

APPENDIX A – CONTAINMENT SITE ALTERNATIVES

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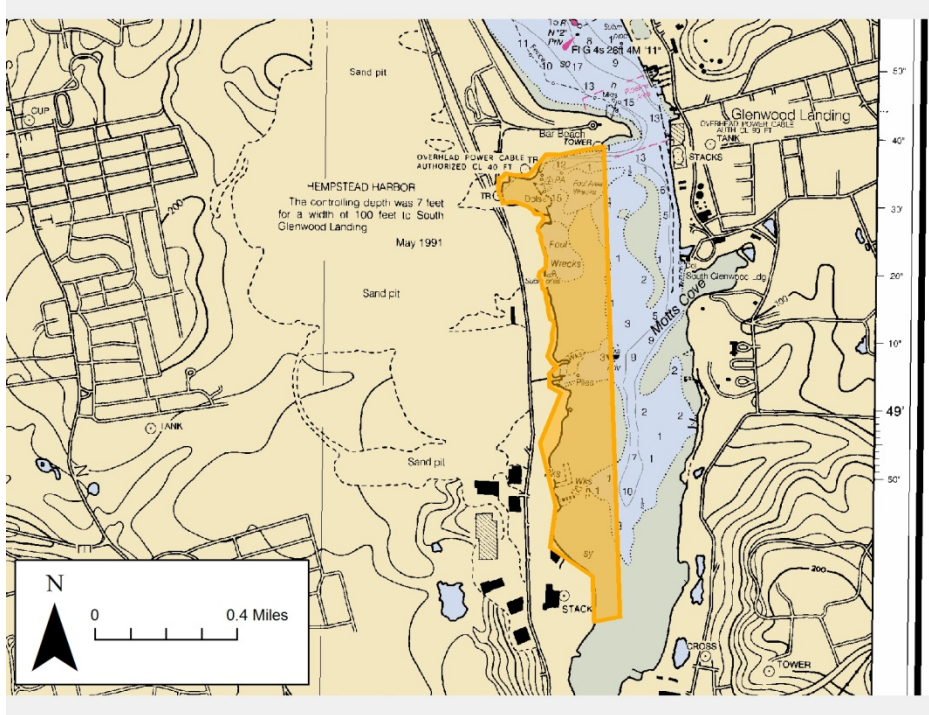
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**Containment Site Alternative A
Hempstead Harbor CDF**

Containment Site Alternative A - Hempstead Harbor CDF



Impacts to Environmental Resources -Containment Site Alternative A - Hempstead Harbor

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Portions of project footprint mapped as Intertidal Marsh & Coastal Shoals, Bars, and Mudflats; adjacent area mapped as Coastal Shoals, Bars, and Mudflats	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - short term impact during construction due to dewatering or building dikes	Potential - depending on characteristics of completed project
Federal & State Listed Species	Listed species habitat, and NY "Significant Coastal Fish & Wildlife Habitat" within project footprint	Potential - if species are immobile and within construction footprint	Potential - if species are immobile and within construction footprint	----	Potential - depending on characteristics of completed project	Potential - short term impact if species are in project vicinity	Potential - short term impact from dewatering	Potential - depending on characteristics of completed project
Shellfish	4 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 40507330 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	None documented	NA	NA	NA	NA	----	NA	NA
Birds	58 species documented within 1 mile	----	----	----	Yes - loss of shallow water habitat for waterfowl species by CDF placement	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - increased turbidity from dewatering; increased turbidity from vessel traffic to and from CDF	Potential - depending on characteristics of completed project
Marine Mammals	3 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources - Containment Site Alternative A - Hempstead Harbor

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	Channel to 7 feet along eastern shore from Bar Beach to South Glenwood Landing	----	Potential - dewatering run-off could deposit in channel	Potential - small vessel traffic may be forced offshore of CDF into navigation channel	No - resources not within CDF footprint	----	----
Ports	Port of Hempstead Harbor	No - resources not within CDF footprint	No - existing littoral transport minimal due to low energy environment; no change expected with CDF	Unlikely - majority of port activity is north of Bar Beach and the CDF leaves adequate room for operations at South Glenwood Landing	----	----	----
Coastal Structures	Bulkheads at South Glenwood Landing within 1/2 east of CDF	No - resources not within CDF footprint	No - existing littoral transport minimal due to low energy environment; no change expected with CDF	----	No - resources not within CDF footprint	Potential - current speeds may increase east of CDF due to narrowing of harbor	----
Cable/power/utility crossings	None documented	NA	NA	----	NA	NA	----
Recreational Areas	Bar Beach Town Park (with boat ramp) and Hempstead Harbor Park adjacent to northern terminus of CDF; golf course in upland adjacent area to west of CDF	Yes - Bar Beach Boat Ramp within CDF footprint	Unlikely - CDF is on opposite side of Bar Beach than recreational areas, dewatering run-off not expected to migrate to beaches	Potential - small vessel traffic may be forced offshore of CDF into navigation channel	Yes - Bar Beach Boat Ramp within CDF footprint	Unlikely - CDF is on opposite side of Bar Beach than recreational areas, dewatering run-off not expected to occur at beaches	Yes - CDF will be visible from Bar Beach Town Park and golf course
Commercial & Industrial Facilities	Multiple facilities around industrial harbor; Glenwood Landing Energy Center is within 1/2 mile east of CDF	No - resources not within CDF footprint	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative A - Hempstead Harbor**

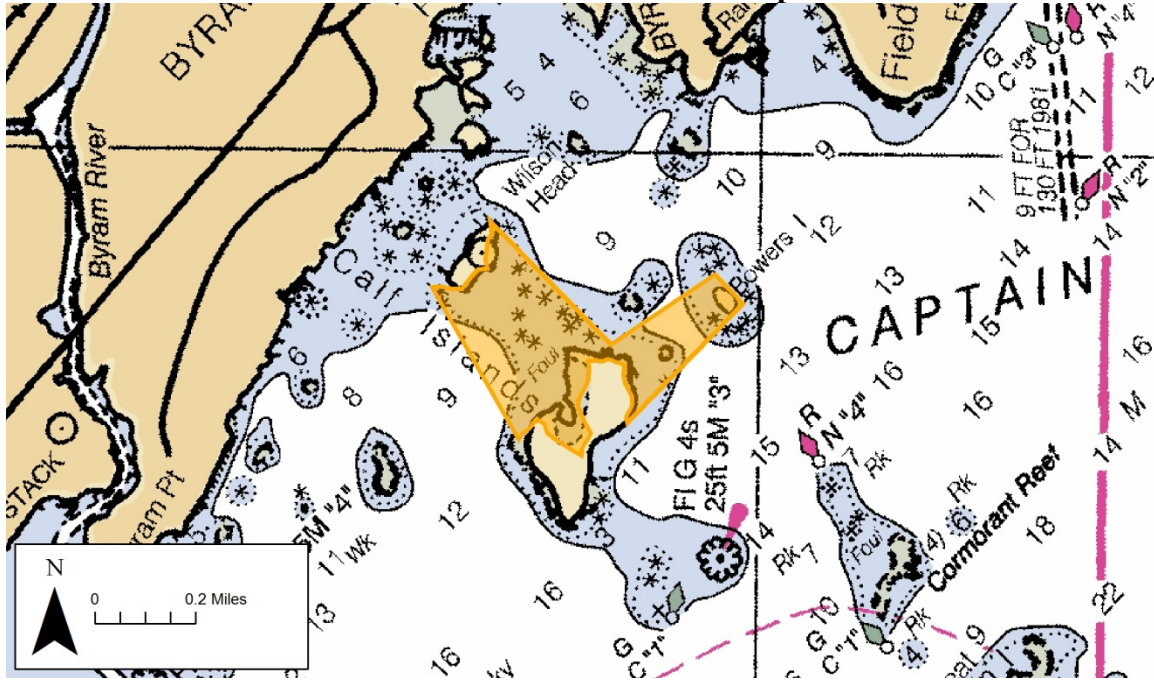
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	Three documented inside north end of CDF; one documented in harbor east of CDF, within 1/4 mile	Likely - resources in close proximity to work area with containment structures	Potential - increased sedimentation from dewatering; increased sedimentation/scour from vessel traffic to and from CDF	Yes - resources inside CDF would be buried during site operation	----
Historic Districts	Glenwood Landing Historic District and Cedarmere-Clayton Estates across harbor from containment; Roslyn Village Historic District at head of harbor, within 1/2 mile	No - historic district sites not within CDF footprint	Potential - increased shoreline erosion at Cedarmere-Clayton Estates from vessel boat wake	----	Potential - CDF facility could be seen from historic district sites in vicinity
Archaeological Sites	None documented	NA	NA	----	NA

**Impacts to Physical Resources
Containment Site Alternative A - Hempstead Harbor**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as silt-clay/sand and sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	No - existing littoral transport minimal due to low energy environment; no change expected with CDF
Currents	----	----	Yes - increase/channelization in currents due to narrowing of harbor
Waves	----	----	Unlikely - existing wave energy low due to sheltered environment; no change expected with CDF

**Containment Site Alternative B
Greenwich Captain Harbor CDF**

Containment Site Alternative B - Greenwich Captain Harbor CDF



Impacts to Environmental Resources -Containment Site Alternative B – Greenwich Captain Harbor

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Project footprint and nearshore areas mapped as Coastal Shoals, Bars, or Mudflats	Potential - due to filling of wetland area within project footprint	Yes - resource will be covered with berm material	Yes - at project footprint and in local area due to changes in wave energy		----	Potential - short term impact during construction	Potential - depending on characteristics of completed project
Federal & State Listed Species	Listed species habitat, and NY "Significant Coastal Fish & Wildlife Habitat" within project footprint	Potential - if species are immobile and within construction footprint	Potential - if species are immobile and within construction footprint	----	Potential - depending on characteristics of completed project	Potential - short term impact if species are in project vicinity	Potential - short term impact from dewatering	Potential - depending on characteristics of completed project
Shellfish	3 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007330 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Stewart B. McKinney National Wildlife Refuge is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	No - resource is in the upland	Potential - depending on characteristics of completed project
Birds	17 species documented within 1 mile	----	----	----	Yes - loss of natural shoreline habitat around existing islands for shore dependent species by CDF placement; potential loss of shoreline habitat from wave focusing and shoreline erosion	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	11 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative B - Greenwich Captain Harbor

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	Mooring fields in Byram Harbor within 1/2 mile north of CDF	----	Unlikely - minimal littoral transport at existing island sites and adjacent rocky shoreline; no change expected with CDF	Yes - vessels approaching from south must travel around CDF	No - resources not within CDF footprint	----	----
Navigation Channels & Shipping	None documented	----	NA	NA	NA	----	----
Ports	None documented	NA	NA	NA	----	----	----
Coastal Structures	Calf Islands have groins, majority of surrounding harbor is armored	Yes - Calf Island groins within CDF footprint	Unlikely - minimal littoral transport at existing island sites and adjacent rocky shoreline; no change expected with CDF	----	Yes - Calf Island groins within CDF footprint	Unlikely - reduction in wave energy along shoreline due to wave sheltering	----
Cable/power/utility crossings	Cable area within 1 mile south of CDF	No - resources not within CDF footprint	Unlikely - minimal littoral transport at existing island sites and adjacent rocky shoreline; no change expected with CDF	----	No - resources not within CDF footprint	Unlikely - cable area is seaward of CDF	----
Recreational Areas	Byram Park and Belle Haven Club within 1/2 mile north of CDF	No - resources not within CDF footprint	Unlikely - minimal littoral transport at existing island sites and adjacent rocky shoreline; no change expected with CDF	Potential - small vessel traffic forced either closer to shore or into outer harbor by size of CDF	No - resources not within CDF footprint	Unlikely - reduction in wave energy along shoreline due to wave sheltering	Yes - CDF will be visible from Byram Park and Belle Haven Club
Commercial & Industrial Facilities	None documented	NA	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative B - Greenwich Captain Harbor**

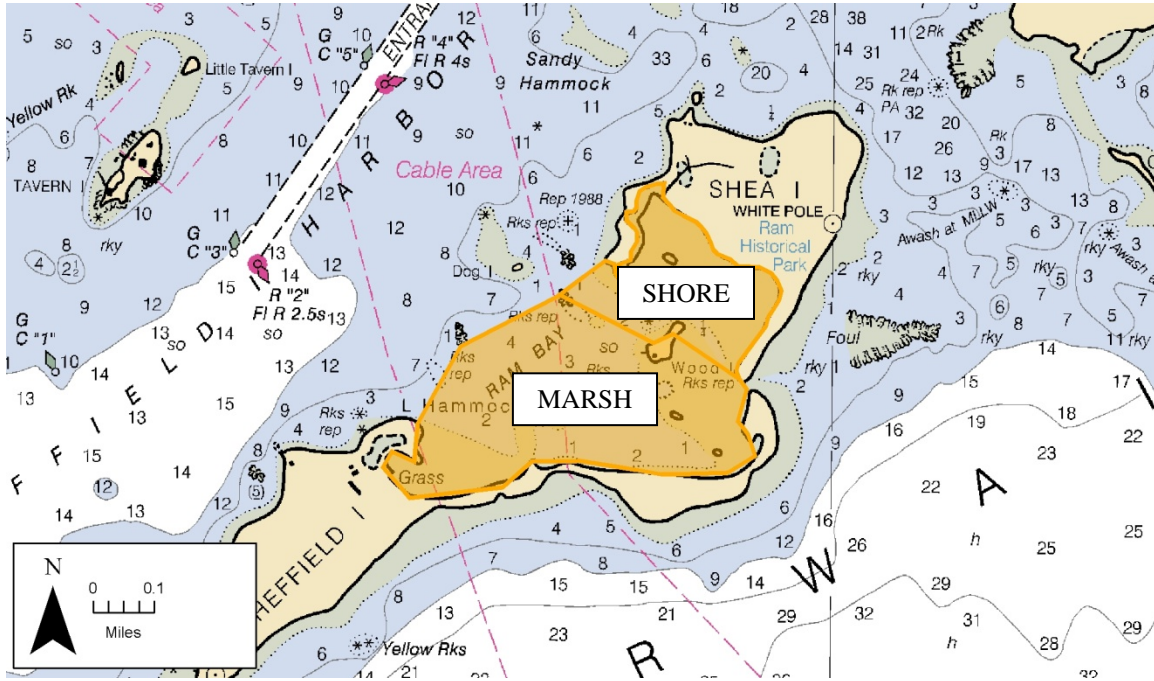
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	Multiple documented in nearshore areas west and east of CDF, within 1/2 mile	No - resources not within CDF footprint	Unlikely - resources beyond possible zone of wave focusing along shoreline; resources beyond dewatering impact zone	No - resources not within CDF footprint	-----
Historic Districts	None documented	NA	NA	-----	NA
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative B - Greenwich Captain Harbor**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as silt-clay/sand and gravel	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Unlikely - minimal littoral transport at existing island sites and adjacent rocky shoreline; no change expected with CDF
Currents	----	----	Potential - increase/channelization in currents due to large size of CDF in harbor
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure; reduction in wave energy along shoreline due to wave sheltering

**Containment Site Alternatives C and D
Norwalk Outer Harbor Islands Marsh and Shore CDFs**

Containment Site Alternatives C and D - Norwalk Outer Harbor Islands Marsh and Shore CDFs



Impacts to Environmental Resources -Containment Site Alternative C - Norwalk Outer Harbor Islands - Marsh

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Wetlands along shorelines of Ram Bay and bay islands	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - short term impact to adjacent wetlands during construction due to dewatering or building dikes	Yes - restoration of marsh resource will increase wetland area
Federal & State Listed Species	Listed species habitat within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - physical change in habitat area due to filling submerged land	Potential - during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of completed project
Shellfish	4 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007320 (34 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Stewart B. McKinney National Wildlife Refuge is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	No - resource is in the upland	Potential - depending on characteristics of completed project
Birds	24 species documented within 1 mile	----	----	----	Unlikely - extent of marsh habitat for shorebird species to increase	Potential - during construction or site operation for nesting shorebirds	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Yes - restoration of marsh resource will increase habitat for shorebird species
Marine Mammals	9 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative C - Norwalk Outer Harbor Islands - Marsh

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	-----	NA	NA	NA	-----	-----
Navigation Channels & Shipping	Entrance channel to Norwalk Harbor within 1/2 mile northwest of CDF; medium intensity vessel traffic within channel and approach	-----	Unlikely - dewatering run-off not expected to deposit in channel	No - vessel traffic patterns are northwest of CDF	No - resources not within CDF footprint	-----	-----
Ports	None documented	NA	NA	NA	-----	-----	-----
Coastal Structures	Multiple residential docks serve houses on Ram Bay islands within footprint of CDF	Yes - resources within CDF footprint	No - residential docks would likely be removed if project was developed	-----	Yes - resources within CDF footprint	No - residential docks would likely be removed if project was developed	-----
Cable/power/utility crossings	Cable area between Norwalk and Northport under western half of CDF	Yes - resources within CDF footprint	Unlikely - minimal littoral transport at existing island site; no change expected with CDF	-----	Yes - resources within CDF footprint	Potential - increase in wave energy south of Sheffield Island due to reflection/ refraction off containment structure may erode cable area south of CDF	-----
Recreational Areas	Ram Historical Park on adjacent Shea Island within 1/2 mile of CDF	No - resources not within CDF footprint	Unlikely - CDF in shoreward bay not expected to affect processes at seaward portions of the island	Yes - access to park through Ram Bay would be impeded by CDF	No - resources not within CDF footprint	Unlikely - CDF in shoreward bay not expected to affect processes at seaward portions of the island	Yes - CDF will be visible from Ram Historical Park
Commerical & Industrial Facilities	None documented	NA	-----	-----	-----	-----	-----
Aquaculture	None documented	NA	NA	-----	NA	NA	-----
Dredge Material Disposal Sites	None documented	-----	NA	-----	-----	NA	-----

**Impacts to Cultural Resources
Containment Site Alternative C - Norwalk Outer Harbor Islands - Marsh**

Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	Three documented inside CDF; five documented shoreward of CDF, within 1/2 mile; seven documented within 1 mile	Likely - resources in close proximity to work area with containment structures	Potential - shoreward resources may be within the dewatering impact zone	Yes - resources inside CDF would be buried during site operation; resources outside CDF not buried	-----
Historic Districts	None documented	NA	NA	-----	NA
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative C - Norwalk Outer Harbor Islands - Marsh**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as silt-clay/sand, and gravel-sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Unlikely - minimal littoral transport on shorelines in Ram Bay and mainland armored/rocky shoreline; no change expected with CDF
Currents	----	----	Unlikely - minor, localized effect of CDF on ambient tidal currents
Waves	----	----	No - CDF is protected from waves by an existing barrier system

Impacts to Environmental Resources -Containment Site Alternative D - Norwalk Outer Harbor Islands - Shore

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Small wetland areas within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - short term impact to adjacent wetlands during construction due to dewatering or building dikes	Potential - depending on characteristics of completed project
Federal & State Listed Species	Listed species habitat within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - physical change in habitat area due to filling submerged land	Potential - during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of completed project
Shellfish	3 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007330 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Stewart B. McKinney National Wildlife Refuge is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	No - resource is in the upland	Potential - depending on characteristics of completed project
Birds	21 species documented within 1 mile	----	----	----	Yes - loss of shoreline habitat for shore dependent species by CDF placement; potential loss of shoreline habitat from wave focusing and shoreline erosion	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative D - Norwalk Outer Harbor Islands - Shore

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	Entrance channel to Norwalk Harbor within 1/2 mile northwest of CDF; medium intensity vessel traffic within channel and approach	----	Unlikely - dewatering run-off not expected to deposit in channel	No - vessel traffic patterns are northwest of CDF	No - resources not within CDF footprint	----	----
Ports	None documented	NA	NA	NA	----	----	----
Coastal Structures	Multiple residential docks serve houses on Ram Bay islands within 1/2 mile of CDF	No - resources not within CDF footprint	Unlikely - minimal littoral transport at existing island site; no change expected with CDF	----	No - resources not within CDF footprint	Unlikely - CDF in inlet of Ram Bay not expected to affect processes in shoreward bay	----
Cable/power/utility crossings	Cable area between Norwalk and Northport west of CDF within 1/2 mile	No - resources not within CDF footprint	Unlikely - minimal littoral transport at existing island site; no change expected with CDF	----	No - resources not within CDF footprint	Unlikely - CDF in inlet of Ram Bay not expected to affect processes in shoreward bay	----
Recreational Areas	Ram Historical Park adjacent to CDF	Potential - portions of resource may be within CDF footprint where tied to shore	Unlikely - minimal littoral transport at existing island site; no change expected with CDF	Yes - access to park through Ram Bay would be impeded by CDF	Potential - portions of resource may be within CDF footprint where tied to shore	Unlikely - CDF in shoreward bay not expected to affect processes at seaward portions of the island	Yes - CDF will be visible from Ram Historical Park
Commerical & Industrial Facilities	None documented	NA	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative D - Norwalk Outer Harbor Islands - Shore**

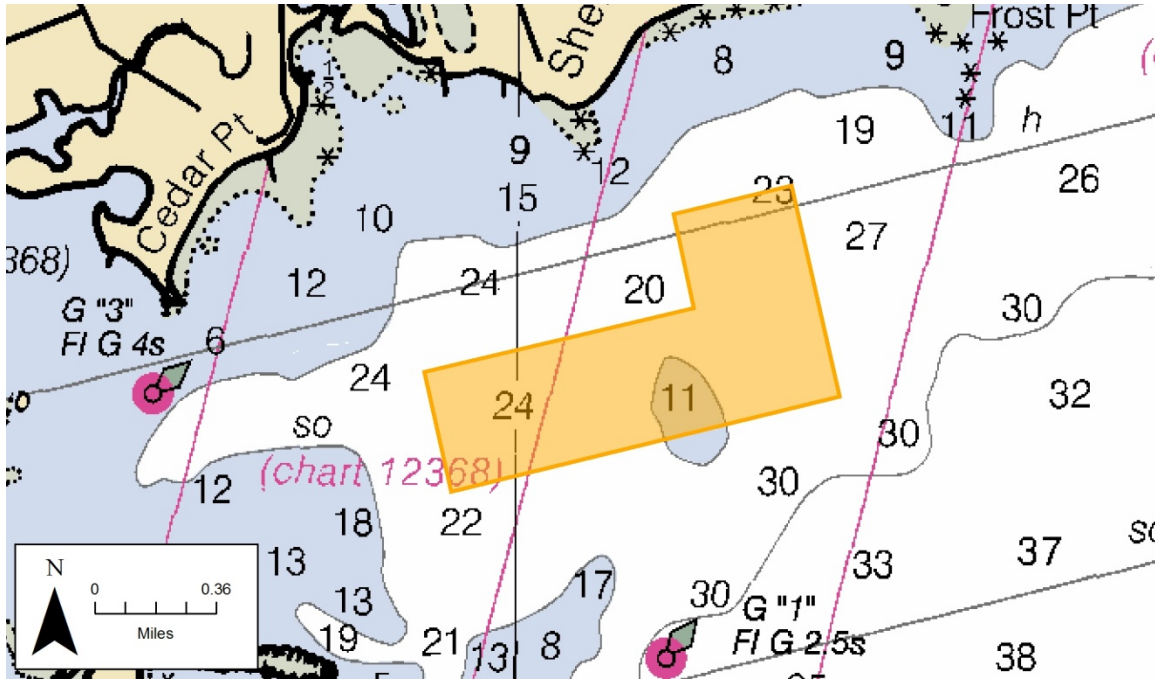
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented inside CDF; seven documented shoreward of CDF, within 1/2 mile; six documented within 1 mile	Likely - resources in close proximity to work area with containment structures	Potential - shoreward resources may be within the dewatering impact zone	Yes - resource inside CDF would be buried during site operation; resources outside CDF not buried	-----
Historic Districts	None documented	NA	NA	-----	NA
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative D - Norwalk Outer Harbor Islands - Shore**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as gravel-sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Unlikely - minimal littoral transport on shorelines in Ram Bay and mainland armored/rocky shoreline; no change expected with CDF
Currents	----	----	Unlikely - minor, localized effect of CDF on ambient tidal currents
Waves	----	----	No - CDF is protected from waves by an existing barrier system

**Containment Site Alternative E
Sherwood Island Borrow Pits CAD**

Containment Site Alternative E – Sherwood Island Borrow Pits CAD



Impacts to Environmental Resources -Containment Site Alternative E - Sherwood Island Borrow Pits

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	None documented	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat within 1/2 mile of site	No - resource not within project footprint	No - resource not within project footprint	----	No - filling sea floor will not impair listed species habitat in upland	Unlikely - construction activity would occur 1/2 mile from resource	Unlikely - resource occurs in upland	Unlikely - resource occurs in upland
Shellfish	3 species documented within 1 mile	No - proposed CAD fills existing borrow pit, no excavation necessary	Yes - resource is within CAD footprint	----	Unlikely - cap sediment would provide suitable shellfish habitat; sediment in nearshore habitat not expected to change	----	Unlikely - short-term turbidity increase during placement or capping	Potential - increase in habitat due to restoration of pit to ambient depth
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007310 (35 species documented)	No - proposed CAD fills existing borrow pit, no excavation necessary	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	None documented	NA	NA	NA	NA	----	NA	NA
Birds	22 species documented within 1 mile	----	----	----	No - CAD site on sea floor would not impact bird habitat	Unlikely - construction/site operation not likely to disturb mobile resource	Unlikely - short-term turbidity increase during placement or capping	No - CAD site on sea floor would not provide bird habitat
Marine Mammals	9 species documented within 1 mile	Potential - strikes during construction and operation	----	----	No - water column habitat for mammals not altered	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	No - water column habitat for mammals not altered
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative E - Sherwood Island Borrow Pits

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	None documented	----	NA	NA	NA	----	----
Ports	None documented	NA	NA	NA	----	----	----
Coastal Structures	Multiple groins along shoreline at Compo Beach and Compo Cove approximately 1 mile west of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	----	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	----
Cable/power/utility crossings	None documented	NA	NA	----	NA	NA	----
Recreational Areas	Compo Beach, Sherwood Island State Park, and Burial Hill Beach within 1 mile shoreward of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	Potential - recreational vessel traffic will be diverted during construction of CAD	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	No - CAD below water surface
Commerical & Industrial Facilities	None documented	NA	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative E - Sherwood Island Borrow Pits**

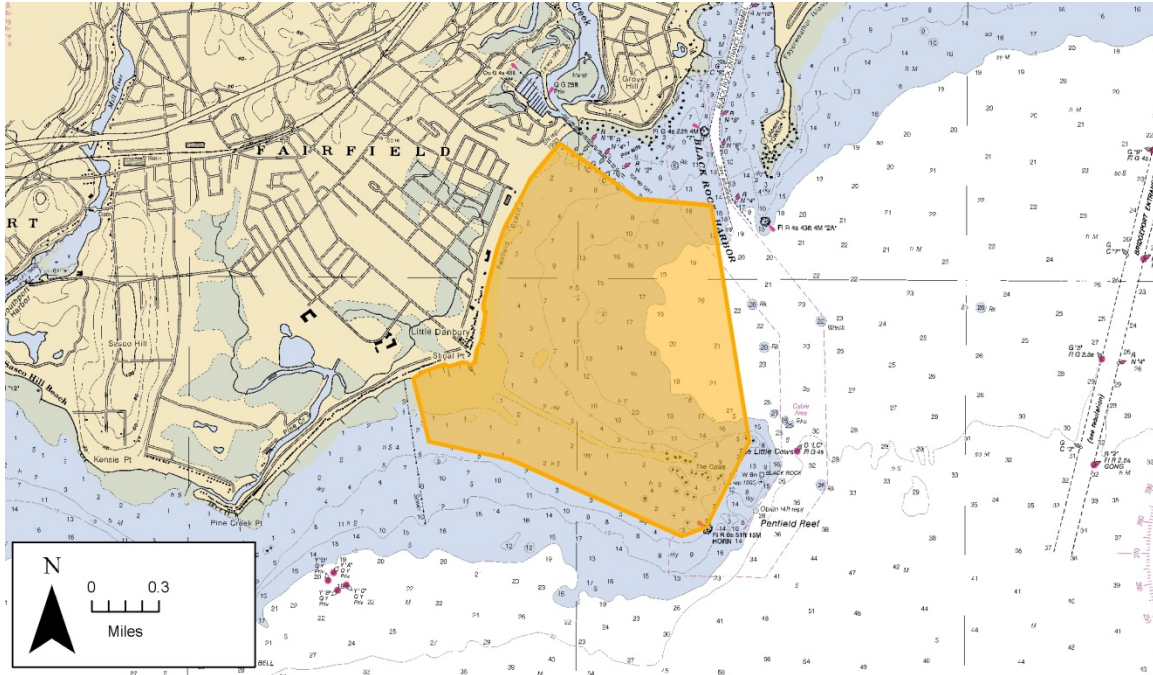
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	Two documented shoreward of CAD, within 1/2 to 1 mile	No - resources not within CAD footprint	Potential - increased sedimentation during CDF filling	No - resources not within CAD footprint	-----
Historic Districts	Compo/Owenoke and Mill Cove Historic Districts shoreward of CAD	No - resources not within CAD footprint	Unlikely - changes in bathymetry would not result in wave focusing or increased erosion along the shoreline	-----	No - CAD below water surface
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative E - Sherwood Island Borrow Pits**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CAD footprint mapped as sand/silt/clay, silt-clay/sand, sand, gravel-sand, and gravel	Likely - reduction in TOC following placement of granular cap material	----
Littoral Drift	----	----	No - littoral drift patterns/rates not impacted by offshore CAD
Currents	----	----	No - filling of CAD to ambient sea floor elevation will not alter local current patterns/rates
Waves	----	----	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology

**Containment Site Alternative F
Penfield Reef CDF**

Containment Site Alternative F – Penfield Reef – CDF



Impacts to Environmental Resources -Containment Site Alternative F - Penfield Reef

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Small wetlands inland of project footprint, but not within impact range; wetlands at Ash Creek and Fayerweather Island within 1/2 mile of CDF	No - resource not within project footprint	No - resource not within project footprint	Potential - at nearby wetlands due to changes in wave energy	Potential - change in wave action and sedimentation/erosion regime could affect shoreline habitat	----	Potential - short term impact during construction	NA
Federal & State Listed Species	Listed species habitat at shoreward side of project footprint and in adjacent shoreline area	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - physical change in habitat area due to filling submerged land	Potential - during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of completed project
Shellfish	6 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007310 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	None documented	NA	NA	NA	NA	----	NA	NA
Birds	1 species documented within 1 mile	----	----	----	Yes - loss of natural shoreline habitat for shorebird species by CDF placement; potential loss of shoreline habitat from wave focusing and shoreline erosion	Potential - during construction or site operation for nesting shorebirds	Unlikely - shorebird species not impacted by changes in turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative F - Penfield Reef

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	-----	NA	NA	NA	-----	-----
Navigation Channels & Shipping	Medium to high intensity vessel traffic within 1/2 mile north and east of CDF associated with Black Rock Harbor; harbor entrance channel within 1/2 mile north of CDF	-----	Potential - dewatering run-off could deposit in channel	Yes - vessel traffic impinged by CDF	No - resources not within CDF footprint	-----	-----
Ports	None documented	NA	NA	NA	-----	-----	-----
Coastal Structures	Multiple groins and one jetty along shoreline within 1 mile of CDF	Yes - CDF connected to shore in area of six groins	Yes - CDF would form a barrier to net sediment transport from east to west and cause accumulation at jetty east of CDF	-----	Yes - CDF connected to shore in area of six groins	Yes - increase in wave energy along shoreline at Jennings and West Fairfield Beaches due to wave focusing	-----
Cable/power/utility crossings	Cable area adjacent to and within footprint of eastern extent of CDF	Yes - resources within CDF footprint	Potential - dewatering runoff may migrate to cable area	-----	Yes - resources within CDF footprint	Potential - dewatering runoff may scour adjacent cable area	-----
Recreational Areas	Penfield Beach and Jennings Beach within footprint of CDF; Fayerweather Island and Black Rock Harbor within 1/2 mile north of CDF	Yes - resources within CDF footprint	Yes - CDF would form a barrier to net sediment transport from east to west; potential change to the rate and direction of littoral drift at remaining portions of Jennings and West Fairfield Beaches due to wave sheltering and/or wave focusing	Yes - vessel traffic impinged by CDF	Yes - resources within CDF footprint	Yes - increase in wave energy along remaining shoreline of Jennings and West Fairfield Beaches due to wave focusing	Yes - CDF will be visible from remaining portions of Penfield Beach and Jennings Beach, and from Fayerweather Island and Black Rock Harbor
Commerical & Industrial Facilities	Fairfield Water Pollution Control in upland within 1/2 mile west of CDF	No - resources not within CDF footprint	-----	-----	-----	-----	-----
Aquaculture	None documented	NA	NA	-----	NA	NA	-----
Dredge Material Disposal Sites	None documented	-----	NA	-----	-----	NA	-----

**Impacts to Cultural Resources
Containment Site Alternative F - Penfield Reef**

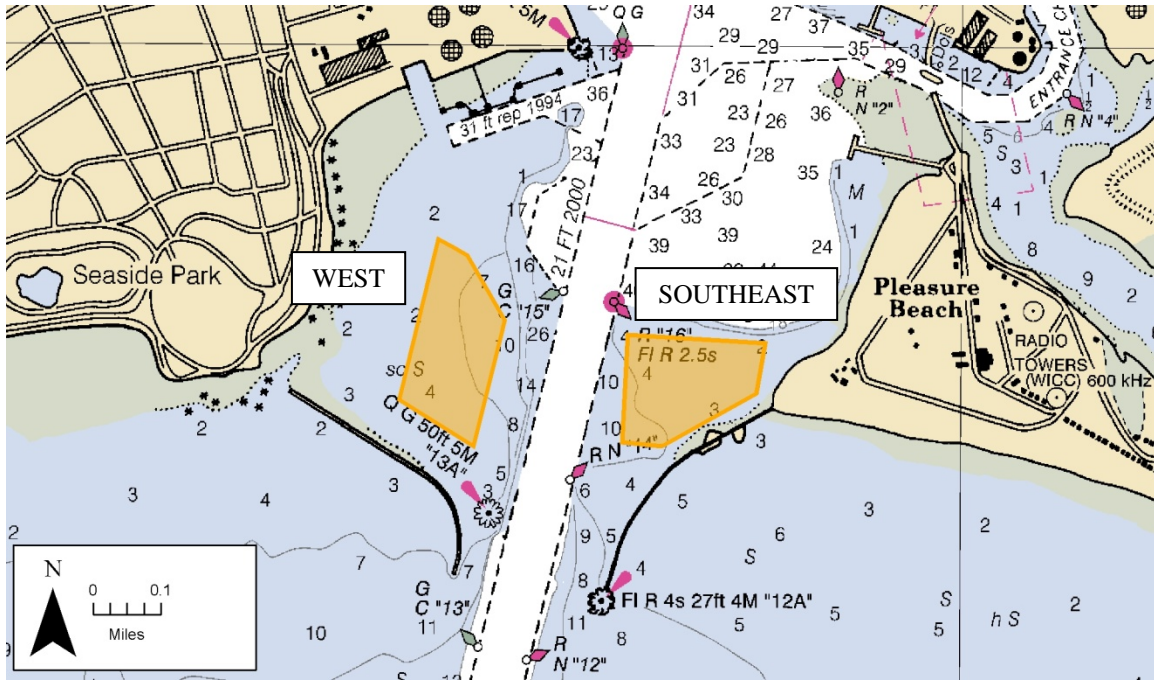
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented within 1 mile southwest of CDF; two documented within 1/2 mile northeast of CDF	No - resources not within CDF footprint	Potential - resources within possible zone of wave focusing along shoreline	No - resources not within CDF footprint	-----
Historic Districts	Fairfield, Black Rock, and Seaside Park Historic Districts shoreward of CDF	No - resources not within CDF footprint	Potential - Seaside Park within possible zone of wave focusing along shoreline	-----	Yes - CDF visible from Black Rock and Seaside Park Historic Districts
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative F - Penfield Reef**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as gravel, gravel-sand, sand, and silt-clay/sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Yes - CDF would eliminate longshore sediment transport on Lordship Beach and impound easterly transport along Long Beach
Currents	----	----	Potential - increase/deflection in local currents due to large size of CDF
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure; reduction/increase in wave energy along shoreline at Long Beach due to wave sheltering and/or wave focusing

**Containment Site Alternatives G and H
Bridgeport Outer Harbor West and Southeast CADs**

Containment Site Alternatives G and H – Bridgeport Outer Harbor West and Southeast CADs



Impacts to Environmental Resources -Containment Site Alternative G - Bridgeport Outer Harbor West

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	None documented	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat at nearshore and upland areas within 1 mile	No - resource not within project footprint	No - resource not within project footprint	----	No - filling sea floor will not impair listed species habitat in upland	Potential - during construction	Unlikely - resource occurs in upland	Unlikely - resource occurs in upland
Shellfish	5 species documented within 1 mile	Yes - resource is within CAD footprint	Yes - resource is within CAD footprint	----	Unlikely - cap sediment would provide suitable shellfish habitat; sediment in nearshore habitat not expected to change	----	Unlikely - short-term turbidity increase during placement or capping	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007310 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Stewart B. McKinney National Wildlife Refuge is east of CAD; within 1 mile	No - resource not within project footprint	No - resource not within project footprint	Unlikely - change not expected at resource located updrift of CAD	Unlikely - change not expected at resource located updrift of CAD	----	No - resource is in the upland	Unlikely - change not expected at resource located updrift of CAD
Birds	26 species documented within 1 mile	----	----	----	No - CAD site on sea floor would not impact bird habitat	Unlikely - construction/site operation not likely to disturb mobile resource	Unlikely - short-term turbidity increase during placement or capping	No - CAD site on sea floor would not provide bird habitat
Marine Mammals	9 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	No - water column habitat for mammals not altered	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	No - water column habitat for mammals not altered
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative G - Bridgeport Outer Harbor West

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	Johnsons Creek anchorage area within 1 mile northeast of CAD	----	No - anchorage area isolated from outer harbor	No - vessel route to anchorage area is on opposite side of harbor from CAD	No - resources not within CDF footprint	----	----
Navigation Channels & Shipping	Entrance channel to Bridgeport Harbor adjacent to CAD; high intensity vessel traffic in vicinity of harbor including Bridgeport - Port Jefferson ferry	----	Potential - particle settling during dumping could deposit in channel	Yes - vessel traffic impinged during CAD construction	No - resources not within CDF footprint	----	----
Ports	Port of Bridgeport	No - resources not within CAD footprint	No - working areas of port are armored and isolated from CAD	Yes - vessel traffic impinged during CAD construction	----	----	----
Coastal Structures	Bridgeport Harbor and Seaside Park heavily armored; jetties at harbor entrance; multiple groins along Long Beach within 1 mile east of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	----	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	----
Cable/power/utility crossings	Cable area between Bridgeport and Long Beach within 1 mile northeast of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	----	No - resources not within CAD footprint	No - cable area isolated from outer harbor	----
Recreational Areas	Seaside Park within 1/2 mile west of CAD, Miamoque Yacht Club within 1 mile northeast of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	No - vessel route to yacht club is on opposite side of harbor from CAD; no recreational boating access to Seaside park within harbor	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	No - CAD below water surface
Commercial & Industrial Facilities	Multiple facilities around industrial harbor; LNG facility is within 1/2 mile north of CAD	No - resources not within CAD footprint	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative G - Bridgeport Outer Harbor West**

Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	Multiple documented in Bridgeport Harbor adjacent to CAD	No - resources not within CAD footprint	Potential - increased sedimentation during CDF filling	No - resources not within CAD footprint	-----
Historic Districts	Seaside Park Historic District west of CAD	No - resources not within CAD footprint	Unlikely - changes in bathymetry would not result in wave focusing or increased erosion along the shoreline	-----	No - CAD below water surface
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative G - Bridgeport Outer Harbor West**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Potential - CAD footprint mapped as silt-clay/sand	Likely - reduction in TOC following placement of granular cap material	----
Littoral Drift	----	----	No - littoral drift patterns/rates not impacted by offshore CAD
Currents	----	----	No - filling of CAD to ambient sea floor elevation will not alter local current patterns/rates
Waves	----	----	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology

Impacts to Environmental Resources -Containment Site Alternative H - Bridgeport Outer Harbor Southeast

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	None documented	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat at nearshore and upland areas within 1 mile	No - resource not within project footprint	No - resource not within project footprint	----	No - filling sea floor will not impair listed species habitat in upland	Potential - during construction	Unlikely - resource occurs in upland	Unlikely - resource occurs in upland
Shellfish	5 species documented within 1 mile	Yes - resource is within CAD footprint	Yes - resource is within CAD footprint	----	Unlikely - cap sediment would provide suitable shellfish habitat; sediment in nearshore habitat not expected to change	----	Unlikely - short-term turbidity increase during placement or capping	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007310 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Stewart B. McKinney National Wildlife Refuge is east of CAD; within 1/2 mile	No - resource not within project footprint	No - resource not within project footprint	Unlikely - change not expected at resource located updrift of CAD	Unlikely - change not expected at resource located updrift of CAD	----	No - resource is in the upland	Unlikely - change not expected at resource located updrift of CAD
Birds	26 species documented within 1/2 mile	----	----	----	No - CAD site on sea floor would not impact bird habitat	Unlikely - construction/site operation not likely to disturb mobile resource	Unlikely - short-term turbidity increase during placement or capping	No - CAD site on sea floor would not provide bird habitat
Marine Mammals	9 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	No - water column habitat for mammals not altered	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	No - water column habitat for mammals not altered
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative H - Bridgeport Outer Harbor Southeast

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	Johnsons Creek anchorage area within 1 mile northeast of CAD	----	No - anchorage area isolated from outer harbor	Yes - vessel traffic impinged during CAD construction	No - resources not within CDF footprint	----	----
Navigation Channels & Shipping	Entrance channel to Bridgeport Harbor adjacent to CAD; high intensity vessel traffic in vicinity of harbor including Bridgeport - Port Jefferson ferry	----	Potential - particle settling during dumping could deposit in channel	Yes - vessel traffic impinged during CAD construction	No - resources not within CDF footprint	----	----
Ports	Port of Bridgeport	No - resources not within CAD footprint	No - working areas of port are armored and isolated from CAD	Yes - vessel traffic impinged during CAD construction	----	----	----
Coastal Structures	Bridgeport Harbor and Seaside Park heavily armored; jetties at harbor entrance; multiple groins along Long Beach within 1 mile east of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	----	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	----
Cable/power/utility crossings	Cable area between Bridgeport and Long Beach within 1/2 mile northeast of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	----	No - resources not within CAD footprint	No - cable area isolated from outer harbor	----
Recreational Areas	Seaside Park within 1/2 mile west of CAD, Miamoque Yacht Club within 1 mile northeast of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	Yes - vessel traffic to yacht club impinged during CAD construction	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	No - CAD below water surface
Commercial & Industrial Facilities	Multiple facilities around industrial harbor; LNG facility is within 1/2 mile northwest of CAD	No - resources not within CAD footprint	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative H - Bridgeport Outer Harbor Southeast**

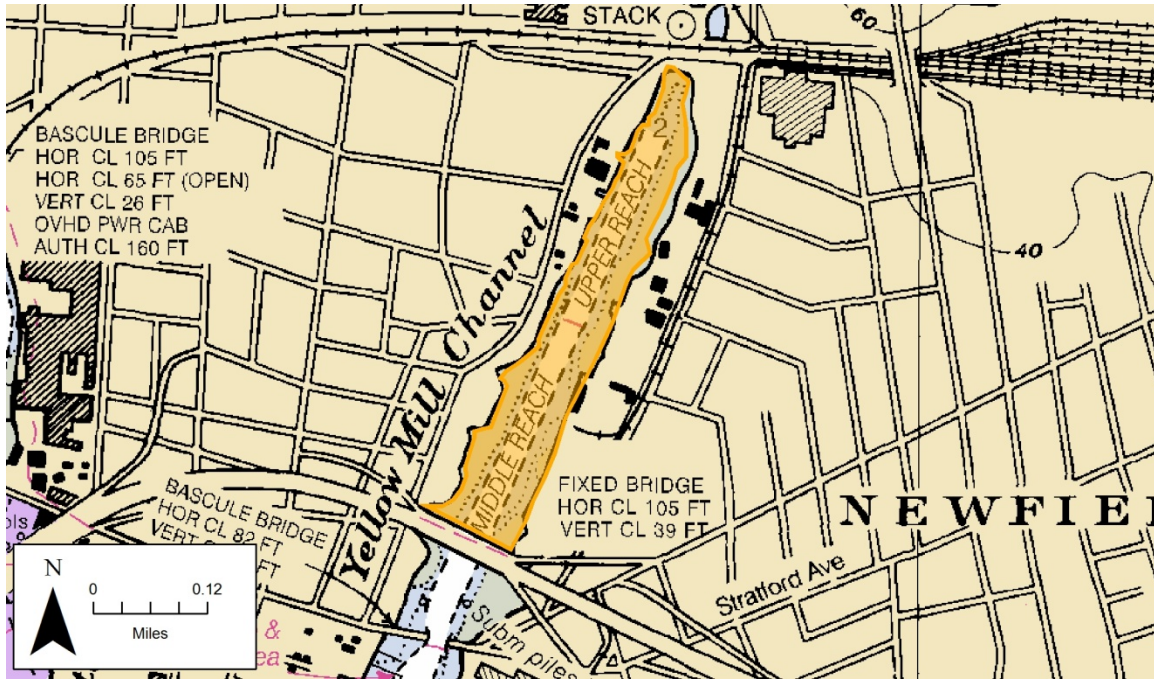
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	Multiple documented in Bridgeport Harbor adjacent to CAD	No - resources not within CAD footprint	Potential - increased sedimentation during CDF filling	No - resources not within CAD footprint	-----
Historic Districts	Seaside Park Historic District west of CAD across harbor entrance channel	No - resources not within CAD footprint	Unlikely - changes in bathymetry would not result in wave focusing or increased erosion along the shoreline	-----	No - CAD below water surface
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative H - Bridgeport Outer Harbor Southeast**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Potential - CAD footprint mapped as silt-clay/sand	Likely - reduction in TOC following placement of granular cap material	----
Littoral Drift	----	----	No - littoral drift patterns/rates not impacted by offshore CAD
Currents	----	----	No - filling of CAD to ambient sea floor elevation will not alter local current patterns/rates
Waves	----	----	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology

**Containment Site Alternative I
Bridgeport Yellow Mill Channel CDF**

Containment Site Alternative I – Bridgeport Yellow Mill Channel CDF



Impacts to Environmental Resources -Containment Site Alternative I - Bridgeport Yellow Mill Channel

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	None documented	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat within project footprint and at adjacent nearshore and upland areas	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - physical change in habitat area due to filling submerged land	Potential - during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of completed project
Shellfish	2 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007310 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	None documented	NA	NA	NA	NA	----	NA	NA
Birds	26 species documented within 1 mile	----	----	----	Yes - loss of shallow/mid water habitat for waterfowl species by CDF placement	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	4 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative I - Bridgeport Yellow Mill Channel

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	Johnsons Creek anchorage area within 1/2 mile east of CDF	----	No - anchorage area isolated from CDF	No - anchorage area isolated from CDF	No - resources not within CDF footprint	----	----
Navigation Channels & Shipping	Bridgeport Harbor channels and Yellow Mill Channel are adjacent to and coincident with CDF; high intensity vessel traffic in vicinity of harbor including Bridgeport - Port Jefferson ferry	----	Potential - dewatering run-off could deposit in channel	Yes - CDF would limit vessel access to south of I-95 bridge	Yes - CDF development would convert northern portion of channel to upland	----	----
Ports	Port of Bridgeport	No - resources not within CDF footprint	No - working areas of port are armored and isolated from CDF	Yes - CDF would limit vessel access to south of I-95 bridge	----	----	----
Coastal Structures	Shoreline of Bridgeport Harbor heavily armored within 1 mile southwest of CDF	No - resources not within CDF footprint	No - existing littoral transport minimal due to low energy environment; no change expected with CDF	----	No - resources not within CDF footprint	Potential - increase in local wave energy in adjacent harbor due to reflection/refraction off containment structure	----
Cable/power/utility crossings	Submerged cable and pipeline area adjacent to CDF from I-95 bridge south to Bridgeport Harbor	No - resources not within CDF footprint	No - existing littoral transport minimal due to low energy environment; no change expected with CDF	----	No - resources not within CDF footprint	Potential - increase in local wave energy in channel due to reflection/refraction off containment structure	----
Recreational Areas	Eastside Park and Waterview Park adjacent to CDF along western shoreline of Yellow Mill Channel	No - resources not within CDF footprint	Potential - dewatering run-off could deposit in adjacent parks	Yes - CDF would limit vessel access to south of I-95 bridge	No - resources not within CDF footprint	No - CDF will be bounded by existing landforms on all sides	Yes - CDF will be contiguous to both parks
Commercial & Industrial Facilities	Multiple facilities around industrial harbor; LNG facility is within 1/2 mile west of CDF	No - resources not within CDF footprint	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative I - Bridgeport Yellow Mill Channel**

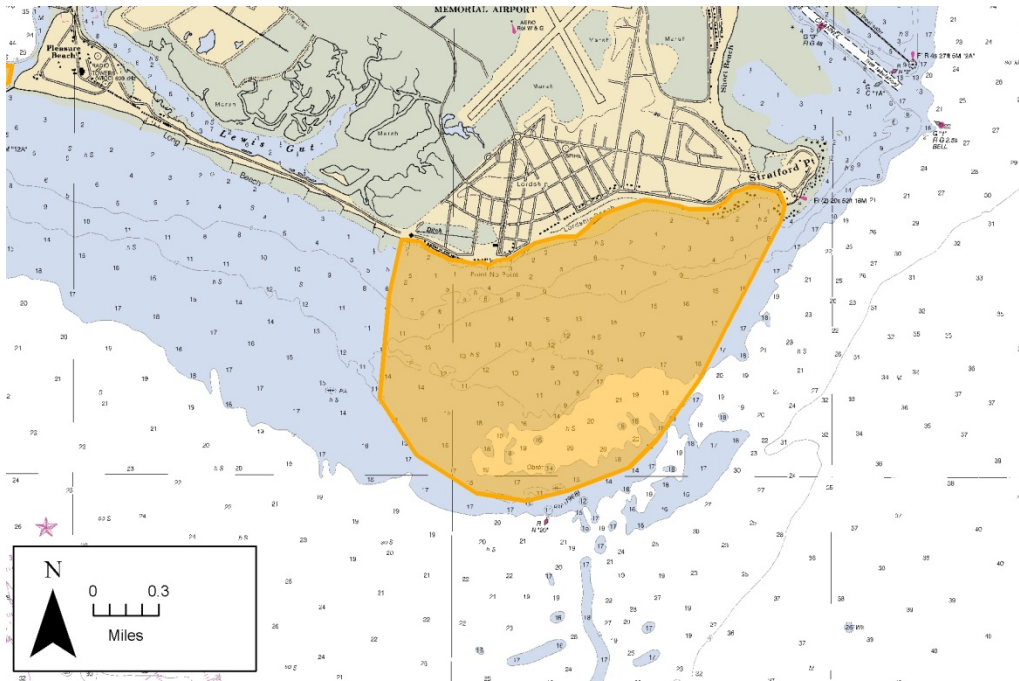
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented in channel immediately south of CDF; multiple documented in Bridgeport Harbor	No - resources not within CDF footprint	Potential - increased sedimentation from dewatering; increased sedimentation/scour from vessel traffic to and from CDF	No - resources not within CDF footprint	-----
Historic Districts	Deacon's Point, East Main Street, East Bridgeport, and Wilmot Apartments Historic Districts in upland surrounding CDF	No - resources not within CDF footprint	No - CDF confined by upland with no alteration to local wave and current patterns	-----	Potential - CDF facility could be seen from historic districts
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative I - Bridgeport Yellow Mill Channel**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as sand-clay/silt	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	No - existing littoral transport minimal due to low energy environment; no change expected with CDF
Currents	----	----	Potential - increase/deflection of tidal currents in Bridgeport Harbor due elimination of channel as part of estuary
Waves	----	----	Potential - increase in local wave energy in adjacent navigation channel due to reflection/refraction off containment structure

**Containment Site Alternative J
Stratford Point CDF**

Containment Site Alternative J – Stratford Point CDF



Impacts to Environmental Resources -Containment Site Alternative J - Stratford Point

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Wetlands inland of project footprint in Lewis Gut, but not within impact range; small wetlands at tip of Stratford Point adjacent to CDF	No - resource not within project footprint	No - resource not within project footprint	Potential - at nearby wetlands due to changes in wave energy	Potential - change in wave action and sedimentation/erosion regime could affect shoreline habitat	----	Potential - short term impact during construction	NA
Federal & State Listed Species	Listed species habitat at shoreward side of project footprint and in adjacent shoreline area	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - physical change in habitat area due to filling submerged land	Potential - during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of completed project
Shellfish	6 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41007300 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Stewart B. McKinney National Wildlife Refuge is adjacent to CDF; within 1/2 mile	No - resource not within project footprint	No - resource not within project footprint	Potential - at Long Beach due to changes in wave energy	Potential - change in wave action and sedimentation/erosion regime could affect Long Beach shoreline habitat	----	No - resource is in the upland	Unlikely - change not expected at resource upland of CDF
Birds	27 species documented within 1 mile	----	----	----	Yes - loss of natural shoreline habitat for shorebird species by CDF placement; potential loss of shoreline habitat from wave focusing and shoreline erosion	Potential - during construction or site operation for nesting shorebirds	Unlikely - shorebird species not impacted by changes in turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative J - Stratford Point

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	-----	NA	NA	NA	-----	-----
Navigation Channels & Shipping	Medium intensity vessel traffic within 1 mile south of CDF; Stratford Harbor entrance channel within 1/2 mile north of CDF	-----	Unlikely - dewatering run-off not expected to deposit in channel	No - vessel traffic patterns are south of CDF	No - resources not within CDF footprint	-----	-----
Ports	None documented	NA	NA	NA	-----	-----	-----
Coastal Structures	Shoreline armoring at Stratford Point, multiple groins along shoreline at western end of CDF and within 1 mile west of CDF	Yes - CDF connected to shore in area of shoreline armoring and eleven groins	Yes - CDF would form a barrier to net sediment transport from west to east and cause accumulation at the western edge of CDF	-----	Yes - CDF connected to shore in area of eleven groins	Yes - increase in wave energy along shoreline at Long Beach due to wave focusing	-----
Cable/power/utility crossings	None documented	NA	NA	-----	NA	NA	-----
Recreational Areas	None documented	NA	NA	NA	NA	NA	NA
Commercial & Industrial Facilities	Igor I Sikorsky Memorial Airport within 1 mile north of CDF	No - resources not within CDF footprint	-----	-----	-----	-----	-----
Aquaculture	None documented	NA	NA	-----	NA	NA	-----
Dredge Material Disposal Sites	None documented	-----	NA	-----	-----	NA	-----

**Impacts to Cultural Resources
Containment Site Alternative J - Stratford Point**

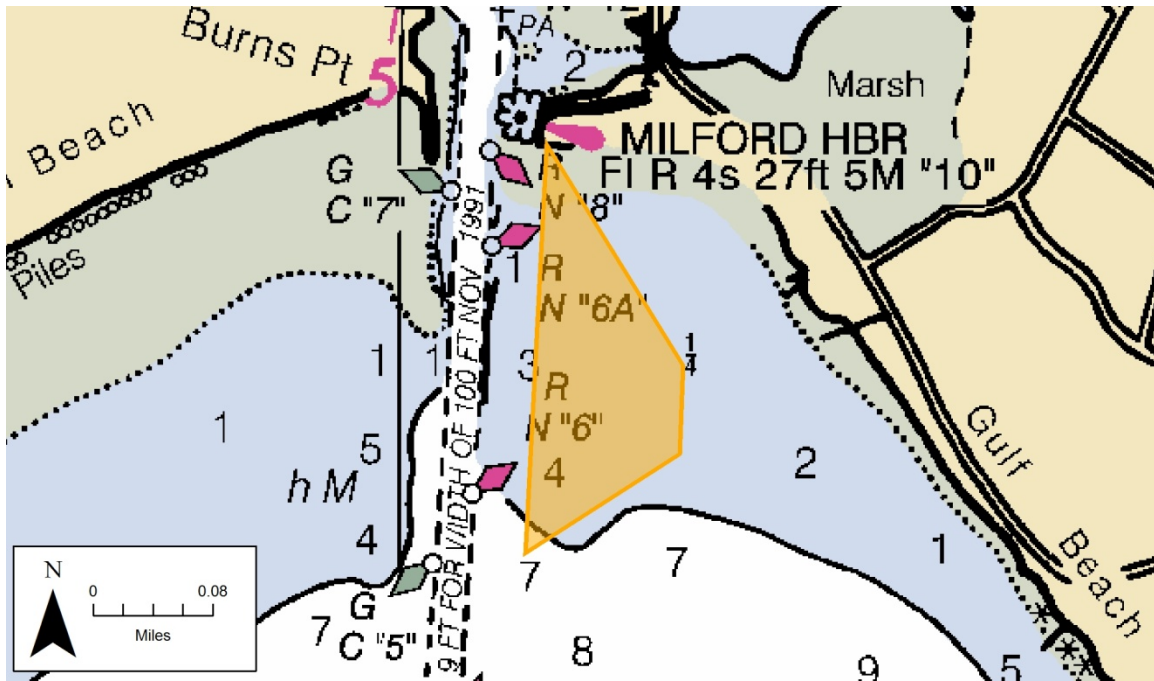
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	Two documented within 1 mile west of CDF	No - resources not within CDF footprint	Potential - resources within possible zone of wave focusing along shoreline	No - resources not within CDF footprint	-----
Historic Districts	None documented	NA	NA	-----	NA
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative J - Stratford Point**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as gravel, gravel-sand, and sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Yes - CDF would form a barrier to net sediment transport from east to west; potential change to the rate and direction of littoral drift at Jennings and West Fairfield Beaches due to wave sheltering and/or wave focusing
Currents	----	----	Potential - increase/deflection in local currents due to large size of CDF
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure; reduction/increase in wave energy along shoreline at Jennings and West Fairfield Beaches due to wave sheltering and/or wave focusing

**Containment Site Alternative K
Milford Harbor CDF**

Containment Site Alternative K – Milford Harbor CDF



Impacts to Environmental Resources -Containment Site Alternative K - Milford Harbor

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Small wetland behind barrier beach but not in project impact area	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat in upland 1/4 mile from site	No - resource at shoreline	No - resource not within project footprint	----	Potential - increase in wave action could cause erosion/deposition of material at shoreline and change habitat conditions	Potential - short term impact during construction if species are sedentary	Potential - short term impact to sedentary species	Potential - depending on characteristics of built project
Shellfish	3 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107300 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Silver Sands State Park/Charles Island Natural Area Preserve west of CDF; within 1 mile	No - resource not within project footprint	No - resource not within project footprint	Unlikely - resource outside zone of influence for littoral drift created by CDF	No - resource not within project footprint	----	No - resource is in the upland	Unlikely - resource outside zone of influence for littoral drift created by CDF
Birds	14 species documented within 1 mile	----	----	----	Potential - loss of natural shoreline habitat for shorebird species from wave focusing and shoreline erosion	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative K - Milford Harbor

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	Moorings along Milford Harbor Channel within 1/2 mile northwest of CDF	-----	No - mooring area isolated from outer harbor	Yes - vessel route to harbor impinged by CDF	No - resources not within CDF footprint	-----	-----
Navigation Channels & Shipping	Entrance channel to Milford Harbor	-----	Potential - dewatering run-off could deposit in channel	Yes - vessel traffic impinged by CDF	No - resources not within CDF footprint	-----	-----
Ports	None documented	NA	NA	NA	-----	-----	-----
Coastal Structures	Jetties at entrance to harbor; bulkheads throughout Milford Harbor within 1 mile northwest of CDF	Yes - eastern jetty within CDF footprint	Yes - CDF would form a barrier to net sediment transport from east to west on Gulf Beach causing accumulation against eastern jetty	-----	Potential - CDF integrated into eastern jetty	Potential - current speeds may increase west of CDF due to narrowing of harbor	-----
Cable/power/utility crossings	None documented	NA	NA	-----	NA	NA	-----
Recreational Areas	Gulf Beach adjacent to northern terminus of CDF; Silver Sands State Park within 1 mile southwest of CDF	No - resources not within CDF footprint	Yes - CDF would form a barrier to net sediment transport from east to west on Gulf Beach causing accumulation at Gulf Beach	Potential - small vessel traffic may be forced offshore of CDF into navigation channel	No - resources not within CDF footprint	Unlikely - reduction in wave energy along shorelines adjacent to Milford Harbor entrance due to wave sheltering	Yes - CDF will be visible from Gulf Beach and Silver Sands State Park
Commercial & Industrial Facilities	None documented	NA	-----	-----	-----	-----	-----
Aquaculture	None documented	NA	NA	-----	NA	NA	-----
Dredge Material Disposal Sites	None documented	-----	NA	-----	-----	NA	-----

**Impacts to Cultural Resources
Containment Site Alternative K - Milford Harbor**

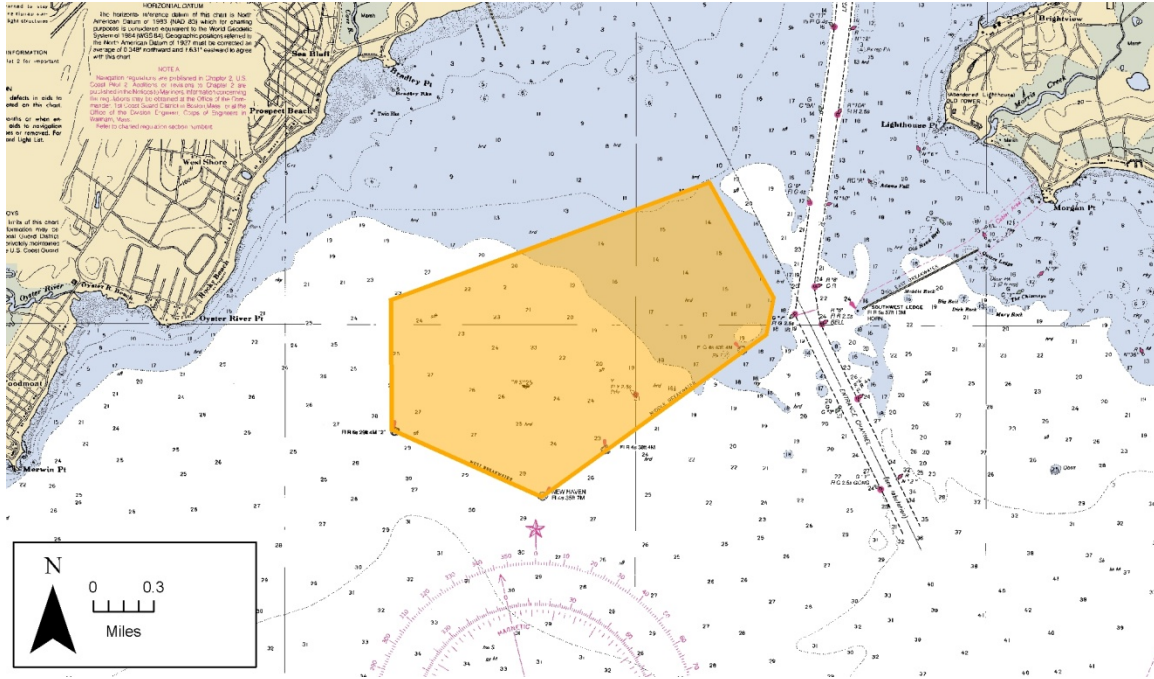
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented in nearshore area across entrance to Milford Harbor, within 1/2 mile	No - resources not within CDF footprint	Potential - increased erosion due to wave reflection off CDF containment; increased sedimentation from dewatering	No - resources not within CDF footprint	-----
Historic Districts	South of the Green and River Park Historic Districts inside Milford Harbor	No - resources not within CDF footprint	No - CDF outside harbor entrance, wave and current patterns at resource inside harbor not altered by CDF	-----	Potential - CDF facility could be seen from historic districts
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative K - Milford Harbor**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as sand, and gravel-sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Yes - CDF would form a barrier to net sediment transport from east to west on Gulf Beach; decrease in rate of littoral drift along Gulf Beach shoreline east of CDF
Currents	----	----	Potential - increase/deflection of tidal currents in/out of Milford Harbor
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure; reduction/increase in wave energy along shorelines adjacent to Milford Harbor entrance due to wave sheltering and/or wave focusing

**Containment Site Alternative L
New Haven Breakwaters CDF**

Containment Site Alternative L – New Haven Breakwaters CDF



Impacts to Environmental Resources -Containment Site Alternative L - New Haven Breakwaters

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	None documented	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat at nearshore and upland area within 1 mile northwest of CDF	No - resource not within project footprint	No - resource not within project footprint	----	Unlikely - resource not in immediate vicinity	Potential - short term impact to sedentary species during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of built project
Shellfish	5 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107250 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	None documented	NA	NA	NA	NA	----	NA	NA
Birds	5 species documented within 1 mile	----	----	----	Potential - habitat for shorebird species within zone of shoreline erosion caused by wave focusing	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative L - New Haven Breakwaters

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	New Haven Harbor Channel to east	----	Potential - dewatering runoff could deposit in channel	Potential - some vessel traffic that currently travels behind breakwaters may be forced further inshore or outside of breakwaters by CDF	No - resources not within CDF footprint	----	----
Ports	Port of New Haven approximately 4 miles to northeast	No - resources not within CDF footprint	No - significant distance between CDF and port	Potential - possible increased use of Port facilities during construction and use	----	----	----
Coastal Structures	Breakwaters form southwestern and southeastern edges of CDF	Yes - Breakwaters to be incorporated into CDF	Unlikely - current speeds may increase east of breakwater due to narrowing of harbor	----	No - breakwaters to be incorporated into CDF dike wall	Potential - current speeds may increase east of breakwater due to narrowing of harbor	----
Cable/power/utility crossings	Cross Sound Cable within 1/2 mile east of CDF	No - resources not within CDF footprint	Potential - dewatering runoff could deposit in cable area	----	No - resources not within CDF footprint	Potential - current speeds may increase east of breakwater due to narrowing of harbor	----
Recreational Areas	Bradley Point Park, Morse Park, and Lighthouse Point Park (and boatramp) just over 1 mile shoreward of CDF	No - resources not within CDF footprint	Potential - enhanced sheltering effect of breakwater-based CDF could slow longshore sediment transport and cause accumulation at shoreward beaches	Potential - small vessel traffic that currently travels behind breakwaters may be forced further inshore or outside of breakwaters by CDF	No - resources not within CDF footprint	No - significant distance between CDF and parks	Yes - CDF will be visible from Bradley Point Park, Morse Park, and Lighthouse Point Park
Commercial & Industrial Facilities	None documented	NA	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	Morris Cove Disposal Site across channel within 2 miles to east	----	No - significant distance between CDF and disposal site	----	----	No - significant distance between CDF and disposal site	----

**Impacts to Cultural Resources
Containment Site Alternative L - New Haven Breakwaters**

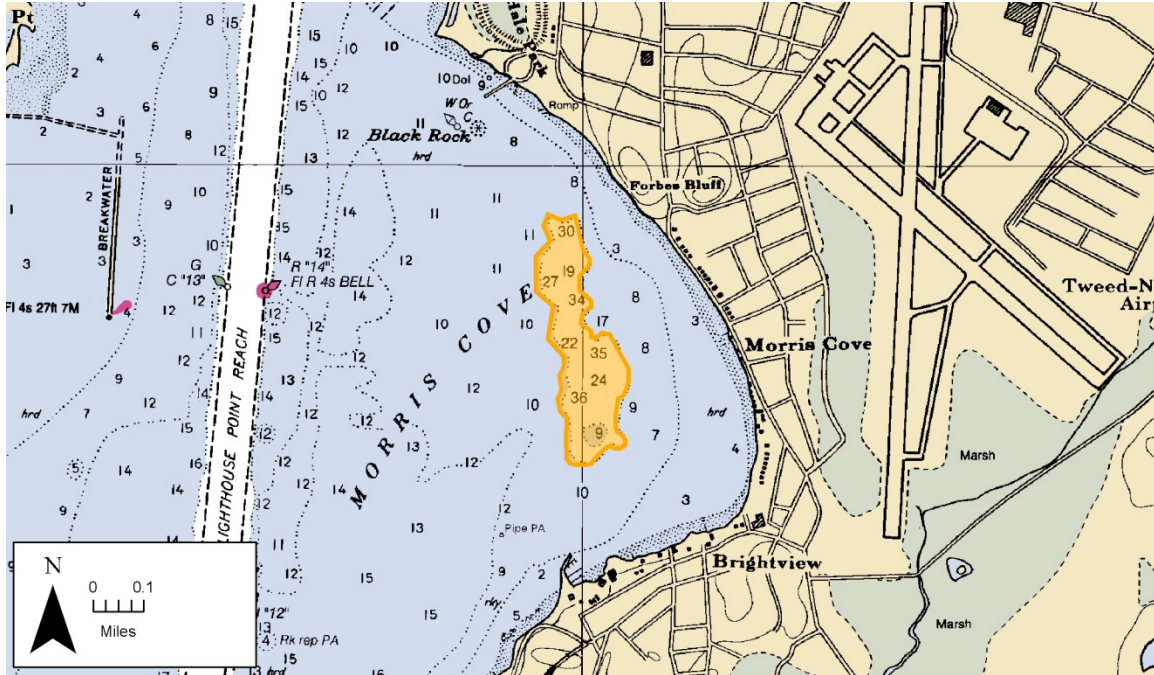
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	None documented	NA	NA	NA	-----
Historic Districts	None documented	NA	NA	-----	NA
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative L - New Haven Breakwaters**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as sand, sand-clay/silt, and silt-clay/sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF due to enhanced wave sheltering
Currents	----	----	Likely - increase/deflection of tidal currents in/out of New Haven Harbor
Waves	----	----	Potential - further reduction in local wave energy shoreward of CDF due to wave sheltering; reduction/increase in wave energy along West Haven shoreline due to wave sheltering and/or wave focusing

**Containment Site Alternative M
Morris Cove CAD**

Containment Site Alternative M – Morris Cove CAD



Impacts to Environmental Resources -Containment Site Alternative M - Morris Cove

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Wetlands inland of project footprint within 1 mile, but not within impact range	No - resource not within project footprint	No - resource not within project footprint	No - resource is in the upland	No - resource is in the upland	----	No - resource is in the upland	No - resource is in the upland
Federal & State Listed Species	Listed species habitat at nearshore and upland areas within 1/2 mile	No - resource not within project footprint	No - resource not within project footprint	----	No - filling sea floor will not impair listed species habitat in upland	Potential - during construction	Unlikely - resource occurs in upland	Unlikely - resource occurs in upland
Shellfish	6 species documented within 1 mile	No - proposed CAD fills existing borrow pit, no excavation necessary	Potential - resource may be within CAD footprint where borrow pit is not deep	----	Unlikely - cap sediment would provide suitable shellfish habitat; sediment in nearshore habitat not expected to change	----	Unlikely - short-term turbidity increase during placement or capping	Potential - increase in habitat due to restoration of pit to ambient depth
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107250 (35 species documented)	No - proposed CAD fills existing borrow pit, no excavation necessary	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	None documented	NA	NA	NA	NA	----	NA	NA
Birds	7 species documented within 1 mile	----	----	----	No - CAD site on sea floor would not impact bird habitat	Unlikely - construction/site operation not likely to disturb mobile resource	Unlikely - short-term turbidity increase during placement or capping	No - CAD site on sea floor would not provide bird habitat
Marine Mammals	9 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	No - water column habitat for mammals not altered	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	No - water column habitat for mammals not altered
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative M - Morris Cove

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	New Haven Harbor Channel within 1 mile to west	----	Unlikely - particle settling during dumping not expected to deposit in channel	Likely - access to CAD during construction will be via New Haven Harbor Channel and a new access branch to Morris Cove	No - resources not within CAD footprint	----	----
Ports	Port of New Haven over 2 miles to north	No - resources not within CAD footprint	No - significant distance between CAD and port	Likely - access to CAD during construction will be via New Haven Harbor Channel and a new access branch to Morris Cove	----	----	----
Coastal Structures	Multiple groins, bulkheads, and seawalls along shoreline of Morris Cove within 1 mile of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	----	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	----
Cable/power/utility crossings	Cross Sound Cable within 1 mile west of CDF	No - resources not within CAD footprint	Unlikely - particle settling during dumping not expected to deposit in cable area	----	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	----
Recreational Areas	East Shore Park, Fort Nathan Hale Park, Pardee Parkway, and Lighthouse Point Park within 1 mile shoreward of CAD	No - resources not within CAD footprint	No - littoral drift patterns/rates not impacted by offshore CAD	Potential - recreational vessel traffic will be diverted during construction of CAD	No - resources not within CAD footprint	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology	No - CAD below water surface
Commercial & Industrial Facilities	Tweed New Haven Airport within 1 mile east of CAD	No - resources not within CAD footprint	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented (besides Morris Cove)	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative M - Morris Cove**

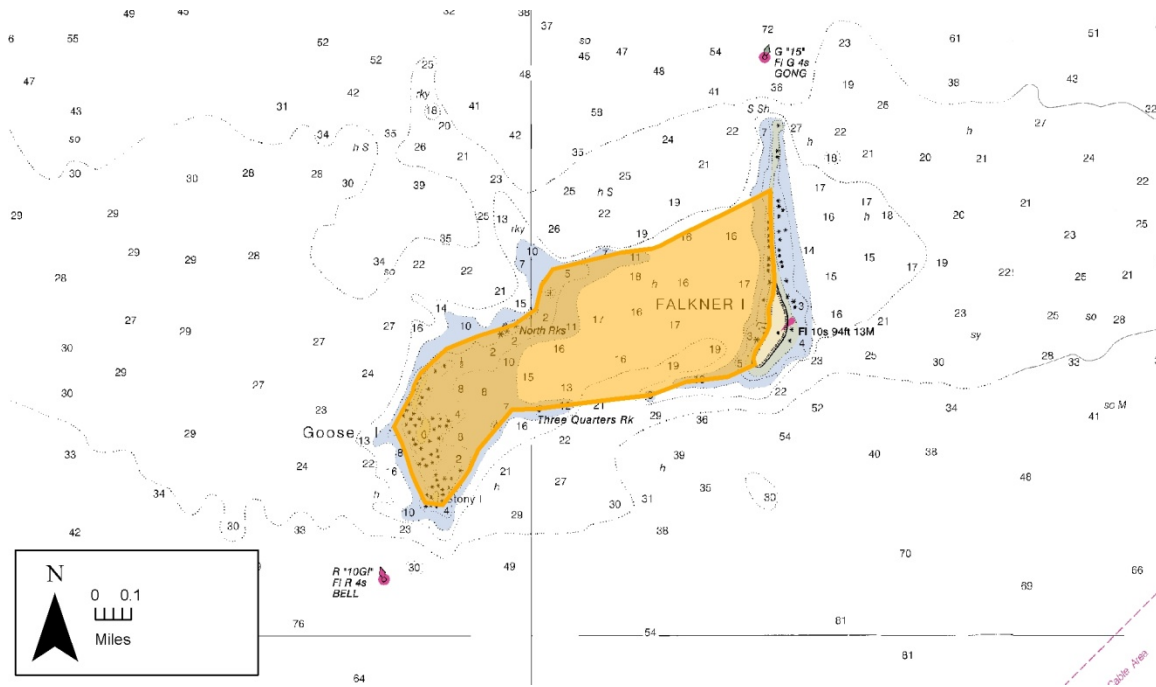
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented seaward of CAD, within 1/2 mile	No - resources not within CAD footprint	Potential - increased sedimentation during CDF filling	No - resources not within CAD footprint	-----
Historic Districts	Fort Nathan Hale Historic District shoreward of CAD	No - resources not within CAD footprint	Unlikely - changes in bathymetry would not result in wave focusing or increased erosion along the shoreline	-----	No - CAD below water surface
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative M - Morris Cove**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Potential - CAD footprint mapped as sand, and sand-clay/silt	Likely - reduction in TOC following placement of granular cap material	----
Littoral Drift	----	----	No - littoral drift patterns/rates not impacted by offshore CAD
Currents	----	----	No - filling of CAD to ambient sea floor elevation will not alter local current patterns/rates
Waves	----	----	No - filling of CAD to ambient sea floor elevation will not alter the local wave climatology

**Containment Site Alternative N
Falkner Island CDF**

Containment Site Alternative N – Falkner Island CDF



Impacts to Environmental Resources -Containment Site Alternative N - Falkner Island

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	None documented	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat on Falkner Island	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - physical change in habitat area due to filling submerged land	Potential - during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of completed project
Shellfish	None documented	NA	NA	----	NA	----	NA	NA
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107240 (33 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Stewart B. McKinney National Wildlife Refuge within CDF at Falkner Island	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	No - resource is in the upland	Potential - depending on characteristics of completed project
Birds	6 species documented within 1 mile	----	----	----	Yes - loss of natural shoreline habitat around existing island/shoal for shore dependent species by CDF placement	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	10 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative N - Falkner Island

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	None documented	----	NA	NA	NA	----	----
Ports	None documented	NA	NA	NA	----	----	----
Coastal Structures	None documented	NA	NA	----	NA	NA	----
Cable/power/utility crossings	None documented	NA	NA	----	NA	NA	----
Recreational Areas	None documented	NA	NA	NA	NA	NA	NA
Commercial & Industrial Facilities	None documented	NA	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	None documented	----	NA	----	----	NA	----

**Impacts to Cultural Resources
Containment Site Alternative N - Falkner Island**

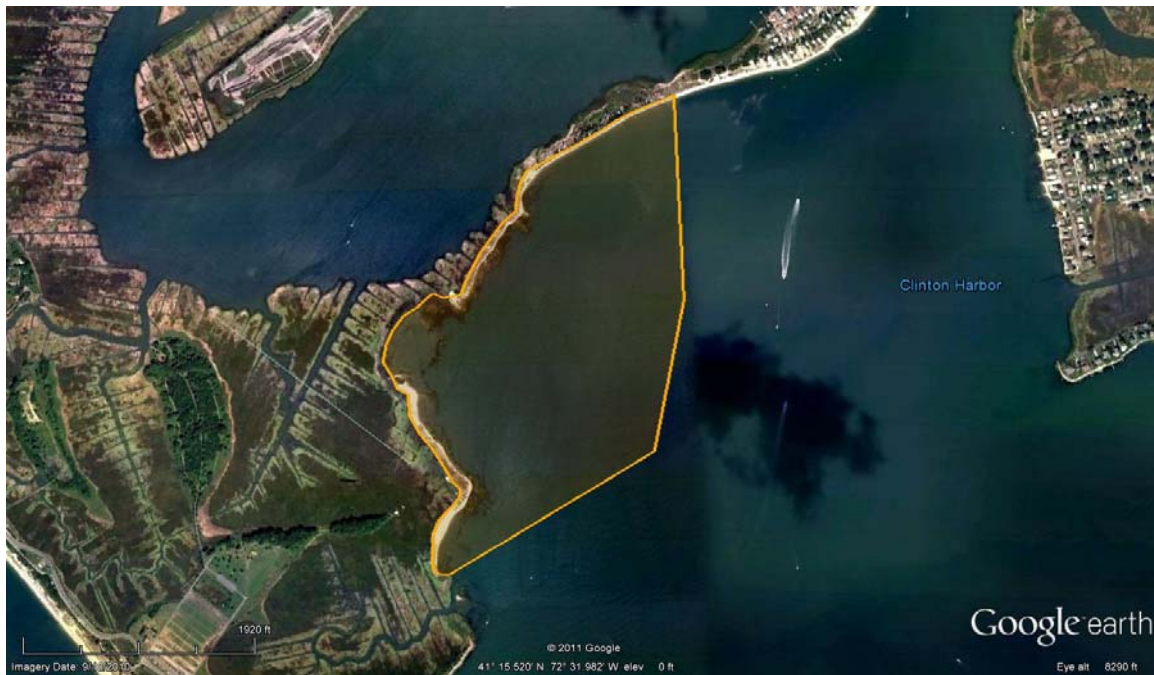
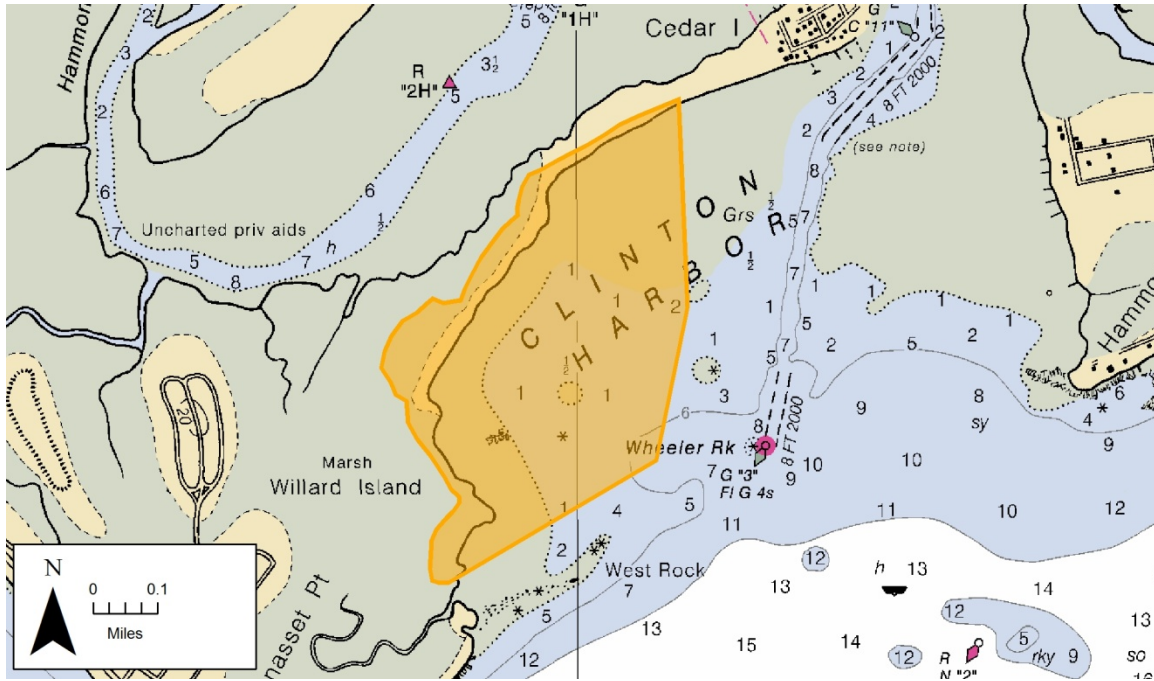
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented inside CDF, one documented north of CDF, within 1/2 mile, one documented on non-project side of Falkner Island	Likely - resources in close proximity to work area with containment structures	Potential - shipwreck to north may be within the dewatering impact zone	Yes - resource inside CDF would be buried during site operation; resources outside CDF not buried	-----
Historic Districts	None documented	NA	NA	-----	NA
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative N - Falkner Island**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as gravel, and sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	No - CDF too far offshore to affect littoral transport processes along shoreline
Currents	----	----	Unlikely - minor, localized effect of CDF on ambient tidal currents
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure

**Containment Site Alternative O
Clinton Harbor CDF**

Containment Site Alternative O – Clinton Harbor CDF



Impacts to Environmental Resources -Containment Site Alternative O - Clinton Harbor

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Portions of project footprint, and adjacent shoreline area mapped as wetland	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - short term impact during construction due to dewatering or building dikes	Yes - restoration of marsh resource will increase wetland area
Federal & State Listed Species	Listed species habitat within project footprint	Yes - resource within project footprint	Yes - resource within project footprint	----	Potential - depending on characteristics of completed project	Potential - short term impact during construction	Potential - short term impact from dewatering	Potential - depending on characteristics of completed project
Shellfish	2 species documented within 1 mile	Yes - resource is within CDF footprint	Yes - resource is within CDF footprint	----	Yes - resource is within CDF footprint	----	Potential - degradation of resource due to increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107230 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	Mapped behind barrier spit, inside Clinton Harbor	No - resource not within CDF footprint	No - resource not within CDF footprint	Potential - increased sedimentation from dewatering during flood tide	Unlikely - little to no change in wave energy; significant runoff during dewatering could result in a loss of resource	----	Potential - increased suspended sediment concentration from dewatering during flood tide	Unlikely - CDF not likely to cause a measurable change in water quality in Clinton Harbor
Marine Protected Areas	Hammonasset Beach State Park and Natural Area Preserve west of CDF, within 1 mile; Hammock River March Wildlife Area east of CDF, within 1 mile	No - resources not within CDF footprint	No - resources not within CDF footprint	No - resources outside zone of influence for littoral drift created by CDF	No - resources outside zone of influence for littoral drift created by CDF	----	No - resources are in the upland	No - resources outside zone of influence for littoral drift created by CDF
Birds	17 species documented within 1 mile	----	----	----	Unlikely - extent of marsh habitat for shorebird species to increase	Potential - during construction or site operation for nesting shorebirds	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Yes - restoration of marsh resource will increase habitat for shorebird species
Marine Mammals	9 species documented within 1 mile	Unlikely - strikes not likely at nearshore site	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative O - Clinton Harbor

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	Entrance channel to Clinton Harbor within 1/2 mile east of CDF	----	Unlikely - dewatering run-off not expected to deposit in channel	Yes - vessel traffic impinged by CDF	No - resources not within CDF footprint	----	----
Ports	None documented	NA	NA	NA	----	----	----
Coastal Structures	Bulkheads within Clinton Inner Harbor within 1/2 mile north of CDF; groins at Town Beach and residential area within 1 mile east of CDF	No - resources not within CDF footprint	No - magnitude of change not significant enough to affect distant resources	----	No - resources not within CDF footprint	No - magnitude of change not significant enough to affect distant resources	----
Cable/power/utility crossings	Cable and pipeline area between Clinton and Cedar Island within 1/2 mile northeast of CDF	No - resources not within CDF footprint	No - effects of CDF do not extend to inner harbor	----	No - resources not within CDF footprint	No - effects of CDF do not extend to inner harbor	----
Recreational Areas	Clinton Town Beach within 1 mile northeast of CDF; Hammonasset State Park within 1 mile west of CDF	No - resources not within CDF footprint	No - magnitude of change not significant enough to affect distant resources	Potential - small vessel traffic may be forced offshore of CDF into navigation channel	No - resources not within CDF footprint	No - magnitude of change not significant enough to affect distant resources	Yes - constructed wetlands will be visible from Clinton Town Beach
Commercial & Industrial Facilities	None documented	NA	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	Clinton Harbor Disposal Site within 1/2 mile southeast of CDF	----	No - magnitude of change not significant enough to affect distant resources	----	----	No - magnitude of change not significant enough to affect distant resources	----

**Impacts to Cultural Resources
Containment Site Alternative O - Clinton Harbor**

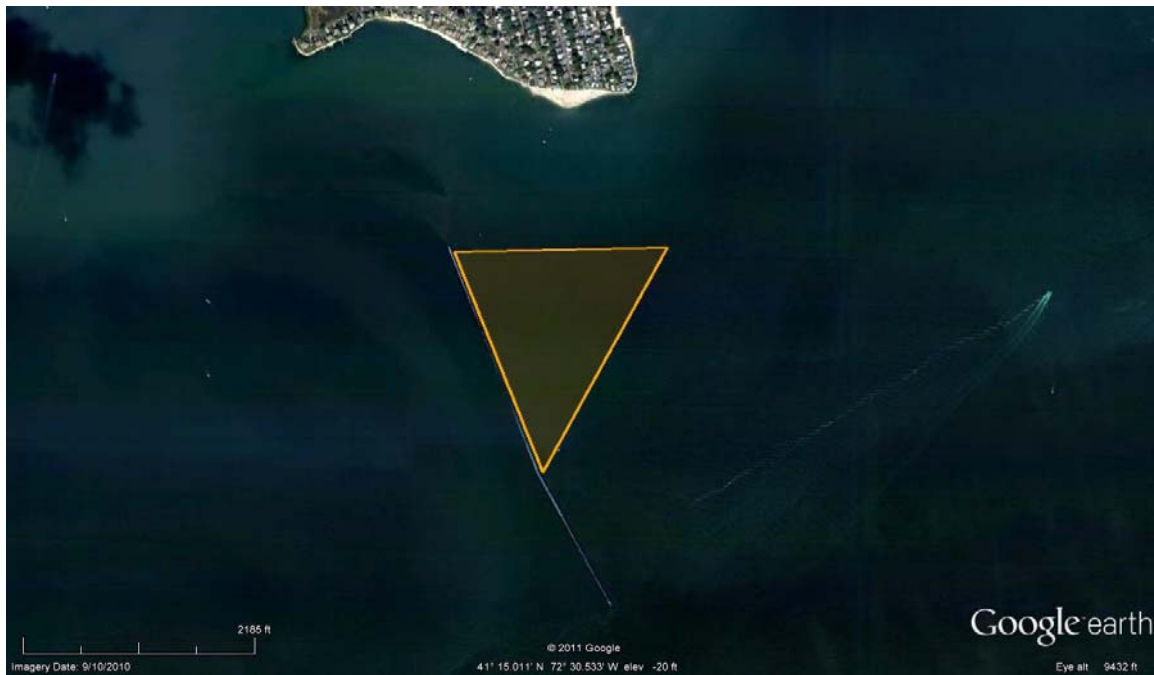
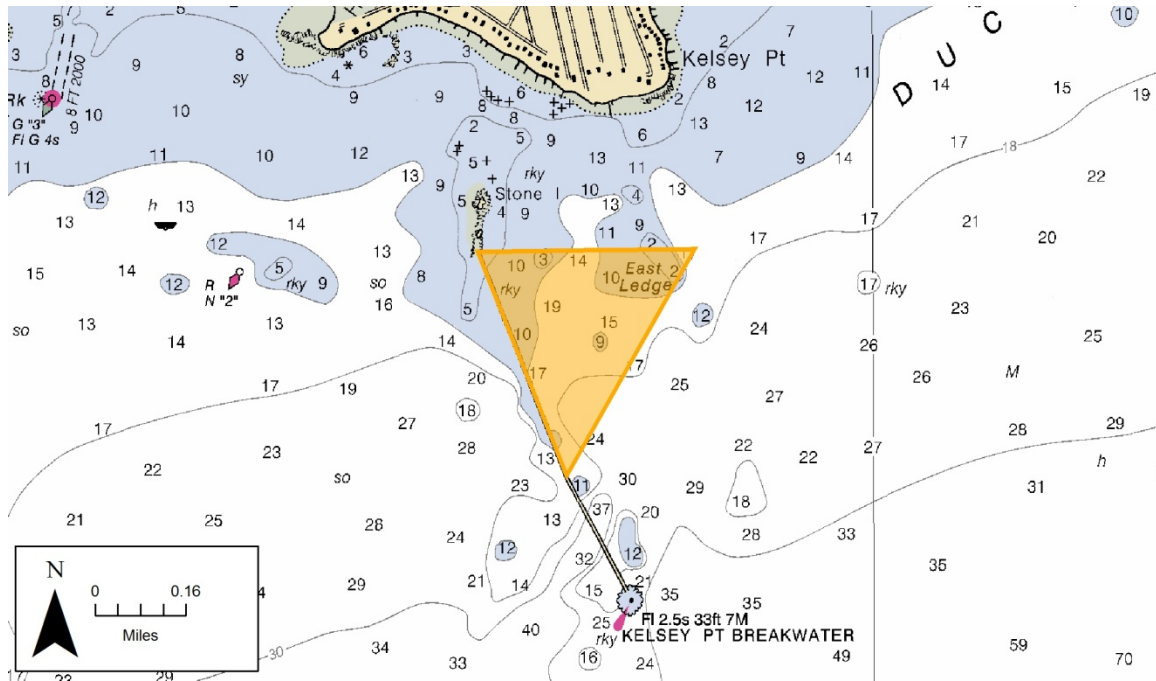
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	None documented	NA	NA	NA	-----
Historic Districts	Clinton Village Historic District inside harbor entrance, within 3/4 mile	No - resource not within CDF footprint	No - wave and current patterns at resource inside harbor not altered by CDF	-----	Potential - CDF facility could be seen from historic district site in vicinity
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative O - Clinton Harbor**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Potential - CDF could reduce sediment supply to Cedar Island Beach
Currents	----	----	Potential - increase/deflection of tidal currents in/out of Clinton Harbor
Waves	----	----	Potential - increase in local wave energy along west end of Cedar Island Beach due to interaction with CDF shoreline

**Containment Site Alternative P
Duck Island Roads CDF**

Containment Site Alternative P – Duck Island Roads CDF



Impacts to Environmental Resources -Containment Site Alternative P - Duck Island Roads

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Wetland on shore approximately 1/2 mile from site but not in immediate vicinity of site	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat on shoreline approximately 1/2 mile from site	No - resource not within project footprint	No - resource not within project footprint	----	Unlikely - resource not in immediate vicinity	Potential - short term impact to sedentary species during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of built project
Shellfish	1 species documented within 1 mile	No - resource not within project footprint	No - resource not within project footprint	----	Unlikely - sediment characteristics in nearshore habitat not expected to change	----	Unlikely - nearshore resource outside zone of increased turbidity	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107230 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	None documented	NA	NA	NA	NA	----	NA	NA
Marine Protected Areas	Hammock River March Wildlife Area north of CDF, within 1 mile	No - resource not within CDF footprint	No - resource not within CDF footprint	No - resource outside zone of influence for littoral drift created by CDF	No - resource outside zone of influence for littoral drift created by CDF	----	No - resource is in the upland	No - resource outside zone of influence for littoral drift created by CDF
Birds	6 species documented within 1 mile	----	----	----	Unlikely - habitat for shorebird species not within zone of shoreline erosion caused by wave focusing	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative P - Duck Island Roads

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	----	NA	NA	NA	----	----
Navigation Channels & Shipping	None documented	----	NA	NA	NA	----	----
Ports	None documented	NA	NA	NA	----	----	----
Coastal Structures	Kelsey Point Breakwater is western boundary of CDF; multiple groins along shoreline within 1/2 mile north of CDF	Yes - Breakwater to be incorporated into CDF	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF may cause accumulation at shoreline groins	----	No - breakwater to be incorporated into CDF dike wall	Potential - increase in wave energy along shoreline due to wave focusing may cause erosion at select shoreline groins	----
Cable/power/utility crossings	None documented	NA	NA	----	NA	NA	----
Recreational Areas	None documented	NA	NA	NA	NA	NA	NA
Commercial & Industrial Facilities	None documented	NA	----	----	----	----	----
Aquaculture	None documented	NA	NA	----	NA	NA	----
Dredge Material Disposal Sites	Clinton Harbor Disposal Site within 1/2 mile northwest of CDF	----	Unlikely - resource is too distant to receive run-off during construction	----	----	Potential - increase/channelization in ambient tidal currents between shoreline and CDF could induce scour at disposal site	----

**Impacts to Cultural Resources
Containment Site Alternative P - Duck Island Roads**

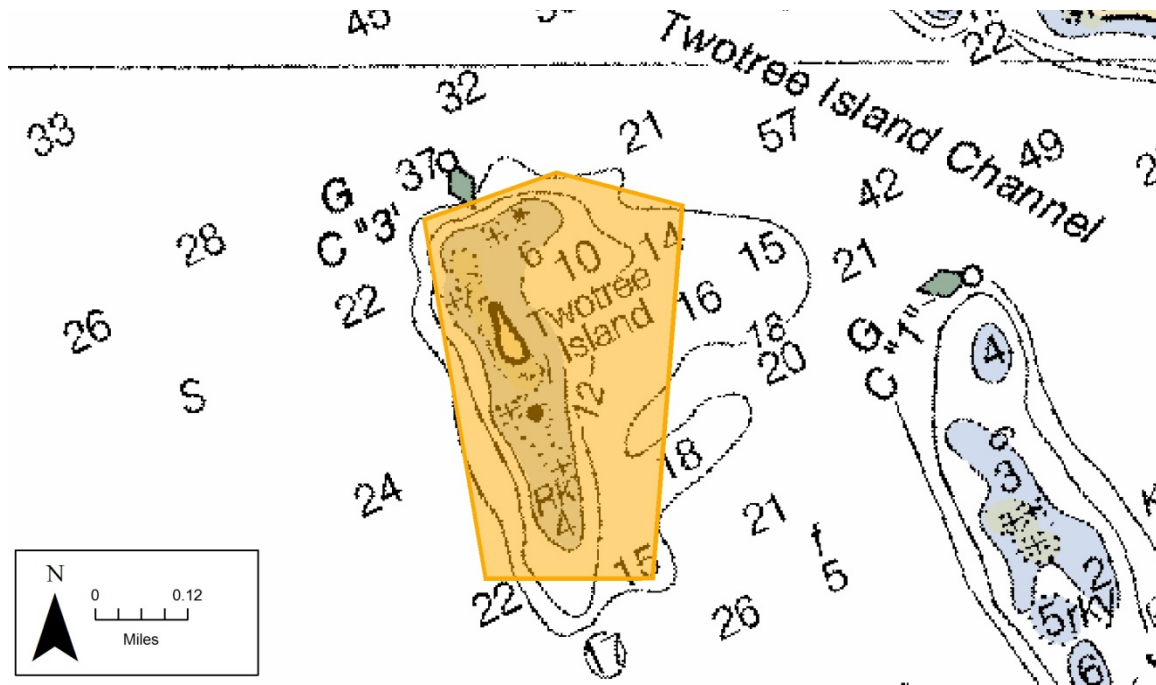
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	None documented	NA	NA	NA	-----
Historic Districts	Clinton Village Historic District inside harbor entrance	No - resource not within CDF footprint	No - wave and current patterns at resource inside harbor not altered by CDF	-----	Potential - CDF facility could be seen from historic district site in vicinity
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative P - Duck Island Roads**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Likely - decrease in rate of littoral drift along shoreline shoreward of CDF
Currents	----	----	Potential - increase/channelization in ambient tidal currents between shoreline and CDF
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure; increase/reduction in wave energy along shoreline due to wave sheltering and/or wave focusing

**Containment Site Alternative Q
Twotree Island CDF**

Containment Site Alternative Q – Twotree Island CDF



Impacts to Environmental Resources -Containment Site Alternative Q - Twotree Island

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	Wetland area at shoreline approximately 1/2 mile from site	No - resource not within project footprint	No - resource not within project footprint	Potential - change in wave action and sedimentation/erosion regime could affect shoreline habitat	Potential - change in wave action and sedimentation/erosion regime could affect shoreline habitat	----	Potential - short term impact during construction	NA
Federal & State Listed Species	Listed species habitat at shoreline within 1/2 mile of site	No - resource not within project footprint	No - resource not within project footprint	----	Potential - change in wave action and sedimentation/erosion regime could affect shoreline habitat	Potential - short term impact during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of built project
Shellfish	3 species documented in 1 mile	No - resource not within project footprint	No - resource not within project footprint	----	Unlikely - sediment characteristics in nearshore habitat not expected to change	----	Unlikely - nearshore resource outside zone of increased turbidity	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107210 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	Mapped inside CDF footprint and along nearshore areas shoreward of CDF	Potential - resource in close proximity to work area with containment structures; nearshore resources would not be impacted	Yes - resource inside CDF would be buried during site operation; nearshore resources would not be impacted	Potential - increased sedimentation from dewatering	Potential - increased wave energy caused by wave focusing could result in loss of resource	----	Potential - increased suspended sediment concentration from dewatering	Potential - decreased wave energy caused by sheltering could increase habitat area
Marine Protected Areas	None documented	NA	NA	NA	NA	----	NA	NA
Birds	6 species documented within 1 mile	----	----	----	Yes - loss of natural shoreline habitat around existing island/shoal for shore dependent species by CDF placement; potential loss of shoreline habitat from wave focusing and shoreline erosion	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative Q - Twotree Island

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	None documented	-----	NA	NA	NA	-----	
Navigation Channels & Shipping	None documented	-----	NA	NA	NA	-----	
Ports	None documented	NA	NA	NA	-----	-----	
Coastal Structures	Armoring and multiple groins and bulkheads along shoreline of Jordan Cove within 1 mile north of CDF	No - resources not within CDF footprint	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF may cause accumulation at shoreline groins	-----	No - resources not within CDF footprint	Potential - increase in wave energy along shoreline due to wave focusing may cause erosion at select shoreline groins	-----
Cable/power/utility crossings	None documented	NA	NA	-----	NA	NA	-----
Recreational Areas	Pleasure Beach and Dock Road Boat Launch within 1 mile northeast of CDF	No - resources not within CDF footprint	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF may cause accumulation at beach	No - CDF does not impinge recreational boat traffic	No - resources not within CDF footprint	Potential - increase/reduction in wave energy along shoreline due to wave sheltering and/or wave focusing	Yes - CDF visible from Pleasure Beach
Commercial & Industrial Facilities	Millstone Power Plant within 1 mile northwest of CDF	Unlikely - minor, localized effect of CDF on ambient tidal currents; though Millstone operators historically expressed concern over CDF interference with intake of cooling water	-----	-----	-----	-----	-----
Aquaculture	None documented	NA	NA	-----	NA	NA	-----
Dredge Material Disposal Sites	None documented (although Niantic Bay Disposal Site over 1 mile southwest of CDF)	-----	NA	-----	-----	NA	-----

**Impacts to Cultural Resources
Containment Site Alternative Q - Twotree Island**

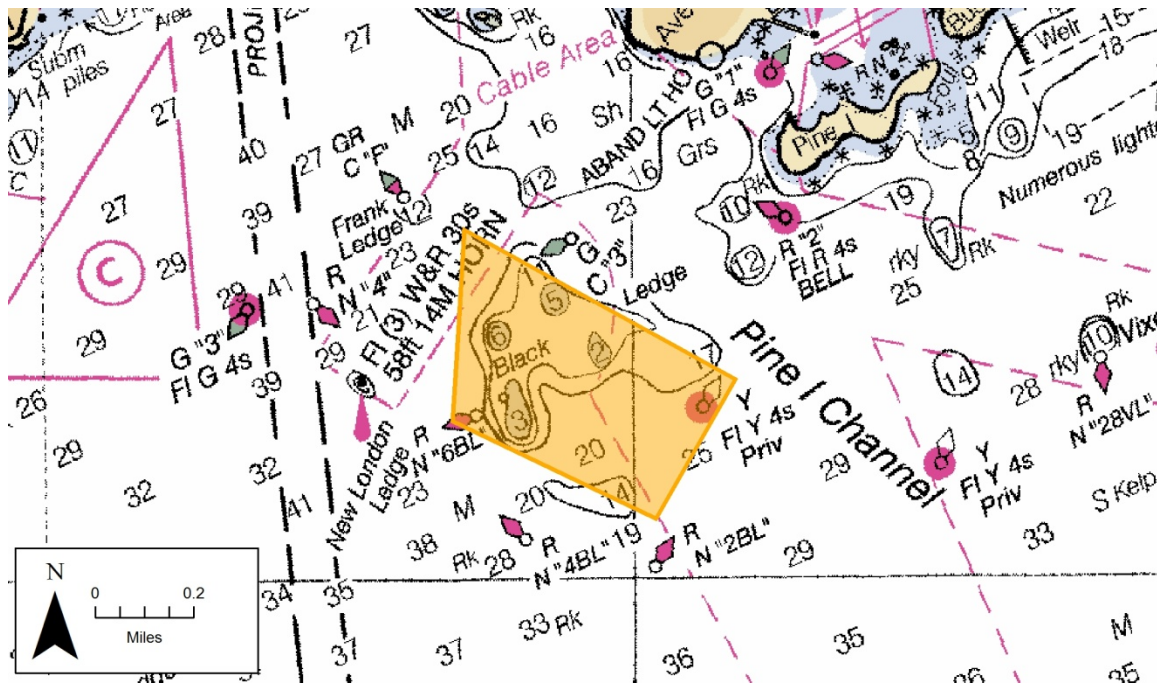
Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented north of CDF, within 1/2 mile; one documented NW of CDF, along shoreline; one documented east of CDF within 3/4 mile	No - resources not within CDF footprint	Potential - increased sedimentation at closest resource from dewatering and/or wave sheltering	No - resources not within CDF footprint	-----
Historic Districts	Millstone Point Quarry, The Seashore, and Hartford Colony Historic District along shoreline north of CDF	No - resources not within CDF footprint	Potential - increased sedimentation/erosion at shoreline due to changes in wave patterns	-----	Potential - CDF facility could be seen from historic district sites in vicinity
Archaeological Sites	None documented	NA	NA	-----	NA

**Impacts to Physical Resources
Containment Site Alternative Q - Twotree Island**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as gravel, gravel-sand, and sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF
Currents	----	----	Unlikely - minor, localized effect of CDF on ambient tidal currents
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure; increase/reduction in wave energy along shoreline due to wave sheltering and/or wave focusing

**Containment Site Alternative R
Groton Black Ledge CDF**

Containment Site Alternative R – Groton Black Ledge CDF



Impacts to Environmental Resources -Containment Site Alternative R - Groton Black Ledge

Environmental Resources	Within Influence of Site	Direct Destruction	Burial	Changes in Local Sedimentation / Erosion	Habitat Impairment	Harassment	Water Quality Impairment	Habitat Enhancement
Wetlands	None documented	NA	NA	NA	NA	----	NA	NA
Federal & State Listed Species	Listed species habitat at shoreline within 1/2 mile of site	No - resource not within project footprint	No - resource not within project footprint	----	Potential - change in wave action and sedimentation/erosion regime could affect shoreline habitat	Potential - short term impact during construction	Potential - short term impact to sedentary species	Potential - depending on characteristics of built project
Shellfish	1 species documented within 1 mile	No - resource not within project footprint	No - resource not within project footprint	----	Unlikely - sediment characteristics in nearshore habitat not expected to change	----	Unlikely - nearshore resource outside zone of increased turbidity	Unlikely - sediment characteristics in nearshore habitat not expected to change
Federally Managed Species (Magnuson-Stevens)	EFH Square 41107200 (35 species documented)	Potential - bottom dwelling species	Potential - bottom dwelling species	----	Potential - physical change in sediment characteristics or water depth	----	Potential - short term impact to sedentary species	Potential - increase in habitat diversity due to bathymetric variations
SAV (eelgrass)	Mapped along nearshore areas shoreward of CDF	No - resource not within CDF footprint	No - resource not within CDF footprint	Potential - increased sedimentation from dewatering	Potential - increased wave energy caused by wave focusing could result in loss of resource	----	Potential - increased suspended sediment concentration from dewatering	Potential - decreased wave energy caused by sheltering could increase habitat area
Marine Protected Areas	Bluff Point State Park Natural Area Preserve in upland NE of CDF, within 1 mile	No - resource not within CDF footprint	No - resource not within CDF footprint	Potential - increased shoreline erosion at resource due to wave focusing	No - resource in the upland	----	No - resource in the upland	Potential - shoreline accretion due to wave sheltering
Birds	9 species documented within 1 mile	----	----	----	Potential - loss of natural shoreline habitat for shorebird species from wave focusing and shoreline erosion	Unlikely - construction/site operation not likely to disturb mobile resource	Potential - degradation of waterfowl habitat by increased turbidity during construction or dewatering	Potential - depending on characteristics of completed project
Marine Mammals	9 species documented within 1 mile	Potential - strikes during construction and operation	----	----	Yes - loss of habitat due to CDF placement	Potential - during construction	Potential - degradation of habitat by increased turbidity during construction or dewatering	Potential - increase fisheries habitat and feeding area for mammals
Terrestrial Wildlife	None documented	NA	NA	----	NA	NA	----	NA

Impacts to Infrastructure Resources – Containment Site Alternative R - Groton Black Ledge

Infrastructure	Within Influence of Site	Direct Interference	Changes in Sedimentation Patterns	Changes in Vessel Traffic Patterns	Burial	Undermining / Erosion	Visual Impact
Mooring Areas	Pine Island and Avery Point Special Anchorage areas within 1 mile northeast of CDF; New London Anchorage C within 1 mile west of CDF; New London Anchorage E within 1 mile south of CDF	-----	No - resources not expected to be influenced by construction run-off or littoral drift	No - CDF designed around existing ledge already avoided by vessels	No - resources not within CDF footprint	-----	-----
Navigation Channels & Shipping	Entrance channel to New London Harbor and high density vessel traffic within 1/2 mile to west of CDF	-----	Potential - dewatering runoff may migrate to channel	No - CDF designed around existing ledge already avoided by vessels	No - resources not within CDF footprint	-----	-----
Ports	None documented	NA	NA	NA	-----	-----	-----
Coastal Structures	Armoring and multiple groins along shoreline of Avery Point within 1 mile north of CDF	No - resources not within CDF footprint	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF may cause accumulation at shoreline groins	-----	No - resources not within CDF footprint	Potential - increase in wave energy along shoreline due to wave focusing may cause erosion at select shoreline groins	-----
Cable/power/utility crossings	Cable area from Avery Point intersects northwestern and eastern footprint of CDF	Yes - resources within CDF footprint	Potential - dewatering runoff may migrate to other portions of cable area	-----	Yes - resources within CDF footprint	Potential - increase in local wave energy around CDF due to reflection/refraction off containment structure may scour cable area	-----
Recreational Areas	Bayberry Lane Boat Launch within 1 mile to north of CDF; Bluff Point State Park approximately 1 mile to northeast of CDF	No - resources not within CDF footprint	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF may cause accumulation at beach	No - CDF designed around existing ledge already avoided by vessels; boat ramp isolated from CDF	No - resources not within CDF footprint	Unlikely - reduction in wave energy along shoreline due to wave sheltering	Yes - CDF visible from Bluff Point State Park
Commercial & Industrial Facilities	None documented	NA	-----	-----	-----	-----	-----
Aquaculture	None documented	NA	NA	-----	NA	NA	-----
Dredge Material Disposal Sites	None documented (although New London Disposal Site over 1 mile south of CDF)	-----	NA	-----	-----	NA	-----

**Impacts to Cultural Resources
Containment Site Alternative R - Groton Black Ledge**

Cultural Resources	Within Influence of Site	Direct Destruction	Changes in Local Sedimentation / Erosion	Burial	Visual Impact
Shipwrecks	One documented north of CDF, within 1/2 mile	No - resource not within CDF footprint	Potential - increased sedimentation at closest resource from dewatering and/or wave sheltering	No - resource not within CDF footprint	----
Historic Districts	Eastern Point and Pequot Colony Historic Districts along shoreline north of CDF	No - resources not within CDF footprint	Potential - increased sedimentation/erosion at shoreline due to changes in wave patterns	----	Potential - CDF facility could be seen from historic district sites in vicinity
Archaeological Sites	One documented on Pine Island NE of CDF, within 1/2 mile	No - resource not within CDF footprint	Potential - increased sedimentation/erosion at shoreline due to changes in wave patterns	----	Potential - CDF facility could be seen from historic district sites in vicinity

**Impacts to Physical Resources
Containment Site Alternative R - Groton Black Ledge**

Physical Resources	Change in Grain Size	Change in TOC	Change in Direction, Rate, Amplitude, or Period
Sediments	Yes - CDF footprint mapped as gravel, gravel-sand, sand, and silt-clay/sand	Potential - dependent on design for final restoration	----
Littoral Drift	----	----	Potential - decrease in rate of littoral drift along shoreline shoreward of CDF
Currents	----	----	Potential - increase/deflection of tidal currents in/out of New London Harbor
Waves	----	----	Yes - increase in local wave energy around CDF due to reflection/refraction off containment structure; increase/reduction in wave energy along shoreline due to wave sheltering and/or wave focusing