilities Master Plan" which articulates construction activities including: shoreline stabilization, construction of an over-water assembly building, sediment dredging, a dry dock, and demolition of several buildings located adjacent to or on their property in the Thames River, Connecticut.
[2] CTDEEP & USACE Joint Permit Application, South Yard Facilities Master Plan, General Dynamics Electric Boat, Groton, Connecticut (May 2018), Part 4, p. 3 of 3 ("[Electric Boat] anticipates disposal of the dredged sediment via ocean-going dump scows at an authorized dredge material location, preferably the Eastern Long Island Sound

Notwithstanding this objection, DOS has identified several alternatives (including CLDS), which, if selected by Electric Boat, would be consistent with the coastal policies of the NYS CMP and the Town of Southold LWRP. The alternatives are summarized here and discussed at length in the Alternatives section of this decision, beginning on page 32, below.

1. CLDS: This alternative is located within Long Island Sound and was designated by the U.S. Environmental Protection Agency (EPA) on July 7, 2016. CLDS has sufficient capacity for the proposed project and Electric Boat has already agreed that CLDS is an available alternative in its permit application for this project to the Connecticut Department of Energy and Environmental Protection (CTDEEP) & the U.S. Army Corps of Engineers (Corps).
2. Groton Black Ledge Island Confined Disposal Facility: This alternative was identified in the Long Island Sound Dredged Material Management Plan (LIS DMMP) and the Long Island Sound Studies Dredged Material Containment Facilities Feasibility Report by the USACE New England Division, September 1985, Waltham, MA. Located 3.5 miles the Electric Boat project site Groton Black Ledge Island is a potential location for an island confined disposal facility (CDF) for dredge material with a capacity of 6,930,000 cubic yards for fill and 570,000 cy for cap.
3. Twotree Island Confined Disposal Facility: This alternative was identified in the LIS DMMP and the Long Island Sound Studies Dredged Material Containment Facilities Feasibility Report by the USACE New England Division, September 1985, Waltham, MA. Located 7 miles from the Electric Boat project site, Twotree Island is a potential location for an island confined disposal facility (CDF) for dredge material with a capacity of 2,966,200 cubic yards for fill and 433,800 cy for cap.
4. Rhode Island Sound Disposal Site (RISDS): This alternative is located in the Atlantic Ocean approximately 7.5 nautical miles east of the northern end of Block Island, Rhode Island, 31 nautical miles from the eastern entrance to the Long Island Sound, and 44 nautical miles from the New London Harbor. RISDS has sufficient capacity for the proposed project.
5. Upland alternatives: P&W Railroad Company Facility was identified as a facility that might be used for offloading of dredge material to upland options. Other potential temporary staging/de-watering sites identified included: Electric Boat property in Groton, CT; WestRock paperboard mill in Montville, CT; Dow Chemical complex in Allyn's Point, CT; CT Scrap Company at 7 Wharf Road in Norwich, CT; City-owned parcels in Thamesville industrial area in Norwich, CT; and City-owned parcels in New London, CT.

Disposal Site (ELDS) or the Central Long Island Sound Disposal Site (CLDS)."), Available at: http://www.dos.ny.gov/opd/programs/pdfs/Consistency/F-2019-0672-ElectricBoatConsistencyCertification.pdf.

Stated Project Purpose

Electric Boat has completed a South Yard Facilities Master Plan, which articulates anticipated construction activities including shoreline stabilization, constructing an over-water assembly building, sediment dredging, a dry dock, and demolition of several buildings. In connection with that work, Electric Boat has applied to the U.S. Army Corps of Engineers (Corps) for permits to blast and dredge sediments from the bottom of the Thames River to accommodate the projected activities at the facility and to subsequently dispose of 890,000 cy of dredged material at ELDS.

To be clear, the subject of this review does not include any activities in the South Yard Facilities Master Plan, except the planned disposal of dredged materials in eastern Long Island Sound (LIS or Sound). The vast majority of the activities comprising the South Yard Facilities Master Plan would occur outside of the NYS Coastal Area or have been determined to have no impact upon the uses and resources of the Coastal Area of NYS. Accordingly, DOS has limited the scope of its review to encompass only the portion of Electric Boat's permit application that concerns the proposed method of disposal for the 890,000 cy of sediments that will be dredged during the construction of the project and does not include any portion of the project proposed for the Thames River.

Description of the Proposed Project Under Review[3]

Electric Boat proposes to dispose of 890,000 cy of silt and clay material at ELDS, at a maximum daily production rate of 6 tugs/day (one every 4 hours) for up to 60 days between October 1st and January 31st.[4] to account for weather and operational constraints. Approximately 180 scows trips will be taken to and from the ELDS throughout the duration of the proposed disposal. Each disposal event will release approximately 5,000 cy of dredged material while the scow moves along a prescribed route within the disposal site,[5] as frequently as every four hours, weather permitting.

According to the submitted policy analysis, the sediment plume resulting from a disposal event is anticipated to settle and turbidity to return to limiting permissible concentrations (LPC) within 4 hours. There is the potential for a near constant flux of turbidity, potentially exceeding limits if maximum production rates occur, continuously for 30 days, or sporadically over 60 days if the project is prolonged. The Corps' STFATE[6] model data provided speaks to the likelihood that there will be turbidity outside of the disposal site for a single event; however, the data does not address the chronic and cumulative turbidity to be expected from repetitive disposals at this previously undisturbed site.

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[3] DOS is reviewing only that portion of the project that concerns the selected method of disposal for the material to be dredged at the facility. The scope of the review does not include the proposed dredging, which will take place in the Thames River.

[4] See October 25, 2019 Applicant's Response at *Information Request #2 (General Comment)*, 5th page of document.

[5] This route would be determined by the Marine Analysis Section, New England District Regulatory Branch, U.S. Army Corps of Engineers.

[6] STFATE stands for Short-Term FATE of dredged material placed in open water. https://www.westerndredging.org/phocadownload/2018_Norfolk/Presentations/4A_2.pdf

The U.S. Navy has long planned to expand operations in New London; Electric Boat has had sufficient time to plan, request and obtain the resources necessary to identify and develop alternatives to open water disposal. Despite advance knowledge, and the sizeable financial investment from the Navy for this project, the South Yard Facilities Master Plan and subsequent needs for long-term construction of submarines failed to identify sufficient resources for the exploration, identification, and use of alternatives to open water disposal in connection with this specific project. This limited effort also precluded detailed consideration of the reasonable and anticipated future dredging needs of this project that will be required on a regular basis. The future dredging projects that will be necessary to maintain operations will likely include increasingly more contaminated material as sediments will continue to settle into the basin and be influenced by runoff and discharges into the Thames River; these sediments will also require a plan for disposal in the future. Any cost analyses of disposal alternatives should factor in the total amount of dredged material disposal needs that will be generated from this project and current and future costs associated with the disposal of these materials.

While Electric Boat utilized the potential placement, sites identified in the Long Island Sound Dredged Material Management Plan (LIS DMMP) for its alternatives analysis,[7] the cost assumptions borrowed from this document were outdated, thus causing the applicant to incorrectly calculate costs associated with reasonable alternatives. Electric Boat omitted any demonstration that it conducted its own serious analysis of these or other alternatives, and instead limited its justification for disposal at the improperly designated ELDS to short-term low cost and expediency, without considering long-term needs and cost efficiencies of the project. For example, Electric Boat did not consider the true costs and benefits of a confined disposal facility (CDF) located in proximity to the project location. Such a CDF could be built to safely and adequately handle dredged material over many years and could lead to substantial cost savings. As detailed below, such an alternative would be consistent with the LIS CMP and Town of Southold LWRP,[8] it would also further the shared goal between Connecticut and New York to work together to reduce or eliminate the need for open water disposal of dredged material in Long Island Sound.[9]

The failure to sufficiently analyze alternatives to open water disposal for this large and ongoing project stands in sharp contrast to other Naval installations, which have successfully addressed the needs for alternatives to open water disposal. For example, the Naval Base in Norfolk, VA, was able to include as part of its planning process the creation of a CDF, the Craney Island Dredged Material Management Area,[10] to accommodate dredged material and avoid open water

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[7] See LIS DMMP Technical Supporting Document TDS#9-LIS-DMMP-Containment-Site-Report, and Electric Boat's Revised Policy Analysis, August 26, 2019, p. 2-1. http://www.dos.ny.gov/opd/programs/pdfs/Consistency/F-2019-0672-ElectricBoatConsistencyCertification.pdf)

[8] Attachment D, Alternatives Analysis, of the June 27, 2019 Electric Boat submission.

[9] See 81 FR 44220 (July 7, 2016).

[10] See 74 FR 46583 (September 10, 2009) (describing the Record of Decision for "dredging in the heavily-used waterway would occur from the Lamberts Point Deperming Station in the Lamberts Bend Reach, south to Naval Support Activity Norfolk Naval Shipyard, commonly referred to as the Norfolk Naval Shipyard (NNSY), in the Lower Reach. Dredged material would be placed at the U.S. Army Corps of Engineers' (Corps) Craney Island Dredged Material Management Area (CIDMMA). The deepening project will establish continuously safe and expeditious transit routes for U.S. Naval Ships to Lamberts Point Deperming Station and NNSY.") available at: https://www.govinfo.gov/content/pkg/FR-2009-09-10/pdf/E9-21819.pdf

disposal.[11] Similar commitments to the development and implementation of alternatives to dredge disposal are needed to preserve and improve LIS.

Jurisdiction

The CZMA authorizes "interstate consistency" review where a federal action occurring in one state will affect uses or resources of another state's coastal zone. DOS demonstrated, and the U.S Secretary of Commerce agreed, that the designation and use of open water disposal sites in Connecticut waters in Long Island Sound have reasonably foreseeable effects on New York's

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[11] See "Craney Island Dredged Material Management Area" (February 8, 2018), available at: https://www.nao.usace.army.mil/About/Projects/Craney-Island/; see also "ELIZABETH RIVER AND SOUTHERN BRANCH NAVIGATION IMPROVEMENTS: Draft General Reevaluation Report and Environmental Assessment" U.S. Army Corps and Engineers and the Port of Virginia, (December 12, 2017), available at https://www.nao.usace.army.mil/Portals/31/ERSB%20Main%20Report%20Compiled.pdf?ver=2017-12-12-095633-363

The report describes beneficial use and the use of a CDF as a benefit:

> In 2011, the U.S. Department of the Navy (Navy) deepened a significant portion of the existing Federal channel to a required depth of 47 feet and a width of 600 feet, over the downstream-most three-miles. Extensive geotechnical and environmental sediment sampling was completed to support the Navy's project (Navy 2009). Based on the data, all of the dredged material was removed (~ 3.2 million cubic yards from approximately 364 acres of the 454.5 acres of the Federal channel) using a hydraulic dredge with the material being directly pumped into the upland cells of [Craney Island Dredged Material *Management* Area] CIDMMA." p. 35
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> "Beneficial Use of Dredged Material. The dredged material from the channel improvements is a potential resource for environmental restoration, beach nourishment, flood control structures, and Craney Island Eastward Expansion fill." p. 106

The report describes the Elizabeth River in the same scope as the industrialization and support for the U.S. Navy as the Thames River:

> "Views along the Elizabeth River include a waterfront with a mix of industrial, commercial, naval, marine, and urban shoreline uses. South of the downtown areas, the Elizabeth River waterfront is highly industrialized and includes many facilities that support the U.S. Navy and the commodities shipping industry (Navy 2009)." p. 84

In describing the dredging for the U.S. Navy, the report states that:

> "Using up to two 3,600 horsepower, diesel-driven, booster pumps mounted on barges, the dredged material would be pumped to the Craney Island Dredged Material Disposal Material Management Area (CIDMMA) through submerged pipelines placed outside of the Federal navigation channel for **a distance of approximately 38,000 feet from the Elizabeth River branch and approximately 45,000 feet from the Southern Branch's Lower reach**, respectively." p. 118 (Emphasis added)

The distance from the Electric Boat dredging site in the Thames River is **35,300 ft to the proposed location for the TwoTree Island CDF and 15,400 ft to the proposed location for the Groton Ledge CDF** (See Figure 1, p. 30 of this decision); well within the distance of the submerged pipelines installed for the benefit of the U.S. Navy in the Elizabeth River, Virginia. The same resources and commitment to environmental stewardship is required for the Thames River and Long Island Sound.

coastal resources and uses.[12] Since 2006, DOS has exercised its interstate consistency review authority over 15 CFR 930 subpart C, D, and F federal agency activities in the Connecticut state waters of LIS to the 20 foot bathymetric contour closest to the Connecticut shoreline.[13] Within this 20 foot bathymetric contour DOS is authorized to conduct CZMA consistency review over Ocean Dumping Act § 103 activities and Clean Water Act § 404 activities, including specifically the location of ELDS.

Through the CZMA and NYS's statutorily authorized interstate consistency review (15 CFR Part 930 Subparts D and I), DOS has reviewed Electric Boat's proposed project to ensure that it is consistent with the federally approved policies in the LIS CMP, which includes specific enforceable policies reflecting the findings, needs, and objectives of the public interest in the Long Island Sound region. In addition to the LIS CMP, New York is bound by the terms of the CZMA to represent the Town of Southold in this determination, as they have developed a local waterfront revitalization plan.[14]

The Town of Southold LWRP encompasses the entire town, including its waters in Long Island Sound, as well as natural, public, and developed waterfront resources. The Southold LWRP policies are the enforceable policies for consistency review of federal activities that may affect the coastal resources and land and water uses of Long Island Sound and guide federal and state agencies in their decision-making responsibilities for activities affecting the town's coastal resources.

The Southold LWRP specifically addresses EPA's designation of an open water disposal site in the eastern Sound. Under the CZMA, the U.S. Department of Commerce granted approval of the Southold LWRP for incorporation into NYS Coastal Management Program, specifically the LIS CMP.[15] No federal agencies raised objections to the adoption and incorporation of the Southold LWRP into the NYS CMP- process and none objected to its content.[16]

Accordingly, DOS has reviewed the proposed project using applicable coastal policies of both the LIS CMP and the Town of Southold LWRP.

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[12] See letter dated March 28, 2006 from John King, Chief, Coastal Programs Division, National Oceanic and Atmospheric Administration (NOAA) to George Stafford, Director, Division of Coastal Resources. "Based on our review of your Submission, we concur that the changes to Table 2 and the addition of Table 2A are RPCs [routine program changes] to Uses Subject to Management and Coordination, Public Involvement and the National Interest, and OCRM approves the incorporation of these tables into the NYSCMP. Table 2A, Interstate Activities, was developed in accordance with 15 C.F.R. part 930, subpart I." See 15 C.F.R. Part 930 Subpart I "Consistency of Federal Activities Having Interstate Coastal Effects".
https://www.dos.ny.gov/opd/programs/pdfs/Consistency/2006InterstateConsistencyRPC.pdf

[13] Id.

[14] On November 30, 2005, the Town of Southold, New York, which includes much of the North Fork of Long Island and Fishers Island, adopted a local waterfront revitalization program (Southold LWRP), which has been incorporated into the federally approved NYS Coastal Management Program. The LWRP was prepared in accordance with Executive Law Article 42 and 19 NYCRR Parts 601 and 603. See: https://docs.dos.ny.gov/opd-lwrp/LWRP/Southold_T/Index.html

[15] In 2001, the U.S. Department of Commerce approved the routine program change to the NYS CMP through the procedures in 15 CFR § 930.84.

[16] Southold LWRP Section II – K pp. 26.

Background

In 1972, Congress enacted the Marine Protection, research, and Sanctuaries Act (33 U.S.C. § 1401 et seq.) or (referred to as the Ocean Dumping Act or "ODA" (P.L. 92-532)) to address the dangers of unregulated dumping of waste materials into ocean waters. The primary intent of the ODA is to prevent any significant adverse ecological and other effects from ocean dumping. To minimize such effects, Congress banned the dumping of dredged material into the ocean except at sites designated by EPA (or at temporary sites designated by the Army Corps) to minimize the impacts of dumping on the marine environment.

Open water disposal in LIS is constrained by federal law, as well as public concerns about impacts to marine resources. Congressional history confirms that ODA was made applicable to LIS to afford greater protection to the marine environment from open water disposal than was otherwise available under the Clean Water Act. In 1980, Congress amended the ODA to make it applicable to the Long Island Sound through the "Ambro Amendment."[17] The Ambro Amendment requires that any dumping of dredged material in Long Island Sound by federal agencies, or by private applicants whose projects exceed 25,000 cy of dredged material is subject to the sediment testing criteria of the Act. For private projects dumping less than 25,000 cy of dredged material into the Sound, the applicant must meet only the less stringent standards of Section 404 of the Clean Water Act, 33 U.S.C. § 1344.

In practice, however, dredged material disposal in the Sound has continued unconstrained despite the stricter environmental standard. While New York has previously recognized Connecticut's legitimate economic need to routinely dredge its rivers, New York and Connecticut have also jointly agreed to take steps to reduce and eliminate open water disposal in LIS. Despite past agreements and shared goals, Connecticut and the federal agencies have continued to support the formal designation of additional disposal sites in LIS, while simultaneously failing to identify and implement alternatives to open water disposal necessary to achieve those shared goals.

Long Island Sound: An Estuary of National Significance

Long Island Sound is one of the largest estuaries along the Atlantic coast of the United States and has historically been one of the most productive estuarine waters in the world. In March 1987, EPA designated Long Island Sound as an Estuary of National Significance under § 320 of the 1987 Clean Water Act Amendments, with the goal of protecting and restoring the estuary. 33 U.S.C. § 1330; PL 100-4 1987 HR1.[18] The LIS region is also one of the most densely populated areas in North America; about 23 million people live in the Sound's watershed.[19] Today the Sound continues to provide valuable breeding, nesting and feeding habitats for myriad aquatic, avian and terrestrial species and supports a regional economy based in part on fishing and shellfishing, shipping, recreational boating, tourism and other coastal recreation, and water dependent industries, augmented by a much reduced commercial fishing industry, that benefits coastal communities in New York, Connecticut and Rhode Island. For these reasons, the health,

[17] 33 U.S.C. § 1416(f)
[18] See 33 U.S.C. § 1330; see also P.L. 100-4 § 317. NATIONAL ESTUARY PROGRAM
[19] http://longislandsoundstudy.net/about-the-sound/by-the-numbers/

robustness and resilience of the Long Island Sound ecosystem is of paramount importance to New York State.

Commercial and recreational fishing have been an integral part of the history and economy of LIS. More than 45 species of finfish, crustaceans, and shellfish have been caught in the Sound, with commercial efforts concentrated on lobsters, surf clams, butterfish, Atlantic mackerel, herring, flounder, squid, and porgy. Commercial lobstering and finfishing once represented significant sectors of local economies along the LIS. Environmental conditions, however, have continued to be a challenge. Pollution, along with other ecological stressors, has impacted the marine coastal economy based on fishing, shellfishing and seafood processing. The decline and, in some cases, collapse of commercial fishing in Long Island Sound is documented in the Programmatic Environmental Impact Statement (PEIS) for the DMMP with descriptions of the most commercially viable species: American Lobster, Eastern Oyster, Scallop, Blue Crab, Hard Clam, Atlantic Surf Clam, Blue Mussel, and Horseshoe crabs. New York State has suffered economically due to the reduction of marketable seafood from the Sound. As detailed in the PEIS that was prepared for the LIS DMMP, water pollution is partially responsible for this decline.[20]

Long Island Sound Physical Geography

Long Island Sound is a 110-mile-long, semi-enclosed, tidal estuary at the interstate boundaries of New York, Connecticut, and Rhode Island. It is hydrologically connected to the Atlantic Ocean at its eastern end through the Block Island Sound, and at its western end through the East River at Throgg's Neck and the New York City incorporated municipal boundary. As an estuary, Long Island Sound is freely connected to ocean waters and is measurably diluted with freshwater from runoff. More than seventy-five rivers and streams draining a watershed greater than 16,000 square miles flow into the Sound. Eighty percent of freshwater inflow arrives from three rivers in Connecticut: the Thames, Connecticut and Housatonic.

The semi-enclosed geographical nature of the Sound causes sediments to accumulate and concentrate on the floor of the Sound rather than being flushed out to the open ocean. Wind, current, and flow dynamics in the Sound tend to transport sediments from Connecticut's higher energy and flow eastern Sound waters toward New York's western Sound waters where suspended contaminants are deposited. When a scow releases dredged sediments in the eastern Sound, the finer sediments and silts – to which heavy metals and organic carbons adhere - are transported by currents beyond the confines of the disposal site.[21]

Eastern Long Island Sound and ELDS Physical Geography

The eastern basin of Long Island Sound is a dynamic location characterized by strong to moderate currents and strong tidal currents, vulnerability to ecological stressors, and a net western movement of sediments. The Race has particularly strong tidal currents.[22] The eastern

[20] See LIS DMMP PEIS at pp. 4-53, 4-123 – 4-133.
[21] FSEIS, Chapter 5 – Environmental Consequences, Section 5.1 "Open-Water Disposal Processes" pp. 5-1 to 5-3.
[22] Id. at p. 3-6.

basin of the Sound includes the area between Six Mile Reef to the west and "The Race" to the east.[23] Ocean waters flow into the Sound as bottom currents and water leaves the Sound as surface currents through the constricted eastern entrance, and near the location of the ELDS. Incoming ocean waters upwell along the Connecticut shore and move oceanward via a counterclockwise gyre along the Long Island Shore. At the eastern edge of the Sound, extending approximately 5 to 8 km westward from "The Race", there is a large area of erosion or non-deposition, likely caused by a combination of strong tidal currents and a net westward movement of sediments into the estuary.[24] These current velocities have been measured at 62-82 cm/sec[25] and are sufficient to erode silt and sand, and prevent deposition of silt and clay.[26] There is a paucity of silt and clay sized particles in surface sediments (0-25%) in the eastern basin reflecting the high energy current resuspension of fine sediment.[27] The eastern Sound has benthic habitat features including, diverse bottom topography and hard bottom. These features support high quality habitats in the marine environment.

ELDS is located near this eastern entrance to the Sound and is affected by these water flow patterns. At ELDS, water depths range from approximately 46 to 79 feet. At the eastern edge of the LIS, extending approximately 5 to 8 km westward from "The Race", there is a large erosion or non-deposition basin, likely caused by a combination of strong currents and a net westward movement of sediments into the LIS estuary.[28] Current speeds in the eastern basin are the strongest observed in the Sound. These current velocities have been measured at 62-82 cm/sec and are sufficient to erode and move any silt and sand, preventing deposition through scour.[29]

The eastern Sound has several geographic features that make it especially vulnerable to ecological stressors. Due to its coastal proximity, the Sound is a regular target for major coastal storms and hurricanes that contribute winds, upwelling, storm surge, flooding, and circulation

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[23] ENSR International 2001. Physical Oceanographic Evaluation of Long Island Sound and Block Island Sound. DEIS for the Designation of Dredged Material Disposal Sites in Central and Western Long Island Sound. September 2003. U.S. Environmental Protection Agency, New England Region, Boston, MA. U.S. Army Corps of Engineers, New England Division, Concord, MA. Appendix G1. Section 2.1.2

[24] Id.

[25] Long E.E. (1978) Tide and Tidal Current Observations from 1965 through 1967 in Long Island Sound, Block Island Sound and Tributaries. NOS Oceanographic Circulatory Survey Report No. 1:91 pages.

[26] Hjulstrom, F. 1935. Studies of the morphological activity of rivers as illustrated by the River Fyris. Univ. Uppsala Geol. Inst. Bull 25: 221-557.

[27] NYS DOS Seawolf Decision Letter, F-1995-138.

[28] See Letter dated July 22, 2009 from Fred Anders, Chief Natural Resources Management Bureau, DOS, to Diane Ray, U.S. Department of the Army, Corps of Engineers/New England District at p. 10, available at: Corps of Engineers, New England District, Concord, MA. p. 19; see also SAIC. 1994. Analysis of the Contribution of Dredged Material to sediment and Contaminant Fluxes in Long Island Sound. June 1994. DAMOS Contribution No. 88. U.S. Army Corps of Engineers, New England District, Concord, MA. p. 19. "On page 24 of [the] DAMOS Special Technical Report 'Analysis of the Contribution of Dredged Material to Sediment and Contaminant Fluxes in Long Island Sound,' it predicts that there is a maximum expected dispersion loss of 6.0% during disposal activities, a 0.06% mound remolding loss, and during a hurricane, scouring loss of 15.8%. In total, there is a potential 21.86% loss of material [for a disposal event]." Id. If this value is applied to the current proposal, that accounts for 194,554 cubic yards of material that could be impacting the ecosystem of Long Island Sound outside of the disposal area.

[29] See Letter dated July 22, 2009 from Fred Anders, Chief Natural Resources Management Bureau, DOS, to Diane Ray, U.S. Department of the Army, Corps of Engineers/New England District at p. 4, fn 14; see also Long E.E. 1978 Tide and Tidal Current Observations from 1965 through 1967 in Long Island Sound, Block Island Sound and Tributaries. NOS Oceanographic Circulatory Survey Report No. 1:91 pages.

dynamics that cause resuspension and remobilization of contaminated sediments. The strong currents that characterize the eastern LIS reflect that it is poorly suited to serve, as it has for decades, as a dump site for contaminated and uncontaminated dredged materials.[30]

Eastern LIS is also home to the Cross Sound Ferry route. The Ocean Dumping Act regulations more specifically mandate that: "[t]he dumping of materials into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding … regions of heavy commercial or recreational navigation." 40 CFR § 228.5(a). EPA's criteria for site selection also require that the agency consider "interference with shipping . . . and other legitimate uses of the ocean." 40 CFR § 228.6(a)(8). ELDS boundaries are located directly in the middle of the ferry route used by approximately 12,000 boats annually, and 24 to 30 per day during the months when dredge material disposal occurs rendering eastern LIS unsuitable for the location of an open water disposal site.[31]

The LIS CMP identified Fishers Island and its surrounding waters as one of the State's regionally important natural areas; these areas possess significant natural resources which are at risk and require additional management to protect or restore resource values.[32] The importance of the natural resources of the island are more than just regional as The Nature Conservancy has named the Peconic Bay/Block Island Sound area, including Fishers Island, as one of the world's "Last Great Places," and has included the region in its program designed to protect and manage natural habitats.[33]

The Sound is heavily used, and its seafloor has been impacted by human activities. [34] Existing background levels of heavy metal contamination from legacy pollution remain toxic and harmful indefinitely, but the full extent of the impacts of all contaminants present in the Sound, including dredge disposal sites, remains unknown as neither EPA nor the Corps has conducted comprehensive research to understand the condition of the benthic marine environment.[35]

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[30] See FSEIS at p. 4-9: "Eastern Long Island Sound increasingly narrows and deepens toward the east and has stronger tidal currents that scoured the seafloor. Water enters Long Island Sound from Block Island Sound through two deep elongate depressions (The Race), located between Fishers Island and Little Gull Island. These depressions reach a maximum water depth of approximately 330 feet (101 m) on the Long Island Sound side."; see also FSEIS at p. 4-15. "Parts of the seafloor in eastern Long Island Sound is relatively flat and featureless, as strong tidal currents prevent the deposition of marine sediments and erode the finer grain size fractions in the sediments. This process leaves exposed lag deposits of gravel and gravelly sand that armor the seafloor. Larger sessile benthic organisms were not observed on these gravel pavements, suggesting periodic mobilization of the gravel."

[31] See Id. at pp. 4-145-150. There were 6,727 vessel and barge trips "to and from" New London Harbor in 2012 for a total of 13,429 (p. 4-147).; see also "Waterborne Commerce of the United States. Calendar Year 2012. Part 1 – Waterways and Harbors Atlantic Coast, Freight Traffic and Trips and Drafts." https://usace.contentdm.oclc.org/digital/collection/p16021coll2/id/149/

[32] See LIS CMP at p. 92. https://www.dos.ny.gov/opd/programs/pdfs/LISCMP.pdf

[33] See http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/rhodeisland/placesweprotect/block-island.xml; see also Town of Southold LWRP Section II –J. Reach 10 pp. 12 and 13.

[34] See J.C. Varekamp, et al., Metals, Organic Compounds, and Nutrients in Long Island Sound: Sources, Magnitudes, Trends, and Impacts, in Long Island Sound: Prospects for the Urban Sea, at pp. 203, 204-206 (Latimer et al. eds., 2014) ("Varekamp")

[35] "Sandy Point in West Haven is located in the outer harbor. During the 1800's Sandy Point was home to flourishing oyster beds. Oysters were taken from the Chesapeake Bay and transplanted along the site.

Ongoing Litigation Concerning the Designation of ELDS

EPA and the Corps' failure to encourage the development of alternatives to open water disposal in LIS led to a LIS DMMP that failed to establish shovel-ready alternatives to open water disposal for dredged materials in the LIS region that are too contaminated for beach nourishment projects. The deficiencies in the LIS DMMP also formed the basis for EPA's designation of ELDS, which NYS has sued to reverse in federal court.[36]

The designation of ELDS added yet a third dredged material disposal site in Long Island Sound to two that had already received federal designation during the prior year - CLDS and WLDS. Together with a fourth disposal site (RISDS) in adjacent federal waters offshore from Rhode Island, these four disposal sites represent the highest concentration of federally designated open water dump sites on the east coast of the United States.[37]

Inaccuracies in the Applicant's Consistency Certification

Electric Boat has relied upon a number of legal and factually incorrect statements to justify its need to dispose of 890,000 cy of dredged material at ELDS. In particular, the applicant has incorrectly: (1) stated that open water disposal is in the interest of national security without regard to the stated that harm to the environment or the economic interests of New York State; (2) solely relied on cost to justify the selection of ELDS and; and (3) stated there are no reasonable alternatives to open water disposal at ELDS. Each of these positions is unsupported by either law or fact.

Applicant's Misplaced Reliance on National Security for the Use of ELDS

Electric Boat has presented national security to justify the use of open water disposal of 890,000 cy of dredged material at ELDS. DOS recognizes that the development of military infrastructure, including this submarine project, is in the interest of national security and does not disagree that military readiness is paramount to the national defense.[38] However, DOS disagrees

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Today the only signs of oysters on the beach are the signs, which read that oyster beds are contaminated and that shellfishing is prohibited." Historical Harbor Habitats, Matthew D. Cacopardo (Yale-New Haven Teachers Institute) http://teachers.yale.edu/curriculum/viewer/new_haven_05.05.04_u See also "Biogeochemistry and Contaminant Geochemistry of Marine and Estuarine Sediments, New Haven, Connecticut," (Kruge & Benoit 2002)

[36] The EPA's decided to move forward with the designation of ELDS in violation of numerous provisions of the ODA and the CZMA and despite DOS's October 3, 2016 federal consistency objection. 81 FR 87820. See also Rosado, et al. and Town of Southold, et al. v. Wheeler, et al. and Connecticut Dept. of Energy & Environ. Protection, U.S. District Court, Eastern District of New York (No. 17-cv-04843) Wheeler (alleging substantive and procedural violations of numerous provisions of the Marine Sanctuaries Resources and Protection Act, 33 U.S.C. § 1401 et seq., Administrative Procedure Act, 5 U.S.C. § 551 et seq., and the Coastal Zone Management Act, 16 U.S.C. § 1451 et seq.)(Rosado v. Wheeler); DOS objection dated October 3, 2016 (corrected version) to EPA's federal consistency determination (hereinafter DOS objection to ELDS designation), p. 14.

[37] See the USEPA website at: https://www.epa.gov/ocean-dumping/ocean-disposal-map

[38] See Statement of Consistency with Long Island Sound Coastal Policies and the Town of Southold Local Waterfront Revitalization Program, Revised August 26, 2019, p. 2-2. http://www.dos.ny.gov/opd/programs/pdfs/Consistency/F-2019-0672-ElectricBoatConsistencyCertification.pdf

with the applicant's categorization that the use of open water disposal at ELDS is in the interest of national security. Reasonable and practicable alternatives exist that are less harmful to the environment than open water disposal in eastern Long Island Sound and would allow the project to move forward.

Electric Boat's Cost Analysis Did Not Include a Full Cost Accounting of Its Long-term Disposal Needs or the Environmental Costs of Open Water Disposal

Electric Boat has selected ELDS as the location for the disposal because it perceives open water disposal at this site to be the lowest cost alternative. However, Electric Boat did not include the cost of the impact to the environment and to New York State's coastal resources and uses into its calculations. The continuous disposal of 890,000 cy of dredged material over a period of two months would leave behind a swath of permanently destroyed benthic habitat, smother valuable rock outcroppings, and introduce fine-grained and silty material into New York designated and federally-recognized Significant Coastal Fish and Wildlife Habitats. As mentioned, Electric Boat also did not include the impact of the reasonable and anticipated future dredging needs of this project on the costs associated with disposal alternatives.

Electric Boat failed to utilize a full-cost accounting methodology that include the costs of environmental harm, which must be considered when assessing impacts from a proposed project. LIS, as a public resource, is not priced and allocated by market forces; therefore, open water dumping will always appear cheaper when compared on a spreadsheet designed to analyze short-term costs associated with various disposal alternatives.

Applicant's Misplaced Reliance on Cost for the Use of ELDS and Unsupportable Rejection of All Reasonable Alternatives

In spite of well-established law and regulations to the contrary, Electric Boat improperly relied solely on cost when it eliminated disposal alternatives in favor of open water disposal at ELDS based on cost considerations alone.

New York's coastal policies set a clear preference for reducing and reusing dredged material. Moreover, Ocean Dumping Act § 103(b) mandates that ocean dumping should not be permitted when there are practicable alternative locations and methods of disposal or recycling available. Notwithstanding DOS's long history of objections to open water disposal in eastern LIS and strong commitment to reduce or eliminate such activities, Electric Boat submitted a consistency certification to dispose 890,000 cy of dredged material at ELDS.

The statement incorrectly relies upon the standards for an appeal to the U.S. Department of Commerce (15 CFR Part 930 Subpart H) by asserting that open water disposal "is necessary in the interest of national security." Id. The correct standard of review for a private applicant seeking a permit, license or other form of federal agency approval is: "The proposed activity complies with the enforceable policies of (name of State) approved management program and will be conducted in a manner consistent with such program." (15 CFR § 930.57(b)).

Congress made certain that open water disposal was not a preferred option for disposal of dredged material. As expressed in the regulations concerning determinations of need for ocean dumping, an analysis should determine that:

> (1) There are no practicable improvements which can be made in processing technology or in overall waste treatment to reduce the adverse impacts of the waste on the total environment; and,
>
> (2) There are no practicable alternative locations and/or methods of disposal or recycling available, including without limitation, storage until treatment facilities are completed, which have less adverse environmental impact or potential risk to other parts of the environment than ocean dumping.[39]

Electric Boat's use of cost, without regard to environmental protection, as the determinative factor in the selection of open water disposal at ELDS runs directly contrary to federal law and recent court decision, which held that the CZMA is not a law subordinate to other federal laws. See Ohio v. United States Army Corps of Engineers, 259 F. Supp. 3d 732, 754 (N.D. Ohio 2017), citing Islander E. Pipeline Co., LLC v. McCarthy, 525 F.3d 141, 143-44 (2nd Cir. 2008). See also Natural Resources Defense Council, Inc. v. Callaway, 524 F.2d 79, at 91 (2nd Cir. 1975) (rejecting the Corps approval of the Navy's preferred site citing misplaced reliance on costs associated with the project). Electric Boat wrongly rejected all practicable alternatives as being "too costly" based solely on an economy of cost basis, which is a conclusion not authorized by the CZMA or its regulations.[40]

Policy Analysis

Applicable LIS CMP and Town of Southold LWRP Policies:

LIS CMP Policy 5: Protect and improve water quality and supply in the Long Island Sound coastal area.
LIS CMP Policy 5.3: Protect and enhance the quality of coastal waters.

Protect water quality based on physical factors (pH, dissolved oxygen, dissolved solids, nutrients, odor, color, and turbidity), health factors (pathogens, chemical contaminants, and toxicity), and aesthetic factors (oils, floatables, refuse, and suspended solids). Protect water quality of coastal waters from adverse impacts associated with excavation, fill, dredging, and disposal of dredged material.[41]

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[39] 40 CFR § 227.16(a)(2)
[40] See 15 CFR § 930.57 (requiring full consistency with management program with no inclusion or exception for non-compliance on the basis of "cheaper cost"); see also Electric Boat's alternatives analysis at Attachment D. http://www.dos.ny.gov/opd/programs/pdfs/Consistency/F-2019-0672-ElectricBoatConsistencyCertification.pdf
[41] See LIS CMP at p. 78

Southold LWRP Policy 5: Protect and improve water quality and supply in the Town of Southold.

Sub-policy 5.1: Prohibit direct or indirect discharges that would cause or contribute to contravention of water quality standards.

Sub-policy 5.2: Minimize non-point pollution of coastal waters and manage activities causing nonpoint pollution.

Sub-policy 5.3: Protect and enhance quality of coastal waters.

One of the principal purposes of these policies is to protect the overall water quality of Long Island Sound, through a combination of managing new sources and remediating existing sources of pollution. In particular, LIS CMP Policy 5.3 is directed at protecting and improving water quality in the Sound, including the protection of water quality caused by the introduction of pathogens, chemical contaminants, and toxicity, and "from adverse impacts associated with excavation, fill, dredging, and disposal of dredged material." Cumulative impacts from past, present and future dredged material disposal events must be considered when judging water quality. As one of a number of causes of water quality impairment, disposal of dredged material in the open waters of the Sound at ELDS has significant potential to adversely affect human health and the estuarine environment.

New York's long-term concerns associated with dredged material disposal at an open water disposal site include: 1) potential for cumulative effects on both water quality and the benthic ecology of repeated, consecutive dumping episodes over the course of the project schedule; 2) cumulative, indirect and secondary effects on the LIS ecosystem from use of several designated open water disposal sites and in concert with other stressors acting on the system; 3) the possibility of bioaccumulation of contaminants up the food chain; 4) nutrient enrichment at the disposal site leading to localized hypoxic events; and 5) the possibility for transport/ migration of dredged materials outside the boundary of the disposal site.

Point sources (as opposed to non-point sources) are sources of pollution which can be directly traced to a discrete source or point of origin. Each disposal event, in releasing a load of dredged material and tracking it from the barge across the in-water disposal area, emanates directly from the barge itself which is, in effect, a moving point source of pollution. The released load tracks both laterally across and vertically downward within the water column, creating a sediment plume in the wake of the barge. This sediment discharge is a pollutant with light and oxygen limiting adverse impacts in the water column imposing stress on the pelagic ecosystem. This is materially an adverse effect on the receiving water quality and, therefore, contravenes LIS CMP policy 5.

The applicant notes in the August 26, 2019[42] revised policy analysis that there is a history of offshore disposal and poses it as a consideration in weighing impacts of the project. That there is a history of environmentally damaging disposal activities within the Long Island Sound, and in particular in eastern LIS, is not a justification for continuing poor environmental practices such as open water disposal at ELDS and does not minimize any potential for incurring significant or

[42] Statement of Consistency with Long Island Sound Coastal Policies and the Town of Southold Local Waterfront Revitalization Program, Revised August 26, 2019, p. 2-6.

enduring impacts from the proposed activity. To the contrary, this history serves to increase the potential for cumulative impacts.

In the applicant's August 26, 2019 revised policy analysis,[43] the applicant minimized cumulative impacts to water quality, citing both the Long Island Sound Study (LISS) and EPA sources, characterizing water quality in the Long Island Sound in the vicinity of ELDS as "generally good" and then independently concludes that the "baseline stressor level among biological receptors is relatively low".[44]

The applicant's analysis of the impacts of each individual disposal event are described as:

> "approximately 1-5% of the sediment remains suspended in the water column for some time, causing a temporary increase in particle concentration in the water column. Field studies conducted in Long Island Sound have confirmed that suspended sediment plumes following placement of dredged material are transient and have short-term (i.e., hours in duration) impacts on water quality [citations omitted]. Modeling conducted by the USACE as part of the SD evaluation for Electric Boat showed that the water column at the disposal site will meet the limiting permissible concentration within a four-hour period following disposal."[45]

In this context the applicant dismisses a need to evaluate cumulative impacts by determining that cumulative effects of this project on water quality *would be of concern* <u>if</u> the project was in an area of intensive, persistent high levels of water quality stress on the LIS ecosystem or if disposal events were continuous and widespread throughout the area. LIS CMP policy 5 does not allow for such a narrowly drawn analysis.

The applicant proceeds even further by dismissing any water quality impacts from each individual disposal as discrete and "temporary" because such individual events would not result in "long-term or widespread changes that would trigger a change in water quality classification."[46] The applicant's baseless assertion that an individual disposal must lead to a re-classification of an entire water body before a conclusion that there are reasonably foreseeable effects on New York's coastal uses and resources can be drawn has no basis in law or fact. A thorough consideration of the cumulative impacts from the proposed 60-day disposal was not demonstrated.[47] While the individual disposal events that may occur up to four times a day over

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[43] See Id. p. 2-7
[44] See Id. at p. 2-13.
[45] See Id. at p. 2-12.
[46] See Id. at p. 2-13. Long Island Sound's water classification for Long Island Sound are classified as SA waters. Class SA waters are suitable for shellfishing for market purposes, primary and secondary contact recreation, and fishing.
[47] See 15 CFR § 930.11(g). "Effect on any coastal use or resource (coastal effect)":

> "The term "effect on any coastal use or resource" means any reasonably foreseeable effect on any coastal use or resource resulting from a Federal agency activity or federal license or permit activity (including all types of activities subject to the federal consistency requirement under subparts C, D, E, F and I of this part.) Effects are not just environmental effects but include effects

60 days may not directly lead to a re-classification of Long Island Sound as an "SA" water body, the proposed disposal at ELDS will be impaired temporarily on-site in Connecticut waters and permanently as the drifting silty material will settle off-site in New York waters.[48]

In its July 27, 2019 consistency certification, and August 26, 2019 revised policy analysis,[49] Electric Boat states that off-site turbidity and sedimentation may occur at high-energy events or conditions, however, and dismisses these impacts without an analysis of whether water quality criteria within NYS waters will be met throughout the duration of the project. The applicant defends consistency with the water quality policies with assertions that the sediment plumes would be intermittent, based on one barge not less than every four hours, and that suspended sediments would be both temporary and rapidly diluted and settled out of the water column.[50] These coastal policies, however, do not discriminate between those adverse impacts which may be from sustained activities and a prolonged presence of pollutants in the water column and those adverse impacts that may be more temporal in nature.

In a response to DOS's request for additional information,[51] the applicant submitted information on September 27, 2019 stating that production rates for the proposed dredging and disposal will likely take up to 60 days due to potential weather conditions and operational constraints. Maximum production rates would involve up to six scows per day, once every four hours, for approximately 180 trips, and that sediment plumes and turbidity per disposal event are anticipated to dissipate within 4 hours of release. The sediment sampling plan accompanying the applicant's certification introduces additional support that a disposal at ELDS will introduce contaminants into the benthic habitat and the water column.

The sediment concentrations contained in the sediment sampling plan also indicates a limited number of exceedances of "effect range median" (ERMs) and somewhat more frequent exceedances of the more conservative "effect range low" (ERLs). These results should be viewed in combination with the toxicity test results which yielded adverse results in the suspended particulate phase toxicity test for the more sensitive *A. punctulata* larval tests. The applicant dismissed the significance of these results when viewed in the context of a screening level STFATE modeling analysis. This type of analysis necessarily relies on a number of assumptions of future conditions related to sediment characteristics and hydrodynamic conditions during

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on coastal uses. Effects include both direct effects which result from the activity and occur at the same time and place as the activity, and indirect (cumulative and secondary) effects which result from the activity and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects are effects resulting from the incremental impact of the federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions."

[48] See Applicant's revised consistency certification dated August 26, 2019 at p. 2-13 (dismissing cumulative impacts) "In such cases the additional, temporary increase in suspended sediments associated with placement events could cause continuous reductions in water clarity due to elevated suspended sediment concentrations in the water column. But in this case, the frequency of placement events will be limited to one barge every 4 hours so that the suspended sediment plume will dissipate between events."

[49] Id. at p. 2-16.

[50] See Id. at pp. 2-12 to 2-14

[51] See Applicant's Response to State of New York Department of State Status of Consistency Review and Second (2nd) Request for Additional Information, dated Sept. 27, 2019, p. 5.

release of the dredge spoils. Given the apparent limited spatial sampling and therefore the possibility that other more toxic sediments may exist within the Electric Boat site footprint in the Thames River, it cannot be stated with confidence that this analysis did in fact represent a reasonable worst-case condition for the for the dredged materials. Thus, there exists uncertainty related to this risk analysis that remains unaddressed by the applicant.

As the Sound benthic chemistry is transformed under climate change, preliminary scientific evidence warns that legacy heavy metal contaminants will drastically change bioavailability and increase in toxicity.[52] Of particular concern is the absence of a discussion of bioavailability as it relates to the range of toxins potentially available to the biota of the Sound. Sediment-bound toxins may be remobilized by storm and flooding activity, as well as changing benthic layer water chemistry under a range of environmental factors -- such as increasing temperatures and acidification, nitrogen loading and anoxic conditions -- that are magnified by climate change.[53] The resuspension of sediments during and after disposal could result in the disturbance through re-exposure and bioavailability of contaminants in dredged sediments readily transferable to the Sound ecosystem and may also result in substantial local oxygen depletion. Combined with eutrophication, hypoxic/anoxic conditions, and a layer of ammonia and hydrogen sulfide, this will create a deadly "toxic soup" effect for benthic level marine life.

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[52] The Incidence and Severity of Sediment Contamination in Surface Waters of the United States, National Sediment Quality Survey: Second Edition EPA-823-R-04-007, Washington, D.C.: U.S. Environmental Protection Agency, 2004. W. Sunda and W. Cai (2012). "Eutrophication Induced CO2-Acidification of Subsurface Coastal Waters: Interactive Effects of Temperature, Salinity, and Atmospheric PCO2" Environ SciTechnol. Oct 2:46(19):10651-9; Melzner, Frank, Jörn Thomsen, Wolfgang Koeve, Andreas Oschlies, Magdalena Gutowska, Hermann Bange, HansPeter Hansen, Arne Körtzinger (2013). "Future ocean acidification will be amplified by hypoxia in coastal habitats", Marine Biology, 160: 8. August 1. p. 1875-1888; "Synthesis of Climate Change Drivers and Responses in Long Island Sound." November 13, 2009. US Environmental Protection Agency at http://longislandsoundstudy.net/wp-content/uploads/2011/03/LISS-Synthesis-of-CC-Impacts-Memo.pdf; J. Latimer, M. Tedesco, R. Swanson, C. Yarish, P. Stacey, and C. Garza. 2014. Long Island Sound: Prospects for the Urban Sea. New York: Springer, p.163; S. Moffitta, T. Hillb, P. Roopnarined, and J. Kennette. (2014) "Response of seafloor ecosystems to abrupt global climate change", Proceedings of the National Academy of Sciences of the USA, vol. 112 no. 15; J. Slater and D. Capone (1984). "Effects of metals on nitrogen fixation and denitrification in slurries of anoxic saltmarsh sediment" Marine Ecology - Progress Series Vol. 18: 89-95; K. Sakadevan, H. Zheng and H. Bavor. 1999. "Impact of heavy metals on denitrification in surface wetland sediments receiving wastewater". Wat. Sci. Tech 40(3), 349-355; J. Camargoa and Á. Alonsob (2006) "Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: A global assessment". Environment International, Vol 32, Iss 6, August, Pages 831–849; J. Gray, R. Shiu-sun Wu and Y. Ying Or (2002) "Effects of hypoxia and organic enrichment on the coastal marine environment". Marine Ecology Progress Series, Vol. 238: 249–279; R. Jones and G. Lee (1981). "The Significance of Dredging and Dredged Material Disposal as a Source of Nitrogen and Phosphorus for Estuarine Waters," IN: Estuaries and Nutrients, Humana Press, Clifton, NJ, pp 517-530; J. Varekamp (2012). "Long Island Sound in the 21st century: Cleaner but some problems linger." Sound UPDATE: Newsletter of the Long Island Sound Study - Fall 2012 found at http://longislandsoundstudy.net/wp-content/uploads/2012/11/ToxPath2012_for-Web.pdf

[53] See Rice, E., Dam, H.G. & Stewart, G. (2015) Impact of Climate Change on Estuarine Zooplankton: Surface Water Warming in Long Island Sound Is Associated with Changes in Copepod Size and Community Structure, Estuaries and Coasts 38(1): 13-23.; Chris Field and Chris Elphick (2014), Sentinels of climate change: coastal indicators of wildlife and ecosystem change in Long Island Sound - Final report September, 2014 , Connecticut Department of Energy and Environmental Protection/ US EPA Long Island Sound Study found at http://www.sound.uconn.edu/lissm/documents/Elphick_et_al_Sentinels_final_report.pdf.

In addition to the adverse effects associated with the re-introduction of dredged material and its potential contaminants to the water column and benthos, the open-water disposal of dredged material at ELDS has adverse effects on aquatic species and the benthic community directly through sediment dispersal through the water column, and burial. Adverse impacts of chemical contamination to an ecosystem may not manifest until after several generations of species propagation. Contaminants have been shown to bioaccumulate in benthic and aquatic marine species with long term, low level exposure resulting in an array of behavioral and physiological impacts on specific species.[54] Considering the limited sampling density that was performed other possible hot spots may have been missed making it unclear that the remainder of the project footprint should be classified as suitable for open water disposal.

Electric Boat did not provide a sufficient analysis or evaluation of the bioavailability of elevated contaminants found in the 890,000 cy of dredged material and provided minimal data on the cumulative effects to the benthic ecology from repeated disposal activities at these sites. Chronic effects from the cumulative impacts of repeated disposal events at the now-defunct NLDS and benthic and water column ecosystem exposure to contaminated and/or fine-grained materials are, and remain, significant.[55] The applicant has been unable to provide credible information that the continuation of this ecosystem impact to the adjacent 1.3 nm^2 to the west of ELDS will not result in an expansive footprint and the continuation of adverse impacts to New York's water quality and ecosystem health and instead improperly concludes that "ELDS is a containment site, meaning that the placed sediments are not expected to be transported offsite."[56]

A particular vulnerability to the stressors at the benthic layer is a result of the changing benthic water chemistry. This is of special concern because of its impacts on the remobilization and bioavailability of legacy contaminants, and upwelling effects that bring these toxic benthic waters to the surface to compound water quality and hypoxic conditions. Hypoxia occurs when dissolved oxygen (DO) levels in seawater are below what is essential for supporting marine life. Long Island Sound's current hypoxic conditions have a synergistic effect when combined with anticipated effects of climate change at the benthic layer, and the additional heavy metals and other contaminants accumulating at the benthic layer of dredge disposal sites.

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[54] See Valente, R. M; Rhoads, D. C; Myre, P. L.; Read, L. B.; Carey, D.A. 2006. Evaluation of Field Bioaccumulation as a Monitoring Tool. DAMOS Contribution No. 169. U.S. Army Corps of Engineers, New England District, Concord, MA, p. 3; see also Kevin R. Roche, Antoine F. Aubeneau, Minwei Xie, Tomás Aquino, Diogo Bolster, and Aaron I. Packman (2016). An Integrated Experimental and Modeling Approach to Predict Sediment Mixing from Benthic Burrowing Behavior. Environ. Sci. Technol. 2016, 50, 10047−10054.

[55] See 15 CFR § 930.11(g):

> [t]he term ''effect on any coastal use or resource'' means any reasonably foreseeable effect on any coastal use or resource resulting from a Federal agency activity or federal license or permit activity…. Effects are not just environmental effects but include effects on coastal uses. Effects include both direct effects which result from the activity and occur at the same time and place as the activity, and indirect (cumulative and secondary) effects which result from the activity and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects are effects resulting from the incremental impact of the federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions.

[56] Applicant's revised consistency certification dated August 26, 2019 at p. 2-15.

The applicant's conclusions that the disposal of 890,000 cy at ELDS is consistent with these policies are flawed based upon insufficient data identifying a) the particular ecosystem stressors acting on the Eastern Long Island Sound, their intensity, and frequency and interactions and b) specifically, the level of stress that would be exerted on benthic and pelagic ecosystems and water quality within ELDS itself during the disposal events over the course of this project as well as throughout the use of ELDS by others. The applicant's conclusions are presumptive and illogical in that they rely on our acceptance of an assertion that relatively healthy ecosystems and environmental conditions cannot be substantially harmed by activities which act to degrade both. Disposal at an eastern Long Island Sound site would require consistency with New York's water quality standards, which seek to maintain or restore waters so that they are suitable for fish, shellfish and wildlife propagation and survival. Electric Boat has stated in its policy analysis that disposal at the ELDS could cause elevated suspended solids and turbidity outside of the site boundaries and within NYS waters. Due to the proximity of the disposal site to New York State's boundary, the disposal activity could detrimentally impact New York's water quality.

Based on the potential risks to human health and ecological integrity discussed above, and the failure to adequately consider alternatives that would reduce this risk, the proposed activity is not consistent with these policies.

LIS CMP Policy 6: Protect and restore the quality and function of the Long Island Sound ecosystem.
LIS CMP Policy 6.1: Protect and restore ecological quality throughout Long Island Sound.

Avoid significant adverse changes to the quality of the Long Island Sound ecosystem as indicated by physical loss, degradation, or functional loss of ecological components. Avoid fragmentation of natural ecological communities and maintain corridors between ecological communities. Maintain structural and functional relationships between natural ecological communities to provide for self-sustaining systems. Avoid permanent adverse change to ecological processes. Reduce adverse impacts of existing development when practical. Mitigate impacts of new development; mitigation may also include reduction or elimination of adverse impacts associated with existing development.[57]

Southold LWRP Policy 6: Protect and restore the quality and function of the Town of Southold's ecosystem.
Sub-policy 6.1: Protect and restore ecological quality throughout the Town of Southold.

A. Avoid adverse changes to the Long Island Sound and the Peconic Bay ecosystems that would result from impairment of ecological quality as indicated by:

2. Degradation of ecological components
Degradation occurs as an adverse change in ecological quality, either as a direct loss originating within the resource area or as an indirect loss originating from nearby activities. Degradation usually occurs over a more extended period of time

[57] See LIS CMP at pp. 79-80

than physical loss and may be indicated by increased siltation, changes in community composition, or evidence of pollution.
3. Functional loss of ecological components
Functional loss can be indicated by a decrease in abundance of fish or wildlife, often resulting from a behavioral or physiological avoidance response. Behavioral avoidance can be due to disruptive uses that do not necessarily result in physical changes, but may be related to introduction of recreational activities or predators. Timing of activities can often be critical in determining whether a functional loss is likely to occur. Functional loss can also be manifested in physical terms, such as changes in hydrology.

B. Protect and restore ecological quality by adhering to the following measures.
1. Maintain values associated with natural ecological communities. Each natural ecological community has associated values which contribute to the ecological quality of the Town of Southold. These values should be assessed on a case-by-case basis.
3. Avoid fragmentation of ecological communities and maintain corridors to facilitate the free exchange of biological resources within and among communities.
4. Maintain ecological integrity of particular locales by maintaining structural and functional attributes, including normal variability, to provide for self-sustaining systems.
5. Avoid permanent adverse change to ecological processes. [58]

The LIS ecosystem consists of physical components, biological components, and their interactions. Ecosystem health relative to its function has been a focus of NYS for several decades. Healthy ecosystems support functional habitats, providing a resilience to risk for sustainable resources. Material deemed suitable for open-water disposal can and should be used to provide responsible and resilient solutions, while maintaining habitat value and function.

LIS water quality impairment should be viewed from a perspective of environmental degradation and ecosystem stressors. Eastern LIS water quality has benefitted from a higher energy environment and more frequent tidal flushing than the central and western basins, resulting in more ecologically diverse populations. The courser grained sediments, cobble and rock outcroppings found in the eastern Sound provide premium habitat and foraging area for an insurmountable variety of resident and transient species. The Sound's cumulative legacy of long-term pollution and habitat degradation has resulted from a range of human activities, such as historical point discharges, wetland filling and draining, dumping of waste, channel dredging and harbor deepening, road and hard surface runoff, agricultural runoff, wastewater contamination, and dredged material disposal. Following a systems approach in managing these issues, Policy 6.1 requires a reduction in adverse impacts resulting from existing stressors, when practical, as well as mitigation of impacts from new stressors.

[58] See Town of Southold LWRP Section III at pp. 20-21, available at: https://docs.dos.ny.gov/opd-lwrp/LWRP/Southold_T/Amendment1/Final/SoutholdAmenSIII.pdf

Certain natural resources that are important for their contribution to the quality, function and biological diversity of the Sound ecosystem have been specifically identified by the State for protection. Several NYS-designated Significant Coastal Fish and Wildlife Habitats (SCFWHs) are designed in eastern LIS in accordance with NYS CMP to achieve, in part, several relevant CZMA objectives. In particular, located to the east of ELDS are two SCFWH(s) with ecological value to Long Island and the LIS ecosystem and include the "Fishers Island Beaches, Pine Islands and Shallows" SCFWH[59] and the "Dumpling Islands and Flat Hammock" SCFWH,[60] in which intertidal areas provide significant benthic ecosystem attributes including habitats for foraging, spawning, nursery and nesting areas for many species of fish, birds and colonial waterbirds. To the southeast of ELDS, a third SCFWH, "The Race",[61] provides one of two major migratory routes through the Sound, provides significant spawning, nursery and foraging areas, and supports a nationally significant recreational fishery. There are several other SCFWHs in the vicinity of the ELDS and Fishers Island, New York where breeding and foraging endangered and threatened species benefit from the diversity of living resources and functional benthic habitats that support them, both within and surrounding the designated SCFWH(s).

Successful resolution of problems, such as estuarine water quality, in such complex, interdependent social-ecological systems, requires identifying and addressing the full array of potential stressors affecting that system.[62] The short-term, direct environmental impacts of the deposition of dredged material at an open water disposal site include:

1) water quality impacts (turbidity and toxicity) during the disposal process;
2) permanent alteration of the bottom substrate through deposition of material;
3) loss of bottom dwelling organisms through burial and suffocation; and
4) resuspension, transport, and redeposition of contaminants during disposal.

The long-term concerns associated with dredged material disposal at an open water disposal site include:

1) potential for cumulative effects on both water quality and the benthic ecology of repeated, consecutive dumping episodes over the course of the project schedule;
2) cumulative, indirect and secondary effects on the LIS ecosystem from use of several designated open water disposal sites and in concert with other stressors acting on the system;
3) the possibility of bioaccumulation of contaminants up the food chain;
4) nutrient enrichment at the disposal site leading to localized hypoxic events; and
5) the possibility for transport/ migration of dredged materials outside the boundary of the disposal site.

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[59] https://www.dos.ny.gov/opd/programs/consistency/Habitats/LongIsland/Fishers_Island_Beaches_Pine_Islands_Shallows.pdf
[60] https://www.dos.ny.gov/opd/programs/consistency/Habitats/LongIsland/Dumpling_Islands_Flat_Hammock.pdf
[61] https://www.dos.ny.gov/opd/programs/consistency/Habitats/LongIsland/The_Race.pdf
[62] See F. Berkes (2015). *Coasts for People: Interdisciplinary Approaches to Coastal and Marine Resource Management*. New York: Routledge.

The DOS objection on October 3, 2016 EPA's site designation ELDS cites the inadequacy of analysis by the EPA to address and analyze cumulative impacts related to the ELDS designation.[63] DOS made clear in the objection that "EPA failed to thoroughly analyze the effects of legacy contamination in the sediments of Long Island Sound, as well as the possible effects of having three dump sites within the semi-enclosed waters of Long Island Sound all operating at the same time. Furthermore, they did not consider the effects of climate change, rising water temperature, or increasing acidification on the bio-availability of contaminants in sediments."[64] With these important analyses still lacking in Electric Boat's consistency certification, there remains no tangible means for DOS to evaluate the potential cumulative impacts of the proposed open water disposal action on the state coastal resources and uses.

Electric Boat's proposal to dispose of 890,000 cubic yards of Thames River sediments at ELDS will have the effect of smothering benthic life and degrading the marine environment both at the site and in the surrounding area repeatedly during the multi-month disposal activity and permanently once the disposal events were complete. Some of the potential adverse impacts of the deposition of dredged material at an open water disposal site include water quality impacts (turbidity and toxicity) during the disposal process, permanent alteration of the bottom substrate through deposition of material, loss of bottom dwelling organisms through burial and suffocation, and resuspension, transport, and redeposition of contaminants during disposal.

Given the relatively high current velocities and unstable character of the eastern portion of the Sound, the disposal of materials at ELDS could impair or affect these nearby SCFWHs and Long Island Sound as a nationally significant estuary through: direct physical alteration, disturbance, or pollution of the area through direct and indirect biological and chemical effects of disposal; habitat impairments and destruction from sedimentation by reducing vital resources (food, cover, living space) or changing the environmental conditions (alteration of substrate and water-column changes such as introducing limiting effects on light and oxygen) beyond the tolerance range of marine organisms.[65] Any alteration and/or effects on these valuable habitats affects the

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[63] See DOS objection dated October 3, 2016, at pp. 42-56. Inadequate cumulative impacts analyses related to the ELDS designation was determined to be inconsistent with the LISCMP policies #5, #6, and #11. https://www.dos.ny.gov/opd/programs/pdfs/Final_ConsistencyDecisionELIS%2010%203%2016%20CORRECT_new.pdf

[64] See DOS objection dated October 3, 2016 (corrected version) at p. 3.

[65] See FSEIS at p. 4-49.

> "The sedimentary environments in Long Island Sound reflect the dominant hydrodynamic forces acting on the sediment []. Generally, areas with high bottom current velocities (such as the area around The Race) are areas of erosion; the substrate of these areas typically consists of coarser-grained sediment (sand and gravel) or bedrock. Finer grained sediment particles transported into these areas remain suspended in the water column until they encounter areas in Long Island Sound with slower tidal current velocities where they can settle out. Hence, bottom sediments in Long Island Sound are increasingly fine-grained with decreasing current velocities. Knebel and Poppe (2000) identified four sedimentary environments based on grain size distribution and current velocities and defined them as follows (Figure 4-30 [of the FSEIS]): "Erosion or Non-deposition", where boulder fields to gravelly coarse-to-medium sands are present; "Coarse-grained Bedload Transport", characterized by coarse-to-fine sand with small amounts of mud; "Sediment Sorting and Reworking", characterized by heterogeneous sands and muds; and "Fine-grained Deposition", characterized by bottom sediments that are muds and muddy, fine sands. The substrate of eastern Long Island Sound includes three of these sedimentary environments. The substrate of central and

availability and viability of food sources and resources within Long Island Sound and associated SCFWH(s), does not advance and instead contravenes the intentions of the policies, and must be avoided. Additional discussions of reasonably foreseeable effects on both the undisturbed benthic habitat of ELDS and surrounding areas, as well as these SCFWH(s) are discussed in the analysis of Policy 11.

Electric Boat's consistency certification fails to examine legacy and new contamination, regardless of relative amounts, from the perspective of open water disposal acting as a system stressor that contributes to compromising ecosystem function. Electric Boat erroneously and arbitrarily maintains in its consistency certification that the use of the ELDS for disposal of dredged material would have negligible effects on ecosystem quality.[66] This assertion fails to assess the cumulative effects of 890,000 cy at ELDS creating a permanent alteration of undisturbed sand and gravel benthic habitat to a fine-grained silt environment.

The applicant's proposed project at ELDS would unnecessarily add stress on the estuarine system, resulting in reasonably foreseeable, and avoidable, cumulative effects and would exacerbate the Sound ecosystem's exposure to additional contamination and introduction of silt and fine-grained riverine sediments into the high energy eastern end of the estuarine environment. The FSEIS, upon which Electric Boat relies for justification in using ELDS, contains data reflecting elevated contaminant levels (e.g., mercury, copper, and pesticides such as dieldrin) in their baseline sediment survey and concludes, without supporting evidence, that the historical use of NLDS as an adjacent site, and the presence of contaminants such as mercury and copper, does not preclude continuing use of adjacent area as a dredged material disposal area as there would be no further degradation of the Long Island Sound ecosystem.[67] This illogical conclusion is belied by the fact that the disposal of 890,000 cy of dredged material onto previously undisturbed benthic habitat simply expands the ecosystem stressor to cover greater acreage, adding further stress to an already impaired area, and impacting previously unaffected areas as well.

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western Long Island Sound consists mostly of the Fine-grained Deposition sedimentary environment." Id.

See also FSEIS, Figure 4-30, "Sedimentary environments in Long Island Sound (Source: Knebel and Poppe, 2000)."; see also Knebel, H.J. and L.J. Poppe. 2000. Sea-floor environments within Long Island Sound – A regional overview. Journal of Coastal Research (Special Thematic Section) 16: 535–550.

[66] Statement of Consistency with Long Island Sound Coastal Policies and the Town of Southold Local Waterfront Revitalization Program (Revised August 26, 2019), pp. 2-11 to 2-24.

[67] See FSEIS, App. J – EPA Responses to Public Comments #15, p. 71. EPA dismisses the 8.9 mcy of dredged material disposal at NLDs, including the contaminated Seawolf dredged material from the December 1996 disposal and draws the unsubstantiated conclusion "it is not surprising that USEPA [writing in the third person] did not find significant adverse cumulative impacts from the proposed action [ELDS site designation]". EPA derived this conclusion by conflating its own failure to acknowledge the significant adverse effects from past disposal at the NLDS and instead presumed that the expansion of 20 mcy of additional dredged material over the next 30 years at adjacent ELDS would also, without explanation, not have any "significant adverse effects". Id; see also FSEIS at p. 3-31. "[T]he capacity at [ELDS] would be sufficient to accommodate the dredged material disposal needs for the 30-year planning period."

According to "Analysis of the Contribution of Dredged Material to Sediment and Contaminant Fluxes in Long Island Sound,"[68] the remolding phase of a disposal mound involves compaction and local erosion until an equilibrium of grain-size distribution is attained and a mound can be considered armored. With silt or clay caps or uncapped mounds, this condition may be attained only after considerable erosion. In the applicant's proposed project, the persistent erosion of the clay/silt material is expected since coarse material is virtually absent from all of the core samples taken for this project. In support of this impact to the benthic habitat and water quality from this proposed project, DAMOS report # 180, which examined the NL-06 mound in 2007, noted that 8 months after disposal, "There was a very thin layer of sand (thinner than at NEREF) over silt/clay and the grain size major mode was >4 phi at every station. At many stations the consolidated clay was exposed at the surface."[69] This indicates that a lag layer had yet to fully form and thus resuspension, with water quality and physical impacts, is still ongoing.

As sediments eventually disperse and settle downward, benthic communities are buried and directly, adversely impacted and the substrate is permanently altered. Subsequent, repeated disposal events, either as part of this individual project, or as the ELDS continues to be used to capacity over time, will compound the impacts and delay recovery of benthic communities. It is anticipated that erosion of the mounds that would be created at ELDs from the disposal of 890,000 cy will occur throughout the disposal and for an undetermined time after. The boundaries of this new disposal site encompass previously undisturbed bottom containing sand (including sand waves) and cobble and nearby boulders.[70] The addition of fine-grained silt and clay to an area containing predominantly course-grained material lends to the concern that much of the fines will not remain on-site. This will render the nearby exclusion areas within the ELDS boundaries, which provide high-quality habitat value associated with the rocky outcroppings and ship-wreck, meaningless due to inadequate protections.

In the applicant's August 26, 2019 response to these concerns, it was stated that the time period will likely be 60 days of consecutive dumping, rather than dumping the 890,000 cy over a condensed 30 days.[71] While a 60-day schedule may reduce the overall daily quantities being dumped at ELDS, this approach does not lessen impacts but instead doubles the impact period's length of time. The suspension of the nearly million cubic yards of material will increase impairments to organisms from short- and long-term suspended clays and silt in the water column, and potentially lead to the impairment or destruction of irreplaceable rocky outcrops and high-quality benthic habitat immediately adjacent to ELDS and will likely impair crustaceans, epiphytes, submerged aquatic vegetation, shellfish, and bottom-dwelling fish, such as flounder, scup and northern puffer fish through smothering and the loss or alteration of habitat.

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[68] SAIC. 1994. Analysis of the Contribution of Dredged Material to sediment and Contaminant Fluxes in long Island Sound. June 1994. DAMOS Contribution No. 88. U.S. Army Corps of Engineers, New England District, Concord, MA. p. 11.

[69] AECOM. 2009. Monitoring Survey at the New London Disposal Site, July / August 2007. DAMOS Contribution No. 180. U.S. Army Corps of Engineers, New England District, Concord, MA, 80pp. (p 75.) (DAMOS Report # 180, p.75).

[70] See FSEIS at pp. 3-33, 4-10.

[71] Applicant's Response to State of New York Department of State Status of Consistency Review and Second (2nd) Request for Additional Information, dated Sept. 27, 2019, p. 5.

The applicant provided no data refuting the findings in the DAMOS Report # 180, as to the quantity of sediment can be expected to the be lost from a disposal site through erosion/resuspension before an adequate lag layer is developed to stabilize a mound. With a paucity of coarse sediment, development of a suitable lag covering might take years and significant erosion of dredged material from this proposed project. Due to the anticipated instability due to current speeds at ELDS,[72] the fine sand and shells that accumulate on the surface of mounds is not adequate lag material and thus insufficient to prevent material resuspension, especially during storm events.

In view of the many environmental problems currently experienced by the LIS, resulting from myriad water quality and ecosystem stressors which continually act upon it, and given the presence of the previously identified SCFWHs proximate to ELDS, DOS has justifiably found that use of ELDS for receipt of dredged material is inconsistent with the LIS CMP and Town of Southold LWRP coastal policies. Due to the above considerations, this proposal is inconsistent with these policies.

LIS CMP Policy 8: Minimize environmental degradation in the long Island Sound coastal area from solid waste and hazardous substances and wastes.
LIS CMP Policy 8.1: Manage solid waste to protect public health and control pollution.

Plan for proper and effective solid waste disposal prior to undertaking major development or activities generating solid wastes. Manage solid waste by: reducing the amount of solid waste generated, reusing or recycling material, and using land burial or other approved methods to dispose of solid waste that is not otherwise being reused or recycled. Prevent the discharge of solid wastes into the environment by using proper handling, management, and transportation practices.[73]

LIS CMP Policy 8.3: Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.

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[72] See Letter dated July 22, 2009 from Fred Anders, Chief Natural Resources Management Bureau, DOS, to Diane Ray, U.S. Department of the Army, Corps of Engineers/New England District at p. 10, available at: Corps of Engineers, New England District, Concord, MA. p. 19; see also SAIC. 1994. Analysis of the Contribution of Dredged Material to sediment and Contaminant Fluxes in Long Island Sound. June 1994. DAMOS Contribution No. 88. U.S. Army Corps of Engineers, New England District, Concord, MA. p. 19. "On page 24 of [the] DAMOS Special Technical Report 'Analysis of the Contribution of Dredged Material to Sediment and Contaminant Fluxes in Long Island Sound,' it predicts that there is a maximum expected dispersion loss of 6.0% during disposal activities, a 0.06% mound remolding loss, and during a hurricane, scouring loss of 15.8%. In total, there is a potential 21.86% loss of material [for a disposal event]." Id. If this value is applied to the current proposal, that accounts for 194,554 cubic yards of material that could be impacting the ecosystem of Long Island Sound outside of the disposal area.; see also Long E.E. 1978 Tide and Tidal Current Observations from 1965 through 1967 in Long Island Sound, Block Island Sound and Tributaries. NOS Oceanographic Circulatory Survey Report No. 1:91 pages.
[73] See LIS CMP at p. 81. "Plan for proper and effective solid waste disposal prior to undertaking major development or activities generating solid wastes. Manage solid waste by: reducing the amount of solid waste generated, reusing or recycling material, and using land burial or other approved methods to dispose of solid waste that is not otherwise being reused or recycled. Prevent the discharge of solid wastes into the environment by using proper handling, management, and transportation practices." Id.

Prevent release of toxic pollutants or substances hazardous to the environment that would have a deleterious effect on fish and wildlife resources. Prevent environmental degradation due to persistent toxic pollutants by: limiting discharge of bioaccumulative substances, avoiding resuspension of toxic pollutants and hazardous substances and wastes, and avoiding reentry of bioaccumulative substances into the food chain from existing sources.[74]

Southold LWRP Policy 8: Minimize environmental degradation in Town of Southold from solid waste and hazardous substances and wastes.

Southold LWRP Policy 8.3: Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.

A. Prevent release of toxic pollutants or substances hazardous to the environment that would have a deleterious effect on fish and wildlife resources. The Town's Site Plan application process will determine whether proposed land use activities will involve toxic substances. Protection measures to prevent their release to the environment, particularly fish and wildlife resources, will be determined during the environmental review. Further, the dredging of toxic material from underwater lands and the deposition of such material shall be conducted in the most mitigative manner possible so as not to endanger fish and wildlife resources, in either the short or long term.

B. Prevent environmental degradation due to persistent toxic pollutants by:

1. limiting discharge of bio-accumulative substances,

2. avoiding re-suspension of toxic pollutants and hazardous substances and wastes, and avoiding reentry of bio-accumulative substances into the food chain from existing sources.[75]

The intent of these policies is to protect people from sources of contamination and to protect Long Island Sound's coastal resource from degradation through proper control and management of wastes and hazardous materials. New York regulates dredged material as a solid waste. In NYS, the open-water placement of dredged material is the least-favored option for managing dredged material and should be considered only after all other options are exhausted.

The EPA National Estuary Program's funded Long Island Sound Comprehensive Conservation and Management Plan identifies and recommends strategies to undertake and support efforts to comprehensively address toxic contamination in Long Island Sound by: controlling and preventing toxic contamination from all sources; addressing sediment contamination; improving human health risk management; monitoring and assessing toxic contaminants; and, conducting toxic contaminant research. The 2003 goal for achieving this strategy is to "[e]liminate toxicity of bioaccumulation impacts on living resources by reducing contaminant inputs, cleaning up contaminated sites and managing risk to humans from seafood consumption."[76]

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[74] See Id. at p. 82

[75] See Town of Southold LWRP Section III at pp. 31-35, available at: https://docs.dos.ny.gov/opd-lwrp/LWRP/Southold_T/Amendment1/Final/SoutholdAmenSIII.pdf

[76] ENSR International 2001. Physical Oceanographic Evaluation of Long Island Sound and Block Island Sound. DEIS for the Designation of Dredged Material Disposal Sites in Central and Western Long Island Sound. September

Electric Boat did not fully consider all adverse impacts of open water disposal pertinent to Long Island Sound.[77] Further, Electric Boat simply dismisses the reasonably foreseeable coastal effects to New York's coastal resources and uses by assuming that the project is consistent with this policy solely because the dredged material proposed for placement has been deemed suitable for open-water disposal at ELDS under the testing and analysis requirements in the MPRSA [ODA] regulations, 40 CFR §§ 227.6 and 227.27."[78] However, the 890,000 cy of dredged material are not "contaminant free" and do contain a range of chemicals that will be bioavailable and have cumulative impacts.

Current sediment sampling and testing protocols do not provide New York with the adequate and appropriate data necessary to draw adequate conclusions on the contaminant content and quantity in dredged materials destined for disposal in Long Island Sound. Sediment assessment data does not provide adequate answers for determining the impacts and effects on the proposed ELDS location and on the Long Island Sound environment, especially concerning bioturbation, bioavailability, bioaccumulation, and sub-lethal effects. Moreover, data on levels of contaminants in tissues of LIS aquatic species are limited.[79]

Electric Boat limited the sampling plan to eleven (11) cores that were taken for the proposed dredging, creating 26 samples for sediment analysis. Although the 26 samples from 11 locations that were collected provide an initial characterization of site conditions, it is reasonable to expect that a more intensive sampling effort would have yielded samples with still higher concentrations than are reported in the Corps' suitability determination; 11 locations seem to be a limited amount of samples to fully characterize a site of such extent, particularly when a spatial interpolation scheme had to be applied to determine the suitability of a portion of the dredged material for placement at ELDS.

The sediment chemistries reveal and confirm that the open water disposal of the 890,000 cy will adversely affect the coastal resources in the ELDS benthic habitats, as well as the impacts of materials drifting offsite. The minimum amount of sediment sampling provided revealed that while most concentrations that exceeded the effects range low (ERL) were within the surficial 0-4 foot depth (core samples # B02, B04, B06, B07, B08, B09, B10, B11), a limited number of ERL exceedances were reported at deeper depths within the core samples.[80] Arsenic was slightly above the ERL in two cores (B05 and B09), nickel exceeded the ERL at depth in 4 cores (samples # B05, B07, B08 and B11, with 3 of 4 being marginal exceedances). Core sample # B11 (derived from a 4-34 foot interval) had ERL exceedances for mercury (Hg), nickel (Ni), zinc

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2003. U.S. Environmental Protection Agency, New England Region, Boston, MA. U.S. Army Corps of Engineers, New England Division, Concord, MA. Appendix G1. Section 2.1.2

[77] See Statement of Consistency with Long Island Sound Coastal Policies and the Town of Southold Local Waterfront Revitalization Program (Revised August 26, 2019), pp. 2-26 to 2-27.

[78] Id. at 2-26.

[79] See Johan C. Varekamp, Anne E. McElroy, John R. Mullaney and Vincent T. Breslin. (2014) Chapter 5 Metals, Organic Compounds, and Nutrients in Long Island Sound: Sources, Magnitudes, Trends and Impacts in Latimer, James S; Tedesco, Mark A; Swanson, R. Lawrence; Yarish, Charles; Stacey, Paul E; Garza, Corey. Long Island Sound: Prospects for the Urban Sea. New York: Springer, 2014.

[80] See CENAE-RDB, Marine Analysis Section – June 6, 2019 Suitability Determination for Electric Boat – South Berth, Thames River, Groton, CT, File Number NAE-2017-02739, p. 5.

(Zn) and total Polychlorinated biphenyl (PCB). Concentrations of these chemistries within the project footprint tended to be elevated relative to mean ELDS concentrations.[81] The addition of the dredged material with these exceedances compared to the undisturbed benthic habitat at ELDS leads to the spread of contaminated materials over an increasingly larger footprint of open water disposal in the Sound.

In addition to the adverse effects associated with the re-introduction of dredged material contaminants to the water column and benthos discussed under the Policy 5 section, the open-water disposal of dredged material potentially affects aquatic species, especially the benthic community, directly through sediment dispersal through the water column, burial of biota and habitat under dumped dredged sediments, and long term bioavailability of pollutants within the dredged material disposal mounds and surrounding benthic sediments. In addition, disposal in the eastern Sound and its resulting adverse effects are exacerbated because strong middle and bottom currents disperse the descending fine sediments and clays to other areas in the Sound. Moreover, following placement, the bottom currents will continue to erode the deposition and transport materials and any associated contaminants elsewhere in the Sound.

Recolonization is evidence of bioturbation that can remobilize dredged sediment contaminants into the benthic layer of the eastern Sound. Remobilized contaminants then may become bioavailable to the food chain, especially fish and shellfish. The recolonization rate of benthic species is an inaccurate proxy for measuring the ability of the Sound benthic ecosystem for naturally restoring its own health. Sediment-dwelling organisms modify their local environment as they burrow, scavenge for food, and hide from predators. Biological reworking of sediments, termed bioturbation, mixes particles in the sediment bed. Reworked sediments encounter different biogeochemical environments that control particle transformation, for example, by microbial metabolism, precipitation/dissolution, and sorption/desorption processes.

Recolonization must be seen in context of bioturbation rates. Particulate organic matter is metabolized more slowly in anoxic sediments, and particles retained in such environments are more likely to be preserved. Similarly, reduced metal sulfides are oxidized when transported from depth into surficial environments, leading to liberation of bioavailable dissolved metals. Bioturbation is thus an important transport process that should be included in biogeochemical models for sediment diagenesis and contaminant fate in sediments.[82] Earlier Corps research confirms that heavy recolonization by benthic species occurs even on heavily contaminated dredged sediment mounds. [83] The DAMOS studies do not provide the type of research data

[81] See Dredging Alternatives Assessment and Recommendation Report, South Yard Facilities Master Plan, General Dynamics Electric Boat, Groton, Connecticut, December 2019, prepared by Henningson Durham & Richardson Architecture and Engineering, P.C. (HDR) for the New York State Department of State (NYSDOS), pp. 2 – 6.
[82] See Kevin R. Roche, Antoine F. Aubeneau, Minwei Xie, Tomás Aquino, Diogo Bolster,and Aaron I. Packman (2016). An Integrated Experimental and Modeling Approach to Predict Sediment Mixing from Benthic Burrowing Behavior. Environ. Sci. Technol. 2016, 50, 18, 10047−10054.
[83] Earlier Corps research confirms that heavy recolonization by benthic species occurs even on heavily contaminated dredged sediment mounds. The DAMOS studies do not provide this type of research data which is essential for New York to determine the effects and impacts of disposal of contaminated dredge materials into Long Island Sound. See Monitoring Survey of the Central Long Island Sound Disposal Site – September and October 2011, USACE DAMOS - Disposal Area Monitoring System, January 2013 found at: http://www.nae.usace.army.mil/portals/74/docs/DAMOS/TechReports/192.pdf

which is essential for New York to determine the effects and impacts of disposal of contaminated dredge materials into Long Island Sound.[84]

Given the foregoing, this proposal is not consistent with these policies.

LIS CMP Policy 10: **Protect Long Island Sound's water-dependent uses and promote siting of new water-dependent uses in suitable locations.**
LIS CMP Policy 10.6: **Provide sufficient infrastructure for water-dependent uses.**

Use suitable dredged material for beach nourishment, dune reconstruction, or other beneficial uses. Avoid placement of dredged material in Long Island Sound when opportunities for beneficial reuse of the material exist. Allow placement of suitable dredged material in nearshore locations to advance maritime or port-related functions, provided it is adequately contained and avoids negative impacts on vegetated wetlands and significant coastal fish and wildlife habitats. Avoid shore and water surface uses which would impede navigation.[85]

Southold LWRP Policy 10: **Protect Southold's water-dependent uses and promote siting of new water-dependent uses in suitable locations.**
Southold LWRP Policy 10.5: **Provide sufficient infrastructure for water-dependent uses.**

A. Provide adequate navigation infrastructure.
Dredging is an essential activity but with costs and impacts that require it to be undertaken only to the extent necessary to meet the current and future needs of water-dependent uses of the Town of Southold. The Town of Southold will work in cooperation with New York State, Suffolk County, the Village of Greenport and private owners of water-dependent uses to:

> *5. Avoid placement of dredged material in Long Island Sound when upland alternatives exist.*
> *6. Put clean dredge material to beneficial use for either beach nourishment or dune reconstruction.*[86]

The purpose of these policies is to promote beneficial uses of dredged material, consistent with past practices in the Long Island Sound region, by requiring the beneficial use of suitable dredged material wherever possible.

NYS Governor Cuomo signed into law the Community Risk and Resiliency Act (CRRA) on September 22, 2014 to strengthen New York State's preparedness for the effects of climate

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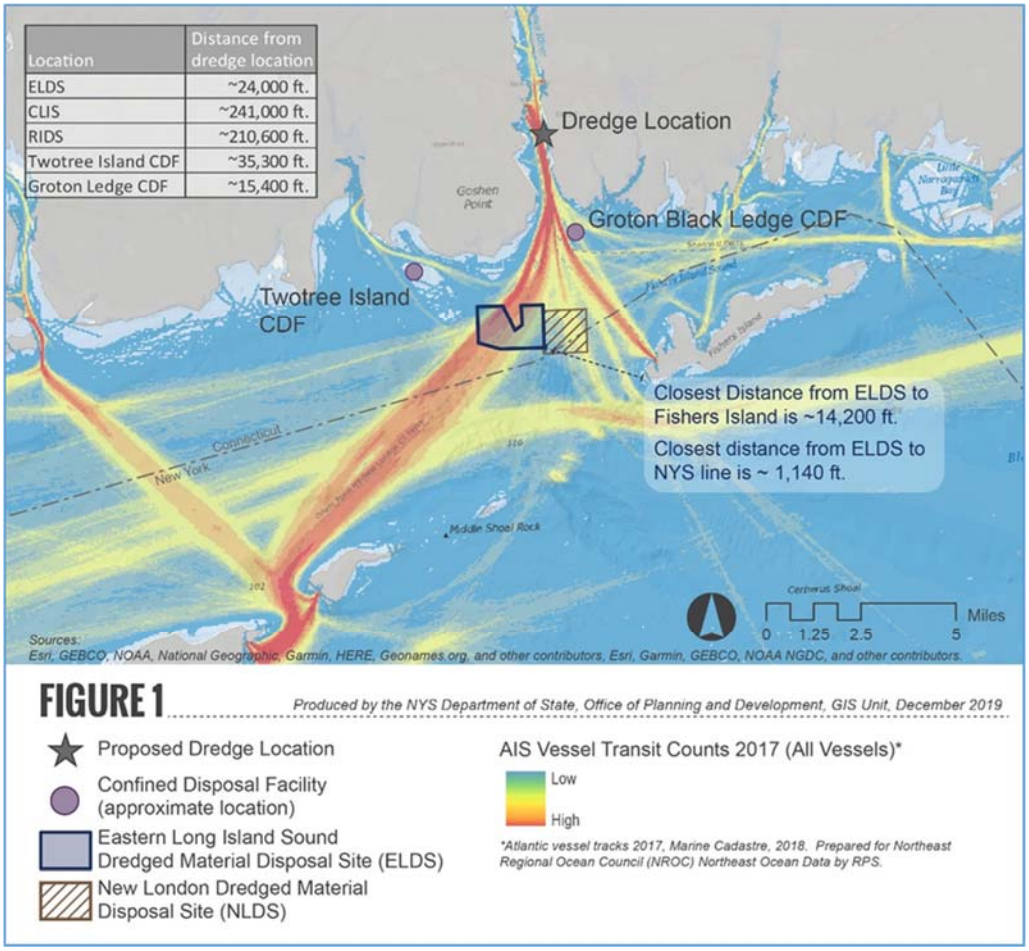
[84] Monitoring Survey of the Central Long Island Sound Disposal Site – September and October 2011, USACE DAMOS - Disposal Area Monitoring System, January 2013 found at: http://www.nae.usace.army.mil/portals/74/docs/DAMOS/TechReports/192.pdf
[85] See LIS CMP at p. 84-85
[86] See Town of Southold LWRP Section III at pp. 42-51, available at: https://docs.dos.ny.gov/opd-lwrp/LWRP/Southold_T/Amendment1/Final/SoutholdAmenSIII.pdf

change and to help protect communities against severe weather and sea level rise.[87] Climate change impacts and sea level rise are risks that all coastal states face. The opportunity to utilize the full range of resiliency measures is prudent and arguably necessary to ensure long term, uninterrupted operations over time.

Given the importance of the components of the South Yard Facilities Master Plan project, which are outside the scope of this consistency review, it would seem prudent to ensure any new or refurbished infrastructure is as resilient as possible to ensure long term safety and operation of the site facilities. Resiliency can be enhanced with some carefully selected alternatives available to open water disposal. For instance, creating expanded port facilities through expansion of fast land with adequate shore protection; or, the design and orientation of confined disposal facilities or containment islands for storm protection and wave attenuation. As with many alternatives, the cost will be reduced overtime as additional future facility dredging projects are scheduled; and the risk reduction of damage or loss of infrastructure can help ensure timely operations over time.



[87] https://www.dec.ny.gov/energy/104113.html

ELDS is located in one of the busiest recreational and ferry traffic areas in the Sound (Northeast Regional Ocean Counsel[88] (NROC) boating survey, and Automatic Identification System Coast Guard[89] (AIS CG) data in Figure 1) and the NROC boating survey, and AIS CG data show significant commercial vessel traffic, including cargo, ferry, and barge traffic.[90] The Cross Sound Ferry follows a route between New London and Orient Point, New York and currently makes approximately 12,000 regularly scheduled trips each year, following a route that goes directly through the Eastern Site.

Electric Boat neglected to provide any analysis of current vessel uses and any potential conflicts with these water-dependent uses. Disposal at ELDS presents the risk of interference with the safety, logistics, and flow of important interstate ferry traffic between New York and New England via the Cross Sound Ferry, which travels between Orient Point, New York and New London, Connecticut. (See Figure 1). Instead, Electric Boat's response to DOS on August 26, 2019 claims that "ELDS presents no more of an impediment to ferry traffic than the previous adjacent New London Disposal Site which had been in existence for decades."[91] This is patently false and misleading. The ELDS is directly over the ferry traffic routes, as illustrated by ship track data available to Electric Boat.

By comparison, the now-defunct New London Disposal Site (NLDS) was *not* located where the predominant ferry and passenger traffic exists.[92] Simply put, this assertion on parity between ELDS, where the applicant is proposing to dispose of 890,000 cy of dredged material repeatedly on a daily basis for up to two months, and the NLDS, which is outside of the ferry traffic lanes and heavy commercial traffic impacts, is incorrect and misleading. Just as the EPA designation incorrectly concluded that there are no recreational or commercial uses in the pathway and within the boundaries of ELDS, likewise, Electric Boat also failed to recognize the significant recreational fishing and boating traffic in the area and region.[93] The use of ELDS by the applicant to repeatedly dispose of dredged material in multiple daily trips over 60 days and directly into the heavily used commercial traffic lanes will have significant adverse effects on the Cross Sound Ferry and other commercial boat uses as water-dependent uses.

Therefore, the proposed activity is not consistent with these policies.

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[88] https://www.northeastoceancouncil.org/

[89] https://www.navcen.uscg.gov/?pageName=aismain

[90] See FSEIS at pp. 4-145-150. There were 6,727 vessel and barge trips "to and from" New London Harbor in 2012 for a total of 13,429 (p. 4-147).; see also "Waterborne Commerce of the United States. Calendar Year 2012. Part 1 – Waterways and Harbors Atlantic Coast, Freight Traffic and Trips and Drafts." https://usace.contentdm.oclc.org/digital/collection/p16021coll2/id/149/

[91] Statement of Consistency with Long Island Sound Coastal Policies and the Town of Southold Local Waterfront Revitalization Program (revised August 26, 2019), pp. 2-28.

[92] See FSEIS at p. ES-4. "The NLDS is bisected by a 1,000-foot (300-m) wide submarine transit corridor that was established to minimize conflicts between disposal buoy positions and submarine traffic to and from the Submarine Base in Groton, Connecticut."

[93] See ELDS Site Designation SEIS at: https://www.epa.gov/sites/production/files/2016-11/documents/elis_fseis_-_full_report_with_appendices_submitted_04nov16.pdf and see Electric Boat Consistency Certification at: http://www.dos.ny.gov/opd/programs/pdfs/Consistency/F-2019-0672-ElectricBoatConsistencyCertification.pdf

Policy 11: Promote sustainable use of living marine resources in Long Island Sound

Policy 11.1: Ensure the long-term maintenance and health of living marine resources.

Ensure that commercial and recreational uses of living marine resources are managed in a manner that: results in sustained useable abundance and diversity of the marine resource; does not interfere with population and habitat maintenance and restoration efforts; uses best available scientific information in managing the resources; and minimizes waste and reduces discard mortality of marine fishery resources. Ensure that the management of the state's transboundary and migratory species is consistent with interstate, state-federal, and interjurisdictional management plans. Protect, manage, and restore sustainable populations of indigenous fish, wildlife species, and other living marine resources. Foster occurrence and abundance of Long Island Sound's marine resources by: protecting spawning grounds, habitats, and water quality; and enhancing and restoring fish and shellfish habitat, particularly for anadromous fish, oysters, and hard clams.[94]

Southold LWRP Policy 11: Promote sustainable use of living marine resources in Long Island Sound, the Peconic Estuary and Town waters.
Southold LWRP Policy 11.1: Ensure the long-term maintenance and health of living marine resources.

A. Ensure that commercial and recreational uses of living marine resources in the Town of Southold are managed in a manner that:
1. places primary importance on maintaining the long-term health and abundance of marine fisheries,
3. does not interfere with population and habitat maintenance and restoration efforts,
4. uses best available scientific information in managing the resources
C. Foster the occurrence and abundance of the Town's marine resources through:
1. protection of spawning grounds, habitats, and water quality,
2. enhancement and restoration of fish and shellfish habitat.[95]

The living marine resources of the Sound play an important role in the social and economic well-being of the people of the Long Island Sound region. Commercial and recreational uses of the Sound's living marine resources constitute an important contribution to the economy of the region and the State. Continued use of the Sound's living resources depends on maintaining long-term health and abundance of marine fisheries resources and the habitats, and on ensuring that the resources are sustained in usable abundance and diversity for future generations.

Electric Boat's anticipated re-colonization at ELDS following the repeated disturbances from the 890,000 cy proposed disposal does not indicate the level of contaminants in the biota, sub-

[94] See LIS CMP at p. 86.
[95] See Town of Southold LWRP Section III at pp. 51-56

lethal effects of this contamination, or normal patterns of spatial distribution.[96] In fact, re-colonization can create bioturbation that re-suspends more fine sediments into the water column for dispersal.[97] It is the nature of potential trophic changes likely to result from the dumping of dredged material, particularly when the dumped material is composed of different physical characteristics than the ambient, benthic material.[98] These physical habitat alterations will affect species colonization and may result in lower biodiversity and longer re-colonization periods.[99] This potential change to species diversity or viability could present a negative impact to the ecosystem health of the estuary. There is no supporting evidence in the applicant's submission that management of silty or potentially contaminated material would successfully encourage re-colonization at the ELDS by the same species that may have originally inhabited these locations prior to burial under 890,000 cy of dredged material.

Under the regulatory practices of the Connecticut Department of Agriculture, which regulates where and when shellfish can be harvested in Connecticut waters, there would be direct effects on commercial and recreational New York fishers as soon as any dumping at ELDS takes place. As noted in the Final EIS for the Designation of Dredged Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York (April 2004): "Connecticut restricts shellfish harvesting within 1000 feet (300 meters) of dredged material disposal sites." This is further illustrated in the chapter on "Affected Environment" in the 2016 FSEIS for designation of ELDS, which shows that Connecticut has prohibited any shellfishing at the historically used New London, Cornfield Shoals and Niantic Bay Disposal Sites.[100] Shellfish beds and shellfishing are found is areas throughout eastern Long Island Sound and Block Island Sound.[101] This now expanded loss of otherwise available shellfishing grounds within the shared Long Island Sound constitutes a harm to New York.

Another ecosystem stressor that is inadequately addressed by the applicant is the changing climate and the effects on the Sound ecosystem and its living resources. There is mounting evidence that climate change-induced alterations in the Sound ecosystem, including increased precipitation and flooding, increased storm activity and intensity, ocean acidification (reduced

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[96] See Statement of Consistency with Long Island Sound Coastal Policies and the Town of Southold Local Waterfront Revitalization Program (revised August 26, 2019), pp. 2-17, 2-31.

[97] See J. Lake, G. Hoffman, S. Schimmel (1985). Bioaccumulation of Contaminants from Black Rock Harbor Dredged Material by Mussels and Polychaetes US Environmental Protection Agency Technical Report D-85-2; A Jakimska, P Konieczka, K Skóra, and J Namiesnik (2011). Bioaccumulation of metals in tissues of marine animals, Part I: the role and impact of heavy metals on organisms. Pol. J. Environ. Stud; C. Hammerschmidt and W. Fitzgerald (2006). Bioaccumulation and Trophic Transfer of Methylmercury in Long Island Sound. Archives of Environmental Contamination and Toxicology V 51, pp 416-424; Chen, C., Amirbahman, A., Fisher, N. et al. (2008) Methylmercury in Marine Ecosystems: Spatial Patterns and Processes of Production, Bioaccumulation, and Biomagnification EcoHealth 5: 399.

[98] See Valente, R. and Fredette, T. (2003) Benthic Recolonization of a Capped Dredged Material Mound at an Open Water Disposal Site in Long Island Sound. Dredging '02: pp. 1-14.; Wilber DH, Clark DG, 2007. Defining and assessing benthic recovery following dredging and dredged material disposal, p. 603–618. In: R.E. Randall (ed.), Proceedings of the XVIII World Dredging Congr., Lake Buena Vista, FL, USA.; A. Brooks (1983) A Study of the Benthic Macrofauna at the Central Long Island Sound Disposal Site, US Army Corps of Engineers.

[99] See id.

[100] See FSEIS at Figure 4-46

[101] See Id. at p. 4-109

pH), and warming of marine waters, are changing the chemistry of the Sound environment and amplifying negative impacts of legacy contaminants already present in benthic sediments.[102] This changing chemistry of the system will create new toxic threats, stressors, risks and vulnerabilities. Studies show warming temperatures and lower pH can "activate" contaminants in the bottom sediments and increase their bioavailability. Climate change effects may also reduce the Sound's capacity to absorb the stress of additional contamination loads, particularly because of warming of marine waters and ocean acidification. With this level of risk and uncertainty of continued dumping and subsequent elevated contaminants to living resources in the Sound, proposals to expand the distribution of open water dump sites should be avoided.

Based on the foregoing, the proposed activity is not consistent with these policies.

Alternatives Analysis

The CZMA regulations give a State the option, at the time it objects to the consistency certification for a proposed project, to describe any alternatives that would permit the project to be conducted in a manner consistent with its management program. NOAA's regulations state:

> The objection **may describe** alternative measures (if they exist) which, if adopted by the applicant, may permit the proposed activity to be conducted in a manner consistent with the enforceable policies of the management program.[103]

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[102] See W. Sunda and W. Cai (2012). Eutrophication Induced CO_2-Acidification of Subsurface Coastal Waters: Interactive Effects of Temperature, Salinity, and Atmospheric PCO2. *Environ. Sci. Technol.*, *46* (19), pp 10651–10659; R. Feely, et al. (2008). Evidence for Upwelling of Corrosive "Acidified" Water onto the Continental Shelf, Science, v320, 1490-1492; R. Feely, et al. (2004), Impact of Anthropogenic CO2 on the CaCO3 System in the Oceans, Science, v305, 362-366; C. Kennedy (2009). An Upwelling Crisis: Ocean Acidification. National Oceanic and Atmospheric Administration's Climate.gov website at https://www.climate.gov/news-features/features/upwelling-crisis-ocean-acidification. October 30, 2009. Accessed December 1, 2019; F. Melzner, J. Thomsen, W. Koeve, A. Oschlies, M. Gutowska, H. Bange, H. Hansen, A. Körtzinger, (2013). Future ocean acidification will be amplified by hypoxia in coastal habitats, Marine Biology, 160: 8. August 1, pp 1875-1888; Doney et al., 2009 and Pew Center, 2009 as quoted in EPA's "Synthesis of Climate Change Drivers and Responses in Long Island Sound" at http://longislandsoundstudy.net/wp-content/uploads/2011/03/LISS-Synthesis-of-CC-Impacts-Memo.pdf Accessed December 1, 2019; S. Moffitta, T. Hillb, P. Roopnarined, and J. Kennette (2014). Response of seafloor ecosystems to abrupt global climate change, *PNAS; J.* Latimer; M. Tedesco, R. L. Swanson, C. Yarish, P. Stacey, C. Garza (2014). *Long Island Sound: Prospects for the Urban Sea*. New York: Springer; E. Mecray, M. Buchholtz ten Brink, and E. Galvin (2000). Distribution and accumulation of contaminated sediments in Long Island Sound, Long Island Sound Research Conference, Stamford, CT; I. Johnson (1987). The effects of combinations of heavy metals, hypoxia and salinity on oxygen consumption and carbohydrate metabolism in *Crangon crangon* (L.) & *Carcinus maenas* (L.) *Ophelia* Volume 27, Issue 3; J. Camargoa, and Á. Alonsob (2006) Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: A global assessment. Environment International, Vol 32, Iss 6, August, Pages 831–849; C. Magalhãesa, J. Costaa, C. Teixeiraa, and A. Bordaloa (2007). "Impact of trace metals on denitrification in estuarine sediments of the Douro River estuary, Portugal" *Marine Chemistry*, Vol 107, Iss 3, Pages 332–341; J. Gray, R. Shiu-sun Wu, Y. Ying Or (2002) Effects of hypoxia and organic enrichment on the coastal marine environment. Marine Ecology Progress Series, Vol. 238: 249–279; T.I. Moiseenko, (2010). Effect of Toxic Pollution on Fish Populations and Mechanisms for Maintaining Population Size. Russian Journal of Ecology, Vol. 41, No. 3, pp. 237-243; USEPA (2011) Synthesis of Climate Change Drivers and Responses in Long Island Sound" USEPA at http://longislandsoundstudy.net/wp-content/uploads/2011/03/LISS-Synthesis-of-CC-Impacts-Memo.pdf. Accessed December 1, 2019.

[103] 15 CFR § 930.63(b)

NOAA's regulations further provide:

> If a State agency proposes an alternative(s) in its objection letter, the alternative(s) shall be described with sufficient specificity to allow the applicant to determine whether to, in consultation with the State agency: adopt an alternative; abandon the project; or file an appeal under subpart H. Application of the specificity requirement demands a case specific approach. More complicated activities or alternatives generally need more information than less-complicated activities or alternatives.[104]

In the context of Long Island Sound, the Long Island Sound Regional Dredging Team (RDT)[105] also plays a role in evaluating alternatives to open water disposal for projects that exceed 25,000 cy. With respect to Electric Boat's application, on October 7, 2019, the RDT met via teleconference to evaluate Electric Boat's assessment of alternatives for the disposal of the dredged material associated with the South Yard Facilities Master Plan. The RDT met despite NYS's request to the Corps to postpone the meeting until NYS had sufficient time to research and identify beneficial use alternatives to ELDS.[106] The Corps denied NYS's request.

On the October 7, 2019 teleconference, Electric Boat presented its alternatives analysis to the RDT, dismissing all alternative sites that did not have enough capacity for the full volume of the proposed material and rejecting other alternatives disposal methods as too costly.[107] With the exception of NYS, all of the members of the RDT (Connecticut, EPA, and Corps) accepted Electric Boat alternatives analysis and decision to dispose of the 890,000 cy at ELDS as adequate and complete, even though the current RDT Charter (2007) acknowledges that some alternatives may have limited capacity and that some projects may need to be spread out over multiple beneficial use opportunities or disposal locations to meet the goals of reducing or eliminating open water disposal within Long Island Sound, even at a higher cost. NYS firmly objected during the teleconference to the applicant's conclusion that ELDS is the only alternative for disposal of the 890,000 cy of dredged material.

An alternative may involve changes – sometimes major – in the location or design of a proposed project to make it consistent with the NYS's CMP. Accordingly, based on DOS's further analysis, DOS has determined that the following alternatives are practicable and, if employed, would make the project consistent with LIS CMP Policies 5, 6, 8, 10 and 11 and the Town of Southold LWRP Policies 5, 6, 8, 10 and 11 and would not require further consistency review by DOS:

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[104] 15 CFR § 930.63 (d)

[105] See 40 CFR § 228.15(b)(4)(vi)(E). Participation in the Long Island Sound Regional Dredging Team is voluntary for New York State and Connecticut and a regulatory requirement for the Corps and EPA. New York State does participate in both the Steering Committee and Regional Dredging Team in accordance with the roles and responsibilities set forth in 40 CFR § 228.15(b)(4)(vi)(C), (E), and (F).

[106] See email dated October 5, 2019 from Greg Capobianco, NYS Department of State to the Corps

[107] See Attachment D, Alternatives Analysis, of the June 27, 2019 Electric Boat submission.

1. Central Long Island Sound Disposal Site (CLDS)[108]

Electric Boat has already agreed that CLDS is an available alternative by affirmatively asserting "[Electric Boat] anticipates disposal of the dredged sediment via ocean-going dump scows at an authorized dredge material location, preferably the Eastern Long Island Sound Disposal Site (ELDS) or the Central Long Island Sound Disposal Site (CLDS)."[109] Electric Boat's submission to the Corps identifying CLDS as one of the locations for open water disposal renders this alternative both reasonable and available.

This open-water disposal site is located within Long Island Sound and was designated by the U.S. Environmental Protection Agency (EPA) on July 7, 2016, effective August 8, 2016. According to the DAMOS website, the CLDS "covers a 11.04 km² (3.2 nmi²) area and is centered at 41° 08.950' N, 72° 52.950' W (NAD 83). It is located approximately 10.89 km (5.6 nmi) south of South End Point, East Haven, Connecticut. Historically, CLDS has been one of the most active disposal sites in the New England region."[110] Between 1941 and 2004, the site received close to 14 million cubic yards of dredged material.[111]

DOS conditionally concurred with the site designation of CLDS (40 CFR § 228.15(b)(4) on April 27, 2016, on the condition that use of the site remain consistent with the associated site restrictions[112] and the current Site Management and Monitoring Plan (March 2016).[113] CLDS is only 35 nautical miles from New London, and prior shipments of dredge spoil from projects in the New London Dredging Center to CLDS demonstrates that shipping from the Eastern Sound to CLDS is regularly conducted and therefore feasible and capable of being done.[114] For example, CLDS was used for the receipt of dredged material from the Thames River by the U.S. Navy in connection with its disposal of 217,000 cy of dredged material at the site in 2009.[115]

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[108] As described in 40 CFR § 228.15(b)(4) and (5), the WLDS and CLDS have been evaluated for the significance of physical and chemical impacts as part of the designation process. As a result of the physical and environmental studies performed, the level of impairment at these alternative locations as a result of their use as disposal sites has been judged to be acceptable when in use is in compliance with the site restrictions.

[109] CTDEEP & USACE Joint Permit Application, South Yard Facilities Master Plan, General Dynamics Electric Boat, Groton, Connecticut (May 2018), Part 4, p. 3 of 3; and in the March 16, 2018 Sediment and Analysis Sampling Plan for Electric Boat – South Berth, Thames River, Groton, CT, File Number NAE-2017-02739 issued by the Marine Analysis Section, Regulatory Branch, New England District U.S. Army Corps of Engineers, stating "The applicant proposes to mechanically dredge this material and dispose of it at the Central Long Island Sound Disposal Site (CLDS) or Eastern Long Island Sound Disposal Site (ELDS)."

[110] https://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Disposal-Sites/Central-Long-Island-Sound/

[111] See LIS DMMP at p. 4-27. https://www.nae.usace.army.mil/portals/74/docs/Topics/LISDMMP/LISDMMP%20Final/01a-LIS-DMMP-Main-Report-Final-Dec15.pdf

[112] Federal Register Notice for Site Designation: https://www.govinfo.gov/content/pkg/FR-2016-07-07/pdf/2016-16147.pdf

[113] https://www.epa.gov/sites/production/files/2016-03/documents/r1_clds_smmp_draft.pdf

[114] See FSEIS at p. 3-5.

[115] See DOS objection dated November 9, 2009 to U.S. Navy project to dispose of 217,000 cy of dredged material at NLDS. https://www.dos.ny.gov/opd/programs/pdfs/consistencyDecisions/F-2009-0645.pdf

There is sufficient capacity at CLDS. The Corps estimated the total amount of material to be dredged to be 52,890,300 cy for all regions of the Sound: western, central and eastern,[116] of which 49.6 mcy would require open water disposal.[117] Of that 49.6 mcy, the Corps projected that 15.1 million cubic yards would be suitable for beach replenishment, leaving only 34.4 million cubic yards of fine-grained material that could not be beneficially used in this way.[118]

The Corps calculated in 2004 that CLDS had 38 million cubic yards of remaining capacity.[119] While DOS maintains that the 36 mcy capacity at CLDS is the accurate calculation, regardless of which assessment is used, there is clearly sufficient capacity at CLDS for disposal of 890,000 cy of dredged material from this proposed project.

CLDS is located 48 miles from the Electric Boat project site and the cost of using this alternative was reported by the applicant in its submission as $48/cy. Electric Boat dismissed this alternative based on its cost estimate of disposal at ELDS, which it stated would be $13/cy. No detail was provided to support these cost estimates.

DOS reassessed the cost of using the CLDS alternative by using the cost estimating tool found in the DMMP (used, in that case, to evaluate the cost of disposal at NLDS) in order to provide a consistent and accurate cost estimate for disposal at ELDS and CLDS.[120] The application of the tool in the current context reveals that costs should be more accurately estimated at $25.28/cy for disposal at ELDS and $34.30/cy at CLDS. When DOS compared these revised cost estimates to Electric Boat's estimates, the difference in cost was reduced from $35/cy to $9.02/cy, or by almost 75%. Put another way, Electric Boat may have over-estimated the cost of disposal at CLDS v. ELDS by $25.98/cy, or by over $23 million dollars.

DOS has therefore determined that the disposal at CLDS of the 890,000 cy, or any portion thereof not otherwise used beneficially elsewhere, would be consistent with both the LIS CMP and Town of Southold LWRP policies.

2. <u>Groton Black Ledge Island Confined Disposal Facility (CDF)</u>[121]

The Groton Black Ledge Island CDF is a potential containment island that was identified in the LIS DMMP and in the Long Island Sound Studies Dredged Material Containment Facilities Feasibility Report issued by the USACE New England Division, September 1985, Waltham, MA. The USACE Report first identified the island as a potential location for a confined disposal facility (CDF) for dredge material.

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[116] See LIS DMMP at p. ES-8.
[117] See LIS DMMP at Table 4-1 (p. 4-12 and 4-13).
[118] Note that However, beach replenishment is not an exhaustive list of beneficial options and fine-grained dredged materials can be used for marsh restoration and for CDFs, for example.
[119] See FEIS (2004), Appendix J-2 Site Monitoring/Management Plan for Central Long Island Sound
[120] See LIS DMMP Technical Appendix TSD#13-LIS-DMMP-Emissions-Offsets-Costs-Tool-June2014.xlsx
[121] See 2015 LIS DMMP, p. 3-365; see also LIS DMMP, Appendix G

The proposed Groton Black Ledge Island CDF site is located 3.5 miles[122] from the Electric Boat project site and has a capacity of 6,930,000 cubic yards for fill and 570,000 cy for cap.[123] This site was evaluated as part of the submitted alternatives analysis; however, it was dismissed by Electric Boat because it will require a sponsor, has not been constructed, and could cost more than open-water disposal at ELDS, although the applicant's proposed cost for ELDS disposal does not include costs to environmental or commercial impacts. Costs presented for this site in the Electric Boat's alternatives analysis is $88/CY. Nothing precludes Electric Boat from sponsoring this project and obtaining permits for the purpose of long-term maintenance of the Electric Boat facility and Naval operations.[124]

With future maintenance over the lifetime of the facility, it is anticipated that several million cy of dredged material will need to be removed from the Electric Boat's new dry dock area, as well as for maintenance of other navigational and Naval facilities. Considering that DOS has found both the site designation and the proposed use of ELDS for the purpose of this application to be inconsistent with the LIS CMP, a sustainable alternative for Thames River navigation and the Naval submarine program is needed.

The DMMP identified this site as a potential Island CDF with significant capacity that would meet the needs of this river system and could be designed to provide benefits such as habitat creation, increased navigation infrastructure, resilience to storm surge and increased harbor safety.[125] While initial construction costs of a CDF may be higher than the one-time cost of open-water disposal at ELDS, this does not consider the long term environmental costs associated with multiple dredging and disposal events that are reasonably foreseeable in conjunction with this project. It is also suggested that t Electric Boat may be able to recover its cost if it were to maintain ownership and charge tipping fees from other generators.

As discussed above, future dredging projects necessary to maintain operations are likely to be required new sediments settle into the basin. These sediments will likely to be influenced by runoff and discharges into the Thames River and will thus also require a plan for disposal. Any cost analyses of disposal alternatives should factor in the total amount of dredged material disposal needs that will be generated for the lifetime of this project.

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[122] See fn 11, supra. The ~15,300 ft distance from the proposed dredged location in the Thames River to the Groton Ledge CFD site is well within the distance that projects for the U.S. Navy base in Newport News, VA transports dredged material to the Management Area CIDMMA through submerged pipelines placed outside of the Federal navigation channel at a distance of approximately 38,000 feet from the Elizabeth River branch and approximately 45,000 feet from the Southern Branch's Lower reach.
[123] See LIS DMMP at p. 5-365, Table 5-263.
[124] See fn 11, supra.
[125] See LIS DMMP, Table 5-36, Suitable Fine, page 5-51, Final Report, December 2015

The federal government, including the Naval Facilities Engineering Command (NAVFAC), has generally identified CDFs as feasible beneficial use alternatives for the receipt of dredged material.[126] The applicability is described as:

> "CDFs are used to contain dredged sediments to reduce exposure to the material. These technologies can be applied to contain halogenated and nonhalogenated volatile organic compounds (VOCs) and nonhalogenated semi-volatile organic compounds (SVOCs). Beneficial reuse of contaminated sediments includes creating near-shore habitats or innovative land expansions."

These same short- and long-term benefits of Groton Ledge CDF and Twotree Island CDF (described in #3) could be realized in eastern LIS, and by extension the entire Sound.

The NAVFAC estimates that "installation time for a CDF typically ranges from 6 to 12 months"; well within the estimated timeframe for the proposed project in the Thames River.[127]

DOS has determined that this alternative is consistent with both the LIS CMP and Town of Southold policies.

3. Twotree Island Confined Disposal Facility (CDF) [128]

Similar to the Groton Black Ledge alternative described above, the DMMP identified Twotree Island as an available disposal location as a CDF for dredged material from the Thames River and Eastern Long Island Sound, both located in the "New London Area Dredging Center" as geographically classified in the DMMP.[129] The proposed Twotree Island CDF site is located 7 miles (~35,300 ft)[130] from the Electric Boat project site and its capacity is 2,966,200 cubic yards for fill and 433,800 cy for cap.[131] The DMMP cost for this alternative was listed as $109/CY.[132]

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[126] See Naval Facilities Engineering Command (NAVFAC), Engineering and Expeditionary Warfare Center at: https://www.navfac.navy.mil/navfac_worldwide/specialty_centers/exwc/products_and_services/ev/erb/tech/rem/cdf.html

[127] See the following NAVFAC publications for additional guidance in implementing the CDF alternatives: IMPLEMENTATION GUIDE FOR ASSESSING AND MANAGING CONTAMINATED SEDIMENT AT NAVY FACILITIES, Prepared by SPAWAR Systems Center (SSC) San Diego (January 2005), available at: https://itrcweb.org/contseds-bioavailability/References/ug-2053-sed-rev-2.pdf

[128] See LIS DMMP p. 5-366

[129] See LIS DMMP, p. 5-50; see also Figure 1, p. 30 of this decision

[130] See fn 11, supra. The ~35,300 ft distance from the proposed dredged location in the Thames River to the Twotree CFD site is well within the distance that projects for the U.S. Navy base in Newport News, VA transports dredged material to the Management Area CIDMMA through submerged pipelines placed outside of the Federal navigation channel at a distance of approximately 38,000 feet from the Elizabeth River branch and approximately 45,000 feet from the Southern Branch's Lower reach.

[131] LIS DMMP at p. 5-366, Table 5-265

[132] See LIS DMMP Table 5-36, pg. 5-51

The applicant's alternatives analysis supports that the presumptive classification of both suitable and unsuitable dredged materials may be placed at the Twotree Island CDF. The DMMP also includes the Twotree Island CDF as an alternative for other eastern LIS projects consisting of silt material, such as Pawcatuck River and Inner Little Narragansett Bay Federal Navigation Project Maintenance beginning in 2021. The inclusion of the Twotree Island CDF for disposal availability commencing in 2021 strongly supports that this alternative could be sponsored and available by 2021 and within the timeframe of this proposed project. Nothing precludes Electric Boat from sponsoring or co-sponsoring this project and obtaining permits for the purpose of long-term maintenance of the Electric Boat facility and Naval operations. The NAVFAC estimates that "installation time for a CDF typically ranges from 6 to 12 months"; well within the estimated timeframe for the proposed project in the Thames River.[133]

DOS has determined that this alternative is consistent with both the LIS CMP and Town of Southold policies.

4. Rhode Island Sound Disposal Site (RISDS)[134]

Electric Boat asserted in its May 2018 Permit Application to the Corps that "[Electric Boat] anticipates disposal of the dredged sediment via ocean-going dump scows at an authorized dredge material location, preferably the Eastern Long Island Sound Disposal Site (ELDS) or the Central Long Island Sound Disposal Site (CLDS)."[135] The applicant's planned use of "ocean-going" scows reaffirms the availability of RISDS as a reasonable and available alternative.

The Rhode Island Sound Site (40 C.F.R §228.15(b)(3)) is located in the Atlantic Ocean approximately 7.5 nautical miles east of the northern end of Block Island, Rhode Island, 31 nautical miles from the eastern entrance to the Long Island Sound, and 44 nautical miles from the New London Harbor. It covers a one square nautical mile area that ranges between 118 and 128 feet deep, with an average depth of 122 feet. A total of 5.3 million cubic yards of dredged material has been placed at this site since 2003, and it has an estimated remaining capacity of 16.5 to 19.5 million cubic yards.[136]

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[133] See the following NAVFAC publications for additional guidance in implementing the CDF alternatives: IMPLEMENTATION GUIDE FOR ASSESSING AND MANAGING CONTAMINATED SEDIMENT AT NAVY FACILITIES, Prepared by SPAWAR Systems Center (SSC) San Diego (January 2005), available at: https://itrcweb.org/contseds-bioavailability/References/ug-2053-sed-rev-2.pdf

[134] Site Designation: 40 CFR §228.15(b)(3) at https://www.law.cornell.edu/cfr/text/40/228.15
Site SMMP: https://www.epa.gov/sites/production/files/2015-10/documents/r1_rhode_island_smmp_final.pdf

[135] See CTDEEP & USACE Joint Permit Application, South Yard Facilities Master Plan, General Dynamics Electric Boat, Groton, Connecticut (May 2018), p. 2. http://www.dos.ny.gov/opd/programs/pdfs/Consistency/F-2019-0672-ElectricBoatConsistencyCertification.pdf. The joint application is for the following federal permits and approvals: Rivers and Harbors Act, 33 USC 403, Clean Water Act, Section 494, 33 USC 1344, Marine, Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1433; Regulatory Programs of the Corps of Engineers 33 CFR 320-332.

[136] Army Corps, Long Island Sound Dredged Material Management Plan (Dec. 2015), section 4.9.4 at 4-31. More information regarding the location of site can be found on the Disposal Area Monitoring System (DAMOS) website at https://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Disposal-Sites/Rhode-Island-Sound/

DOS re-assessed this alternative based upon the recommendations included in the LIS DMMP to provide an accurate cost for disposal at ELDS and RISDS. Electric Boat's application submitted a cost for disposal at the ELDS of $13/CY, presumably based on disposal cost for the closed New London Disposal Site (NLDS), although the applicant's proposed cost for ELDS disposal does not include costs to environmental or commercial impacts. Although Electric Boat did not include an estimated cost for the RISDS location in its submission, the DMMP had reported costs for the RISDS disposal at $41/cy based on a hypothetical dredge location. Using the cost estimating tool presented in the DMMP[137] for disposal of material from the Electric Boat site at the ELDS, DOS has recalculated the estimated cost of disposal at ELDS at $25.28/CY, and disposal at the RISDS at $33.86/CY. Based on DOS' analysis, the difference in cost is far less that the estimates presented by Electric Boat, and it appears that the differential between the two alternatives (ELDS and RISDS) is 30% of, or more than 2/3 less than, the differential provided by Electric Boat's analysis.

CLDS (above) and RISDS are alternatives that are both available and feasible.[138]. DOS has determined that disposal of the Electric Boat's dredged material at RISDS would have no effect on the uses and resources of the NYS Coastal Area and that this alternative is consistent with both the LIS CMP and Town of Southold policies.

5. Other alternatives that warrant additional evaluation:

There are upland facilities or sites that were individually considered and dismissed by the applicant as unable to accept the entire volume of the proposed action. DOS has not evaluated the feasibility of these sites and has not found that they would be consistent with the NYS CMP; however, it would be reasonable for the applicant to expand its analysis of these upland sites to consider utilizing a combination of sites which cumulatively could address the project's needs.

a. Processing at P&W Railroad Company Facility - The P&W facility was identified in the applicant's alternatives analysis and dismissed due to the need for permitting of the use on-site. This facility might be used for offloading of dredge material to upland options. P&W Railroad was bought out by Genesee & Wyoming Inc. (G&W) in 2016, who also owns a similar site in Norwich, CT.

   Based on additional discussions with G&W, they still own this site and would be willing to lease it out if there will be a use of the railway, and possibly at a higher price even if there is no need for the railway. The site is on the banks of the river and accessible by barge.

b. Other potential temporary staging/de-watering sites that were identified during discussions with P&W include:

[137] See LIS DMMP Technical Appendix TSD#13-LIS-DMMP-Emissions-Offsets-Costs-Tool-June2014.xlsx
[138] See generally 40 CFR § 228.5(e) ; see also 40 CFR §§ 228.15(b)(3) and (4).

1. On Electric Boat property in Groton, CT
2. WestRock paperboard mill in Montville, CT
3. Dow Chemical complex in Allyn's Point, CT
4. CT Scrap Company at 7 Wharf Road in Norwich, CT
5. City-owned parcels in Thamesville industrial area in Norwich, CT
6. City-owned parcels in New London, CT

The use of upland disposal sites in Connecticut and New York were dismissed by the applicant in part based on limited space and processing capacity. The number of possible staging/dewatering locations identified above may provide adequate capacity for some, most, or all of Electric Boat's dredged material and therefore, these options appear to be viable alternatives to placement in the ELDS.

DOS has determined that the disposal of the 890,000 cy, or any portion thereof not otherwise used beneficially elsewhere at the sites referenced above, is consistent with, or would have no effect upon, the LIS CMP and Town of Southold policies.

Conclusion

Based on the foregoing, the proposed project is not consistent with the enforceable policies 5, 6, 8, 10, and 11 of the federally approved LIS CMP and the enforceable policies 5, 6, 8, 10, and 11 Town of Southold LWRP.

Pursuant to 15 CFR Part 930, Subpart H, and within 30 days from receipt of this letter, you may request that the U.S. Secretary of Commerce override this objection. In order to grant an override request, the Secretary of Commerce must find that the proposed activity is consistent with the objectives or purposes of the Coastal Zone Management Act or is necessary in the interest of national security. A copy of the request and supporting information must be sent to the New York Department of State and to the federal permitting or licensing agency. The Secretary may collect fees from you for administering and processing your request.

If you would like to continue discussions with this office while pursuing an appeal, please call Gregory Capobianco at (518) 474-6000. If you or your client are represented by counsel, kindly have your attorney contact Mr. Capobianco for referral to our Legal Division.

Sincerely,

Kisha Santiago-Martinez
Office of Planning, Development and
Community Infrastructure

KS/jls

ecc: OCRM – Jeffrey L. Payne, David Kaiser
COE/NE – Diane Ray
COE/NY – Steve Ryba
CT DEEP – Brian Thompson
NYS DEC/Division of Marine Resources - Dawn McReynolds
NYSDEC/Region 1 – Sue Ackerman
Southold LWRP contact – Mark Terry
Woods Hole Group – Leslie Fields