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DEPARTMENT OF THE NAVY

NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

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FROM:

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Executive Summary

This Environmental Assessment (EA) has been prepared pursuant to the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality (CEQ), "Regulations for Implementing the Procedural Provisions of NEPA" (40 CFR Parts 1500-1508); and the Navy's Environmental and Natural Resources Program Manual (OPNAVINST 5090.1B). This EA has been prepared to evaluate whether the proposed action is a major federal action having significant effects on the quality of the human environment, which would require preparation of an Environmental Impact Statement (EIS), or whether the impacts of the proposed action after mitigation are less than significant, which would result in preparation of a Finding of No Significant Impact (FONSI).

extra space

Naval Submarine Support Facility (NSSF) at Naval Submarine Base New London (SUBASE), Groton, Connecticut, maintains and provides radiological support services for the nuclear-powered submarines homeported at SUBASE. Currently, NSSF operates in three separate older facilities located in or immediately adjacent to the Tames River. The main facility is the radiological support barge, a modified, 52-year-old, World War II barge moored pier-side along the river. Two shore-side facilities located in the 100-year floodplain adjacent to the waterfront provide additional support to the radiological support barge. The radiological support barge and the current shore based facilities have become increasingly costly to maintain and present operating inefficiencies and difficulties to the radiological control program t SUBASE. Therefore, the staff of Commander Submarine Force US Atlantic Fleet (SUBLANT) has identified a need to replace the aging and inefficient radiological control facilities at SUBASE and has initiated exploration of alternatives to the current operation of these facilities.

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The proposed action is the construction of a Controlled Industrial Facility (CIF), would consolidate and update the current radiological nuclear propulsion plant maintenance capabilities at SUBASE. The proposed site of this facility is a former ship maintenance ramp (marine railway) concrete ramp sloping into the Tames River at the southern end of lower base. In order to construct a facility at this site, the marine railway would be filled to equal the current existing grade at the northern end of the site thus elevating the base grade of the proposed construction site above the 100-year floodplain elevation. The total volume of fill placed waterward of a vertical plane at the High Tide Line (HTL) is 4,791 cubic yards (3,663 cubic meters) and includes 4,705 cubic yards (3,597 cubic meters) of clean aggregate fill on the upland side of the retaining wall and 86 cubic yards (66 cubic meters) of riprap on the river side of the retaining wall. The total volume of fill placed shoreward of the HTL is 1,874 cubic yards (1,433 cubic meters). Also, included in the overall project for the proposed action would be demolition of Building 91, currently used for radiological nuclear propulsion plant maintenance; demolition of Building 357, a waterfront operations building at the proposed site of construction; demolition of an electrical vault at the proposed site of construction and the partial demolition of concrete dock areas within the footprint of the proposed new facility. A hazardous waste accumulation site currently located adjacent to Building 357 would be disestablished, moved and reestablished elsewhere, as needed.

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The proposed action was selected after a through and comprehensive analysis of all practicable alternative actions. The no action alternative (the use of existing facilities) was rejected since it would only maintain status quo radiological support services at SUBASE in the current outdated and increasingly inefficient support barge and attending waterfront facilities. Alternative 1 (radiological nuclear propulsion plant maintenance at a nuclear-capable shipyard) was also rejected since this alternative would involve moving submarines to the nearest nuclear-capable shipyard for routine radiological nuclear propulsion plant maintenance an/or transporting radiologically-controlled equipment via public transportation routes to the selected shipyard. This alternative would adversely impact fleet readiness and further complicate current radiological nuclear propulsion plant maintenance procedures by shifting work from SUBASE to a remote location. Alternative 2 (radiological nuclear propulsion plant maintenance at SUBASE) proposed that radiologically-controlled equipment would be removed from submarines at SUBASE and transported to a nuclear capable shipyard via public transportation routes. This alternative was also rejected for reasons similar to those concerning Alternative 1 as it would not improve operating efficiencies at SUBASE. The proposed action was selected after rejecting the aforementioned alternatives as impracticable and after a comprehensive siting study examined all practicable construction sites at SUBASE (see Figure 3). All potential upper base sites were rejected from final consideration due to concerns for lessened security outside of the lower base, safety issues associated with the increased handling and transportation of radiologically-controlled materials from the submarines, and concerns for increased logistical inefficiencies should the CIF be located too far away from the submarines.. Six sites were examined on the lower base and the proposed site was selected based on its superior location outside identified Installation Restoration (IR) contamination sites, above the 100-year floodplain, away from the explosive safety distance arcs at the active submarine piers, and in a location that would involve only minor disruption and demolition of existing infrastructure in the extensively developed lower base.

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The proposed facility would take full advantage of all usable upland space within this spatially constricted building site. The building's footprint is configured tightly between the existing buildings and roads which surround the proposed facility on three sides. The storage and controlled areas of the proposed facility required location immediately adjacent to Barbel Road to allow transport truck access into and out of the enclose storage bay. The support area of the CIF must therefore be located on the waterward end of the building. This support area provides necessary logistical support facilities for the controlled area of the CIF. These logistical support facilities are critical and integral to the functioning of the overall facility. Essential activities located on the first floor of the support facility and requiring direct access to the controlled area include material storage areas, a health office, restrooms, a chemistry lab, mechanical and electrical rooms, and equipment calibration room, an emergency response storage room, decontamination spaces, and emergency shower facilities. Noncritical support function, e.g., offices, training rooms, classroom space, etc. Were situated on the second floor to reduce the overall building footprint and minimize filling waterward of the

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HTL. No further minimization or relocation of the support spaces was possible given the spacial restrictions of the construction site.

Table 1 on the following page summarizes and compares the impacts of each alternative in relation to the affected environment. Based on the analyses presented in this EA, the proposed action or alternatives would not significantly impact the quality of the human environment.

Table 1
Alternative Comparison Matrix

	No Action Alternative (Use of existing facilities)	**Alternative 1** (Radiological plant maintenance at a nuclear-capable shipyard)	**Alternative 2** (Radiological plant maintenance at SUBASE by a nuclear-capable shipyard)	**Proposed Action** (Build a CIF)
Terrestrial Ecology	use of existing facilities, **no impact**	use of existing facilities, **no impact**	use of existing facilities, **no impact**	current site predominantly paved, **no impact**
Topography, Geology, and Soils	use of existing facilities, **no impact**	use of existing facilities, **no impact**	use of existing facilities, **no impact**	minor changes from construction, **no significant impact**
Hydrology and Water Quality	use of existing facilities, **no impact**	use of existing facilities, **no impact**	use of existing facilities, **no impact**	minor changes from construction, **no significant impact**
Air Quality	use of existing facilities, **no impact**	increased emissions from transfers between SUBASE and Electric Boat, **no significant impact**	increased emissions from transfers between SUBASE and the nuclear-capable shipyard, **no significant impact**	increased emissions during construction of CIF and truck traffic between CIF and lower base piers, **no significant impact**
Noise Impacts	use of existing facilities, **no impact**	increased traffic on local byways from transfers between SUBASE and Electric Boat, **no significant impact**	increased traffic on local byways from transfers between SUBASE and the nuclear-capable shipyard, **no significant impact**	proposed location within industrial area (noise reduction construction techniques used for office areas), increase of noise during construction, **no significant impact**
Vegetation and Wildlife	use of existing facilities, **no impact**	use of existing facilities, **no impact**	use of existing facilities, **no impact**	predominantly paved site, minimal impact to marine environment, **no significant impact**
Land Use	use of existing facilities, **no impact**	use of existing facilities, **no impact**	use of existing facilities, **no impact**	proposed site within industrial operations of lower base and previously developed site, **no impact**
Traffic and Transportation	use of existing facilities exasperates	increase in traffic on Thames River and	increase in traffic over roads between	location off major roads of the lower

Impacts are projected to be minor and would be mitigated by the incorporation of environmental controls including:

- Standard sedimentation and erosion control measures and best management practices during construction activity
- Existing concrete marine railway to remain with a new concrete bulkhead keyed into the concrete ramp and existing bank and wall on the sides to retain fill material
- Construction of the facility above the 100-year floodplain
- Schedule delivery of materials for non peak commuter hours; provide off base parking and a shuttle service for construction workers
- Adhere to the strict guidelines of the Naval Nuclear Propulsion Program (NNPP) for radiological nuclear propulsion plant maintenance
- Clean riprap to be placed waterward of the vertical retaining wall to protect the toe of the wall. Riprap will dissipate wave energy, control turbidity and provide suitable substrate and interstitial space for macrofloa and fauna

macroflora

For the proposed action, the Navy and SUBASE would obtain the applicable regulatory permits for the construction and operation of the proposed CIF. This EA is being submitted to various Federal, state, and local agencies for review under each of the agency's review procedures for Federal projects. Federal, state, and local agencies have been contacted during preparation of this EA to inform them of the proposed action and alternatives and to solicit any concerns or issues regarding the action (see Appendix C, Correspondence). Through correspondence with the Connecticut Department of Environmental Protection (CTDEP) and the Corps of Engineers (COE), the CTDEP has been established as the lead permit processing agency for the Clean Water Act, Section 404 and the Rivers and Harbor Act, Section 10 (see Department of Army letter, Appendix C, Correspondence). Therefore, the Navy would apply for these permits directly to the CTDEP, Office of Long Island Sound Programs who would then forward the application to the COE for final approval. Permits or authorization to undertake the proposed action are described in Table 2:

Table 2
Permit Summary

Regulation	Action	Agency
Clean Water Act, Section 404	Authorization required	Army Corps of Engineers (coordinated by Connecticut Department of Environmental Protection, Office of Long Island Sound Programs)
Clean Water Act, Section 401	Authorization required	Connecticut Department of Environmental Protection, Office of Long Island Sound Programs
Coastal Zone Management Act	Coastal Consistency Determination (as part of Sections 401 review)	Connecticut Department of Environmental Protection, Office of Long Island Sound Programs

1.0 Introduction

1.1 Background

Naval Submarine Base (SUBASE), New London, Groton, Connecticut is located on the Atlantic coast midway between the cities of Boston and New York. SUBASE lies to the east of the Thames River within two Connecticut Townships, Ledyard and Groton (see Figure 1). SUBASE began as a Navy Yard in 1868 on 112 acres of land presented to the Navy by the State of Connecticut. The installation was officially designated a submarine base in 1916. Currently, SUBASE encompasses 1,412 acres of land. The lower base, the waterfront area, consists of 547 acres and includes operational and direct support facilities while the upper base consists of the remaining acres and includes housing and community support facilities.

Other Department of Defense (DoD) activities in the immediate area include the Supervisor of Shipbuilding Conversion and Repair, located at the Electric Boat Division of the General Dynamics Corporation in Groton, Connecticut and the US Coast Guard Academy, New London, Connecticut.

The mission of SUBASE is to maintain and operate facilities to support training and developmental operations of the submarine force; to provide support to submarines, submarine rescue vessels, and assigned service and small craft; to provide support to other activities of the Navy and other governmental activities in the area; and to perform such other functions as may be directed.

1.2 Purpose and Need

In order to maintain fleet readiness, periodic maintenance of Navy submarines is required. Nuclear-powered ships need radiological support facilities collocated in their homeport to provide support for radiological propulsion plant maintenance and operation. The proposed Controlled Industrial Facility (CIF) would consolidate and update current radiological propulsion plant maintenance capabilities at SUBASE. The proposed CIF would continue to support the mission of SUBASE to maintain and operate facilities to support training and developmental operations of the submarine force. Moreover, the proposed CIF would satisfy a goal of SUBASE to increase the flexibility of SUBASE to support the submarine force.

Naval Submarine Support Facility (NSSF) is responsible for the radiological nuclear propulsion plant maintenance and support services of the nuclear-powered submarines homeported at SUBASE. Currently, NSSF operations are conducted in three separate facilities: the radiological support barge, Building 91, and Building 103. This separation of operations requires multiple handling of controlled material and waste and the dedication of personnel time to the transportation of waste and materials among the facilities. Both Buildings 91 and 103 are located in the 100-year flood plain.

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radiological nuclear propulsion plant maintenance would be used. Maintenance personnel involved in the transfer operations would be trained in handling radioactive material.

The proposed CIF would be constructed on the site of a former ship maintenance ramp (marine railway), a concrete ramp sloping into the Thames River, located at the south end of the lower base adjacent to Piers 1 and 2 (see Figure 3). In order to construct a facility at this site, construction would include placement of a total volume of approximately 10,700 cubic yards (8,200 cubic meters) of clean aggregate fill material atop the concrete ramp. After filling, new grades would approximately meet existing grades around the perimeter of the ramp providing a proposed 17 feet (5.20 meter) Finished Floor Elevation (FFE) for the proposed facility. The new elevation of the facility would be above the base flood elevation. The total volume of fill placed waterward of a vertical plane at the ~~High Tide Line~~ (HTL) is 10,477 cubic yards (8,010 cubic meters) and includes 10,391 cubic yards (7,944 cubic meters) of clean aggregate fill on the upland side of the retaining wall and 86 cubic yards (66 cubic meters) of riprap on the river side of the retaining wall. Placement of fill seaward of HTL would not directly or indirectly impact any *special aquatic sites* regulated under the Clean Water Act, defined at 40 CFR 230.40 through 230.45 as wetlands, mudflats, vegetated shallows, coral reefs, riffle and pool complexes, sanctuaries, and refuges. The proposed site would require the demolition of Buildings 91 & 357, electric vault 52, and partial demolition of concrete dock areas within the footprint of the proposed new facility. Building 91 is a ---------- SF (----------SM) facility used for radiological nuclear propulsion plant maintenance. Building 357, a 1,097 SF (102 SM) waterfront operations facility currently not in use, would not be required to be relocated. Also, an approximately 120 SF (11 SM) fenced area attached to Building 357 is one of the 60 to 70 hazardous waste accumulation site on SUBASE. This accumulation site would be disestablished in compliance with the Resource Conservation and Recovery Act (RCRA) as well as the SUBASE Hazardous Waste Management Plan and reestablished as needed. With the demolition of Building 91, the site would be available for lower base parking. Also, Building 103, which would no longer be required, would be available to SUBASE for reuse. Finally, the radiological support barge, no longer being required, would be inactivated. Impacts associated with inactivation of the radiological support barge are expected to be small and would be performed in accordance with all applicable regulations.

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Reconcile per Executive Summary

The footprint of the proposed building has been configured to minimize fill impacts waterward of the HTL. The footprint of the building fully utilizes all available upland area with only the minimum required clearances maintained for fire lanes and access roads around the facility. The storage and controlled areas of the proposed CIF were situated in the northern upland areas of the proposed site in order to allow transport trucks to deliver and pickup radiological-controlled material from the CIF. The support area is an integral part of the CIF building and could not be situated on an upland portion of the proposed site due to the restricted upland acreage available at this location. The first floor of the support area contains spaces requiring direct access to the controlled area include material storage areas, a health office, restrooms, a chemistry lab, mechanical and electrical rooms, and equipment calibration room, an emergency response storage room, decontamination spaces, and emergency shower facilities.. In order to minimize fill impacts waterward of the HTL, non-critical

* Make consistent with last paragraph of pg. 2-7

radiologically

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support functions in the support facility, e.g., spaces for classrooms, offices, a training room and a lunch room were situated on a second level above the critical first floor support functions. This two floor configuration reduced fill impacts to the waters of the Tames River by approximately 689 SY (576 SM).

Thames

1.4 History of the Naval Nuclear Propulsion Program (NNPP)

1.4.1 History and Mission of the Program

In 1946, at the conclusion of World War II, Congress passed the Atomic Energy Act, which established the Atomic Energy Commission (AEC) to succeed the wartime Manhattan Project, and gave it sole responsibility for developing atomic energy. At that time, then-Captain (later Admiral) Hyman G. Rickover was assigned to the Navy Bureau of Ships, the organization responsible for Naval ship design. Rickover recognized the military implications of successfully harnessing atomic power for submarine propulsion, and that it would be necessary for the Navy to work with the AEC to develop such a program. By 1949, Rickover had forged an arrangement between the AEC and the Navy that led to the formation of the Naval Nuclear Propulsion Program (NNPP). In 1954, the nuclear submarine USS NAUTILUS put to sea and demonstrated the basis for all subsequent US nuclear-powered ship designs. In the 1970s, government restructuring moved the NNPP from the AEC (which was disestablished) to what became the Department of Energy (DOE). As the NNPP grew in size and scope over the years, it retained its dual responsibilities within the DOE and the Department of the Navy, and its basic organization, responsibilities, and technical discipline have remained as it was when first established.

Today, the NNPP continues as a joint DOE/Navy organization responsible for all matters pertaining to Naval nuclear propulsion pursuant to Presidential Executive Order 12344, permanently enacted as Public Law 98-525 (42 USC 7158). The Program is responsible for:

- The nuclear propulsion plants in over 100 US nuclear powered ships.
- Two Moored Training Ships located in Charleston, South Carolina used for Naval nuclear propulsion plant operator training.
- Radiological propulsion plant maintenance performed at six shipyards (four public and two private).
- Two DOE government-owned, contractor-operated laboratories devoted solely to Naval nuclear propulsion research, development, and design work.
- Two land-based prototype Naval nuclear reactors used for research and development work and training of Naval nuclear propulsion plant operators.

The NNPP's conservative design practices and stringent operating procedures have resulted in the demonstrated safety record of Naval nuclear propulsion plants. US Naval reactors have accumulated over 4,800 reactor years of operation and have steamed over 110 million miles without a reactor accident or any significant radiological effect on the environment.

1.4.2 Nuclear Propulsion for Navy Ships

Before the advent of nuclear power, the submarine was, in reality, a small surface ship that could submerge for only short periods of time. As it required oxygen as well as fossil fuel to operate its diesel engines, the

Have previously just used the acronyms. Need to define acronyms where initially used in report.

2.4.2 Description of the Proposed Action

The proposed CIF is an approximately 32,300 Square Foot (SF)/3,000 Square Meter (SM) multipurpose facility which would replace the existing radiological nuclear propulsion plant maintenance capabilities of the radiological support barge and its two associated buildings, Buildings 91 and 103. Structurally the facility is two connected buildings, sharing a common wall. The facility includes a 13,300 SF (1,250 SM) controlled area, a 11,300 SF (1,050 SM) support area, and a 7,700 SF (700 SM) storage area. Radiological nuclear propulsion plant maintenance activities would be conducted in the one and two-story portions of the building while support activities would be conducted only in the two-story portion of the building. The nonradiological area would support operations in the radiological portion of the facility, and would be made up of personnel support areas such as restrooms, offices, locker rooms, and non-contaminated material storage. In addition, there are spaces for access control to the radiological areas as well as training and classroom areas.

The proposed site of the CIF, as determined through the above discussed Siting Study, is a former ship maintenance ramp (marine railway), a concrete ramp sloping into the Thames River, located at the south end of the lower base. In order to construct a facility at this site and to elevate the facility to above the base flood elevation, construction would include placement of a total volume of approximately 10,700 cubic yards (8,200 cubic meters) of clean aggregate fill material atop the concrete ramp. After filling, new grades would approximately meet existing grades around the perimeter of the ramp providing a proposed 17 feet (5.20 meter) Finished Floor Elevation (FFE) for the proposed facility. Placement of 731 cubic yards (559 cubic meters) of clean aggregate fill material atop the concrete ramp would be seaward of ~~mean high water (MHW)~~ HTL. Placement of fill seaward of ~~MHW~~ HTL would not directly or indirectly impact any *special aquatic sites* regulated under the Clean Water Act, defined at 40 CFR 230.40 through 230.45 as wetlands, mudflats, vegetated shallows, coral reefs, riffle and pool complexes, sanctuaries, and refuges.

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Also, construction of the CIF at the proposed site would require the demolition of Building 357, electric vault 52, and partial demolition of concrete dock areas within the footprint of the proposed new facility. Building 357, a 1,097 SF (102 SM) waterfront operations facility, currently not in use, would not be required to be relocated. Also, an approximately 120 SF (11 SM) fenced area attached to Building 357 is one of the 60 to 70 hazardous waste accumulation sites on SUBASE. This accumulation site would be disestablished in compliance with the Resource Conservation and Recovery Act (RCRA) as well as the SUBASE Hazardous Waste Management Plan and reestablished as needed. As it would no longer be required, Building 91 would be demolished as part of the proposed action. The site would then be available for lower base parking. Finally, Building 103, which would no longer be required, would be available to SUBASE for reuse.

Need to be consistent with statement on pg. 1-8, last paragraph.

The footprint of the proposed building has been configured to minimize fill impacts waterward of the HTL. Barbel Road has been realigned at the northern end of the facility to provide more useable upland area for construction and the footprint of the building fully utilizes all available upland area with only the minimum required clearances maintained for fire lanes and access roads around the facility. The storage and controlled areas of the proposed CIF were situated in the northern upland areas of the proposed site in order to allow

restrooms

transport trucks to deliver and pickup radiological-controlled material from the CIF. The support area is an integral part of the CIF building and could not be situated on an upland portion of the proposed site due to the restricted upland acreage available at this location. The first floor of the support area contains spaces for material storage, personnel decontamination, emergency response and health facilities, equipment calibration, chemistry labs and mandated elevators and restroom. These functions provide direct and integral support to the controlled area and can not be situated apart from he CIF. In order to minimize fill impacts waterward of the HTL, non-critical support functions in the support facility, e.g., spaces for classrooms, offices, a training room and a lunch room were situated on a second level above the critical first floor support functions. This two floor configuration reduced fill impacts to the waters of the Tames River by approximately 689 SY (576 SM).

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2.5 Comparison of Alternatives

The proposed action would have the following beneficial environmental and operational effects.

- Current radiological nuclear propulsion plant maintenance functions would be consolidated and updated to a single facility designed specifically for that function and incorporating construction techniques that minimize the potential of exposure to workers, the general public, and the natural environment.
- Locating the proposed CIF at SUBASE would limit the amount of radiologically controlled material and waste that would be transported over public roads. Off-base transfers would be limited to the removal of radioactive and mixed (radiological and hazardous) waste which has been processed and packaged in accordance with all applicable regulations.
- The proposed location of the CIF on the waterfront would maintain the operational efficiency gained from proximity to serviced submarines.
- The proposed location of the CIF would alleviate existing traffic congestion by consolidating existing plant maintenance operations into one facility.

The proposed action would impact terrestrial resources; topography, geology, and soils; hydrology and water quality; and air quality related to construction activities. All impacts are anticipated to be minor as discussed in Section 4.0, Environmental Consequences, of this document.

There are several important comparisons that can be made between the various alternatives. With respect to the environmental impacts associated with construction of the proposed CIF, Alternatives 1 and 2 are desirable because these impacts would be avoided through the use of existing facilities. With respect to operational efficiency, the proposed action is desirable because operations would be conducted in one facility dedicated only to radiological propulsion plant maintenance in the submarine's homeport. Since increased physical separation of interrelated maintenance activities makes it much harder to coordinate maintenance and increases the risk for schedule delays and cost overruns, the proposed action is the most desirable option.

Moreover, weapons handling involves the use of a crane which would normally be used for other maintenance activities. Therefore, the schedules for other maintenance functions would be affected. For certain types of weapons, storage space at SUBASE is insufficient; therefore, these weapons would have to be shipped to Yorktown, VA, where proper, adequate storage would be available.

Traffic on local waterways would increase under Alternative 1 because of the increased submarine movements between SUBASE and the local shipyard. Traffic on local roads would increase under both Alternatives 1 and 2 because of the transfers of controlled material and wastes. Additionally, under Alternative 1, personnel would have to travel between SUBASE and Electric Boat for all non-radiological nuclear propulsion plant maintenance normally conducted while a submarine is in port. This would also increase the time necessary to accomplish these activities. These factors complicate the use of Electric Boat facilities; increasing costs and limiting operations.

The proposed action is the preferred alternative. The proposed action minimizes the potential for exposure of the general public and the natural environment to radiologically controlled materials. Most controlled material movements would be internal to SUBASE. Stringent radiological controls are involved in transfer operations and CIF operations to minimize exposure. Transfers of controlled material off-base would be limited and would be undertaken in accordance with DOT regulations. The proposed site of the CIF provides significant advantages over any of the other potential sites considered.

The site was selected based on the following advantages:

- minimal impact to private vehicle parking;
- compatibility with adjacent structures;
- displaced functions can be readily relocated at low cost;
- adequate access and efficient transfer of radioactive waste and materials because of location away from the congested area of the lower base; and
- minimal impact to weapons handling

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Most of the lower base falls within the 100- and 500-year floodplain; however, the southern sections of the lower base are at higher elevations. A portion of the proposed site lies within the 100- and 500-year floodplain. With normal leveling of the site during construction, the proposed site would be over the 500-year floodplain. Therefore, the proposed CIF has minimal potential to increase flood hazard impacts. All utility lines are available across Amberjack Road with minor modifications for the extension of lines. Based on the analyses in this EA, no significant impacts are projected.

pg 55/176 ln 25,26,27
Do you want to retain these references to 500-year floodplain?

Boat Division of General Dynamics facilities are located on the east bank. City Coal Company, Naval Undersea Warfare Center (NUWC), New London City and State Piers occupy the west bank of the river. North of the I-95 bridge are SUBASE, the US Coast Guard Academy, a Northeast Utilities fossil fuel power station, and Dow Chemical Company.

The river receives significant waterborne traffic at marine terminals located along its entire length and is also a major conveyor of wastewater and industrial discharge. The Norwich Wastewater Treatment Facility (WWTF) is the dominant discharge source in the upper river. The Montville Power Plant, Montville WWTF, Dow Chemical, AES Thames Cogeneration Plant and SUBASE power plant are the most significant sources in the mid-river reach. Pfizer Chemical and Electric Boat are the principal dischargers in the lower river. Non-point discharges from road, agricultural, and other runoff sources occur throughout the river's drainage basin and account for a significant source of water, sediment and chemical constituents in the river.

The Thames River is utilized by recreational boaters and fishers. Numerous marinas line both banks of the river from New London harbor to the City of Norwich. Shellfish beds are located in the area of Mamacoke Island and in Ledyard, north of the Naval Submarine Base as well. These act as relay beds for the first several years and then oysters and hard-shelled clams are transported to purging beds outside the river for depuration. Several parks and beaches including Ocean Beach State Park, Harkness Memorial Park, and Bluff Point State Park are located at or near the mouth of the Thames River.

Typical of most east coast estuaries, the Thames River experiences a semi-diurnal tide; the tidal flow progresses up the river relatively quickly. High tide arrives at the Smith Cove entrance in less than one minute relative to the National Ocean Service (NOS) station at the State Pier in New London while Norwich sees a 13 minute delay relative to New London (NOS, 1989). Low tide occurs at Smith Cove 10 minutes after the State Pier and occurs at Norwich 25 minutes after the State Pier. The tidal range also varies somewhat. At Smith Cove, it averages about 96 percent (2.5 ft/ 0.76 m) of the State Pier mean of 2.6 ft /0.79 m. At Norwich, it increases to 115 percent (2.7 ft /0.82 m) relative to New London. Spring tide range at New London averages 3.0 ft (0.91 m).

Currents in the Thames River are primarily tidal driven except at or near the surface where the freshwater river discharge can be strong enough to offset the flood tide flow at times (M&E, 1991, ASA 1991b). As is typical in estuarine circulation, the upper meters exhibit mean downstream flow and the lower meters exhibit upstream flow. The tidal current amplitude increases from New London to Montville. In general, the upper meters show a similar flood and ebb magnitude indicating that the flooding period is approximately the same as the ebbing period. For the lower meters the ebb period is longer.

3.1.3.3 Water Quality

Under the Connecticut water quality criteria, the Thames River is classified SB. The uses defined as suitable for SB waters include swimming, harvesting of shellfish, certain fish and wildlife habitat, certain recreational activities, agricultural, and industrial uses. In essence, an SB classified water body should be suited to balance

pg61/176 ln 18

the needs of industrial and recreational users. These criteria, however, are not currently met because of periodic high bacteria levels and low dissolved oxygen in the lower saline layer in the upper reaches of the river (Black & Veatch 1991).

In addition to water quality data from point source discharge facilities authorized under the National Pollution Discharge Elimination System (NPDES) Program, occasional intensive water quality data has been collected in the channel. The State of Connecticut Department of Environmental Protection (CT DEP), with the assistance of technical consultants, has been developing a model of the Thames River. The model would be used as a tool to predict environmental impacts caused by changes in riverine inputs, depths and other variables. Water quality data for the Thames River near SUBASE exists. One water sample collected at Pier 32 in 1991, revealed no detectable polyaromatic hydrocarbons and low metal levels. Total suspended solids were recorded at 14 mg/l. Ambient concentrations of several metals approached or slightly exceeded EPA water quality criteria.

3.1.3.4 Floodplain Areas

Flood studies and mapping prepared by the Federal Emergency Management Agency (FEMA) define those areas along the Thames River that are prone to flooding during a 100- and 500-year storm event. Also, FEMA has designated areas adjacent to the Thames River as V13 zones. This indicates that areas below 13 feet in elevation (based on National Geodetic Vertical Datum (NGVD))) may be susceptible to impacts from wave action in a storm event.

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Flood hazard data for the proposed construction site is referenced to Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS) compiled by FEMA, as well as SUBASE Public Works Department mapping and local benchmark elevations for SUBASE and surrounding area. According to the most current FIS for the area (Town of Groton, February 15, 1984), the 100-year and 500-year flood elevations on the southern portion of SUBASE are 10.8 feet (3.3 meters) and 13.5 feet (4.1 meters) NGVD, respectively.

SUBASE uses North American Vertical Datum of 1988 (NAVD 88) for essentially all siting, mapping and design purposes. A detailed topographic survey was prepared for the proposed construction site in November of 1995 (RMM, 1995). Elevations and contours depicted on the site survey map (see Figure 7) are referenced to NAVD 88 and existing SUBASE control monuments.

A data conversion from NGVD to NAVD is required to determine floodplain limits for siting the proposed facility. A uniform correction factor of approximately 1 foot (actual ~ 0.955 feet/0.3 meters) can be used for most areas throughout SUBASE to convert NAVD to NGVD. In order to conform to FEMA elevational data (NGVD) from FIRM and FIS sources, 1 foot (0.3 meters) must be added to the elevations as shown on the topographic survey (SUBASE datum). NAVD 88 elevations of 9.8 feet (3.0 meters) and 11.5 feet (3.5 meters) NAVD, respectively, are indicated as the 100-year and 500-year flood elevations. The V-zone includes all areas below 12.0 feet (3.7 meters) NAVD in elevation. A summary follows in Table 3:

 pg 62/176 ln 22, 33 Do you want to retain references to 500-year flood elevation?

Table 3 Summary of Floodplain Data		
	NGVD	NAVD 88
100-yr (A-zone) flood elevation	10.8 ft (3.3 m)	9.8 ft (3.0 m)
500-yr (B-zone) flood elevation	13.5 ft (4.1 m)	12.5 ft (3.8 m)
V-zone elevation	13.0 ft (4.0 m)	12.0 ft (3.7 m)

add hyphen

Most of the lower base along the Thames River is in both the 100-and 500-year floodplain, however, the more southern sections are at somewhat higher elevations. As a result, the only part of the proposed building site that lies within the 100-year floodplain is a portion of the marine railway, the sloping concrete ramp. Also, a portion of the site north of the marine railway lies within the 500-year floodplain. The remainder of the site is above both the 100-and 500-year floodplains.

add hyphen

3.1.3.5 Subsurface Hydrology

Groundwater in the southeastern part of the state, generally, is readily available and is obtained from stratified drift deposits, glacial till areas or bedrock. In the lower elevations of SUBASE, groundwater depth is shallow, sometimes less than 5 feet (1.5 meters) near the Thames River. At the higher elevations, throughout most parts of SUBASE, the depth to groundwater is typically about 10 feet (3 meters) from the surface. Groundwater on SUBASE is classified as GA and GB. The GA designation applies only to limited areas within northern portions of SUBASE; the remaining areas are classified as either GB or GB/GA. These designations are summarized in Table 4.

Currently, the CT DEP is re-evaluating groundwater resources on SUBASE. It is anticipated that groundwater on the entire SUBASE will be reclassified as GB following completion of CT DEP investigations.

At low tide, groundwater flows west toward the Thames River. At high tide, groundwater flows in an easterly direction to a point 300 feet (91.4 meters) inland where it encounters resistance from groundwater flowing west towards the river from upland sources. Thus, a small portion of the aquifer at the lower base ebbs and flows with the tide. This tidal effect diminishes with distance from the river (Atlantic Environmental 1992).

Soils and groundwater at several areas of SUBASE have been contaminated by historic Navy disposal practices. Investigations are continuing to ascertain the extent and nature of contamination. A management plan is in place and remediation of several of these sites has begun. No groundwater resources have been developed for domestic/potable water sources.

pg 63/176 ln 6, 8, 11, 12

Do you want to retain references to 500-year flood elev. & floodplain?

4.0 Environmental Consequences

4.1 Natural Environment

4.1.1 Terrestrial Ecology

4.1.1.1 No Action Alternative and Alternatives 1 and 2

Radiological nuclear propulsion plant maintenance activities would take place in existing facilities under these alternatives. No impact on terrestrial resources would result.

4.1.1.2 Proposed Action

The proposed site of the CIF consists of paved area and the former marine railway. Few terrestrial resources are present at the proposed site. Therefore, no impact on terrestrial resources would result.

4.1.2 Topography, Geology, and Soils

4.1.2.1 No Action Alternative and Alternatives 1 and 2

Radiological nuclear propulsion plant maintenance activities would take place in existing facilities under these alternatives. No impacts on topographic, geologic, or soil resources would result.

4.1.2.2 Proposed Action

Permanent impacts on local topography and geology would result from the construction process as construction activities modify existing land forms. Soil impacts such as soil disturbance and soil loss because of erosion may result during the construction process. The proposed project site is a fully developed paved site. Much of the construction would take place without excavating or removing existing impervious surface material, thereby, reducing opportunities for soil erosion to occur.

Minor topographic and geologic changes would result from construction of the proposed CIF. Pile foundations are required for the proposed CIF to minimize topographic and geologic disturbances. Grading the site would be required to accommodate the building and associated paved areas, resulting in minor, temporary soil disturbance. All grades would be stabilized and within accepted minimums and maximums. A sedimentation and erosion control plan would be prepared for the proposed project. Standard erosion and sedimentation measures which would be incorporated include:

- Stabilization of building construction areas, graded areas, paved areas, and trenching conducted for utilities using filter fabric and/or hay bales.
- Installation of a floating silt curtain in the open water adjacent to the building site to control sedimentation and turbidity in the Thames River
- Revegetation of any exposed areas of the site as soon as possible after soils are disturbed.

Construction of the proposed CIF would require placement of clean aggregate fill material atop the existing concrete ramp in order to level the site, thus elevating the structure to above the base flood elevation. A new concrete bulkhead, keyed into the existing concrete ramp on the bottom and into the existing bank and wall on the sides, is proposed to retain the fill material. Therefore, no material removal or disturbance of the river bed is

one word

pg 85/176 ln 34

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proposed. The total volume of fill placed waterward of a vertical plane at the HTL is 4,791 cubic yards (3,663 cubic meters) and includes 4,705 cubic yards (3,597 cubic meters) of clean aggregate fill on the upland side of the retaining wall and 86 cubic yards (66 cubic meters) of riprap on the river side of the retaining wall. The total volume of fill placed shoreward of the HTL is 1,874 cubic yards (1,433 cubic meters). After filling, new grades would approximately meet existing grades around the perimeter of the ramp, hence leveling the site. The proposed Finished Floor Elevation (FFE) of the facility is 17 feet (5.20 m) which would be above the 500-year floodplain. To facilitate the driving of support piles for the facility, the existing concrete marine railway will be rubblized in place. The resulting concrete rubble will remain on-site and will eventually be covered with clean aggregate fill material in order to level the site for construction of the facility. No disturbance to the Tames River is proposed in this action and no adverse impacts are expected.

Do you want to retain reference to 500-yr floodplain?

Thames

4.1.3 Hydrology and Water Quality

4.1.3.1 No Action Alternative

Radiological propulsion plant maintenance activities would continue as is done currently; therefore, no new impacts would result. However, the continued use of the radiological support barge would result in higher repair and maintenance costs and operational inefficiencies. The Navy has successfully operated the radiological support barge at SUBASE without impact to the environment. Therefore, continued use of the radiological support barge would be expected to have no impact on the hydrology and water quality of the environment.

4.1.3.2 Alternatives 1 and 2

Radiological nuclear propulsion plant maintenance activities would take place in existing facilities for these alternatives. No impacts would result.

4.1.3.3 Proposed Action

Potential impacts on water resources would result from increased sedimentation of water bodies from soil erosion during construction activities, increased turbidity, and introduction of contaminants to water bodies from soil erosion and surface runoff. Temporary impacts on water quality resulting from construction activities at the construction site include increased sedimentation and turbidity from soil erosion. Sedimentation and erosion control measures as discussed in Section 4.1.2 would be incorporated during the construction process to mitigate sedimentation increases and to comply with the state erosion and sediment control ordnance. A storm water management plan would be prepared for the proposed project to comply with the state storm water management ordnance. Storm water discharges from the proposed CIF roof and associated parking and circulation after construction would be surface runoff. Temporary dewatering, with sandbags or by other appropriate methods, would be required during installation of the aforementioned bulkhead. Any temporary impacts from dewatering would be expected to be negligible. No radioactivity would be discharged to the storm water or sanitary collection systems. A recycling process returns any radioactive contaminated water to the submarine (see Section 3.2.8.2.1, Control of Radioactive Surface and Liquid Contamination).

A portion of the site falls within the 100 and 500-year floodplain. By normal leveling during construction, the site would be over the 500-year floodplain. Therefore, the proposed action has minimal potential to increase flood hazard impacts. The Building 91 area will be used only for parking following demolition of the structure. No new structures are planned and elevations would remain substantially the same as under existing conditions. No significant impacts to hydrology or water quality would result.

4.1.4 Air Quality

4.1.4.1 No Action Alternative

Radiological nuclear propulsion plant maintenance activities would continue in existing facilities under this alternative. No changes in existing emissions would result.

4.1.4.2 Alternatives 1 and 2

Radiological nuclear propulsion plant maintenance activities would take place in existing facilities under these alternatives. No direct emission increases would result. Vehicles used for the transfer of controlled materials between SUBASE and a nuclear-capable shipyard would result in the emission of ozone-depleting substances under these alternatives. The number of transfers would vary from day to day based on the number of submarines in port and the nature of the maintenance upkeeps. No significant impacts on air quality would result.

Can upkeep be used in a plural form?

4.1.4.3 Proposed Action

An analysis of the proposed action was conducted to determine the applicability of the CAA General Conformity Rule. Air pollutant emissions associated with the proposed action originate from truck traffic between the piers and proposed CIF and construction related equipment emissions. No other air pollutant sources emitting nonattainment pollutant precursor compounds are reasonably foreseeable for the proposed CIF. Although the proposed action would result in a slight increase over existing emissions due to the aforementioned associated emissions, no significant impact to air quality would result as described in the following paragraphs.

Emissions for the proposed CIF project with associated demolition are divided into construction related activities and operation categories. Construction related emissions occur and cease before emissions for CIF operations start. Therefore, the emissions for each category are not cumulative. Results of the emission analysis are summarized in Table 5. Nonattainment pollutants would be emitted from internal combustion engines powering construction equipment during the demolition, site preparation, and building construction phases of the proposed CIF. For purposes of this analysis, construction equipment engine emissions are assumed to occur uniformly during a two-year period.

Construction equipment powered by internal combustion engines, typically diesel fueled, are bulldozers, backhoes, graders, dump trucks, general purpose trucks, pile drivers, and paving equipment. Best engineering estimates were used to estimate the number of pieces of equipment needed to complete construction activities. Emission factors for heavy-duty diesel equipment (EPA 1991) were used with an estimate of 50 gallons of diesel fuel consumption per piece of equipment per day of active use to determine emissions. The pile driver is estimated to consume 100 gallons of diesel fuel per day.

pg 87/176 ln 1,2 Do you want to retain these references to 500-yr floodplain?

4.1.6.2 Proposed Action

Previous development of the site area has, in effect, eliminated all evidence of terrestrial vegetative and wildlife habitat, both at the proposed CIF construction site and Building 91. The CIF site adjoins the Thames River; therefore, installation of the bulkhead and placement of fill material atop the existing concrete ramp (marine railway) has the potential to affect aquatic resource features. The concrete marine railway would remain in place to minimize any impacts to the marine environment. Also, the fill material would be placed atop the existing concrete. No material removal or disturbance of the river bed (riverbed) is proposed. The total volume of fill placed waterward of a vertical plane at the High Tide Line (HTL) is 4,791 cubic yards (3,663 cubic meters) and includes 4,705 cubic yards (3,597 cubic meters) of clean aggregate fill on the upland side of the retaining wall and 86 cubic yards (66 cubic meters) of riprap on the river side of the retaining wall. The total volume of fill placed shoreward of the HTL is 1,874 cubic yards (1,433 cubic meters).

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The state's Natural Diversity Data Base notes the Thames River as a habitat area for the state threatened Atlantic sturgeon (*Acipenser oxyrhynchus*). According to the records, this fish was known to exist in the river in the vicinity of SUBASE. However, it has been many years since an individual of the species has been observed in the Thames River. Further, because no potential habitat exists in or near the area to be filled, no impacts are anticipated. Similarly, no habitat areas for the winter flounder (*Pleuronectes americanus*), a commercially important species, exist in or near the project. This species would remain unaffected by the proposed action.

Temporary effects of erosion and sedimentation during construction would be minimized and mitigated through strict adherence to proper erosion and sediment control guidelines and best management practices. Temporary dewatering (by placement of sandbags or other appropriate methods) would be required during installation of the bulkhead. Any temporary impacts associated with bulkheading and backfill would be expected to be negligible. Placement of fill material, as well as other aspects of the project, is expected to have no permanent impact on either the aquatic or terrestrial environments since all fill material would be placed atop existing concrete and only a minimal amount of fill (731 cubic yards/559 cubic meters) would be placed seaward of ~~MHW~~ HTL.

need to reconcile fill volume per Executive Summary and use HTL.

4.2 Manmade Environment

4.2.1 Land Use

4.2.1.1 No Action Alternative and Alternatives 1 and 2

Radiological nuclear propulsion plant maintenance activities would take place in existing facilities under these alternatives. No land-use impacts would result.

4.2.1.2 Proposed Action

The proposed CIF site is located within the waterfront operations area of the lower base. This site is compatible with existing site and surrounding land uses within the industrial operations area of SUBASE. No significant impacts on land use would result from the proposed action.

4.2.2 Traffic and Transportation

4.2.2.1 No Action Alternative

If the status quo is maintained, traffic congestion of the lower base would continue without the needed alleviation. Currently, the transportation of controlled material and waste from the radiological support barge to Building 91 occurs along Albacore Road, a major road of the lower base. Also, the staging, shipping area, and truck dock of Building 91 do not allow sufficient area for handling of waste to be disposed at the current level of generation and parking of trucks for loading waste. Trucks must park in Albacore Road, blocking traffic on a major road. These activities exasperate congestion of lower base traffic. No new impacts would result.

4.2.2.2 Alternative 1

Under Alternative 1, submarines would be transported to the local nuclear-capable shipyard for radiological nuclear propulsion plant maintenance. Limited radiological nuclear propulsion plant maintenance would be performed at SUBASE on board the submarines. Controlled materials would be transported to the shipyard over public roads for maintenance and processing. This alternative would result in an increase in boat traffic on the Thames River between SUBASE and Electric Boat. Two tugboats would be required to tow the boats to the shipyard. For the transfers of controlled materials over public roads, controlled material would be transferred in properly-equipped vehicles and accompanied by qualified workers trained in the transportation and handling of radiologically controlled material. Therefore, no significant impacts to traffic and transportation are expected from this alternative.

4.2.2.3 Alternative 2

Under Alternative 2, controlled materials would be transported to a nuclear-capable shipyard over public roads for maintenance and processing. Controlled material would be transferred in properly-equipped vehicles and accompanied by qualified workers trained in transportation and handling of radiologically controlled material. Therefore, no significant impacts to traffic and transportation are expected from this alternative.

4.2.2.4 Proposed Action

The proposed CIF site is away from the congested area of the lower base and has good access off Amberjack Road. Therefore, impacts to traffic and transportation during normal CIF operations would be minimal. The potential for traffic congestion would occur during construction activities of the proposed CIF and demolition of Building 91. With the incorporation of certain measures which could be implemented during construction activities, impacts would be minimal. These measures include:

- providing shuttles to the construction site for workers from a remote parking site so additional parking would not be necessary at the construction site; and
- requesting delivery of materials during non peak commuter hours and using designated routes for deliveries to the construction site.

Various measures would be analyzed prior to the start of construction activities, and feasible measures would be taken which would alleviate traffic congestion during construction activities. After demolition, the site of Building 91

Sections 401 and 404: Section 404 (33 USC. §1344) regulates the discharge of dredge or fill material to the waters of the United States, which includes wetlands and other special aquatic sites. The Army Corps of Engineers is the permit granting authority for any such activity. Through correspondence with the Connecticut Department of Environmental Protection (CTDEP) and the Corps of Engineers (COE), the CTDEP has been established as the lead permit processing agency for the Clean Water Act, Section 404 (see Department of Army letter, Appendix C, Correspondence). The total volume of fill placed waterward of a vertical plane at the ~~High Tide Line~~ (HTL) is 4,791 cubic yards (3,663 cubic meters) and includes 4,705 cubic yards (3,597 cubic meters) of clean aggregate fill on the upland side of the retaining wall, thus elevating the proposed structure to above the base flood elevation and leveling the site for construction. No wetlands have been identified within the project area.

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Section 401 (33 USC. §1341) requires individual states to issue water quality certification or a waiver prior to issuance of a permit under Section 404. Authorization to undertake the proposed activities would be required under both Section 404 and Section 401.

Section 402: Section 402 sets forth the regulatory criteria, guidelines and limitations of the NPDES program; principally, the program regulates industrial sources, certain storm water conveyances and municipal treatment discharges. CT DEP ensures compliance with Federal mandates through the State Pollutant Discharge Elimination System (SPDES). As an industrial activity, discharges associated with the new process facility must be addressed within the context of the NPDES/SPDES permit program. To achieve full compliance with both this section and the provisions of Section 301, the permittee would be responsible for implementing appropriate controls and management practices. Storm water discharges regulated under Section 402 are covered under permitting for the entire base. Storm water discharges from the proposed CIF would comply with the existing permit conditions. No discharges of radiologically controlled liquids would be made from the proposed CIF. Water processed within the proposed CIF would be returned to the nuclear-powered submarines.

4.4.4 Executive Order 11988, Floodplain Management

Under Executive Order (EO) 11988, Federal agencies are directed to take appropriate action to minimize flood hazards and impacts resulting from structural siting or other modifications to floodplains. Both long-term and short-term effects are to be evaluated. Construction activities are proposed within the 100-year and 500-year floodplain; however, with normal leveling of the site during construction, the CIF would be sited above both the 100-year and 500-year flood elevations. Compliance with EO 11988 requires review of the proposed project by the appropriate agency, in this case, the CT DEP Office of Long Island Sound Programs (OLISP).

4.4.5 Coastal Zone Management Act

The federal Coastal Zone Management Act enabled the coastal states to develop and implement regulatory guidelines to ensure appropriate protection and compatibility of uses within their coastal zones. The Connecticut Coastal Management Act ((CCMA) C.G.S. §22a 90-112) establishes policies for resource protection and review procedures applicable to proposed development within coastal areas. Federal land resources are exempted from CCMA review. However, for projects which could potentially affect coastal water resources, the proposed actions

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pg 104/176 ln 26, 28

Do you want to retain these references to 500-yr floodplain & flood elevation?

must be reviewed with respect to the State's coastal guidelines to ensure they are consistent with CCMA resource and policy objectives to the maximum extent practicable. Where the project actions would not affect water resources, state review is not required.

The construction of the CIF, attending demolition of associated structures, and placement of fill waterward of the HTL on the marine railway has been determined by the Navy to be consistent, to the maximum extent practicable, with the Connecticut Coastal one Management Program. The Navy will seek concurrence from the CT DEP OLISP to support this position. The proposed project is situated in an area of intensely developed shoreline at SUBASE. By upgrading the current radiologically-controlled materials facilities at SUBASE the project would be protective of coastal resources in the Tames River and Long Island Sound and would provide for efficient state-of-the-art handling and processing of radiologically-controlled materials at this federal facility. Although the fill placed waterward of the HTL for the CIF would not directly support a water-dependent activity, the construction of the proposed facility at this location lower base directly supports and facilitates the water-dependent functions of the submarine piers. A comprehensive review of alternative sites for the CIF eliminate upper base locations for security, safety, and logistical support reasons. Five potential lower base sites were also considered and eliminated because of size, location, interference with explosive safety arcs adjacent to active submarine piers, impacts to floodplains, and potential disturbance of contaminated soils and groundwater in identified Installation Restoration (IR) sites. The proposed site was selected as providing the best logistical support to waterfront operations at SUBASE in a secure and safe location. This site's location was also determined to be the most protective of the general environment and coastal resources of all the sites considered on the lower base. The CIF is sited as far landward as possible consistent with safety, security and logistical support requirements. The fill proposed waterward of the HTL would occur on the existing concrete apron of the abandoned marine railway. This marine railway was excavated from an upland area prior to World War II. The proposed fill will not directly or indirectly impact special aquatic sites in the Tames River and engineering controls to prevent erosion to, or siltation of, the river would be instituted during construction and be maintained after completion of the facility.

4.4.6 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Army Corps Of Engineers (ACOE) for the construction of any structure in or over any navigable waters of the US, the excavation or deposition of material in such waters, or any obstruction or alteration in a "navigable water of the US." This act applies to all structures as well as dredging and disposal activities. The proposed action involves the placement of fill material and the construction of a retaining wall at the southern edge of the proposed facility to retain the fill within the Thames River, a navigable waterway, seaward of MHW. The lateral extent of ACOE jurisdiction in tidal areas is to MHW. Through correspondence with CT DEP and the COE, the CT DEP has been established as the lead permit processing agency for Section 10 of the Rivers and Harbors Act of 1899 (see Department of Army letter, Appendix C, Correspondence).

6.0 Unavoidable Adverse Environmental Effects and Measures that Offset Those Adverse Effects

Unavoidable adverse environmental effects that would result from the proposed action include construction-related impacts to water quality from site runoff; air quality from dust and vehicular emissions; noise from construction activities; and on-base increases in vehicular traffic generated by construction personnel. Impacts are projected to be minor and temporary. These impacts would be alleviated by using accepted Best Management Practices (BMPs) and specific safety and control measures throughout the construction process. Anticipated effects and possible measures to offset those effects are as follows:

- Unstable site conditions during earthwork and grading could result in increased sediment levels in runoff entering the drainage system and, ultimately, the Thames River.

  Measures: Placement of silt fencing, haybales or other sediment control devices, together with observance of proper construction practices for sensitive areas, would minimize introduction of sediments to the river. Erosion and sediment control devices would be removed only after the site is fully stabilized following construction.

- Construction of the proposed CIF at the proposed site requires a new concrete bulkhead keyed into the concrete ramp on the bottom and into the existing bank and wall on the sides to retain required fill material in order to elevate the facility above the base flood elevation. rubblized

  Rubblization Measures: The existing concrete ramp would be rubberized to facilitate the driving of support piles for the CIF. Rubliation will not impact existing groundwater flows or the migration of potential contaminates beneath the construction site. Preliminary groundwater sampling at the proposed CIF site indicates that groundwater meets applicable regulatory standards for discharge to the river.

- Clean riprap would be placed waterward of the vertical retaining wall to mitigate for the fill placed waterward of the High Tide Line. Riprap will dissipate wave energy, control turbidity and provide suitable substrate and interstitial space for macrofloa and fauna
  macroflora

- A temporary increase in suspended particulate matter can be expected due to demolition, earthwork and site grading. Increases in particulate emissions are not anticipated in conjunction with routine, on-going SUBASE activities.

  Measures: To reduce the presence of air-borne particulates related to construction, site watering would occur, as necessary, where demolition, earthwork, blasting or other site disturbance has occurred; exposed areas would be paved, replanted or otherwise stabilized as soon as practicable to limit the period of exposure. Potentially hazardous particulates associated with asbestos removal would receive special handling as part of the abatement program. Particulate levels are expected to return to pre-construction levels following demolition and site work.

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8.0 Irreversible and Irretrievable Commitment of Resources

The proposed action would require the commitment of resources in the form of labor; building materials; energy, fuels, and utility services; capital; and land for construction, operation, and maintenance of the proposed CIF. The fill required for the proposed construction of the CIF would result in a permanent commitment of a small area of the Thames River shoreline, approximately 6,800 SF (630 SM) to ~~MHW~~ to an upland use as well as a minor reduction in flood storage capacity, approximately 5,700 cubic yards (4,400 cubic meters) to the base flood elevation.

How was this volume calculated? Would this be affected by our other volume revisions?

Revise to 7425 SF (690 SM) to HTL.